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PATENT AND TRADEMARK OFFICE NOTICES

Order

Oswald H. Milmore of Mariposa, California, whose registration number is 13,989, is hereby suspended for a one-year period beginning July 15, 1977, from practice as a Patent Agent in applications before the United States Patent and Trademark Office, without prejudice to his registration upon a sufficient showing after a period of not less than one year.

This action is taken under the provisions of Section 32 of Title 35, U.S. Code, and Section 1.348, Title 37, of the Code of Federal Regulations.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

June 22, 1977.

Right of Priority (35 U.S.C. 119) Based on a Foreign Application Filed Under a Bilateral or Multilateral Treaty

Under Article 4A of the Paris Convention for the Protection of Industrial Property (21 UST 1583; 24 UST 2140; TIAS 6923, 7727; 852 O.G. 511) a right of priority may be based either on an application filed under the national law of a foreign country adhering to the Convention or on a foreign application filed under a bilateral or multilateral treaty concluded between two or more such countries. Examples of such treaties are the Hague Agreement Concerning the International Deposit of Industrial Designs, the Benelux Designs Convention, and the Libreville Agreement of September 13, 1962, relating to the creation of an African and Malagasy Industrial Property Office. The Convention on the Grant of European Patents and the Patent Cooperation Treaty will be further examples of such treaties once they enter into force.

The Priority Claim

In claiming priority of a foreign application previously filed under such a treaty, certain information must be supplied to the Patent and Trademark Office. In addition to the application number and the date of the filing of the application, the following information is required: (1) the name of the treaty under which the application was filed, (2) the name of at least one country other than the United States in which the application has the effect of, or is equivalent to, a regular national application, and (3) the name and location of the national or intergovernmental authority which received such application.

Certification of the Priority Papers

Section 119 of Title 35 of the United States Code requires the applicant to furnish a certified copy of priority papers. Certification by the authority empowered under a bilateral or multilateral treaty to receive applications which give rise to a right of priority under Article 4A(2) of the Paris Convention will be deemed to satisfy the certification requirement.

Aug. 9, 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Government Publications Subscription Service

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The Government Printing Office has the largest number of subscriptions of any activity in the United States. The Superintendent of Documents maintains about 835 mailing lists containing nearly 3 million addresses. Many of these subscribers frequently change their addresses and inform the Superintendent of Documents in a wide variety of methods. Some large organizations have as many as 20 identical subscriptions to the same street address but with different internal deliveries. Altogether the Government Printing Office is mailing nearly 5 million subscription copies each month. The Government Printing Office requests your cooperation to more effectively maintain the many mailing lists.

For your convenience, a change of address form is reproduced on the last page of the OFFICIAL GAZETTE.

BRADFORD R. HUTHER,
Acting Assistant Commissioner for Administration.

Aug. 9, 1977.

Trademark Applications Under Section 44 of The Trademark Act of 1946

[37 CFR Parts 2 and 4]

Proposed Rulemaking

AGENCY: Patent and Trademark Office, Commerce:

ACTION: Proposed rulemaking.

SUMMARY: This notice invites written comment on a Patent and Trademark Office proposal to amend the rules of practice and forms for trademark cases filed under section 44 of the Trademark Act of 1946. The proposed changes are being made because of the decision by the Court of Appeals for the District of Columbia Circuit in *SMC Corporation* v. *Langis Foods Ltd.*, 539 F. 2d 196, 190 USPQ 288 (1976). The effect of the proposed amendments is to eliminate the requirement for an allegation of use of the mark and the submission of specimens showing use of the mark in the case of applications for trademark registration which are based on a foreign application or registration. The proposed changes would require the applicant to submit a certified copy of his foreign application if he is claiming a right of priority based on that foreign application. Furthermore, the identification of goods and services may only include goods or services on which the applicant is using the mark, or has a bona fide intention to use the mark.

DATES: Comment must be received on or before November 1, 1977. Requests to speak at the hearing by October 17, 1977. Hearing date October 26, 1977. 9:30 a.m., e.d.t.

ADDRESSES: Comments may be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. All comments received will be available for public inspection in Room 11E10, Crystal Plaza, Building 3, 2021 Jefferson Davis Highway, Arlington, Va.

HEARING LOCATION: Room 11C24, Crystal Plaza, Building 3, 2021 Jefferson Davis Highway, Arlington, Va. 22202.

FOR FURTHER INFORMATION CONTACT: C. Morten Wendt, Patent and Trademark Office (703–557–3268).

SUPPLEMENTARY INFORMATION: On April 30, 1974, at 921 O.G. TM 250, notice was published that trademark applications filed under section 44 of the Act of 1946 without specimens and without a statement of use would receive a filing date conditional upon the ultimate decision in the civil action which was brought to review the decision of the Trademark Trial and Appeal Board in *John Lecroy & Son, Inc.* v. *Langis Foods Limited*, 177 USPQ 717 (1973).

The civil action was finally determined by the Court of Appeals for the District of Columbia Circuit sub nom. *SCM Corporation* v. *Langis Foods Ltd.*, 539 F. 2d 196, 190 USPQ 288 (1976). The court stated that the issue of whether an applicant filing an application under the provisions of section 44(d) of the Trademark Act need allege use of the mark was not presented to the District Court or to the Court of Appeals in the case it decided. Therefore, the issue of whether an applicant filing in application under the provisions of section 44 of the Trademark Act need allege use of the mark somewhere and submit specimens to show such use remains for determination.

The last ruling by the Patent and Trademark Office was *John Lecroy & Son, Inc.* v. *Langis Foods Ltd.*, 117 USPQ 717 (TTAB 1973) in which the Board stated "There is nothing in the Act authorizing the Patent Office to require of a

foreign applicant under section 44(d) use of his mark prior to the filing of his application in his home country * * *," page 719. The Board expressly overruled *In re Certain Incomplete Trademark Applications* 137. USPQ 69 (Comr. Pats. 1963), which held that an allegation of use of the mark somewhere and specimens were required. This reversed the ruling of *Ex parte Society Fromageries Bel*, 105 USPQ 392 (Comr. Pats. 1955), which had reversed the ruling of *Ex parte British Insulated Callender's Cables Ltd.*, 83 USPQ 319 (Comr. Pats. 1949).

The Court of Appeals in *SCM Corporation* v. *Langis Foods Ltd., supra*, held that under section 44(d) of the Trademark Act a foreign applicant obtained a constructive use date in the United States as of the filing date of the first application in a convention country.

In light of that decision, it is proposed that the Commissioner rescind the policy set forth in *In re Certain Incomplete Trademark Applications, supra*, to reflect the concept that a filing in a foreign country creates a constructive use of the trademark in the United States sufficient for filing an application under section 44(d) of the Trademark Act. Likewise, a foreign registration would be construed to be constructive use for the purpose of filing an application under section 44(e) of the Act. Accordingly, an application filed under section 44 need not allege use of the mark or be accompanied by specimens. However, the applicant filing under section 44(d) would be required to submit a certified copy of the application which is the basis of a priority claim and the applicant filing under section 44(e) must still submit a certification or certified copy of the registration in the country of origin of applicant.

The Lisbon revision of Article 4A of the Paris Convention, ratified by the United States on January 4, 1962, provides that a regular national filing in any Convention country shall give rise to a right of priority, whatever may be the subsequent fate of that application. Thus a foreign applicant may file in the United States, claiming priority under section 44(d) but relying on use in commerce rather than a registration under section 44(e).

Notice is hereby given that pursuant to the authority contained in section 41 of the Act of July 5, 1946 (60 Stat. 440, 15 U.S.C. 1123) and section 6 of the Act of July 19, 1952, as amended (85 Stat. 364, 88 Stat. 1949, 35 U.S.C. 6 as amended), the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by amending §§ 221.21, 2,39, 2.56, 4.1 and 4.7.

It is proposed to revise and amend the sections as follows (additions are indicated by arrows; deletions are bracketed):

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

1. By amending § 2.21(a) to read as follows:

§ 2.21 *Requirements for receiving a filing date.*

(a) Materials submitted as an application for registration of a mark will not be accorded a filing date as an application until all of the following elements are received:

* * * * *

(5) At least one specimen or facsimile of the mark as actually used ►, except that a specimen or facsimile is not required when § 2.39 is applicable◄;

* * * * *

2. By revising paragraphs (a) and (b) and by the addition of new paragraphs (c) and (d) to § 2.39 to read as follows:

§ 2.39 *Omission of ►allegations◄ [allegation] of use [in commerce] by foreign applicants.*

(a) The ►allegations◄ [allegation] that the mark is in use in commerce ►and that the specimens or facsimiles show the mark as actually used in connection with the goods◄, required by § 2.33(b), and the statements of the dates of applicant's first use ►and that the applicant has adopted and is using the mark shown in the accompanying drawing◄, required by § 2.33(a) (1) ►(iv)◄ (vii), and (viii), may be omitted in the case of an application filed pursuant to section 44(e) of the act for registration of a mark duly registered in the country of origin of a foreign applicant, provided the application when filed is accompanied by a ►certification or certified copy issued by◄ [certificate of] the trademark office of the [foreign] country ►of origin of applicant◄ showing that the mark has been registered in [the] ►that◄ country [of origin of the applicant] and also showing the mark, the goods for which registered and that said registration is then in full force and effect. If the ►certification or certified copy◄ [certificate] is not in the English language, a translation is required.

(b) Such allegations and statements may also be omitted in the case of an application claiming the benefit of a prior foreign application in accordance with section 44(d) of the act. The application in such case shall state the date and country of the first foreign application [and,] ►. A certification or certified copy issued by the trademark office of the country where the first foreign application was filed shall accompany the application or be submitted within such time as is specified by the office. The certification or certified copy shall show the mark, the goods for which the first foreign application was filed, and the date of filing thereof. If the certification or certified copy is not in the English language, a translation is required. Before◄ [before] the application can be considered as allowable ►in the absence of an allegation of use in commerce◄, there must be filed a ►certification or certified copy issued by◄ [certificate of] the trademark office of the [foreign] country ►of origin of applicant◄ showing that the mark has been registered in [the] ►that◄ country [of origin of the applicant] and also showing the mark the goods for which registered and the date of ►issue of the registration. If the certification or certified copy is not in the English language, a translation is required.◄ [filing of the application. In such cases the specification of goods shall not exceed the scope of that covered by the foreign registration or application.] In the event the application is based upon a subsequent regularly filed application in the same foreign country the application must so state and must show that any prior filed application has been withdrawn, abandoned or otherwise disposed of, without having been laid open to public inspection and without having any rights outstanding, and has not served as a basis for claiming a right of priority.

►(c) The foreign application or the foreign registration, which is the basis of a claim to registration under section 44(d) or 44(e) of the act, shall be deemed to be constructive use of the mark for the purpose of filing an application under the act.◄

►(d) The specification of goods identified in an application filed under section 44(d) or 44(e) of the act shall not exceed the scope of that covered by the foreign application or registration, and, furthermore, such identification of goods in the application under the act shall include only those goods on or in association with which the applicant is actually using the mark or has a bona fide intention to use the mark on the filing date of the application under the act.◄

3. By revising § 2.56 to read as follows:

§ 2.56 *Specimens.*

The application must include five specimens of the trademark as actually used on or in connection with the goods in commerce. The specimens shall be duplicates of the actually used labels, tags, or containers, or the displays associated therewith or portions thereof, when made of suitable flat material and of a size not to exceed 8½ inches (21.6 cm.) wide and 13 inches (33.0 cm.) long. ►Specimens are not required when § 2.39 is applicable, but if commercial specimens are available, the applicant is encouraged to submit such specimens.◄

PART 4—FORMS FOR TRADEMARK CASES

f. By amending the "Notes" following § 4.1 by renumbering paragraph (2) as (2)(b), paragraph (3) as (3)(b), and paragraph (5) as (5)(b) and adding subparagraphs (2)(a), 3(a), and 5(a) to read as follows:

NOTES.—[Amended]

►(2)(a) A foreign applicant relying upon section 44(d) or 44(e) of the act shall specify only those goods which are comprehended within the identification of goods of the foreign application or registration upon which he relies and on which, on the filing date of the application, he is actually using the mark or has a bona fide intention to use the mark.◄

* * * * *

►(3)(a) A foreign applicant relying upon section 44(d) or 44(e) of the act may omit the allegations of the date of first use of the mark, the date of first use of the mark in commerce and that the mark is now in use in such commerce.◄

►(5)(a) A foreign applicant relying upon section 44(d) or 44(e) of the act who does not allege use of the mark may omit specimens and an allegation that specimens showing the mark as actually used are presented with the application, but if commercial specimens are available, the applicant is encouraged to submit such specimens.◄

* * * * *

5. By amending the "Notes" following § 4.7 by renumbering paragraph (12) as (12)(a) and adding subparagraph (b) to read as follows:

NOTES [Amended]

* * * * *

►(12)(b) A foreign applicant relying upon section 44(d) or 44(e) of the act who does not allege use of the mark may omit specimens and an allegation that specimens showing the mark as actually used as presented with the application, but if commercial specimens are available, the applicant is encouraged to submit such specimens.◄

Dated: July 22, 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: August 3, 1977.

HOWARD I. FORMAN,
Acting Assistant Secretary for Science and Technology.

[FR Doc. 77-23095; Filed 8-9-77; 8:45 am]

May–July 1977 Classification Orders

The reclassifications covered by the following classification changes became effective between May 31 and July 1977.

	Class	Subclasses
Classification Order 588, effective May 31, 1977:		
Abolished	244	40-44.
Established	244	198-219.
Classification Order 589, effective May 31, 1977:		
Abolished	222	176-178.
Established	222	608-628.
Classification Order 590, effective June 21, 1977:		
Abolished	19	.32; 144.5; 161.
	28	All.
Established	19	66.1; 66.2; 161.1.
	(New) 28	100-299.
	29	4.6.
Classification Order 591, effective June 27, 1977:		
Abolished	340	172.5.
	444	All.
Established	(New) 364	200; 300; 900.
Classification Order 592, effective June 28, 1977:		
Abolished	321	All.
Established	(New) 363	1-178.
Classification Order 593, effective June 28, 1977:		
Abolished	425	242-252; 302; 305; 324; 326; 342; 387 and Digests 203-216 and 232-234.
Established	425	302.1; 305.1; 324.1; 326.1; 342.1; 387.1 and 522-595.
Title changes	425	Digest 231.

ALFRED C. MARMOR,
Administrator for Documentation,
August 10, 1977.

Patent Suits

Notices under 35 U.S.C. 290: Patent Act of 1952

2,611,813, Sharpless and Eichert, Jr., MAGNETIC DATA STORAGE SYSTEM, **filed** Sept. 19, 1966, D.C. Md. (Baltimore) Doc. 17653-W, *Technitrol, Inc.* v. *Control Data Corporation.* Case transferred to the United States Court of Appeals, Fourth Circuit, Va. (Richmond) Doc. 75-1857. Judgment, it is ordered and adjudged by United States Court of Appeals for the Fourth Circuit that the judgment of the said District Court appealed from is hereby vacated and the case is remanded for proceedings consistant with the opinion of said Court of Appeals, Mar. 8, 1977.

2,875,450, H. M. Umann, SANITARY FIXTURE; **3,196,250,** same, HOT AIR BLOWER; **3,247,524,** same, HYGIENIC APPARATUS FOR USE ON TOILET BOWLS; **3,308,847,** same, SOLENOID-OPERATED, SHUT-OFF AND REGULATOR VALVE, **filed** May 3, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1600-IH, *Rusco Industries, Inc. et al.* v. *Joseph Robinson, doing business as American Bidet Service Co.*

2,921,511. (See 2,848,914.)

2,931,284. (See 2,848,914.)

2,961,105, J. M. Shubin, REFUSE VEHICLE AND LOADING APPARATUS THEREFOR, **filed** Apr. 11, 1977, D.C., N.D. Calif. (San Francisco) Doc. C-77-733-SW, *Maxon Industries, Inc. et al.* v. *Able Body Co. Inc.*

2,998,258, A. A. Ambrose, ADAPTER FOR LATHE CHUCK AND THE LIKE, **filed** June 30, 1976, D.C., E.D. Mich. (Detroit) Doc. 76-71374, *True Grip, Inc.* v. *Sturdy Broaching Service, Inc.* Order of dismissal with prejudice as to any claim or counterclaim prior to the date of this order and without prejudice as to any claim or counterclaim which may arise subsequent to this order, Apr. 26, 1977.

3,009,235, G. De Mestral, SEPARABLE FASTENING DEVICE, **filed** May 4, 1977, D.C., S.D.N.Y., Doc. 77-C-2167, *Actief N.V.* v. *Consolidated Foods Corp.*

3,065,759, F. Lewis, HAIR STRAIGHTENING METHOD AND APPARATUS, **filed** Apr. 15, 1977, D.C., S.D.N.Y., Doc. 77-C-1832 CBM, *Frederick Lewis* v. *Clairol, Inc. et ano.*

3,168,978, Garnier, Rubet, Desroches, Marchal and Lutz, TURBOMOLECULAR VACUUM PUMP, **filed** May 2, 1977, D.C., N.D. Calif. (San Francisco), Doc. C77-888-SC, *Sargent-Welch Scientific Company* v. *Airco, Inc. et al.*

3,196,250. (See 2,875,450.)

3,206,623, A. E. Snowdon, ELECTRIC SYNCHRONOUS INDICATOR MOTOR, **filed** Apr. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1393-RJK, *The Superior Electric Company* v. *Computer Devices Corporation.*

3,212,632, Baum and Mosetich, FASTENER ASSEMBLAGE; **3,342,659,** same, METHOD OF MAKING ASSEMBLED FASTENER STRIPS, **filed** Sept. 22, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c3149, *Duo-Fast Corp.* v. *Spotnails, Inc.* Enter stipulated order dismissing cause with prejudice, Apr. 14, 1977.

3,247,524. (See 2,875,450.)

3,304,316, Geraci and Chodsky, PHENYL MERCURY SALTS OF BRANCHED CHAIN ALIPHATIC MONOCARBOXYLIC ACIDS, **filed** May 6, 1977, United States Court of Claims (District of Columbia) Doc. 250-77, *Orthopedic Equipment Company, Inc. and Marriott Corporation* v. *The United States.*

3,308,847. (See 2,875,450.)

3,316,574, R. L. Pare, ROAD EXPANSION JOINT; **Re. 26,733,** J. A. Welch, ELASTOMERIC EXPANSION JOINT, **filed** Nov. 9, 1972, D.C. Del. (Wilmington) Doc. 4514, *Robert L. Pare and The General Tire & Rubber Company* v. *Watson-Bowman Associates, Inc.* Final judgment, the complaint and counterclaim and all amendments of each herein be and the same are hereby dismissed, Apr. 25, 1977.

3,342,659. (See 3,212,632.)

3,371,455, G. C. Fox, SWIMMING POOL STRUCTURE, **filed** July 22, 1976, D.C.N.J. (Trenton) Doc. 76-1420, *Fox Pool Corp.* v. *Paul Lewis, doing business as American Pools.* Consent judgment for permanent injunction against defendant, May 4, 1977.

3,391,732, C. B. Murray, RADIATOR CONSTRUCTION, **Reg. No. 792,168** (MESABI), L & M Radiator Service, Inc., **filed** Apr. 21, 1977, D.C. Ariz. (Tucson) Doc. C-77-84-Tuc, *L & M Radiator, Inc.* v. *Industrial Radiator Service Co., Inc.*

3,427,997, Brown, Jr., Butler, Carter, Ferik and Ogle, INFLATABLE BULKHEAD FOR RAILROAD CAR; **Re. 27,615,** same, **filed** Sept. 28, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c2498, *General Foods Corporation et al.* v. *Unarco Industries, Inc.* Order cause is dismissed with prejudice, Apr. 25, 1977.

3,434,209, B. Weissman, METHOD FOR BUILDING SUPERSTRUCTURES ON DENTITION, **filed** Apr. 27, 1977, D.C., S.D.N.Y., Doc. 77-C-2089, *Ipco Hospital Supply Corp.* v. *Pulpment Corp. of America.*

3,447,278, H. W. Collins, TRUSS ELEMENT; **3,641,303,** same, METHOD AND APPARATUS FOR CONTINUOUSLY MAKING TRUSS ELEMENTS, **filed** Dec. 5, 1974 D.C., S.D. Ohio (Cincinnati) Doc. C-1-74-484, *United States of America* v. *Integrated Building Industry, Inc. et al.* Judgment entered in accordance with findings of fact and conclusions of law, Apr. 19, 1977.

3,522,814, G. R. Olson, WASHER FOR PARTS AND THE LIKE, **filed** May 2, 1977, D.C., N.D. Calif. (San Francisco) Doc. C-77-0887-RHS, *Safety-Kleen Corp.* v. *Jack C. Stephens.*

3,641,303. (See 3,447,278.)

3,713,126, J.C. Stetner, BURGLAR DETERRENT TIMING SWITCH, **filed** May 12, 1977, D.C., E.D. Mo. (St. Louis) Doc. 77-498C(2), *Novar Electronics Corp.* v. *World Finance Company.* **Same, filed** May 16, 1977, D.C., N.D. Ala. (Birmingham) Doc. 77-L-0664-S, *Novar Electronics Corporation* v. *Audio Interface Systems, Inc.*

3,724,798, J. A. Lucasey, STAND FOR SUPPORTING AN APPLIANCE, **filed** Apr. 29, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1503, *Lucasey Manufacturing Corporation* v. *Peerless Industries, Inc. and Peerless Sales Company.*

3,811,171, W. L. Grube, PIERCE NUT APPLYING TOOL; **3,999,659,** same, PIERCE NUTS IN STRIP FORM, **filed** Apr. 20, 1977, D.C., E.D. Mich. (Detroit) Doc. 77-70969, *Multifastener Corporation* v. *MacLean-Fogg Lock Nut Co.*

3,909,392, Horecky, Jr., Fahrig, Shields and McKinney, FLUID CATALYTIC CRACKING PROCESS WITH SUBSTANTIALLY COMPLETE COMBUSTION OF CARBON MONOXIDE DURING REGENERATION OF CATALYST, **filed** May 6, 1977, D.C., S.D. Tex. (Houston) Doc. CA H-77-709, *Standard Oil Co.* v. *Charter International Oil Co. et al.*

3,934,297, D.C. Hanna, OVERHEAD CAR WASHES; **3,939,516,** same, MODULE CAR WASH, **filed** Apr. 14, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77-1370-LEW, *Daniel C. Hanna* v. *Allen Group, Inc. et al.*

3,939,516. (See 3,934,297.)

3,999,659. (See 3,811,171.)

Re. 26,733. (See 3,316,574.)

Re. 27,615. (See 3,427,997.)

Reg. No. 792,168. (See 3,391,732.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 28,257, Re. S.N. 813,212, Filed July 5, 1977, Cl. 340/172.5, METHODS AND APPARATUS FOR REMOVING PARITY BITS FROM BINARY WORDS, William H. Spencer, et al., Owner of Record: *Bell & Howell Company, Chicago, Ill.,* Attorney or Agent: Luc P. Benoit, Ex. Gp.: 237

3,559,507, Re. S.N. 812,413, Filed July 1, 1977, Cl. 74/801, GEAR WRENCH, Paul Heinz Wagner, Owner of Record: *Inventor,* Attorney or Agent: Terrell C. Birch, et al., Ex. Gp.: 345

3,646,748, Re. S.N. 789,555, Filed Apr. 20, 1977, Cl. 57/149, TENDONS FOR PRESTRESSED CONCRETE AND PROCESS FOR MAKING SUCH TENDONS, Frederic A. Lang, Owner of Record: *Pic Inc., Landenburg, Pa.,* Attorney or Agent: Robert B. Washburn, Ex. Gp.: 244

3,876,652, Re. S.N. 807,055, Filed June 16, 1977, Cl. 260/302 R, CERTAIN 5-ALKOXY-4-ISOBUTYLTHIAZOLES, Alan O. Pittet, et al., Owner of Record: *International Flavors & Fragrances, Inc., New York, N.Y.,* Attorney or Agent: Arthur L. Liberman, et al., Ex. Gp.: 122

3,910,055, Re. S.N. 812,549, Filed July 5, 1977, Cl. 61/45, CABLE ATTACHMENTS, Brian Edgar Lund Biram, Owner of Record: *C. C. L. Systems Limited, Surbiton, Surrey, England,* Attorney or Agent: A. D. Caesar, et al., Ex. Gp.: 351

3,941,514, Re. S.N. 814,798, Filed July 11, 1977, Cl. 417/216, TORQUE LIMITING CONTROL, Joseph E. Louis, et al., Owner of Record: *Sundstrand Corporation, Rockford, Ill.,* Attorney or Agent: Ernest A. Wegner, et al., Ex. Gp.: 343

3,964,647, Re. S.N. 813,220, Filed July 6, 1977, Cl. 222/174, SPRAY DISPENSING DEVICE, Harry S. Dearling, Owner of Record: *Tobe Dearling, New York, N.Y.,* Attorney or Agent: Leonard J. Santisi, Ex. Gp.: 311

3,985,194, Re. S.N. 813,234, Filed July 6, 1977, Cl. 180/89 A, TILT CAB POWER STREAM AND VALVE CONTROL THEREFOR, Dale A. Knutson, Owner of Record: *Applied Power, Inc., Milwaukee, Wis.,* Attorney or Agent: John J. Byrne, et al., Ex. Gp.: 316

3,991,843, Re. S.N. 813,223, Filed July 5, 1977, Cl. 180/33 C, CYCLES, Charles Patrick Duncan Davidson, Owner of Record: *The Lucas Electrical Company Limited, Birmingham, England,* Attorney or Agent: John Clarke Holman, et al., Ex. Gp.: 316

4,011,159, Re. S.N. 814,732, Filed July 11, 1977, Cl. 210/40, METHOD OF REMOVAL OF PETROLEUM PRODUCTS FROM SOLID OR LIQUID SURFACES, Claude Stein, et al., Owner of Record: *Societe Chimique des Charbonnages, Paris, France,* Attorney or Agent: Karl W. Flocks, Ex. Gp.: 176

4,020,036, Re. S.N. 814,066, Filed July 8, 1977, Cl. 260/40 R, THERMOSETTING POLYESTER COMPOSITION CONTAINING NORMALLY SOLID CARBOXY-CONTAINING DIENE POLYMER, Aubrey South, Jr., Owner of Record: *Phillips Petroleum Company, Bartlesville, Okla.,* Attorney or Agent: Donald J. Quigg, et al., Ex. Gp.: 141, Sept. 6, 1977

PATENT NOTICES

Certificates of Correction for the Week of Sept. 6, 1977

P.P. 4,063	3,963,001	3,995,763	4,002,698	4,014,905	4,021,302	4,024,473	4,026,950
P.P. 4,064	3,963,353	3,995,813	4,003,052	4,014,996	4,021,370	4,024,516	4,027,089
Re. 29,147	3,965,437	3,995,820	4,005,877	4,015,044	4,021,533	4,024,624	4,027,344
D. 244,662	3,967,252	3,995,821	4,006,024	4,015,508	4,021,686	4,024,734	4,027,523
3,334,067	3,969,546	3,996,071	4,006,046	4,016,042	4,021,712	4,024,902	4,027,771
3,642,868	3,970,728	3,996,174	4,006,806	4,016,113	4,021,968	4,024,973	4,027,821
3,681,358	3,971,739	3,996,211	4,007,046	4,016,235	4,022,019	4,025,046	4,028,087
3,687,892	3,972,856	3,996,245	4,008,663	4,016,245	4,022,583	4,025,059	4,028,116
3,755,097	3,975,013	3,996,257	4,008,819	4,016,616	4,022,615	4,025,087	4,028,119
3,763,013	3,976,729	3,996,266	4,009,042	4,017,359	4,022,619	4,025,241	4,028,405
3,773,695	3,978,457	3,996,267	4,009,964	4,017,365	4,022,721	4,025,361	4,028,466
3,775,290	3,981,859	3,996,359	4,010,233	4,017,662	4,022,816	4,025,400	4,028,527
3,775,294	3,983,291	3,996,374	4,010,556	4,017,730	4,022,909	4,025,572	4,028,599
3,779,968	3,984,601	3,997,704	4,011,068	4,018,067	4,023,437	4,025,600	4,029,833
3,825,068	3,991,271	3,998,112	4,011,083	4,018,596	4,023,475	4,025,885	4,029,910
3,827,499	3,992,534	3,998,152	4,011,919	4,018,679	4,023,605	4,026,045	4,030,147
3,845,119	3,993,443	3,998,299	4,012,429	4,018,952	4,023,692	4,026,316	4,034,454
3,889,842	3,993,447	3,998,714	4,013,591	4,019,960	4,023,755	4,026,758	4,034,906
3,896,677	3,993,877	4,000,461	4,013,681	4,020,287	4,023,823	4,026,782	
3,916,997	3,994,237	4,001,806	4,014,194	4,020,298	4,024,215	4,026,870	
3,954,910	3,995,085	4,001,858	4,014,271	4,020,538	4,024,337	4,026,886	
3,959,327	3,995,554	4,001,882	4,014,325	4,021,032	4,024,451	4,026,947	

Disclaimers

Design No. 244,913.—*Carl Brandenfels*, Scappoose, Oreg. MOBILE KITCHEN TABLE. Patent dated July 5, 1977. Disclaimer filed July 22, 1977, by the assignee, *H.T. Products, Inc.*

The term of this patent subsequent to Dec. 9, 1989, has been disclaimed.

3,320,090.—*Lawrence Graubart*, Daly City, Calif. PHENOXY-POLYURETHANE MAGNETIC TAPE BINDER. Patent dated May 16, 1967. Disclaimer filed July 11, 1977, by the assignee, *Ampex Corporation*.

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

3,992,508.—*Shigeru Saitoh, Tetsuya Watanabe, Koji Konno*, and *Tadashi Nakamura*, Iwaki, Japan. METHOD OF REMOVING NITROGEN OXIDES FROM A GAS CONTAINING NITROGEN OXIDES. Patent dated Nov. 16, 1976. Disclaimer filed May 31, 1977, by the assignee, *Kureha Kagaku Jogyo Kabushiki Kaisha*.

The term of this patent subsequent to Nov. 9, 1993, has been disclaimed.

Dedication

3,725,126.—*Willis D. Haller*, St. Paul, and *Raymond M. Colline*, Oakdale, Minn. MAGNETIC RECORDING TAPE. Patent dated Apr. 3, 1973. Dedication filed June 14, 1977, by the assignee, *Minnesota Mining and Manufacturing Company*.

Hereby dedicates to the Public the remaining term of said patent.

Disclaimer and Dedication

3,882,646.—*Gene A. Stritzel*, Webster, N.Y. GRINDING WHEEL ASSEMBLY HAVING MULTIPLE GRINDING SURFACES FOR SELECTIVE ENGAGEMENT WITH A WORKPIECE. Patent dated May 13, 1975. Disclaimer and dedication filed July 20, 1977, by the assignee, *The Gleason Works*.

Hereby disclaims and dedicates to the Public all claims of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 2, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-23-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-3-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-19-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-12-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-14-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-29-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	4-14-70
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during July 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,943,327 to 2,947,000, inclusive
Plant Patents..... Numbers 1,957 to 1,962, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED SEPTEMBER 6, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T962,001
PREPARATION OF DICALCIUM PHOSPHATE FROM PHOSPHATE ROCK BY THE USE OF SULFUR DIOXIDE, WATER, AND CARBONYL COMPOUNDS

John F. McCullough; John F. Phillips, Jr., and Leslie R. Tate, all of Florence, Ala., assignors to Tennessee Valley Authority

Filed Oct. 6, 1976, Ser. No. 730,210
Int. Cl.² C01B *15/16, 25/26;* C05B *11/14*
U.S. Cl. 423—307
1 Sheets Drawing. 33 Pages Specification

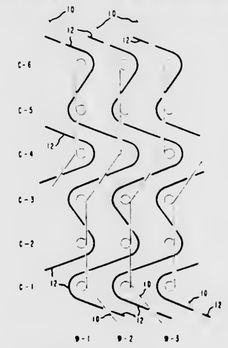
Dicalcium phosphate is prepared from phosphate rock by a process which comprises reacting phosphate rock with sulfur dioxide and an organic carbonyl compound for 0.5 to 10 hours while maintaining the temperature of the reaction mixture below 50° C. The reaction yields a mixture of gangue, solid calcium α-hydroxy sulfonate and soluble dicalcium phosphate. The solids are separated from the liquid and P_2O_5 values adhering to the solid are washed free with a mixture of carbonyl, water, and sulfur dioxide. The wash effluent is recycled to the process and both carbonyl and some sulfur dioxide are recovered from the filter cake by heating it. The offgas from the heated filter cake is recycled to the process and the dry filter cake, now largely calcium sulfite hemihydrate, is discarded.

Dicalcium phosphate is precipitated from the reaction mixture filtrate in high yield by partially distilling sulfur dioxide from the filtrate. The precipitated anhydrous dicalcium phosphate is separated from the liquid and dried. Offgas from this drying process as well as both distillate and filtrate is returned to the process. Thus, the only starting materials consumed in the process are phosphate rock and sulfur dioxide. All carbonyl is recovered for recycle.

T962,002
ELASTIC WARP KNIT FABRIC

Francis Paul Moore, 1903 Harwyn Road, Wilmington, Del. 19810

Filed Apr. 4, 1977, Ser. No. 784,455
Int. Cl.² D04B *21/18*
U.S. Cl. 66—195
1 Sheets Drawing. 6 Pages Specification

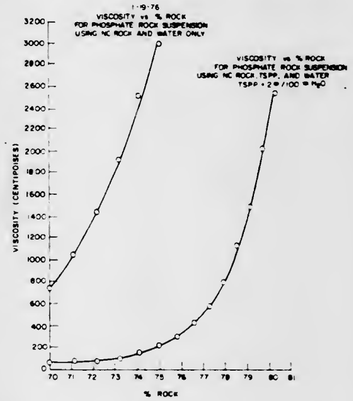


A Raschel warp knit structure of elastic (12) and non-elastic (10) yarns which produce a two-way stretch fabric. The new and unique feature of this invention is the stitch used to produce the fabric. The stitch consists of two groups of three chain stitches of non-elastic yarn into which is interlaced an elastic yarn. The elastic yarn traverses laterally in its path through the fabric to connect three adjacent wales.

T962,003
CONCENTRATED PHOSPHATE ROCK-WATER SUSPENSION FERTILIZER

Cecil P. Harrison, Florence, Ala., assignor to Tennessee Valley Authority

Filed Sept. 30, 1976, Ser. No. 728,304
Int. Cl.² C05B *13/02*
U.S. Cl. 71—33
2 Sheets Drawing. 16 Pages Specification



Processes for preparing concentrated phosphate rock-water suspension fertilizer with exceptionally satisfactory handling and storage properties are disclosed. Although there are various parameters in the processes that can be varied, they may, for the sake of convenience, be categorized in two embodiments. In the first embodiment, the process involves the blending together of water, fine-ground phosphate rock, and a small amount of a particle dispersant in proportions so that the final product contains 70–78 percent by weight of phosphate rock. In the second embodiment, the process involves the use of specialized procedures in the blending of water, fine-ground phosphate rock, gelling-type clay, and small amounts of dispersant and gelling agents in preparation of final product suspension containing 60 percent by weight of phosphate rock.

T962,004
METHOD OF PREPARING SILVER HALIDE GRAINS OF IMPROVED PHOTOGRAPHIC AND HANDLING CHARACTERISTICS

Claude G. Dostes; Dany C. Dubromel, and Jean-Francois Le Guen, all c/o Kodak Pathe, Vincennes, France

Continuation of Ser. No. 637,491, Dec. 3, 1975, abandoned. This application Mar. 29, 1977, Ser. No. 782,572
Int. Cl.² G03C *1/28, 1/30*
U.S. Cl. 96—110
No Drawing. 17 Pages Specification

A method is disclosed of forming silver halide grains capable of forming a surface latent image upon exposure to visible light. The grains are formed by incorporating from 10^{-6} to

10^{-10} mole of iridium per mole of silver before first ripening. The iridium is incorporated in the presence of a water soluble purine base or a water soluble salt thereof.

T962,005

SIMPLY INSTALLED FLOOR TILE

Homer Breault, Pine Glen, and Alvin E. Witt, both of Media, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 651,680, Jan. 23, 1976, abandoned. This application Mar. 23, 1977, Ser. No. 780,551
Int. Cl.² E04F *15/10*
U.S. Cl. 156—71
No Drawing. 9 Pages Specification

Instead of following the conventional practice of removing the previous floor covering of sheet linoleum, floor tiles or the like, the floor tiles of the present invention are so remarkably thin that they are laid on top of the old flooring while still providing adequate clearance for doors, drawers, and related items imposing limits on the floor elevation. The principal layer has a thickness of organic composition from 0.005 inch (5 mils) to 0.040 inch (40 mils) and the cured transparent polyurethane top layer is at least 0.001 inch (1 mil) and not more than 10 mils in thickness. The combination of principal layer and top layer has a thickness from 0.010 to 0.045 inch. By keeping the flooring so thin, its usefulness for installation over existing flooring without exceeding the available clearance is enhanced.

T962,006

PHOTOPOLYMERIZABLE POLYMERIC COMPOSITIONS CONTAINING AROMATIC DIACRYLATES

James G. Pacifici, Rte. 16, Heatherwood; Raymond D. Clark, 532 Dogwood Drive, both of Kingsport, Tenn. 37663, and Gordon C. Newland, 1917 E. Sevier Ave., Kingsport, Tenn. 37664

Continuation of Ser. No. 653,808, Jan. 30, 1976, abandoned. This application Jan. 6, 1977, Ser. No. 757,180
Int. Cl.² C08F *2/46*
U.S. Cl. 204—159.23
No Drawing. 16 Pages Specification

The invention relates to photopolymerizable polymeric compositions useful as coating and moldable compositions which are hardenable by ultraviolet radiation. These coating and moldable compositions comprise mixtures of photopolymerizable or photocrosslinkable acrylates of bis-(hydroxyalkyl) terephthalates and isophthalates in combination with at least one ethylenically unsaturated monomer component and a photoinitiator.

T962,007

TREATMENT OF TRANSITION METAL COMPOUND

Anthony David Caunt; Alan Branford Newton, both of Welwyn Garden City; Ian Gabriel Williams, Letchworth, and Michael Stanley Fortuin, Chester, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 18, 1976, Ser. No. 733,408
Claims priority, application United Kingdom, Oct. 29, 1975, 44633/75; Apr. 29, 1976, 17490/76; Apr. 29, 1976, 17491/76
Int. Cl.² C08F *4/64*
U.S. Cl. 252—429 B
No Drawing. 20 Pages Specification

According to the present invention (1) a titanium trihalide is ground in the presence of from 5 up to 75% molar, relative to the titanium trihalide, of (2) a Lewis Base compound which is an organo-phosphorus compound of the formula

$$R_1R_2R_3P(O)_a$$

and either (a) from 1 up to 50% molar, relative to the titanium trihalide, of a titanium tetrahalide and/or (b) from 0.2 up to 50% molar, relative to the titanium trihalide, of an oxidizing agent, wherein when a titanium tetrahalide is present, the molar quantity of the organo-phosphorus compound is at least equal to the molar quantity of the titanium tetrahalide.

The titanium halides (1) and (a) are preferably the chlorides. Suitable forms of titanium trichloride are obtained by the reduction of titanium tetrachloride with hydrogen, titanium metal, aluminum metal or an organo-aluminium compound. It is preferred to use a material of the type, titanium trichloride/aluminium chloride, such as is obtainable by the reduction of titanium tetrachloride with aluminium metal.

In the organo-phosphorus compound, R_1 is conveniently an alkyl group containing 2 to 10 carbon atoms. The groups R_2 and R_3 can be alkyl, aryl, cycloalkyl, alkaryl or aralkyl groups. Preferably, R_2 and R_3 are both alkyl groups and preferably R_1, R_2 and R_3 are all the same, for example, butyl as in tributylphosphine and tributylphosphine oxide.

Suitable oxidizing agents include oxygen gas or halogen-containing materials such as chlorine gas, carbon tetrachloride, hexachlorocyclopentadiene, stannic chloride, phosphorus pentachloride and iodine.

The product produced by grinding (1), (2) and either (a) and/or (b) above may be admixed with (A) to form an olefin polymerization catalyst, wherein

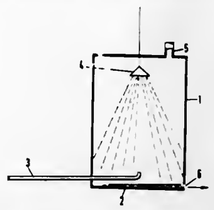
(A) is at least one organo-metallic compound of aluminium or of a non-transition metal of Group IIA of the Periodic System, or a complex of an organo-metallic compound of a non-transition metal of Group IA or IIA of the Periodic System and an organo-aluminium compound. That polymerization catalyst may be modified by the addition of a Lewis Base which is effective to modify the stereospecificity of the catalyst and/or a substituted or unsubstituted polyene.

T962,008

METHOD OF TREATING POLYMER LATICES

Bala Perampalam Chandra, Huntingdon; Jeffrey Chester Greaves, and Victor Gordon Lovelock, both of Welwyn Garden City, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 4, 1976, Ser. No. 728,994
Claims priority, application United Kingdom, Oct. 13, 1975, 41848/75
Int. Cl.² C08F *6/16*
U.S. Cl. 528—500
1 Sheets Drawing. 13 Pages Specification



In accordance with the invention, a method of continuously treating an aqueous latex of a synthetic polymer contaminated with unreacted residual monomer used in the production of the polymer, comprises feeding the aqueous latex as a spray into a vessel defining a chamber so that all or a substantial quantity of the droplets of spray avoid contact with the side wall of the chamber, and contacting the falling spray with steam flowing counter-current thereto, whereby residual monomer is separated from the latex and is removed with the flow of steam leaving the chamber. Preferably at least 80% by weight of the droplets of spray avoid contact with the side wall of the chamber. Apparatus which includes the vessel and means to provide a flow of steam up the chamber to contact the falling spray is also disclosed.

In this method all or most of the spray falls directly to the bottom of the chamber without touching the side wall of the chamber. In this way foaming difficulties are avoided. The droplets of spray are contacted by the rising steam and monomer is removed with the steam flow. The latex which collects in the bottom of the vessel may be removed by any convenient method, e.g. by allowing it to run out of the chamber by gravity or by pumping it out of the chamber.

The chamber used in this method is conveniently defined by a wide cylindrical tube, the spray being introduced through a spraying head at the top of the tube. The size of the chamber used will depend, inter alia, on the required residence time of the latex in the chamber; the efficiency of monomer removal will depend on the residence time of the latex at a particular contact temperature. In this method a plurality of such chambers may be operated sequentially or contemporaneously.

The steam is preferably introduced into the chamber through a single injection point positioned at or near the bottom of the chamber although one or more injection points intermediate of the top and bottom of the vessel may be used as well.

The temperature of the steam before injection into the chamber may be within the range 60°–150° C, but is preferable at or near 100° C. The temperature of the steam inside the chamber may be adjusted by varying the pressure inside the chamber below atmospheric pressure, although for convenience, the pressure inside the chamber is often atmospheric so that the temperature of steam inside the reaction is at or near 100° C and this is a satisfactory arrangement for the treatment of many latices.

The method of the invention is especially suitable for the removal of vinyl chloride monomer from a homo- or copolymer of vinyl chloride.

T962,009

REDUCTION OF 2-ACYL-1-NAPHTHOLS TO 2-ALKYL-1-NAPHTHOLS

Robert Benson Fugitt, 23 Alwyn Road, Newark, Del. 19713

Continuation-in-part of Ser. No. 672,725, April 1, 1976, abandoned. This application Mar. 25, 1977, Ser. No. 781,105
Int. Cl.² C07C *39/14*
U.S. Cl. 260—624 C
No Drawing. 9 Pages Specification

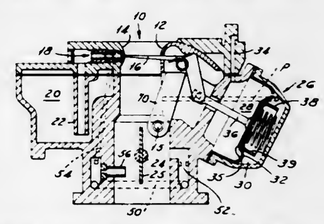
Hydrogenation of 2-acyl-1-naphthols at 200 to 1000 pounds per square inch and 115° to 200° C. in the presence of a copper chromite catalyst produces the corresponding 2-alkyl-1-naphthols. These compounds are useful in the synthesis of 2-alkyl naphthoquinone miticides.

T962,010

VARIABLE VENTURI CARBURETOR IDLE SPEED FUEL CONTROL

Frank T. Newbury, Barnsfield, High Easter Road, Dunmow, Essex, and Terence Inkpen, 7 Oakwood Court, Althorne, Chelmsford, Essex, both of England

Continuation of Ser. No. 670,475, March 25, 1976, abandoned. This application Feb. 18, 1977, Ser. No. 770,161
Int. Cl.² F02M *9/06*
U.S. Cl. 261—41 D
2 Sheets Drawing. 12 Pages Specification



A variable area venturi carburetor has a movable venturi wall with a fuel metering rod attached for cooperation with aligned main and auxiliary fuel jets located in an opening in the fixed venturi wall, a bypass passage connected between the jets siphoning or bleeding off fuel at closed throttle positions into a passage connected to the induction passage just below the closed position of the throttle valve, to prevent stalling of the engine by fuel flow into the main venturi at this time.

T962,011

COEXTRUDED LAMINATE

Roland O. Muehlner, Houston, Tex., assignor to Shell Oil Company

Filed Apr. 25, 1977, Ser. No. 790,529
Int. Cl.² B32B *27/08*
U.S. Cl. 428—517
No Drawing. 7 Pages Specification

A laminate having improved adhesion between sheets comprises at least one sheet of a first sheet composed of a high monoalkenyl arene content polymer and at least one sheet of a second sheet composed of block copolymers of monoalkenyl arenes and conjugated dienes, said block copolymer containing about 0.1 to about 10 percent by weight of a fatty acid amide, said first and second sheets being formed by coextrusion. In a preferred embodiment, the high monoalkenyl arene content polymer is polystyrene, the block copolymer is a styrene-butadiene copolymer, and the fatty acid amide is ethylene bis stearylamide.

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,382
MULTIFILAMENT YARNS FOR REINFORCING ARTICLES

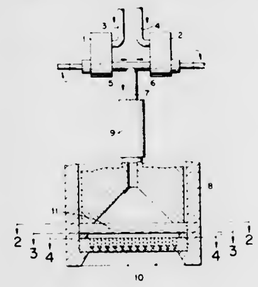
Wilhelmus J. Fontijn, Dieren, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Original No. 3,447,308, dated June 3, 1969, Ser. No. 663,812, Aug. 28, 1967. Continuation-in-part of Ser. No. 580,817, Sept. 20, 1966, abandoned. Application for reissue Mar. 1, 1972, Ser. No. 230,815

Claims priority, application Netherlands, Oct. 6, 1965, 6512918; Aug. 28, 1966, 6612628

Int. Cl.[2] D02G *3/04*; D01D *7/04*

U.S. Cl. 57—140 R 12 Claims



1. Yarn consisting of a plurality of composite filaments, each filament comprising at least two different incompatible synthetic linear high polymers, one polymer functioning as a matrix and the other consisting of a multiplicity of continuous ultrafine cores distributed substantially uniformly throughout the longitudinal body of the matrix each core being characterized by its uniformity in cross-sectional dimension and the cross-sectional dimensions from core to core being of the same order of magnitude, said cores being further characterized by their substantially continuous nature.

Re. 29,383
DIGITAL FLUID FLOW RATE MEASUREMENT OR CONTROL SYSTEM

Robert A. Gallatin, Redondo Beach, and Addison W. Langill, Jr., Balboa, both of Calif., assignors to Process Systems, Inc., Salt Lake City, Utah

Original No. 3,875,955, dated Apr. 8, 1975, Ser. No. 432,158, Jan. 10, 1974. Application for reissue Jan. 31, 1977, Ser. No. 764,339

Int. Cl.[2] G01G *1/00*

U.S. Cl. 137—14 62 Claims

1. A digital fluid flow rate measurement or control system comprising:

a source of fluid at a first pressure;

a fluid receiver at a second pressure lower than the first pressure;

a plurality of individually actuatable, value weighted digital bistable valve elements interconnecting the source to the receiver, each valve element assuming exclusively either an open state in which fluid flows from the source through the valve element to the receiver or a closed state in which no fluid flows from the source through the valve element to the receiver such that the resultant fluid flow rate from the source to the receiver is a function of the product of a flow rate determinative fluid parameter times the sum of the weighted values of the digital valve elements in the open state;

means for sensing the fluid parameter and generating a first signal representative of the value of the fluid parameter;

means responsive to the value of the fluid parameter and the



states of the digital valve elements for generating a second signal representative of the value of the resultant fluid flow rate; and

means responsive to one of the signals for controlling the states of the digital valve elements so as to maintain constant the value represented by the one signal.

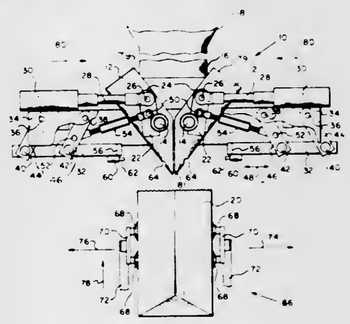
Re. 29,384
EXPANDING FILL SPOUT FOR BAG FILLING MACHINE

Doyle R. Hudson, West Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Original No. 3,750,721, dated Aug. 7, 1973, Ser. No. 172,688, Aug. 18, 1971. Application for reissue Aug. 1, 1975, Ser. No. 601,248

Int. Cl.[2] B65B *1/04*

U.S. Cl. 141—10 8 Claims



8. A method for rapidly and automatically filling a bag with

a plurality of objects from a *split sleeve* filling spout *with clamps positioned about it* comprising the steps of:

a. positioning the bag below the *split sleeve* filling spout;

b. automatically raising the bag upwardly towards the *split sleeve* filling spout while opening the bag and positioning the upper portion of the bag around the *split sleeve* filling spout;

c. automatically *pivoting the split sleeves of the filling spout outwardly while horizontally and positively driving the clamps inwardly against the bag and hence the bag against the outwardly pivoted split sleeves and thereby* holding the upper portion of the raised bag around the *split sleeve* filling spout *in positively driven clamping engagement* while detecting the presence of a bag around the filling spout;

d. filling the raised bag when the detector signals the presence of a raised bag around the *split sleeve* filling spout;

e. releasing the held bag and removing the filled bag downwardly away from around the filling spout.

Re. 29,385

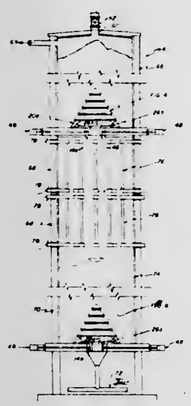
GRAVITY DISCHARGE APPARATUS

Frank J. Miksitz, Phillipsburg, N.J., assignor to Universal Feeders, Inc., Bethlehem, Pa.

Original No. 3,809,286, dated May 7, 1974, Ser. No. 216,105, Jan. 7, 1972. Application for reissue May 7, 1976, Ser. No. 684,192

Int. Cl.² B65G *65/70*

U.S. Cl. 222—1 **15 Claims**



10. Apparatus for conveying granular material by gravity assist from a mass thereof supported on a horizontal wall provided with a discharge opening, said apparatus comprising: a shroud disposed above the discharge opening with at least the lower end of the shroud being disposed within the mass of material; a plate disposed between said shroud and said discharge opening, said plate being of smaller horizontal dimensions than said bottom wall and having at least one vertically facing aperture in register with the discharge opening; and means for orbiting said plate about a vertical axis in a manner such that the aperture in said plate remains in register with the discharge opening and such that a peripheral portion of the plate will slide under a quantity of material and then carry at least a portion of that quantity inwardly toward said aperture whereby material continuously flows inwardly to said aperture along a path which moves around the periphery of said aperture.

Re. 29,386

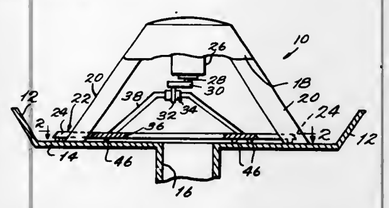
GRAVITY DISCHARGE APPARATUS

Frank J. Miksitz, Phillipsburg, N.J., assignor to Alfred L. Miksitz, Bethlehem, Pa.

Original No. 3,874,566, dated Apr. 1, 1975, Ser. No. 467,558, May 6, 1974. Continuation-in-part of Ser. No. 216,105, Jan. 7, 1972, Pat. No. 3,809,286. Application for reissue May 7, 1976, Ser. No. 684,190

Int. Cl.² B65D *83/06*

U.S. Cl. 222—404 **12 Claims**



10. Apparatus for conveying granular material by gravity assist from a mass thereof supported on a horizontal wall provided with a discharge aperture, said apparatus comprising: a shroud disposed above the discharge aperture with at least the lower end of the shroud being disposed within the mass of material; a feed plate disposed between said shroud and said discharge aperture, said feed plate being of smaller horizontal dimensions than said horizontal wall and having at least one vertically facing feed aperture in register with the discharge aperture, said feed aperture being of greater area than said discharge aperture so that a portion of the upper surface of said horizontal wall is exposed within said feed aperture; and means for orbiting said feed plate about a vertical axis in a manner such that the feed aperture remains in register with the discharge aperture and such that a peripheral portion of the feed plate will slide under a quantity of material and then carry at least a portion of that quantity inwardly toward said feed aperture whereby material continuously flows inwardly to said aperture along a path which moves around the periphery of said aperture and whereby the material is then pushed over the edge of the discharge aperture in the form of a continuous stream.

Re. 29,387

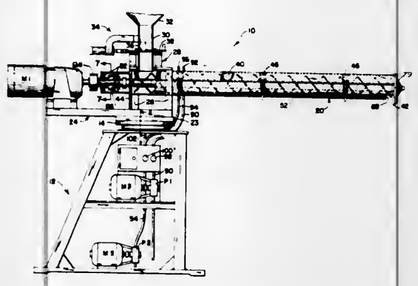
APPARATUS FOR THE CONTINUOUS MIXING OF GRANULAR MATERIALS

Robert S. Lund, Elmhurst, Ill., assignor to Pettibone Corporation, Chicago, Ill.

Original No. 3,730,487, dated May 1, 1973, Ser. No. 175,047, Aug. 26, 1971. Application for reissue Dec. 23, 1976, Ser. No. 753,808

Int. Cl.² B01F *7/04*

U.S. Cl. 259—6 **13 Claims**



1. In a mixing apparatus for granular material, in combination, an elongated mixing trough providing a longitudinal flow path and having a receiving and a discharge end, a pair of parallel companion shafts rotatable in said trough, a plurality of axially spaced sloping parallel interrupted-elliptical disk-like mixing blades on each shaft, the blades on the two shafts having equal but reverse pitch angles and being disposed in transverse pairs, said blades, in one position of the shafts, projecting predominately laterally in the same direction, the maximum radial projection of the blades from the shaft being slightly less than the distance between said shafts, and means for rotating said shafts in unison and in opposite directions whereby the blades of each pair traverse a common portion of said flow path alternately.

Re. 29,388

GLASS COMPOSITIONS AND FIBERS MADE THEREFROM

Alan W. Atkinson, Rochdale, England, assignor to Turner & Newall Limited, Manchester, England

Original No. 3,969,121, dated July 13, 1976, Ser. No. 647,988, Jan. 9, 1976. Continuation-in-part of Ser. No. 441,984, Feb. 13, 1974, abandoned. Application for reissue Jan. 13, 1977, Ser. No. 759,237

Claims priority, application United Kingdom, Feb. 14, 1973, 7151/73

Int. Cl.² C03C *13/00, 3/04*; C04B *31/06*

U.S. Cl. 106—50 **21 Claims**

1. A glass composition, having improved chemical resistance to alkali attack, consisting essentially of:

from 50 to 75 percent by weight Silica

from 10 to 25 percent by weight R_2O

from [1] *7* to 15 percent by weight Titania

from 1 to 20 percent by weight Zirconia

from 0.8 to 20 percent by weight Rare Earth Oxide

from 0 to 20 percent by weight Boric Oxide

from 0 to 10 percent by weight R¹O

from 0 to 1 percent by weight Fluorine (as fluoride)

from 0 to 2 percent by weight Al_2O_3

from 0 to 1 percent by weight P_2O_5

from 0 to 1 percent by weight Chlorine (as chloride)

wherein R_2O is selected from the group consisting of Na_2O, K_2O, mixtures thereof, and mixtures thereof containing up to 5% by weight lithium oxide (based on the total weight of the composition) and R¹O is selected from the group consisting of MgO, CaO, BaO, and SrO, and mixtures of two or more thereof.

Re. 29,389

METHOD OF PREPARING ALUMINUM ORGANOIODIDES

George G. Merkl, 46 Sunset Court, Haworth, N.J. 07641

Original No. 3,856,841, dated Dec. 24, 1974, Ser. No. 345,659, Mar. 28, 1973. Application for reissue Oct. 28, 1975, Ser. No. 626,237

Int. Cl.² C07F *5/06*

U.S. Cl. 260—448 A **16 Claims**

1. A method of forming an aluminum organoiodide comprising the steps of forming a reactive aluminum by permeating highly pure aluminum in the presence of a hydrogen ion source with another metal having an atomic volume close to that of hydrogen, and subsequently, reacting the reactive aluminum with a combination of iodine and an organic compound selected from the group consisting of [alcohol, ketone, aldehyde, phenol, glycol, and carboxylic acids] *an alcohol, a ketone, an aldehyde and a carboxylic acid* whereby said aluminum organoiodide is formed.

Re. 29,390

ELECTRIC DISCHARGE TUBE, COMPRISING A HIGHLY LOADED ANODE

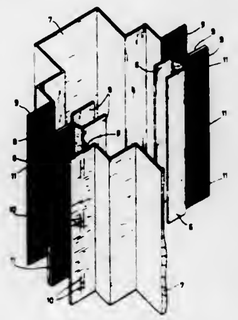
Hendrikus Willemina Evers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Original No. 3,866,076, dated Feb. 11, 1975, Ser. No. 418,583, Nov. 23, 1973. Application for reissue Jan. 12, 1976, Ser. No. 648,309

Claims priority, application Netherlands, Dec. 29, 1972, 7217782

Int. Cl.² H01J *1/46, 21/10*

U.S. Cl. 313—293 **4 Claims**



1. An electronic tube comprising an anode assembled of at least one inner anode member exposed to a higher thermal load and an outer anode member exposed to a lower thermal load, said inner anode member having surface portions placed against corresponding surface portions of said outer anode member and, at a temperature of about 500 degrees centigrade, said surface portions of the inner anode member having a coefficient of thermal radiation which [exceeds the coefficient of the facing surfaces of the outer anode member by] *is* at least 60 percent *of that of a black body.*

Re. 29,391

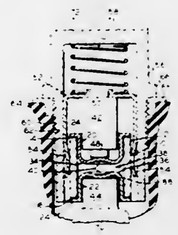
SURGE PROTECTOR ASSEMBLY

Chester J. Kawiecki, Santa Barbara, Calif., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.

Original No. 3,543,207, dated Nov. 24, 1970, Ser. No. 781,134, Dec. 4, 1968. Application for reissue Nov. 20, 1972, Ser. No. 308,294

Int. Cl.² H01H *79/00*; H02H *3/22*

U.S. Cl. 337—28 **15 Claims**



1. A surge protector assembly comprising:

a unitary surge protector including a pair of aligned conductive electrodes each comprising a hollow cylindrical member having a first closed end wall with the opposite end being open and flared to provide an annular flange, and a ceramic spacer cylinder sealed between the flanges of said electrodes for positioning said electrode end walls in facing relation internally of said cylinder forming an arc

discharge gap therebetween, said spacer cylinder forming an enclosure with said electrodes,

elongated contact members within each said hollow cylindrical member and bearing on the inside of the electrode end wall in the direction of the opposite electrode, said contact members each extending outwardly past the electrode's annular flange,

a cylindrical holder within which said protector is received in substantially coaxial relation with respect to said holder, said holder being provided with a spring at one end thereof bringing pressure against one of said contact members urging the same against its corresponding electrode end wall,

and a base member receiving said holder, said base member being provided with means for matingly engaging the exterior of said holder in supporting relation, and for providing outside electrical connection for said contact members.

PLANT PATENTS

GRANTED SEPTEMBER 6, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,097

ST. AUGUSTINE GRASS

Jake T. Gruis, Apopka, Fla.; Terrance P. Riordan, Dublin, and John A. Long, Marysville, both of Ohio, assignors to The O.M. Scott & Sons Company, Marysville, Ohio

Filed Aug. 13, 1976, Ser. No. 714,203
Int. Cl.[2] A01H *5/12*
U.S. Cl. Plt.—88 **1 Claim**

1. A St. Augustine grass, substantially as herein illustrated and described.

4,098

CARNATION PLANT NAMED MATADOR

David A. Krapes, Arvada, Colo., assignor to Denver Wholesale Florists Company, Denver, Colo.

Filed Oct. 7, 1976, Ser. No. 730,659
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—73 **1 Claim**

1. A new and distinct variety of carnation plant substantially as herein shown and described, characterized by its distinct high crowned dark red flowers which are borne on long and sturdy stems, its profuse production of blossoms during its blooming period, and by its very small amount of bullheading.

4,099

CARNATION PLANT NAMED GEORGIA ANN

Vincent P. Quinn, Denver, Colo., assignor to Denver Wholesale Florists Company, Denver, Colo.

Filed Oct. 12, 1976, Ser. No. 731,832
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct variety of carnation plant substantially as herein shown and described, characterized by its profuse production of white spray-type inflorescence, the flowers being of a relatively small size but high centered with alternate whorls of incised and ruffled petals.

4,100

CARNATION PLANT NAMED APACHE

Anthony Euser, Broomfield, Colo., assignor to Denver Wholesale Florists Company, Denver, Colo.

Filed Oct. 12, 1976, Ser. No. 731,833
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct variety of carnation plant, substantially as herein shown and described, characterized by the randomly variegated purple on white coloration of its flowers, and by the profuse production of spray-type blooms on strong upright stems.

PATENTS

GRANTED SEPTEMBER 6, 1977

ERRATA

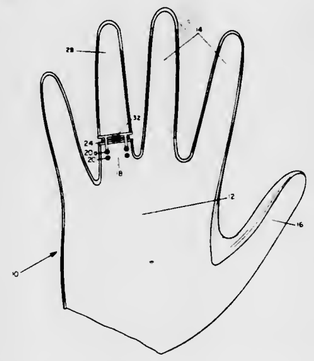
For CLASS	See PATENT NO.
361–098	4,045,887
060–521	4,045,978
029–623.1	4,046,062
165–105	4,046,193
206–611	4,046,313
293–088	4,046,411
428–539.5	4,046,517
526–310	4,046,750
544–148	4,046,762
548–339	4,046,773
560–121	4,046,801
560–061	4,046,802
560–172	4,046,803
264–022	4,046,842
264–022	4,046,843
423–239	4,046,888
361–045	4,047,079
363–049	4,047,089
363–034	4,047,090
363–059	4,047,091
363–135	4,047,092
331–016	4,047,121
364–900	4,047,157
364–900	4,047,158
364–900	4,047,159
364–900	4,047,160
364–200	4,047,161
364–200	4,047,162
358–047	4,047,200
364–200	4,047,201
358–029	4,047,202
358–044	4,047,203
358–093	4,047,204
358–107	4,047,205
354–152	4,047,206
354–155	4,047,207
354–203	4,047,208
354–212	4,047,209
354–238	4,047,210
354–258	4,047,211
354–270	4,047,212
354–299	4,047,213
354–155	4,047,222

PATENTS

GRANTED SEPTEMBER 6, 1977

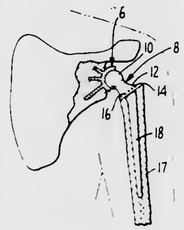
GENERAL AND MECHANICAL

4,045,824
GLOVE FOR RING DISPLAY
Millie T. Weppler, 6324 77th St., Middle Village, N.Y. 11379
Filed June 11, 1976, Ser. No. 695,166
Int. Cl.[2] A41D *19/00*
U.S. Cl. 2—163 **5 Claims**



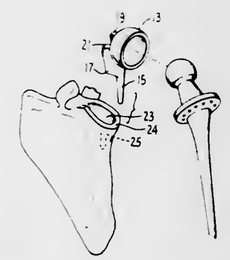
1. A glove comprising a palm portion, a back portion, a plurality of finger stalls and a thumb stall, at least one of said finger stalls being open at the distal end thereof, said open finger stall being of a length short of contacting the knuckles of the finger, a pair of longitudinally spaced apart first and second closure means disposed on the outer surface of said open finger stall, a hollow finger capping member having one closed end and one open end, said member being adapted to receive the finger exposed by said open finger stall, at least one tab member on said capping member, cooperating third closure means on said tab member adapted to engage said first or second means, said capping member contacting and covering the two knuckles on said exposed finger, whereby when said first means is engaged an annular slot is defined between said capping member and said open stall thereby exposing a portion of the finger thereon and thus a ring worn thereon.

4,045,825
HUMERUS PROSTHESIS
Jerome H. Stroot, 2645 Ocean Ave., San Francisco, Calif. 94132
Filed Jan. 28, 1976, Ser. No. 653,277
Int. Cl.[2] A61F *1/24, 1/02, 1/04*
U.S. Cl. 3—1.91 **1 Claim**



1. In a shoulder prosthesis, a humeral component having a superior side when implanted in the humerus bone that faces towards the front side thereof, said humeral component comprising in combination:
   a. a first end terminating in a spherical ball, sized and shaped for fitting in a shoulder socket,
   b. a shoulder offset from said ball by about the diameter of the ball, said shoulder having a superior surface lying in the plane of said superior side and including a disclike edge terminating in a substantially flat surface substantially at a right angle to the principal axis of the ball,
   c. said shoulder having a plurality of holes adjacent said edge on at least said superior surface thereof, whereby sutures can be passed through said holes to enhance fixation of one or more of the tendons of the rotator cuff, namely supraspinatus, subscapularis, infraspinatus and teres minor tendons to bone and
   d. a shaft opposite said first end having a size and shape for attaching said humeral components in the medullary canal of the humerus.

4,045,826
GLENOID COMPONENT FOR SHOULDER PROSTHESIS
Jerome H. Stroot, 2645 Ocean Ave., San Francisco, Calif. 94132
Filed Feb. 9, 1977, Ser. No. 766,878
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **1 Claim**



1. A glenoid component for a shoulder prosthesis comprising:
   a. a hemispherical cup;
   b. a pin extending outwardly from the outer surface of said cup;
   c. a wedge-shaped member extending at right angles to said pin;
   d. a pair of reinforcing ribs extending upwardly from the pin and the wedge and being attached to the outer surface of the hemispherical cup;
   e. providing a symmetrical glenoid component adapted to be used in either shoulder.

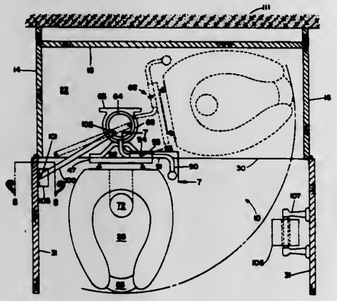
4,045,827
COMBINATION LAVATORY AND TOILET ASSEMBLY
Earl L. Morris, Whittier, and Larry D. Fields, La Puente, both of Calif., assignors to Acorn Engineering Company, Industry, Calif.
Filed Dec. 6, 1976, Ser. No. 747,521
Int. Cl.[2] A47K *4/00*
U.S. Cl. 4—3 **28 Claims**

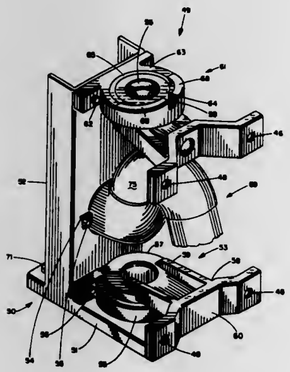
1. A combination lavatory and toilet assembly, comprising:
   a. an enclosure having a rear side with a plurality of apertures therein, an upper side including means defining a lavatory basin with a drain opening therein and communicable with a plumbing drain pipe, a front side defining an access opening closed by a pivotally mounted closure member;
   b. a relatively pivotable toilet adapted to be stored in a first position within the enclosure and being pivotable about a

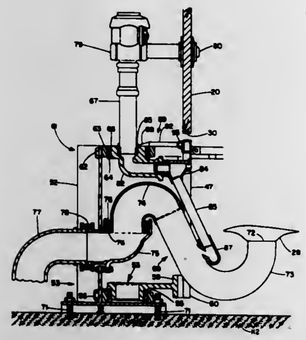
generally vertical axis to a second position disposed exteriorly of the enclosure to permit use thereof;

c. toilet support and pivot means fixedly coupled to the rear portion of the toilet for supporting the toilet independently of the plumbing piping and for pivotal movement between the first and second positions and including:

means for coupling the outlet of the toilet in fluid communication with the plumbing drain; wherein the toilet support and pivot means is independent of the enclosure; and







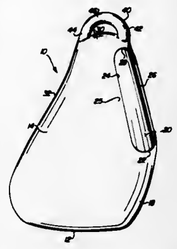
d. linkage means operatively connected to the closure member and the toilet support and pivot means, whereby when the closure member is moved away from its closure position, the toilet is moved from the first position within the enclosure to a second position disposed exteriorly of the enclosure to permit use thereof when the closure member has been displaced no greater than substantially ninety degrees from its closure position.

4,045,828

FEMALE URINAL APPARATUS

Emily A. Burnham, P.O. Box 246, Enterprise, Utah 84725

Filed Feb. 6, 1976, Ser. No. 656,065
Int. Cl.² A47K *11/00*; A61G *9/00*; E03D *13/00*
U.S. Cl. 4—110 **3 Claims**



1. Female urinal receptacle apparatus, comprising, in combination:

a flat, generally tear shaped base;

first side wall means and second side wall means secured to the base and extending upwardly from the base and inwardly towards each other from the base;

a front wall secured to the base and extending upwardly and forwardly from the base and secured to and extending between the first side wall means and the second side wall means;

a back wall secured to the base and to the first and second side wall means and extending generally upwardly and forwardly from the base;

top means secured to the back wall and to the first and second side wall means;

a vertically elongated opening above the front wall and between the first and second side wall means remote from the back wall and extending upwardly and rearwardly from the front wall to the top means;

transition areas adjacent the opening extending from the opening to the first side wall means and the second side wall means; and

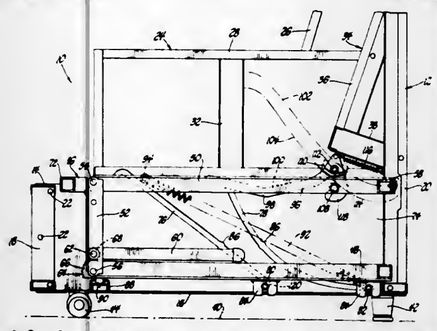
the base, first and second side walls, front wall, back wall, opening, transition areas, and top defining a vertically elongated receptacle having an apex adjacent the front, and increasing in width toward the back to fit the female anatomy, and having a maximum width adjacent the base and a minimum width adjacent the top means to provide stability in use.

4,045,829

SOFA BED ASSEMBLY

William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed July 26, 1976, Ser. No. 708,912
Int. Cl.² A47C *17/14*
U.S. Cl. 5—18 R **16 Claims**



1. A furniture assembly movable between a sitting configuration and a bed configuration comprising:

a support frame;

a foldable bed frame supported by said support frame and movable between a folded and an unfolded position, said bed frame including an inner frame member supported by said support frame and an outer frame member pivotally movable between an extended position wherein it is generally coplanar with respect to said inner frame member and a folded position wherein it is located above said inner frame member, said inner and outer frame members defining a space therebetween when in said folded position for containing bedding material;

guide means interconnecting said support frame and said bed frame for guiding the movement of said bed frame between a stored position within said support frame and a deployed position in which said bed frame may be moved to the unfolded position; and

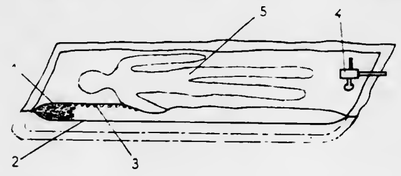
closure means operative when said bed frame is in the folded position and is being moved from the deployed to the stored position for engaging and forcing said outer frame member to follow a predetermined route whereby said bedding material is prevented from causing said outer frame member to interfere with said support frame during such movement.

4,045,830

SYSTEM OF PROTECTION BY MODELING

Jean Loeb, Strasbourg, and Bernard E. Plantif, Saint Medard Enjalles, both of France, assignors to Societe Nationale des Poudres et Explosifs, France

Filed Mar. 24, 1975, Ser. No. 561,029
Claims priority, application France, Mar. 27, 1974, 74.10536
Int. Cl.² A47C *4/54*; A61G *7/08*; A47C *7/14*
U.S. Cl. 5—81 R **13 Claims**



5. A system of protection by modeling or immobilization or both hich comprises at least one flexible and leakproof envelope, a plurality of resilient and deformable bodies within said envelope, means permitting to create a vacuum inside said envelope, said envelope consisting of two separate, elastic skins, joined together so as to insure the leakproofness of said envelope; said means permitting to create a vacuum comprising a gas generator, a pump placed downstream of said generator, the pump having an ejector, said generator communicating with the ejector of said pump, a suction orifice in said envelope in communication with the collector of said pump through a non-return valve, wherein each envelope is equipped with means for breaking up the imbrication of said resilient and deformable bodies when the fluid pressure which prevails outside said envelope is restored inside the envelope.

4,045,831

BED SHEET

William F. Clark, Apt. 202, 49051 Denton Road, Belleville, Mich. 48111

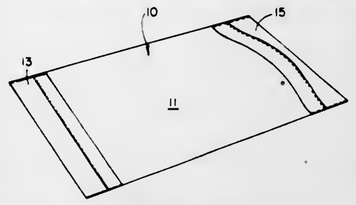
Filed Sept. 17, 1975, Ser. No. 614,344
Int. Cl.² A47G *9/00*
U.S. Cl. 5—334 R **1 Claim**

1. An improved bedsheet for covering a mattress comprising:

a fabric panel which is substantially the same length as said mattress, substantially the same width as the blanket to be used with said sheet and substantially wider than said mattress,

a pair of facing, open pockets at opposite ends of said fabric panel, each of said pockets being deep and wide enough to receive an end of the flattened blanket to be used with said sheet,

one of said pockets being capable of being adapted to enclose the foot portion of said mattress and the other of said pockets being capable of receiving and enclosing the head



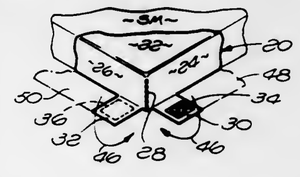
portion of said blanket such that movement of a sleeping person is insufficient to pull the blanket out of the pocket thereby preventing said person from coming into contact with the blanket.

4,045,832

FITTED SHEET CONSTRUCTION

Paula Anne DiForti, and Thomas DiForti, both of 20892 Queens Park Lane, Huntington Beach, Calif. 92646

Continuation-in-part of Ser. No. 522,376, Nov. 8, 1974, abandoned. This application May 13, 1976, Ser. No. 686,444
Int. Cl.² A47G *9/00*
U.S. Cl. 5—334 C **11 Claims**



1. A fitted sheet of material adapted to cover a cushion, said sheet comprising:

a sheet of material having at least an upper panel and at least two side panels, said upper panel and side panels being adapted to cover portions of the upper surface and portions of adjacent side surfaces of said cushion, respectively, when said sheet of material is fitted over said cushion;

said sheet of material having a cut out portion which allows movement of a lower portion of the cushion through the cut out portion; and

means mounted on the sheet of material adapted to removably connect said upper and side panels around said cushion lower portion, at least a portion of said securing means being adapted to pass under said cushion lower portion when said sheet of material is fitted on said cushion and to connect said side panels together to maintain said side panels in substantially fixed relationship to each other so that said sheet of material follows the natural contour of said cushion, whereby said sheet of material is maintained in position on said cushion.

4,045,833

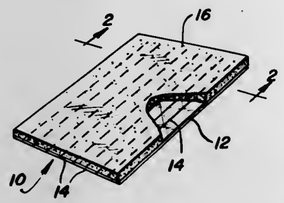
ABSORBENT BED PAD

Frederick K. Mesek, Downers Grove, and Virginia L. Repke, Oak Forest, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 386,114, Aug. 6, 1973, abandoned. This application May 30, 1975, Ser. No. 582,479
Int. Cl.² A61F *13/16*
U.S. Cl. 5—335 **12 Claims**

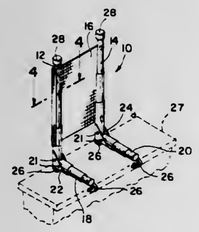
1. An absorbent pad comprising: a through-bonded, nonwoven fabric having given overall concentration of long fibers and short fibers, said fabric being enriched in long fibers in excess of said given overall concentration at one face and being

enriched in short fibers in excess of said given overall concentration at the other face, and having a transition of fiber concentration between said faces; and a liquid-impervious backing sheet adhered to said short fiber-enriched face throughout the



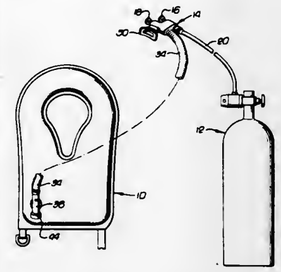
interface therebetween, said fabric face enriched in long fibers being an outermost face of said absorbent pad, said fabric face enriched in long fibers being an outermost face of said absorbent pad.

4,045,834
BACK-REST ATTACHMENT
David R. Mason, 4162 Dearborn St., East Chicago, Ind. 46312
Filed Sept. 8, 1976, Ser. No. 721,359
Int. Cl.² B63B *29/00*
U.S. Cl. 9—7 **1 Claim**



1. A back-rest attachment for a boat seat comprising:
first and second rods substantially disposed in a first plane and spaced from, and co-extensive with one another, each of said rods having first and second ends, respectively;
a fabric disposed between said first and second rods, and attached thereto;
third and fourth rods substantially disposed in a second plane and co-extensive with one another, having third and fourth ends, respectively, said third ends of said third and fourth rods being pivotably attachable to said first ends of said first and second rods, respectively, for said second plane to subtend a range of angles from approximately 0° to 90°;
first and second hinges connectable to said first and third, and said second and fourth rods, respectively, having snap-in means for holding said third and fourth rods in stabilized first and second positions, said second plane being substantially parallel with said first plane in said first position, and substantially perpendicular thereto in said second position; and
clip means attachable to said third and fourth rods for clipping the back-rest attachment to a board or the like. and wherein each of said rods is telescopically collapsible for said backrest attachment to be foldable into a collapsed position, and the folded fabric to be usable as a handle, and further comprising first and second caps attachable to said second ends of said first and second rods, respectively, and wherein each of said rods has selectable extended and collapsed positions and including snap-in means for keeping each of said rods in the selected position of said extended and collapsed positions.

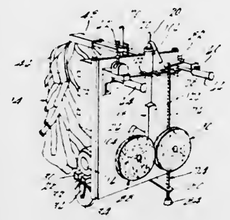
4,045,835
POWER DEFLATOR MECHANISM FOR SCUBA BUOYANCY VESTS
Fred Flam, Los Angeles, and Dennis L. Hart, Hacienda Heights, both of Calif., assignors to Under Sea Industries, Inc., Compton, Calif.
Filed Aug. 30, 1976, Ser. No. 718,908
Int. Cl.² B63C *9/24*
U.S. Cl. 9—313 **9 Claims**



1. In a buoyancy control apparatus for a scuba diver:
a. a buoyancy vest having an inflatable and deflatable chamber;
b. a control unit having a supply passage in communication with said vest chamber and having an inlet passage cooperable with a source of high pressure gas, as from the source of breathable gases used by the diver;
c. said control unit including a normally closed inflation valve for conducting high pressure gas to said supply passage, said valve including a digitally engageable actuator;
d. means forming an aspirating passage in continuous communication with said vest chamber and having an inlet side and an outlet side on opposite sides of a restriction;
e. means forming a jet at the inlet side of said aspirating passage;
f. a normally closed valve at the outlet side of said aspirating passage;
g. said control unit including a normally closed deflation valve for conducting air from said supply passage to the ambient, said deflation valve including another digitally engageable actuator;
h. aspirating valve means operable only upon extended movement of said deflation valve actuator for supplying said jet with a stream of high pressure air.

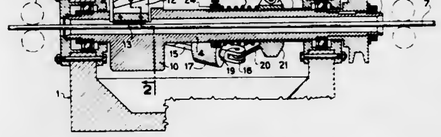
4,045,836
AUTOMOBILE POLISHING APPARATUS
Robert M. Glenn, 1410 Clarendon, Bloomfield Hills, Mich. 48013
Filed Jan. 29, 1976, Ser. No. 653,633
Int. Cl.² B60S *3/06*
U.S. Cl. 15—4 **9 Claims**

1. Automobile polishing apparatus comprising a main frame, wheel mounted on the frame supporting it for rolling movement about the automobile, a large polishing wheel mounted on the frame for rotation about a vertical axis and adapted to polish the side panels and the front and rear of the automobile, portable rotatable polishing means mounted on said frame and adapted to be hand-held for use in polishing the upper surfaces of the automobile including the top, the hood and the deck, means mounted on said main frame for rotating said polishing wheel and means connected to said polishing means for rotating it, wherein said means mounted on said main frame and said last named means each include an electric motor, a first electric switch for controlling the supply of electric power to said motor of said means mounted on said main frame, a second electric switch for controlling the supply of electric power to the electric motor of the last named means, common means for supply electric power to both of said switches including elec-



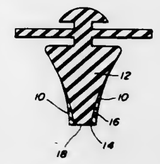
tric cord means for connection to a suitable source of external power, a vertically disposed rotatable shaft having ring contacts connected to said electric cord means, and brush contacts connected to said switches whereby said cord means will not become twisted in moving the polishing apparatus around automobiles in the polishing thereof.

4,045,837
MACHINE FOR POLISHING RODS OR WIRES
Christian Maurice Mandras, Revigny-sur-Ornain, France, assignor to Societe Metallurgique de Revigny, Revigny-sur-Ornain, France
Filed Feb. 2, 1976, Ser. No. 654,498
Claims priority, application France, Feb. 13, 1975, 75.04450
Int. Cl.² B08B *9/02*; B24B *39/04*
U.S. Cl. 15—104.04 **9 Claims**



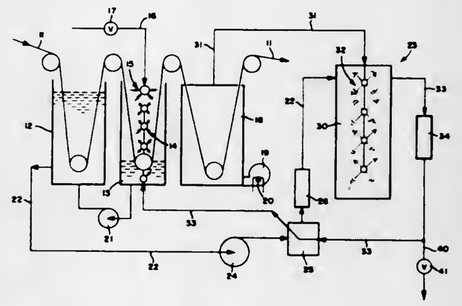
1. A machine for polishing non-rotating rods or wires of metal, comprising in combination: a fixed frame, a hollow tubular element which is mounted to be rotatable in the frame and defining a bore for receiving the rod to be polished, which rod extends coaxially inside the element for axial movement through the element, pressure-applying means actuatable by centrifugal force and mounted on the tubular element, radially movable polishing means carried by the pressure-applying means to be radially applicable against the rod by the pressure-applying means, and means for driving the tubular element and the pressure-applying means in rotation, the pressure-applying means comprising a support mounted on the tubular element to rotate with the tubular element but to be axially movable relative to the tubular element, a plurality of first links equally spaced apart angularly about the tubular element, a pivot pin pivotably mounting each first link on the tubular element, the polishing means being pivotably mounted on each first link on one side of the pivot pin, a slidable weight carried by each first link on an opposite side of the pivot pin to said polishing means and as many second links as there are first links and respectively associated with said first links, each second link having one end portion pivoted to the support and an opposite end portion pivoted to a respective one of said first links on said opposite side of the pivot pin.

4,045,838
SURFACE LAYER FOR WINDSHIELD WIPER BLADES
Raymond P. Porter, North Dartmouth, Mass., assignor to Acushnet Company, New Bedford, Mass.
Filed Mar. 15, 1976, Ser. No. 667,163
Int. Cl.² B60S *1/38*
U.S. Cl. 15—250.36 **23 Claims**



1. A flexible windshield wiper blade, the basic blade of which has a coefficient of friction on at least the sides of the lip of the blade of no greater than about 2.1 according to Friction Test CFRP 113, said basic blade being selected from the group consisting of those blades which inherently have a coefficient of friction of no greater than about 2.1, those blades which have a coefficient of friction above 2.1 and which have been treated to reduce their coefficient of friction so that it is no greater than 2.1, and those blades which have a coefficient of friction above 2.1 which have been coated to reduce their coefficient of friction so that it is no greater than 2.1, at least one coating on said sides of the lip extending all the way to the lip edge, said at least one coating having a coefficient of friction greater than the coefficient of friction of said surface of said basic blade and said coating being selected from the group consisting of those elastomeric and plastic materials having a Young's modulus of from about 10^6 to about 10^{11} dynes/cm², said coating being of a thickness effective to reduce the number of streaks the coated blade will give in Wipe Test WT-1 as compared to the number of streaks given by said basic blade.

4,045,839
APPARATUS FOR RECYCLING PHOTOGRAPHIC WASH WATER
Harry N. Parsonage, Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Division of Ser. No. 462,884, April 22, 1974, Pat. No. 3,997,347.
This application Sept. 30, 1976, Ser. No. 728,166
Int. Cl.² G03D *3/02*
U.S. Cl. 15—302 **3 Claims**



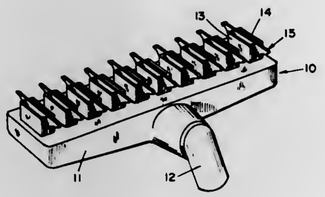
3. Apparatus for washing film developed by a photographic process comprising:
a. A first means, including a tank means for holding recycled wash water, for rinsing said film by immersing said film in said water,

b. A second means for rinsing said film by spraying recycled wash water on said film,
c. A third means for rinsing said film by spraying fresh, relatively uncontaminated, un-recycled water on said film,
d. A means for drying said film to remove any moisture on said rinsed film,
e. Means for collecting the spent rinse water from said second and third rinsing means,
f. Means for passing said spent rinse water from said second and third rinsing means to said first rinsing tank means for inclusion with said recycled wash water,
g. Means for passing the spent wash water from said first rinsing means to a reactor means for oxidizing the thiosulfate salts from said fix solution in said spent wash water to sulfate salts,
h. Means for passing the spent dryer air from said dryer means to said reactor means,
i. Reactor means comprising a reaction vessel and carbon particles having surface portions in contact with polytetrafluoroethylene resin without being completely encapsulated by said resin for reacting the thiosulfates in said spent wash water and the oxygen in said spent dryer air in the presence of said carbon particles to convert said thiosulfates to sulfates and to convert said spent wash water to sulfate water to be recycled, and
j. Means for passing said recycled water back to said second rinsing means for reuse as recycled wash water.

4,045,840
VACUUM CLEANER TOOL FOR CLEANING DEEP PILE CARPETS

Erik Karl Gustav Johansson, Sollentuna, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed July 28, 1975, Ser. No. 599,594
Claims priority, application Sweden, Aug. 28, 1974, 7410912
Int. Cl.² A47L 9/06
U.S. Cl. 15—397 **7 Claims**

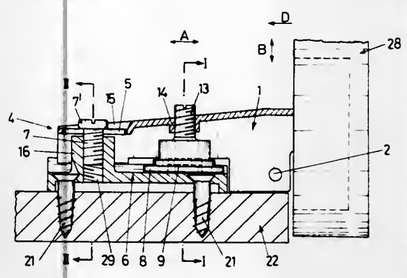


1. A vacuum cleaner tool attachable to a source of negative pressure and for use with deep pile carpets or the like comprising an elongated tool housing which is operatively connected to said source of negative pressure, a plurality of suction nozzles each communicating with said tool housing, extending generally in a plane perpendicular to the underside of said housing, a terminating on an air intake opening plurality of surface engaging runners provided on the same side of said housing as said nozzles and each having a bottom surface thereof located at a greater distance below the underside of said housing than the air intake openings of said nozzles, each of said runners bridging a respective suction nozzle and disposed in a plane that is generally perpendicular to the length direction of said tool housing, and each of said runners dividing the respective suction nozzles in substantially equal sections whereby said runners slide in the direction of movement of said tool on the carpet work surface raising the pile and improving dirt removal from the interior of said carpet.

4,045,841
HINGE

Erich Röck, Kuferstrasse 1085, A-6973 Hochst, and Bernhard Mages, Harte 10, A-6850 Dornbirn, both of Austria

Filed Apr. 5, 1976, Ser. No. 673,893
Claims priority, application Austria, Apr. 7, 1975, 2623/75; Dec. 2, 1975, 9174/75
Int. Cl.² E05D 7/04
U.S. Cl. 16—129 **18 Claims**

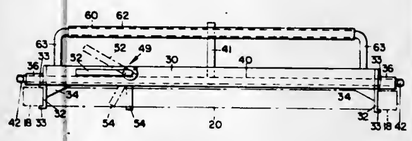


1. A hinge arrangement comprising, in combination, a base plate attachable to furniture means; a hinge arm carrying toggle joint means and being anchorable in said base plate; said toggle joint means having pivot means; said hinge arm having means for mounting said pivot means at one end of said hinge arm; said hinge arm having a longitudinal slot at another end of said hinge arm spaced from said mounting means for said pivot means of said toggle joint means; screw means passing through said slot and carried in said base plate; said hinge arm including a holding shoulder between said longitudinal slot and said mounting means for said pivot means; projecting means on said base plate, said holding shoulder gripping behind said projection means on said base plate.

4,045,842
DETACHABLE HANDLE FOR AIDING IN THE MANIPULATION OF TRANSPORT CARTS

Roland Theriault, 123 Babbs Road, West Suffield, Conn. 06093

Filed Aug. 13, 1976, Ser. No. 714,105
Int. Cl.² B60D 3/00
U.S. Cl. 16—114 R **5 Claims**

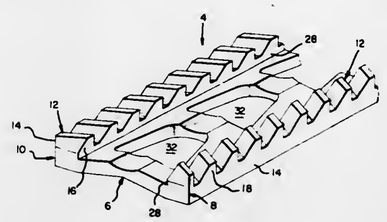


1. In a detachable handle for a transport cart of the type having upstanding end members with vertical corner legs having horizontal cross members extending therebetween, the combination of: a main support bar, inboard and outboard clamps projecting outwardly from the ends of the support bar for gripping the vertical corner legs of the transport cart, and bearing means projecting outwardly relative to the main support bar for gripping a selected one of the cross members.

4,045,843
BUNDLE TIE DEVICES AND MATERIAL

Winfield Warren Loose, Linglestown, and Anthony Francis Thomas, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 1, 1976, Ser. No. 719,641
Int. Cl.² B65D 63/00
U.S. Cl. 24—16 PB **10 Claims**

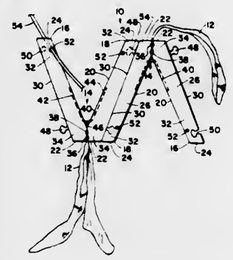


1. A continuous length of bundle tie material comprising:
a continuous strip of plastic material having parallel side edges,
said strip having holes therein at evenly spaced intervals, said holes being centrally located mid-way between said side edges and being symmetrical with respect to the longitudinal axis of said strip,
one surface of said strip having thereon two bands of relatively fine ratchet teeth, each band extending along one of said side edges,
said holes being sufficiently large to permit passage therethrough of an end portion of said strip which has been folded along said longitudinal axis with said bands facing outwardly of the folded end portion whereby,
a section of said strip can be used as a bundle tie device by folding one end of said section along said longitudinal axis with said bands facing outwardly, wrapping said section around said bundle, threading said folded end through one of said holes in said strip, and pulling said folded end until said bundle is held by said section, said relatively fine ratchet teeth in said bands cooperating with edges of said hole to provide a ratchet mechanism for said tie.

4,045,844
SOCK LOCK DEVICE

David P. Murray, 53 George St., Watertown, Mass. 02172

Filed June 2, 1976, Ser. No. 692,093
Int. Cl.² A44B 21/00
U.S. Cl. 24—81 DM **4 Claims**

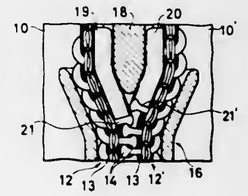


1. A sock lock device adapted to maintain at least two pairs of socks together during a washing and a drying operation on a clothesline, which comprises:
a. at least two clothespin elements, each said clothespin element adapted to receive one said pair of socks therein and including a pair of arms, each said arm having a jaw end and a handle end;
b. means for detachably joining said clothespin elements; and
c. means for hanging said lock device from said clothesline, said detachably joining means further comprising:
d. a snap element mounted on each said arm at said jaw end; and
e. a snap receiving element embedded in each said arm at said handle end for receiving one said snap element therein.

4,045,845
TOP STOP DEVICE FOR SLIDE FASTENERS

Akiyoshi Kando, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Oct. 1, 1975, Ser. No. 618,626
Claims priority, application Japan, Oct. 14, 1974, 49-123746[U]
Int. Cl.² A44B 19/36
U.S. Cl. 24—205.11 F **3 Claims**



1. In a slide fastener of the type including a pair of stringer tapes carrying along their opposed inner edges respective rows of continuous coupling elements which are mutually engageable and disengageable by a slider moving therealong, each row of coupling elements being formed with a plurality of scoops each having a head projecting inwardly beyond the inner edge of one of the stringer tapes, a top stop device comprising, in combination, a pair of stop members of a synthetic resin each united with one of said rows of coupling elements so as to cover at least the head regions of several topmost scoops thereof, each said stop member projecting inwardly beyond the inner edge of one of said stringer tapes substantially to the same extent as said heads of the scoops carried thereby, one of said stop members being shorter than the other stop member and at least the end of said shorter stop member being disposed in direct contact with one of the underlying scoops whereby, upon movement of said slider along said rows of coupling elements to a predetermined topmost position thereon, the scoop immediately underlying the lower end of said one stop member abuts against the inner edge of said other stop member.

4,045,846
FOLDED TAPE SLIDE FASTENER STRINGER WITH EXTERNAL CORD

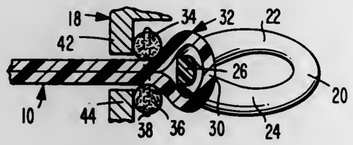
George B. Moertel, Conneautville, Pa., assignor to Textron, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 648,428, Jan. 12, 1976, and a continuation-in-part of Ser. No. 539,642, Jan. 9, 1975, Pat. No. 3,975,802. This application July 19, 1976, Ser. No. 706,351
Int. Cl.² A44B 19/40, 19/12
U.S. Cl. 24—205.16 C **9 Claims**

1. A stringer for a slide fastener comprising
a support tape formed from a longitudinally folded strip defining a folded edge and having opposite folded portions which extend from the folded edge and are secured together,
said support tape having a plurality of spaced slits formed in the strip transversely over the folded edge and defining

strap portions extending over the folded edge between the slits,

a continuous coupling element having a plurality of successive sections each including a head portion extending from a respective slit of the plurality of slits and including an interconnecting portion which is joined with an adjoining



section and extends within the folded edge beneath a respective one of the strap portions,

said continuous coupling element having a thickness to form a bead in the folded edge of the tape, and

cord means secured to the outside of the support tape and extending longitudinally alongside the bead to form a slider flange bearing member.

4,045,847

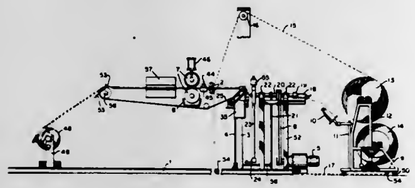
APPARATUS FOR THE MANUFACTURE OF WEFT INSERTED NON-WOVEN FABRICS

Richard L. Walford, 576 Walnut Hill Road, Thomaston, Conn. 06787

Continuation-in-part of Ser. No. 77,514, Oct. 2, 1970, abandoned. This application July 3, 1974, Ser. No. 485,490

Int. Cl.² D04H 3/04

U.S. Cl. 28—101 **8 Claims**



1. In an apparatus for forming fabric of the warp and cross laid weft type, which apparatus includes means for supplying warp yarns in the form of at least one sheet and means for forming aligned wefts and transporting them to lay across the warps, the improvement which comprises,

a. the means for forming and transporting aligned wefts comprising two aligned weft carrying means for carrying aligned wefts, said carrying means being provided with weft loop retaining means, the spacing of the weft loop retaining means being shorter than the dimension of the means, a source of at least one weft yarn, means for stringing weft yarn from weft loop retaining means on one carrying means to weft loop retaining means on the other carrying means and means guiding weft yarn from said source to said stringing means,

b. said means for stringing weft yarn comprising at least one yarn guide and means for moving said yarn guide along the periphery of a circular arc, the chord of said arc being substantially equal to the length of a weft, one end of said chord being adjacent to one weft carrying means and the other end adjacent to the other weft carrying means,

c. moving transfer means for transferring loops of weft yarn from the guide moving along the periphery of the circular arc to the weft loop retaining means on the weft carrying means, whereby movement of the guide means along the circular arc lays wefts from weft loop retaining means on one weft carrying means to the other,

d. means for releasing weft loops from the weft loop retaining means after the completion of the transport of the aligned wefts,

e. the moving transfer means for laying wefts onto the weft carrying means comprising a pair of counter-rotating elements adjacent each weft carrying means, the first of such elements of the first of the pairs thereof being a single unforked finger positioned to receive weft yarn from the end of the yarn guide means, the second counter-rotating element of the first pair being a forked finger positioned to receive the weft yarn from said first counter-rotating element and to transfer it, in the form of a loop, to the weft loop retaining means on one carrying means, said forked finger having an upper and lower fork, a vertically oscillating engaging means positioned to engage the weft yarn transferred to the single unforked finger and to raise it above the forked finger, and a horizontally oscillating means positioned to engage the weft yarn after it has been received by the first counter-rotating element and maintaining it in a position below both forks of said forked finger, both oscillating means being synchronized to hold the yarn during transfer from the first counter-rotating element to the second counter-rotating element, whereby coaction of the two oscillating engaging means and the counter-rotating elements results in a twisted loop around the first counter-rotating element, which loop, when transferred to the second counter-rotating element and from said second counter-rotating element to the weft loop retaining means, effecting a half twist of the yarn, and

f. all of the means effecting motions being synchronized.

7. In an apparatus for forming fabric of the warp and cross laid weft type, which apparatus includes means for supplying warp yarns in the form of at least one sheet and means for forming aligned wefts and transporting them to lay across the warps, the improvement which comprises,

a. the means for forming and transporting aligned wefts comprising two aligned weft carrying means for carrying alinged wefts, said carrying means being provided with weft loop retaining means, the spacing of the weft loop retaining means being shorter than the dimension of the means, a source of at least one weft yarn, means for stringing weft yarn from weft loop retaining means on one carrying means to weft loop retaining means on the other carrying means and means guiding weft yarn from said source to said stringing means,

b. said means for stringing weft yarn comprising at least one yarn guide and means for moving said yarn guide along the periphery of a circular arc, the chord of said arc being substantially equal to the length of a weft, one end of said chord being adjacent to one weft carrying means and the other end adjacent to the other weft carrying means,

c. moving transfer means for transferring loops of weft yarn from the guide moving along the periphery of the circular arc to the weft loop retaining means on the weft carrying means, whereby movement of the guide means along the circular arc lays wefts from weft loop retaining means on one weft carrying means to the other,

d. means for releasing weft loops from the weft loop retaining means after the completion of the transport of the aligned wefts,

e. the moving transfer means for transferring loops of weft yarn from the yarn guide comprising two pairs of counter-rotating elements, a pair of such elements located adjacent each weft carrying means, one of the pairs of such elements comprising a forked finger having an upper and a lower fork and the other counter-rotating element of such one pair being a double hooked finger positioned to receive weft yarn from the yarn guide end, the hooks being positioned one above the upper fork of the forked finger and one below the lower fork, whereby the second pair of counter-rotating elements transfers a loop of weft yarn to the weft loop retaining means without twisting said loop and thus without forming a half twist in the weft.

4,045,848

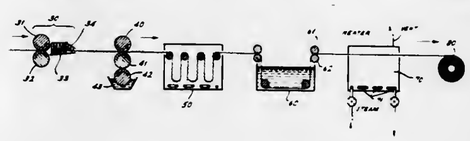
METHOD OF PRODUCING A WARP OF INTERMITTENTLY COLORED YARNS

Ralph Whitaker, Bala-Cynwyd, Pa., assignor to Fred Whitaker Company, Bala-Cynwyd, Pa.

Continuation of Ser. No. 622,016, Oct. 14, 1975, abandoned. This application Sept. 17, 1976, Ser. No. 724,335

Int. Cl.² D02G 1/00

U.S. Cl. 28—218 **3 Claims**



1. In a method of making a multiplicity of warps composed of a plurality of substantially parallel yarns for use in making carpets of a preselected pattern, the steps which comprise:

a. forming the yarns into warps;

b. weaving each of said warps with a sacrificial filling yarn to produce woven prefabrics, said sacrificial yarn being subject to decomposition or dissolution in a concentrated solution of a chemical;

c. forming a multiplicity of crimps in each of said prefabrics;

d. dyeing each of said woven prefabrics with predetermined patterns that are correlated with the desired pattern of the final carpet product in different colors in localized areas so that the localized areas along the lengths of the yarn are dyed in different colors, heat setting each prefabric after dyeing;

e. intimately contacting each prefabric with a dilute aqueous solution of said predetermined chemical;

f. heating and drying each prefabric so as to concentrate said solution to substantially decompose or dissolve said filling yarn without substantially attacking said warp yarns or said dye, completing the drying of said yarns;

g. taking up each of the resulting selectively locally dyed warp yarns as a warp;

h. matching up the warps into the desired pattern of the final product, and

i. feeding each warp resulting into a fabricating machine to form the final carpet product with the preselected pattern.

4,045,849

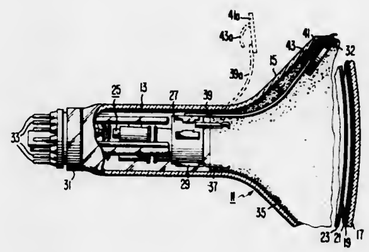
METHOD FOR ASSEMBLING A THERMALLY-SET GETTER SPRING IN A CRT

Earle Solomon Thall, Leola, Pa., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 608,563, Aug. 28, 1975, Pat. No. 4,006,381. This application Oct. 21, 1976, Ser. No. 734,413

Int. Cl.² H01J 9/00

U.S. Cl. 29—25.13 **5 Claims**



1. In a method for assembling a cathode-ray tube including an envelope, a mount assembly within said envelope and a getter container supported on a spring connected to and extending from said mount assembly, the steps comprising

a. providing a spring at least a portion of which has been thermally set to a first shape and then cold formed to a second shape different from said first shape, said portion being of an alloy which restores itself to said first shape upon heating above a predetermined transition temperature,

b. attaching said container to said spring,

c. attaching said spring to said mount assembly,

d. sealing said container and mount assembly in said envelope

e. and then heating said spring above said predetermined transition temperature until said spring is restored to said first shape.

4,045,850

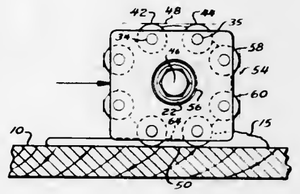
ROLLING PIN WITH DOUGH THICKNESS CONTROL

Guenther Brandes, 3 Wilson Ave., Camden, Maine 04843

Filed Dec. 15, 1975, Ser. No. 640,755

Int. Cl.² B05C 1/08

U.S. Cl. 29—111 **4 Claims**



1. A pin for rolling dough flat including means for operation thereof comprising axially and rotatably on each end of the cylinder, gauge means rotatable around the axis of the cylinder and mounted adjacent each end of the cylinder, and having a peripheral portion spaced laterally from the axis of the cylinder, and rotatable means

comprising two spaced plates having a circular bearing mounted eccentrically with respect to the major axis, and a pair of like diameter rollers mounted adjacent at least one edge with their axes parallel to the major axis and their engaging surfaces equally spaced from the plates.

4,045,851

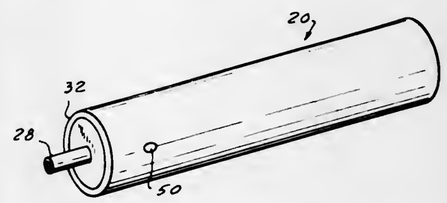
METHOD OF FABRICATION OF HOLLOW FILAMENT SEPARATORY MODULE

Edward Ashare, Framingham; Richard N. Rulison, Medfield; Lawrence T. Wright, Whitman, and Myron J. Coplan, Natick, all of Mass., assignors to Albany International Corporation, Albany, N.Y.

Filed Sept. 20, 1974, Ser. No. 507,714

Int. Cl.² B01D 31/00

U.S. Cl. 29—157 R **5 Claims**



1. The method of producing a hollow filament separatory module including the steps of winding a plurality of layers of

semi-permeable hollow filaments on a removable cylindrical support to create an annulus of filaments, each of said layers being helically wound at an angle to the axis of the winding support with adjacent layers wound in opposite hand, removing the cylindrical support, extending the annular filament array parallel to the axial direction by application of force to substantially increase the length in the order of up to five times the original length while decreasing the diameter of the annulus and decreasing the helix angle imparted to the wound filaments during the winding by a similar multiple, opening ends of filaments of the annulus and isolating said open ends from the main portions of the filaments, and providing a first means for allowing fluid to flow in contact with the outer surfaces of said filaments at the main portions thereof and providing a second means to allow fluid to flow within said hollow filaments and through the open ends thereof.

4,045,852

WHEEL TRUING MACHINE

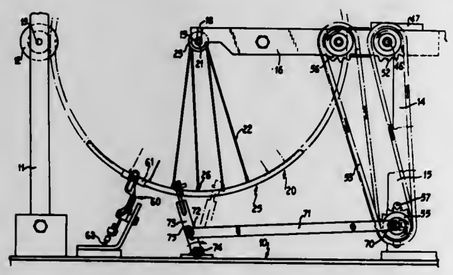
Andrew Gordon Winch, Nottingham, England, assignor to Raleigh Industries Limited, Nottingham, England

Filed July 22, 1975, Ser. No. 598,038

Claims priority, application United Kingdom, July 24, 1974, 32595/74

Int. Cl.² B21K *1/34*

U.S. Cl. 29—159.02 **10 Claims**



1. A method of truing a newly built spoked wheel having a hub and rim, subsequent to fitting spokes to the wheel and loosely screwing nipples to the spokes at the wheel rim comprising the steps of securing the rim and hub in a concentric relationship, locally depressing the rim relative to the hub to a datum radius in the region of a nipple, tightening said nipple at least partially, and further locally depressing said rim relative to said hub in the region of each of said remaining nipples until all of said nipples are tightened as desired.

4,045,853

METHOD OF MANUFACTURING FILTER DRUMS

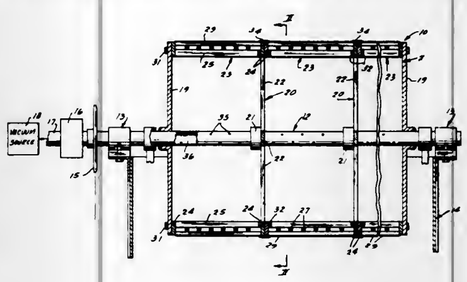
Harold R. White, New Lenox, Ill., assignor to Alar Engineering Corporation, Chicago, Ill.

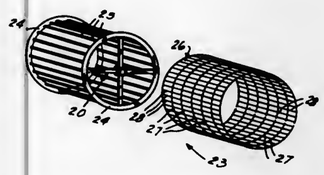
Filed Aug. 31, 1976, Ser. No. 719,164

Int. Cl.² B23P *15/16*

U.S. Cl. 29—163.5 F **8 Claims**

1. The method of making a filter drum which comprises the steps of, making an elongate flat grid comprised of elongate spaced rods with overlying spaced ribs arranged transversely of said rods and secured thereto, rolling said grid into cylindrical form, forming a cylindrical frame constructed of open end rings and circumferentially spaced longitudinal bars connecting said end rings, wrapping said rolled grid around said cylindrical frame with the grid rods overlying the frame bars, joining opposed ends of the wrapped grid, securing a plurality of said grid wrapped cylindrical frames in end to end relation around a through axle by means of spiders on the axle secured to the frame end rings, mounting end heads on end portions of





the through axle, and securing the end heads to the opposite ends of the assembled cylindrical frames.

4,045,854

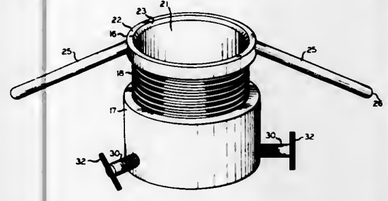
DEVICE FOR INSTALLATION OF PLASTIC FIFTH WHEEL LINER ON A TRUCK TRAILER

David C. Burton, Williamstown, Ky., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 24, 1976, Ser. No. 699,730

Int. Cl.² B23P *17/02*

U.S. Cl. 29—235 **2 Claims**



1. An apparatus for installing a fifth wheel bearing liner and retaining keeper on a king pin of a trailer, said apparatus comprising:

a. a first member having a first threaded portion, said first member having a bore at least partially therethrough with the longitudinal axes of the bore being generally coaxial with the longitudinal axis of the first threaded portion;

b. at least one shoulder forming member movably mounted on said first member and is selectively movable into and out of engagement with a portion of a king pin for removably securing the first member against longitudinal and rotational movement on the king pin, said shoulder forming member being selectively engageable with at least one surface partially defining a groove in said king pin;

c. a second member having a second threaded portion in threaded engagement with the first threaded portion whereby relative rotation between said first and second members effects extension and retraction of the assembly thereof, said second member having a through bore generally coaxial with the second threaded portion, said second member has a surface on a free end thereof adapted for engagement with a keeper to be installed on the king pin and has a recess surrounding said second member bore and recessed in said second member surface for providing clearance for a portion of said keeper during installation thereof; and

d. a handle secured to and extending outwardly from said second member and having a free end portion, said free end portion of the handle is spaced below said second member surface providing clearance between the handle free end member surface providing clearance between the free end portion of the handle and a bearing and a bearing liner, which is to be supported on said second member surface for installation with said keeper, during installation of the liner and keeper.

4,045,855

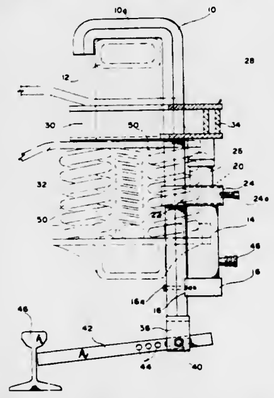
TRUCK BOLSTER LIFTING DEVICE

Anthony Richard Kruk, Winnipeg; Richard Bryant, Montreal, and Samuel Harper, Winnipeg, all of Canada, assignors to Canadian Pacific Limited, Montreal, Canada

Filed Sept. 24, 1975, Ser. No. 616,269

Int. Cl.² B23P *19/02*; B66F *7/26*

U.S. Cl. 29—252 **2 Claims**



1. An apparatus for use in replacing the bolster-supporting springs between a truck and a bolster of a railway car, the railway car being positioned on a track, said apparatus comprising a pair of hanger bars laterally spaced apart to provide access therebetween to the bolster-supporting springs when the apparatus is in use on a railway car, first engagement means in the form of hooks on the upper ends of said hanger bars to engage an upper part of the truck, second engagement means comprising a member slidably mounted on said hanger bars to maintain their lateral spacing, and having a portion insertable into the end of the bolster so as to engage the bolster, hydraulically actuated means connected at one end to said hanger bars and at the other end to each second engagement means to urge said first and second engagement means together when actuated, and thus raise said bolster to permit removal and replacement of the springs, said hydraulically actuated means comprising a piston and cylinder arrangement mounted at its lower end on each of said hanger bars and engaging said member at its upper end, a pair of unitary, rigid support bars and means for mounting said support bars on the lower ends of said hanger bars such that each support bar extends into engagement with a rail of the track on which the railway car is positioned, and supports the lower end of the corresponding hanger bar against movement in the direction of said rail, thereby preventing the truck from rolling about a longitudinal axis when the bolster is raised, said support bar mounting means comprising a mounting bracket mounted on the lower end of each hanger bar, means for pivotably connecting each of said support bars to the corresponding bracket, and aperture means cooperating with said connecting means for adjustably mounting each of said support bars at different spaced positions relative to the corresponding hanger bar.

4,045,856

PULLING TOOL

John E. Sneed, 4522 SW. 54th St., Fort Lauderdale, Fla. 33314

Filed Dec. 22, 1976, Ser. No. 753,609

Int. Cl.² B23P *19/04*

U.S. Cl. 29—262 **10 Claims**



1. A pulling tool for pulling an object relative to a support and comprising:

a pole having engaging means at one end thereof for engaging an object to be pulled;

a stop affixed at a selected position on said pole;

a threaded rotatable sleeve loosely receiving said pole therein and having one end for abutment with said stop and another end from which said engaging means projects;

an annular member threadedly engaging the exterior of said sleeve for movement of said sleeve axially of said annular member upon rotation of said sleeve;

standoff means coupled to said annular member for engaging a support while said object is pulled; and

means for turning said sleeve to retract said sleeve and said pole.

4,045,857

METHOD FOR MANUFACTURE OF ALUMINUM SHEET AND SINTERED HIGH-DENSITY ALUMINUM LAMINATE BY DIRECT POWDER ROLLING PROCESS

Yoshikazu Suzuki, Sapporo, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Nov. 6, 1974, Ser. No. 521,369

Claims priority, application Japan, Nov. 8, 1973, 48-125184

Int. Cl.² B22F *3/24*

U.S. Cl. 29—420 **5 Claims**



1. A method for the manufacture of a high density sintered aluminum laminate from aluminum powder which comprises directly rolling of aluminum in powder for the fracturing of the oxide coat on the surface layer of individual aluminum particles and for compacting the aluminum powder into green sheets under rolling pressure sufficient to cause coherence of the aluminum particles and so that the sheets have a fixed strength and uniform density in the direction of the width, piling a plurality of green sheets one on top of another with filaments of inorganic material interposed between adjoining pairs thereof as a reinforcing material, heating and simultaneously rolling the pile of green sheets at a draft in the range of from 25% to 50% at temperatures in the range of from 300° C to 600° C for a period of from 3 minutes to 10 minutes thereby

forming a sintered aluminum laminate and then subjecting the sintered aluminum laminate at least once, before the laminate is allowed to cool below 300° C, to the treatment of rolling at a draft in the range of from 25% to 50% and to the subsequent treatment of annealing thereby allowing the laminate to acquire high density and prescribed thickness.

4,045,858

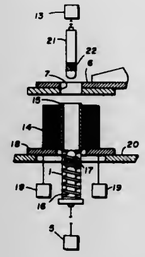
CORE TRANSFER PROCESS

David M. Carr, and Thomas O. Chandler, both of Tuscaloosa, Ala., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 595,971, July 14, 1975, abandoned. This application Sept. 1, 1976, Ser. No. 719,862

Int. Cl.[2] D01H *9/00*; B23P *19/02*

U.S. Cl. 29—427 **4 Claims**



1. A process for transferring a package of yarn from a hollow core to a dye spring, comprising:

a. in any order:

1. inserting through a first end of said dye spring a reciprocally mounted first transfer head provided with an expandable portion adapted for expansion to grip the remote end of said dye spring,
2. positioning said remote end in axial alignment with said core and in close end-to-end relationship with one end of said core,
3. axially compressing said package, and
4. gripping said core with a second transfer head,

followed by

b. simultaneously withdrawing said core while inserting said remote end of said dye spring through said package.

4,045,859

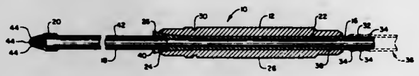
METHOD OF MAKING A SUCTION WAND

Deaton A. Cooley; Charles C. Reed, both of Houston, and Russell G. Sharp, Sugar Land, all of Tex., assignors to Texas Medical Products, Inc., Houston, Tex.

Division of Ser. No. 547,529, Feb. 6, 1975, Pat. No. 3,963,028. This application Mar. 12, 1976, Ser. No. 666,289

Int. Cl.[2] B23P *11/02*

U.S. Cl. 29—451 **4 Claims**



1. A method for assemblying a suction wand having a disposable fluids handling conduit and a reusable, weighted handle for the fluids handling conduit comprising:

injection molding at least one fluids handling conduit comprising a forward suction tip, probe, and a rear handle insert including an external enlarged rearwardly tapering surface spaced from the rear end of said insert;

fabricating a handle from metal, the handle having an axial bore generally corresponding to the exterior surface of the insert and a flared end;

telescopically inserting the insert portion of the conduit through the handle; and

friction-securing the handle to the conduit at the insert by urging the flared end of the metal handle against the enlarged tapering surface.

4,045,860

METHOD OF ASSEMBLING AN AEROSOL DISPENSER

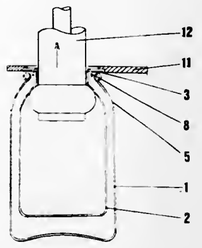
Richard Winckler, Ville D'Avray, France, assignor to Cebal, Paris, France

Filed May 7, 1976, Ser. No. 684,260

Claims priority, application France, May 7, 1975, 75.14928; Feb. 20, 1976, 76.05316

Int. Cl.[2] B23P *11/02*

U.S. Cl. 29—451 **5 Claims**



1. The method of assembling an aerosol dispenser including the steps of:

1. placing a flanged flexible bag within a rigid outer casing,
2. forming a shouldered dome on said casing to define a mouth including an annular collar encircling said mouth,
3. positioning an annular seal above said collar of said mouth,
4. withdrawing the flanged portion of said bag from said casing through said mouth and said seal and positioning said flange and seal in stacked relation on said collar,
5. positioning a cover member above said assembly in overlying relation thereto, and
6. securing said cover to said casing by simultaneously crimping said cover, said flange and said seal to said collar to form an impermeable seal therebetween.

4,045,861

METHOD OF FORMING A PRESSURE ACCUMULATOR

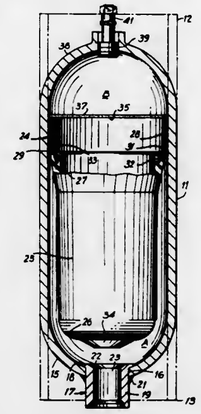
Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Division of Ser. No. 552,227, Feb. 24, 1975. This application June 18, 1976, Ser. No. 697,421

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—454 **6 Claims**

1. The method of forming a pressure vessel of the type having a deformable separator therein, from an elongated cylindrical rigid metal sleeve having at least one open end, which comprises the steps of inserting an annular supporting member of resilient sheet metal having a cylindrical retaining portion with an annular mounting portion at one end to which the periphery of said deformable separator is bonded into said cylindrical sleeve through said at least one open end so that the cylindrical retaining portion of the supporting member is in juxtaposition to the inner wall surface of the cylindrical sleeve in spaced relation to said open end, thereafter bonding said retaining portion to said sleeve and thereafter deforming inwardly said at least one open end of said sleeve to close such



end and thereafter forming an axial opening in said now closed end.

4,045,862

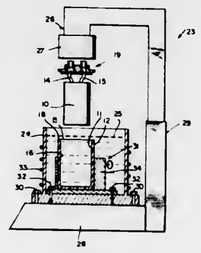
ELECTRONIC COMPONENT AND METHOD

William J. Evans, Indianapolis, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Jan. 10, 1973, Ser. No. 322,403

Int. Cl.[2] H01G *9/10*

U.S. Cl. 29—570 **5 Claims**



1. A method of closing and sealing an open end of a body housing electrical component means having external terminal means, the method comprising the steps of immersing in a bath a body having an open end connected to a void in the body and electrical component means in the void in the body, filling the void of the body immersed in the bath thru the open end with material of the bath, contacting the immersed body with means for closing and sealing the open end of the body to retain the electrical component means and material of the bath within the body, initiating bonding of a continuous substantially V-shaped means of the means for closing and sealing the open end of the body to a continuous lip circumscribing the open end of the body prior to finally positioning the means for closing and sealing the open end of the body with respect to the body, compressing material of the bath in the void of the body during the bonding together of the body and the means for closing and sealing the open end of the body by means carried by the means for closing and sealing the open end of the body while the body and the means are immersed in the bath, and removing from the bath the bonded together body and means for closing and sealing the open end of the body with the electrical component means and material of the bath.

4,045,863

METHOD OF PRODUCING METALLIC CARRIER SYSTEM FOR A MULTI-ELECTRODE SEMICONDUCTOR STRIP

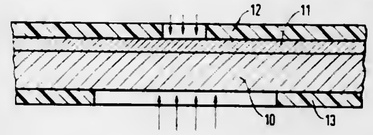
Gerhard Mitterhummer; Hanns-Heinz Peltz; Heinrich Mayer, all of Munich, and Fritz Couzelmann, Koelgsbrunn, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 385,163, Aug. 2, 1973, abandoned, which is a division of Ser. No. 259,399, June 5, 1972, abandoned. This application Aug. 30, 1976, Ser. No. 718,824

Claims priority, application Germany, June 3, 1971, 2126533

Int. Cl.[2] B01J *17/00*; C23F *1/02*

U.S. Cl. 29—588 **6 Claims**



1. A method for producing a metallic carrier system for a multi-electrode semi-conductor chip comprising the steps of:

a. providing a base carrier sheet of a first metal that can readily be soldered;

b. etching recesses in the carrier sheet in portions of the carrier sheet to be covered by inner feed lines;

c. applying covering masks to opposite sides of the sheet by photolithographic process with open portions in the mask on one side of the carrier sheet conforming to the inner feed lines;

d. producing inner feed lines with recessed expansible portions by the galvanic deposition of at least a second metal in the open portions of the mask, and into said recesses, said second metal being of a type capable of being readily connected to a semiconductor body;

e. covering the feed lines with protective layers; and

f. then etching the outer carrier legs from the opposite side of the sheet in accordance with the pattern of the covering mask applied thereto by selective etching;

the recessed expansible portions of the feed lines compensating for the difference in expansion between the connection legs of the carrier sheet, the inner feed lines and the semi-conductor chip.

4,045,864

METHOD OF MANUFACTURING MAGNETIC HEADS

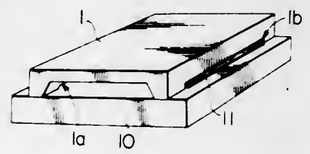
Tadashi Morokuma, Tokyo, and Naotsune Tsuda, Hachioji, both of Japan, assignors to Olympus Optical Co. Ltd., Tokyo, Japan

Filed July 8, 1976, Ser. No. 703,501

Claims priority, application Japan, July 29, 1975, 50-92337; Apr. 20, 1976, 51-45108; May 8, 1976, 51-52527

Int. Cl.[2] G11B *5/42*

U.S. Cl. 29—603 **4 Claims**



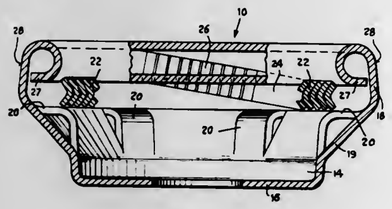
1. A method for forming magnetic heads, comprising the steps of:

providing a first core block piece having at least one raised portion upon which a gap defining surface is to be etched;

masking at least a pair of spaced areas on each of said raised portions with an etch resistant material;
sputter etching those areas of said raised portions which are not masked so as to form a gap defining surface on each of said raised portions;
disposing a second core block piece in abutting relation with said non-etched areas of said raised portions so as to form a clearance between each said gap defining surface and said second core block piece;
causing a gap filling material to melt and permeate into each said clearance;
solidifying said gap filling material to form a unitary core block; and
cutting said unitary core block so as to form a plurality of magnetic head cores.

4,045,865
METHOD OF MAKING AN ELECTRICAL IGNITING UNIT

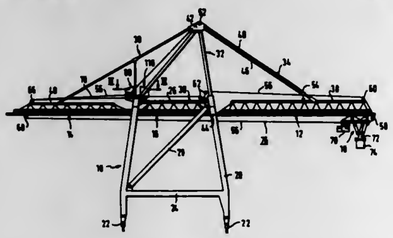
Laurence G. Horwitt, New Haven, Conn., assignor to Sun Chemical Corporation, New York, N.Y.
Division of Ser. No. 715,148, Aug. 17, 1976, Pat. No. 4,007,353.
This application Oct. 22, 1976, Ser. No. 735,071
Int. Cl.² H01C *17/02*
U.S. Cl. 29—611 **3 Claims**



1. The method of making an electrical igniting unit for use with the holders of cigar lighters which includes the steps of forming a shallow metal cup having a relatively thin side wall, subjecting said cup to low temperature nitriding, disposing a spiral-wound heating resistance element in said cup with an outer end of the heating element juxtaposed to the side wall of the cup, and crimping inwardly the entire leading edge of the side wall of the cup so as to sandwich the said outer end of the heating element between the crimp and the side wall.

4,045,866
CRANE AND METHOD OF BUILDING THE SAME

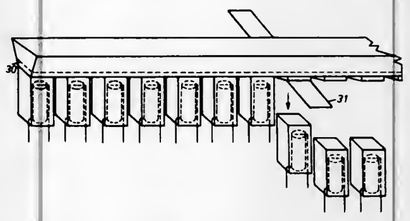
Hans Tax, Potsdamer Str. 3, Munich 40, Germany (8000)
Filed Sept. 13, 1976, Ser. No. 722,427
Claims priority, application Germany, Sept. 26, 1975, 2543041
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **6 Claims**



1. In a method of building a crane in which an upright tower is erected at an assembly site, a boom is pivotally fastened to the top portion of the tower, a trolley is installed for movement along the boom, a hoist is suspended from the trolley, a plurality of electrically actuated winches are secured to said tower and connected to said boom, said trolley, and said hoist by tension elements, said boom, trolley and hoist constituting the principal operating elements of said crane, an electric power supply system is mounted on said tower and conductively connected to said winches, the improvement which comprises:
a. fixedly mounting at least two of said winches in a first container at a construction site remote from said assembly site;
b. transporting said container to said assembly site;
c. fastening said container to the erected tower, the fixed mounting of said at least two winches in said container being maintained during said transporting and said fastening;
d. operatively connecting said at least two winches while mounted in said container to at least one of said principal operating elements by means of respective tension elements;
e. fixedly mounting at least a portion of said power supply system in a second container at a mounting site remote from said assembly site;
f. transporting said second container to said assembly site;
g. fastening said second container to the erected tower, the fixed mounting of said portion being maintained during said transporting and said fastening of said second container; and
h. conductively connecting said portion of said power supply system, while mounted in said second container, to said at least two winches fixedly mounted in said first container while said containers are fastened to said tower.

4,045,867
METHOD FOR ENCAPSULATING ELECTRICAL COMPONENTS

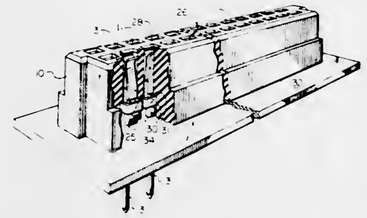
Arne Gudmund Ström, Kalmar, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Aug. 13, 1975, Ser. No. 604,438
Claims priority, application Sweden, Sept. 19, 1974, 7411786
Int. Cl.² B29C *6/04, 17/10;* H01G *1/02, 1/153*
U.S. Cl. 29—628 **5 Claims**



1. A method for encapsulating electrical components in capsules filled with a hardenable plastics material, said capsules being part of a mould having a trough-shaped pouring ingate mounted above and in fluid communication with the entrances of said capsules, said capsules being provided with holes in their bottom portions and being spaced from one another along said trough-shaped pouring ingate, each of said electrical components to be provided with a first electrical connection wire connected to a first terminal of said electrical component, and a second electrical connection wire connected to a second terminal of said electrical component, said method comprising: the steps of inserting said electrical components into said capsules such that the connection wires pass through the holes provided in the bottoms of the capsules, one electrical component for each of said capsules; pouring a liquid hardenable plastics material into said trough-shaped pouring ingate, said step of pouring comprising pouring a surplus amount of said liquid hardenable plastics material so that an excess amount of said material remains in said trough-shaped pouring ingate after all of said capsules have been filled, and pouring said material into said trough-shaped pouring ingate under vacuum; curing said liquid hardenable plastics material; and separating said trough-shaped pouring ingate along with the excess hardened plastics material from said thus-formed encapsulated components such that a plurality of individual encapsulated components results.

4,045,868
METHOD OF FABRICATION AND ASSEMBLY OF ELECTRICAL CONNECTOR

J. Preston Ammon; Harry R. Weaver, both of Dallas, and Claude Rodriguez, Carrollton, all of Tex., assignors to Elfab Corporation, Dallas, Tex.
Division of Ser. No. 597,751, July 21, 1975. This application Mar. 2, 1976, Ser. No. 663,145
Int. Cl.² H01R *43/00*
U.S. Cl. 29—629 **16 Claims**

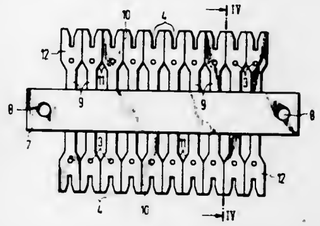


1. A method of assembling an electrical connector which includes a removable insulator having a plurality of sleeves formed therethrough and press fit contacts having upper mating portions for positioning in the sleeves in spaced alignment with a plurality of contact receiving apertures in a mounting substrate, said method comprising:
inserting the contacts into the sleeves in the insulator through the bottom thereof;
seating a generally transversely extending intermediate portion of the contacts against a shoulder formed in the sleeves, the contacts being retained within the sleeves by frictional engagement with the inner walls thereof;
guiding the portions of the contacts protruding from beneath the insulator into the aligned receiving apertures;
mounting the insulator generally flush against the mounting substrate to press fit the contacts into the apertures for rigidly securing the contacts to the substrate while permitting the insulator to be removed from the contacts by applying an upward force to overcome the frictional engagement between the contacts and the inner walls of the sleeves.

4,045,869
METHOD FOR PRODUCING ELECTRICAL CONNECTOR STRIPS

Gunter Hartmann, Munich, and Rudolf Winckler, Gauting, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Sept. 16, 1975, Ser. No. 613,892
Claims priority, application Germany, Sept. 19, 1974, 2444892
Int. Cl.² H01R *43/02*
U.S. Cl. 29—630 A **4 Claims**

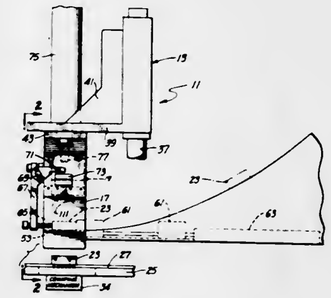
1. A method for producing an electrical connector strip comprising the steps of:
providing a thin planar strip of metal from the group consisting of brass or tin-bronze,
partially cutting the strip to form critical edges thereby,
treating the thereby formed thin planar strip with a strong deoxidation agent,
tinning only those selected portions containing said critical edges of the connector strip to which solder connections are to be made,
affixing an insulation carrier to the strip,



and free-cutting the strip at non-critical edges to form a plurality of connector elements to preserve the solderability of the tinner portions.

4,045,870
SOCKET INSERTER

Eldred D. Scott, Laguna Hills, Calif., assignor to Precision Engineered Products, Inc., Orange, Calif.
Filed Jan. 28, 1977, Ser. No. 763,313
Int. Cl.² H05K *3/30*
U.S. Cl. 29—741 **17 Claims**



1. An apparatus for transporting a socket to a location on a base for attachment to the base wherein the socket is of the type having at least one aperture therein, said apparatus comprising:
a supporting structure;
a retaining means on the supporting structure for releasably retaining a socket at a socket retaining station with the aperture in the socket being at a predetermined location;
a socket holding mechanism including at least one protrusion sized for entering said aperture and being releasably retained therein;
means for mounting the socket holding mechanism for movement from a first position located on the side of the socket retaining station remote from the base along a path which extends through the socket retaining station and toward same location on said base and back toward the first position;
said mounting means mounting the socket holding mechanism so that said protrusion moves through said predetermined location in moving along said path toward said location on said base and said retaining means releasably holding the socket at the retaining station sufficiently so that the protrusion is inserted into said aperture and releasably retained therein as the socket holding mechanism is moved through the retaining station whereby the socket holding mechanism removes the socket from the retaining

means and delivers it to said location at said base for attachment to the base; and

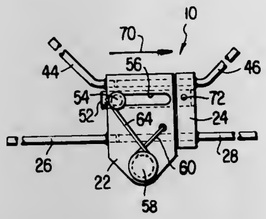
actuator means for moving said socket holding mechanism along said path.

4,045,871

PALATAL EXPANDER

John E. Nelson, Holtwood, Pa., assignor to HMW Industries, Inc., Lancaster, Pa.

Filed June 16, 1976, Ser. No. 696,510
Int. Cl.[2] A61C 7/00
U.S. Cl. 32—14 E 16 Claims



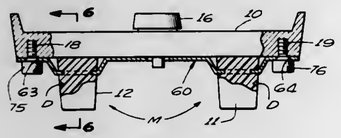
1. An orthodontic device for intraoral use comprising a body, means carried by said body for connecting said body to an anchor tooth on one side of a human palate, a block joined to said body or relative movement between the two, means carried by said block for connecting said block to an anchor tooth on the other side of a human palate, a bias spring acting between said body and block for producing relative movement between them, and removable means engaging both said body and said block for preventing said relative movement until said device has been installed in a human mouth.

4,045,872

ANALOG MODULE FOR RECONVERSION OF JAW MOVEMENT INFORMATION

Gene W. Arant, 2444 Jupiter Drive, Los Angeles, Calif. 90046

Continuation-in-part of Ser. No. 419,641, Nov. 28, 1973, abandoned. This application Mar. 14, 1975, Ser. No. 558,284
Int. Cl.[2] A22C 7/00
U.S. Cl. 32—32 18 Claims



1. An analog module for dental articulators, comprising:

an elongated metallic support member adapted to fit underneath and in parallel relationship to either a reconverter instrument upper frame or an articulator upper frame,

said support member having on each of its ends means for removable attachment thereof to a corresponding frame,

said support member having adjacent each of its ends an integrally formed separate retaining means; and

a pair of analog blocks made of a hard material capable of being milled, each of said blocks being disposed beneath said member and being attached to a respective one of said retaining means to be rigidly supported thereby, so that said member maintains a fixed lateral spacing of said blocks;

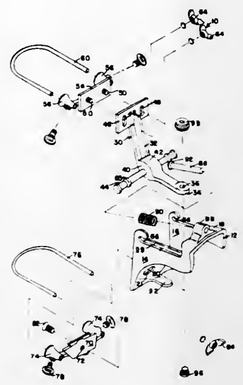
whereby when the module is attached to a reconverter instrument upper frame a pair of openings representing the jaw movement pattern of a patient may be formed in the lower sides of said blocks, and when the module is subsequently attached to an articulator upper frame the relative positions of said block openings remain unchanged.

4,045,873

DENTAL ARTICULATOR

Walter L. Burnett, 4336 Covington Highway, Decatur, Ga. 30035

Filed June 28, 1976, Ser. No. 700,141
Int. Cl.[2] A61C 11/00
U.S. Cl. 32—32 19 Claims



1. In a dental articulator for mounting a dental model comprising upper teeth and lower teeth:

a base frame having means thereon for supporting the base stably on a flat surface such as a table or desk,

a pivoting frame on said base comprising an upper arm extending on said pivoting frame and having a transverse attaching plate formed integrally therewith, said plate having a pair of vertical adjusting slots therein,

an upper plate having spaced mounting sleeves attached thereto,

a removable upper model frame having respective terminal ends insertible into a respective sleeve,

a pressure means for holding said removable upper model frame in place,

attaching means on said plate to provide the vertical adjustment for the articulation of the upper and lower model thru the vertical movement of only the top,

a lower bracket comprising a lower model frame and a lower plate,

a pair of spaced mounting sleeves on said lower plate,

said lower model frame having respective terminal ends insertible in the respective openings in the mounting sleeves and adjustable pressure means for holding said lower model frame in place.

4,045,874

DENTAL DRILL GUIDE ATTACHMENT

Richard C. Roman, 230 Westmoreland Drive, Vernon Hills, Ill. 60060

Filed May 17, 1976, Ser. No. 686,716
Int. Cl.[2] A61C 13/12
U.S. Cl. 32—40 R 10 Claims

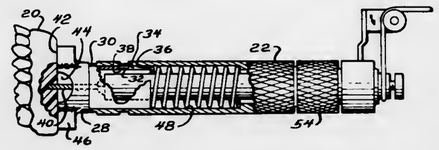
1. A drill guide attachment for dental drills and the like, which attachment comprises:

a first sleeve defining a bore adapted to receive a dental drill therein;

means for securing said first sleeve to a drill positioned in said first sleeve;

a second sleeve in telescoping, coaxial, sliding relation with said first sleeve and positioned adjacent an end of said first sleeve, said sleeves being adapted for bidirectional axial motion relative to each other, said second sleeve having an outer end defining a flat surface in a plane transverse to the axis of said second sleeve, whereby the positioning of said flat surface against a workpiece simultaneously positions said drill positioned in said sleeves in a predetermined manner relative to said workpiece;

means for limiting the distance of said bidirectional, axial motion between said sleeves;



and resilient biasing means for urging said sleeves axially apart;

said second sleeve defining aperture means for viewing the contact point between a drill positioned in said sleeves and a workpiece during the drilling operation;

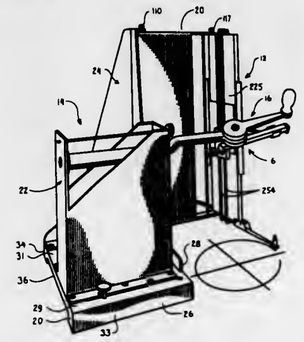
said flat surface at the outer end of said second sleeve being defined in part by a pair of opposed projections carried by said second sleeve and extending outwardly therefrom.

4,045,875

ELLIPSOGRAPH DRAFTING APPARATUS

Raul Chajon Cortez, 2046 S. Elizabeth, Apt. 1602, Wichita, Kans. 67213

Filed Mar. 18, 1976, Ser. No. 668,268
Int. Cl.[2] B43L 11/04
U.S. Cl. 33—30 D 15 Claims



1. An ellipsograph drafting apparatus to draw any ellipse existing within major and minor axes boundaries of a straight line to a circle on a horizontal marking surface, comprising:

a. a main support means;

b. an intermediate connector means having a linkage assembly pivotally connected to said main support means and a base support member pivotally connected to said linkage assembly for pivotal movement about a vertical axis;

c. an elliptical control means connected to said main support means and said intermediate connector means;

d. said elliptical control means having a protractor control assembly rotatable about a horizontal axis, a slide and crank arm assembly rotatably mounted to said protractor control assembly, to a pivot arm and slide assembly connected to said slide and crank arm assembly, and a marking instrument and actuator assembly connected to said base support member;

e. said pivotal arm and slide assembly mounted on said base support member for conjoint movement therewith about the vertical axis and for vertical movement relative thereto;

f. slide and crank arm assembly having a connector member pivotally connected to a pivot member of said pivot arm and slide assembly; and

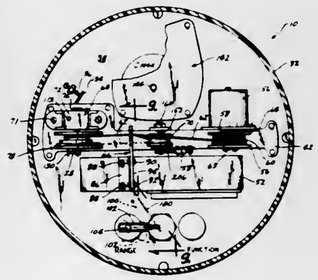
g. said connector member rotatable about a common central point in planes from 0° to 90° relative to a vertical axis through said central point to cause said pivot member to move identical to said connector member and transmit a vertical projection of the movement of said pivot member onto the horizontal marking surface through said marking instrument and actuator assembly.

4,045,876

LIQUID LEVEL INDICATOR AND FLOW MEASURING DEVICE

James H. Bowen, Des Moines, Iowa, assignor to W. G. Jaques Company, Des Moines, Iowa

Filed July 7, 1975, Ser. No. 593,889
Int. Cl.[2] G01B 5/18
U.S. Cl. 33—126.6 13 Claims



1. In a liquid level indicating means comprising,

a housing adapted to be positioned above a body of water having an upper surface,

a movable probe line having a probe on the lower end thereof extending downwardly from said housing, said probe line and said probe being electrically conductive,

control means in said housing for intermittently lowering and raising said probe line so that said probe is intermittently moved into and out of engagement with the upper surface of said liquid, said control means including a reversible power means secured to said probe line, a timing means, and a control circuit interconnecting said power means and said timing means, first means in said control circuit connected to said probe line, said probe and said power means and being electrically responsive to engagement of said probe to the upper surface of said liquid to cause said power means to reverse itself to raise said probe line upon contact of said probe with the upper surface of said liquid, second means in said control circuit to stop the upward movement of said probe line, said timing means being operatively connected to said power means to effect the lowering of said probe line by said power means after a predetermined length of time,

a recording chart means in said housing,

a recording means operatively connected to said probe line which is responsive to the downward movement of said probe line into engagement with said liquid so that the level of said liquid is recorded on said recording chart means.

4,045,877

RETRACTABLE DIAL BORE GAUGE

Harold T. Rutter, Kirkwood, Mo., assignor to Sunnen Products Company, St. Louis, Mo.

Filed Mar. 11, 1976, Ser. No. 665,892
Int. Cl.² G01B 5/12
U.S. Cl. 33—178 R **20 Claims**



1. In a dial bore gauge for measuring the size and surface characteristics of a cylindrical work surface, said gauge including dial means including a scale and means to indicate a reading on the scale, a work engaging portion including spaced opposed work engaging contacts for engaging opposite sides of a surface to be gauged, one of said work engaging contacts being fixedly positioned on the work engaging portion and the other being movable along an arcuate path primarily in a radial direction thereon, a pair of other work engaging members on the work engaging portion located at spaced locations on opposite sides of one of said work engaging contacts, and means connecting the dial means with the work engaging portion of the gauge, the improvement comprising a first member pivotally mounted on the work engaging portion, said first member having angularly related portions one of which includes means on which the movable work engaging contact is located, and means on said gauge engageable with the other angularly related portion of said first pivotal member biasing said movable work engaging contact outwardly on the work engaging portion whereby said work engaging contacts are able to engage opposite sides of a cylindrical surface being gauged, second means including a second member pivotally mounted on the work engaging portion for supporting the spaced pair of work engaging members, said second pivotal member having angularly related portions one of which supports the spaced work engaging members, means engageable with the other angularly related portion biasing said second pivotal member and said pair of spaced work engaging members mounted thereon outwardly into engagement with the surface being gauged, and means operable to retract the movable work engaging contact and the spaced pair of work engaging members on the work engaging portion, said retraction means including an operator member having separate operative connections to the first and second pivotal members.

10. In a dial bore gauge for measuring the size and surface characteristics of cylindrical work surfaces, said gauge including dial means for indicating the reading and including a scale and means for indicating a reading on the scale, a work engaging portion including spaced opposed work engaging contacts for engaging opposite sides of a cylindrical surface to be gauged, one of said work engaging contacts being fixedly positioned on the work engaging portion and the other being movable along an arcuate path primarily in a radial direction thereon, a pair of other work engaging members on the work engaging portion at spaced locations on opposite sides of one of said work engaging contacts, and means operatively connecting the dial means with the work engaging portion of the gauge, the improvement comprising means for mounting the movable work engaging contact on the work engaging portion including a shaft fixedly supported on the work engaging portion and a member pivotally mounted on said shaft, said pivot member having an opening therethrough for receiving said shaft, said opening having a diameter larger than the diameter of the shaft and a pair of spaced shoulders formed on one side of said opening, biasing means located on said pivotal member and engageable with said shaft to bias the shaft into engagement with said spaced shoulders, said pivotal member having a first arm portion extending therefrom to a free end, a hardened work engaging member mounted on said arm and adjacent to said free end to form said movable work engaging contact, and a second arm portion, and means operatively connecting said second arm portion with the means for indicating the reading on the scale, said last means including means normally biasing the pivotal member in a direction to move the movable work engaging contact along an arcuate path about the said shaft primarily in a radial outward direction

19. Means to mount a first member in a second member comprising a spherical first member having predetermined hardness and wear characteristics, a second member having a portion with a socket formed therein, said socket being of a size and shape to receive and support the first member therein, a groove formed in the second member at a location to intersect the socket at an intermediate location, the portions of said second member on opposite sides of the groove resiliently yielding relative to each other to permit movement of the first member into and out of the socket, the second member being an elongated member having an end portion, said socket being formed in the end portion, said groove extending into said elongated member from the socketed end portion a distance substantially greater than the diameter of the socket.

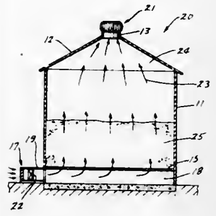
20. Means to mount a first member in a second member comprising a spherical first member having predetermined hardness and wear characteristics, a second member having a portion with a socket formed therein, said socket being positioned adjacent one side thereof, and of a size and shape to receive and support the first member therein, a groove formed in the second member at a location to intersect the socket at an intermediate location, the portions of said second member on opposite sides of the groove resiliently yielding relative to each other to permit movement of the first member into and out of the socket, the groove formed in the second member bifurcating a portion thereof, the portions of the second member difurcated by the groove being of different thickness in opposite sides of the groove.

4,045,878

VENTILATION PROCESS FOR INDUCING BIOCHEMICAL REACTIONS IN STORED FOOD GRAIN WHILE PRESERVING DORMANCY

Sylvester L. Steffen, R.R. 3, New Hampton, Iowa 50659

Filed Dec. 19, 1975, Ser. No. 642,577
Int. Cl.² E04H 7/00
U.S. Cl. 34—26 **3 Claims**



1. A method for controlling the storage environment of cured grain wherein hydrolysis of the grain starches and protein is stimulated under conditions which restrict respiration of grain within a grain storage structure of a type including:

means for forming a grain storage chamber including a top and a bottom portion;

a perforated floor forming at least a part of the bottom portion of said grain storage chamber;

means attached to said perforated floor for forming a plenum chamber below said perforated floor;

an atmospheric air inlet opening disposed in said plenum chamber means;

damper means attached to said plenum chamber means for selectively opening or closing said inlet opening;

said top portion having an exhaust opening disposed therein;

exhaust means attached to said top portion for forcibly exhausting air from the top of said grain storage chamber;

wherein said method comprises:

forcing atmospheric air to flow through the stored grain at substantially all times when the grain moisture at dormancy, for a given grain, locality and time, is above a predetermined grain moisture floor, with said damper means in an open position; and

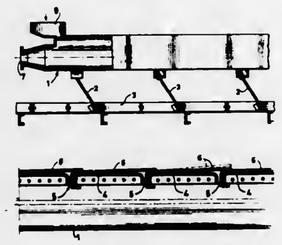
closing said damper means for substantially preventing the flow of outside air through the stored grain and simultaneously forcibly exhausting accumulated heat and moisture from said exhaust means by use of said exhaust means at substantially all times when the grain moisture at dormancy for a given grain, locality and time, is at or below said predetermined grain moisture floor.

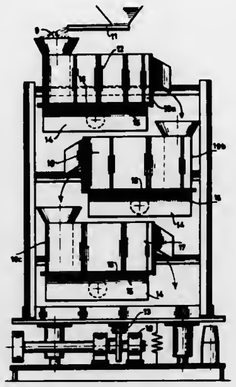
4,045,879

PROCESS FOR TREATING OIL CONTAINING VEGETABLE RAW MATERIALS

Johan Frederik Witte, Amsterdam-Nieuwendam, Netherlands, assignor to Stork Amsterdam B.V., Amstelveen, Netherlands

Continuation-in-part of Ser. No. 443,844, Feb. 19, 1974, abandoned. This application Feb. 18, 1976, Ser. No. 658,995
Claims priority, application Netherlands, Feb. 20, 1973, 7302358
Int. Cl.² F26B 3/00, 5/00; C11B 1/04, 1/10
U.S. Cl. 34—31 **7 Claims**





1. A process for treating oil-containing vegetable seed particles to facilitate subsequent oil extraction from said particles, said process comprising the steps of:

a. forming the seed particles in a thin layer in a receiver provided with a bottom having apertures;

b. moving the particles close to one another regularly for a relatively short time and moving the particles away from one another for a relatively short time while advancing said particles through the receiver;

c. the movement of said particles towards and away from one another being obtained by effecting vibration of the receiver with a vertical vibration component having a low frequency of most 1000 vibrations per minute and high amplitude of about 5 to about 50 mm.;

d. supplying a heat and moisture-containing gaseous fluid through the apertures in the bottom of the receiver during periods in which the apertures are open;

e. heating the particles to a temperature of at least 90° C to inactivate enzymes rapidly;

f. thereafter decreasing the moisture content and temperature of the vegetable seed particles, by contacting the particles with each other regularly for a relatively short time and separating said particles from each other also for a relatively short time, said contact and said separation being obtained as in step (c), while a gaseous drying fluid supplied through openings in the bottom acts discontinuously on each individual particle when said oenings are open due to the action of the vertical vibration component.

2. Process according to clalim 1, wherein the oil-containing vegetable seed particles are heated and moistened in a first receiver, in a second receiver their temperature is maintained at a value ranging from 95° to 115° C for 1 to 3 minutes and in a third receiver the raw materials are cooled and dried, the fluids for the heating, moistening and transfer being supplied in each stage.

3. Process according to claim 1, wherein the total amplitude of the vertical component of vibration is between 10 and 40 mm.

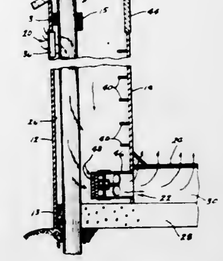
4. Process according to claim 1, wherein the frequency of the vibration is between 200 to 400 vibrations per minute.

4,045,880

SOLAR GRAIN DRYING APPARATUS

Sylvester L. Steffen, R.R. 3, New Hampton, Iowa 50659

Filed Apr. 12, 1976, Ser. No. 676,125
Int. Cl.² F26B 19/00; F24J 3/02
U.S. Cl. 34—93 **1 Claim**



1. A grain storage structure for utilizing solar energy for heating air and surface winds for circulating heated air through stored grain, said structure comprising:

a base floor;

outside sidewalls constructed of heat absorbing material extending upwardly around the periphery of said base floor, said outside sidewalls forming a first closed structure and including a plurality of air intakes for permitting ambient air to pass through said sidewalls;

controllable louver means positioned over said air intakes for selectively allowing or preventing the flow of ambient air through said sidewalls;

a roof disposed on top of said first closed structure, said roof having openings therein;

inside sidewalls forming a second closed structure and disposed inwardly of said outside sidewalls, thereby forming

a solar plenum between said outside sidewalls and said inside sidewalls;

means for sealing an upper portion of said inside sidewalls with respect to said outside sidewalls;

an air pervious floor disposed above said base floor and within said second closed structure, thereby forming a lower plenum between said base floor and said air pervious floor;

a grain storage chamber formed by said inside sidewalls and said air pervious floor;

means for operably connecting said solar plenum to said lower plenum, whereby air from said solar plenum may enter said lower plenum;

fan means, disposed within said connecting means and disposed between said solar plenum and said lower plenum, for forcing air into said lower plenum and through said grain storage chamber;

controllable damper means positioned within said connecting means for selectively allowing and preventing the flow of air from said solar plenum to said grain storage chamber; and

at least one wind powered turbine disposed over an opening in said roof in communication with said grain storage chamber.

4,045,881

SYSTEM FOR VENTING THE HEATING PIPES OF A TUBULAR ROTARY DRYER

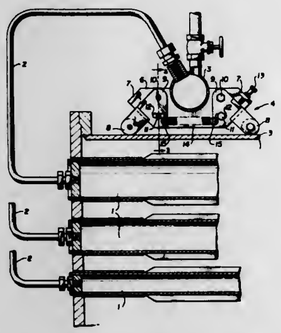
Bernd Brandt, Wesseling-Berzdorf; Peter Janssen, and Heinz Liesenfeld, both of Wesseling, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed July 25, 1975, Ser. No. 599,301

Claims priority, application Germany, Aug. 27, 1974, 2440897

Int. Cl.² F26B *11/04*

U.S. Cl. 34—138 **12 Claims**



1. A venting system for venting air to a collecting pipe from the heating pipes of a tubular rotary dryer, a dryer drum having a longitudinal axis and being rotatable about said longitudinal axis, heating pipes within said dryer drum, said collecting pipe being disposed annularly and continuously around the dryer drum, holding blocks supporting the collecting pipe on the dryer drum, said holding blocks mounted for movement relative to the drum in a direction parallel to said longitudinal axis of the dryer drum, and connector pipe means for connecting said collecting pipe to the heating pipes.

4,045,882

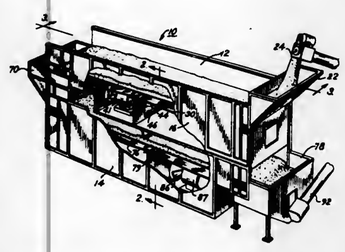
GRAIN DRYING APPARATUS AND PROCESS

James F. Buffington, R.R. No. 4, Plymouth, and Lee E. Norris, R.R. No. 1 Box 341, Mentone, both of Ind. 46539

Filed June 30, 1976, Ser. No. 701,284

Int. Cl.² F26B *17/12*

U.S. Cl. 34—171 **7 Claims**



1. A grain drying apparatus comprising a housing having upper and lower elongated sections, a porous conveyor belt in each of said sections extending substantially the full length thereof, a grain receiving means at one end of the conveyor in said upper section, a grain receiving and holding bin disposed at the other end of the conveyor in said upper section and having and opening for discharging grain onto the conveyor in said lower section, a compartment beneath the conveyor in said upper section, two interconnecting compartments beneath the conveyor in said lower section, one of said latter compartments being located near the receiving end of the conveyor and the other near the discharge end, a first heating means and blower operationally disposed between said two latter compartments for drawing cool air downwardly through the grain near the discharge end of the conveyor in said lower section and forcing heated air upwardly through the grain near the receiving end of said conveyor, and a second heating means and blower operationally disposed between said two conveyors for drawing air from the grain receiving end of the conveyor in said lower section and heating and forcing it upwardly through the conveyor in said upper section.

4,045,883

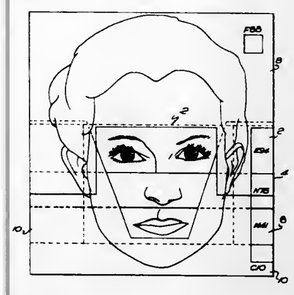
IDENTIFICATION KIT AND METHOD

Wilfred Edward Ryan, 47 Lower Green Road, Pembury, Tunbridge Wells, Kent, England

Continuation-in-part of Ser. No. 852,855, Aug. 25, 1969, abandoned. This application Apr. 20, 1973, Ser. No. 352,894

Int. Cl.² G09B *1//16*

U.S. Cl. 35—28 **2 Claims**



1. A method of assembling a photographic representation of the facial features of a person recollected from the memory of an identifying person, the method comprising the steps of determining from an identifying person at least one basic facial characteristic of the recollected face, selecting from first and second pluralities of photographic parts a photographic representation of said basic facial characteristic, selecting from said first and second pluralities of photographic parts photographic representations of the remaining facial features of the recollected face, the photographic parts each carrying indicia so that the selection of a photographic representation from one of said pluralities of photographic parts automatically enables the selection of the corresponding photographic representation from the other of said pluralities of photographic parts, and thereafter assembling said selected photographic representations in co-operating and vertically adjustable relationship so as to form first and second corresponding photographic assemblies of said recollected face, a first assembly of photograpic representations comprising a front-face head view and the second assembly of photographic representations comprising a profile view of said front face head view with the facial features in the first assembly being in the same geometric scale as those in the second assembly said first assembly comprising a top facial frame bearing a representation of the top of the head, the forehead, the hair and the ears of the recollected person, a bottom frame bearing a representation of the lower cheeks and chin, separable intermediate parts fitting between said top frame and bottom frame and consisting of a representation of both eyes and upper nose, a representation of the lower nose parts including nostrils and tip and the inner parts of the cheek, and a representation of the mouth, said top facial framing member having downwardly extending projections overlying side portions of said intermediate parts bearing the eyes and the lower nose representations, and the lower two of said intermediate parts occupying the top central portion of said bottom frame, said second profile assembly comprising, a single top and side frame defining the top and one entire side edge which bears a representation profile of the hair, the top of the head, the forehead, and an ear, and which defines part of the other side edge of the assembly, and second, third, fourth and fifth intermediate pieces, representing in sequence an eye on the second piece, a nose on the third piece which is positioned in front of the second piece to define a side extension at one edge thereof in common with the other side edge of the top profile frame, a mouth on the fourth piece and a chin on the fifth piece, said fourth and fifth pieces fitting to each other so as to join along a common edge meeting with the edge of the third piece, the indicia on each of said frames and intermediate pieces in the front face and profile assemblies identifying the facial features and permitting recording, in terms of these indicia, of the separate facial features assembled from the pluralities of photographic parts, to thereby provide a front and a corresponding profile total face which matches a recollected face.

4,045,884

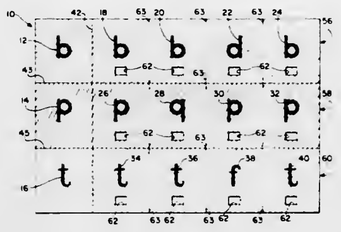
TEACHING DEVICE FOR THE CORRECTION OF READING, SPELLING AND WRITING LEARNING DISABILITIES

Frances Lee Zand, 1247 Hillside, Northbrook, Ill. 60062

Filed Mar. 18, 1976, Ser. No. 668,293

Int. Cl.² G09B *17/00*

U.S. Cl. 35—35 R **8 Claims**



1. A teaching device comprising first means with at least one standard symbol, which is representative of a letter, depicted thereon and at least three test symbols depicted on said first means for each of said standard symbols, each of said test symbols being aligned in a set with an associated standard symbol in a normal reading direction, a majority of said test symbols being identical to, and having the same orientation as, their associated standard symbols, and at least one second means with a matching symbol depicted thereon which is identical to said standard symbol and which is constructed so that said matching symbol may be overlaid selectively on said associated standard symbol or on said test symbols which are aligned with their associated standard symbol to provide a visual test of whether or not said test symbols correspond to their associated standard symbol with which they are aligned, wherein said teaching device is useful for the correction of learning disabilities involving mirror image reversals, recognition and orientation learning disabilities relating to letters, said standard symbols each comprise a standard letter, said test symbols each comprise a test letter and at least one, but not more than a minority, of said test letters are a letter that is mirror image reversal of its associated standard letter, or a letter that is identical to the associated standard letter but is improperly oriented with respect thereto or a properly oriented letter that is similar in some respects, but is not identical, to the associated standard letter and the matching symbols each comprise a matching letter that corresponds to one of said standard letters.

4,045,885

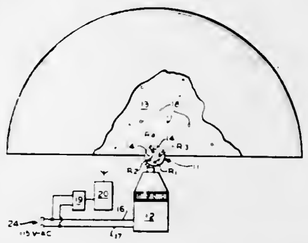
PLANETARIUM WITH STAR IDENTIFYING MEANS

Philip Stern, 3800-21st Ave. North, St. Petersburg, Fla. 33713

Filed July 30, 1976, Ser. No. 710,266

Int. Cl.² G09B *27/00*

U.S. Cl. 35—42.5 **9 Claims**

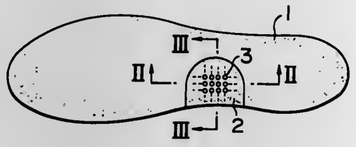


1. In a planetarium (according to claim 1,) having a light emitting star globe with a light source therein and having plural pin holes therein through which light from said source is projected, and a screen upon which such projected light forms separate star images approximately in relationships as stars represented by said images appear visible in the firmament; light occluding means for providing intermittent occlusion of a beam of said light which is projected to form a star image, to cause blinking of said star image, and control means for initiating and terminating said intermittent occlusion; said light occluding means comprising an interrupter unit fixed to a generally spherical wall defining said star globe; said unit including an occluding arm, and an actuator, responsive to said control means, for causing reciprocation of said arm back and forth intermittently into and from the path of light projected from said light source.

4,045,886
MEANS FOR REDUCING FATIGUE FROM WEARING FOOTGEAR

Katsuhisa Terasaki, 43, Okimiyacho, Edogawa, Tokyo, Japan (133)

Filed June 22, 1976, Ser. No. 698,709
Claims priority, application Japan, June 30, 1975, 50-91371[U]; Feb. 19, 1976, 51-18739[U]
Int. Cl.² A43B *13/38*
U.S. Cl. 36—44 **5 Claims**

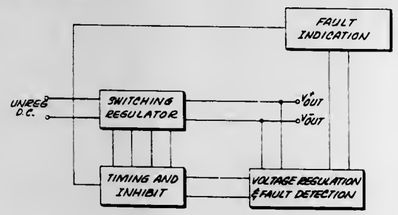


1. A combination of an insole sheet and first and second sheet pieces for reducing fatigue from wearing footgear, said insole sheet being a relatively flexible synthetic resin sheet having a first group of regularly arranged openings which open in at least the upper surface thereof and a second group of regularly arranged openings which open in at least the lower surface thereof, said first and second groups of openings being provided at least in a region which corresponds to the arch portion of the foot, said first sheet piece having a plurality of projections adapted to massage the arch portion of the foot on the upper surface thereof and a plurality of regularly arranged projections on the lower surface thereof which are adapted to engage with said first group of openings, said second sheet having a plurality of regularly arranged projections on the upper surface thereof which are adapted to engage with said second group of openings, wherein said first and second sheet pieces are mounted to said insole sheet at its upper and lower sides, respectively, in a manner to support only the arch portion of the foot.

4,045,887
SWITCHING REGULATOR CONTROL CIRCUIT

John Rawson Nowell, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Apr. 12, 1976, Ser. No. 676,175
Int. Cl.² H02H *7/20*
U.S. Cl. 361—98 **13 Claims**

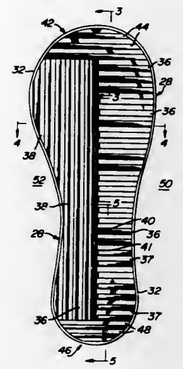


1. A control circuit for a switching regulator utilizing SCR-inductive reactor switching comprising:
a. timing means connected to the switching regulator for triggering each SCR sequentially at the switching regulators optimal switching rate;
b. first fault detection means connected to the switching regulator for individually detecting over-voltage, under-voltage and over current faults, and providing inhibit signals to the timing means;
c. second fault detection means for providing fault signals to a master control panel for shutting down the switching regulator;
d. fault indication means connected to the fault detection means for individually indicating the type of fault detected; and
e. voltage regulation means connected to the switching regulator output and the timing means for maintaining a desired voltage at the switching regulator output.

4,045,888
ATHLETIC SHOE

Bruce Oxenberg, 6233 Trotter St., Philadelphia, Pa. 19111

Filed Oct. 26, 1976, Ser. No. 735,873
Int. Cl.² A43B *5/00, 13/04*
U.S. Cl. 36—114 **21 Claims**



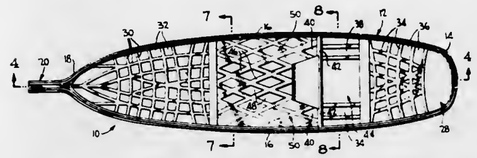
1. An athletic shoe, comprising:
a fabric upper;
padding connected to said upper, disposed inside said shoe about the ankle, back and tongue areas of said upper;
a resilient, rubber-like lower, said lower having a sole and a heel portion;
a plurality of gripping members mounted on said lower, each of said gripping members being triangularly shaped in cross-section, each of said gripping members being provided with a principal sloping face depending outwardly from said lower, said triangularly shaped gripping members pointing in the direction of the acute angle which each said principal sloping face makes with said lower;
a first set of said plurality of triangularly shaped gripping members, tranversely disposed along said sole portion of the outside half of the bottom of said lower, pointing towards the rear of said lower;
a second set of said plurality of triangularly shaped gripping members, transversely disposed along said heel portion of the outside half of the bottom of said lower, pointing towards the front of said lower;
a third set of said plurality of triangularly shaped gripping members longitudinally disposed along the inside half of the bottom of said lower, pointing towards the center of said lower; and
a longitudinally dividing member running substantially the length of the bottom of said lower, separating said first and said second set of said plurality of triangularly shaped gripping members from said third set of said plurality of triangularly shaped gripping members.

4,045,889
SNOWSHOE

Richard G. Woolworth, Lancaster, Pa., assignor to Woodstream Corporation, Lititiz, Pa.

Filed Apr. 29, 1976, Ser. No. 681,445
Int. Cl.² A43B *5/04*
U.S. Cl. 36—122 **8 Claims**

1. A snowshoe comprising rib means including front, side and rear portions defining a continuous peripheral support surrounding front, central, and rear sections of the snowshoe, said rear and central sections being substantially flat and said front section extending upwardly in a smooth fashion from said central section to define an upturned tip portion, said rear section being defined by latticework means forming openings comprising a major portion of the area of said rear section to permit passage of snow therethrough, said central section including means for securing a foot harness to said snowshoe,

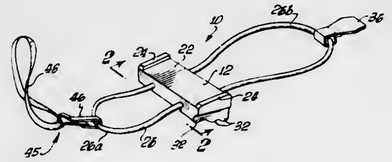


a central portion of said central section adapted to support the shoe of a user and being defined by latticework means forming openings comprising a major portion of the area of said central portion to preclude snow from being trapped between the shoe of the user and the upper surface of the snowshoe, both sides of said central portion of said central section being substantially continuous to preclude passage of snow or the like therethrough and provide additional flotation to the snowshoe.

4,045,890
SKI BOOT CLEAT

John A. D'Alessandro, 9236 Appleby St., and Lawrence A. Tsohino, 9331 Gallatin Road, both of Downey, Calif. 90240

Filed Aug. 18, 1976, Ser. No. 713,633
Int. Cl.² A43B *5/00*; A43D *5/00*
U.S. Cl. 36—132 **5 Claims**



1. A removable ski-boot cleat comprising:
a cleat body member with fulcrum means formed thereon;
a stretchable strap removably secured to said cleat-body member;
a pair of longitudinally disposed channels formed in said cleat-body member, wherein each channel includes corresponding slots through which said strap is passed to be held in said channels;
mounting means for stretching said strap to attach said cleat to said boot; and
restraining means to removably attach the ski to said boot.

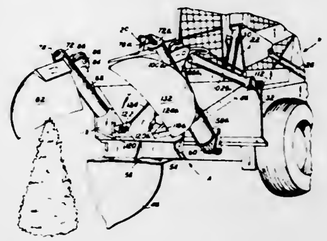
4,045,891
DEVICE FOR DIGGING, BALLING AND RELOCATING A TREE AND OTHER MATERIAL

Leonard A. Grew, 43 Kingston Road, Duluth, Minn. 55801

Filed Jan. 19, 1976, Ser. No. 650,565
Int. Cl.² A01G *23/06*
U.S. Cl. 37—2 R **16 Claims**

14. Device for digging, balling and relocating material for use with a vehicle having an attachment plate and means for lifting and lowering the attachment plate comprising, in combination:
a. a first side blade segment and a second side blade segment, with the first and second side blade segments at least partially forming a receptacle having an open top when in a juxtaposed relation,
b. first and second arms having longitudinal axes,

c. means for rotatably mounting each of said arms about the longitudinal axis thereof on the attachment plate,
d. means for pivotally mounting each of said arms at one end thereof on the attachment plate about an axis substantially perpendicular to the longitudinal axis of the arm, and

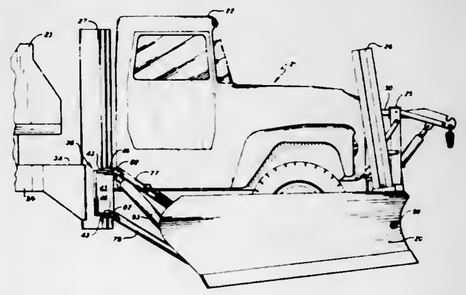


e. first and second means for rotating and pivoting said first and second arms, respectively, with the first blade segment being carried by the first arm and the second blade segment being carried by the second arm, to thereby move the first and second side blade segments together and to separate the first and second side blade segments.

4,045,892
HYDRAULICALLY OPERATED FRONT AND REAR WING HANGERS FOR SNOW PLOWS

Eugene A. Farrell, Fishers Landing, N.Y., assignor to Frink Sno-Plows, Clayton, N.Y.

Filed Nov. 8, 1976, Ser. No. 739,499
Int. Cl.² E01H *5/00*
U.S. Cl. 37—50 **7 Claims**



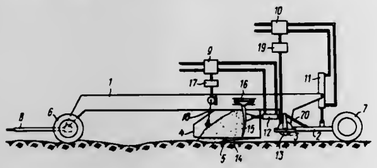
1. Hanger means for a patrol wing plow blade on a snow plow vehicle comprising substantially vertically extending front and rear tubular ways, each way tube being secured to the vehicle and having a single longitudinally extending slot therein, slide means for each way partially within and partially without the way and having portions extending through the way slot, a double action hydraulic cylinder in each way, the cylinder being secured to the portion of the slide within the way, a piston within the cylinder having a piston rod extending downward in the way and having its lower end secured to the lower end of the way, the rod having a first passage therein extending from the bottom end up through the piston and in communication with the interior of the cylinder above the piston and a second passage extending from a point adjacent the bottom of the way to a point adjacent the piston and in communication with the interior of the cylinder below the piston, each passage having means at the bottom of the way for connecting the passage with a source of fluid under pressure, the respective portion of each slide outside the way being operatively connected to opposite ends of the plow blade, whereby the plow ends are raised and lowered by the selective admission of fluid under pressure to the passages.

4,045,893

AUTOMATED PLANER

Mikhail Leibovich Feinziber, Budapeshtskaya ulitsa, 17, korpus 5, kv. 62; Eduard Nikolaevich Kuzin, ulitsa 3 Internatsionala, 74, kv. 199; Gennady Ivanovich Timofeev, ulitsa 3 Internatsionala, 69, kv. 97, all of Leningrad; Semen Semenovich Roitershtein, ulitsa Generala Khazova, 32, kv. 20, Pushkin Leningradskoi oblasti; Jury Stepanovich Kozlov, ulitsa Dimitrova, 10, korpus 1, kv. 160, Leningrad; Vladimir Fedorovich Korelin, ulitsa Belgradskaya, 20, kv. 123, Leningrad; Nikolai Vasilievich Dmitrievsky, Piskarevsky prospekt, 10, kv. 289, Leningrad; Igor Petrovich Bratyshev, proezd Solomennoi Storozhki, 12a, kv. 52; Fedor Evstafievich Omelyan, ulitsa Zhivopisnaya, 5, korpus 4, kv. 49, both of Moscow; Efim Iosifovich Sheinis, Budapeshtskaya ulitsa, 17, korpus 5, kv. 75, Leningrad; Vladimir Grigorievich Pak, ulitsa Rakhimova, 3; Vladimir Ivanovich Romanov, mikroraion 2, 36, kv. 29, both of Andizhan; Zalman Eremeevich Garbuzov, ulitsa Michurinskaya, 13, kv. 20, Leningrad, all of U.S.S.R., and Grigory Borisovich Naret, deceased, late of Leningrad, U.S.S.R. (by Avgustina Alexandrovna Naret, administrator)

Filed Apr. 22, 1976, Ser. No. 679,131
Int. Cl.[2] E02F 5/00
U.S. Cl. 37—108 A 11 Claims



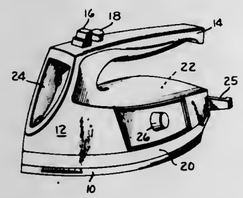
1. An automated planer comprising: a fore frame; a rear frame; a hinged means to connect said fore and rear frames; running gear; a scoop with a cutting edge; electrohydraulic distributors; hydraulic cylinders; a planer dip angle pickup, a prime-mover engine clutch engagement mechanism; a ground level pickup positioned in front of the cutting edge of said scoop; said planer dip angle pickup connected by means of one of said electrohydraulic distributors to one of said hydraulic cylinders joining said rear and fore frames; said scoop with a cutting edge secured on said fore frame with side walls joined by a bottom plate in their rear part and a rear wall positioned in slideways parallel to said bottom plate and connected to said fore frame by means of another of said hydraulic cylinders in its turn connected by another of said electrohydraulic distributors to said ground level pickup.

4,045,894

IRON WITH THERMOSTAT MOUNT

Kaj Toft, Monroe, Conn., and Llewellyn D. Busby, Asheboro, N.C., assignors to General Electric Company, Bridgeport, Conn.

Filed Nov. 22, 1976, Ser. No. 743,680
Int. Cl.[2] D06F 75/06, 75/26
U.S. Cl. 38—77.83 4 Claims



1. An extra capacity steam iron having a soleplate with heating means, separate forward main, and rear surge, steam generators, means selectively delivering water to the generators, and heat regulating thermostat means, the improvement comprising:

a walled enclosure on said soleplate between the generators;

a boss upstanding from the soleplate disposed in and smaller than said enclosure to provide some peripheral space therebetween;

a coverplate to define steam distributing means from the generators,

the boss extending through the enclosure and above the coverplate above the coverplate;

a slanted surface on the boss above the coverplate and parallel to the adjacent contoured outside surface of the iron;

said slanted surface having a positioning groove therein for locating the thermostat repetitively;

said thermostat secured to the surface abutting said groove and;

a control button on the side of the iron connected to the thermostat;

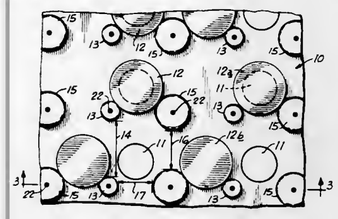
whereby a direct coupling connects the side control button and thermostat which responds to both main and surge steam demands for a substantially uniform soleplate temperature.

4,045,895

DISPLAY SIGN

Gerald L. Work, Spokane, Wash., assignor to American Sign and Indicator Corporation, Spokane, Wash.

Filed July 26, 1976, Ser. No. 708,913
Int. Cl.[2] G09F 11/34
U.S. Cl. 40—28 C 3 Claims



1. In an information display device having:

an upright panel with a plurality of discrete light-transmitting areas arranged along transversely spaced upright columns and surrounded by a background;

a backing member spaced parallel to the panel;

and a plurality of circular discs equal in number to the number of light-transmitting areas on the panel, each disc having a diameter capable of overlying a light-transmitting area and a thickness less than the spacing between the panel and backing member, the diameter of each disc being greater than said spacing;

each disc being located between the panel and backing member for planar movement between a first position overlying a light-transmitting area and a second position clear of such area;

the improvement comprising:

first projection means located in the path of movement of the discs between the panel and backing member and arranged in columns located at a corresponding first side of each light-transmitting area, said first projection means including discrete projections on which the individual discs rest while at their first and second positions, and over which each disc must move when being shifted between its first and second position; and

second projection means spaced transversely apart from said first projection means and located in the path of movement of the discs between the panel and backing member and arranged in parallel columns flanking the first projection means at each side thereof for resting engagement by a disc while at its first or second position respectively;

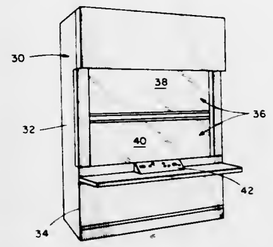
said first and second projection means in adjacent columns being spaced transversely by a distance less than the disc diameter.

4,045,896

X-RAY FILM STORAGE AND VIEWING DEVICE

Bruce E. Adlon, Northbrook; Walter H. Villiers, Chicago, and Sherwin S. Tarnoff, Northbrook, all of Ill., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 26, 1975, Ser. No. 635,322
Int. Cl.[2] G09F 11/32, 13/10
U.S. Cl. 40—106.1 10 Claims



1. In a system for storing and displaying display panel mounted cut film radiographs including: a storage area, a display area, and a main conveyor for carrying said panels between said storage and display areas by lifting said panels at one end thereof, the improvement comprising:

means for positioning and damping pendulum motion of said panels when carried on said conveyor to and from said display area,

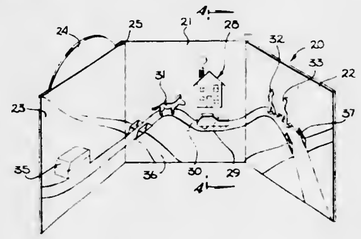
said positioning and damping means including a pair of cams rotated synchronously with said conveyor in a direction corresponding to the direction of movement of said conveyor, said cams positioned to contact the other, free swinging, end of said display panels carried by said conveyor to restrain said swinging end relative to said one end whereby pendulum motion is damped and the panel is correctly positioned for entry to or egress from the display area.

4,045,897

COHESIVE DISPLAY BOARD

Victor Genez Gates, 1342 Harvard, Santa Monica, Calif. 90404

Filed Apr. 29, 1976, Ser. No. 681,584
Int. Cl.[2] G09F 1/00
U.S. Cl. 40—125 A 6 Claims



1. A display board comprising:

a. a surface being at least partially coated with a powdered synthetic fiberous material;

b. at least one display item having at least one side coated with a powdered synthetic fiberous material for selectively engaging portions of said partially coated surface;

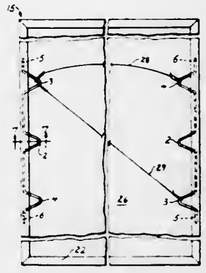
whereby, said display item may be displayed by disposing said display item on the coated portion of said surface such that said fiberous material on said display item engages at least a part of said coated portion of said surface.

4,045,898

MAT-RETAINING SPRING FOR PICTURE FRAME

James Donald Reinhardt, Pewee Valley, Ky., assignor to Cardinal Extrusions Co., Louisville, Ky.

Filed Sept. 3, 1976, Ser. No. 720,271
Int. Cl.[2] G09F 1/12
U.S. Cl. 40—156 10 Claims



1. A mat retainer for the inwardly open frame space of a unitary rectangular frame having a perimetric wall and spaced relatively wide and narrow front and rear face-flange means on said perimetric wall, comprising:

A. a resilient strip having a length smaller than the smallest of the side and end length dimensions of the frame, a still smaller width and shallower depth and also having a concavo-convex curvature substantially throughout its length and depth, said curvature being in a plane normal to its width,

1. said strip being composed of a strand of spring wire provided with at least two loops which are

a. spaced longitudinally along the length of the strip and

b. arranged to extend in the same lateral direction across the width of the strip between its concave and convex faces,

2. the bulge of said concavo-convex strip having an amplitude sufficient substantially to bridge the frame space between the front and rear face-flange means,

3. said concavo-convex strip, when its bulge is compressed, being laterally insertable side-wise or edge-wise into an operative position between said face-flange means,

a. said compressed bulge tending to expand in said operative position toward said front and rear face-flange means, which prevent complete expansion,

4. said concavo-convex strip being operative, when operatively inserted between said face-flange means with a mat in place adjacent the front face-flange means, to exert sufficient expansive force to press the margin of the mat forwardly and hold it against the said front face-flange means.

4,045,899

INDICATOR DEVICE FOR A GARMENT HANGER

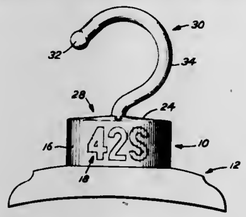
William H. Richardson, Oklahoma City, Okla., assignor to City Products Corporation, Chicago, Ill.

Filed Feb. 17, 1976, Ser. No. 658,595
Int. Cl.[2] G09F 3/00, 3/04
U.S. Cl. 40—322 11 Claims

1. An indicator device for use in conjunction with a garment hanger having a hook comprising, in combination:

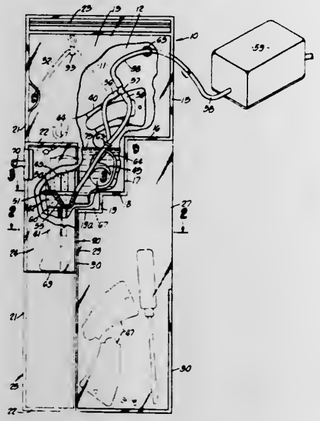
a flexible disc section having an edge, a central aperture therethrough and at least a pair of slots extending substantially radially from said central aperture, said slots termi-

nating prior to said edge, said flexibility, central aperture and slots cooperatively defining means for flexing said disc section to receive said hook in an assembled state;
a sidewall section extending from said edge of said disc section; and
an indicia secured to said sidewall section;



said slots defining at least two disc portions, said disc portions securingly engaging said hook in said assembled state, whereby said indicator device is substantially positionally maintained on said garment hanger;
said disc portions being tapered to increase the flexibility of said disc section.

4,045,900
GUN CLEANER
John A. Byer, 820 S. Maryland St., Apt. 107, Los Angeles, Calif. 91205
Filed June 29, 1976, Ser. No. 700,766
Int. Cl.² F41C *31/00*
U.S. Cl. 42—1 R 8 Claims



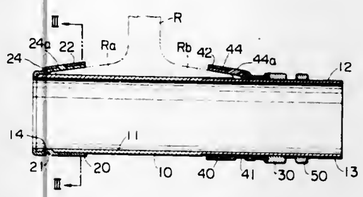
1. A gun cleaning system, the combination including:
a. a gun container having pouch adapted to receive a gun with its barrel pointed downward, and having an elongated barrel-receiving portion of reduced cross-sectional size, extending downwardly from said pouch;
b. said barrel-receiving portion being adjustable in length to accommodate the barrel of said gun;
c. a cleaning solution in said pouch filling said barrel-receiving portion; and
d. means whereby said barrel-receiving portion may be elongated below said barrel to permit said cleaning solution to drain downwardly into a position below said gun barrel.

4,045,901
TRAWLER DOORS
Augusto Prudenzi, 84 Partridge Ave., Somerville, Mass. 02145
Filed Sept. 29, 1976, Ser. No. 727,952
Int. Cl.² A01K *73/04*
U.S. Cl. 43—9 6 Claims



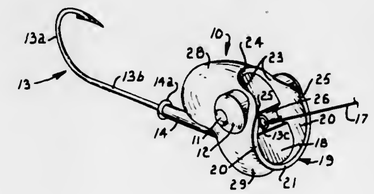
1. A pair of cooperating trawler doors for fishing, said doors being adapted for attachment, respectively, to a pair of towlines affixed one to each side of the open mouth of a trawler net and to hold the mouth open by causing the towlines to diverge as the net is towed through the water, each door comprising upper and lower stiffening members and at least three sheet metal plates affixed therebetween, the front and rear plates extending over a majority of the area of each door and defining a longitudinally arcuate body portion with a convex inner side and a concave outer side, at least one intermediate plate being offset from the arc of said body portion to form a louver providing a plurality of slots having a substantial vertical component for passage of water through the door from one side to the other as the door is towed through the water, first attaching means affixed to the forward portion of the convex inner side of the door for attaching the forward portion of one of said towlines to the towing vessel, and second attaching means affixed to the aft portion of the concave side of the door for attaching the aft portion of said towline to the net.

4,045,902
FASTENING DEVICE FOR A REEL ON FISHING RODS
Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Japan
Filed Apr. 5, 1976, Ser. No. 673,542
Claims priority, application Japan, July 17, 1975, 50-99946[U]
Int. Cl.² A01K *87/06*
U.S. Cl. 43—22 2 Claims



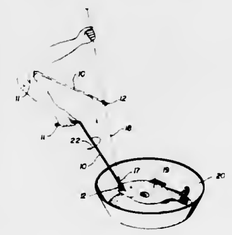
1. In a fastening device for a reel on fishing rods comprising a cylindrical body having an axially aligned hole for receiving the fishing rod, a fixed sleeve mounted to one end of said cylindrical body, a fastening collar screwed over said cylindrical body near the other end thereof and a movable sleeve slidably inserted over said cylindrical body at a position between said fixed sleeve and said fastening collar and co-movable with said fastening collar in the axial direction of said cylindrical body the improvement comprising each of said sleeves being provided with a shell-shaped hood on the side of which said reel is to be mounted, said hood comprising an arched top wall portion and a pair of plain side wall portions tangentially merging into the circular wall portin of said sleeve, a recess formed through said top wall portion of said hood, and a seat piece made of a resilient resin material and having an outer projection snugly received within said hood said outer projection being snugly received within said recess, said seat piece having an inner cavity to snugly receive one foot of said reel, and said cavity having an arcuate top terminating in spaced vertical side walls that are parallel to each other in any plane normal thru said cavity.

4,045,903
ARTIFICIAL FISHING LURE
Douglas W. Parker, 2720 S. Waldron Road, Fort Smith, Ark. 72901
Filed Feb. 2, 1976, Ser. No. 654,071
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.11 9 Claims



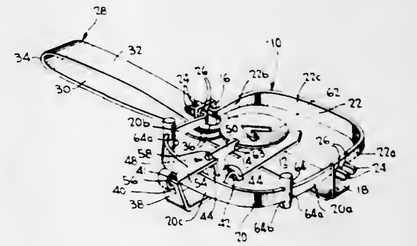
8. An underwater fishing lure comprising:
a lure body having a leading end when traveling through water;
a substantially flat surface on the leading end of said lure body, said surface being inclined from vertical at a rearwardly inclined angle from bottom to top of the surface when the lure travels through water;
a rim section extending substantially around the periphery of said surface and projecting forwardly thereof, said rim section including a pair of spaced side walls projecting forwardly on opposite sides of said surface;
trough means presenting a generally transverse recess in said surface for directing water against said side walls;
a harness having first and second legs terminating in respective end portions spaced apart from one another;
a spinner member mounted to swivel on the end portion of said first leg; and
flexible means for attaching said lure body to the end portion of said second leg in a manner permitting said lure body to roll about the axis of said second leg and to pivot thereon.

4,045,904
FISH HOOK EXTRACTOR
Joseph C. Lore, Ridge, Md. 20680
Filed Apr. 28, 1976, Ser. No. 681,288
Int. Cl.² A01K *97/00*
U.S. Cl. 43—53.5 1 Claim



1. A fish hook extractor comprising an elongated rigid bar member of circular cross section, a handle extension on one end of the bar member for rotating the bar member on its longitudinal axis during use, and a substantially circularly curved rigid loop integrally formed on the other end of the bar member and extending away from one side of the bar member and lying in a plane with the bar member, the handle extension projecting laterally of the bar member substantially normal to said plane, said loop terminating in a straight side extension arranged at an angle of about 45° to the longitudinal axis of the bar member, said straight side extension having a square end face forming on the extension a substantially square corner closely spaced from one side of the bar member so that a fishing line or leader for a predetermined size of fish hook may pass through the small gap between said square corner and bar member, and said gap blocking passage of the predetermined size of fish hook therethrough so that the hook when introduced into the loop cannot leave the loop by way of the small gap, said straight side extension converging with said bar member and forming therewith a wedge passage by means of which the bight of a fish hook within the loop can be engaged and firmly twisted by manual rotation of the bar member on its longitudinal axis.

4,045,905
ANIMAL TRAP
Anthony J. Souza, Lititz, Pa., assignor to Woodstream Corporation, Lititz, Pa.
Filed Nov. 6, 1975, Ser. No. 629,679
Int. Cl.² A01M *23/26*
U.S. Cl. 43—88 13 Claims



1. In an animal trap including a base, a pair of generally U-shaped jaws, each comprising a pair of parallel spaced legs and a cross member, said cross member having an inner gripping face, said legs being journaled in said base for pivotal movement of said jaws toward and away from each other between fully open, when set, and fully closed, when sprung, positions; spring means operatively associated with said jaws and normally operative to pivot said jaws toward each other to the fully cosed position in which said cross members abut each other at the inner gripping faces; and animal actuated trigger means for releasing said spring means: the improvement comprising spacer means comprising at least one elongated spacer element mounted on at least one leg of at least one of said jaws and extending toward the corresponding leg of the other of said jaws whereby the corresponding leg of the other of said jaws abuts said spacer means when said trap is sprung to space said jaws apart a predetermined distance and prevent same from fully closing, said cross members being free of spacer means and said inner gripping faces being unimpeded by said spacer means.

11. For use in combination with a trap of the animal actuated, leg-hold type which includes spring means normally operative upon a pair of generally U-shaped jaws for pivoting said jaws toward each other to a fully closed position, a jamb element for maintaining said jaws at least slightly spaced apart when said trap is in the fully closed position, said jamb element comprising a body having slot means for closely receiving one of said jaws therein whereby said jamb element is mounted on said jaw, said body including a portion extending from said jaw to and abutting said other jaw when said trap is in the fully closed position, said body being a generally elongated cylinder, said slot means comprising a slot formed in one end of said body, said slot being longitudinally extending and comprising

opposite generally parallel side walls and an end wall, said side walls inclining toward each other at their free ends, and said portion comprising the other end of said body.--

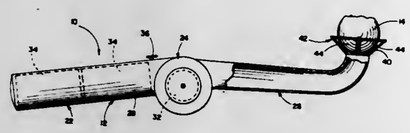
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4,045,906

PLAY DEVICE FOR SUSPENDING AND MOVING A FLOATABLE OBJECT RELATIVE TO MOVABLE AREAS

Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91356, and Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316

Filed Feb. 12, 1976, Ser. No. 657,484
Int. Cl.² A63H *29/16, 33/26*
U.S. Cl. 46—44 **18 Claims**



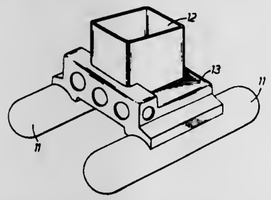
1. A play device comprising
a. a hand holdable blower means for providing a selectively directable air stream;
b. a floatable object having such size, shape and weight for being suspended in said air stream; and
c. movable means for being disposed on a supporting surface and defining at least one area in which the object is to be positioned by being moved thereto by the air stream, said area being spaced above the supporting surface, said movable means being movable relative to the supporting surface when contacted by the air stream to thereby move the said area and thereby render it more difficult to move the object into the area.

4,045,907

FLOATABLE TOYS

Michael Anthony Mumford, Peterborough, England, assignor to Miles Mumford Limited, England

Filed Jan. 19, 1976, Ser. No. 650,359
Claims priority, application United Kingdom, Jan. 17, 1975, 2185/75; Sept. 11, 1975, 37408/75
Int. Cl.² A63H *23/04*
U.S. Cl. 46—93 **8 Claims**



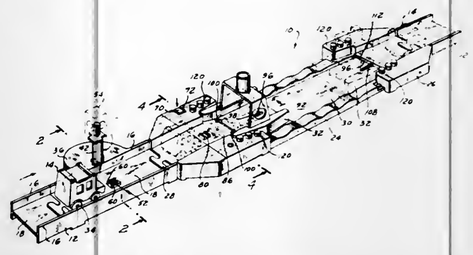
1. A floatable toy and adapted to float on water, comprising two hulls, a container for water and means mounting said container on and between said hulls, a discharge outlet connected to said container at or near the bottom thereof, said mounting means being constructed and arranged to maintain said container at all times clear of the surface of water on which said toy floats even when said container is filled with water, said discharge outlet comprising a nozzle which extends downwardly from the bottom of said container and includes an opening directed rearwardly of said toy being constructed and arranged such that when water in said container is allowed to discharge through said outlet, the discharge imparts a forward reaction which drives said toy through the water.

4,045,908

POWERED VEHICLE TRANSPORT VEHICLE AND TRACK HAVING A WELL THEREIN

Burt Ensmann, Flush; Edwin A. Nielsen, Oceanside; Edward Snyder, III, Dix Hills, and Frank D. Ventura, Commack, all of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Continuation of Ser. No. 494,699, Aug. 5, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,343
Int. Cl.² A63H *17/26*
U.S. Cl. 46—204 **21 Claims**



1. A toy comprising, in combination, a powered toy vehicle having a power source contained therein and at least one driven wheel, driven by said power source for driving against a supporting surface to propel the powered vehicle thereover, and a transport vehicle including a frame, said frame having a support surface comprising means for supporting said powered vehicle thereon; and releasable stop means mounted in said frame for selectively preventing movement of said powered vehicle beyond a predetermined position on said support surface, said frame including at least one pair of drivingly engaged wheels rotatably mounted therein and located in direct peripheral engagement with each other; one of said engaged wheels located in said frame to engage the driven wheel of said powered vehicle when the latter is in said predetermined position, to be driven by said driven wheel, and the other of said engaged wheels being at least partially exposed in said frame to engage the surface on which the transport vehicle is placed, whereby the driven wheel of the powered vehicle directly drives said one engaged wheel to cause said other of the engaged wheels to propel the frame in the driving direction of the powered vehicle.

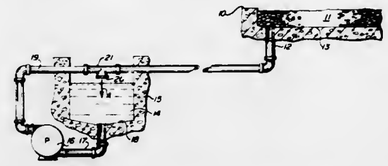
10. A toy for use with a powered toy vehicle having a pair of driven rear wheels for driving against a supporting surface to propel the powered toy vehicle thereover, said toy including a track providing a vehicle support surface defining a path of travel for such vehicles, said track including a track section having an elongated well formed therein extending along a portion of said path of travel, a transport vehicle positioned in said well and having two pairs of track engaging wheels rotatably mounted thereon and a vehicle support platform located at substantially the same elevation as the vehicle support surface of said track, said transport vehicle including a pair of transmission wheels rotatably mounted thereon and respectively frictionally engaged with the wheels of one of said pair of track engaging wheels and which extend through said support platform in predetermined positions to respectively engage the driven wheels of the powered toy vehicle, and releasable stop means mounted in said transport vehicle for selectively preventing movement of said powered toy vehicle from the track support surface onto the transport vehicle beyond a predetermined position on the support platform of the transport vehicle at which the driven wheels of the powered toy vehicle engage the transmission wheels of the transport vehicle, thereby causing the transmission wheels and said one pair of track engaging wheels to rotate and move the transport vehicle, and powered toy vehicle thereon, along said elongated well.

4,045,909

HYDROPONIC NUTRIENT FEEDING AND DRAINING SYSTEM

John H. Moss, Phoenix, Ariz., assignor to Hydroculture, Inc., Glendale, Ariz.

Continuation of Ser. No. 260,974, June 8, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 427,443
Disclosure was also published under second Trial Voluntary Protest Program on Feb. 20, 1976
Int. Cl.² A01G *31/02*
U.S. Cl. 47—62 **1 Claim**



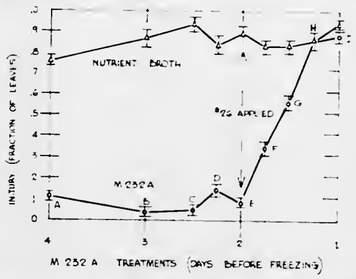
1. A hydroponic growing system including:
a. a nutrient solution supply reservoir;
b. at least one hydroponic growing bed, the bottom of which is located higher than the normal level of nutrient solution in said reservoir;
c. a conduit in fluid communication between the lower portion of said supply reservoir and the lower portion of said growing bed;
d. a nutrient solution supply pump disposed in series in said conduit for withdrawing nutrient solution from said reservoir and introducing said solution into said growing bed in a first mode of operation when said pump is energized; and
e. a dump valve in series in said conduit between said pump and said growing bed for rapidly draining nutrient solution from said growing bed into said nutrient solution reservoir, when said pump is de-energized in a second mode of operation, bypassing said pump, and dump valve comprising:
i. a hollow body member having an inlet and an outlet,
ii. a liquid nozzle member formed in said inlet for receiving nutrient solution under pressure from said pump in said first mode of operation and for discharging said solution into said outlet, and
iii. means defining at least on aperture in said hollow body member intermediate of and in constant unobstructed communication with said inlet and said outlet for draining nutrient solution into said reservoir during said second mode of operation, bypassing said pump.

4,045,910

METHOD FOR REDUCING FROST DAMAGE OF PLANTS

Deane C. Arny, and Steven E. Lindow, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Aug. 2, 1976, Ser. No. 710,414
Int. Cl.² A01G *1/00*
U.S. Cl. 47—2 **4 Claims**



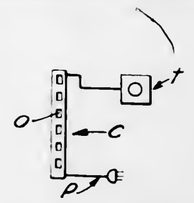
1. The protection of plants against frost damage comprising treating the plants with a bacterium identified as M232A (*Erwinia herbicola* var. anamus) at a time prior to onset of freezing temperature sufficient to permit adequate propagation for establishment and distribution of the bacterium over the plants.

4,045,911

VERSATILE HORTICULTURAL GROWTH APPARATUS

R. Louis Ware, 2108 Middlefork Road, Northfield, Ill. 60062

Continuation of Ser. No. 618,828, Oct. 1, 1975, abandoned. This application Nov. 11, 1976, Ser. No. 740,872
Int. Cl.² A47G *7/00*; A01G *9/02*
U.S. Cl. 47—39 **20 Claims**



1. Plant growth apparatus for use in artificial light horticulture comprising a plurality of modular elements adapted to be quickly and easily assembled into an integral structure and wherein the relative dispositions of said modular elements within said structure can be readily altered, which apparatus comprises:
a. a pair of upright substantially vertical support columns;
b. internal support means disposed between said vertical columns to laterally space and rigidize said vertical columns into a base frame;
c. laterally extending leg portions affixed at the bottom of each of said vertical columns to support said base frame in generally upright fashion;
d. receptive connecting means at corresponding spaced intervals on the laterally outward face portions of said vertical columns;
e. at least a pair of laterally extending shelf support brackets having fastening means at their inner ends adapted to be fastened into said receptive connecting means on said vertical columns, each pair of brackets being respectively disposed one on each of said columns at the same vertical position on the same face side of the columns;
f. an elongate, multiple outlet electric power strip energized by a single external power feed line connection positioned vertically on one of said support columns and extending vertically on said column for at least a portion of the column height, with at least one of the electric outlets in said strip being closely adjacent the fastening point of each of said shelf support brackets disposed on said column;
g. at least one generally rectangular light-providing shelf unit substantially horizontally disposed upon each pair of said laterally extending support brackets, said light-providing shelf unit comprising:
i. a flat upper surface adapted to hold plant materials and other objects as a shelf area,
ii. an open under section containing laterally disposed therein at least one fluorescent tube light, the area beneath said open under section defining a plant growth area which is substantially as wide as the distance between said column supports, and
iii. end encasement sections extending longitudinally outwardly from said open under section, said encasement sections containing the ballast units and other electrical circuitry for the fluorescent light operation, and wherein said shelf support brackets engage said light-providing shelf unit outside said plant growth area at said end encasement sections.

4,045,912

PRODUCTION OF ALFALFA SEEDS

Paul L. F. Sun, Beloit, Wis., assignor to Kent Feeds, Inc., Muscatine, Iowa

Filed Nov. 6, 1974, Ser. No. 521,255
Int. Cl.² A01H *1/02*
U.S. Cl. 47—58 **17 Claims**

1. A process for producing alfalfa seeds which comprises:

Step A - crossing by controlled pollination cytoplasmic male sterile alfalfa plants with maintainer line alfalfa plants to give cytoplasmic male sterile hybrid alfalfa seeds,

Step B - selectively recovering the hybrid seeds produced in Step A,

Step C - crossing, using random pollination, cytoplasmic male sterile hybrid alfalfa plants derived from seed produced in Step A randomly mixed with male fertile alfalfa plants to give alfalfa seeds, the ratio of male sterile hybrid alfalfa plants to male fertile alfalfa plants being in the range of about 1:1 to 3:1, and

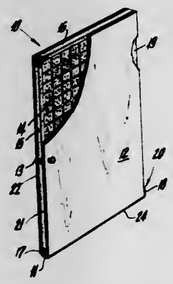
Step D - non-selectively recovering the seeds from the last-mentioned crossing.

4,045,913

FIRE RESISTANT, SOUND ATTENUATING, DROP SEAL DOOR

John T. Wright, Cattaraugus, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 512,344, Oct. 4, 1974. This application Mar. 31, 1976, Ser. No. 672,160
Int. Cl.² E06B *7/215*
U.S. Cl. 49—307 **6 Claims**



1. A solid, fire resistant sound attenuating, drop seal door which comprises in combination:

a. a solid, sound attenuating door, having an elongated slot, wholly embedded in the bottom rail thereof;

b. an elongated generally U-shaped cover to fit snugly within said slot;

c. an elongated gasket support movably positioned within said cover;

d. an extension secured to the gasket support and extending beyond the inner stile of the door;

e. a plurality of parallelogram shaped wedges disposed in two series positioned within said cover, a first series of wedges having wedge elements spaced apart and rigidly affixed to said cover, a second series of wedges having wedge elements alternately spaced between the elements of the first series and rigidly affixed to said gasket support, all of said wedge elements formed with confronting plane cam faces in a manner that when the extension is moved in a horizontal direction by contact with the inner door jamb, the second series of wedge elements and gasket support will move downwardly with respect to said first series of wedge elements and the rectangular cover; and

f. a horizontally disposed tension means coupled between the first and second series of wedge elements for raising the gasket support when the door is opened;

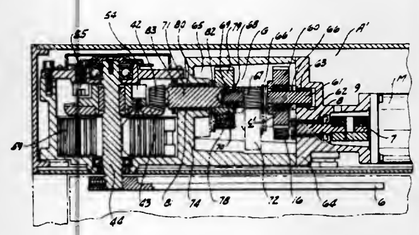
said confronting cam faces being so disposed that the cam faces at one end of said wedge elements serve to cam the gasket support downwardly against the bias of the horizontally disposed tension means, and the cam faces on the opposite ends of said wedge elements serve to cam the gasket support upwardly under the influence of the horizontally disposed tension means.

4,045,914

AUTOMATIC DOOR OPERATOR

John C. Catlett, Milwaukee, Wis., assignor to The Stanley Works, New Britain, Conn.

Filed Sept. 8, 1975, Ser. No. 611,342
Int. Cl.² E05F *15/12*
U.S. Cl. 49—334 **7 Claims**



1. A door operator for utilization with swing-mounted doors comprising a prime mover, a door driving shaft, means connecting said door driving shaft to the door to be operated thereby, means mounting said door driving shaft for rotation about its vertical axis, a drive shaft operatably engaged to said prime mover and having its longitudinal axis perpendicular to the axis of said door driving shaft, and transmission means connecting said prime mover drive shaft and said door driving shaft for operation of the latter into door opening condition pursuant to the power of the prime mover, said transmission means comprising an input shaft axially aligned with said drive shaft and operatably engaged thereto, a first driving gear carried on said input shaft, a first driven gear meshing with said first driving gear, a first shaft axially parallel to said input shaft, an over-riding clutch coupling said first driven gear and said first shaft, a second driving gear engaged upon said first shaft between the over-riding clutch and the end of said first shaft remote therefrom, a bevel pinion shaft axially aligned with said first shaft, means engaging said first shaft and said bevel pinion shaft in coaxial relationship, a second shaft axially parallel with said first shaft, a second driven gear carried on said second shaft between its ends and meshing with said second driving gear, a third driving gear carried on one end of said second shaft spacedly from said second driven gear, a third driven gear mounted on said bevel pinion shaft and meshing with said third driving gear, and cooperating bevel gear means operatively interconnecting said door driving shaft and said bevel pinion shaft at the end of the latter remote from said first shaft.

4,045,915

PORTABLE SANDBLASTER

Neal J. Gilbert, Highland, and Edward L. Horton, San Gabriel, both of Calif., assignors to Enviro-Blast International, Los Angeles, Calif.

Filed Oct. 6, 1975, Ser. No. 620,052
Int. Cl.² B24C *3/06*
U.S. Cl. 51—427 **16 Claims**

1. In portable apparatus to sandblast a worksurface of a particular configuration, the combination of:

a structure comprising an outer casing from which a sandblasting hood is rigidly supported inside the casing,

the casing having an outer end opening and the sandblasting hood having an outer end extending through the outer end opening of the casing to provide a projecting open end for application to the worksurface;

a rotatable sandblasting nozzle in the hood directed towards the end opening thereof;

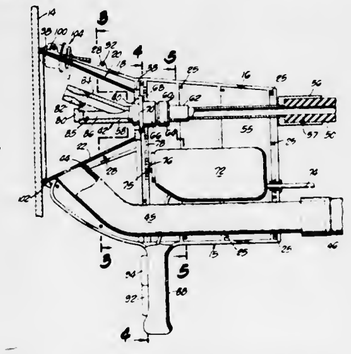
means to deliver to the nozzle a stream of grit-laden compressed air;

a seal carried by the projecting open end of the sandblasting hood, said seal extending beyond said projecting open end and being adapted to make intimate contact with said worksurface and cooperate therewith to isolate the interior of the sandblasting hood chamber from the atmosphere and from the interior of the casing;

means to withdraw an air stream from the sandblasting hood to entrain particles resulting from the sandblasting operation and to continuously draw atmospheric air into the hood past the seal at high velocity to prevent escape of the grit particles past the seal;

said withdrawing means operating at a rate to maintain a relatively high vacuum in the sandblasting hood and thus compress said seal against the worksurface with a fluid pressure differential force which, if unopposed, would tend to immobilize the structure relative to the worksurface; and

thrust means carried by said outer casing and extending therefrom for moving contact with the worksurface to divert a sufficient portion of said force from the seal to make the structure readily manually movable along the worksurface.



16. In an apparatus for sandblasting worksurfaces of different configurations, the combination of:

a casing having an outer end opening;

a set of sandblasting hoods with open ends for use interchangeably in the casing, each hood being releasably attachable to the casing inside the casing with the open end of the hood conforming to the outer end opening of the casing,

each of said hoods having a continuous seal around the rim of its open end with the seal extending beyond the end opening of the casing and being adapted to contact the worksurface and cooperate therewith to confine in the hood particles resulting from the sandblasting operation,

the sandblasting hoods of said set having their open ends and seals shaped to conform to different configurations of worksurfaces;

blasting nozzle means for employment in each of the processing chambers;

a supply conduit to deliver to the nozzle means a stream of grit-laden compressed air;

means to cooperate with each of the interchangeable hoods to withdraw therefrom an airstream entraining the particles resulting from the sandblast operation,

said withdrawing means operating at a rate to maintain a vacuum in the sandblasting hood and thus compress said seal against the worksurface with a force which, if unopposed, would tend to immobilize the seal relative to the worksurface; and

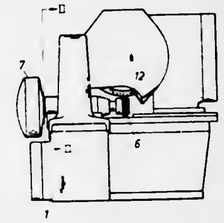
thrust means mounted on and extending from said casing and equipped with means for moving contact with a worksurface to divert a sufficient portion of said force from the seal to the worksurface to make the structure readily manually movable along the worksurface.

4,045,916

ROLLING DRIVE ON A GEAR GRINDING MACHINE

Max Seitz, Munich, Germany, assignor to Carl Wurth Maschinen- und Zahnradfabrik, Munich, Germany

Filed Nov. 14, 1975, Ser. No. 632,069
Claims priority, application Germany, Nov. 26, 1974, 2455808
Int. Cl.² B24B *17/00*
U.S. Cl. 51—123 G **3 Claims**



1. A gear grinding machine for grinding teeth or workpieces, comprising:

a rotatable workpiece spindle;

a rotary grinding wheel;

rolling motion producing means including a movable rolling cam carriage and a rolling cam pivotally supported thereon and arranged to reciprocate said workpiece spindle in a predetermined path; and

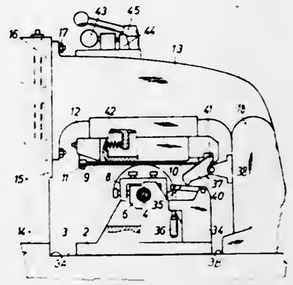
adjusting means for adjusting the pivot axis of said rolling cam relative to the axis of said workpiece spindle.

4,045,917

GEAR GRINDING MACHINE

Herbert Loos, Dorfen; Max Seitz, Munich, and Manfred Erhardt, Puchheim, all of Germany, assignors to Carl Hurth Maschinen- und Zahnradfabrik, Munich, Germany

Filed Nov. 14, 1975, Ser. No. 632,080
Claims priority, application Germany, Dec. 13, 1974, 2459033
Int. Cl.² B24B *19/00, 17/00*
U.S. Cl. 51—123 G **8 Claims**



1. A gear grinding machine for grinding teeth on workpieces, comprising:

a rotatable workpiece holder;

a rotary grinding wheel having an annular active surface;

deformable roller motion producing means arranged to reciprocate said workpiece holder in a predetermined path and to simultaneously rock the gear teeth formed on the workpiece about the axis thereof so as to impart to a given tooth flank of the workpiece back-and-forth rolling movements with respect to and along the active surface of said grinding wheel; and

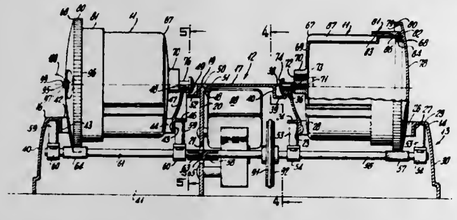
control means for additionally and synchronously controlling the rotatable reciprocating motion of said workpiece during its range of movement so that the tension on said deformable rolling motion producing means is maintained constant and the workpiece is not subjected to the action of disengaging forces which result from deformation of said rolling motion producing means so that stray movements of said workpiece relative to said active surface are avoided.

4,045,918

ABRADING AND POLISHING TUMBLER APPARATUS

Robert Nathan Freedman, Great Neck, N.Y., assignor to Natural Science Industries, Ltd., Far Rockaway, N.Y.

Filed Jan. 23, 1976, Ser. No. 651,868
Int. Cl.² B24B *31/02*
U.S. Cl. 51—164 **16 Claims**



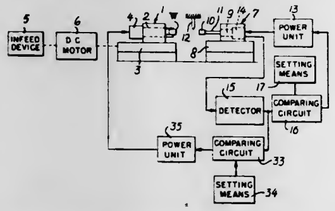
1. A tumbling apparatus comprising a tumbling barrel, bearing means for supporting a first end section of said barrel for free rotation of said barrel about a longitudinally extending axis and for free rocking of said barrel about a transversely extending axis and engaging said barrel first end section at selectively transferable alternative points respectively concentric and eccentric to the central longitudinal axis of said barrel, said axes of rotation and rocking extending substantially through said bearing means, and drive means for simultaneously rotating and rocking said tumbling barrel about said longitudinally extending and transverse axes, respectively, when said bearing means engages said first end section at said eccentric point.

4,045,919

HIGH SPEED GRINDING SPINDLE

Sadao Moritomo, Ichikawa, Japan, assignor to Seiko Seiki Kabushiki Kaisha, Japan

Division of Ser. No. 576,183, May 9, 1975, Pat. No. 4,019,288.
This application Jan. 13, 1976, Ser. No. 648,829
Claims priority, application Japan, May 10, 1974, 49-52082; May 16, 1974, 49-54916
Int. Cl.² B24B *49/00*
U.S. Cl. 51—165.77 **11 Claims**



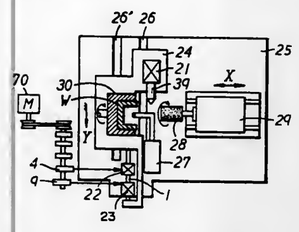
1. An apparatus for grinding a workpiece comprising: a grinding wheel spindle assembly having a rotary wheel spindle, and a grinding wheel attached at one end of said wheel spindle; a wheel spindle motor connected to rotationally drive said wheel spindle at a first revolution speed effective for feed grinding and at a value different from that corresponding to a first resonance frequency of said wheel spindle as determined when said grinding wheel is in pressure contact with the workpiece to thereby feed-grind the workpiece and to rotationally drive said wheel spindle at a second revolution speed lower than said first revolution speed and at another value different from that corresponding to a second resonance frequency of said wheel spindle as determined when said grinding wheel is in spark-out operation; a speed controller coacting with said wheel spindle motor to effect rotation of said wheel spindle at said first revolution speed and responsive to a detecting signal to effect rotation of said wheel spindle at said second revolution speed; workpiece supporting means for supporting a workpiece and being movable relative to said grinding wheel spindle assembly; and feed sensing means for detecting spark-out or finish of the feed grinding and providing a corresponding detecting signal which is transmitted to said speed controller to accordingly lower the revolution speed of said wheel spindle to said second revolution speed.

4,045,920

CAM-CONTROLLED GRINDING MACHINE

Nobuo Fukuma, Toyota, and Hideyuki Matsubara, Toyoake, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 656,076, Feb. 6, 1976, Pat. No. 4,015,372.
This application Nov. 23, 1976, Ser. No. 744,400
Int. Cl.² B24B *49/04*
U.S. Cl. 51—165.88 **3 Claims**



1. In a cam-controlled grinding apparatus including a rotatable abrasive wheel mounted on the bed thereof and slidable in the axial direction of said wheel, a chuck, capable of holding a workpiece, disposed in confrontation with the abrasive wheel and rotatable about an axis substantially parallel to the wheel axis and furthermore movable in a direction normal to the wheel axis, a wheel feed mechanism for controlling the relative movement between said workpiece and said wheel by means of a cam, a dresser, including a dresser point, for dressing said wheel, and a dresser feed mechanism, the improvement of said grinding apparatus comprising:

measuring means for measuring a dimension of the workpiece processed while grinding is taking place;

final dimension signal means for issuing a final dimension signal as soon as the dimension measured by said measuring means has reached a predetermined target dimension;

release means for separating the wheel from the workpiece in response to said final dimension signal;

watching means for determining when sparkout grinding has proceeded for a predetermined period of time and for issuing a sparkout signal when said predetermined period of time has elapsed;

comparison signal means for issuing a comparison signal in response to the comparison of the timing between said final dimension signal and said sparkout signal whenever said final dimension signal precedes said sparkout signal; and

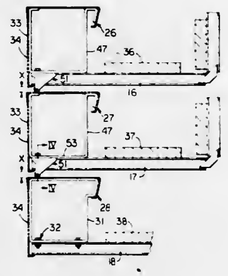
compensating means for compensating wear of said dresser point upon issuance of said comparison signal.

4,045,921

ALIGNMENT DEVICE FOR TELESCOPING GYMNASIUM SEATING

Richard P. Molloy, Portage, Mich., assignor to Interkal, Inc., Kalamazoo, Mich.

Filed July 22, 1976, Ser. No. 707,611
Int. Cl.² E04H *3/12*
U.S. Cl. 52—9 **4 Claims**



1. In a telescoping gymnasium seating unit, including a plurality of movable upright frame means respectively sized and movable between a first position wherein said frame means are nested one in the other when fully telescoped and a second position wherein said frame means are unnested, each of said frame means having horizontal support members and seating means thereon adjacent the front ends thereof with an upwardly facing, elongated and horizontally extending planar-like seating surface thereon and a horizontally facing skirtboard extending downwardly from the outwardly facing edge of said seating surface, each of said seating means on each of said frame means being vertically offset from a seating means on a mutually adjacent frame means in said second position of said frame means, the lower edges of said skirtboards being vertically spaced above said seating surfaces when said frame means is in said first position, the improvement comprising:

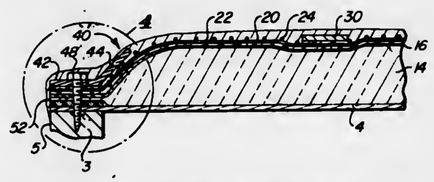
low friction means secured to said seating means and extending downwardly therefrom and engaging the upwardly facing seating surface of the next seating means located therebelow when said frame means are in said first position to maintain said vertical spacing uniform between said seating means when vertical loads are applied to said seating means when said frame means are in said first position.

4,045,922

INSULATIVE ROOF APPARATUS FOR MOBILE HOMES AND THE LIKE

Frank S. Elliott, 4815 N. 63rd Drive, Phoenix, Ariz. 85033

Filed June 28, 1976, Ser. No. 700,324
Int. Cl.² E04B *7/00*
U.S. Cl. 52—94 **4 Claims**



1. Insulative roof apparatus for mobile home buildings and the like, including structural members comprising, in combination:

a base for the insulative roof apparatus comprising a structural roof of the building and including an outer periphery of the roof secured to outer peripheral structural members of the building;

a flexible edge gasket disposed on the base at the outer periphery of the structural roof to provide a seal for the roof apparatus at the outer periphery of the building;

an insulative layer disposed on the base;

a foil layer disposed on the insulative layer;

a mesh layer disposed over the foil layer;

fastening means secured to outer peripheral structural members and to the edge gasket for fastening the insulative layer, the foil layer, and the mesh layer to the structural members of the building; and

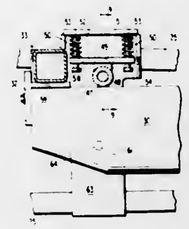
seal coat means disposed on the mesh and the fastening means for sealing the insulative roof apparatus to the building.

4,045,923

TELESCOPIC SWINGAWAY JIB

Venkatachalam Shanmugasundaram, Chambersburg, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed May 6, 1976, Ser. No. 683,747
Int. Cl.² B66C *23/04*
U.S. Cl. 52—118 **8 Claims**

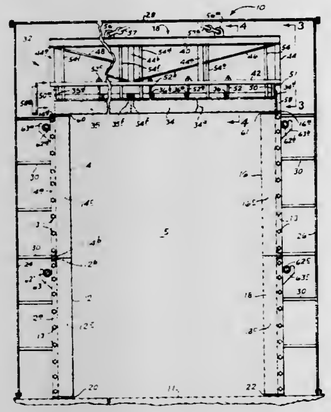


1. An extension jib for crane booms comprising a stationary jib base section adapted for attachment to a crane boom, and an extensible and retractable movable jib section slidably mounted within said stationary jib section, said movable jib having top, bottom and side walls, longitudinally spaced opposing spring-urged rollers mounted on the stationary jib section, said rollers engaging the top and bottom walls of said movable jib section; each spring-urged roller comprising a freely rotatable transverse axis cylindrical roller of sufficient length to substantially span the width of the movable jib section, a mounting plate carrying said roller, headed guide pins engaged slidably with the mounting plate and allowing the mounting plate and roller to move toward and away from the adjacent wall of the movable jib section, and compression springs on said headed guide pins urging the mounting plate and roller toward the adjacent wall of the movable jib section, whereby the rollers bear the dead weight of the moving jib section when the latter is extended from the stationary jib section; and longitudinal spaced opposing bearing pad units mounted on the stationary jib adjacent the spring-urged rollers and engaging the top and bottom walls of the movable jib when the spring-urged rollers yield due to a load being placed on said movable jib section.

4,045,924
FURNACE ROOF CONSTRUCTION

Allen Jacob Jones, Grants Pass, Oreg., assignor to S. J. Agnew, Tenino, Wash.

Filed Dec. 15, 1975, Ser. No. 640,965
Int. Cl.² E04C 3/04; E04B 7/00
U.S. Cl. 52—125 5 Claims



1. A furnace having upright, laterally spaced refractory wall panels and a truss-panel roof assemblage comprising:

at least one refractory roof panel having supporting frame members attached to an upper face thereof, said roof panel dimensioned lengthwise to span the distance between said wall panels;

a load supporting truss having top and bottom chords, said truss disposed above said roof panel and rigidly connected to said frame members by means of upright legs, said legs interconnecting said bottom chord adjacent opposite ends thereof to said frame members to maintain a selected spacing between said bottom chord and said upper face;

removable means comprising a bearing anchor provided at opposite ends of said truss for releasably connecting said bottom chord to said wall panels for enabling truss loads to be transmitted to said wall panels, said bearing anchors also providing lateral support to said truss-panel roof assemblage; and

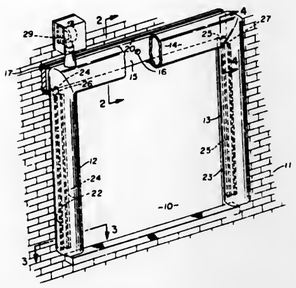
a plurality of bracing struts interconnecting said top chord and said frame members for providing additional lateral support to said truss.

4,045,925
INFLATABLE DOCK SEAL AND MOUNTING THEREFOR

Larry O'Neal, 4953 Timbercrest Drive, Canfield, Ohio 44406

Filed Apr. 30, 1976, Ser. No. 681,796
Int. Cl.² E04B 1/345
U.S. Cl. 52—2 5 Claims

1. An inflatable dock seal and mounting therefor for positioning said dock seal on a wall above and beside a dock opening therein and comprising at least one inflatable member arranged in an inverted U-shape and having an upper horizontal section and a pair of spaced vertical sections, flexible noninflatable longitudinally positioned channel-like fastening members on the exterior of at least two of said sections, said fastening members each being integral and U-shaped with the open side facing toward a corresponding vertical section and having attached flanges on each leg thereof, said flanges being attached to said corresponding vertical section to close said fastening member, said fastening members each having an open end, rigid elongated structural members each slidably received therein through said open end to be positioned one in each of said channel-like fastening members, said structural members being attached to said wall through said fastening members
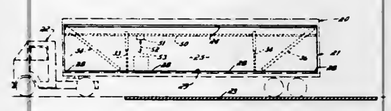


beside said dock opening to hold said sections of said inflatable member thereagainst via said fastening members, and means for inflating said inflatable member.

4,045,926
EASILY ERECTED ROOF STRUCTURE FOR MODULAR BUILDINGS

Louis L. Gibbs, 1547 Silverglade Court, Cincinnati, Ohio 45240

Continuation-in-part of Ser. No. 500,572, Aug. 26, 1974, Pat. No. 3,924,366. This application Dec. 8, 1975, Ser. No. 638,431
The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.
Int. Cl.² E04B 1/343, 1/344
U.S. Cl. 52—127 9 Claims



1. A roof structure comprising

a center roof section having two opposed side edges,

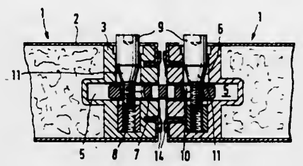
a pair of side roof sections, each of said side roof sections having an outer edge and inner edge, each of said side roof sections being pivotally attached along side inner edge thereof to one of said pivotal edges of said center roof section, said side roof sections being pivotal between a downwardly folded storage position where said side roof sections are disposed substantially perpendicular relative to said center roof section and an erected position where said side roof sections are pivoted upwardly relative to said folded position to form a continuous roof structure with said center roof section, and

a plurality of legs connected to at least one of said center roof section and said side roof sections for supporting said roof structure in spaced relation above a base in both folded and erected positions, said legs being connected to said roof structure to permit downward motion of said center roof section relative to said base as said side roof sections are translated from said folded position to said erected position said legs being further connected to said roof structure such that said downward motion serves as at least a portion of the driving force for translating said side roof sections from said folded position to said erected position.

4,045,927
WALL CONSTRUCTION

D. Angel Chocarro Diaz, Pamplona, Spain, assignor to Iberica del Frio S.A., Spain

Filed Jan. 8, 1976, Ser. No. 647,559
Int. Cl.² E04C 2/40; E04B 1/40
U.S. Cl. 52—127 8 Claims



1. A wall, comprising;

a plurality of wall panels, each comprising first and second panel plates generally similar to one another and juxtaposed and spaced apart to define a panel space between them, each panel plate having an edge, a flange extending from the edge toward an adjacent edge of the other panel plate, and a bent portion of the flange extending from an edge of the flange, parallel to the edge of the plate, into the panel space;

a connecting member disposed between the first and second panel plates of each wall panel opposite a similarly disposed connecting member of an adjacent wall panel, each connecting member having a face parallel to the respective flanges, having two mutually parallel grooves in the face, receiving one of the bent portions in each groove, and being thereby secured to the respective wall panel, each connecting member also having a blind opening recessed into the face and a through aperture extending transversely of and through the member in the area of the blind opening;

an anchoring bar for each pair of mutually opposite connecting members, each bar having two end portions, one in each blind opening, each end portion having a bevelled hole; and

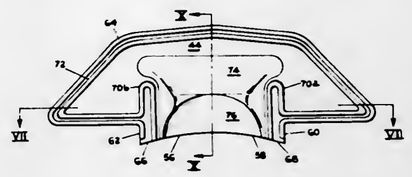
a pair of connecting bolts for each anchoring bar, each bolt having: a screw-threaded end threadedly engageable with the respective connecting member on one side of the respective blind opening, a frusto-conical bolt portion flaring out from the end, and an enlarged body portion extending away from the flaring portion, the enlarged body portion having a diameter substantially equal to the maximum diameter of the bevelled hole, and the flaring portion being normally engageable with the respective bevelled hole, to permit insertion of the bolts, through the anchoring bar, when the panels are slightly spaced apart, and to enable the bolts, when fully threaded into the respective connecting member, to draw the panels together to bear tightly against one another.

4,045,928
END CAP AND CONNECTORS FOR ROOF RIDGE VENTILATOR

Richard C. Malott, Spring Lake, Mich., assignor to Leigh Products, Inc., Coopersville, Mich.

Filed July 18, 1975, Ser. No. 597,036
Int. Cl.² B65D 43/06; F24F 7/02; F16L 55/10
U.S. Cl. 52—199 5 Claims

2. An end cap for a generally T-shaped roof ridge ventilator, said end cap having a generally T-shaped body, said body having a deflectable web forming the exterior generally vertical face thereof and flanges defining a peripheral channel means for slidably seating over the end of a generally T-shaped ventilator, said end cap characterized in that the central portion of said web as viewed from the exterior, has a concavity approximately midway between its top and bottom, the portion of said web below said concavity being bowed outwardly

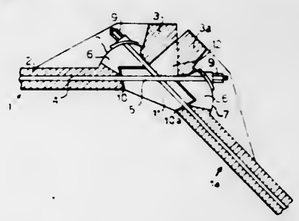


to form a curved portion of progressively decreasing radius toward the bottom thereof to thereby define a flexible bulge.

4,045,929
LIQUIDTIGHT TANK MADE OF PRESTRESSED REINFORCED CONCRETE, PARTICULARLY FOR PURIFICATION PLANTS

Gianfranco Velo Dalbrenta, Via Velo n. 14, Fontaniva, Italy

Filed Dec. 1, 1975, Ser. No. 636,478
Int. Cl.² E04H 12/16
U.S. Cl. 52—224 4 Claims



1. A liquidtight tank or reservoir comprising:

a. a plurality of plate elements disposed adjacent to each other according to a pre-established configuration, each of which plate elements is delimited by two rectilinear edges and a pair of plane surfaces and comprises two rectilinear ribs extending along the two rectilinear edges respectively and projecting sideways from one of said plane surfaces; each of said plate elements being provided with holes which are substantially orthogonal to the length of said ribs; each of said rectilinear ribs being provided with a plurality of perforations each of which extends completely through the rib, the dimension of each of said perforations, as measured in a direction orthogonal to the length of said rib, being greater than the dimension of the perforation as measured in a direction along the rib; and each of said ribs being provided at each of said perforations, with a cavity having at its bottom a cylindrical support seating;

b. cables arranged to be put under tension, each of which extends through one of said holes of one plate element and through corresponding perforations of ribs of two plate elements adjacent to said one plate element, the ends of said cable projecting from said perforations into the corresponding cavities;

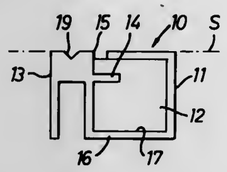
c. anchorage clamps, each of which locks the ends of one of said cables, and rests on a corresponding one of said seatings and is housed in a corresponding one of said cavities; and

d. filling elements, each of which is disposed between two adjacent ribs belonging to two adjacent plate elements and between the corresponding edges of said elements.

4,045,930
FIRE RESISTANT SEALS

Bernard Dixon, Pampisford, England, assignor to Dixon International Limited, Great Britain

Filed Nov. 24, 1976, Ser. No. 744,736
Claims priority, application United Kingdom, Nov. 27, 1975, 48795/75
Int. Cl.² E16J 15/00; E06B 7/16
U.S. Cl. 52—232 8 Claims

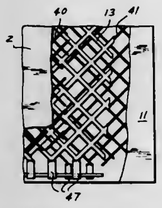


1. A fire-resistant seal for application to a structure, comprising
   a holder of substantially tubular form for securing to the structure, the holder having an external elongate opening extending therealong,
   a chamber defined by the interior of the holder,
   a fire-resistant barrier material which swells under fire-conditions, retained in said chamber in the holder,
   and a baffle surface extending within the holder and forming with the holder interior adjacent to the baffle surface a strait which extends between the opening and the chamber, the strait being co-extensive with the length of the opening.

4,045,931
INSULATING FLEXIBLE COMPOSITE ELEMENT

Otto Alfred Becker, Robert-Koch-Strasse 59, 66 Saarbruecken 6, Germany

Division of Ser. No. 465,848, May 1, 1974, Pat. No. 3,917,471, which is a division of Ser. No. 125,549, March 18, 1971, Pat. No. 3,811,239. This application Nov. 3, 1975, Ser. No. 628,385
Claims priority, application Germany, Mar. 19, 1970, 2013115; Feb. 19, 1971, 2108110
Int. Cl.² E04B 2/36
U.S. Cl. 52—406 3 Claims

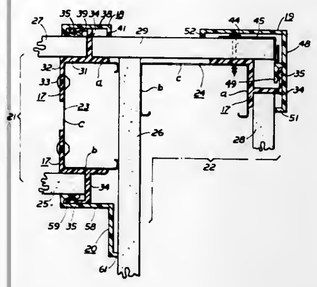


1. An insulating flexible composite element comprising
   a. a pair of spaced sheets of flexible material, at least the interior surfaces of which are reflecting thereby to form a radiation chamber,
   b. a flexible spacing element positioned in said chamber, said element serving to space apart said sheets of flexible material and being formed so as to provide a plurality of separate radiation chambers,
   c. supporting means of net-like material positioned on either side of said flexible spacing element and serving to prevent penetration of said spaced sheets into said separate chambers of said flexible spacing element, and,
   d. means for tensioning at least said flexible spacing element and said supporting means for maintaining these members in their assembled positioned thereby to preserve said radiation chambers in said flexible spacing element.

4,045,932
JOINT SYSTEM FOR WALL PANEL CONSTRUCTION

Allen Z. Bogert, Panacres, Pipersville, Pa. 18947

Filed July 8, 1976, Ser. No. 703,514
Int. Cl.² E04C 2/00
U.S. Cl. 52—460 11 Claims



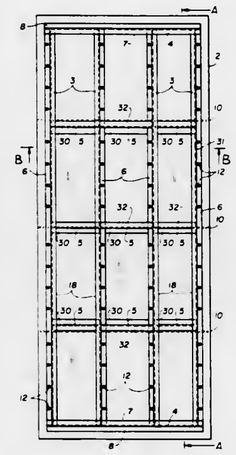
1. Wall panel construction including a plurality of panels disposed in edge-to-edge relation along a junction, a framework for supporting said panels, said framework having a support stud underlying the junction of said panels and extending along the length of said junction, a receiver mounted on said support stud having a base portion confronting at least one of said panels and having a seating surface in face-to-face abutting relationship with the interior surface of said one panel along the junction edge thereof, a mounting web extending perpendicularly from said base portion disposed intermediate said panels along the length of said junction, said web projecting from said base portion a distance greater than the thickness of said panels, the end of said web outermost from said base portion having a pre-formed integral locking flange extending therefrom parallel to said base portion with its interior surface spaced from the seating surface of said base portion by a distance equal to the thickness of the panel plus a predetermined clearance, said pre-formed locking flange and the seating surface of said base portion providing a channel into which the marginal portion of one of the panels may loosely fit during assembly, and a cover element for said junction substantially coextensive in length with said receiver and having two wings respectively adapted to overlie the adjacent edges of the panels comprising the junction, one wing of said cover element having a locking channel on its undersurface adapted to receive said locking flange, said locking channel being defined between an outer wall of said cover strip and an inner locking wall substantially parallel to said outer wall, the thickness of said locking wall corresponding to said predetermined clearance so that after assembly when said locking channel is engaged with said locking flange, the space between said seating surface and said locking wall is equal to the thickness of said one panel and the marginal portion of said one panel fits tightly between said seating surface and said locking wall.

4,045,933
PREFABRICATED PANEL STRUCTURE

Joseph R. Grillo, 1815 E. 21st St., Brooklyn, N.Y. 11229

Filed June 28, 1976, Ser. No. 700,723
Int. Cl.² E04C 2/38; E04B 2/28
U.S. Cl. 52—475 3 Claims

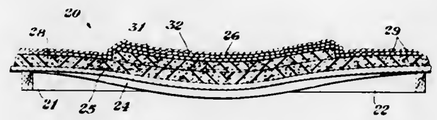
1. A prefabricated Panel which comprises:
   a. A frame for supporting facing in a prefabricated panel which comprises; substantially parallel longitudinal members, fixed at the ends by transverse end members attached to said longitudinal members and stiffened with cross braces attached to said longitudinal members, at least said longitudinal members, and transverse end members comprising metal members having a web with two subetantially parallel flanges extending in opposite directions from said web and said flanges on at least one side of said longitudinal and transverse end members being in substantial planar alignment and at least said flanges on said longitudinal members in planar alignment with said flanges on said transverse end members having holes through which means for joining said supported facing to said frame can pass.
   b. one or more substantially flat rigid members which at least cover the frame and are adjacent to the flanges of the longitudinal and transverse end members which are in substantial planar alignment, said flat rigid members having holes in alignment with the holes in the flanges of the frame adjacent thereto,
   c. a stone facing member having an exposed front and a back, the back of said facing member being adjacent to said rigid member and having means extending from blind holes in the back of said facing member which pass through said holes in said rigid member and said frame to join said facing, said rigid member and said frame into a prefabricated panel.



4,045,934
ROOF AND METHOD OF PREPARATION

James P. Sheahan, and Lowell E. Putnam, both of Worthington, Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 567,454, April 11, 1975, abandoned.
This application Apr. 2, 1976, Ser. No. 673,334
Int. Cl.² E04B 7/00, 1/66
U.S. Cl. 52—514 9 Claims

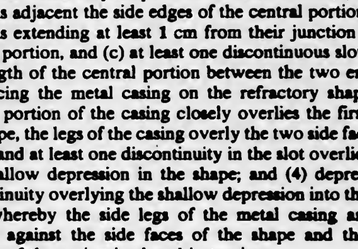


1. A roof structure, the roof structure comprising in cooperative combination
   a roof support means, the roof support means carrying theron
   a roof deck, the roof deck supporting
   a water impermeable membrane, the water impermeable membrane having a generally flat surface generally coextensive with the roof and deck,
   a first layer of closed cell plastic foam insulation adjacent the membrane and remote from the deck, the membrane and first layer defining at least one generally upwardly facing cavity in which water does not drain under the influence of the force of gravity,
   the improvement which comprises
   at least one second layer of a closed cell plastic foam disposed within the cavity, the plastic foam of the second layer being present in a quantity sufficient to displace at least a major portion of water which would collect in the cavity under the influence of the force of gravity.

4,045,935
METAL CASED REFRACTORY AND METHOD OF MAKING SAME

Frank E. Morris, Collegeville, Pa., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Sept. 15, 1976, Ser. No. 723,392
Int. Cl.² E04B 5/04; E04C 2/04; B23K 31/02
U.S. Cl. 52—599 12 Claims



1. A metal cased refractory comprising: (1) a preformed refractory shape having (a) a first face, (b) two opposed end faces adjacent the first face, and (c) two opposed side faces adjacent the first face, the first face having at least one preformed, shallow, discontinuous depression of small area compared to the area of the first face and lying wholly within a central portion of the first face, and (2) a U-shaped metal casing having (a) a central portion extending over the width of the first face between the two side faces and (b) two side legs extending a significant distance over each side face from its juncture with the first face, the central portion of the metal casing having a slot extending between the two end faces, the slot having at least one discontinuity overlying at least one depression in the first face of the refractory shape, the metal of said discontinuity being displaced from the plane of the central portion of the metal casing and disposed within the depression, whereby the metal of the central portion is placed in tension and the side legs of the U-shaped casing are held closely against the side faces of the preformed shape.

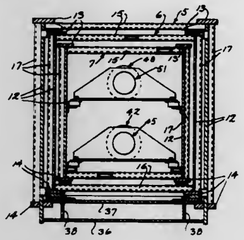
10. Method of attaching a metal casing to a refractory shape comprising: (1) forming a refractory shape with (a) a first face, (b) two adjacent opposed end faces, (c) two adjacent opposed side faces, and (d) at least one shallow discontinuous depression, small in area compared to the area of the first face, lying wholly within a central portion of the first face; (2) forming a U-shaped metal casing with (a) a central portion having two end edges and two side edges, the central portion between the two side edges being slightly wider than the width of the first face of the refractory shape between its side faces, (b) two leg portions adjacent the side edges of the central portion, the leg portions extending at least 1 cm from their junction with the central portion, and (c) at least one discontinuous slot running the length of the central portion between the two end edges; (3) placing the metal casing on the refractory shape so the central portion of the casing closely overlies the first face of the shape, the legs of the casing overly the two side faces of the shape, and at least one discontinuity in the slot overlies at least one shallow depression in the shape; and (4) depressing the discontinuity overlying the shallow depression into the depression, whereby the side legs of the metal casing are drawn closely against the side faces of the shape and the central portion of the casing is placed in tension.

4,045,936

TELESCOPIC BOOM WITH SECTIONS OF BEAM AND TRUSS CONSTRUCTION

Russell L. Sterner, South Milwaukee, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Apr. 26, 1976, Ser. No. 680,257
Int. Cl.² B66F 9/08; F16C 23/04
U.S. Cl. 52—632 **7 Claims**



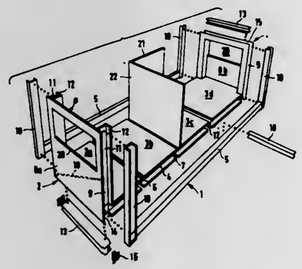
1. In a telescopic boom having inner and outer boom sections, wherein the inner boom section is extensible and retractable within the outer boom section, the improvement wherein each section has: I-beam side walls having top and bottom flanges; and truss top and bottom walls, the truss members of both said top and bottom walls for each section extending laterally between said side walls and being connected thereto interiorly of the flanges, the truss members being further connected to the interior surfaces of the flanges; and wherein the outer boom section has: a pair of bottom wear assemblies, each including a bottom wear pad in bearing engagement with one of the bottom flanges of the inner boom section; a pair of top wear assemblies, each including a top wear pad in bearing engagement with one of the top flanges of the inner boom section; and a set of side wear assemblies connected to said I-beam side walls, each including a side wear pad in bearing engagement with the exterior edge of one of the flanges of the inner boom section.

4,045,937

METHOD OF CONSTRUCTING A PREFABRICATED ROOM ELEMENT AND A BUILDING OF A PLURALITY OF SAID ELEMENTS

Fritz Christoph Stucky, Baar, Switzerland, assignor to Credelca A.G., Zug, Switzerland

Filed June 21, 1974, Ser. No. 481,917
Claims priority, application United Kingdom, June 21, 1973, 29447/73
Int. Cl.² E04B 1/35; E04H 1/00
U.S. Cl. 52—745 **7 Claims**



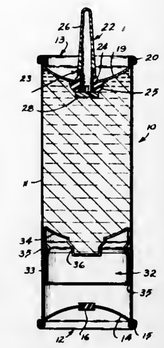
1. A method of constructing a transportable prefabricated room element comprising preparing a floor panel member having a horizontally extending channel therein, preparing a vertical structure having a vertically extending channel therein, preparing a load-bearing frame comprising a horizontal load-bearing beam and a vertical load-bearing beam, and assembling the floor panel member, the vertical structure and the load-bearing frame with the horizontal beam engaged in the horizontally extending channel and the vertical beam engaged in the vertically extending channel at a location remote from a building site to produce a transportable prefabricated room element.

4,045,938

METHOD OF FILLING BARRIER PRESSURE CONTAINER

Harold M. Hansen, Westfield, N.J., assignor to Barrier Pressure Container, Inc., Tuckahoe, N.Y.

Filed Mar. 26, 1976, Ser. No. 670,817
Int. Cl.² B65B 31/09; B67D 5/38, 1/04
U.S. Cl. 53—22 R **1 Claim**



1. The method of filling a barrier pressure container with a flowable viscous product, said container having a generally cylindrical body with a wide mouth open top and a piston located adjacent to the bottom of said body, comprising the steps of: positioning said body along a generally vertical axis, introducing flowable material into said container body through the open top of said body until the material reaches a predetermined level below the open top of said container, inserting a top member having a concave wall and an annular peripheral flange into the open top of said container so that the concave wall engages the material and forces the material upwardly and outwardly to exhaust substantially all of the air above the material from the container without discharging material from the container before the peripheral flange of the top member engages the container, securing the annular flange of the top to said container, and pressurizing the space below the piston to cause the piston to apply pressure against the material within said body.

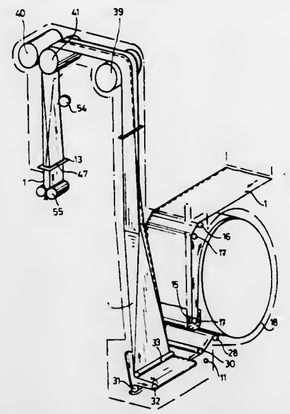
4,045,939

PROCESS FOR THE PRODUCTION OF A PACKAGING RECEIVING A STERILE LIQUID

Herbert Baumstingl, Tremelo, Austria, assignor to Papeteries de Belgique, Austria

Filed Jan. 23, 1976, Ser. No. 651,934
Int. Cl.² B65B 31/02, 55/06, 55/10
U.S. Cl. 53—22 A **4 Claims**

1. A method for the production in a sole enclosure of a pack containing a sterile liquid, the method comprising a sterilization step followed by a pack forming and filling step, said sterilization step comprising filling entirely the enclosure with previously heated water to a temperature of between 120° and 150° C and at a pressure of between 3 and 5 kg/cm$_2$, circulating said heated water over a period of 10 to 40 minutes, replacing the hot water by sterile cold water to cool the enclosure to ambient temperature, discharging the sterile water from the enclosure and drying the enclosure by continuously blowing compressed sterile air into the enclosure at a temperature of between 60° and 70° C, and said pack forming and filling step comprising feeding along a path through the enclosure a flexible web of pack-forming material made of at least one layer of synthetic plastics material that is weldable by pressure, continuously injecting a sterile gas into the enclosure while the web is being fed through the enclosure, sterilizing the two faces of the web, folding the web over in the enclosure to form it into



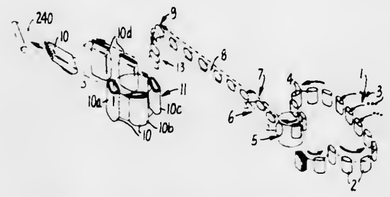
a longitudinally open tube, feeding said tube downwardly past a filling pipe means which projects into the tube through the longitudinal gap in the tube, and successively welding the tube first longitudinally and then transversely below said filling pipe means, introducing a sterile liquid into the portion of the longitudinally welded tube above said transverse weld, and separating the tube at said transverse weld to form individual liquid-containing packs.

4,045,940

BALER SYSTEM AND METHOD

Thomas J. White, San Ramon; Henry L. Spence, Pleasanton, and Etheridge R. McClelland, Livermore, all of Calif., assignors to Filper Corporation, Reno, Nev.

Filed Sept. 21, 1972, Ser. No. 290,894
The portion of the term of this patent subsequent to Sept. 6, 1991, has been disclaimed.
Int. Cl.² B65B 35/50, 57/10
U.S. Cl. 53—26 **19 Claims**



1. The method of packaging a uniform plurality of filled primary containers in master containers that includes the steps of:

a. moving a succession of said primary containers in arranged in a row, in one direction along a path extending longitudinally of said row to discharge point, and discharging said primary containers from said path at said point,

b. positioning an upwardly opening empty master container in a receiving position for receiving primary containers discharged from said point;

c. accumulating at an accumulating station between said discharge point and a master container in said receiving position, a predetermined number of primary containers less than said uniform plurality, as they are discharged from said point, then;

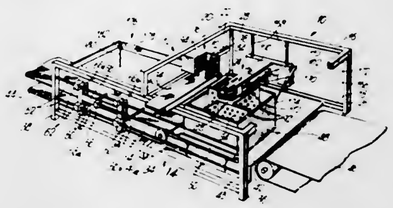
d. discharging the primary containers so accumulated at said accumulating station into the master container in said receiving position and a approximately the same time discharging directly from said discharge point past said accumulating station into said master container additional primary containers in a number to fill said master container with additional primary containers in sufficient number to make up said uniform plurality thereof.

4,045,941

METHOD AND APPARATUS FOR CASING FLEXIBLE CONTAINERS

Gysbertus Flantua, Grimsby, Canada, assignor to Bonar & Bemis Ltd., Burlington, Canada

Filed Sept. 17, 1976, Ser. No. 724,136
Claims priority, application Canada, Feb. 24, 1976, 246435
Int. Cl.² B65B 5/10
U.S. Cl. 53—35 **9 Claims**



9. A method of loading a plurality of flexible containers symmetrically in a generally rectangular open-top case comprising the steps of:

a. locating removable divider means in said case, said divider means forming a plurality of symmetrically positioned compartments in said case;

b. feeding said containers singly to laterally displacable diverter means,

c. displacing said diverter means laterally so as to overlie an empty compartment in said case;

d. releasing the container from the diverter means to fall into said empty compartment;

e. rotating said divider means and said case to bring a new empty compartment to a position adjacent said diverter means;

f. repeating said feeding, displacing, releasing and rotating steps until each compartment is full; and

g. removing said divider means from said case, leaving said containers in position in the case.

4,045,942

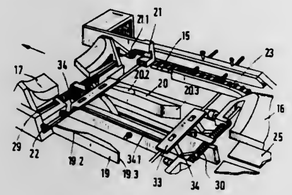
APPARATUS FOR FORMING A WRAPPER ABOUT A GROUP OF ARTICLES

Rolf Muller, Trier-Ehrang, Germany, assignor to The Mead Corporation, Dayton, Ohio

Filed May 10, 1976, Ser. No. 685,051
Claims priority, application Germany, May 9, 1975, 2520625
Int. Cl.² B65B 21/24
U.S. Cl. 53—48 **4 Claims**

1. Apparatus for forming article carriers of the wraparound type having a top wall, side walls, bottom panels, end flaps foldably joined to the opposite end edges of one of said bottom panels, said end flaps being provided respectively with a pair of outer flap parts and adapted for attachment respectively to said side walls, said apparatus comprising conveyor means on which the carrier is advanced in continuous motion with said side walls of the package being disposed parallel to the direction of travel, a pair of auxiliary fold elements arranged respec-

tively to fold upwardly said end flaps, fold elements pivotally mounted respectively on rods extending transverse to the direction of travel, said rods being pivotally mounted at each end thereof on endless elements which extend parallel to the direction of travel, each of said fold elements having at least one cam follower adapted to engage a cam surface to swing



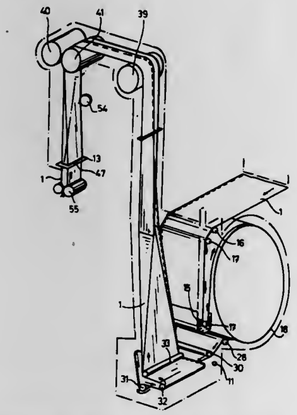
said fold elements upwardly, and wherein the improvement resides in moving said fold elements (16, 17) inwardly in a directly transverse to the direction of travel by means of second cam followers (43) secured respectively to said fold elements and controlled respectively by second cam surfaces (31, 32) to press said outer flap parts against the side walls of the carrier.

4,045,943

APPARATUS FOR PACKAGING STERILE PRODUCTS

Herbert Baumstingl, Tremelo, Austria, assignor to Papeteries de Belgique, Austria

Filed Jan. 23, 1976, Ser. No. 651,933
Int. Cl.² B65B *31/02, 55/06, 55/10*
U.S. Cl. 53—112 A **10 Claims**



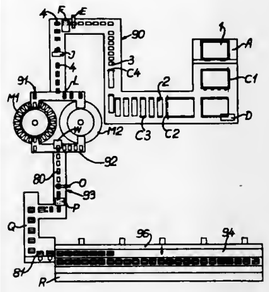
1. Apparatus for conditioning a sterile liquid product in a continuous tubular pack, said apparatus comprising in a sole enclosure:
- inlet slot means through which a web can be fed into the interior of the enclosure;
- a receptacle containing a sterilizing bath and is provided with guides for the web in this bath and a heated rotatable drum contained in a casing concentric therewith, which drum is arranged to pick up the web from the sterilizing bath and heat the web on its inner and outer faces by direct contact and radiation respectively;
- means for longitudinally folding the web to form a longitudinally open tube;
- means for longitudinally welding the open tube to close the tube longitudinally;
- a pipe for filling said tube with the sterile liquid product;
- outlet slot means through which the filled tube can be discharged from the enclosure; and
- means for continuously passing a sterile gas into the enclosure, said enclosure being capable of resisting an inter pressure of hot water at 120° C of at least 3kg/cm$_2$, bei provided with removable gasket means for tempori sealing the inlet and outlet slot means, and being provic with inlet and discharge means for said hot water enabling the interior of the enclosure to be sterilized.

4,045,944

PROCESSING OF SHEETS OF PRINTED SECURITY PAPERS INTO BUNDLES AND PACKETS

Gualtiero Giori, Lonay, Switzerland, assignor to De la Rue Gi S.A., Switzerland

Continuation-in-part of Ser. No. 559,236, March 17, 1975, P No. 3,939,621. This application Jan. 5, 1976, Ser. No. 646,4
Claims priority, application Switzerland, Mar. 26, 19 4183/74
The portion of the term of this patent subsequent to Feb. 2 1993, has been disclaimed.
Int. Cl.² B65B *63/00*
U.S. Cl. 53—123 **14 Clai**



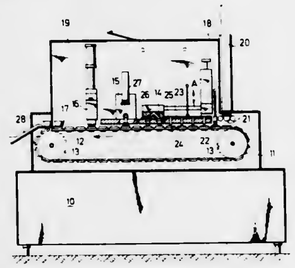
1. An installation for processing piles each formed of constant number of sheets each printed with N numbere security papers such as banknotes, in which the numbering the security papers at like positions of the successive sheets each pile and of the successive piles is in an uninterrupte sequence, into bundles of security papers each having sa constant number of security papers in sequential order ar arranged in packets of sequentially numbered bundles, cor prising:
- means for receiving a pile of sheets and cutting the pile in N bundles of security papers;
- means for conveying the bundles of each successively c pile in a given order along a first path;
- a bundle collecting device comprising two rotary drun each having N individual magazines arranged at its p riphery;
- a distribution head at the end of said first path for alternatel delivering bundles to fill one drum and then the othe drum;
- means for driving the drum being filled in synchronsim wit the delivery of bundles along said first path to receive the end of the said first path successive ones of the bundles formed from each pile in successive magazines t form N packets of a given number of bundles from a give number of piles;
- means for successively discharging said packets of bundle from said magazines of each of said drum while said maga zines of the other of said drums are being filled, and
- means for conveying the successive packets of bundles dis charged from the filled drum of said collecting devic along a second path to a packet wrapping device.

4,045,945

APPARATUS FOR THE STERILE FILLING OF FOODS INTO CONTAINERS

Erwin Möller, Wuppertal-Barmen; Franz Hubert Bausch, Wuppertal-Ronsdorf, both of Germany, and Martin Frölich, Gumlingen BE, Switzerland, assignors to Firma Hamba-Maschinenfabrik Hans A. Müller, Wuppertal-Vohwinkel, Germany

Filed Apr. 9, 1973, Ser. No. 349,532
Claims priority, application Germany, Apr. 17, 1972, 2218585
Int. Cl.² B65B *31/02, 55/10*
U.S. Cl. 53—167 **2 Claims**



1. In an apparatus for the sterile packing of foods in cup-shape containers comprising an endless conveyor defining a transport path, a filling station along said path for depositing food in said containers, a lid-applying station downstream of said filling station along said path for applying a lid to each of the filled containers, a sealing station along said path downstream of the lid-applying station sealing the applied lid to each container, said containers after sealing of said lids being ejected from said path, the improvement which comprises:
- a hood overlying said conveyor and enclosing all of said stations to define a sterile chamber;
- a magazine along said path for depositing said containers on said conveyor upstream of said filling station;
- spray means disposed downstream of said magazine along said path and within said chamber for spraying said containers with a sterilizing fluid; and
- a drying means between said spraying means and said filling station along said path for drying the fluid in said containers, said drying means including means for blowing a gas onto said containers and radiant-heating means confronting said containers on said conveyor, said conveyor being provided with a multiplicity of cells each receiving a respective container, said drying means comprising a heating plate extending longitudinally in the direction of displacement of the conveyor over a plurality of conveyor cells and a plurality of blow nozzles spaced apart in said direction with a distance equal to the spacing of said cells and extending through said plate, said drying means further comprising means for feeding said nozzles with sterile air.

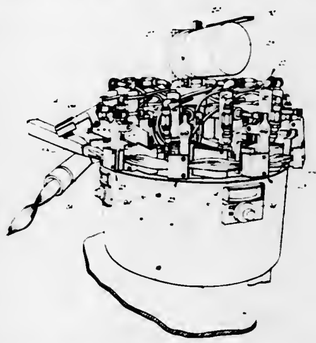
4,045,946

APPARATUS FOR CONTINUOUSLY FORMING AND FILLING TAMPON SACKS

Jean E. Schaefer, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 484,813, July 1, 1974, Pat. No. 3,982,374.
This application Apr. 21, 1976, Ser. No. 678,998
Int. Cl.² B65B *9/12*
U.S. Cl. 53—180 M **26 Claims**

1. In apparatus for forming and filling flexible tubing to form sealed packages,
- a rotatable turret, drive means for rotating said turret;
- a plurality of pleating and sealing stations located at substantially equally spaced intervals about the periphery of said turret, each station including pleating means movable from an open to a closed position, and sealing means also movable from an open to a closed position; and
- open-close means for sequentially closing and opening said pleating means and said sealing means during each cycle



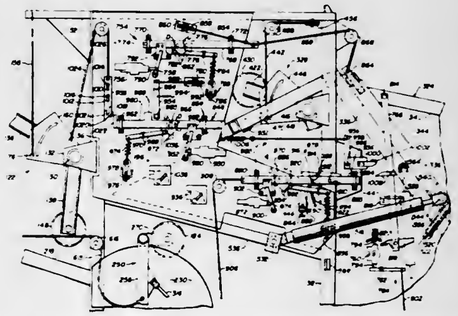
of rotation of said turret, whereby a continuous length of flexible tubing may be fed to the turret for engagement at spaced intervals by successive pleating and sealing stations and the tubing gathered and sealed at predetermined spaced intervals to form individual packages.

4,045,947

FRONT AND REAR UPPER APRONS IN A CROP MATERIAL ROLL FORMING MACHINE

Aquila D. Mast, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Feb. 9, 1976, Ser. No. 656,687
Int. Cl.² A01D *39/00*
U.S. Cl. 56—343 **20 Claims**



1. In a crop material roll forming machine, the combination comprising:
- a mobile frame adapted to move across a field;
- crop material delivery means supported by said frame;
- a first upper apron assembly supported by said frame and mounted above a first portion of said delivery means, said first upper apron assembly and said first delivery means portion defining a first roll forming region;
- a second upper apron assembly supported by said frame and mounted above a second portion of said delivery means, said second upper apron assembly and said second delivery means portion defining a second roll forming region; and
- means to drive at least a part of said delivery means in a predetermined direction for delivering crop material from the field to said first and second roll forming regions and also to drive at least a part of each of said first and second upper apron assemblies in a direction opposite to that of

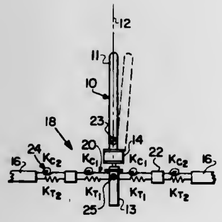
said part of said delivery means for performing roll forming operations at said regions.

4,045,948

VIBRATION ATTENUATING SUPPORT FOR ROTATING MEMBER

Alan J. Hannibal, Fairview, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Aug. 23, 1976, Ser. No. 716,868
Int. Cl.² D01H 7/10; F16F 15/12
U.S. Cl. 57—129 **18 Claims**



1. A support for mounting a rotating first member on a second member and for reducing the transmission of vibrations from said rotating first member to said second member, the first member being rotatable about an axis and tending while rotating to tilt about and translate along axes transverse to said axis of rotation, the first member also normally being rotated at a speed within a predetermined range of rotational speeds, said support comprising:

a. a body having mass and a moment of inertia with respect to an axis passing through the center of gravity of the mass body transverse to said axis of rotation, the mass body also having formed in it an opening;

b. means secured to the mass body for mounting the first member resiliently relatively to the mass body; and

c. means secured to the mass body for mounting the mass body resiliently relative to the second member,

the support being dimensioned and configured to circumscribe the first member and its axis of rotation and to be coupled to the first member such that the first member, when mounted in the support, extends into the opening in the mass body and has a center of gravity which is spaced along the axis of rotation from the center of gravity of the mass body,

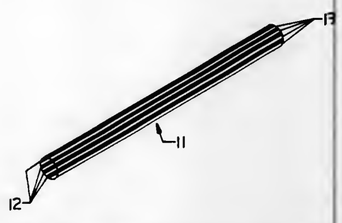
the support, when mounting the first member, predominately determining (i) a translational natural mode of vibration with an associated natural frequency at which the mass body translates in resonance along axes transverse to the axis of rotation of the first member and (ii) a cocking natural mode of vibration with an associated natural frequency at which the mass body cocks or tilts in resonance about axes transverse to the axis of rotation of the first member, the mass and moment of inertia of the mass body and the stiffnesses of the mounting means being such that both of said natural frequencies of the translational and cocking modes of vibration fall outside of a frequency range corresponding to the predetermined rotational speed range of the first member and such that at least one of said natural frequencies falls below the frequency range corresponding to the predetermined rotational speed range of the first member.

4,045,949

INTEGRAL, ELECTRICALLY-CONDUCTIVE TEXTILE FILAMENT

George A. Paton, Newport News; Sterling M. Nichols, Williamsburg, and John H. Sanders, Newport News, all of Va., assignors Dow Badische Company, Williamsburg, Va.

Continuation-in-part of Ser. No. 646,311, Jan. 2, 1976, abandoned. This application Apr. 29, 1976, Ser. No. 681,680
Int. Cl.² D02G 3/04, 3/44
U.S. Cl. 57—140 BY **4 Claims**



1. An integral, electrically-conductive textile filament having a resistance of not more than about 10^9 ohms/cm, the filament comprising:

a. from 2 to about 1000 electrically-conducting, longitudinally-directed strata of fiber-forming polymeric material having finely-divided particles of electrically-conductive carbon black uniformly dispersed therein, the concentration of electrically-conductive carbon black in each electrically-conducting stratum being within the following limits:

1. For2 electrically-conducting strata: from about 30 percent by weight — at a total concentration of carbon in the integral filament of about ½ percent by weight — to about 70 percent by weight — at a total concentration of carbon in the integral filament of about ½ percent by weight; and

2. For about 1000 electrically-conducting strata: from about 30 percent by weight — at a total concentration of carbon in the integral filament of about 12 percent by weight — to about 70 percent by weight — at a total concentration of carbon in the integral filament of about 2 percent by weight; and

b. in coextensive union with each electrically-conducting stratum along the length of at least one major surface thereof, a non-conducting stratum of the same fiber-forming polymeric material.

4,045,950

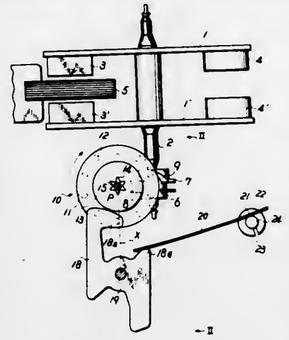
CONTROL APPARATUS FOR AN INTERMITTENTLY ROTATED WHEEL

Shoichiro Kumazawa, Kamagaya, Japan, assignor to Kabushiki Kaisha Seikosha, Japan

Filed Oct. 16, 1975, Ser. No. 623,016
Int. Cl.² G04C 3/00
U.S. Cl. 58—23 D **4 Claims**

1. A control device for controlling the rotation of an intermittently driven wheel comprising: a driven wheel mounted to be rotationally driven in a forward direction in a stepwise intermittent manner; a lock wheel connected to said driven wheel to be driven thereby and having a smooth non-toothed peripheral surface; a turnably mounted lock lever having a lever arm extending toward said lock wheel and terminating in an arm end portion in frictional contact with said lock wheel peripheral surface; and means including a lever spring for applying an adjustable biasing force to said lock lever tending to turn it so as to urge said arm end portion into frictional

contact with said lock wheel peripheral surface with an adjustably settable frictional bias force to thereby prevent said lock



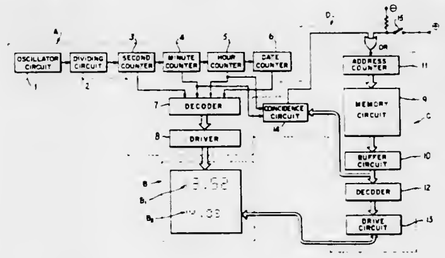
wheel and driven wheel from undergoing rotation in the reverse direction.

4,045,951

DIGITAL ELECTRONIC TIMEPIECE

Kojiro Tanaka, Yachiyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 19, 1975, Ser. No. 642,378
Claims priority, application Japan, Dec. 20, 1974, 49-147273
Int. Cl.² G04C 3/00
U.S. Cl. 58—23 R **6 Claims**



1. A digital electronic timepiece comprising in combination:

time measuring means including an oscillator circuit for developing an output signal at a certain frequency, a dividing circuit connected to receive the oscillator output signal for developing output pulses at a frequency lower than the frequency of the oscillator output signal, and a counter connected to receive the output pulses from the dividing circuit for counting the same to develop a pulse count representative of time;

memory means having a plurality of successive addresses for memorizing time table information representative of different times and being successively addressable by a control signal for reading-out successive memorized times;

display means connected to receive the pulse count representative of time and successive times read-out from said memory means for simultaneously displaying a time represented by the pulse count and a time read-out from said memory means; and

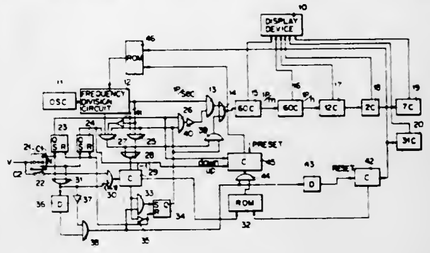
control means comprising a coincidence circuit connected to compare the pulse count with the read-out contents of said memory means for developing a control signal when the times respectively represented by the pulse count and the read-out contents of said memory means coincide, thereby to read-out a next successive time memorized in said memory means and display the same.

4,045,952

ELECTRONIC TIMEPIECE APPARATUS

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1976, Ser. No. 663,295
Claims priority, application Japan, Mar. 8, 1975, 50-28278
Int. Cl.² G04B 27/00; G04C 3/00
U.S. Cl. 58—23 R **4 Claims**



1. An electronic timepiece comprising:

an oscillator for generating standard clock pulses;

electronic time counting means coupled to the oscillator for frequency-dividing and counting the clock pulses from the oscillator;

display means coupled to the electronic time counting means for indicating the time in accordance with a signal from the electronic time counting means;

memory means for storing an amount of correction by which to correct the error in the frequency of the standard clock pulses from the oscillator;

control means coupled to the electronic time counting means for adjusting the counting period of the electronic time counting means as a function of the amount of correction stored in the memory means;

actuating switch means for correcting the time;

time correction control means coupled to the actuating switch means for changing the time upon operation of the actuating switch means;

time period counting means for counting the time period between a time-correcting operation initiated by the actuating switch means and the immediately preceding time-correcting operation;

means for obtaining an amount of correction for a unit length of time based on the count value of the time period counting means and the period of time by which the time has been changed by the correction control means; and

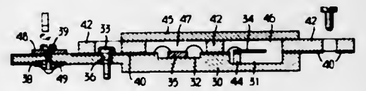
means for changing the amount of correction stored in the memory means as a function of the obtained amount of correction for a unit length of time.

4,045,953

CIRCUIT BOARD FOR AN ELECTRONIC TIMEPIECE

Joichi Miyazaki, Funabashi, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Continuation-in-part of Ser. No. 615,916, Sept. 23, 1975, abandoned. This application July 30, 1976, Ser. No. 710,199
Claims priority, application Japan, Sept. 30, 1974, 49-112490
Int. Cl.² G04C 3/00
U.S. Cl. 58—23 R **8 Claims**



1. A circuit board assembly for an electronic timepiece comprising: a lower substrate having at least two recesses

therein; an upper substrate superposed on and connected to said lower substrate and having at least two openings in registry with respective ones of said recesses; covering means hermetically covering said openings to define at least two hermetically sealed compartments; an oscillator mounted in one of said compartments; an IC chip mounted in another of said compartments; and means defining a pattern of electrodes on at least one of said upper and lower substrates in electrical connection with said oscillator and said IC chip.

4,045,954

SAFETY MECHANISM FOR A WATERTIGHT WATCH HAVING A PIEZO ELECTRIC BUZZER

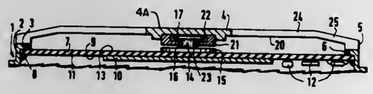
Wolfgang Ganter, Schramberg, and Albert Ginter, Lauterbach, both of Germany, assignors to Gebruder Junghans GmbH, Schramberg, Wurttemberg, Germany

Filed Jan. 29, 1976, Ser. No. 653,623

Claims priority, application Germany, Jan. 30, 1975, 7502725[U]

Int. Cl.² G04C *21/02, 21/34;* G04B *23/12;* G08B *3/10*

U.S. Cl. 58—38 R **7 Claims**



1. In a watch of the watertight type having housing means, including a downwardly apertured portion for transmitting sound; a diaphragm attached to said housing means in a manner effecting a watertight seal, said diaphragm being capable of flexure toward and away from said apertured housing portion; a piezo electric buzzer element secured internally of said diaphragm and being responsive to electrical excitation for producing a buzzing sound; electrical circuit means connected to said piezo element for electrically exciting said piezo element; and safety means for preventing an excessive amount of flexure of said diaphragm in response to pressure acting thereon; the improvement wherein said safety means comprises:

a first safety element secured to said diaphragm; and

a second safety element secured to said housing means;

said first safety element being movable, with said diaphragm, relative to said second safety element in an inward direction away from said apertured housing portion;

said second safety element including stop means for contacting said first safety element to limit the amount of flexure of said diaphragm.

4,045,955

REGULATING MEANS FOR GAS TURBINE PLANT

Roine Bränström, and Goran Nilsson, both of Finspong, Sweden, assignors to Stal-Laval Turbin AB, Finspong, Sweden

Filed Aug. 4, 1976, Ser. No. 711,666

Claims priority, application Sweden, Aug. 29, 1975, 7509603

Int. Cl.² F02C *9/06*

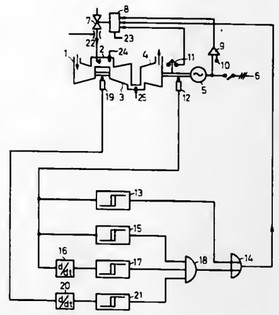
U.S. Cl. 60—39.28 R **10 Claims**

1. Apparatus for controlling the flow of fuel supplied via a regulating valve to a gas turbine plant including a compressed-gas generating unit and a power turbine driven by the gas from the compressed-gas generating unit for the purpose of reducing power turbine speed in the event of overspeed comprising:

first means responsive to the angular velocity of a rotor included in said power turbine,

second means responsive to the angular acceleration of the power turbine rotor,

and third means jointly responsive to output signals provided by said first and second means for controlling said valve to reduce the rotor's angular velocity when said



output signals provided by both said first and second means concurrently exceed predetermined values.

4,045,956

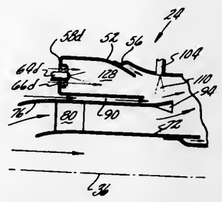
LOW EMISSION COMBUSTION CHAMBER

Stanley J. Markowski, East Hartford, and James J. Nolan, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 533,922, Dec. 18, 1974, Pat. No. 3,973,395. This application Mar. 26, 1976, Ser. No. 670,914

Int. Cl.² F02C *7/22*

U.S. Cl. 60—39.65 **6 Claims**



1. A low NOx combustion chamber having an axis and comprising:

A. means to produce pilot combustion swirling about said axis and similarly swirling hot, fully combusted, pilot exhaust gases of reduced oxygen content and of a temperature above the vaporization temperature of the fuel to be utilized in the combustion chamber,

B. means to inject atomized fuel into the swirling pilot products of combustion in selected quantity to produce a first swirling mixture of fuel and air of reduced oxygen content so that the first swirling mixture has a first ignition delay time to prevent autoignition of the atomized fuel droplets, said first swirling mixture also having a selected temperature to vaporize the fuel so that said first swirling mixture is a vaporized, swirling fuel-air mixture having a reduced oxygen content to produce autoignition at the culmination of the first time delay,

C. means to mix a selected quantity of swirling combustion air with the first swirling mixture to effect molecular mixing between the fuel and air since both the first mixture and combustion air are swirling, and in selected quantity to produce a second swirling, vaporized fuel-air mixture of oxygen level greater than that of said first mixture to effect a new and reduced ignition delay time so as to autoignite the second mixture at an ER less than one and at a time sooner than the expiration of the first ignition delay time to thereby reduce the dwell time of the engine air at NOx creating temperature,

D. said combustion chamber having an axis and a pilot combustion chamber axially upstream of a main combustion chamber and wherein the first and second mixtures swirl concentrically about the axis,

E. said pilot combustion chamber including:

1. a forward wall, and

2. means operatively associated with the forward wall to cause pilot combustion and pilot products of combustion to swirl about the axis, and

F. wherein said swirl causing means in said pilot combustion chamber comprises a plurality of circumferentially spaced and disposed fuel atomizing nozzles supported in said forward wall concentrically about and at an angle with respect to the axis so that pilot zone combustion occurs and pilot products of combustion will flow in swirling fashion about the axis.

4,045,957

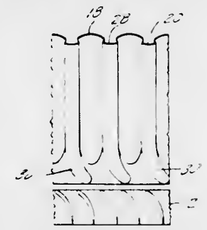
COMBINED GUIDE VANE AND MIXER FOR A GAS TURBINE ENGINE

Vincent J. DiSabato, Southington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 20, 1976, Ser. No. 659,889

Int. Cl.² F02K *3/06*

U.S. Cl. 60—262 **5 Claims**



1. A mixer for a fan jet engine power plant located downstream of the turbine for mixing the flow from the turbine and the fan, comprising a sinuous circumferentially shaped body having inner and outer lobes, the inner lobes being closer to the axis of the engine and having a bottom wall, the improvement comprising flow guide means having an upstream portion aligned with the direction of approaching flow and, a downstream portion to circumferentially turn the flow, the flow guide means disposed adjacent the bottom wall extending within the body of the mixer to turn the flow exhausting from said turbine in a predominantly circumferential direction whereby the turning of the turbine exhaust is accomplished within the mixer prior to being mixed with the fan discharge air flow.

4,045,958

MULTI-DIRECTIONAL POSITIONER

William M. Wells, Midfield, Ala., assignor to Thomas H. Hudson, Birmingham, Ala., a part interest

Filed Mar. 25, 1976, Ser. No. 670,571

Int. Cl.² F01C *9/00;* F15B *7/00*

U.S. Cl. 60—325 **7 Claims**

1. In a multi-directional positioner for moving one element relative to another element,

a. a ball-like member,

b. housing having a socket therein receiving said ball-like member with a rotating fit with the inner surface of said socket extending an angular distance around said ball-like member to retain said ball-like member in said socket with a portion of said ball-like member projecting outwardly of said socket,

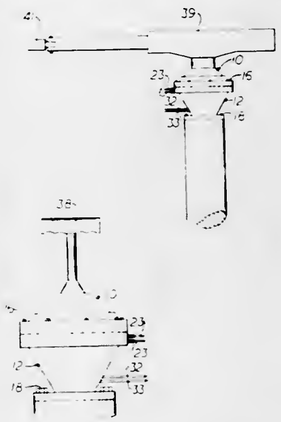
c. means operatively connecting said portion of the ball-like member projecting outwardly of said socket to said one element,

d. means operatively connecting said housing to said another element,

e. at least one arcuate groove in the inner surface of said housing extending in a plane passing generally through the center of said ball-like member,

f. a piston in said arcuate groove in said housing and pivotally connected to the adjacent side of said ball-like member,

g. means to introduce fluid under pressure into said arcuate groove in said housing selectively at opposite sides of the piston therein to impart relatively movement between said ball-like member and said housing,



h. at least one arcuate groove in the outer surface of said ball-like member extending in a plane passing generally through the center of said ball-like member and perpendicular to said arcuate groove in the inner surface of said housing,

i. a piston in said arcuate groove in the outer surface of said ball-like member and pivotally connected to the adjacent portion of said housing, and

j. means to introduce fluid under pressure into said arcuate groove in the outer surface of said ball-like member selectively at opposite sides of the piston therein to impart relative movement between said ball-like member and said housing.

4,045,959

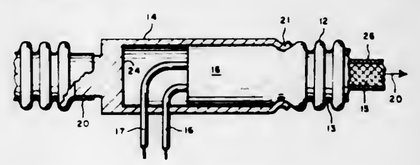
EXPANDED RING BELLOWS

Dallas D. Burns, Brooklyn Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 17, 1975, Ser. No. 559,289

Int. Cl.² F01B *19/08, 29/08*

U.S. Cl. 60—632 **4 Claims**



1. A self-erecting structure, comprising:

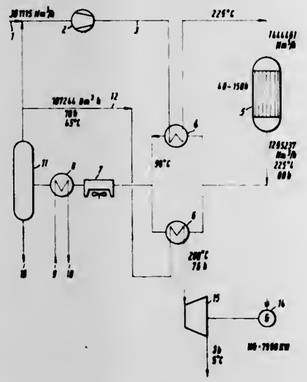
a plurality of unexpanded convoluted bellows means joined together sequentially defining an enclosed tubular ring having an interior circular path and a first diameter; and activation means for generating sufficient pressure within

said enclosed path to increase said first diameter to a second diameter of significantly greater size.

4,045,960
PROCESS FOR PRODUCING ENERGY

Gerhard Cornelius, Bergen-Enkheim; Friedemann Marschner, Oberursel; Emil Supp, Dietzenbach, and Toma Variam, Neu-Isenburg, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 9, 1976, Ser. No. 647,965
Claims priority, application Germany, Jan. 15, 1975, 2501377
Int. Cl.² F01K *17/00*
U.S. Cl. 60—648 5 Claims



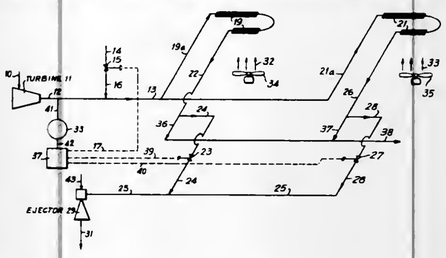
1. Process of recovering energy from a residual gas from a catalytic synthesis of methanol, comprising the steps of:
a. reacting a gaseous mixture having a temperature in the range of 190°–280° C and containing hydrogen and carbon oxides in a methanol synthesis zone in the presence of a catalyst at a pressure of 25–150 bars and producing a methanol containing product gas,
b. cooling said product gas by indirect heat exchange,
c. in a separation zone, separating methanol from the cooled product gas,
d. withdrawing from said separation zone residual gas containing hydrogen, carbon oxides and methane and having a pressure of 25–150 bars,
e. mixing a first partial stream of said residual gas and fresh synthesis gas and feeding the mixture into said catalytic synthesis of methanol,
f. withdrawing a second partial stream of said residual gas and heating it to a temperature of 50°–500° C and
g. feeding the heated second partial stream of step (f) to an expansion turbine for a partial expansion with the performance of work.

4,045,961
CONTROL OF FREEZING IN AIR-COOLED STEAM CONDENSERS

Willem Schoonman, Wyckoff, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Continuation-in-part of Ser. No. 504,243, Sept. 9, 1974, abandoned. This application June 30, 1975, Ser. No. 591,677
Int. Cl.² F28B *11/00*
U.S. Cl. 60—686 20 Claims

1. A method of controlling the operation of an air-cooled steam condenser having a plurality of heat exchanger tubes comprising causing non-condensible inert gas to accumulate in a portion of the condenser tubes for a predetermined time and in a predetermined amount sufficient under the conditions present in the condenser to substantially lower the heat transfer

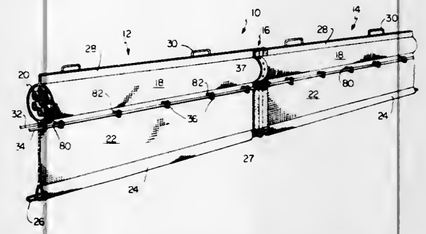


capacity but insufficient to allow damage to occur to the condenser from freezing of condensate therein.

4,045,962
CABLE CONNECTOR ASSEMBLY FOR OIL CONTAINMENT BOOM

Paul Preus, 21 Smith Road, Toms River, N.J. 08753

Filed July 2, 1976, Ser. No. 702,066
Int. Cl.² E02B *15/04*
U.S. Cl. 61—1 F 2 Claims



1. A barrier for water carried pollutants comprising a series of end-to-end connectable boom sections, each boom section comprising a flexible tubular sleeve containing flotation means and a depending skirt, flexible draft members extending along each side of the skirt immediately below the tubular sleeve and means connecting the flexible draft members to the boom at spaced intervals characterized in that the connecting means comprises a pair of U-shaped anchor shackles, adapted to receive a threaded anchor pin at the extended ends of the legs thereof, a boss on the bridge portion of each shackle having an opening therein, the axis of which lies in a plane parallel to the longitudinal axes of the legs of each of the U-shaped shackles, internal threads in the openings in each boss, a connector bar having threads at both ends compatible with threads in the pair of bosses and openings through the skirt of the boom to snugly receive the connector bar.

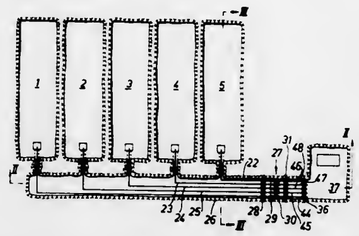
4,045,963
UNDERGROUND INSTALLATION FOR STORING PETROL PRODUCTS

Bengt Hansson, Sollentuna, and Sigfrid Svensson, Goteborg, both of Sweden, assignors to Armerad Betong Vägförbättringar Aktiebolag, Stockholm, Sweden

Filed May 24, 1976, Ser. No. 689,378
Claims priority, application Sweden, May 28, 1975, 7506113
Int. Cl.² B65G *5/00*
U.S. Cl. 61—.5 7 Claims

1. An installation for storing petrol products comprising:
a plurality of underground storing rooms (1–5) for the petrol products,

an underground pump chamber (37) filled with oil and containing at least one submersed pump,
a dry underground valve chamber (27) disposed between the storing rooms (1–5) and the underground pump chamber (37) and containing valves (30),

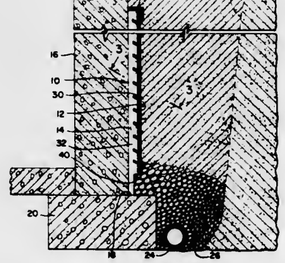


inlet pipes (22–26) connecting the storing rooms (1–5) to the inlets of said valves (30), and
at least one outlet pipe (44–48) connecting the outlets of said valves (30) with said underground pump chamber (37).

4,045,964
SUBTERRANEAN PANEL DRAIN

James A. Barclay, 82 Buena Vista Drive, Dobbs Ferry, N.Y. 10522

Filed Dec. 15, 1975, Ser. No. 640,848
Int. Cl.² E02B *11/00*; E02D *31/02*
U.S. Cl. 61—11 10 Claims

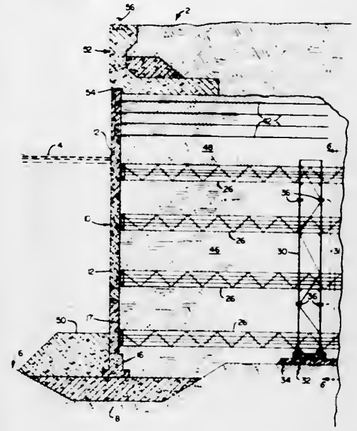


1. A subterranean panel drain comprising a unitary member having a top edge, a bottom edge, and first and second sides, said unitary member having a transverse cross-section defining a plurality of alternately disposed ridges and valleys on said first side and said second side respectively, the ridges on said first side corresponding to the valleys on said second side and the ridges on said second side corresponding to the valleys on said first side, said valleys defining a plurality of substantially vertically disposed fluid-flow channels extending between said top edge and said bottom edge, and a plurality of openings disposed in said ridges on said first side to communicate with the corresponding channels on said second side, said openings being inclined upwardly from said first side to said second side, said unitary member being adapted for subterranean installation whereby water in soil adjacent said first side is capable of flowing through said openings, entering said corresponding channels on said second side, and being directed along said corresponding channels toward said bottom edge of said member.

4,045,965
QUAY STRUCTURE

Henri C. Vidal, Paris, France

Filed June 26, 1975, Ser. No. 590,730
Int. Cl.² E02D *5/00*
U.S. Cl. 61—39 20 Claims



1. A quay structure comprising:
a wall having a plurality of wall panels, said panels being arranged in vertical rows with the panels in adjacent rows, engaging each other in edge to edge relation with a tongue and groove connection, each wall panel including a plurality of rigid framework truss members attached at one end to each of said wall panels, said truss members extending in substantially parallel relation away from one side of said wall,
rigid framework tower means for providing a plurality of vertically spaced supports, said tower means being spaced from said wall on said one side and including means for supporting the tower means of an adjacent wall panel, said truss members being supported on said tower supports in spaced relation to each other; and
particulate material substantially filling the space between said tower means and said one side of said wall, and surrounding said truss members and said tower means.

4,045,966
CASINGLESS PILE METHOD AND APPARATUS

Fredric Rueche, 30303 Beck Road, Wixom, Mich. 48096

Filed Oct. 14, 1975, Ser. No. 621,682
Int. Cl.² E02D *5/36*
U.S. Cl. 61—53.64 5 Claims

1.
A mandrel for forming in situ a casingless pile, comprising,
an elongate hollow tubular mandrel having a lower end portion with an outer wall portion adapted to engage the sides of a bore hole and having an inflatable bladder surrounding the mandrel below said outer wall portion,
a nozzle below the bladder,
an air pipe for supplying air under pressure to the bladder,
a conduit for supplying concrete under pressure to the nozzle,
said inflatable bladder comprising an elastomeric band surrounding said mandrel below said outer wall portion,
and a rigid annular pressure plate between said band and said nozzle for protecting the lower end of said band when the mandrel is inserted in a bore hole,

the diameter of said band, when deflated, being less than the



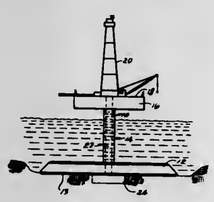
diameter of said outer wall portion, said band being inflatable to a larger diameter than said outer wall portion.

4,045,967

APPARATUS FOR SUPPORTING A DRILLING PLATFORM ON THE OCEAN FLOOR

Joseph F. Schirtzinger, Pasadena, Calif., assignor to Sea-Log Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 458,986, April 8, 1974, Pat. No. 3,996,756. This application Feb. 17, 1976, Ser. No. 658,224
Int. Cl.² E02B 17/00; E02D 27/04
U.S. Cl. 61—86 **4 Claims**



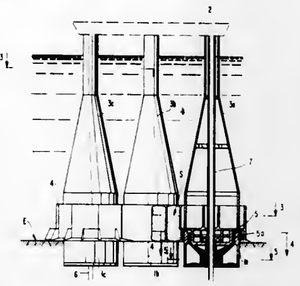
1. A mounting structure for anchoring a monopod drilling platform to the ocean floor, comprising an open precast vessel having a bottom wall and a side wall extending up from and around the perimeter of the bottom wall, the side wall terminating in a continuous edge at the top lying in a plane, the top edge of the wall forming an opening in the top of the vessel, a monopod drilling structure having a base and a supporting column extending upwardly from the base, the column having a vertical passage opening through the bottom of the base, the base having a flat bottom surface surrounding the opening of the vertical passage, the opening of the passage being substantially smaller than the opening in the top of the vessel, the vessel being adapted to be submerged in the ocean floor with the bottom of the platform base extending across the top edge of the vessel, and sealing means secured to the vessel adjacent the top edge of the vessel and frictionally engaging the bottom of the platform to form a water-tight intersection while permitting lateral movement of the platform relative to the vessel to position the vertical passage over any selected portion of the open vessel.

4,045,968

OFFSHORE PLATFORM AND METHOD FOR ITS INSTALLATION

Benjamin C. Gerwick, Jr., Oakland, Calif., assignor to Kajima Corporation, Tokyo, Japan

Filed Dec. 24, 1975, Ser. No. 644,017
Claims priority, application Japan, Dec. 24, 1974, 49-147594
Int. Cl.² E02B 17/00; E02D 5/00
U.S. Cl. 61—86 **12 Claims**



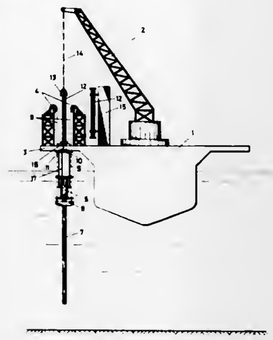
1. A concrete platform for use in offshore drilling and the like, comprising a superstructure and a base structure, said superstructure including a deck and supporting towers, said base structure including a base raft and caissons, said caissons extending downwardly from the base raft to be embedded in the soil of the sea floor layer whereby external horizontal forces acting on the platform are opposed by soil pressure acting laterally on the sunken portions of the caissons, energy absorbing means interconnecting said caissons and said base raft, said energy absorbing means including (a) members which are relatively rigid under wave forces but which fail under strong earthquake and (b) an energy-absorbing resilient (elastic) material.

4,045,969

SUBMERGIBLE PILE DRIVING METHOD AND APPARATUS FOR CONTINUOUS OPERATION

Joost W. Jansz, The Hague, Netherlands, assignor to Hollandsche Beton Groep N. V., Rijswijk, Netherlands

Filed Apr. 30, 1976, Ser. No. 681,944
Claims priority, application Netherlands, Oct. 13, 1975, 7512023
Int. Cl.² E02D 7/00
U.S. Cl. 61—535 **9 Claims**



1. In an apparatus for underwater pile driving at substantial depths including a ship having a lifting device and cable handling means, a submersible subframe, means for suspending the subframe from the lifting device, cables connected to a pile to be driven and running down from the cable handling means, and a pile driving head guided on the cables and vertically reciprocable in the subframe, the improvements characterized by:

a. the means for suspending the subframe comprising a string of connected, substantially rigid tube sections, said means for suspending the subframe minimizing twisting of the subframe and pile driving head,

b. a plurality of conduits secured to the string for communicating hydraulic, pneumatic and electrical energy to and from the subframe.

c. first flexible hose means coupled to said conduits at lower ends thereof for conveying the energy from the conduits to the pile driving head, and

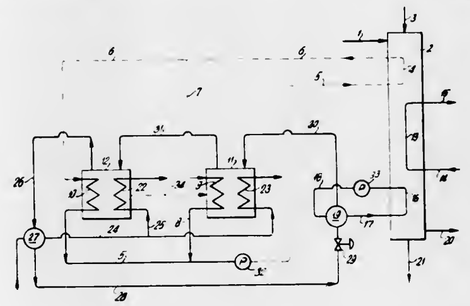
d. second flexible hose means coupled to said conduits at upper ends thereof for conveying the energy from sources on the ship to the conduits, said second flexible hose means being coupled to the upper end of the conduits at a point below the point of suspension of the tube string from the lifting device and having a length adapted to the length of the pile to be driven.

4,045,970

METHOD AND APPARATUS FOR THE INDIRECT COOLING OF HOT GASES, PARTICULARLY, COKE OVEN GASES

Kurt Tippmer, Recklinghausen, Germany, assignor to Firma Carl Still Recklinghausen, Germany

Filed Oct. 15, 1976, Ser. No. 732,958
Claims priority, application Germany, Oct. 21, 1975, 2547034
Int. Cl.² F25D 17/06, 17/02; F25B 7/00
U.S. Cl. 62—95 **6 Claims**



1. A method for the indirect cooling of hot gases, particularly, coke oven gases, using a gas cooler having a cooling chamber with three different heat exchangers arranged therein, comprising directing the gases to be cooled through a first heat exchanger in the gas cooler while circulating a coolant through the first heat exchanger which comprises a cooling medium taken from the desorber stage of an absorber-desorber-type refrigerating machine, thereafter directing the gases through a second heat exchanger while cooling water is circulated through the heat exchanger and finally directing the gases through a third heat exchanger while circulating a cooling agent taken from the evaporator stage of the refrigerating machine.

4,045,971

FROST DETECTOR

George John Breaner, Jr., Kirkwood, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 1, 1976, Ser. No. 662,376
Int. Cl.² F25D 21/02
U.S. Cl. 62—140 **14 Claims**

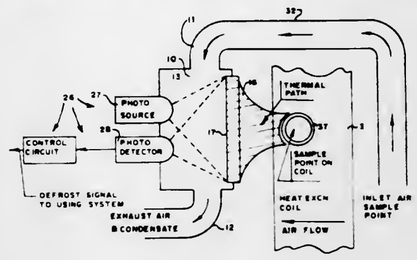
1. A frost detector for a refrigeration device having an evaporating coil, comprising:

a housing, said housing having a light impervious passageway through it, said housing including at least one side wall partially defining said passageway, said side wall having an opening in it;

a thermal conductive means mounted in said opening, said conducting means having a first surface area closing the opening in said passageway, and a second surface area;

an energy source operatively mounted to said housing, said energy source being adapted to illuminate the first surface area of said thermal conducting means;

an energy sensitive device operatively mounted to said housing to sense the level of energy reflected from said thermal conductive means;



means for mounting said housing to a refrigerant carrying portion of said refrigeration device along the second surface of said thermal conducting means, the thermal resistance between the second surface of said thermal conducting means and the refrigerant carrying portion of said refrigeration device being adjustable to vary the heat transfer characteristic of said thermal conducting means; and

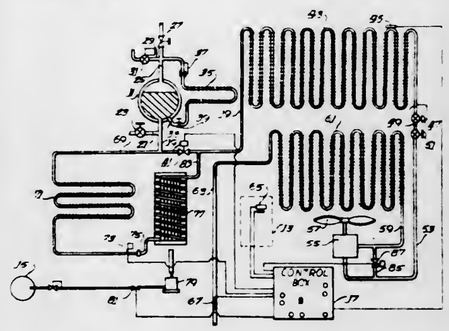
means for operatively connecting said light impervious passageway to a source of air, said connecting means being positioned so that the air pressure drop across said evaporating coil forces air through said light impervious passageway.

4,045,972

CO_2 COOLING OF VEHICLES

Lewis Tyree, Jr., 145 Briarwood Ave., North, Oak Brook, Ill. 60521

Filed July 23, 1976, Ser. No. 708,268
Int. Cl.² F25D 21/06
U.S. Cl. 62—156 **13 Claims**



1. A system for cooling the cargo compartment of a refrigerated vehicle using CO_2, which system comprises a vessel carried by the vehicle for holding liquid CO_2, means for filling said vessel with liquid CO_2,

first heat-exchanger means for vaporizing said liquid CO_2 and warming said CO_2 vapor,

conduit means for supplying liquid CO_2 from said vessel to said first heat-exchanger means,

means for lowering the pressure of said warmed CO_2 vapor to about atmospheric pressure without the creation of solid CO_2 and simultaneously cooling said CO_2 vapor, which pressure-lowering means includes a gas-driven motor through which said CO_2 vapor is passed,

pressure-regulation means for maintaining a minimum vapor pressure of at least about 80 psia between said first heat-exchange means and said pressure-lowering means,

fan means connected to said motor for circulating the atmosphere in said cargo compartment in association with said first heat-exchange means,

second heat-exchange means connected to the discharge from said pressure-lowering means for receiving said cooled CO_2 vapor therefrom, and

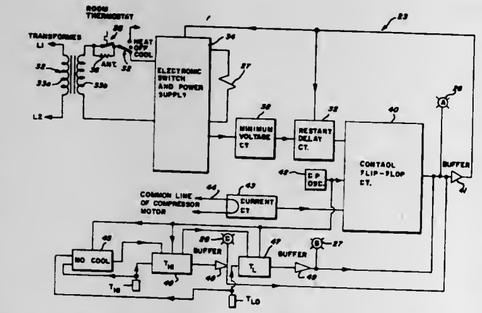
means for exhausting said CO_2 vapor which exits from said second heat-exchange means to the atmosphere exterior of said cargo compartment.

4,045,973

AIR CONDITIONER CONTROL

Richard M. Anderson, Smyrna; Robert S. McGill, III, Murfreesboro, and Robert W. Ramsey, Nashville, all of Tenn., assignors to Heil-Quaker Corporation, Lewisburg, Tenn.

Filed Dec. 29, 1975, Ser. No. 645,285
Int. Cl.[2] F25B 49/00
U.S. Cl. 62—158 31 Claims



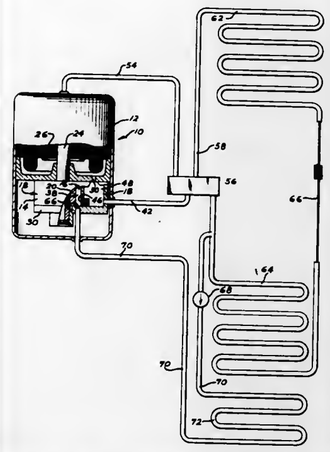
1. A control system for an electrically driven air conditioner refrigerant compressor comprising: electronic switch means for controlling energization of said compressor from an electrical power source; voltage sensing means for determining whether the voltage of said power source is below a preselected minimum voltage only prior to energization of said compressor by said electronic switch means; control means for controlling operation of said electronic switch means; time delay means connected to said electronic switch means, said control means, and said voltage sensing means for delaying attempted energization of said compressor by operation of said electronic switch means by said control means for a predetermined period of time as an incident of each operation of said electronic switch means to de-energize said compressor and as an incident of each determination of a voltage below said preselected minimum voltage; and current sensing means for causing said control means to de-energize said electronic switch means in the event the current drawn by said drive motor exceeds a preselected level after a preselected short time following energization of said compressor.

4,045,974

COMBINATION MOTOR COOLER AND STORAGE COIL FOR HEAT PUMP

William J. McCarty, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 11, 1976, Ser. No. 713,439
Int. Cl.[2] F25B 41/00
U.S. Cl. 62—196 B 2 Claims



1. A reversible refrigeration system adapted for heating and cooling, a hermetic casing for containing a high pressure refrigerant gas, a motor-driven compressor unit in said casing including a cylinder having an annular compression chamber, a rotor eccentrically rotatable within said chamber, said rotor having a peripheral surface adapted to move progressively into sealing relation with successive portions of said annular chamber, a blade slidably arranged in said compressor being biased against said peripheral surface of said rotor for following said rotor thereby to divide said chamber into high and low pressure sides, means including a gas suction port communicating with said annular chamber for introducing low pressure refrigerant gas into said annular chamber, means including a gas discharge port communicating with said annular chamber for conducting hot compressed refrigerant gas from said chamber into said hermetic casing, an indoor heat exchanger and an outdoor heat exchanger connected in reversible refrigerant flow relationship, means connected between said heat exchangers for expanding refrigerant from condenser pressure to evaporator pressure, means for reversing the flow of refrigerant through said system to operate each of said heat exchangers interchangeably as a condenser or as an evaporator, a refrigerant injection passageway in said compressor communicating with said compressing chamber being adapted to be covered and uncovered by said rotor during the rotation thereof, wherein the improvement comprises:

a conduit having one end connected at some point between said reversing valve and said outdoor coil and having its other end connected to said injection passageway;

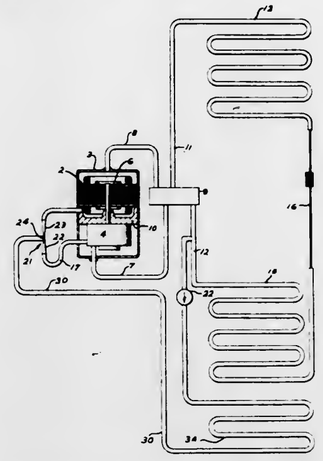
a one-way refrigerant pressure responsive valve arranged in said conduit being operable when said outdoor coil is operating as a condenser due to higher refrigerant pressure being present on the condenser side of said one-way valve relative to the pressure in said injector passageway for permitting a regulated portion of refrigerant flow to enter said conduit and be injected into said compression chamber through said injection passageway to lower the temperature of said refrigerant being compressed so that said refrigerant discharged into said casing is at a temperature sufficient for cooling said motor and to maintain its temperature within operating limits.

4,045,975

COMBINATION MOTOR COOLER AND STORAGE COIL FOR HEAT PUMP

William J. McCarty, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 11, 1976, Ser. No. 713,438
Int. Cl.[2] F25B 41/00
U.S. Cl. 62—196 B 4 Claims



1. A reversible refrigeration system adapted for heating and cooling, a motor compressor unit, an indoor heat exchanger and an outdoor heat exchanger connected in reversible refrigerant flow relationship, means connected between said heat exchangers for expanding refrigerant from condensor pressure to evaporator pressure, a valve for reversing the flow of refrigerant through said system to operate said system in a heating or cooling mode with each of said heat exchangers arranged interchangeably as a condenser or as an evaporator, said motor compressor unit being mounted in a hermitically sealed casing for containing a high pressure refrigerant gas, a discharge passage leading from said compressor into said casing for conducting compressed refrigerant from said compressor into said casing, aspirating means in said discharge passage for creating a low pressure region in said discharge gas stream as it passes through said aspirating means, wherein the improvement comprises:

a conduit having one end connected at some point between said reversing valve and said outdoor coil and having its other end connected to said aspirating means;

a one-way refrigerant pressure responsive valve arranged in said conduit being operable when said outdoor coil is operating as a condenser due to higher refrigerant pressure being present on the condenser side of said one-way valve relative to the pressure on the aspirator side thereof for permitting a regulated portion of refrigerant flow to enter said conduit and be injected by action of said aspirating means into said compressed refrigerant passing through said discharge passage to lower the temperature of said compressed discharge refrigerant entering said casing.

4,045,976

VALVE FOR SOFT ICE CREAM MACHINE

John W. Mills, 301 S. Idaho, Columbus, Kans. 66725

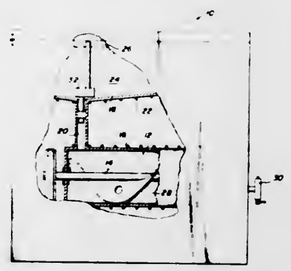
Filed Feb. 26, 1976, Ser. No. 661,760
Int. Cl.[2] A23G 9/00
U.S. Cl. 62—308 9 Claims

1. In an apparatus for freezing and dispensing a confectionery product, the apparatus comprising a freezing chamber, a liquid product reservoir located above the freezing chamber, and a tubular communicating line between the liquid product reservoir and the freezing chamber, an improved airmix feeding element for controlling the flow of air and liquid product through the tubular communicating line comprising:

a. a lower tubular member snugly yet removably received within the tubular communicating line,

b. an air-retaining chamber fixed to an upper portion of the lower tubular member and communicating therewith,

c. an upper tubular member fixed to the air-retaining chamber and extending upward to a point above the maximum anticipated level of the liquid product in the liquid product resivoir, the lower end of the upper tubular member extending somewhat inside the air-retaining chamber, the upper tubular member having near the lower end thereof a small aperture opening into the liquid product reservoir, and



d. a checkvalve attached to the lower end of the upper tubular member for retaining air in the air-retaining and freezing chambers to assure the desired overrun in the resultant dispensed food product, the checkvalve comprising an elastomeric sleeve fixed to the lower end of the upper tubular member and a flat place disposed within the elastomeric sleeve, the flat plate being of such a size and being arranged such that the elastomeric sleeve is laterally stretched to form a pair of lip-like portions sealingly engaging the interstitial flat plate.

8. A checkvalve for retaining air in the freezing chamber of an apparatus for freezing and dispensing a frozen confectionery product, the checkvalve comprising an elastomeric sleeve and a flat plate disposed within the elastomeric sleeve the flat plate being of such a size and being arranged such that the elastomeric sleeve is laterally stretched to form a pair of lip-like portions sealingly engaging the interstitial flat plate.

4,045,977

SELF OPERATING EXCESS REFRIGERANT STORAGE SYSTEM FOR A HEAT PUMP

James W. Oliver, Jr., Staunton, Va., assignor to Dunham-Bush, Inc., West Hartford, Conn.

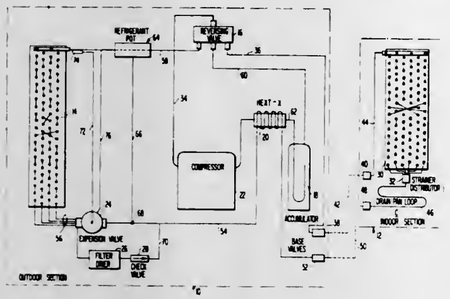
Filed Sept. 9, 1976, Ser. No. 721,928
Int. Cl.[2] F25B 13/00
U.S. Cl. 62—324 2 Claims

1. In a heat pump closed loop refrigeration and heating system including an indoor coil, an outdoor coil, a compressor and conduit means connecting the indoor coil and the outdoor coil in series and defining a closed loop, a mass of refrigerant within said closed loop, a compressor for compressing the refrigerant, and a reversing valve within said closed loop for reversing the direction of flow of refrigerant between said indoor and outdoor coils, and expansion means for said coils to permit one of said coils to selectively act as an evaporator coil and the other as a condenser and vice versa, the improvement comprising:

a refrigerant pot surrounding a portion of said conduit means connecting said outdoor coil and said reversing valve and forming a closed chamber in heat exchange relation to said conduit means, and

a small diameter bleed tube connecting said refrigerant pot

to said conduit means connecting said indoor coil to said outdoor coil at a point upstream of said expansion means; whereby, during the heating cycle, relatively cool refrigerant passing from said outdoor coil to said reversing valve through said conduit means within said refrigerant pot



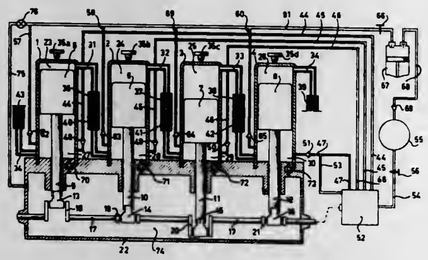
causes condensation of refrigerant vapor within said chamber to reduce the chamber pressure such that liquid refrigerant migrates from said conduit means through small diameter bleed tube to said chamber thereby removing excess condensed refrigerant from said system.

4,045,978

HOT-GAS RECIPROCATING MACHINE

Jacobus Hubertus Abrahams; Joannes Jacobus Maria Collette, and Robertus Aloysius Tarcisius Johannes Walters, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 582,352, May 30, 1975, abandoned.
This application June 2, 1976, Ser. No. 692,126
Claims priority, application Netherlands, June 14, 1974, 7407951
Int. Cl.² F02G *1/04, 1/06*
U.S. Cl. 60—521 **8 Claims**



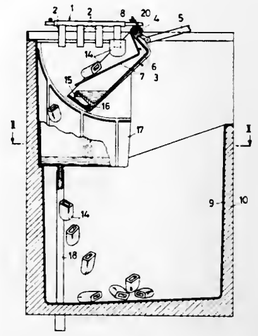
2. In a hot-gas reciprocating machine operable with a source of pressurized working medium, and including a housing defining therein a plurality of working spaces with a piston in each of said spaces, the pistons being reciprocated at a variable rate and at a predetermined phase difference relative to each other, and means selectively for supplying working medium from said source to said working spaces, and for removing working medium from said working spaces, respectively for increasing and decreasing the mean pressure of the medium in said working spaces, the improvement in combination therewith of a control member for controlling the flow of said medium to and from said plurality of working spaces, comprising a housing including an inlet communicating with said source of working medium, a plurality of outlets, each communicating with one of said working spaces, a rotor rotatable in said housing, means for rotating said rotor at a rate corresponding to said reciprocation of said pistons, said rotor also being movable between first and second axial positions, first valve means operable by said rotor when in its first position, for communicating said inlet duct successively with one at a time of said outlet ducts corresponding to the phase difference of said pistons, and second valve means operable by said rotor in its second position, for communicating said inlet duct continuously with all of said working spaces at once.

4,045,979

ICE-MAKING MACHINE

Leone Mazzini, Cremona, Italy, assignor to Castel Mac S.p.A., Castelfranco Veneto, Italy

Filed Nov. 28, 1975, Ser. No. 636,116
Int. Cl.² F25C *5/08*
U.S. Cl. 62—352 **3 Claims**



1. In ice-making machine having a cooling circuitry connected to freezing elements immersed in a water-containing tub tiltable about a horizontal shaft, an actuating mechanism adapted to bring the tub from a horizontal position wherein the freezing elements are active to a tilted position wherein the cooling action is stopped after the formation of ice cubes or slugs around said elements, and a reservoir arranged beneath the tub, a device for deflecting ice cubes into said reservoir comprising

an ice cube deflecting baffle arranged between the tub bottom and the freezing elements and adapted to deflect the ice over one end wall of said tub and towards the underlying reservoir, when said tub is in its tilted position, and

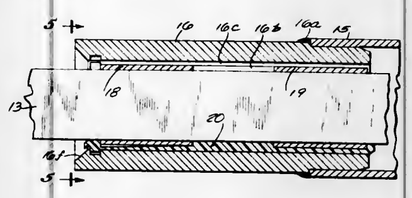
a water manifold provided adjacent said one end wall of the tub for collecting and preventing water from said tub from entering said reservoir when said tub is in its tilted position.

4,045,980

RETAINER FOR SLIP SLEEVE LINERS

Thomas D. Woodward, Munster, Ind., and Gail G. Worsley, Hazelcrest, Ill., assignors to Rexnord Inc., Milwaukee, Wis.

Filed July 6, 1976, Ser. No. 702,825
Int. Cl.² F16D *3/06*
U.S. Cl. 64—23 **8 Claims**



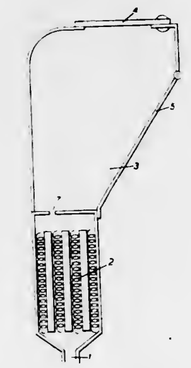
1. In a telescoping drive shaft assembly comprising an outer member having an open end and an axial bore, an inner member, and a liner fitting within the bore of said outer member and having an axial bore in which said inner member fits and is axially slidable, said liner including an outer body and a relatively low friction inner face such that only nominal axial securement of the liner in the outer member is required, retainer means providing such axial securement which includes (1) a keyway provided in the outer member adjacent to one of said unloaded sections of the liner, (2) a radially outward recess provided in the outer member at the open end of said keyway, and (3) a flexible key slidable endwise in said keyway and disposed alongside the liner, said key having inner and outer locking ends which project into the bore of the outer member at the opposite ends of the liner, the outer locking end having a radially outward projection which extends into said recess, the portion of the key adjacent to said outer locking end being of reduced section and spaced from the liner whereby the outer locking end of the key may be moved inwardly to withdraw the projection from the recess and allow the key together with the liner to be withdrawn axially from the outer member.

4,045,981

PROCESS FOR BULKING KNITTED FABRIC ARTICLES

Dennis Edward Clissett, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 510,140, Sept. 27, 1974, abandoned.
This application July 27, 1976, Ser. No. 709,261
Int. Cl.² D04B *15/92*; D06C *5/24*
U.S. Cl. 66—147 **8 Claims**



1. A process for developing yarn bulk in a knitted fabric article comprising yarn having potential bulk which is compatible with the time required to knit the article, said process comprising agitating and tumbling the fabric article in a chamber, directly after knitting in an automatic integrated process therewith and before said article is subjected to any wet treatment, by a turbulent stream of upwardly flowing heated air introduced into the chamber so as to support the fabric therein and removing the fabric in crease-free condition from the chamber after a period of time sufficient to develop the bulk.

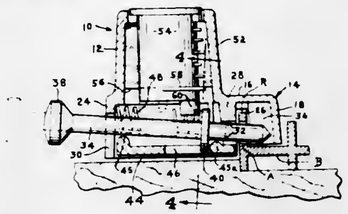
8. A process for developing yarn bulk in a knitted fabric article comprising yarn having potential bulk which is compatible with the time required to knit the article, said process comprising agitating and tumbling the fabric article in a chamber, directly after knitting in an automatic integrated process therewith and before said article is subjected to any wet treatment, by a turbulent stream of upwardly flowing heated air introduced into the chamber at a flow rate of 28–145 liters/minute and at a temperature of 112° C–160° C so as to support the fabric therein and removing the fabric in crease-free condition from the chamber after a treatment time of 0.5–2.0 minutes and sufficient to develop the bulk.

4,045,982

COMPACT PORTABLE LOCK FOR SLIDING WINDOWS AND DOORS

Howard Byron Gorton, San Gabriel, and Richard B. Lyons, Huntington Beach, both of Calif., assignors to Ajax Hardware Corporation, City of Industry, Calif.

Filed Dec. 27, 1976, Ser. No. 754,186
Int. Cl.² E05C *65/08*
U.S. Cl. 70—90 **3 Claims**



1. A compact lock adapted to be attached to the rail of a sliding door or window to limit the movement thereof, the lock comprising a housing having an inverted rectangular box-shaped base with a top wall and sidewalls and a hollow cylindrical projection upstanding from the top wall and offset from the center of the top wall away from one of the sidewalls thereof, a circular opening in the top wall of the projection, the housing having aligned upwardly extending slots formed in opposite sidewalls adjacent the said sidewall and a pair of closely spaced fins extending inward from a central portion of the said sidewall on the underside of the base, the base having a downward flange parallel to the said sidewall and spaced inward from said slots, the flange and the sidewall opposite the said sidewall having aligned openings defining a passage transverse of the housing inclined downwardly toward the lower portion of the said sidewall and terminating in the space between the said pair of fins; a plunger disposed in the passage and extending outward of the base and terminating in an operating portion, the plunger having an outward annular flange disposed on the plunger intermediate said flange and the sidewall opposite the said sidewall, the circular opening in the top wall of the projection receiving a key-operated cylinder extending downwardly in the projection and having an operating stop at the lower end thereof offset from the axis of said cylinder, the cylinder being adapted when turned with a key to move from a locking position in which the stop blocks the annular flange and therefore the plunger from movement away from the spaced fins and therefore holds the plunger in locked position, and a second or unlocked position in which the stop does not interfere with the movement of the plunger, and a cover plate secured to the base on the underside thereof, the cover plate having a rectangular window adapted to receive the annular flange, the margins of the window defining at least one limit of travel of the annular flange and therefore the plunger; whereby with the plunger retracted, the aligned slots of the lock may receive the rail of a door or window and the plunger may be released to pass through a predrilled opening in the rail to the extended position, and the lock may be turned to the locked position to secure the lock in such attachment.

4,045,983

UNIVERSAL BARREL KEY APPARATUS

Donald R. Hughes, 2600 Brower Ave., Simi Valley, Calif. 93065

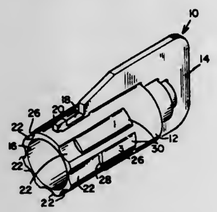
Filed July 29, 1976, Ser. No. 709,583
Int. Cl.² E05B *19/02*
U.S. Cl. 70—404 **8 Claims**

1. A barrel key apparatus comprising:

a handle section;

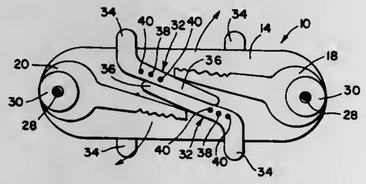
a tubular section with an inner end attached to said handle section and terminating in an outer end, said tubular section being partially hollow with an access opening within

the outer end thereof connecting with said hollow, said tubular section having a longitudinal center axis;
a projection extending inwardly through one wall thickness of the outer hollow surface of said tubular section adapted for cooperation with a mating groove in a lock to establish the proper inserting position within the lock;
said tubular section having a plurality of elongated grooves located upon the outer surface of said tubular section, each said groove beginning at said outer end and extending a predetermined distance towards said inner end terminating in a back end, an attaching opening provided within each said groove adjacent said back end, each said



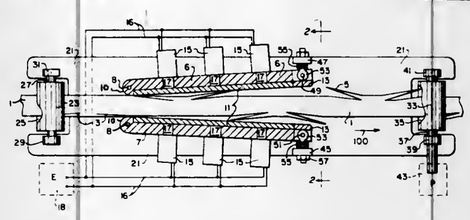
attaching opening being radially disposed in respect to said longitudinal center axis;
a plurality of elongated push pins of various lengths, each said push pin having mounted on one end thereof an attaching member, each said push pin having a body section having an upper surface and a lower surface, said lower surface to matingly cooperate within a said groove, said upper surface to be flush with the said outer surface of said tubular section, each said attaching member having securing means thereon, a said attaching member to be located entirely within an attaching opening and to be secured to said tubular section by said securing means.

4,045,984
KEY HOLDER
Wallace McDonald, Apt. E2, 1701 W. Larpenteur, St. Paul, Minn. 55113
Filed Mar. 10, 1976, Ser. No. 665,781
Int. Cl.² A47G *29/10*
U.S. Cl. 70—456 R 4 Claims



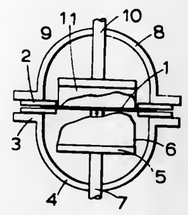
1. A key holder comprising
a first rigid plate,
a second rigid plate,
key retaining means extending between said first and second plates for pivotally mounting a key for movement from a stored position wholly between said plates to a use position wherein a portion of said key extends outwardly beyond the perimeter of said plates, and
an L-shaped lever pivotally mounted between said plates whose longer leg is a portion contacting and rotating a key mounted on said key retaining means from it stored to its use position, said longer leg including a series of holes for selectively receiving a pivot pin mounting said lever between said plates, and whose shorter leg normally extends beyond the perimeter of said plates for finger contact to pivot said lever.

4,045,985
APPARATUS FOR MAKING BARBED MATERIAL
Daniel Dennis Musgrave, 8201 Caraway St., Cabin John, Md. 20731
Filed Feb. 22, 1977, Ser. No. 770,357
Int. Cl.² B21F *25/00*; B21D *26/14*
U.S. Cl. 72—56 10 Claims



1. Apparatus for making barbed material comprising: a base; mechanism on said base adapted for moving a piece of magnetic material in a predetermined direction substantially along a predetermined center line; and means on said base for exerting a tractive magnetic force on an edge of said piece in a direction substantially perpendicular to said centerline whereby a deformable portion of said edge can be bent out from said piece.

4,045,986
FORMING DUCTILE MATERIALS
David Brian Laycock, Cambridge, and Anthony John Barnes, Malvern, both of England, assignors to T.I. Superform, Worcester, England
Filed Apr. 5, 1976, Ser. No. 673,859
Int. Cl.² B21D *22/10*
U.S. Cl. 72—60 13 Claims

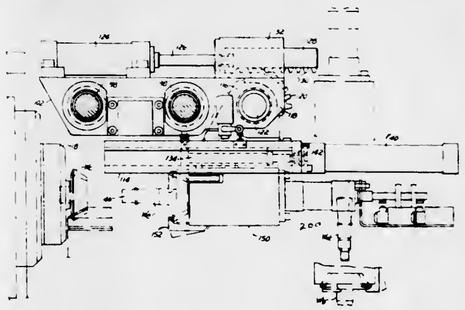


1. A method of forming a shaped body from a sheet of ductile metal, said method comprising clamping the periphery of sheet in a given plane, applying a differential pressure across said sheet to force said sheet into at least partial contact with a molding surface lying on that side of said sheet which is then at the lower pressure, said sheet being thereby partially shaped, advancing a male mold towards the opposite side of said sheet to project at least partially through said clamping plane, and applying reversed pressure conditions to cause said sheet to come into engagement with said mold and eventually take up the contours of said mold.

4,045,987
GEAR ROLLING EQUIPMENT
Leonard A. Gabriele, Warren, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Mar. 2, 1976, Ser. No. 663,062
Int. Cl.² B21H *5/04*
U.S. Cl. 72—84 5 Claims

1. A machine for finish-rolling bevel pinions having a shank extending axially from one side thereof, comprising
a frame including a column portion and a base portion,
a knee,

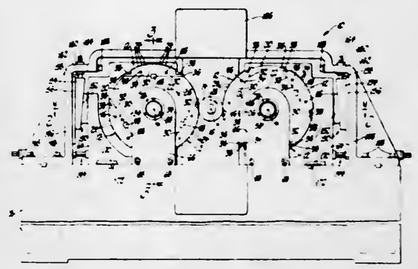
means mounting said knee for vertical movement in said base laterally of said column,
a horizontal work spindle in said column having an outer end portion overlying said knee,
a collet at the outer end of said work spindle operable to grip the shank of a work gear and to hold it against rotation relative to said work spindle,
means mounting said work spindle for rotation,
a brake associated with said work spindle and operable to hold said work spindle against rotation in any random position,
a vertical tool spindle in said knee for carrying a tool in the form of a bevel gear substantially conjugate to the work gear and for preventing relative rotation between said tool spindle and the gear-like tool thereon,
locating means acting between said knee and tool spindle effective to stop said tool spindle in a precisely located angular position,



a motor carried by said and connected to one of said spindles for driving said one spindle in rotation,
pressure applying means acting between said base and said knee for raising said knee to apply pressure of metal forming intensity between the teeth of the gear and tool,
positioning means comprising a horizontal trackway along which work gears are advanced serially with the shank extending downwardly, fingers disposed along the trackway in position to enter into spaces between the teeth of the gears for positioning work gears serially at a preliminary loading station with the teeth thereof in precisely located angular position,
and transfer means for transferring said work gears serially from said preliminary loading station to move the shanks thereof into said collet without disturbing the angular position thereof.

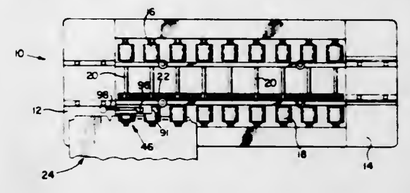
4,045,988
ROTARY FORMING MACHINE AND TOOL
Marvin R. Anderson, Grosse Pointe Shores, Mich., assignor to Anderson-Cook Inc., Fraser, Mich.
Continuation-in-part of Ser. No. 676,827, April 14, 1976, abandoned. This application Aug. 4, 1976, Ser. No. 711,673
Int. Cl.² B21H *5/02*
U.S. Cl. 72—108 30 Claims

1. A rotary forming machine comprising: a work spindle for rotatably mounting a workpiece about a first axis; a pair of tool spindles rotatably mounted about spaced second axes on opposite sides of the first axis about which the workpiece rotates; a plurality of rotary tools associated with each tool spindle; each tool including leading and trailing ends and having a flat base mounting surface engaged with the associated tool spindle as well as including an oppositely facing partially circular forming face generated about the second axis of the associated tool spindle and having forming tooth groups located thereabout for an angle less than 180°; the teeth within each group having the same size and having a progressively increasing size from one group to the next group; the teeth within each group having a profile that is conjugate to the shape to be formed in the workpiece; mounting means for securing the tools to their associated tool spindles while permitting any tool on either tool spindle to be removed and replaced without replacement



of the other tools; and drive means for rotating the tool spindles so that the forming faces of associated pairs of the tools simultaneously engage and form the workpiece during a partial revolution of the tool spindles for less than 180°

4,045,989
SHEET METAL BENDING APPARATUS
Marshall John Ryan, Palatine, Ill., assignor to The Lockformer Company, Lisle, Ill.
Filed Dec. 3, 1976, Ser. No. 747,252
Int. Cl.² B21B *39/02*; B21D *5/08*; B21B *1/24*
U.S. Cl. 72—133 12 Claims

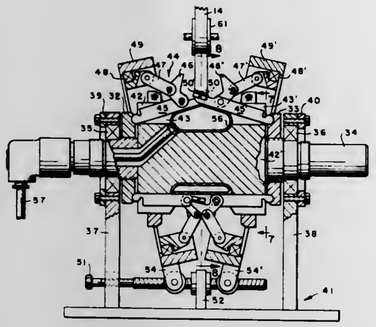


1.In an apparatus for bending a metal sheet wherein a plurality of forming rolls progressively bend a sheet portion, the improvement in a first bending station of the apparatus comprising a first roll, means for mounting said first roll for rotation about its axis, forming protrusions positioned in spaced apart relationship on the surface of said first roll, roll drive elements engageable by said sheet and carried by said first roll, movement of said sheet against a drive element operating to move a forming protrusion into contact with the sheet for bending the sheet, and including means for angularly shifting the position of said first roll relative to said mounting means to thereby determine the drive element engaged by the sheet and to thereby determine the protrusion contacting the sheet.

4,045,990
ENDLESS REINFORCEMENT
Norman E. Klein, Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Division of Ser. No. 432,162, Jan. 10, 1974, Pat. No. 4,002,789. This application July 9, 1976, Ser. No. 704,069
Int. Cl.² B21D *13/00*
U.S. Cl. 72—190 14 Claims

1. Apparatus for forming a unitary strip including a multiplicity of continuous filaments disposed in a contiguous lateral undulating relationship throughout the length of strip, said apparatus including interdigitating gripper means arranged in an oval path, wherein each gripper means includes a clamping jaw member movable from an opened to a closed position,

means for advancing said gripper means around said oval path, and means for increasing the degree of interdigitation of said



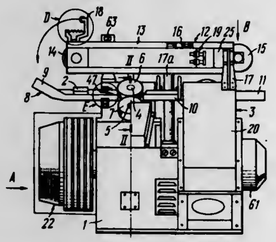
gripper means during a portion of their advancement around said oval path.

4,045,991

AUTOMATIC FORGE ROLLING MACHINE

Mikhail Vladimirovich Kholmogorov, ulitsa Trofimova, 20, kv. 50; Jury Vasilievich Katkov, 3 linia, 11, korpus 2, kv. 63; Grigory Vasilievich Vorbiev, Proletarsky prospekt, 23, korpus 1, kv. 131; Alexandr Mikhailovich Gusev, Chernomorsky bulvar, 15, korpus 2, kv. 124, and Eduard Gurgenovich Nazaretian, 1 ulitsa Mashinostroenia, 10, kv. 6, all of Moscow, U.S.S.R.

Filed Dec. 22, 1976, Ser. No. 753,289
Int. Cl.² B21B *39/06*
U.S. Cl. 72—251 **3 Claims**



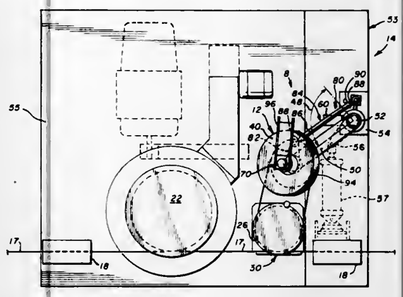
1. An automatic forge rolling machine comprising: a bed; stands mounted on said bed; two roll shafts mounted within each said stand and having each one free end; pairs of roll forging dies arranged one above the other on free ends of said roll shafts; a means for feeding a workpiece to said dies; said means being provided with a guideway for the workpiece to travel therealong; a conveyer kinematically associated with one of said roll shafts; a hauling member on the conveyer, said member carrying a pusher for advancing the workpiece along said guide way; means for braking the workpiece, said means being positioned ahead of a pair of said dies; a braking element of said means for braking the workpiece, said element being arranged substantially above said guide way and spring-biased towards the latter; a mechanism for tensioning the conveyer hauling member arranged behind said dies in the direction of the workpiece travel; said tensioning mechanism being made so that the tensioning of the hauling member is maintained constant in the direction of the workpiece travel, thereby providing accuracy of an initial position of the pusher ahead of said means for braking down the workpiece.

4,045,992

DANCER PULLEY MECHANISM

Evan Griffiths, Newington, Conn., assignor to Amtel, Inc., Providence, R.I.

Filed June 4, 1976, Ser. No. 690,011
Int. Cl.² B21C *1/10*
U.S. Cl. 72—279 **9 Claims**



1. In a multiple stage wire drawing system having a plurality of successive drawing stages, each having a die block and a succeeding rotatable draw block adapted for drawing wire stock through the die block and for receiving a generally helical coil of wire stock wound thereon, the multiple stage wire drawing system further having at least one guide and dancer pulley assembly, mounted operationally between a die block of a succeeding stage and the preceding draw block, and comprising a pair of axially spaced rotatable guide pulleys including a first guide pulley aligned for receiving wire stock from a coil on the preceding draw block and a second guide pulley aligned for feeding stock to the succeeding stage die block, a rotatable dancer pulley, and a dancer pulley control mechanism for shifting the dancer pulley back and forth, with its axis of rotation inclined to the axis of at least one of the guide pulleys for feeding wire stock from the frist guide pulley to and partly around the inclined dancer pulley and then to and partly around the second pulley to the succeeding stage die block, for controlling the tension of the wire stock, the improvement wherein the dancer pulley control mechanism comprises a dancer pulley pivot arm pivotal back and forth for shifting the dancer pulley back and forth relative to the guide pulleys, a rotary support rotatably mounted on the pivot arm about a first axis generally parallel to and spaced from the pivot axis of the pivot arm and rotatably supporting the dancer pulley for rotation about a second axis inclined to said first axis, and angle control means connected to the rotary support and responsive to pivotal movement of the dancer pulley pivot arm for automatically rotating the rotary support relative to the pivot arm, in conjunction with the pivotal movement of the pivot arm, for automatically controlling the relationship of the axis of rotation of the dancer pulley to the guide pulleys.

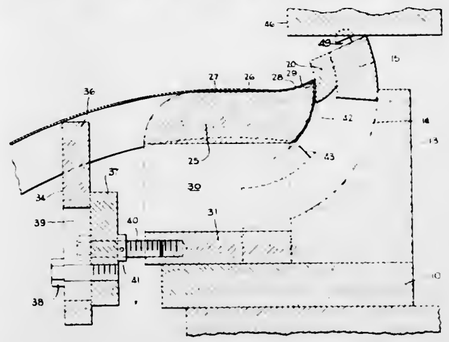
4,045,993

FENDER FLANGING APPARATUS

Herbert J. McCauley, Buffalo, N.Y., assignor to McCauley Metal Products, Inc., Buffalo, N.Y.

Filed Dec. 2, 1976, Ser. No. 746,862
Int. Cl.² B21D *7/06*
U.S. Cl. 72—387 **7 Claims**

1. Apparatus for forming a flange along the end of a bicycle fender or similar workpiece of curving transverse cross section and having a curved end portion whereby the fender end is of generally arcuate shape as viewed in side elevation, said apparatus comprising a supporting shoe fitting within the fender and having an end portion complementary to the interior of the fender, said end of said shoe being arcuate in side elevation, and a forming member having an internally arcuate surface concentric with the arcuate end of said shoe, means mounting said forming member for pivotal movement on an axis coincident with the common axis of said arcuate surfaces, whereby pivotal movement of said forming member bends the curved



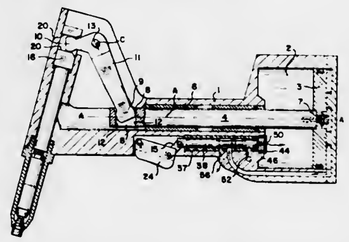
fender end portion downwardly across the arcuate end portion of said shoe to form a flange along said curved end portion.

4,045,994

COMPRESSED AIR RIVET SETTING TOOL

Anthony E. Di Maio, and Willem Swier, both of Georgetown, Mass., assignors to Marson Fastener Corporation, Chelsea, Mass.

Division of Ser. No. 551,592, Feb. 21, 1975, Pat. No. 3,981,177.
This application July 6, 1976, Ser. No. 702,876
Int. Cl.² B21J *15/34*
U.S. Cl. 72—391 **4 Claims**



1. A compressed air-powered blind rivet setting tool comprising

a. a housing;

b. a piston within the housing for movement by compressed air;

c. a piston rod connected to the piston and supported for reciprocating movement along a straight line within the housing;

d. rivet pulling means reciprocally mounted in said housing and spaced from the piston rod;

e. a pivotable lever member pivoted about a pivot axle on the housing, said lever member having a first cam surface at one end portion which surface is slidably engageable on the pulling means and having a second cam surface at the other end portion slidably engageable with the piston rod so that as the piston rod is moved a distance by the compressed air the rivet pulling means is moved a fraction of that distance, said lever member cam surfaces being shaped so that as the member pivots about the axle the distances between the axle and the lines of contact between the cam surfaces on the one hand and the pulling means and piston rod on the other hand remain constant; and

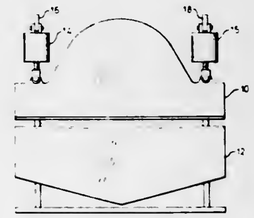
f. compressed air control means including valve means which direct compressed air to cause movement of the piston in one direction for actuating the rivet pulling means and cause movement of the piston in the other direction to return the piston, said compressed air control means includes a sleeve having an internal wall, a valve member slidable a selected distance within the sleeve between two limits each limit being defined by the engagement of a seal ring carried by the valve member against seat surfaces of the sleeve in abutting air tight engagement, said seat surfaces being formed in recesses in the internal sleeve wall.

4,045,995

FLUID-MECHANICAL DRIVE FOR PRESS BRAKE

Charles H. Sparks, Eugene, Oreg., assignor to Steel Structures, Inc., Eugene, Oreg.

Filed Oct. 29, 1975, Ser. No. 626,849
Int. Cl.² B21D *7/06*
U.S. Cl. 72—450 **8 Claims**



1. In a press brake having a fixed lower blade and die and a cooperative vertically movable upper blade and die, upright end frames for supporting said blades, and drive means for said upper blade,

the improvement comprising:

a pair of lever members, one pivoted intermediate its opposite ends to each said end frame member above said upper blade for movement about a horizontal pivot axis normal to the length dimension of said upper blade,

a pair of extensible and retractable fluid cylinder means pivotally interconnecting one end portion of each said lever member and said upper blade at a first set of two spaced positions along said upper blade,

and mechanical means operably interconnecting the opposite end portion of each said lever member and said upper blade at a second set of two spaced positions along said upper blade which are spaced along said upper blade from said first two positions such that upon extension of said pair of cylinder means a downward driving force is applied to said upper blade and upon retraction of said pair of cylinder means an upward force is applied to said upper blade at four spaced-apart positions along the length of said upper blade,

said four positions being substantially equally spaced apart along the length of said upper blade so as to equalize the downward forces applied to said upper blade upon extension of said pair of extensible cylinder means, and said upper blade having a substantially uniform vertical dimension of minimum height throughout its length whereby said four positions adequately support said blade from bending in use.

4,045,996

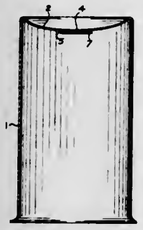
TEST FIXTURE FOR LEAK DETECTORS

James E. Sopcak, Chicago, and Walter Rowland, Darien, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Sept. 15, 1976, Ser. No. 723,358
Int. Cl.² G01M *3/26*
U.S. Cl. 73—1 R **8 Claims**

1. An improved test fixture for verifying the proper operation of leak detectors in a can-making line, comprising a can

having a body, a closure on one end of said body, an orifice of a predetermined size formed in said can, and a filtering medium of predetermined porosity affixed to said can covering said



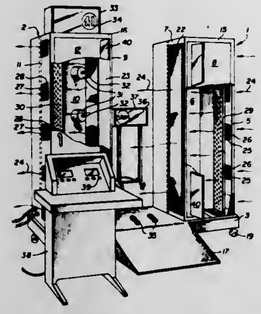
orifice, and means for introducing a test fluid, maintained at a predetermined pressure, into said can to produce a simulated leak having a predetermined flow rate.

4,045,997

AIR CURTAIN DEVICE

Lane Crawford Showalter; John Leslie Brokenshire, both of Waterloo, and Geoffrey B. Watts, Kitchener, all of Canada, assignors to Maraland Engineering Limited, Canada

Filed Mar. 11, 1976, Ser. No. 665,997
Int. Cl.² G01N *33/22*
U.S. Cl. 73—23 **9 Claims**



1. An air curtain device for use in detecting selected vapours emitted from objects positioned therein, said device comprising first and second spaced apart cabinets, a vertical wall of said first cabinet provided with an air discharge grill, a vertical wall of said second cabinet provided with a corresponding and complementary air intake grill, said air discharge grill being directly opposite to said air intake grill, air intake means on said first cabinet upstream of said air discharge grill, air exhaust means in said second cabinet downstream of said air intake grill, said air intake and air discharge means being synchronized to provide a substantially uniform horizontal flow of air from the first cabinet to the second cabinet, and vapour detection means located intermediate said air intake grill and said air exhaust means.

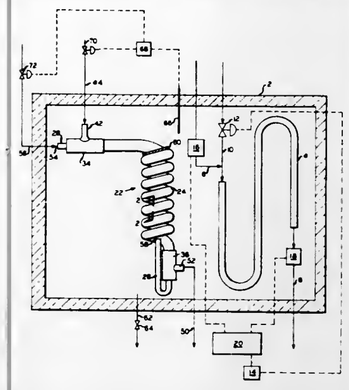
4,045,998

TEMPERATURE CONTROL SYSTEM

Gregory A. Ford, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 1, 1976, Ser. No. 662,778
Int. Cl.² G01N *31/08*
U.S. Cl. 73—23.1 **5 Claims**

1. A chromatographic analyzer comprising:
an insulated housing;
a chromatographic column positioned within said housing, said column being filled with a packing material that selectively retards passage therethrough of constituents of the fluid mixture to be analyzed;
first conduit means passing through said housing and communicating between a source of carrier gas and the inlet of said column;
a first sensing element disposed within said housing and in said first conduit means to detect a property of the carrier gas flowing through said first conduit means;
second conduit means passing through said housing and communicating with said first conduit means downstream of said first sensing element for introducing a sample of the fluid mixture to be analyzed into said first conduit means;
third conduit means passing through said housing and communicating with the outlet of said column;
a second sensing element disposed within said housing and in said third conduit means to detect a property of the fluid flowing through said third conduit means;
means for comparing the outputs of said first and second sensing elements;
means disposed within said housing for maintaining the temperature of said housing at a substantially constant value comprising in combination, a helix having a plurality of spaced turns, said helix consisting essentially of an outer tubular member and an inner tubular member disposed within said outer tubular member, said inner tubular member having an outside diameter smaller than the inside diameter of said outer tubular member whereby the space between said inner and outer members provides a first passage for a first fluid medium and said inner tubular member provides a second passage for a second fluid medium; said outer tubular member having a first end and a second end, said inner tubular member having a first end, a first end portion, a second end and a second end portion; a first fitting disposed about and having one end sealed with respect to said first end portion of said inner tubular member and having the opposite end thereof operably connected to said first end of said outer tubular member and an inlet port in the wall of said first fitting; fourth conduit means passing through said housing and communicating between a source of supply of said first fluid medium and said inlet port of said first fitting; fifth conduit means passing through said housing and communicating between a source of supply of said second fluid medium and said first end of said inner tubular member; a second fitting disposed about and having one end sealed with respect to said second end portion of said inner tubular member and having the opposite end thereof operably connected to said second end of said outer tubular member and an outlet port in the wall of said second fitting; sixth condit means passing through said housing and communicating with said outlet of said second fitting; wherein said second end of said inner tubular member is adapted to discharge said second fluid into one open end of said helix;
means for determining the temperature within said housing and establishing a first signal responsive thereto; and
means responsive to said first signal for controlling the flow from said source of said first fluid into said inlet port of said first fitting.

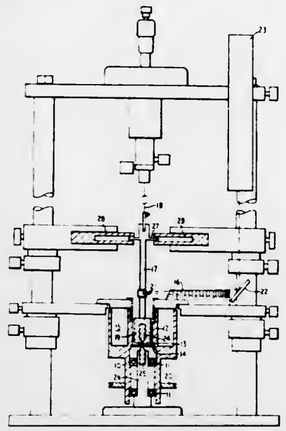


4,045,999

ROTATIONAL VISCOMETERS

Alexander Allan Palmer, St. Ives, Australia, assignor to Sydney Hospital, Sydney, Australia

Filed Nov. 5, 1976, Ser. No. 739,267
Int. Cl.² G01N *11/14*
U.S. Cl. 73—59 **3 Claims**



1. A rotational viscometer consisting of a first member and a second member, relatively rotatable about a common vertical axis, the member between them defining a cavity for the reception of a fluid under test, means for rotating the first member, a permanent magnet arranged within the second member and on the said axis, a second permanent magnet arranged on the said axis adjacent the first magnet, the arrangement being such that the magnets interact to maintain the members coaxial during rotation of the first member, said first member being a hollow vertically extending cylinder open at its upper end defining within it a cavity for the reception of a fluid to be tested, said cavity having a floor of electrically non-conductive material, and said second member being a cylinder arranged within the said cavity, the permanent magnet arranged within said second member tapering to a point on the said axis at its lower end, the second magnet being supported immediately below the floor of the said cavity, the upper end thereof being tapered to a point lying on said axis.

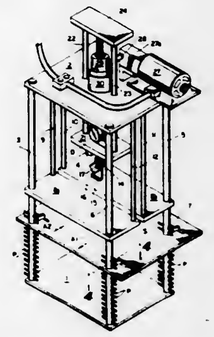
4,046,000

APPARATUS AND METHOD FOR TESTING ARTICLE CARRIERS

Richard Kenneth Watkins, Lithonia, and William S. Layman, Marietta, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Feb. 25, 1977, Ser. No. 772,068
Int. Cl.² G01N *3/08*
U.S. Cl. 73—95 **13 Claims**

10. A method of testing the mechanical strength of a basket style article carrier having bottom, side and end walls and a handle secured to the carrier end walls, the method comprising loading the carrier with articles, restraining the articles in such manner as to prevent movement thereof in a direction away from the carrier bottom wall, imparting a gradually increasing force to the carrier handle in a direction away from the carrier bottom wall until the carrier fails mechanically.

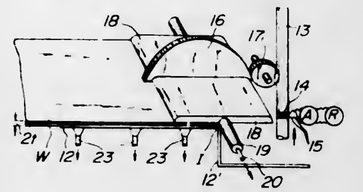


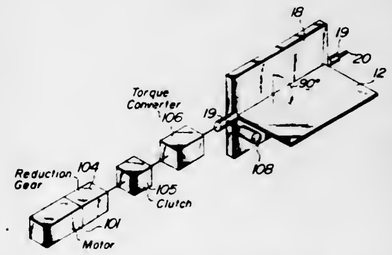
4,046,001

APPARATUS FOR MEASURING RESTORING FORCE NECESSARY FOR RAISING FOLDED PORTIONS OF HARD PAPER BOXES

Fumiaki Maeda; Seiji Naruse, both of Chiba, and Ko Kamiya, Ichikawa, all of Japan, assignors to Lion Fat & Oil Co. Limited and Toyo Sieki Seisakusho Ltd., both of Tokyo, Japan

Filed June 27, 1975, Ser. No. 590,915
Claims priority, application Japan, July 2, 1974, 49-78501[U]
Int. Cl.² G01N *3/22*; G01L *5/12*; B31B *5/74*
U.S. Cl. 73—100 **9 Claims**

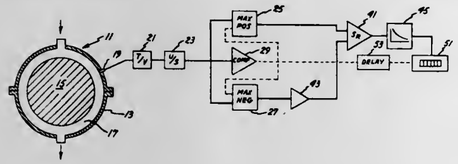




1. An apparatus for measuring a restoring force necessary for raising folded portions of a hard paper box, comprising
a framework;
a base plate for disposing thereon a hard paper box having ruled folded line edges formed between small and large portions and slidably supported by said framework and including a plurality of suction nozzles each extending through said base plate and opened at the top surface thereof;

means for adjusting the position of said base plate;
a hollow rotary wing including a base surface for sandwiching a folded box between said base surface and the base plate, an interior space, a plurality of suction holes formed in the base of said wing and a hollow center shaft rotatably supporting said wing at that center of said wing which makes contact with a hard paper box to be tested and having a suction tube extended therethrough and communicated with said interior space;
a vacuum supply source communicated with said suction nozzles of said base plate on the one hand and with said suction holes of said hollow rotary wing on the other hand;
means for rotating said hollow rotary wing; comprising a torque converter coupled to said hollow rotary wing on the one hand and to a driving motor for rotating said wing on the other hand and for producing an electric signal corresponding to a torque applied to said hollow rotary wing; and
a detector means for detecting a force necessary for rotating said hollow rotary wing, including means for receiving said electric signal from said torque converter, and therefrom detecting a difference between a force for rotating said hollow rotary wing under no load condition and a force for rotating said hollow rotary wing under a loaded condition.

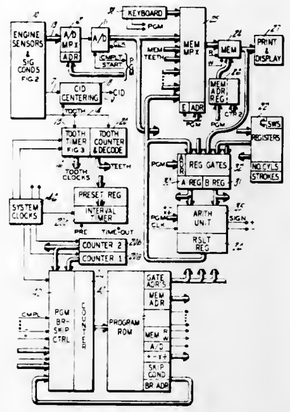
4,046,002
METHOD AND APPARATUS FOR DETERMINING ROTOR LIFE EXPENDED
Bartholomew D. Murphy, Marblehead, Mass., and David C. Gonyea, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Nov. 2, 1976, Ser. No. 738,321
Int. Cl.² G01N *3/00*
U.S. Cl. 73—116 **16 Claims**



1. A method for determining the life expended for a turbomachine part based upon cyclic duties imposed on the turbomachine part comprising the steps of:
determining a stress versus time curve for the turbomachine operation;
identifying a stress cycle including a maximum heating stress and a maximum cooling stress;
combining the maximum heating stress and the maximum cooling stress for each cycle to determine a stress range for the cycle;
comparing the stress range for each cycle with a calculated curve representing stress range versus life expended to determine the life expended for each cycle; and,
accumulating the cyclic life expended for each cycle to determine the total life expended for the turbomachine part.

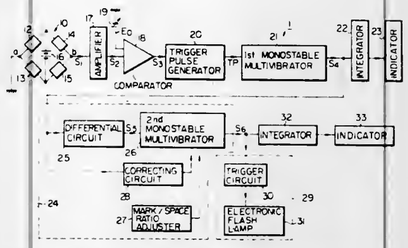
4,046,003
ENGINE TURBOCHARGER DIAGNOSTICS
Lee R. Armstrong, and Henry J. Mercik, Jr., both of Enfield, Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed May 7, 1976, Ser. No. 684,216
Int. Cl.² G01M *15/00*
U.S. Cl. 73—118 **11 Claims**

1. A method of diagnosing the health of a turbocharger on an internal combustion engine during a snap acceleration of the engine while the engine is loaded only by its own inertia, drag,



and accessory loads, by determining a rate of increase in intake manifold pressure during the acceleration.

4,046,004
DIESEL ENGINE DIAGNOSING DEVICE
Yuji Iwasaki, Kawagoe, and Koichi Kashima, Higashimatsuyama, both of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan
Filed Oct. 27, 1976, Ser. No. 736,349
Claims priority, application Japan, Oct. 29, 1975, 50-129345
Int. Cl.² G01F *9/00*
U.S. Cl. 73—119 A **5 Claims**



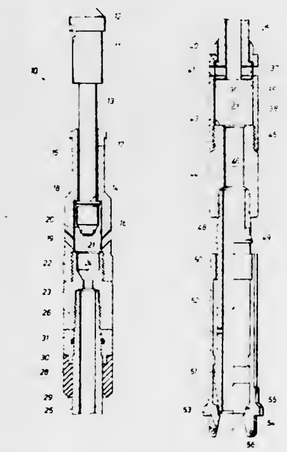
1. A Diesel engine diagnosing device, comprising:
a transducer to convert the time-change of an injection pressure occurring in the fuel injection system of a Diesel engine into an electrical signal;
a first pulse generator to produce first pulses which are generated so as to have a predetermined duration when the primary components of the output electrical signal from said transducer build up;
a second pulse generator to produce second pulses which are generated when triggered by the leading edges of said first pulses and which can be set for a desired mark-space ratio;
an electronic flash emitter which flashes when triggered by the trailing edges of said second pulses;
a first marking provided on the stationary part of said Diesel engine;
a second marking provided on the rotary part of said engine so that said second marking is in an angular position which coincides with the angular position of said first marking when the crankshaft of the Diesel engine is in a predetermined angular position, and;
an injection timing indicator which displays the integral value of the output signal from said second pulse generator.

4,046,005
THREE AXIS JOYSTICK CONTROL
Robert D. Goroski, Trumbull, Conn., assignor to Measurement Systems, Incorporated, Norwalk, Conn.
Filed June 14, 1976, Ser. No. 695,738
Int. Cl.² G01L *5/22*
U.S. Cl. 73—133 R **8 Claims**



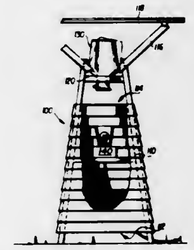
1. A force operated, or "stiff-stick" control device which comprises: an elongated control rod; two pairs of elongated strain gauges mounted on the surface of said control rod, the longitudinal axis of each of said strain gauges being disposed at an acute angle to the longitudinal axis of said control rod, the gauges of each pair being on diametrically opposite sides of said rod, the diameters passing through the pairs being perpendicular to one another, and the angles of slope of the gauges of each pair being in the same direction; and means for connecting each of said strain gauges to electric means to provide signals in response to both lateral and torsional flexing of said rod.

4,046,006
TUBING PLUG APPARATUS FOR PERFORMING DOWN-HOLE PRESSURE TESTS
Alex Dufrene, P.O. Drawer D, Des Allemands, La.
Filed July 9, 1975, Ser. No. 594,331
Int. Cl.² E21B *47/10*
U.S. Cl. 73—151 **9 Claims**



1. A tubing pressure test apparatus comprising:
an elongate body having a fishing neck adapted to be grasped by a wire line tool and which fishing neck is relatively movable with respect to said elongate body and further including a cooperative valve element in a valve seat means movable between open and closed positions by operation of said fishing neck and which valve element controllably opens and closes the flow of well fluids through a passage through said elongate body;
an expandable element carried by said body and expanded radially outwardly toward a surrounding tubing string to close a tubing string to fluid flow therethrough;
expander means at least indirectly supported on said body for expanding said element radially outwardly toward a surrounding tubing string by compressing said element, said means being selectively operated by weight acting on the tubing pressure test apparatus; and
lock means adapted to secure the tubing pressure apparatus at a selected and specified elevation in a tubing string to enable weight acting on the tubing pressure test apparatus to operate said expander means.

4,046,007
COMBINED LIGHTHOUSE AND WIND DIRECTION INDICATOR
Joseph O. Tally, Jr., 560 N St. SW., Washington, D.C. 20024
Filed Nov. 17, 1976, Ser. No. 742,444
Int. Cl.² G01P *13/02*
U.S. Cl. 73—188 **6 Claims**



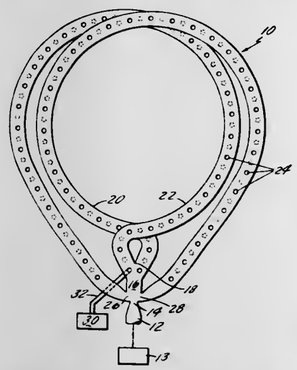
1. A lighthouse and wind direction indicator comprising:
A. a tower having top and bottom, said tower defining adjacent the top a fixed ring mount to support an illuminable target; said tower being open to the atmosphere at both the bottom and top thereof;
B. a movable and illuminable target globe, mounted in the ring mount adjacent to top of the tower, said globe having a closed end at its top and an open, flared-lip end at its bottom, the globe coactively engaging the ring mount intermediate its top and bottom;
C. a light source within the tower, remote from the illuminable target, said light source being trained at least in part toward the target to illumine same;
whereby upon exposure of the globe to the prevailing winds passing from the bottom to the top of the tower, the globe is restrainedly floated vertically and whereby the winds passing from the sides, the globe will tilt within the ring mount and as such, the globe is rendered directionally responsive to the prevailing winds.

4,046,008
FLUIDIC TEMPERATURE SENSOR
Stanley Gordon Best, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed Dec. 15, 1975, Ser. No. 640,994
Int. Cl.² G01K *11/24, 11/26*
U.S. Cl. 73—349 **10 Claims**

1. A fluidic oscillator temperature sensor assembly for determining the average temperature of a stream of flowing gas in a conduit comprising:
a source of pressurized gas;
fluid amplifier means connected to said source for introduc-

ing said pressurized gas into said fluid amplifier as a power stream;

feedback tube means adapted for support across a desired cross-sectional area of said conduit connected to said fluid amplifier means for oscillating the flow of said power stream at a frequency varying directly as a function of the temperature in said feedback tube means, said feedback



tube means having a length approximately one-half wavelength of the expected frequency and having a plurality of perforations along said length for admitting said flowing gas into said feedback tube means to render the temperature therein essentially identical with the average temperature of said flowing gas; and

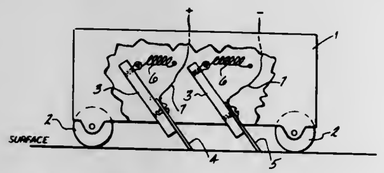
means for sensing said frequency for determining said average temperature.

4,046,009

THERMOCOUPLE FOR CONTINUOUSLY MEASURING THE TEMPERATURE ALONG THE LENGTH OF A SURFACE

Charles A. Sauer, Belleville, Ill., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 23, 1976, Ser. No. 679,770
Int. Cl.² G01K *7/08, 1/14*
U.S. Cl. 73—359 R **10 Claims**



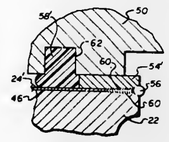
1. An apparatus for measuring the temperature along the length of a surface comprising, in combination, mounting means for mounting the temperature measuring components; several wheels being suitable for contacting the surface to be measured, said wheels being free to rotate about axles which are attached to one end surface of said mounting means; several strips of non-conductive material privotally and separately secured within said mounting means; said temperature measuring components including metal ribbons, which are dissimilar in the manner that at least one of said ribbons is electrically positive with respect to the surface and at least one of the other ribbons is electrically negative with respect to said surface, mounted with securing means adjacent one end of each strip of non-conductive material, provided that the metal ribbons are all placed in the same direction away from the pivot points; tension spring means connected adjacent the ends of the non-conductive strips opposite to the ends supporting said metal ribbons, the ends of said spring means not connected to said non-conductive strips being secured to said mounting means; said metal ribbons projecting below the plane of the bottom of said wheels when said spring means are in a relaxed position; and lead wires connected to the securing means for each metal ribbon, said wires running from said securing means to temperature indicating instruments.

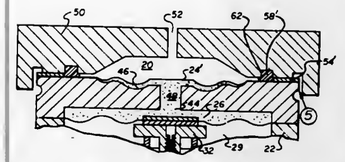
4,046,010

PRESSURE TRANSDUCER WITH WELDED TANTALUM DIAPHRAGM

Lloyd Thomas Akeley, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 12, 1976, Ser. No. 741,323
Int. Cl.² G01L *7/08*
U.S. Cl. 73—406 **3 Claims**





3. An improved pressure transducer for use with corrosive process fluids comprising:

a. a stainless steel body containing a chamber and having a passage from said cavity terminating at an outer face;

b. a position transducer disposed in said chamber;

c. a tantalum isolation diaphragm disposed adjacent said outer face and in contact around the periphery of said isolation diaphragm, said isolation diaphragm being continuously brazed to said outer face around the periphery of said diaphragm;

d. fill fluid disposed in said chamber to contact said position transducer, said passage and between said isolation diaphragm and said outer face;

e. a stainless steel weld ring disposed adjacent said isolation diaphragm and in contact around the periphery of said isolation diaphragm, said weld ring being continuously brazed to said isolation diaphragm and continuously welded to said body around the periphery of said weld ring;

f. an elastomeric seal disposed continuously around the inner periphery of said weld ring; and,

g. a stainless steel pressure body disposed and held continuously against said weld ring and said seal whereby said seal is subjected to a deformation force between said isolation diaphragm and said pressure body sufficient to seal the process fluid from contacting said weld ring.

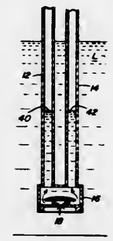
4,046,011

ONE-WAY VALVE FOR FLUID SAMPLER DEVICE

Donald W. Olsen, 850 Kees, Lebanon, Oreg. 97355

Filed June 29, 1976, Ser. No. 700,854
Int. Cl.² G01N *1/14;* F16K *15/04*
U.S. Cl. 73—421 B **11 Claims**

1. A fluid sampler device with one-way valve comprising; first means for sampling fluid, second means for controlling the frequency of sampling in a repetitive manner, and third means for effecting a one-way flow of the fluid being sampled, said first means including a sample chamber, and the third means including a valve chamber for the fluid sample, an inlet thereto, and a sample outlet therefrom, and the third means further including a flexible valve member which normally takes on a concave shape when the valve is passing fluid, and assumes a



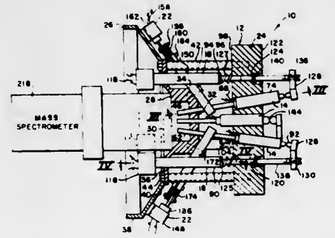
flat plane shape when the fluid flow is stopped and the valve is closed. and fourth means associated with the flexible valve to effect the cleaning action of a valve seat within the valve chamber.

4,046,012

FLUID SAMPLING DEVICE

David K. Studenick, Rockville, Md., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 19, 1976, Ser. No. 743,249
Int. Cl.² G01N *1/24*
U.S. Cl. 73—421.5 R **21 Claims**



1. A fluid sampling device for selectively sampling multiple fluids comprising:

a support frame;

a plurality of fluid inlet means extending through said support frame, each of said inlet means having an aperture extending therethrough;

means responsive to a control signal for selectively opening said aperture for passing said fluid therethrough; and

means responsive to another control signal for selectively closing said aperture for terminating further fluid flow therethrough.

4,046,013

COMBINATION DRILL AND PLUG AND METHOD AND APPARATUS FOR USING SAME FOR EXTRACTING A FLUID SAMPLE FROM AN ELECTRICAL CABLE

Cyril Robert Green, Housedale, Pa., assignor to Mario D. Medio and Grace E. Medio, both of Malverne, N.Y.

Filed June 1, 1976, Ser. No. 691,223
Int. Cl.² G01N *1/10;* F16F *51/00*
U.S. Cl. 73—422 R **26 Claims**

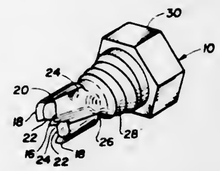
1. A combination drill and plug comprising a drive means having a body with means thereon for removing a mass of material to make an opening,

said removing means being a cutting means comprising at least one arcuate segment defining an ear having a cutting portion at the leading edge thereof in the direction of rotation to form a disk of the removed material,

said ear engaging the disk of removed material to retain the same on said removing means,

thread forming means on said drive means coextensive with said removing means for engaging the wall of the opening formed by the removal of material,

plug means coextensive with said thread forming means including means to plug the opening,



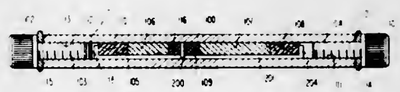
and means engageable with said drive means for rotating and axially advancing said removing means, said thread forming means and said plug means to remove the disk of material during the making of an opening, threading the opening and then plugging the opening to close the same while the disk of removed material is retained on said removing means and removable from engagement therewith after the opening is plugged closed.

4,046,014

SEALABLE ACTIVATED CHARCOAL GAS SAMPLER

John R. Boehringer, 427 Parkview Drive, and John Lecky, 501 Shortridge Ave., both of Wynnewood, Pa. 19096

Continuation-in-part of Ser. No. 588,772, June 20, 1975, abandoned. This application Feb. 9, 1976, Ser. No. 656,258
Int. Cl.² G01N *1/22*
U.S. Cl. 73—421.5 R **11 Claims**



1. A cartridge for sampling ambient gases comprising:

a rigid metallic cylindrical thermally conductive tube, inert to the ambient gases and provided with a threaded portion at each end;

a predetermined charge of gas absorber material within said tube;

first and second rigid, integral, thermally conductive plugs having a rigid substantially permanent force fit in thermally conductive relation with the interior of said tube, said plugs having openings therethrough to permit flow of gases through said plugs and said tube, said plugs permanently enclosing and compressing said absorber material in said tube; and

sealing screw means for each end of said tube.

4,046,015

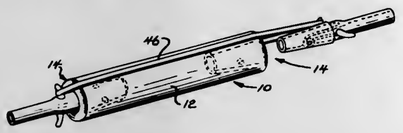
GLASS SAMPLING TUBE

Frederick J. Riedl, Arlington Heights, and George A. Schimmelpfennig, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 12, 1976, Ser. No. 731,500
Int. Cl.² G01N *1/22;* F17C *3/00*
U.S. Cl. 73—421.5 R **8 Claims**

1. In a glass gas sampling tube comprising a tubular body portion having an axially positioned inlet tube portion at each end and sealable joint means at each end for selectively sealing

said inlet tubes from the interior of said body portion, the improvement comprising said joint means being formed of axially extending tapered male inner and female outer glass wall portions which are positioned in cooperating relationship within the body portion and radially spaced from the walls of said body portion, said inner portion having a first opening in



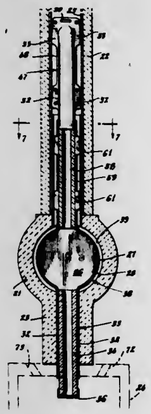
its wall portion in open communication with said inlet tube portion, said outer portion having a second opening in its wall portion, and manually actuated handle portions integral with said inner portion for selectively rotating said inner portion in said outer portion for moving said first opening into or out of communication with said second opening.

4,046,016

MOLTEN STEEL SAMPLERS

Robert J. Hackett, Cross Road, Brookfield Center, Conn. 06805

Continuation-in-part of Ser. No. 644,082, Dec. 24, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,561
Int. Cl.² G01N *1/12*
U.S. Cl. 73—425.4 R 15 Claims



1. A hollow, heat-insulated sampler for deep immersion in molten metal comprising:

A. a hollow chill mold having an open entrance end for exposure to the molten metal,

B. a protective cap temporarily closing the open entrance end during deep immersion movement of the sampler into the molten metal,

C. a hollow, porous, heat-insulating ceramic housing enclosing the chill mold anchored to an elongated hollow heat-insulating support tube connecting the hollow interior of the housing to the atmosphere, and

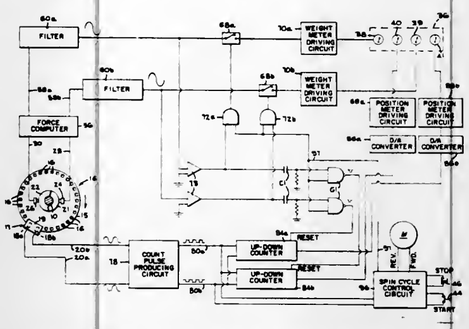
D. a slotted riser vent tube connecting the hollow interior of the chill mold to the interior of the support tube and having elongated vent slot means exposed to the support tube's interior, directing escaping air displaced from the hollow chill mold for venting to the atmosphere.

4,046,017

WHEEL BALANCING APPARATUS

Jerry M. Hill, North Little Rock, Ark., assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 16, 1976, Ser. No. 751,237
Int. Cl.² G01M *1/22*
U.S. Cl. 73—462 7 Claims



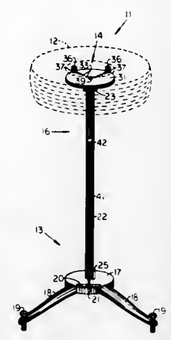
1. In combination with an apparatus for measuring the imbalance of a rotary body in at least one plane normal to the axis of the rotary body including means for rotating the body about its axis, means for detecting forces generated by the imbalance in said plane and for generating signals representative of the magnitude and angular position of said imbalance in said plane, means responsive to said signals for displaying the magnitude of a weight to be added to said body in said plane to correct said imbalance, and means responsive to said signals for indicating the angular position where the weight should be attached to said body in said plane to correct said imbalance, the improvement comprising: means for generating pulses in synchronous relation to the rotation of said body, a digital counter responsive to said pulses for determining the angular position of said body, means responsive to said signals from said detecting means for enabling said counter to start counting at a point in time corresponding to when the angular position of imbalance in said plane of the body is at a preselected rotative position, and means for applying the output of said counter to said position indicating means to thereby indicate when said body is in said rotative position.

4,046,018

WHEEL BALANCING APPARATUS

Glennis W. Lasiter, Kershaw Trailer Court, Colona, Ill. 61241

Filed Sept. 9, 1976, Ser. No. 720,177
Int. Cl.² G01M *1/12*
U.S. Cl. 73—482 5 Claims



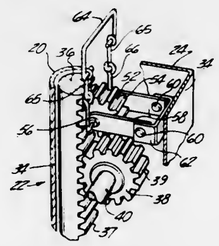
1. A wheel balancing apparatus comprising:
stand means having a base, a shaft, a support bar and a plurality of balancing posts, said base being ground engageable, said shaft being detachably affixed to said base and extending upwardly therefrom, said shaft having affixed thereto at the upwardly extended end thereof said support bar, said balancing posts being parallel, affixed to said support bar, laterally spaced and aligned along said support bar and extending upwardly from said support bar, each balancing post having formed at the upwardly extended end thereof a pointed portion;
support means for holding a wheel, said support means including a flat plate, said plate having formed in the underside thereof a plurality of depressions, said depressions being laterally spaced and aligned, said pointed portions being removably received within said depressions and defining an axis, said plate being pivotable about said axis, a wheel being receivable upon said plate whereby the wheel tilts about said axis when the wheel is unbalanced; and indicating means for adjusting sensitivity having an indicator shaft and a weight, said indicator shaft being attached to said plate and depending therefrom, said weight being elongated, having a first end thereof affixed to said indicator shaft and a second end thereof extended away from said indicator shaft, said weight being slidable along the length of, and rotatable about, said indicator shaft.

4,046,019

LOCKING DEVICE FOR A LIFT

Arthur V. Phillips, 1289 Easley Drive, Westland, Mich. 48185

Filed June 16, 1975, Ser. No. 587,269
Int. Cl.² F16H *19/04*
U.S. Cl. 74—29 5 Claims



1. A locking device for a lift, said lift having a base and a platform wherein said lift may be variably elevated relative to said base, said locking device comprising,
an elongated gear rack secured to said platform and axially and slidably received in a housing, said housing secured to said base;
a first rotatable gear having its axle secured with respect to said base and being positioned to mesh with said gear rack;
a second gear disposed in said housing and adapted to mesh with said rack, means for mounting said second gear axially along said gear rack between a first and second position so that in said first position said second gear is spaced apart from said first gear whereas in said second position, said second gear meshes with both the gear rack and the first gear thereby locking said gear rack against further longitudinal movement.

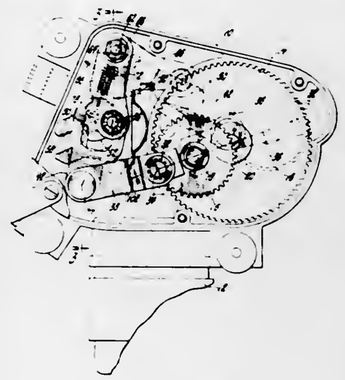
4,046,020

WINDSHIELD WIPER DRIVE MECHANISM HAVING A DEPRESSED PARK POSITION

John A. Budinski, and Raymond A. Flora, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 28, 1976, Ser. No. 652,909
Int. Cl.² F16H *21/40*
U.S. Cl. 74—70 2 Claims

1. A windshield wiper drive mechanism having a normal arcuate wipe pattern and a park position disposed outside the normal arcuate wipe pattern comprising: rotary input means; an output crank arm having one end pivotally mounted on an axis and having an output shaft aligned with said axis; a drive link having one end pivotally connected to said rotary input means; a control link having one end pivotally mounted on said output shaft and being rotatable about the axis of said output shaft relative to said output shaft, the other end pivotally connected to the other end of said drive link, and a cam slot formed therein intermediate the ends; a cam disposed in said cam slot having a pin portion drivingly connected to the other end of said output crank arm and an actuator portion said cam, pin portion and crank arm cooperating to maintain the position





of the control link relative to the position of the output shaft and output crank arm and forming a drive connection between said control link and said output shaft so that said output crank arm, said control link and said output shaft are driven through said normal wipe pattern; and actuator means selectively operable to engage said actuator portion for enforcing movement of said cam in said cam slot so that said control link is rotated about said axis for movement relative to both said output crank arm and said output shaft and said output crank arm and output shaft are pivoted on said axis through an arc outside said normal wipe pattern to the park position upon the completion of wiping while the arc of travel of the control link remains unchanged.

4,046,021

FREE FLOATING ACTUATING LINKAGE

Kenneth E. McKee, Chicago, and Alex J. McAllister, Tinley Park, both of Ill., assignors to International Harvester Company, Chicago, Ill.

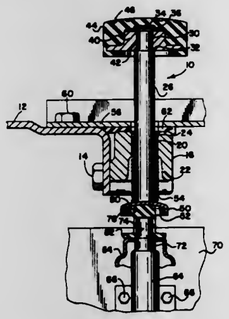
Filed Aug. 19, 1976, Ser. No. 715,966
Int. Cl.² G05G *1/14*; F16H *21/44*
U.S. Cl. 74—110 7 Claims

1. A motion transmitting device for communicating motion

from a first body to a second body independent of the first body and minimizing the transmission of vibrations from the second body to the first body comprising:

a rod guide having a central bore therethrough affixed to the first body;

a rod slidably carried in the rod guide central bore having a first end equipped with a pedal and a second end equipped with a cup having a concave surface;



a control device having a variable rod portion accommodating an insulator cap mounted to the second body thereof that is positioned in axial alignment with the rod and affords contact between the concave surface of the cup and the insulator cap whereby displacement of the rod through the central bore of the rod guide results in displacement of the movable rod portion of the control device.

4,046,022

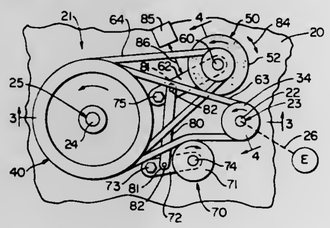
BELT DRIVE SYSTEM

Dewey D. Henderson, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed June 9, 1976, Ser. No. 694,409

Int. Cl.² F16H *9/00, 11/00*

U.S. Cl. 74—220 **28 Claims**



1. In an apparatus having a driving shaft which is rotatable at a first position in one direction only and a driven shaft which is rotatable at a second position remote from said first position, the improvement comprising a belt drive system for selectively rotating said driven shaft in said one direction and in an opposite direction, said belt drive system comprising, a driving sheave assembly fastened to said driving shaft, said driving sheave assembly having means defining a first belt-receiving groove and having a right circular cylindrical driving surface, a driven sheave assembly fastened to said driven shaft and having means defining a first and a second belt-receiving groove, a movable sheave assembly which is movable toward and away from said driving sheave assembly, said movable sheave assembly having means therein defining a second belt-receiving groove and having a right circular cylindrical driven surface, a first belt disposed in said first grooves for rotating said driven sheave assembly in said one direction with said movable sheave assembly disposed in spaced relation from said driving sheave assembly, a second belt disposed in said second grooves, and means serving the dual prupose of moving said movable sheave assembly with its driven surface into engagement with said driving surface and creating slack in said first belt rendering it inoperative so that said driving sheave assembly provides rotation of said driven sheave assembly in said opposite direction through the action of said second belt.

4,046,023

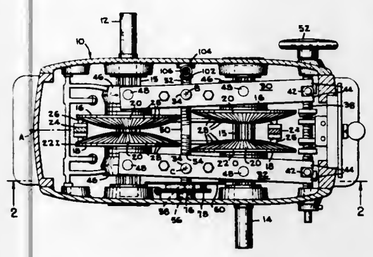
ADJUSTING MECHANISM FOR TRANSMISSION BAND TENSIONER

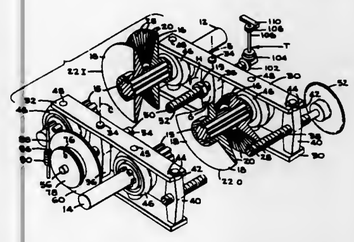
Richard G. Henle, Lafayette Hill; Clifton S. Merkert, Springfield, and David C. Thomas, Jenkintown, all of Pa., assignors to FMC Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 674,002, April 5, 1976. This application Oct. 1, 1976, Ser. No. 728,577

Int. Cl.² F16H *7/08, 55/52*

U.S. Cl. 74—242.8 **6 Claims**





1. In a transmission band tensioning mechanism having a band tensioning shaft and having an adjusting wheel mounted coaxially with said shaft and rotatable relative thereto, said tensioning mechanism having a spring connected between the adjusting wheel and the shaft, the improvement comprising a locking member adjacent the adjusting wheel, a gear engaged with the adjusting wheel and normally urged by the spring acting through the adjusting wheel into engagement with the locking member to be held against rotation, said gear shiftable out of engagement with the locking member while maintaining engagement with the adjusting wheel and rotatable for rotation of the adjusting wheel and tightening of the spring.

4,046,024

ADJUSTABLE STEERING COLUMN SUPPORT

Robert H. Brouckson, Danville, Ky., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 26, 1976, Ser. No. 679,947

Int. Cl.² B62D *1/18;* G05G *5/16*

U.S. Cl. 74—493 **21 Claims**

1. Apparatus for adjustably mounting a steering column in a vehicle, comprising:

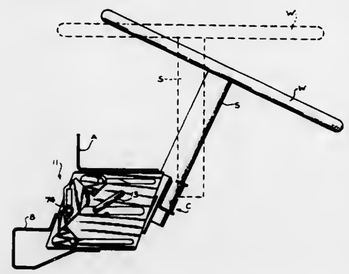
a. a frame assembly fixedly mounted within the vehicle and defining a longitudinal axis;

b. a movable member rigidly mounted to the steering column and operatively associated with said frame assembly for longitudinal and rotational movement relative thereto, said movable member including a frictional surface;

c. first and second frictional members oppositely disposed about said longitudinal axis and disposed adjacent said frictional surface;

d. said frame assembly including means for guiding the movement of said first and second frictional members relative to said frame assembly;

e. clamping means pivotally mounted to said movable member for movement therewith, said clamping means including means for actuating said clamping means, said actuating means being movable between an operative condition and a neutral condition;



f. said clamping means, with said actuating means in said operative condition, exerting a force biasing each of said first and second frictional members into frictional engagement with said adjacent frictional surface of said movable member and with said guiding means to maintain said movable member in a fixed position relative to said frame assembly; and

g. said clamping means, with said actuating means in said neutral condition, releasing said biasing force on said first and second frictional members and permitting simultaneous longitudinal and rotational movement of said movable member relative to said frame assembly.

4,046,025

BICYCLE SPEED CHANGE LEVER DEVICE

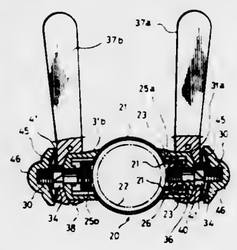
Nobuo Ozaki, Osaka, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed June 4, 1976, Ser. No. 693,128

Claims priority, application Japan, July 11, 1975, 50-96869[U]; June 7, 1975, 50-77156[U]

Int. Cl.² G05G *5/18*

U.S. Cl. 74—501 R **11 Claims**



1. A bicycle speed change lever device comprising

a fixing band having at least one pair of elastically expandable open ends and are mountable onto a bicycle frame tube by expanding said open ends,

at least one inside nut holding means formed within said open ends of said fixing band,

at least one inside nut provided on said inside nut holding means,

at least one cup member mounted to said fixing band and having an internal space which permits housing said inside nut holding means with said inside nut engaged therewith,

at least one threaded shank which passes through said cup member and is engageable at its inner end with said inside nut,

at least one lever handle movably mounted on said cup member, and

at least one outside lock nut engageable with an outer end of said threaded shank.

4,046,026

LINKAGE AND MOTION SYSTEM, ESPECIALLY FOR ACCOMPLISHING A SWINGING MOVEMENT IN EQUIPMENT SUCH AS BUCKETS FOR POWER SHOVELS AND THE LIKE

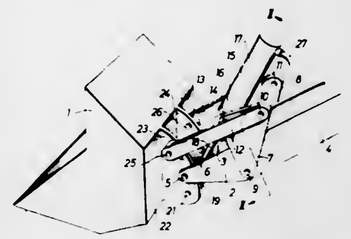
Sten Ove Hammarstrand, Hudiksvall, Sweden, assignor to Svenska Hymas Aktiebolag, Hudiksvall, Sweden

Filed Jan. 5, 1976, Ser. No. 646,495

Claims priority, application Sweden, Jan. 8, 1975, 7500175

Int. Cl.² G05G *1/04*

U.S. Cl. 74—519 **7 Claims**



1. A linkage and motion system especially for oscillating equipment such as buckets to excavators and the like, the equipment or its attachment being pivotably attached to a holder, characterized by a first linkage device connecting said attachment with a second linkage device which in turn is articulately joined to said holder, between said second linkage device and said attachment there being articulately attached a driving means with a linear working motion, said driving means being articulately attached to the attachment at a point at a distance from the articulation points of the holder to the attachment, the articulation points of said second linkage device being so situated that they geometrically form the corner points in a triangle, the articulation points for said first linkage means at the attachment and the articulation points for the driving means at the attachment being on either side of the articulation point of the attachment to the holder.

4,046,027

APPARATUS FOR TRANSMITTING MOTION TO TOOLS IN CIGARETTE PACKING MACHINES OR THE LIKE

Willy Rudszinat, Dassendorf, Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed Apr. 7, 1976, Ser. No. 674,366

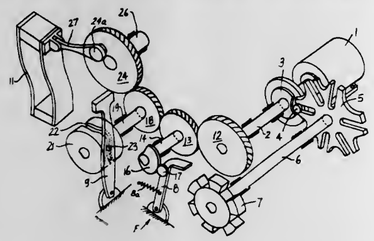
Claims priority, application Germany, Apr. 29, 1975, 2519030

Int. Cl.² F16H *53/00*

U.S. Cl. 74—567 **10 Claims**

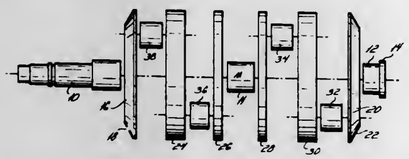
1. In a machine for the processing of smokers' products, particularly in a packing machine for cigarettes or the like, a transmission comprising a plurality of driving components; a plurality of driven components receiving motion from said

driving components; a plurality of product-treating components receiving motion from said driven components; first coupling means between at least one of said product-treating components and the associated driven component; the second coupling means between at least one of said driven components and the associated driving component, each of said coupling



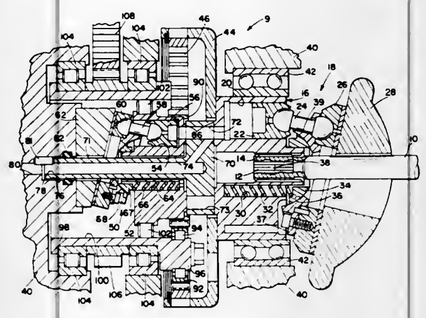
means including separable and reassemblable prefabricated portions provided on and rigid with the respective components and cooperating with each other to maintain, without any adjustment, the respective components in identical predetermined positions relative to each other subsequent to initial and each renewed assembly of such cooperating portions.

4,046,028
CRANK SHAFT
Paul F. Vachris, 57 Chester St., Locust Valley, N.Y. 11560
Filed Feb. 19, 1976, Ser. No. 659,607
Int. Cl.² F16C *3/12*
U.S. Cl. 74—597 **7 Claims**



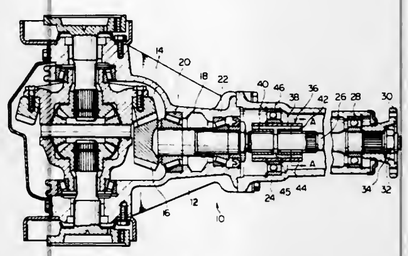
1. A crank shaft comprising a plurality of counterweights, a plurality of crank pins, two end shaft sections and an intermediate shaft section, said shaft sections being aligned and being receivable in main bearings of a crank shaft housing, each end shaft being removabley secured to an adjacent one of said counterweights, said intermediate shaft section being releasably secured to each of two adjacent counterweights and each crank pin being releasably secured to each of two adjacent counterweights, each of said counterweights, said crank pins and said shaft sections being individually separable from the remaining parts of the crank shaft, each crank pin having a central threaded hole and each counterweight having a hole aligned with said threaded hole whereby screw threaded means inserted through an opening in a counterweight and engaging said screw threaded hole of the crank pin secures to the crank pin and counterweight, each crank pin having a plurality of through holes formed therein parallel to said threaded hole and offset therefrom, said counterweights each having a corresponding plurality of holes registering with said plurality of holes in said crank pin said pluralities of holes constituting means for the reception of pin means, said pin means extending through the crank pins and into said openings of said counterweights.

4,046,029
HYDROMECHANICAL TRANSMISSION
Kenneth B. Sugden, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.
Filed Sept. 10, 1976, Ser. No. 722,233
Int. Cl.² F16H *47/04*
U.S. Cl. 74—687 **8 Claims**



1. A hydromechanical transmission, comprising:
an input shaft;
an axial piston hydraulic pump assembly associated with said shaft to be driven thereby;
a movable swashplate operatively associated with said pump for selectively varying the displacement thereof;
an axial piston hydraulic motor assembly coaxial with said pump;
a floating valve plate disposed between and engaging said pump and said motor;
a sun gear carried by one of said pump and said motor;
a ring gear carried by the other of said pump and motor;
a rotatable output carrier coaxial with said pump; and
at least one planet gear carried by said carrier and meshed with both said sun and ring gears.

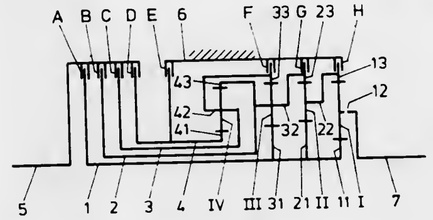
4,046,030
FINAL DRIVE UNIT
Kunihiko Suzuki, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Apr. 6, 1976, Ser. No. 674,186
Claims priority, application Japan, Apr. 9, 1975, 50-46991
Int. Cl.² F16H *1/38*
U.S. Cl. 74—710 **8 Claims**



1. In a final drive unit of a motor vehicle line, the improvement comprising, in combination, first and second drive shafts substantially in axial alignment with each other and rotatably supported by bearings in a housing, said first drive shaft having a first end portion integrally connected with a drive pinion which is in constant mesh with a ring gear and a second end portion, said second drive shaft having a first end portion interlockingly connected with a pinion drive flange which is rotatably driven by a rear universal joint and a second end portion, a vibration damping coupler for resiliently coupling

the second end portion of said first drive shaft with the second end portion of said second drive shaft, and bearing means rotatably supporting said vibration damping coupler in said housing.

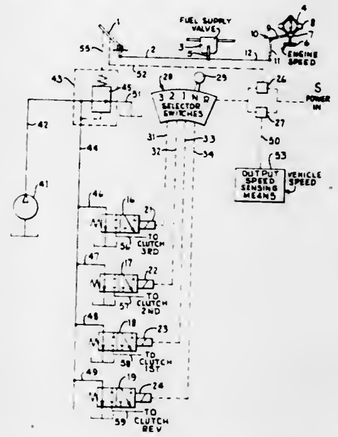
4,046,031
PLANETARY-GEAR TRANSMISSION
Anton Ott, Tettnang; Friedrich Ehrlinger, Friedrichshafen; Dietrich Knödler, Friedrichshafen, and Roland Zdansevicius, Friedrichshafen, all of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany
Filed Oct. 6, 1975, Ser. No. 620,139
Claims priority, application Germany, Oct. 5, 1974, 2447581
Int. Cl.² F16H *57/10*
U.S. Cl. 74—764 **15 Claims**



1. A transmission providing a plurality of speed ratios between an input shaft and an output shaft, comprising:
a plurality of planetary-gear stages including a downstream stage, an upstream stage and an additional stage, ahead of said upstream stage, each of said stages consisting of a sun gear, a ring gear and a planet carrier having at least one pinion in mesh with said sun and ring gears, said downstream stage having its ring gear operatively linked with said output shaft, said additional stage having its planet carrier fixedly connected with the ring gear of said upstream stage and further having its ring gear fixedly connected with the planet carrier of said upstream stage and with the ring gear of said downstream stage;
a plurality of coaxial intermediate shafts, one of said intermediate shafts being rigid with the sun gears of said upstream and downstream stages, another of said intermediate shafts being rigid with the sun gear of said additional stage;
a plurality of clutches selectively actuatable to connect any of said intermediate shafts with said input shaft; and
a plurality of brakes selectively actuatable to immobilize the sun gear of said additional stage and the ring gears of said upstream and downstream stages whereby a plurality of forward and reverse speed ratios are establishable by the joint actuation of a selected clutch and a selected brake.

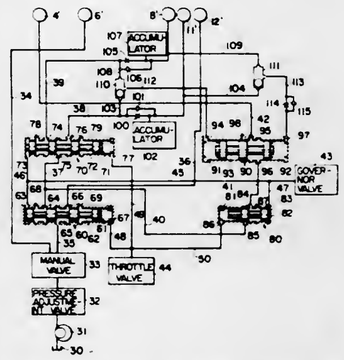
4,046,032
START CONTROL
Eugene R. Braun, Royal Oak, and Elmer A. Richards, Kalamazoo, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio
Division of Ser. No. 404,221, Oct. 9, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,887
Int. Cl.² B60K *41/04*
U.S. Cl. 74—865 **19 Claims**

1. A control system for a multi-ratio transmission connectable at its input to a prime mover in response to actuation of at least one of a plurality of ratio-selecting clutches and at its output to a load, said system comprising:
a manually movable throttle means having an idle position and operative to increase the speed of said prime mover in response to manual movement away from said idle position;
manually movable selector means having an inactive position and a plurality of active positions each corresponding to at least one of said clutches;
first means actuated by manual movement of said throttle means; and



means operative to actuate at least one of said clutches in response to movement of said selector to an active position corresponding to said at least one of said clutches and actuation of said first means.

4,046,033
CONTROL APPARATUS FOR AUTOMATIC TRANSMISSION
Masanao Hashimoto, Toyota, and Takaaki Suzuki, Obara, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Sept. 18, 1975, Ser. No. 614,700
Claims priority, application Japan, Apr. 17, 1975, 50-45819
Int. Cl.² B60K *41/18*; F16H *47/00*
U.S. Cl. 74—869 **8 Claims**



1. A control apparatus for automatic transmissions of the type with an output shaft of an engine operatively connected to an input shaft of a speed-change gear mechanism having a speed-change planetary gear train responsive to hydraulically actuated speed-change frictional engagement devices for establishing different gear ratios, through a torque converter, and a frictional engagement device disposed in parallel to the torque converter for directly linking the output shaft to the input shaft, said control apparatus comprising means for automatically and hydraulically controlling both the selective actuation

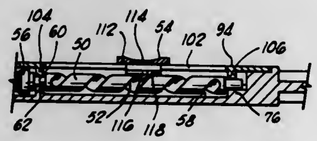
of said speed-change gear mechanism in reponse to the engine output and vehicle speed, and the selective actuation of said frictional engagement device for directly linking said output shaft to said input shaft in response to a predetermined engine output and vehicle speed, said means including (a) a governor valve designed to be responsive to the drive speed of the vehicle for generating a governor pressure corresponding to the drive speed; (b) a throttle valve for generating a throttle pressure in response to the opening of a throttle valve of the engine carburetor; (c) shift valve means operatively connected to said speed-change frictional engagement devices and responsive to the pressures generated by said throttle valve and said governor valve for hydraulically controlling the actuation of said speed-change frictional engagement devices and the shifting of said speed-change gear mechanism from one gear ratio to another; (d) a direct-linkage valve operatively connected to said direct-linkage frictional engagement device and responsive to a predetermined relationship of the pressures generated by said throttle valve and said governor valve for hydraulically actuating said direct-linkage frictional engagement device; (e) individual pressure-reducing means for controlling fluid pressure received by selected ones of said speed-change frictional engagement devices from said shift valve means and adjusting the timing of actuation of said selected speed-change frictional engagement devices; (f) operation means for accepting the fluid pressure being received by said pressure-reducing means from said shift valve means and the controlled fluid pressure being received by said selected speed-change frictional engagement devices from said pressure-reducing means; and (g) an interlock valve operatively connected to said operation means and disposed between said direct-linkage frictional engagement device and said direct-linkage valve for introducing to said direct-linkage frictional engagement device the fluid pressure from said direct-linkage valve and exhausting fluid pressure from said direct-linkage frictional engagement device in response to said fluid prssures from said operation means acting on said interlock valve, said interlock valve introducing fluid pressure to said direct-linkage frictional engagement device when receiving fluid pressure from said direct-linkage valve and exhausting fluid pressure from said directlinkage frictional engagement device when deactuated by the fluid pressures from said operation means acting on said interlock valve during a speed shift operation of said speed-change gear mechanism from one gear ratio to another.

4,046,034

ADJUSTABLE WRENCH

Harry J. Flewelling, 4040 N. Stiles, Oklahoma City, Okla. 73105

Filed Aug. 1, 1975, Ser. No. 600,896
Int. Cl.² B25B *13/16*
U.S. Cl. 81—165 3 Claims



1. In a helix-actuated open end adjustable wrench of the type having a handle portion which extends to form the head and upper jaw, and which includes a lower jaw movably retained in said head as driven by an adjusting worm gear and drive means for imparting rotation to said worm gear, the improvement comprising:

a unitarily formed elongated cavity in said handle portion which includes forward and rear base support bearing formations said elongated cavity being of generally square cross-sectional area formed in the forward approximately one-half of said handle portion and including said forward and rear at base support bearing formations at opposite ends thereof as transverse ribs having axially aligned semi-circular bearing surfaces in longitudinally central indentation therein;

a helical drive rod having a helical groove formed along the central extent thereof and which includes circumferential grooves at each end thereof for mating engagement within said axially aligned semi-circular bearing surfaces of said forward and rear base support bearing formations, and which helical drive rod is further connected at the forward end to impart rotation to said drive means;

a cover plate securable over said cavity and having an elongated central slot extending therealong, said cover plate including unitarily formed forward and rear retaining bearing formations which contact said helical drive rod circumferential grooves in rotational support opposite said respective forward and rear base support bearing formations; and

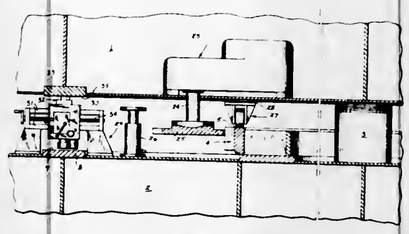
thumb actuating means extending through said cover plate central slot to project a boss into engagement with said helical groove, whereby movement of said thumb actuating means along said elongated slot imparts rotation to said helical drive rod and drive means to rotate said adjusting worm gear.

4,046,035

METHOD OF MACHINING THE UPPER PAD ON THE SWING BEARING OF A LARGE EXCAVATOR

Ellery H. Barber, South Milwaukee, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed May 6, 1976, Ser. No. 683,886
Int. Cl.² B23B *1/00*; B23C *3/02*
U.S. Cl. 82—1 C 6 Claims



1. In an excavator having a base which supports a center pintle, a circular swing gear disposed concentrically about the center pintle and a circular bearing pad disposed concentrically about the center pintle and radially outward from the swing gear, a method of machining an upper bearing pad which is mounted to the bottom of a revolving frame and disposed directly above the lower bearing pad, the steps comprising:

lifting said revolving frame with a set of jacks;

leveling said revolving frame;

inserting a set of temporary rollers between the bottom of said revolving frame and the top surface of said swing gear;

lowering said frame onto said temporary rollers;

mounting a metal cutting machine on said base and beneath a portion of said upper bearing pad; and

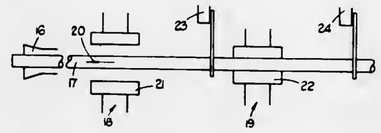
revolving said revolving frame and machining said upper bearing pad with said metal cutting machine.

4,046,036

BAR FEED MECHANISM FOR LATHES

Norman Yearsley, Kenilworth, England, assignor to Wickman Machine Tool Sales Limited, Coventry, England

Filed Oct. 28, 1975, Ser. No. 626,377
Claims priority, application United Kingdom, Nov. 14, 1974, 49264/74
Int. Cl.² B23B *13/00, 3/36*
U.S. Cl. 82—2.7 6 Claims



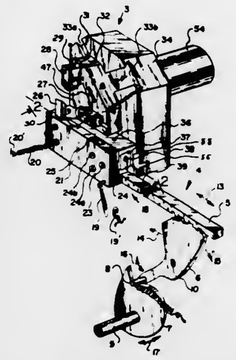
1. A bar feed mechanism for a lathe comprising a pair of bar feed devices spaced lengthwise of the feed path of bar stock in the lathe, and control means for alternatively actuating the two bar feed devices, the control means including two means for sensing the presence or absence of an end of a bar, the two sensing means being disposed adjacent the two bar feed devices respectively, the control means ensuring alternative actuation of the devices in such manner that the bar feed devices are at all times out of engagement with ends of the bar stock.

4,046,037

BOX TOOL

Joseph B. Plevyak, 19 Jefferson St., Newton, N.J. 07860

Filed May 15, 1972, Ser. No. 254,772
Int. Cl.² B23B *29/16, 29/18*
U.S. Cl. 82—35 6 Claims



1. A non-scarring set-retaining cutting tool device comprising in combination: a first lever means; a rounded rotatable-movable element having at least one lowered-surface section on at least one side of the rounded rotatable-movable element and having at least one substantially symmetrically-convexly rounded surface section of predetermined arc, said lowered section having a surface withdrawn from said convex surface and said lowered surface section being continuous with said symmetrically-rounded convex surface section serially located along the arc of said convexly surfaced section, said rounded rotatable-movable element being operatively engaged with said lever means such that movement of said lever causes said element to move rotatably of said rounded surface section in a direction along the arc substantially coincident with a convex surface of said convexly rounded surface; a movable blade-mounting member adjustably settable at different predetermined cutting positions and shaped to receive a position-lockable and position-unlockable key; at least one locking key means to lock and unlock against movement of said movable blade-mounting member in a first direction when in said receiving position; when locked in a key-receiving position, said movable blade-mounting member, said receiving position, and said rounded element being such in position relative to one-another that when said receiving position is locked by said key, rotary movement of said convexly-rounded surface section forcibly is movable of said movable blade-mounting member in first direction; and spring means for returning said movable blade mounting member from a position to which it has been moved in said first direction and for returning said lever means to a pre-actuation position; whereby movement of said lever in to and fro directions brings about movement of a mounted blade to and from said predetermined cutting position such that subsequent to cutting, scarring of a cut piece is substantially avoided by the blade being withdrawable from the cutting position before withdrawal of the cut piece; further there being at least one rotatable piece-mounting means, and movement means for movement of the movable blade-mounting member to and from a cutting position, and for transverse movement one relative to the other of the rotatable piece-mounting means and the movable blade-mounting member subsequent to movement of said movable blade-mounting member to a cutting position and for withdrawal of said movable blade-mounting member from said cutting position prior to transverse movement of one of said movable blade-mounting member and said rotatable piece-mounting means away from one-another; there being at least two lowered surface sections oppositely located and at least two convexly rounded surface sections oppositely located around a circumference of said rounded rotatable-movable element, said rounded rotatable movable element being in a substantially shaft-shaped form, and therebeing at least two separate lockable and unlockable positions for said lockable and unlockable key means which when in a second of said receiving positions is lockable and unlockable of movement of said movable blade-mounting member in an about opposite second direction relative to said first direction, said movable blade-mounting member being movable by contact movement of one of said convexly rounded surface section solely when one of said receiving positions is in an unlocked state while the other is in a locked state, such that when the second one of said second receiving positions is locked while simultaneously a first of said receiving positions is unlocked, said rotary movement of a second of said convexly rounded surface sections is forcibly movable of said movable blade-mounting member in said second direction, and such that when the first of said positions is unlocked while simultaneously the second receiving position is unlocked, said rotary movement of said convexly-rounded surface section is forcibly movable of said movable blade-mounting member in said first direction.

4,046,038

METHOD AND APPARATUS FOR CUTTING OPEN HOLLOW ARTICLES

Theodore V. West, Michigan City, Ind., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1976, Ser. No. 737,470
Int. Cl.² B23B *1/00, 3/06, 3/04*
U.S. Cl. 82—47 8 Claims

1. Apparatus for cutting a hollow article along a severing plane substantially perpendicular to the longitudinal axis of said article, said apparatus comprising:

A. a knife support;

B. a knife comprising

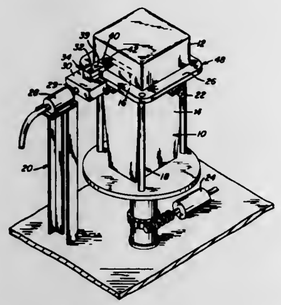
i. an arm, said arm being pivotally mounted to said knife support about an axis substantially parallel to said longitudinal article axis,

ii. at least one blade clamp pivotally mounted to said arm about an axis lying approximately in said severing plane, and

iii. a blade mounted in said blade clamp, said blade having a cutting edge extending in a direction away from said

arm toward said article and terminating in a point for piercing said article;

C. means for providing relative movement between said knife said and article around the periphery thereof;



D. means for directing said knife support toward said longitudinal article axis whereby said article may be cut; and

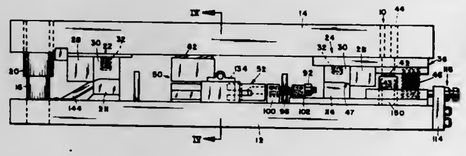
E. means for controlling the pivoting of said knife arm relative to the shape of said article to maintain said blade in cutting relation to said article.

4,046,039

THICKNESS RESPONSIVE VARIABLE POSITION DIE SET

Melbourne L. Griesbach, Muskegon, Mich., assignor to EMF, Inc., Muskegon, Mich.

Filed May 5, 1976, Ser. No. 683,044
Int. Cl.² B26D *5/06, 7/26*
U.S. Cl. 83—13 **25 Claims**



1. A variable-position die set adapted for precisely cutting sheet stock to a specified size as a function of blank thickness, comprising:

a first actuating die plate;

a second actuating die plate superimposed on said first die plate in a spaced, vertical relationship therewith;

a shiftable cutting means positioned between said die plates for severing the edge of the stock upon closing movement of said actuating die plates;

means operatively coupled to said die plates for sensing the thickness of the blank; and

means operatively associated with said sensing means for shifting said cutting means a distance proportional to the sensed thickness of the stock prior to severing of the edge by said cutting means.

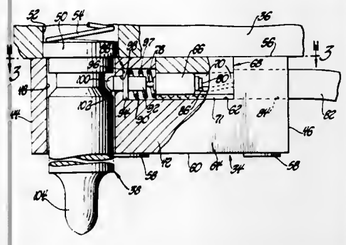
4,046,040

PROGRESSIVE DIE SENSOR

Charles A. Bourdo, 3301 Willet, Pontiac, Mich. 48057

Filed July 6, 1976, Ser. No. 702,554
Int. Cl.² B26D *7/22*
U.S. Cl. 83—63 **7 Claims**

1. A progressive die sensor comprising: a housing for mounting on an upper punch holder; said housing including opposite side surfaces and an upper mounting surface that engages the upper punch holder when the housing is mounted thereon; a depression that opens upwardly in the housing along the mounting surface thereof and has opposite sides opening to the side surfaces of the housing and a rectangular cross section therebetween; means for mounting a downwardly extending probe on the housing in a spaced relationship from the depression for relative movement that indicates an unaligned workpiece condition; a switch received within the depression and including an actuating plunger; a switch cover secured within the housing depression and having downwardly extending side portions of rectangular cross sections between which the switch is received; said switch cover including an upper surface that defines a continuation of the upper mounting surface



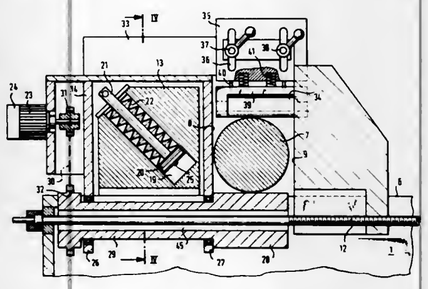
of the housing and which engages the punch holder along with the housing mounting surface during mounting thereon; said side portions of the switch cover including surfaces that form a continuation of the housing side surfaces at the opposite sides of the depression; means for positioning the switch with respect to the housing and the cover in the depression; and a push rod extending between the probe and the switch plunger to actuate the switch in response to probe movement indicating an unaligned workpiece condition such that an electrical signal may be generated when such a condition occurs.

4,046,041

CLAMPING AND FEEDING DEVICE FOR COLD SAWS

Paul Stolzer, Achern, Germany, assignor to KEURO Maschinenbau Gesellschaft mit beschraenkter Haftung & Co Kommanditgesellschaft, Achern, Germany

Filed Aug. 24, 1976, Ser. No. 717,396
Claims priority, application Germany, Sept. 19, 1975, 2541781
Int. Cl.² B23D *49/04, 51/04, 51/18*
U.S. Cl. 83—210 **16 Claims**



1. In a device for feeding a workpiece to the saw component of a sawing maching and for clamping the workpiece during the cutting thereof by the saw component; the sawing machine having a machine frame and a machine table; the device having first and second clamping jaws supported on the machine table and cooperating with one another for immobilizing the workpiece; a feed roller supported at the machine table in the zone of the clamping jaws for feeding the workpiece into the operational range of the saw component; and means for driving the feed roller; the improvement comprising

a. first means connected to said first clamping jaw for displacing said first clamping jaw towards and away from said second clamping jaw in a direction inclined with respect to the surface of said machine table for setting said first clamping jaw to a relatively short distance from said surface of said machine table into a closed position in which it presses the workpiece against said second clamping jaw and for setting said first clamping jaw to a relatively large distance from said surface of said machine table into an open position in which it releases the workpiece; and

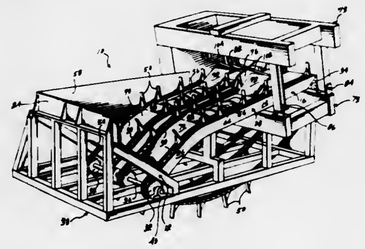
b. second means coupled to said first means and to said feed roller for moving said feed roller into an operative position simultaneously with the displacement of said first clamping jaw, by said first means, into said open position and for moving said feed roller into an inoperative position simultaneously with the displacement of said first clamping jaw, by said first means, into said closed position; in said operative position said feed roller projecting, at least partially, beyond said surface of said machine table for engaging and advancing the workpiece and in said inoperative position said feed roller being withdrawn below said surface of said machine table.

4,046,042

CIRCULAR SHEAR CUTTING DEVICE

Marcel Payeur, Plessisville, Canada, assignor to Forano Limitee, Quebec, Canada

Filed Mar. 22, 1976, Ser. No. 669,150
Int. Cl.² B27M *1/00;* B23D *19/04;* B26D *1/24*
U.S. Cl. 83—418 **12 Claims**



1. A circular shear cutting device for cutting tree lengths comprising: a frame; a pair of circular shear blades rotatably mounted on said frame, each said blade including a periheral portion provided with a continuous cutting edge, the peripheral portions of said blades being in partially overlapping relation to one another; first drive means for rotating said blades in opposite direction to one another; means for successively conveying tree length transversely to said pair of blades; second drive means causing said conveying means to advance tree lengths to a first of said pair of rotating blades, said conveying means cooperating with at least one of said blade to move said tree lengths to the overlapping peripheral portions of said blades where said cutting edges gradually penetrate the conveyed tree length to effect a shear cutting action therethrough.

4,046,043

DEVICE FOR CONVEYING AND CUTTING A PILE OF SHEETS

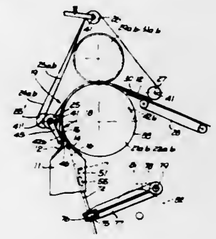
Hermann Kistner, Tamm, and Gunthart Lehmann, Heubach, Lautern, both of Germany, assignors to Maschinenbau Oppenweiler GmbH, Oppenweiler, Germany

Filed Mar. 31, 1976, Ser. No. 672,435
Claims priority, application Germany, Apr. 4, 1975, 2514837
Int. Cl.² B26D *7/06*
U.S. Cl. 83—425.4 **23 Claims**

1. A device for conveying and cutting a pile of sheets comprising:

a frame;

a conveyor for feeding the pile of sheets in a conveying direction, said conveyor including a first conveyor element having a convex cylindrical circumferential surface and being mounted on said frame for rotation of said cylindrical surface around an axis extending at right angles to said conveying direction and a second conveyor element forming an endless belt having an endless circumferential surface, deflecting means for mounting said endless belt on said frame for revolution along an endless path around an axis of revolution parallel to said axis of rotation, so that a portion of said belt is deflected by a segment of said cylindrical surface of said first conveyor element, first and second endless conveyor surfaces supported by said segment and said portion of said belt, respectively, and defining a clamping gap there-between for clamping the pile of sheets and for conveying the pile of sheets along said gap;



a disk-knife rotatably mounted about an axis parallel to said axis of revolution, said disk-knife having two sides, one of said sides having a rim, said rim being surrounded by a circular cutting edge, at least said rim of said one side and said cutting edge defining a common plane, said plane extending at right angles to said axis of rotation; and

first drive means for driving at least one of said conveyor elements and second drive means for rotating said disk-knife;

said first and second conveyor surfaces having edges, said conveyor being arranged so that a portion of said planar rim and said cutting edge overlaps said edges of said first and second conveyor surfaces, said edge of said first conveyor surface being in contact with said cutting edge and said edge of said second conveyor surface being located adjacent said cutting edge, so that said disk-knife and said first conveyor surface constitute a cutting device for cutting a pile of sheets clamped in said clamping gap adjacent to said cutting edge.

4,046,044

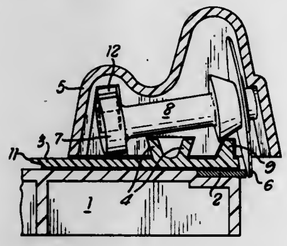
PAPER TRIMMERS

Donald MacDougal Paterson, deceased, late of London, England, and by Alexander Robertson Brackenridge, executor, 2-6 Boswell Court, London WC1N 3PS, England

Filed Nov. 20, 1975, Ser. No. 633,672
Claims priority, application United Kingdom, Nov. 26, 1974, 51138/74
Int. Cl.² B26D *1/20*
U.S. Cl. 83—499 **4 Claims**

1. In a paper trimmer comprising a base board and a fixed cutter blade set in one edge of the board, the improvement comprising a guide rail mounted above and closely spaced from the cutter blade and a carriage mounted on the guide rail, the carriage containing a cutter wheel abutting the fixed blade and adapted to be turned, as the carriage is slid on the guide, by engagement of a friction drive wheel, coupled to the cutter

wheel, with the upper surface of the guide rail, said guide rail including means for maintaining the axis of rotation of the



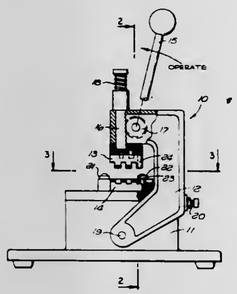
cutter wheel at an acute angle relative to the plane of said board.

4,046,045

WIRE SPLITTER FOR ROUND CONDUCTOR FLAT RIBBON CABLE

Charles H. Stevens, Costa Mesa, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 20, 1976, Ser. No. 752,007
Int. Cl.² B26D 5/10; H02G 1/12
U.S. Cl. 83—620 **7 Claims**



1. A device for preparing a flat multi-conductor ribbon cable having a plurality of individually insulated conductors of circular cross section for termination into a flat cable connector, said cable having webs between the insulation coverings of each of the individual conductors, by selective splitting said webs between groups of at least one adjacent conductor per group, said splitting being effected over a first predetermined dimension along the length of said cable, comprising:

first means comprising upper and lower meshing cutter blades each containing a plurality of spaced cutter sections, each of said sections having a number of adjacent troughs of concave cross section equal to the number of said conductors in the corresponding one of said groups, said troughs being elongated in the length dimension of said flat cable, and each of said cutter sections having cutting edges at the lines of meshing with the adjacent sections of the other of said cutters to shear said webs between said groups of conductors;

second means comprising means for supporting said cutter blades and for imparting motion to at least one of said blades, said sections of each of said cutters producing a shearing action by meshing within the spaces between adjacent cutter sections of the other cutter;

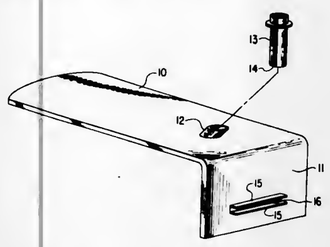
and third means comprising a convex-shape extant on the surface of at one of said cutter blades facing the other of said blades, said convex shape corresponding to a curve in a plane parallel to said troughs, thereby to provide two progressing points of shear from a central point in the direction of said cable length, one progressing to one end of said convex shaped cutter blade and the other to the other end thereof.

4,046,046

MEAT CORING DEVICE INCLUDING A TEMPLATE

Gerald L. Pearson, Spencer, Iowa, and Harold J. Tuma, Brookings, S. Dak., assignors to Spencer Foods, Inc., Spencer, Iowa

Filed Aug. 9, 1976, Ser. No. 712,810
Int. Cl.² B26F 1/32
U.S. Cl. 83—745 **3 Claims**



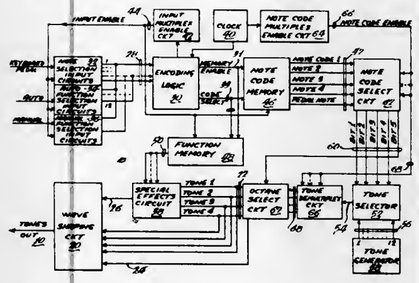
1. A tool for removing a core from a carcass comprising template means having two legs perpendicular to each other, one of said legs being formed to provide a hole therethrough, core cutting means slidably disposed in said hole and being guided by the walls thereof at a controlled angle, and knife guiding means on the other of said legs through which a knife blade may be inserted to cut off the core at a controlled position.

4,046,047

NOTE SELECTOR CIRCUIT FOR ELECTRONIC MUSICAL INSTRUMENT

Patrick S. Roberts, Glendale Heights, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed Aug. 11, 1975, Ser. No. 603,859
Int. Cl.² G10H 1/00
U.S. Cl. 84—1.01 **18 Claims**



1. In an electronic musical instrument having means for providing input signals carrying note selection and note sequence function selection information, means for generating tones, and means for controlling the tone generating means in accordance with note and note sequence function selection information supplied thereto, an improved circuit for supplying information to the control means, comprising:

means for multiplexing together, on a time division basis, the note and note sequence function selection input signals;

an encoding circuit responsive to the multiplexed signals for providing binary coded signals respectively representative of the note selection and function selection information carried thereby;

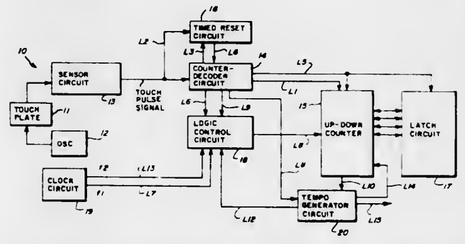
storing means including a note memory for storing said note selection codes and a function memory for storing said function selection codes; and demultiplexing means including means responsive to the code signals and said multiplexing means for respectively enabling the note memory and the function memory during the time divisions that said note selection signals and function selection signals are being applied to the encoding logic input means whereby the note selection codes and the function selection codes representative of the information carried by the multiplexed signals are respectively stored in said note and function memories.

4,046,048

DIGITAL TOUCH RESPONSIVE TEMPO GENERATING DEVICE

Angelo A. Bione, Chicago, Ill., assignor to Hammond Corporation, Chicago, Ill.

Filed June 24, 1976, Ser. No. 699,329
Int. Cl.² G10F 1/00
U.S. Cl. 84—1.03 **12 Claims**



1. A tempo generating device for a rhythm instrument comprising:

a touch detector circuit repetitively actuatable by an instrument player at a desired tempo for producing touch control signals defining a time interval corresponding to said tempo;

a clock means for providing timing pulses;

a digital circuit having a memory energized by said touch control signals and responsive to said timing pulses for determining and retaining a digital value representative of said time interval and for repetitively producing output pulses; and

generator means responsive to said repetitive output pulses from said digital circuit for producing tempo pulses spaced apart as a function of said time interval.

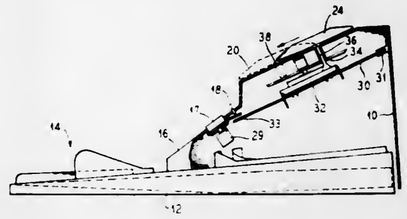
4,046,049

FOOT CONTROL APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENT

David A. Luce, Clarence Center, and Anthony Marchese, Cheektowaga, both of N.Y., assignors to Norlin Music, Inc., Williamsville, N.Y.

Filed June 14, 1974, Ser. No. 479,539
Int. Cl.² G10H 1/02; H01C 10/10
U.S. Cl. 84—1.11 **9 Claims**

1. For use with a foot-controlled electronic musical instrument, a variable element for varying an electrical parameter, a case for housing said variable element, a movable operating member connected with said variable element for controlling said parameter, said operating member being adapted for rectilinear movement by the foot of the player of the instrument, means for mounting said operating member in slidable relation with a wall of said case, means for mounting said variable element directly on the other side of said wall from said operating member, and link means for connecting said variable element with said operating member whereby the force transmitted to said operating member by said player's foot is resisted by said wall and is not transmitted to said variable element.

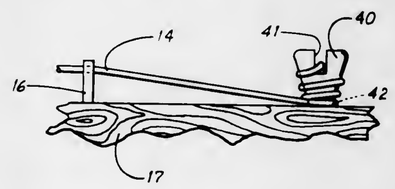


4,046,050

STRING POST FOR MUSICAL INSTRUMENTS

C. Leo Fender, 2851 Rolling Hills Drive Sp. 33, Fullerton, Calif. 92635

Filed Feb. 23, 1976, Ser. No. 660,640
Int. Cl.² G10D 3/14
U.S. Cl. 84—304 **2 Claims**



1. A musical instrument comprising:

a neck;

a plurality of strings extending longitudinally across said neck;

a nut extending laterally across one end of said neck, perpendicular thereto, said nut having a plurality of grooves in the outer surface thereof, one for each of said strings;

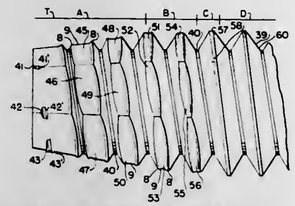
a head connected to said one end of said neck; and

a plurality of string posts extending through said head, perpendicular thereto, each of said string posts having a slot extending laterally thereacross, from the outer end thereof, for receipt of first ends of said strings, said strings being adapted to be wrapped around said string posts and said posts being rotatable to tighten the strings connected thereto, said string posts having a constantly decreasing diameter from said outer ends thereof to a first plane which is positioned virtually at said instrument head and a constantly increasing diameter from said first plane to a second plane which is coplanar with said instrument head so as to form a curved concave shoulder at the base of said posts whereby as said string posts are rotated to tighten said strings, the lowermost wrap of each string is urged toward and into said shoulder at the base of said posts and into contact with said instrument head to maximize the pressure between said strings and said instrument nut.

4,046,051
THREAD FORMING SCREW

Louis J. Lovisek, Greenlawn, N.Y., assignor to Industrial Fasteners Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 523,689, Nov. 14, 1974, abandoned. This application Sept. 17, 1975, Ser. No. 614,179
Int. Cl.² F16B *33/02*
U.S. Cl. 85—47 2 Claims

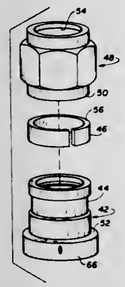


1. A thread forming screw comprising, in combination, a lead end, a shank, progressively higher threads extending from said lead end on to said shank, at least some of said progressively higher threads having flat areas at the thread crests with adjacent flat areas intersecting to form sharp longitudinal line crests with slightly higher ends, said flat areas being of progressively increasing height and decreasing width away from said lead end, a transition portion having at least one turn of a thread thereon having substantially identical flat areas at the thread crest with adjacent flat areas intersecting to form longitudinal line crests with slightly higher ends, said line crests of said transition portion being of substantially the height of the crests of said threads on said shank, and progressively smaller flat areas on the crest of said thread between said transition portion and said shank, said shank having a full thread with a continuous crest thereon, said thread crest having seven of said flat areas for each turn of said thread having said flat areas thereon.

4,046,052
TORQUE LIMITING RF CONNECTOR

Donald B. Nordstrom, Stuart, Fla., assignor to Solitron Devices, Inc., Tappan, N.J.

Filed Oct. 14, 1976, Ser. No. 732,203
Int. Cl.² F16B *31/02*
U.S. Cl. 85—61 11 Claims



1. An RF coupling nut comprising:
an RF cable body;
a base ring to support said cable body, said base ring having internal connecting means at one end for the coupling of said cable body therewithin, a shoulder and an elongated body above said shoulder, said elongated body having a grooved surface;
a tension ring rotatably supported within said grooved surface on said base ring, said tension ring having a cross sectional thickness such that it presents an external diameter greater than said elongated body but less than said shoulder; and
a hex ring having an internal groove of a diameter less than the external diameter of the tension ring compressing said tension ring between and into frictional engagement with said base ring and said hex ring, said hex ring having one end resting against said shoulder when connected to said base ring by said tension ring, said frictional engagement providing frictional connection between the hex ring and base ring that is torque limiting in that said hex ring bidirectionally drives said base ring via said tension ring which is free to rotate when a torque is reached exceeding frictional contact of said tension ring with either or both said base ring or hex ring.

4,046,053
BLIND RIVET

Zia Raheem Alvi, Hatfield; William David Bradley; Keith Denham, both of Welwyn Garden City, and Frederick Arthur Summerlin, Wheathampstead, all of England, assignors to Aerpat A.G., Zug, Switzerland

Filed Mar. 29, 1976, Ser. No. 671,149
Claims priority, application United Kingdom, Apr. 1, 1975, 13290/75
Int. Cl.² F16B *13/08*
U.S. Cl. 85—72 10 Claims



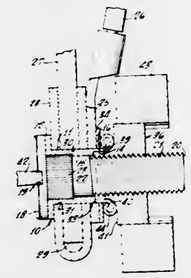
1. A blind rivet comprising a tubular shell having a bore throughout its length, and a mandrel, said mandrel comprising an elongate stem and an enlarged head and having a breaker groove at the junction of the stem and head, the head of the mandrel having a part adjacent to the breaker groove, said part comprising a core having an external diameter at least as great as the diameter of the stem, and a skirt peripherally surrounding said core, said skirt and said core presenting a common face defining a side of said breaker groove and facing towards the stem, said mandrel head being adapted to radially expand said tubular shell and thereby form a blind head when pulled into the bore of the shell, and said skirt being deformable outwardly into engagement with the shell to assist in locking the mandrel head in the expanded shell.

4,046,054
FLARABLE THREADED FASTENER

Bulent Gulistan, Malibu, Calif., assignor to Dentsch Fastener Corporation, Los Angeles, Calif.

Filed Aug. 5, 1976, Ser. No. 712,100
Int. Cl.² F16B *13/06*
U.S. Cl. 85—74 10 Claims

1. A fastener comprising
a sleeve of malleable material, said sleeve having
a cylindrical exterior surface,
a head at one end thereof,
and a cylindrical bore therethrough,
said bore including a counterbore adjacent the opposite end of said sleeve, whereby said sleeve at said opposite end has a reduced-thickness bendable wall,
a screw, said screw having
a head,
and a shank extending from said head, said head of said screw overlying said head of said sleeve, and having surface means for engagement by a driving tool, said shank being longer than said sleeve and having a threaded outer portion projecting outwardly from said opposite end of said sleeve,
said sleeve and said screw including cooperative means for preventing relative movement of said sleeve and said screw,
and a separate, threaded nut received on said threaded end of said shank, said nut being rotatable relative to said shank and to said sleeve, and having
surface means adapted for engagement by a driving tool,
an axial protuberance at the end thereof adjacent said opposite end of said sleeve,

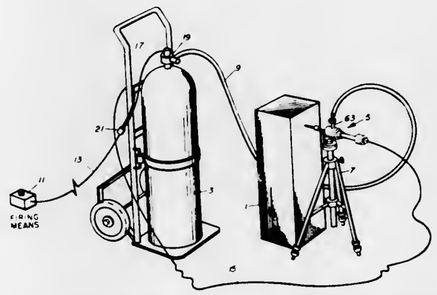


said protuberance terminating in an outer end thereof which is of smaller diameter than the diameter of said counterbore, said protuberance including a concave surface diverging radially outwardly from said end of said protuberance to a substantially radial wall axially inwardly of said protuberance, whereby upon relative rotation of said nut and said shank so as to advance said nut towards said opposite end of said sleeve,
said protuberance is caused to enter said counterbore and said concave surface to bend said relatively thin wall outwardly for forming a flange on said opposite end of said sleeve.

4,046,055
APPARATUS FOR SAFELY NEUTRALIZING EXPLOSIVE DEVICES

Richard T. McDanolds, and Rodney W. Jordan, both of Newton, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 18, 1975, Ser. No. 601,239
Int. Cl.² F42D *5/04*
U.S. Cl. 86—1 B 7 Claims

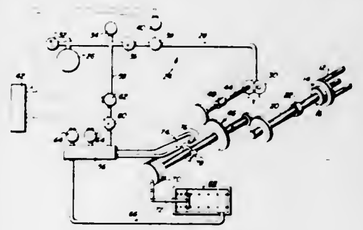


1. An implement for use in neutralizing an explosive device from a safe distance, comprising:
a gun body comprising a cylindrical bore and a contiguous cylindrical counterbore of reduced diameter;
a captive piston comprising a cylindrical head slidable in said bore, a contiguous cylindrical stem or rod of reduced diameter slidable in said counterbore and a pointed end extending forwardly therefrom; said piston being formed with a first transverse opening near said pointed end, a second transverse opening, and a longitudinal bore connecting said openings;
a charge chamber in said gun body adjacent to said cylindrical bore;
an electrically initiated explosive charge in said chamber for propelling said piston forwardly, to penetrate the wall of the explosive device to be neutralized;
a plenum chamber formed in said gun body surrounding an intermediate portion of said piston and in registration with said second transverse opening when said piston is in its forward position; and
means for connecting said plenum chamber to a source of neutralizing fluid.
5. A system for neutralizing an explosive device comprising:
an explosive device;
an implement comprising:
a gun body comprising a cylindrical bore and a contiguous cylindrical counterbore of reduced diameter;
a captive piston comprising a cylindrical head slidable in said bore, a contiguous cylindrical stem or rod of reduced diameter slidable in said counterbore and a pointed end extending forwardly therefrom and positioned adjacent to said explosive device; said piston being formed with a first transverse opening near said pointed end, a second transverse opening, and a longitudinal bore connecting said openings;
a charge chamber in said gun body adjacent to said cylindrical bore;
an electrically initiated charge in said chamber for propelling said piston forwardly, to penetrate the wall of said explosive device;
a plenum chamber formed in said gun body surrounding an intermediate opening when said piston is in its forward position; and
means for connecting said plenum chamber to a source of neutralizing fluid;
a container of neutralizing fluid;
fluid conducting means connecting said container with said connecting means of said implement; and
electrical means, located at a safe distance from said device and electrically connected with said explosive charge of said implement, for initiating said explosive charge to cause said piston to penetrate said explosive device.

4,046,056
PNEUMATIC GUN SYSTEM AND METHOD

George W. Carrie, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 5, 1976, Ser. No. 673,790
Int. Cl.² F41D *7/02*
U.S. Cl. 89—12 24 Claims



1. In combination with a gatling gun having a plurality of

firing chambers, a substantially continuously rotating power drive shaft, intermittent motion means capable of being driven by said shaft for intermittently rotating said chambers sequentially into firing position, and drive means supplied with gas exhausted from said chambers and effective to drive said intermittent motion means after firing has been initiated; a starting system for effecting initial rotation and acceleration of said shaft and firing of said gun, comprising:

a continuously rotatable pneumatic motor separate from said drive means and disposed in driving relationship with said shaft;

a source of pressurized gas disposed remotely from said gun;

conduit means communicating said source with said motor; and

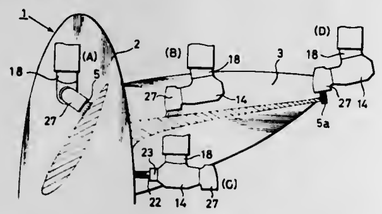
a solenoid operated flow shut-off valve disposed in said conduit means in a normally closed position blocking flow to said motor, said valve shiftable to an open position for permitting delivery of pressurized gas from said source to energize said motor and effect initial rotation and acceleration of said shaft and firing of said gun.

4,046,057

PROPELLER MILLING MACHINE

Yoshiaki Imamura, Hiroshima, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 27, 1974, Ser. No. 527,739
Claims priority, application Japan, Jan. 12, 1974, 49-6788
Int. Cl.² B23C *3/18*
U.S. Cl. 90—14 **3 Claims**



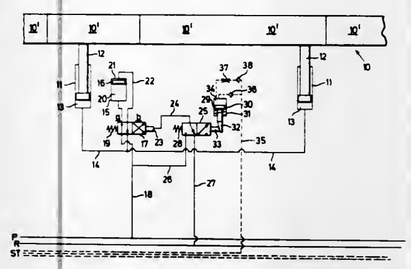
1. A propeller milling machine comprising a double-column bridge under which a work is to be placed, a horizontal cross-rail laid on the bridge, a plurality of ram assemblies, each assembly containing a corresponding shaft, said plurality of assemblies supported by the crossrail to traverse horizontally thereon and to move vertically at right angles to the rail, a plurality of extension heads each with a built-in extension shaft coupled to the associated ram shaft, a plurality of inclined couplers each of which has at least one inclined face and is turnably interposed between each ram assembly and the associated extension head, and a plurality of angle heads, each angle head swingably connected to a corresponding extension head, each of said angle heads having a built-in main spindle rotatably coupled to the extension shaft at right angles thereto for driving a milling cutter also carried by the angle head and wherein said clamp means includes a piston made fast to the rear end of each angle head, said piston being formed with a diametral groove, an annular row of steel balls movable in the groove toward the axis, a flexible contacting part, a sleeve secured to the extension head while in contact with the contacting part, and a cylinder having a inclined plane for contact with the steel balls, said piston and cylinder wall defining hydraulic fluid chambers in the cylinder.

4,046,058

CONTROL SYSTEMS AND ARRANGEMENTS FOR USE IN MINERAL MINING INSTALLATIONS

Hans Theodor Griesbach, Unna, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Division of Ser. No. 423,483, Dec. 10, 1973, Pat. No. 3,965,797.
This application Nov. 17, 1975, Ser. No. 632,191
The portion of the term of this patent subsequent to June 29, 1993, has been disclaimed.
Int. Cl.² F15B *13/04*
U.S. Cl. 91—32 **3 Claims**



1. A system for controlling the operation of shifting rams in a mine working, said system comprising:

a. a plurality of apportioning devices each allocated to at least one of the shifting rams, each said apportioning device having a cylinder containing a floating piston, said cylinder having a first working chamber on one side of said piston and a second working chamber on the other side of said piston, first conduit means for normally connecting said first working chamber to a pressure fluid supply, second conduit means for normally connecting said second working chamber to the working chamber of said at least one ram, a connecting valve mounted in parallel across said first and said second conduit means, said connecting valve having two alternative switching positions, the first position permitting said first and second conduit means to remain in their normally connected condition, the second position connecting said first working chamber to the working chamber of said at least one ram, and said second working chamber to the pressure fluid supply;

b. a stepping mechanism operating said connecting valve; and

c. control signal means for actuating said stepping mechanism to operate said connecting valve to cause a selected apportioning device to perform an operative cycle to transfer a predetermined volume of pressure fluid to the working chamber of said at least one ram, the volume of pressure fluid being a fraction of the total capacity of the working chamber.

4,046,059

FLUIDIC REPEATER

Willie Burt Leonard, 5902 Royalton, Houston, Tex. 77036

Continuation-in-part of Ser. No. 489,829, July 18, 1974, Pat. No. 3,988,966. This application Nov. 5, 1974, Ser. No. 521,036
The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.
Int. Cl.² F15B *13/16*
U.S. Cl. 91—388 **13 Claims**

1. Fluidic repeater comprising

a cylinder

a piston axially movable in said cylinder, there being a space in said cylinder between one end of the cylinder and the adjacent end of the piston therein,

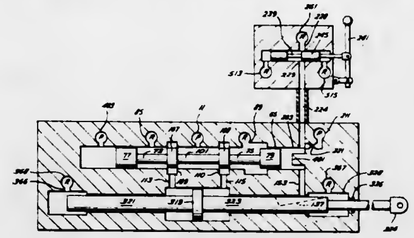
a source of pressure fluid connected through a flow restrictor to supply fluid to said space between one end of the cylinder and the adjacent end of the piston therein,

opposition means to supply an opposing force on the other end of the piston,

a fluid reservoir at lower pressure than said source connected through parallel variable flow restrictors to said space,

one of said variable flow restrictors constituting a transmitter for varying the pressure in said space and thereby cause a responsive change in the position of said piston relative to said cylinder, said force of the opposition means being independent of the position of said transmitter, and

feedback means including another of said variable restrictors



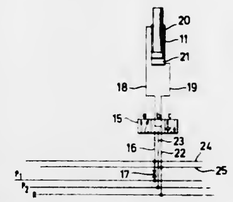
actuated in response to change of position of said piston relative to said cylinder to restrict flow through said other variable restrictor a greater amount when said one restrictor is moved to a position restricting flow a lesser amount, and to restrict flow through said other variable restrictor a lesser amount when said one restrictor is moved to a position restricting flow a greater amount, said amounts being independent of the rate of movement of said piston relative to said cylinder and the duration of said change of position of said piston, thereby to cause an opposite change in the pressure in said space from that caused by the transmitter restrictor and bring the piston to rest relative to said cylinder.

4,046,060

HYDRAULIC CONTROL SYSTEMS FOR USE WITH MINING APPARATUS

Kunibert Becker, Werl, and Walter Weirich, Dortmund, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed Aug. 4, 1975, Ser. No. 601,643
Claims priority, application Germany, Aug. 22, 1974, 2440211
Int. Cl.² F15B *11/16*
U.S. Cl. 91—414 **5 Claims**



1. For use with mineral mining equipment having a series of double-acting hydraulic rams for shifting a conveyor, each ram having a first working chamber which is charged with pressure fluid to extend the ram and a second chamber which is charged with pressure fluid to retract the ram, an improved hydraulic control system for operating the rams, said system comprising:

a. at least one pressurized source of hydraulic fluid;

b. main pressure fluid feed conduit means connected to said at least one pressurized source;

c. pressure fluid return conduit means connected to said at least one pressurized source;

d. further pressure fluid feed conduit means connected to said at least one pressurized source;

e. regulating means for varying the pressure of the fluid in said further conduit means; and

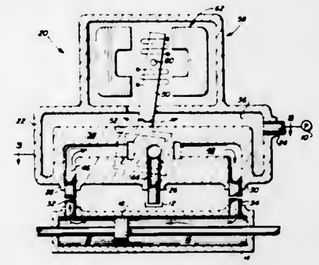
f. a plurality of control devices each associated with at least one of the rams and connected to the working chambers of the rams on the one hand, and connected to said main conduit means, and to said further conduit means, and to said return conduit means on the other hand, each said control device selectively connecting the working chambers with various combinations of said conduit means, each said control device having three intake ports and two outlet ports, said first intake port connected to said main conduit means, said second intake port connected to said further conduit means, and said third intake port connected to said return conduit means; said first outlet port connected to the second working chamber of the associated ram, and said second outlet port connected to the first working chamber of the associated ram, each said control device adjusting the three operative states comprising: a first state wherein said first intake port is connected to said first outlet port, said second intake port is connected to second outlet port, and said third intake port is blocked; a second state wherein said third intake port is connected to both said first and said second outlet ports, and said first and said second intake ports are blocked; and a third state wherein said first intake port is connected to said first outlet port, said third intake port is connected to said second outlet port, and said second intake port is blocked; and wherein adjusting said control device to the first state causes the ram to extend, and adjusting said control device to the third state causes the ram to retract.

4,046,061

FOUR-WAY CLEVIS VALVE AND METHOD

Richard F. Stokes, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 3, 1975, Ser. No. 637,441
Int. Cl.² F15B *13/044*; F16K *11/00*
U.S. Cl. 91—459 **3 Claims**



1. In combination with a fluid control system including a source of pressurized fluid, a low pressure reservoir, and a fluid operated motor having a pair of motor ports communicating with opposed fluid chambers of the motor; a closed center flow control valve comprising:

a housing having an internal cavity, an inlet port communicating with said source of fluid, an exhaust port communicating with said reservoir, and a pair of work ports communicating with said motor ports, said internal cavity communicating with one of said inlet and outlet ports;

means in the housing defining a pair of substantially flat, opposed, transversely spaced surfaces exposed to said cavity, said means having a first passage therein communicating with the other of said inlet and outlet ports, and second and third passages therein communicating with said work ports, each of said first, second and third passages opening onto both of said opposed surfaces at later-

ally spaced locations therealong with said first passage disposed intermediate said second and third passages;

a longitudinally extending control member in said housing having a bifurcated end straddling said means defining said opposed surfaces, said member pivotally mounted to said housing whereby said bifurcated end shifts primarily laterally along said surfaces as the member pivots;

a pair of cup elements affixed to said bifurcated end of the control member, each of said cup elements having a continuous, flat peripheral wall slightly spaced from the adjacent surface and cooperating therewith to define a fluid transfer zone between the cup element and the adjacent surface;

said member pivotal to shift said cup elements laterally in one direction from a first central position wherein said peripheral walls substantially cover said second and third passages toward a second position wherein said first and second passages are interconnected through said fluid transfer zones while said third passage is open to said internal cavity, said member pivotal to shift said cup elements laterally in an opposite direction from said first position toward a third position wherein said first and third passages are interconnected through said fluid transfer zones while said second passage is open to said internal cavity; and

solenoid operated actuator means carried by said housing and operable upon the end of said control member opposite said bifurcated end for selectively pivoting said control member to shift said cup elements in said one and said opposite directions, said peripheral walls of the cup elements operable to variably meter fluid communication of said first passage respectively with said second and third passages through said fluid transfer zones while providing substantially balanced flows through said transfer zones as said cup elements respectively shift in said one and said opposite directions, said peripheral walls being of slightly less width than the openings on said surfaces communicating with said second and third passages to permit restricted communication directly between each of said second and third passages and said cavity in said first central position of said member.

4,046,062

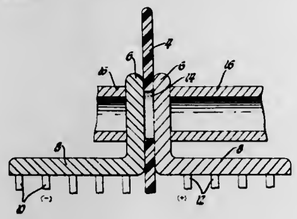
METHOD OF FORMING THROUGH THE PARTITION CELL CONNECTORS FORMED BY AN EXTRUSION-FUSION TECHNIQUE

Robert C. Matter, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 785,698, Dec. 20, 1968, abandoned. This application Apr. 15, 1971, Ser. No. 134,442

Int. Cl.² H01M 6/00

U.S. Cl. 29—623.1 **4 Claims**



1. A method of making substantially liquid-tight intercell connections for lead-acid storage batteries of the type having (a) nonconductive partitions dividing the case of the battery into compartments, (b) apertures in the partitions connecting adjacent compartments, (c) cell groups in the compartments, (d) a plate connector strap on each cell group, and (e) upstanding lead or lead alloy lugs on the connector straps with the lugs facing each other on each side of the apertures, the lugs being thicker than a said partition and having face portions on their face sides adapted to fully engage the immediate surface areas of the partitions around the apertures and joint-forming portions circumscribed by said face portions and adapted by fusion to link one lug to the other through the apertures, said method comprising the steps of:

positioning the cell groups with their associated straps in the compartments so that the lugs of the straps overlay the apertures of the partitions with the face portions adjacent the immediate surface area around the apertures;

positioning tool means on the back sides of the lugs, the tool means for each lug including a clamp portion, a bore in the clamp portion and a conductive plunger movable in the bore, the bores and plungers for opposing lugs being aligned with a substantial area of their associated aperture;

actuating the tool means to cause the clamp portions to engage the lugs with a sufficient clamping force to seal off the apertures with the face portions of the lugs, the joint-forming portions being spaced from each other midway through the apertures and with the partitions defining apertures which are substantially free of lug material; while maintaining the clamping force, squeezing the plungers with sufficient plunger pressure to cause the plungers to sink into the back sides of the lugs to a depth less than their thickness and short of the mouths of the apertures to extrude lead or lead alloy from the joint-forming portions of the lugs into the apertures to bridge the space therein and make contact between the lug extrusions approximately midway through the apertures;

while maintaining the pressure on the plungers and the force on the clamp portions, passing electrical current through the plungers and lug extrusions to fuse the lead or lead alloy in the apertures and to extrude more of the lugs into the apertures until voids therein fill completely with only fused lead or lead alloy which is forced out of the lugs, and, at the same time, seal against the leakage of fused lead or lead alloy from the apertures by the forcible engagement of the face portions of the lugs with the immediate surface areas around the apertures;

deenergizing the electrical current while continuing to maintain the clamping force and plunger pressure to keep the apertures filled during the solidification and cooling of the fused lead or lead alloy in the apertures into weld nuggets, whereby the cell groups are electrically joined by the lugs by liquid-tight, through-the-partition connections that were formed by the solidification of the weld nuggets under pressure.

4,046,063

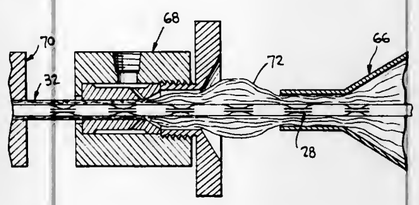
METHOD AND APPARATUS FOR MAKING TOBACCO SMOKE FILTER

Richard M. Berger, Richmond, Va., assignor to American Filtrona Corporation, Richmond, Va.

Division of Ser. No. 629,663, Nov. 6, 1975, Pat. No. 4,022,222. This application Dec. 2, 1976, Ser. No. 746,679

Int. Cl.² A24C 5/50

U.S. Cl. 93—1 C **8 Claims**



1. A method of making smoke filters comprising the steps of:

a. providing a first filtering material including a multiplicity of fibrous members;

b. defining a first elongated annular bonding zone;

c. continuously passing said first filtering material through said first bonding zone and during passage of said first filtering material through said first bonding zone contacting same with a bond activating agent to bond said fibrous members of said first filtering material to each other at spaced contact points thereby forming an elongated, smoke-permeable, inner member defining a tortuous path for passage of smoke therethrough;

d. forming axially spaced sections extending across the interior of said inner member which offer at least as much resistance to passage of smoke as the material of said inner member to thereby form a multiplicity of axially spaced, discrete, inner cavity means within said inner member;

e. providing a second filtering material including a multiplicity of fibrous elements;

f. continuously passing said inner member through a second elongated bonding zone and defining an annular space around said inner member in said second bonding zone;

g. continuously passing said second filtering material into and through said annular space in said second bonding zone and, intermediate the passage of said second filtering material through said second bonding zone, contacting same with a bond activating agent to bond said fibrous members of said second filtering material to each other at spaced contact points thereby forming an elongated, smoke-permeable, intermediate member defining a tortuous path for passage of smoke therethrough surrounding said inner member;

h. overwrapping said intermediate member with an overwrapping material so as to juxtapose portions of the inner surface of said overwrapped material with the exterior surface of said intermediate member to form sealed area precluding passage of smoke thereacross; and transversely severing the resulting product at selected locations to form filter elements.

4,046,064

FILTER ROD MAKING MACHINE

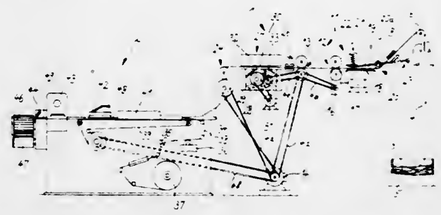
Günter Wahle, Reinbek, Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Germany

Filed May 4, 1976, Ser. No. 683,050

Claims priority, application Germany, May 14, 1975, 2521391; June 28, 1975, 2528906

Int. Cl.² A24C 5/50

U.S. Cl. 93—1 C **13 Claims**



1. In a filter rod making machine wherein a continuous tow of randomly crimped filamentary filter material is transported from a source of supply along a predetermined path toward and into a filter rod making unit, a tow stretching device comprising two pairs of rotary members driven at different speeds arranged to draw the tow from said source and to simultaneously stretch said tow; and a tow braking device adjacent to said path intermediate said rotary members and said source, said braking device including a first guide adjacent to one side of said path and a second guide adjacent to the other side of said path opposite said first guide and arranged to yieldably urge the tow against said first guide with a substantially constant force so as to furnish a substantially constant braking action for each increment of the tow passing between said guides.

4,046,065

RECTANGULAR AND FLAT BOTTOM BAG AND METHOD OF MANUFACTURE

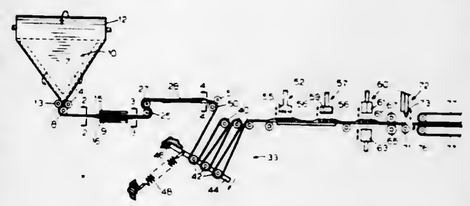
Gary G. Plate, 635 Vickers Court, Burlington, Canada

Filed Sept. 16, 1976, Ser. No. 723,699

Claims priority, application Canada, Aug. 11, 1976, 258890

Int. Cl.² B31B 49/04

U.S. Cl. 93—35 SB **4 Claims**



1. A method of manufacturing a rectangular, flat bottom bag from heat sealable plastics sheet material which comprises: folding said sheet material longitudinally to define a pair of opposed side walls about a fold line, forming a gusset along said fold line having a pair of opposed gusset folds, turning one of said gusset folds upon an adjacent side wall whereby said gusset folds together form an outer planar bottom panel and an inner gusset fold opposed to the adjacent side wall defining an inner fold line, separating the inner gusset fold from the adjacent side wall and transversely heat sealing the sheet material forming the planar bottom panel by an X-weld at an acute angle to the inner fold line of the sheet material, whereby the centre of the X-weld intersects the said inner fold line, severing and removing from said sheet material lateral triangular corner portions defined by said X-weld, and transversely welding and severing said stock material along a line intersecting the centre of said X-weld.

4,046,066

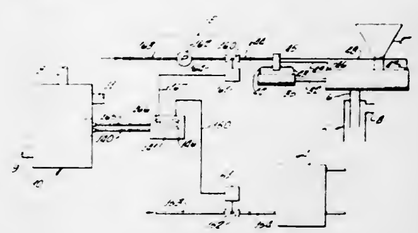
CONTINUOUS FLOW EXPANDER FOR EXPANDING PARTICULATE MATERIAL

Michael J. Wood, Westminster, Calif., assignor to J. P. Burroughs & Son, Inc., Saginaw, Mich.

Filed May 24, 1974, Ser. No. 472,977

Int. Cl.² A23L 1/18; A23B 4/04

U.S. Cl. 99—323.7 **31 Claims**



1. An expander for particulate fodder, comprising:

a. a pressurized region in which particulate fodder is pressurized prior to expansion into puffed form,

b. injection means for introducing particulate fodder into said pressurized region while substantial pressure is maintained in said pressurized region, whereby processing of particulate fodder previously introduced may be continued during the introduction of additional particulate fodder,

c. a restrictive opening through which the pressurized particulate fodder is ejected into a region of pressure lower than that of said pressurized region for expansion into puffed form,

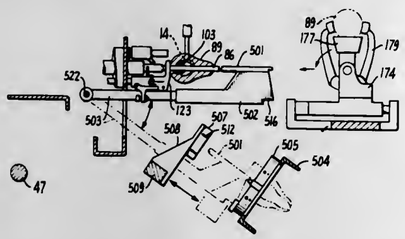
d. transport means for moving pressurized fodder through said pressurized region to said restrictive opening, and
e. means for maintaining enthalpy at said restrictive opening within a predetermined range.

4,046,067

MACHINE FOR CUTTING PEARS INTO SEGMENTS

Malcolm W. Loveland, Orinda, and Rudolph Matthews, Oakland, both of Calif., assignors to Atlas Pacific Engineering Company, Emeryville, Calif.

Filed Dec. 3, 1975, Ser. No. 637,379
Int. Cl.[2] A23N 7/08; A47J 17/00; B26D 4/00, 11/00
U.S. Cl. 99—543 7 Claims



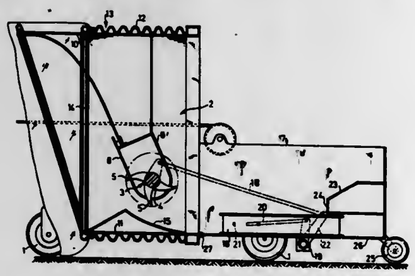
1. In a machine wherein a pear is impaled upon a first spindle which serves as a support for the pear during peeling and coring of the pear, a second spindle for receiving a cored and peeled pear from said first spindle, said second spindle being mounted for movement into a first position in which the second spindle is in axial alignment with the first spindle, pushing means for pushing a pear off the first spindle onto the aligned second spindle, a normally stationary circular knife having a plurality of radial knife blades for cutting the pear into segments, said knife spaced from the axis of said first spindle, means for moving the second spindle to a second position in which the second spindle is in alignment with said circular knife, and means for pushing the pear along the second spindle through the circular knife to cut the pear into segments.

4,046,068

APPARATUS FOR FORMING MATS OR STRANDS OF FODDER FEED MATERIAL FOR FLAT STORAGE THEREOF

Alfred Eggenmüller, Ulm; Heinrich Bellau, Thalfingen; Lorenz Scherer, Oberelchingen; Eugen Notter, Senden, and Werner Wagler, Wullenstetten, all of Germany, assignors to Gebruder Eberhard, Ulm, Germany

Continuation-in-part of Ser. No. 269,760, July 7, 1972, abandoned. This application May 20, 1974, Ser. No. 471,278
Claims priority, application Germany, July 10, 1971, 2134578
Int. Cl.[2] A01F 25/16; B65G 3/04
U.S. Cl. 100—65 22 Claims



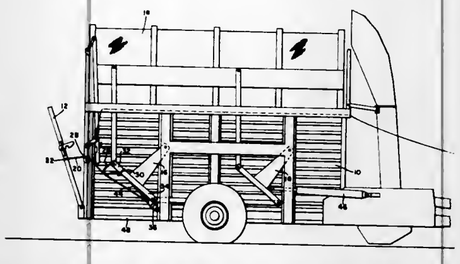
1. Apparatus for forming a continuous strand or mat of agricultural feed stock for storage thereof in flat layers, said apparatus including an undercarriage, a movable molding channel mounted to said undercarriage, compression means arranged in said molding channel comprising a roller extending almost across the full width of said channel, a plurality of teeth secured circumferentially on said roller along the length thereof, a stripping basket arranged in the lower part of said channel and operatively associated with said roller, upper and lower guide plate means mounted in said channel for guiding said feed stock which is pressed by said roller towards a stationary wall, said teeth being arranged along helical lines on the press roller, and the roller being supported within said stripping basket.

4,046,069

MEANS FOR CONTROLLING DISCHARGE DOOR MOVEMENT

Glenn Dale Head, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 496,540, Aug. 12, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,483
Int. Cl.[2] A01D 90/08
U.S. Cl. 100—255 11 Claims



1. In an agricultural machine having a mobile frame, a crop-receiving container on the frame and including a discharge opening, a door hinged at its lower portion to the container and movable between open and closed positions as respects said opening; the improvement residing in means for controlling movement of the door between its open and closed position, comprising: a swingable bell crank having a pair of arms carried by the container for movement between first and second positions; a guide carried by the container above the door hinge; a cable trained over the guide and connected between one bell crank arm and the door for incurring opening of the door as the member moves toward its first position and closing of the door as the member returns toward its second position; and means movable by the other bell crank arm for engaging the cable to increase the tension force transferred to the cable by the bell crank as the bell crank moves.

4,046,070

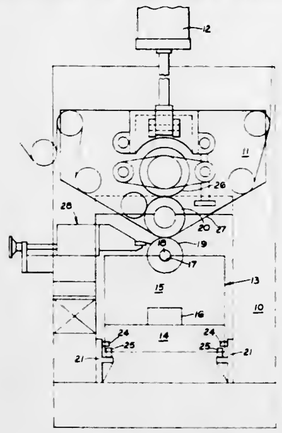
ROTARY PRINTING PRESSES

Angus Murray Halley, Birmingham, England, assignor to James Halley & Sons Limited, West Bromwich, England

Continuation of Ser. No. 462,766, April 22, 1974, abandoned. This application Sept. 16, 1975, Ser. No. 613,751
Int. Cl.[2] B47F 9/15
U.S. Cl. 101—216 2 Claims

1. A rotary printing press having a frame and an image cylinder positioned on said frame in an operative position aligned directly below an impression cylinder, said impression cylinder being so mounted on the frame as to be selectively movable between a non-functioning position spaced above said image cylinder and an operative position where it cooperates with the operatively positioned image cylinder for forming a nip through which material to be printed may be fed, said press including a mounting cradle for said image cylinder comprising an elongate horizontal beam and a pair of upstanding supports on the beam, at least one of said supports being movable

longitudinally of said beam for adjustment of the relative spacing of said supports and each support having bearing means rotatably mounting a respective end of the image cylinder; opposed horizontal slide means on said frame and extending transversely thereof on which said cradle is supported and along which said cradle is selectively movable in a direction parallel to the axis of rotation of the image cylinder for insertion into said frame for operatively positioning the image cylinder mounted thereon and for removal from said frame; locator means on opposite sides of the cradle adapted for engagement with and movement along substantially vertical



longitudinal formations of the slide means to positively locate the cradle laterally of the slide means; and clamping means for releasable endwise connection of the cradle to the frame to positively maintain the cradle longitudinally of the slide means in the operative position of said image cylinder, said slide means comprising horizontally spaced rails along which the cradle is movable, said substantially vertical longitudinal formations being upright flanges on said rails, said locator means comprising rotatable side rollers on the cradle peripherally engaging said flanges, and at least some of said side rollers being eccentrically mounted for selectively adjustable positive location of the cradle laterally of the rails.

4,046,071

RELIEF PRINTING PLATE HAVING PROJECTIONS IN NON-IMAGE AREAS

Masayoshi Mizuno; Tadashi Kawamoto, and Kiichi Iida, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 26, 1975, Ser. No. 617,131
Claims priority, application Japan, Sept. 26, 1974, 49-110001; Mar. 31, 1975, 50-37775; Apr. 28, 1975, 50-50775; May 22, 1975, 50-60167; Sept. 5, 1975, 50-107056
Int. Cl.[2] B41N 1/00; G03C 5/00
U.S. Cl. 101—395 7 Claims

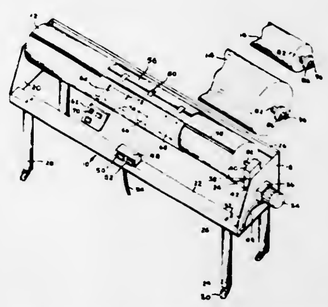
1. A printing plate comprising a support, reliefs comprising photocured photosensitive resin formed thereon as an image area and from about 20 to about 4,000/cm² small projections thereon in non-image areas, the height of the reliefs being at least 0.5 mm larger than that of the small projections, the top of each small projection having an area of not more than 0.04 mm², and the summation of the areas of the tops of the small projections being not more than 30% of the area of the support, the diameter of the top surface of each of the small projections being not more than 0.25 mm and the diagonal length of the top surface of each of the small projections being not more than 0.25 mm.

4,046,072

PRINTING DIE ROTARY GLUING TABLE

Joseph E. Henderson, 5422 Spahn Ave., Lakewood, Calif. 90713

Filed Dec. 30, 1976, Ser. No. 755,801
Int. Cl.[2] B41F 27/12, 27/14
U.S. Cl. 101—415.1 4 Claims



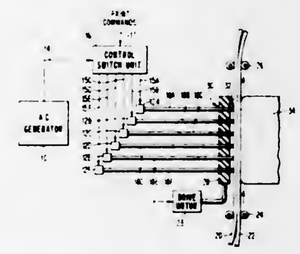
1. A work support useful for gluing flexible printing dies to a flexible sheet backing which comprises:
an elongated frame having opposite, upright end plates;
a plurality of interchangeable, elongated cylindrical work-support members with coaxial end shafts projecting from each end thereof and a longitudinal channel to receive the reverse lip of a flexible sheet material;
end shaft bearing means to mount on each of said end shafts;
cylindrical member support means comprising a pair of V-disposed bracket means on the inboard faces of each of said end plates to receive said end shaft bearing means;
driven gear means on one of said end shafts;
drive means mounted on said frame and having driving gear means carried on one of said end plates to mesh with said driven gear means.

4,046,073

ULTRASONIC TRANSFER PRINTING WITH MULTI-COPY, COLOR AND LOW AUDIBLE NOISE CAPABILITY

Joan LaVerne Mitchell, Peekskill; Keith Samuel Pennington, Somers, both of N.Y., and Frederick Hochberg, deceased, late of Yorktown Heights, N.Y. (by Lee Hochberg, administratrix), assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1976, Ser. No. 653,169
Int. Cl.[2] B41J 3/20; G01D 9/00
U.S. Cl. 101—426 29 Claims



1. An ink printing system, comprising:
ultrasonic energy generating means;
an ink-bearing medium having a back surface through which ink can be transferred upon reduction of the ink viscosity;
means for providing a paper to be printed on in contact with the back surface of said ink-bearing medium;

sonic transmission means connected to said ultrasonic energy generating means for transferring sonic energy to said ink-bearing medium, said sonic transmission means including a plurality of sonic wires or bundles having their downstream ends adapted to contact said ink-bearing medium; and

modulation means for selectively coupling the sonic energy from said ultrasonic energy generating means to said ink-bearing medium via said ends of said sonic wires or bundles;

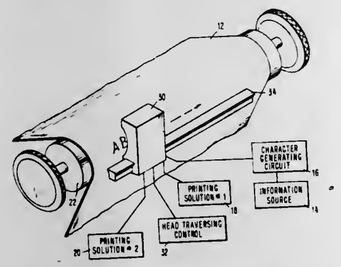
whereby ultrasonic energy applied to said ink-bearing medium causes a reduction in the viscosity of the ink due to the ultrasonic vibrations and thereby transfers the ink to said print paper.

4,046,074

NON-IMPACT PRINTING SYSTEM

Frederick Hochberg, deceased, late of Yorktown (by Lee Hochberg, administratrix), and Keith Samuel Pennington, Somers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,322
Int. Cl.² G01D *15/18*; B41M *5/20*
U.S. Cl. 101—426 **16 Claims**



1. A non-impact recording process including the forming of an energy sensitive surface on a support medium in real time with respect to said recording operation, from a plurality of materials which will produce a visible mark on said surface in response to the impingement of an external energy sources thereon, said process comprising:

forming at least two solutions from said materials with suitable solvents,

forming said solutions into a finely divided mist,

directing said mist onto the surface of said support medium with sufficient velocity to wet same and to form a composite uniform coating thereon, and

selectively exposing said coating to said external energy source to form visible images thereon immediately after forming said coating.

4,046,075

FUSEE CAP CLOSURE

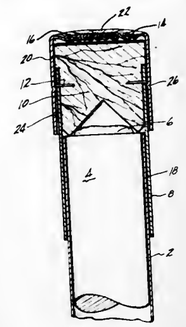
Perry Kay Spangler, Denver, Ind., assignor to Olin Corporation, New Haven, Conn.

Filed July 26, 1976, Ser. No. 708,827
Int. Cl.² F42B *4/26*
U.S. Cl. 102—37.8 **1 Claim**

1. A closure for a fusee having a cylindrical mass of pyrotechnic material encased in a main paper tube and having an end surface upon which is deposited an ignition coating of primer material, said closure comprising:

a. an open-ended paper tube telescoped over said main paper tube and extending beyond said primer-coated end surface of said pyrotechnic material, said open-ended paper tube containing a wooden insert which is secured to said open-ended paper tube and which overlies said primer-coated end surface of said pyrotechnic material, an outer end surface of said wooden insert being coated with a layer of scratch mix, and said open-ended paper tube being releasably secured to said main paper tube with an adhesive material; and

b. a paper cup having a spun-in closed end, said cup being telescoped over said open-ended paper tube with said



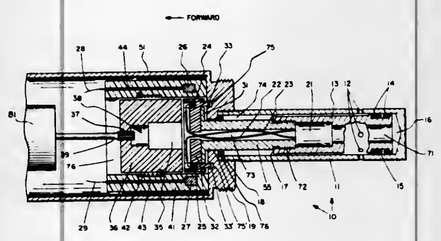
spun-in closed end overlying said layer of scratch mix, said paper cup being formed with an inwardly crimped annular pressure ring on its side wall for frictionally engaging said open-ended paper tube, and said paper cup being releasably secured to said open-ended paper tube with an adhesive material.

4,046,076

IMPULSIVE ROCKET MOTOR SAFETY-ARMING DEVICE

Thomas W. Hampton, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 29, 1975, Ser. No. 617,568
Int. Cl.² F42C *19/08*
U.S. Cl. 102—70.2 A **16 Claims**



12. An impulsive safety-arming device for enabling safe storage and handling as well as for providing reliable ignition of a rocket motor, comprising:

a gas generator;

a container surrounding said gas generator for containing gas produced by said gas generator; and

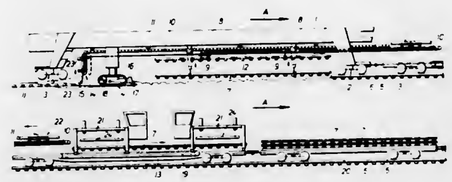
condition responsive means associated with said container for causing said container to fail to contain said gas in response to predetermined conditions.

4,046,077

TRACK RENEWAL METHOD AND APPARATUS

Josef Theurer, Vienna, and Manfred Brunninger, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed July 2, 1976, Ser. No. 702,031
Claims priority, application Australia, July 11, 1975, 5389/75
Int. Cl.² E01B *29/02*
U.S. Cl. 104—2 **6 Claims**



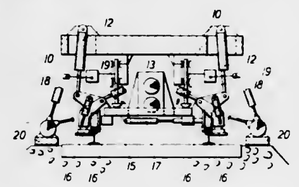
2. A track renewal train for replacing a track consisting of old ties and rails with a track consisting of new ties and rails resting on a ballast bed, comprising a plurality of rail freight cars including a last freight car movable in a working direction over the track consisting of old ties and rails, new ties being stored on selected ones of the freight cars, a bridge-like car coupled to the last freight car and having at respective ends thereof a rail-bound front undercarriage and a rail-bound rear undercarriage, a bogie running on the ballast bed intermediate the rail-bound undercarriages, the bridge-like car being supported with the front undercarriage on the track consisting of old ties and rails and with the bogie on the ballast bed, means on the bridge-like car between the bogie and the front undercarriage for lifting a section of track consisting of old ties and rails off the ballast bed, means for transporting the lifted track section in the working direction from the bridge-like car to a selected one of the freight cars, an endless conveyor means mounted on the bridge-like car above the track section transporting means for conveying a succession of stored new ties against the working direction, the endless conveyor means having a front end projecting forwardly of the bridge-like car over the last freight car and a rear end extending to a region between the bogie and the rear undercarriage, means mounted in said region on the bridge-like car for lowering the conveyed new ties successively onto the ballast bed in selected spacing, and means for planing the ballast bed before the new ties are laid.

4,046,078

TRACK SURFACING APPARATUS

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Continuation-in-part of Ser. No. 644,638, Dec. 29, 1975. This application Jan. 26, 1976, Ser. No. 652,475
Claims priority, application Austria, Jan. 31, 1975, 738/75; Mar. 5, 1975, 1716/75
Int. Cl.² E01B *27/17, 29/04*
U.S. Cl. 104—7 R **10 Claims**



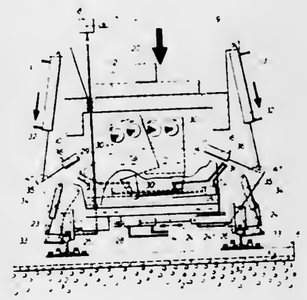
1. In a mobile apparatus for compacting ballast of a ballast bed supporting a track consisting of two rails fastened to ties resting on the ballast, each rail having a rail head with an upper surface and a side face, the apparatus comprising means for determining a deviation of the track position from a desired level: at least two track stabilization units spaced from each other in the direction of track elongation, each unit including a chassis mounted for mobility on the track on two undercarriages spaced from each other in the direction of track elongation, each undercarriage having rail engaging and guiding means associated with each of the rails, said means comprising rollers engaging the upper surfaces of the rail heads and guide elements engaging the side faces of the rail heads and cooperating with the rollers, means for imparting at least approximately horizontal vibrations to a section of the track engaged by the rail engaging and guiding means, the vibration imparting means including the rails engaging and guiding means and a vibration producing means arranged on the chassis, means associated with the rail engaging and guiding means for simultaneously laterally pressing the guiding elements associated with each rail without play against the rail with which they are associated, the pressing means and the vibration producing means being arranged on the chassis for vibration in unison whereby the rail engaging and guiding means transmit the vibration to the track section, and load means in the region of the vibration imparting means for imparting a pressure to both rails of the track in the direction of the ballast bed whereby the track is pressed to a lower level.

4,046,079

TRACK SURFACING APPARATUS

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Dec. 29, 1975, Ser. No. 644,638
Claims priority, application Austria, Jan. 31, 1975, 738/75
Int. Cl.² E01B *27/17*
U.S. Cl. 104—7 R **22 Claims**



1. In a mobile apparatus for compacting ballast of a ballast bed supporting a track consisting of two rails fastened to ties resting on the ballast, which comprises means for determining a deviation of the track position from a desired level, a chassis having a pair of rail engaging and guiding means spaced in the direction of track elongation and associated with each of the rails and mounting the chassis for mobility on the track, means for imparting at least approximately horizontal vibrations to a section of the track engaged by the rail engaging and guiding means, the vibration imparting means being a vibration producing means arranged on the chassis, and load means in the region of, and associated with, the vibration imparting means for imparting a pressure to both rails of the track in the direction of the ballast bed whereby the track is pressed to a lower level while being vibrated, the improvement of the vibration imparting and load means being associated with the rail engaging and guiding means for simultaneously laterally vibrating and vertically loading each of the rail engaging and guiding means, and further comprising means for pressing the rail engaging and guiding means associated with each rail without play with respect to the chassis and against the rail with which

it is associated, the load and the vibration producing means being arranged on the chassis to load and vibrate the rail engaging and guiding means in unison whereby the rail engaging and guiding means transmit the vibration and load to the track section.

4,046,080

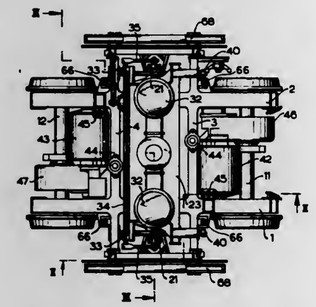
MOTORIZED SWIVELING STREETCAR TRUCKS

Hans Dieling, Rheinda, and Manfred Schindelhutte, Calden, both of Germany, assignors to Wegmann & Co., Kassel, Germany

Continuation-in-part of Ser. No. 496,243, Aug. 9, 1974, abandoned, which is a continuation of Ser. No. 368,379, June 8, 1973, Pat. No. 3,830,166. This application Mar. 18, 1975, Ser. No. 559,456

Int. Cl.² B61C 3/00, 15/00; B61F 3/04, 5/24

U.S. Cl. 105—133 8 Claims



1. A motor powered swivel truck for rail vehicles, especially for streetcars, comprising a welded swivel truck frame having a pair of wheel axles, a cradle frame, a spring system and a sway stabilizing means

A. Said swivel truck frame comprising two longitudinal members, the middle portion of each being disposed at a level below the end portions thereof and having an open profile, the end portions thereof having a closed profile, a pair of cross members welded to said longitudinal member within the wheel axles to define a quadrangle where the middle portions of the longitudinal members have the lower leve, said longitudinal members having an upper flange extending laterally thereof and running longitudinally, said flange being bent downwardly, said cross members having a laterally extending lower flange, said cross members being welded to the upper flange of the middle portion of said longitudinal members within said quadrangle through a stiffening sheet, said stiffening sheet being welded to said upper and lower flanges;

B. The end portions of said longitudinal members having recesses for receiving wheel bearings;

C. Said spring system disposed between said swivel truck frame and said cradle frame and comprising a pair of coil springs, one on each side of said truck;

D. Said sway stabilizing means comprising a torsion rod disposed rotatably at said cradle frame transversely of the direction of travel of said truck, the ends of which are connected to horizontally disposed levers rigidly mounted, said horizontally disposed levers each having a free end, said free ends each connected to a vertical member, said vertical member connected to said swivel truck frame;

E. Said cradle frame comprising a central receiver for receiving a connector attached to a car body, a pair of electric motors having output shafts, said motor disposed on said cradle such that said output shafts are parallel to the wheel axles, the housings for said motor suspended on one side on a longitudinal member.

4,046,081

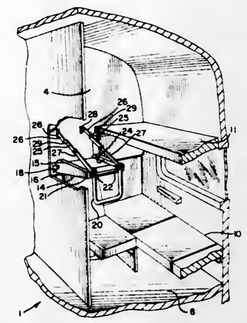
HEADREST LADDER

Jack E. Gutridge, Dyer; Keith J. Hallam, Merrillville, and Ronald W. Marsh, Michigan City, all of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Aug. 23, 1976, Ser. No. 716,728

Int. Cl.² B61D 1/08, 31/00

U.S. Cl. 105—326 5 Claims



1. A sleeping compartment in a passenger vehicle including an outer wall, longitudinally spaced laterally partition walls, an upper bed connected to one of said walls for movement from a stored to a horizontal position, a passenger seat proximate to said bed, and an improved headrest associated with said seat adapted to selectively provide a seat headrest and passenger access ladder and step,

said headrest having upper and lower edge portions and a rigid back portion,

hinge means pivotally coupling said lower edge portion to an associated wall to accommodate movement of the headrest from a generally vertical position to an essentially horizontal load supporting position,

upper support means coupling said upper edge portion and said associated wall in load supporting relation, and

a ladder having an inner end section pivotally coupled to said upper edge portion and an outer end section movable thereabout; whereby,

when the headrest is in the vertical position the ladder is stowably interposed between the back portion and the associated wall, and when the headrest is in the horizontal position the ladder depends vertically therefrom.

4,046,082

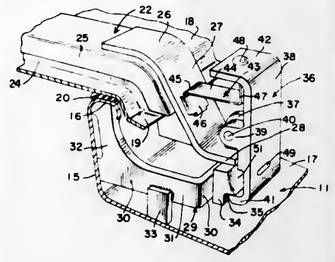
TROUGH HATCH LOCKING DEVICE

George A. Tedesco, and Marvin Stark, both of Michigan City, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed July 14, 1975, Ser. No. 595,818

Int. Cl.² B61D 39/00

U.S. Cl. 105—377 9 Claims



1. A locking device for use in a railway hopper car having a roof with a hatch opening defined by an upstanding coaming, the improvement comprising:

hatch cover means movable to an open position at one side of the opening and to a closed position over the opening;

resilient means interposed between the coaming and the hatch cover means for biasing the hatch cover means upwardly in the closed position thereof;

hold-down means adapted to move pivotally between locked and unlocked positions with respect to said hatch cover means;

locking means pivotally attached about a generally horizontal axis to said hold-down means for positioning in the locked position of the hold-down means overlapping the hatch cover means at one side of the hatch cover means;

said locking means comprising an upper footengageable portion, and a lower keeper finger;

keeper lug means mounted on the roof beneath said locking means and having means engageable with the keeper finger to secure the hold-down means attendant to said hold-down means being positioned in locking position;

said keeper finger adapted to be disposed beneath said keeper lug means and said resilient means biasing said lug means and keeper finger into engaged position; and

said locking means being movable downwardly with said hold-down means upon said foot portion being depressed against the resistance of said resilient means to release said finger from said keeper lug.

4,046,083

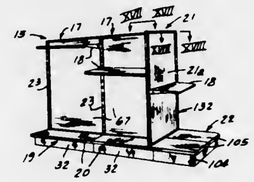
MERCHANDISE DISPLAY SHELVING ASSEMBLY

Robert N. Murdoch, Palatine; Vincent M. Travaglio, Rolling Meadows, and Michael L. Magnifico, Chicago, all of Ill., assignors to Emhart Corporation, Farmington, Conn.

Filed Apr. 5, 1976, Ser. No. 673,694

Int. Cl.² A47B 9/00

U.S. Cl. 108—107 45 Claims



1. A merchandise display shelving assembly, comprising:

base means;

upright shelf-carrying structure supported by said base means and including spaced hollow vertical posts each having at least one vertically elongated flat face panel bar providing a shelf-supporting face for the post, said bar being of substantial thickness and having vertical opposite side edges of substantial width and a series of vertically spaced shelf bracket connection apertures intermediate said edges, a pair of substantially coextensive vertical opposite sides of relatively thin gauge material having body portions engaged with said panel bar along said side edges and spaced apart by the width of said panel bar, and means securing said side edges in edgewise abutment against said body portions;

connecting and stabilizing means extending between said posts;

and means on at least one of said side body portions of each post for attaching said connecting and stabilizing means to and between the posts.

4,046,084

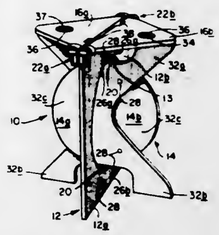
FOLDING STOOL AND TABLE

Charles D. Hosford, and Barry Simpson, both of Dirt Road Rural Delivery 1, Box 122, Waitsfield, Vt. 05673

Filed Feb. 22, 1977, Ser. No. 770,707

Int. Cl.² A47B 3/00; F16M 11/38

U.S. Cl. 108—112 11 Claims



1. An article of folding furniture comprising

A. a first upstanding leg structure made of rigid sheet material and having parallel top and bottom edges,

B. means defining a central opening in the first structure,

C. a second upstanding leg structure made of rigid sheet material and with parallel top and bottom edges, said second structure being positioned in said opening with the vertical axes of the two leg structures coinciding and with opposite side edges of the second structure being disposed on opposite sides of the first structure,

D. means for pivotally connecting the two structures at their vertical axes so that the two structures are pivotable relative to one another about said axes from an open position wherein the two leg structures are disposed at right angles to one another to a closed position wherein the two leg structures are more or less flush against one another,

E. a pair of similar platform sections made of rigid sheet material, and

F. means for hinging corresponding edges of the platform sections to the upper edge of the first leg structure so that the platform sections are swingable from an open, generally horizontal position wherein they are engaged and supported by edges of the second leg structure to a folded position wherein they are disposed flush against one another directly above the leg structures when said structures are in their folded position whereby the leg structures and platform sections form a relatively flat, compact package.

4,046,085

METHOD AND APPARATUS FOR TREATING WASTE MATERIAL IN A COUNTER-CURRENT INCINERATOR

Louis T. Barry, Skillman, and Gordon W. Clop, Garfield, both of N.J., assignors to Nichols Engineering & Research Corporation, Belle Mead, N.J.

Filed July 19, 1976, Ser. No. 706,616

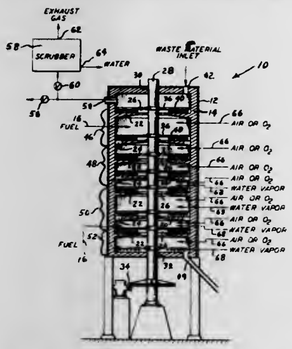
Int. Cl.² F23G 5/04

U.S. Cl. 110—12 8 Claims

1. A method of treating waste material in a counter-flow furnace wherein the waste material to be treated is introduced at one end thereof and the treated material is discharged from the other end thereof, while simultaneously the gases of combustion are caused to flow in counter-current direction with respect to the material being processed and are exhausted at said one end of the furnace, and wherein the furnace has a natural tendency to form zones of processing including sequentially from said one end of the furnace, a drying zone, a charring and volatile burning zone, a fixed carbon burning zone, and an ash cooling zone, said method further comprising the step of adding an oxidant including water vaor to the fixed carbon burning zone.

8. Apparatus for treating waste material comprising, in com-

bination, a multiple hearth furnace having a plurality of vertically spaced hearths, a rotatable center shaft extending through the center of the furanace and passing through each hearth, a plurality of spaced rabble arms secured to the center shaft and extending radially outwardly over each hearth, alternate hearths having drop holes disposed towards the center shaft and the other hearths having drop holes disposed toward the outer periphery thereof, said furanace having an upper



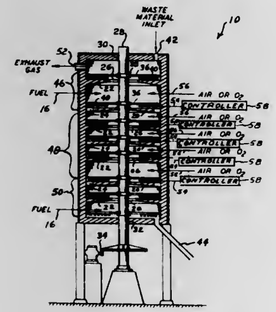
material inlet and a lower material dispensing outlet, and said furnace having an upper exhaust gas outlet, said furnace having a natural tendency to form zones of processing including sequentially from the top thereof to the bottom, a drying zone, a charring and volatile burning zone, a fixed carbon burning zone and an ash cooling zone, and means for adding an oxidant including air and water vapor to the fixed carbon burning zone.

4,046,086

TREATMENT OF WASTE MATERIAL CONTAINING ALKALI METALS IN A CONTROLLED ATMOSPHERE FURNACE

Charles F. von Dreusche, Jr., Ramsey, N.J., assignor to Nichols Engineering & Research Corporation, Belle Mead, N.J.

Filed July 19, 1976, Ser. No. 706,638
Int. Cl.² F23G 5/04
U.S. Cl. 110—12 **10 Claims**



1. A method of treating waste material containing alkali metals in a counter-flow furnace wherein waste material to be processed is introduced at one end thereof and the processed material is discharged from the other end thereof, while simultaneously air is introduced and the gases of combustion are caused to flow in counter-current direction with respect to the material being processed and are exhausted at said one end of the furnace, and wherein the furnace has a natural tendency to form zones of processing including sequentially from said one end of the furnace, a drying zone, a charring and volatile burning zone, and a fixed carbon burning zone, said method further comprising the step of maintaining a maximum temperature in the furnace below about 1400° F. directly adjacent the surface of the bed of material being processed.

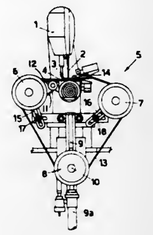
9. Apparatus for treating waste material containing alkali metals comprising, in combination, a multiple hearth furnace having a plurality of vertically spaced hearths, a rotatable center shaft extending through the center of the furnace and passing through each hearth, a plurality of spaced rabble arms secured to the center shaft and extending radially outwardly over each hearth, alternate hearths having drop holes disposed towards the center shaft and the other hearths having drop holes disposed toward the outer periphery thereof, said furnace having an upper material inlet and a lower material dispensing outlet, and said furnace having an upper exhaust gas outlet, means disposed on successive hearths in said furnace for ascertaining the temperature at each hearth and means for maintaining a maximum temperature on that hearth below about 1400° F.

4,046,087

AUTOMATIC APPARATUS FOR CONJOINTLY SEWING TWO ELASTIC CLOTHS HAVING DIFFERENT ELASTICITY

Orlando Manetti, Valdobbiadene, Italy, assignor to Sigismondo Piva S.p.A., Milan, Italy

Filed Apr. 7, 1975, Ser. No. 565,948
Int. Cl.² D05B 21/00
U.S. Cl. 112—121.15 **10 Claims**



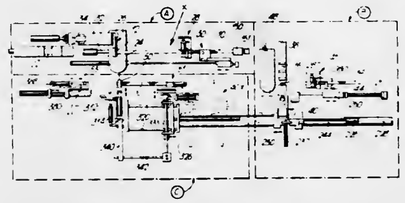
1. An automatic apparatus for conjointly sewing two elastic cloths having a different elasticity, the cloth with a lower elasticity having a substantially annular contour, the sewing of said cloths occurring through a sewing cycle defined by substantially 360° of said annular cloth of lower elasticity, said apparatus comprising a sewing machine having a working table and a rotating member, said sewing machine having a sewing area including a sewing needle, said apparatus further comprising supporting and feeding means for the cloths to be joined on the working table of the sewing machine, said supporting and feeding means comprising a plurality of pulleys, one of which is connected to said rotating member of the sewing machine, said pulleys each having a conical portion and a cylindrical portion operable to support said cloths in overlapping position to be sewn and being positioned in a plane which is perpendicular to the working table of the sewing machine, the axis of one of the pulleys not connected to the rotating member of the sewing machine being defined by a shaft adjustable in its position relative to the other pulleys whereby the center distance between said one pulley and the other pulleys is adjustable, said shaft being fastenable in any of its positions; positioning means for positioning said cloth within the sewing area; and discharging means for automatically discharging the finished pieces formed by the two joined cloths.

4,046,088

APPARATUS FOR SEWING RINGS, BUCKLES AND THE LIKE ELEMENTS ONTO TAPE

John R. Asel, Lorraine; Roger Allaire, St. Leonard; Peter Thalmann, Lachine, and Réne Castonguay, Montreal, all of Canada, assignors to Canadian Lady-Canadelle Inc., W. Montreal, Canada

Filed Apr. 22, 1976, Ser. No. 679,425
Claims priority, application United Kingdom, May 14, 1975, 20441/75
Int. Cl.² D05B 3/12
U.S. Cl. 112—265 **15 Claims**



1. A device for holding an element such as a ring, buckle, or the like while said element is being sewn onto a tape by a sewing machine equipped with a sewing foot and bed capable of moving a tape clamped therebetween through a predetermined path to sew a non-linear seam across the tape, said device comprising a main body part and a holding part, said holding part having clamping means for said element, said body part being movable to suitably position said holding part firstly in a receiving position to receive said element from a supply source and secondly in a sewing position in which said element is disposed adjacent said foot and bed of the sewing machine and so positioned that after threading of said tape through said element parts of said tape adjacent said element may be clamped between said foot and said bed for sewing, and said holding part and said body part having inter-engaging sliding surfaces for movement of said holding part relative to the body part in a plane parallel to those parts of the tape clamped by said foot and bed when the body part is in said sewing position, said body part including releasable locking means for locking said holding part firmly in said body part during transfer of an element from said supply source to said holding part and during movement of said device to the sewing position, said locking means being releasable when the device is in the sewing position so that the holding part is free to move with the tape being sewn which is moved through said predetermined path by the sewing foot and bed.

4,046,089

MACHINE FOR MAKING SHOULDER STRAPS

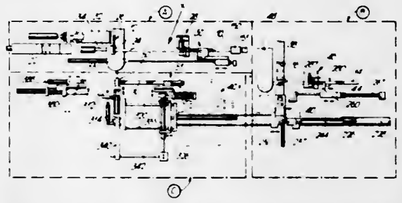
John R. Asel, Lorraine; Roger Allaire, St. Leonard; Peter Thalmann, Lachine, and Rene Castonguay, Montreal, all of Canada, assignors to Canadian Lady-Canadelle Inc., W. Montreal, Canada

Filed Apr. 22, 1976, Ser. No. 679,424
Claims priority, application United Kingdom, May 14, 1975, 20441/75
Int. Cl.² D05B 3/12
U.S. Cl. 112—265 **19 Claims**

1. Apparatus for forming a strap of the type having first and second strap portions united together, the first strap portion being a first tape with a free end and a buckle end with a two-slot buckle attached thereto, the second strap portion being a second tape with a ring attached to one end thereof, including means for uniting the first and second strap portions which means comprise:

a first clamping device for holding the buckle end of the first strap portion with the buckle disposed substantially perpendicular to the end part of the first strap portion adjacent said buckle,

a second clamping device having a narrow projecting end for holding the free end of the first strap portion and being suitably dimensioned for inserting this free end through the ring of the second strap portion and also into a first slot of the buckle,



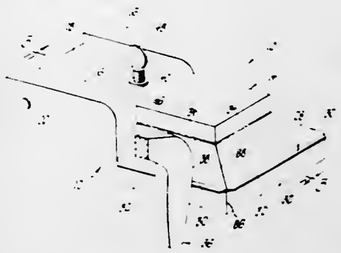
means for causing relative movement of said clamping devices between an initial position in which the free end of the first strap portion is suitably orientated for receiving the ring, and a final position in which the said free end is inserted into said first slot in said buckle.

4,046,090

APPARATUS AND METHOD FOR MAKING DECORATIVE TILES

Thomas W. Capeling, 1295 N. Wayne Road, and Robert G. Lovins, 470 Hickory Lane, both of Westland, Mich. 48185

Filed July 12, 1976, Ser. No. 704,587
Int. Cl.² B21D 53/44, 19/00
U.S. Cl. 113—1 K **8 Claims**



7. A method for fabricating decorative tiles from container cans comprising: positioning a flattened can portion of a generally rectangular shape between rectangular clamping surfaces of two clamp members having respective sets of three edge surfaces one set of which is perpendicular to the associated clamping surface and the other set of which extends inwardly with respect to the perpendicular edge surfaces; moving the clamp members to a closed position to clamp the can portion between the clamping surfaces thereof with three edges of the can portion projecting outwardly from between the edge surfaces of the clamp members; and bending the three outwardly projecting can portion edges away from the inwardly extending edge surfaces toward the perpendicular edge surfaces to provide reinforcing edge flanges.

4,046,091

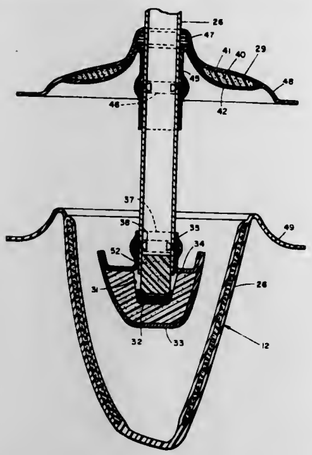
METHOD AND APPARATUS FOR SECURING PYLON AND DECK TO THE HULL OF A SAILING VESSEL

James Arthur Lomas, III, Dana Point; Ronald La Verne Lee, Anaheim, and Andrew Macdonald Holland, Capistrano, all of Calif., assignors to Coast Catamaran Corporation, Irvine, Calif.

Filed Oct. 12, 1976, Ser. No. 731,661
Int. Cl.² B63H 9/06
U.S. Cl. 114—39 **5 Claims**

1. In a method of securing a pylon and a deck to the hull of

a sailboat, the pylon being a hollow tubular element, the steps comprising inserting a core into said pylon so that it extends at least partially outwardly from the distal end thereof; inserting glue into a well in a pylon shoe adapted to receive said pylon; and then assembling said pylon and deck and shoe to said hull



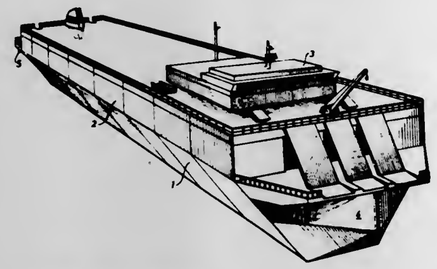
so that the glue in said well is forced by said core into the space between the sidewall of said well and the outer surface of said pylon, and said core is displaced telescopically into said pylon to exert a constant, controlled force for urging said shoe into engagement with said hull.

4,046,092

SHIP'S HULL

Bengt Wilhelm Törnqvist, Hovslagargatan 5 B, 111 48 Stockholm, Sweden

Filed Mar. 29, 1976, Ser. No. 671,735
Claims priority, application Sweden, Apr. 30, 1975, 7505103
Int. Cl.² B63B *1/04*
U.S. Cl. 114—56 5 Claims



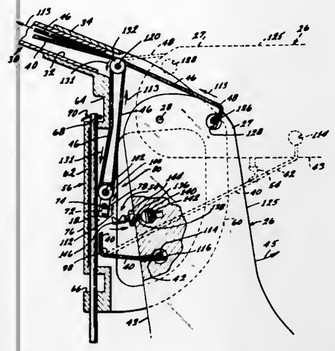
1. A displacement ship for the transport selectively of low and high density cargo comprising: a hull which is substantially uniformly trapezoidal in cross-section and extends between stem and stern of the ship, said hull having downwardly and inwardly inclined side walls forming an angle of from 35° to 55° with the horizontal; a main deck surmounting said hull and coextensive lengthwise therewith, said side walls of the hull extending upwardly above the design water line of the ship a distance at least equal to one-fourth the height of the hull and terminating at said main deck; and at least one additional cargo deck coextensive in length and width with said main deck and positioned thereabove.

4,046,093

KICKUP RUDDER APPARATUS HAVING ADJUSTABLE RAKE

Geoffrey C. Prindle, Dana Point, and J. Sterling Santley, South Laguna, both of Calif., assignors to Surfglas, Inc., Santa Ana, Calif.

Filed Feb. 17, 1976, Ser. No. 658,285
Int. Cl.² B63H *25/06*
U.S. Cl. 114—165 5 Claims



1. In a kickup rudder apparatus including a rudder, the improvement comprises:

means for adjusting the rake of said rudder including a spring-loaded detent engageable by an adjustable lock, said detent including a rod slidably mounted in a slot and springs biasing said rod to one end of said slot, said lock comprising a threaded bolt; and

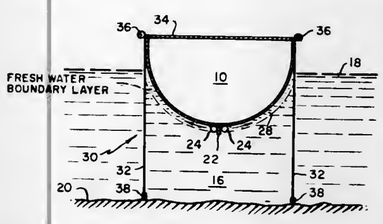
means connected to said detent for manually moving it out of engagement with said lock, said detent releasing said lock when said rudder engages a fixed object, whereby said rudder will kickup.

4,046,094

ANTIFOULING SYSTEM FOR ACTIVE SHIPS AT REST

Herman S. Preiser, 2 Revell Road, Severna Park, Md. 21146, and Arthur Ticker, 12117 Maddox Lane, Bowie, Md. 20715

Filed May 3, 1976, Ser. No. 682,889
Int. Cl.² B63B *29/00*
U.S. Cl. 114—222 7 Claims



1. A system for discouraging and inhibiting the growth of the entire marine fouling community onto a ship's underwater hull surface comprising:

means for providing a thin boundary layer of water along the underwater hull surface of low enough salinity to inhibit a portion of the marine fouling community; and

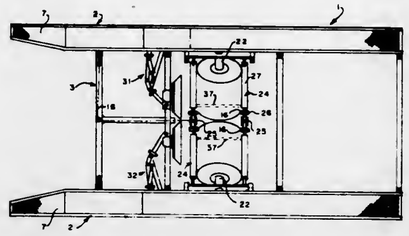
means for excluding all light from underwater hull surface to inhibit another portion of the marine fouling community to thereby inhibit the growth of the entire fouling community.

4,046,095

MARINE VESSEL SCRUBBING DEVICE AND METHOD

Don G. Fike, 16 Town & Campus Apts., Fulton, Mo. 65251

Continuation-in-part of Ser. No. 630,807, Nov. 11, 1975, Pat. No. 4,007,701. This application May 24, 1976, Ser. No. 689,136
Int. Cl.² B63B *59/00*
U.S. Cl. 114—222 4 Claims



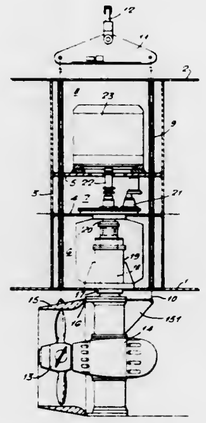
1. In a marine vessel hull cleaning device wherein a floating platform has spaced ways between which a vessel to be cleaned passes lengthwise, the improvement comprising hull scrubbing brushes mounted for rotation on axes generally perpendicular to the long axis of the vessel and at least one transom scrubbing brush supported from said platform, means for moving said transom scrubbing brush clear of the path of said vessel when said vessel moves between said ways, means for moving said transom scrubbing brush into transom engaging position, means for holding said vessel in engagement with said transom scrubbing brush, said holding means comprising means for rotating said hull brushes in a direction such that the engagement of said brushes with the hull of the vessel acts to bias the vessel astern, and means for moving the vessel up and down with respect to said transom scrubbing brushes while the said transom of said vessel is held in engagement with said transom scrubbing brushes.

4,046,096

VESSEL PROPULSION AND/OR STEERING MEANS

Anders Marius Lianes, Alesund, Norway, assignor to A.M. Lianes A/S, Alesund, Norway

Filed June 15, 1976, Ser. No. 696,369
Claims priority, application Norway, June 18, 1975, 752167
Int. Cl.² B63H *25/46*
U.S. Cl. 115—35 5 Claims



1. Structure for mounting a propulsion and steering apparatus in a vessel, comprising:

a stationary vertical sleeve member mounted within a sealed chamber in the vessel;

an intermediary sleeve member mounted for axial displacement within said stationary sleeve member;

a rotatable hollow steering column mounted within said intermediary sleeve member and extending outside said chamber underneath a submerged portion of said vessel and including at its lower end a nozzle structure mounted thereon for supporting a propeller and gear housing;

flange connection means including first and second flange members, said first flange member being mounted to the upper end of said rotatable steering column and including a ring member, said first and second flange members releasably engaging one another;

a separable shaft interconnecting said gear housing to a motor and extending through said rotatable steering column and said first and second flange members;

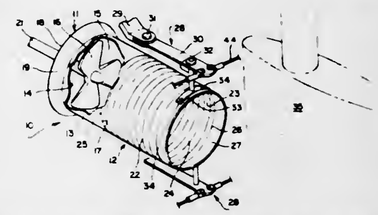
means for releasably locking said intermediary sleeve to said stationary sleeve member, whereby disconnection of said first and second flange members enables said first flange member, said shaft and said rotatable steering column to be lowered within said intermediary sleeve such that said ring member rests on the upper portion thereof adjacent said upper end of said rotatable steering column, and removal of said releasable locking means enables said intermediary sleeve, a portion of said separable shaft and said rotatable steering column to be lowered axially within said stationary vertical sleeve member.

4,046,097

COLLAR FOR REDIRECTING PROPELLER ENERGY

Arthur Charles Hornung, 3143 8th St., Boulder, Colo. 80302

Filed July 19, 1976, Ser. No. 706,830
Int. Cl.² B63H *5/14*
U.S. Cl. 115—42 3 Claims



1. A collar for redirecting propeller energy from propeller blades of a propeller driving a watercraft to prevent water from slipping off the ends of the propeller blades so as to maximize the efficiency of the propeller, the invention intended to be used with a propeller of a watercraft and comprising, in combination:

a rigid collar, cylindrical in configuration, consisting of opposed outside and inside surfaces to form a hollow interior along its length, a rear surface, and a front surface with a diameter larger than the diameter of said rear surface to form a larger opening at said front surface than at said rear surface;

a screen covering the entire opening formed by said front surface and provided with a round through hole in its center to allow free passage therethrough of a propeller shaft so as to permit the positioning of the propeller blades within the collar hollow interior;

said rigid collar assembled to a watercraft by securely affixing said front surface of said rigid collar to that portion of a watercraft from which the propeller projects, said front surface being secured thereto in a rigid manner in any conventional way so as to allow free passage of water therethrough; and

a flexible extension connected to said rigid collar, said flexible extension consisting of opposed outside and inside surfaces to form a hollow interior along the length of said

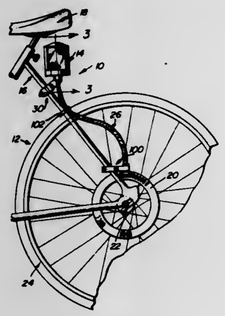
flexible extension with an inside diameter identical to the inside diameter of said hollow interior within said rigid collar, opposed front and rear surfaces with a rigid ring of the same diameter as said flexible extension conjoining said rear surface, wherein further said front surface of the flexible extension conjoins the rear surface of said rigid collar in any conventional way, with said ring similarly conjoining said rear surface of the flexible extension.

4,046,098

ROTATABLE MULTI-SURFACE REFLECTORS FOR BICYCLES

Ralph A. Mancinelli, 23025 Hayes St., East Detroit, Mich. 48021, and Anthony R. Mancinelli, 39330 Donahue Drive, Mount Clemens, Mich. 48043

Filed June 17, 1976, Ser. No. 696,844
Int. Cl.² B60Q *1/30*
U.S. Cl. 116—56 **9 Claims**



1. A rotatable multi-surface reflector for bicycles, and similar vehicles, comprising, in combination:
   A. a rotatable reflector assembly mounted on a vehicle;
   B. transmission means mounted on a wheel of the vehicle for moving the reflector assembly as a function of an angular speed of the wheel; and
   C. connecting means attached to the reflector assembly and to the transmission means for operably connecting the transmission means to the reflector assembly; with the rotatable reflector assembly including, in combination:
   1. a base;
   2. bracket means attached to the base for mounting the base on the vehicle;
   3. reflector means rotatably mounted on the base; and
   4. motion converter means mounted on the base and connected to the connecting means and to the reflector means for imparting an irregular motion to the reflector means.

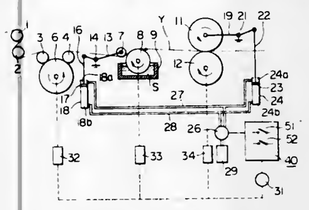
4,046,099

APPARATUS FOR SIZING A YARN SHEET

Tokuji Komatsu, Kanazawa, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Japan

Filed Nov. 13, 1975, Ser. No. 631,730
Claims priority, application Japan, May 16, 1975, 50-64392
Int. Cl.² B05C *1/08*
U.S. Cl. 118—6 **12 Claims**

1. Apparatus for sizing a yarn sheet comprising, in combination, a rotary feed roller of said yarn sheet a size bath, a rotary sizing roller partly immersed in said size bath, first means for placing said yarn sheet in pressure contact with said sizing roller in the area not immersed in said size bath, a rotary squeeze roller for forming a nip for said yarn sheet in cooperation with a bottom roller, second means for placing said squeeze roller in pressure contact with said bottom roller, a drive motor mechanically coupled to said feed, sizing and bottom rollers, means for simultaneously actuating operations of said first and second placing means, and an automatic control device electrically coupled to said drive motor and said actuating means and provided with stopping and starting switches, said control device comprising means operating immediately in response to actuation of said starting switch for operating said actuating means, and for initiating the operation of said drive motor following a predetermined time after actuation of said starting switch and for removing power from said drive motor immediately upon actuation of said stopping switch and for reversing the operation of said actuating means following a second predetermined time after actuation of said stopping switch, said second predetermined time being sufficient to insure that inertia running of said yarn sheet has come to a complete stop.

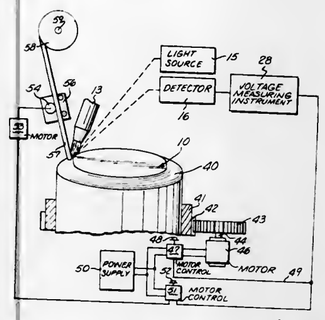


4,046,100

APPARATUS FOR THERMAL DEPOSITION OF METAL

Frederick L. Kuonen, Euclid, Ohio, and Edward M. Boughton, Palos Verdes Estates, Ohio, assignors to TRW Inc., Cleveland, Ohio

Division of Ser. No. 623,647, Oct. 20, 1975, Pat. No. 3,995,073, which is a continuation-in-part of Ser. No. 459,010, April 8, 1974, abandoned. This application Aug. 31, 1976, Ser. No. 719,284
Int. Cl.² B05C *11/00*
U.S. Cl. 118—8 **9 Claims**



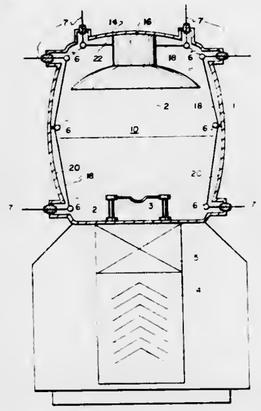
1. Apparatus for depositing metal on a surface of an article comprising,
   means for heating at least the surface of the article to a state of incipient fusion,
   means for directing a light beam at the surface during heating,
   means for detecting the light reflectively of the surface including reflectivity at the time of incipient fusion and for creating an electrical control signal from the light reflections from the surface at the time of incipient fusion of the surface,
   means for effecting deposit of the metal on the surface after incipient fusion thereof, and
   means for controlling the deposit of metal on the surface in response to said electrical control signal.

4,046,101

VACUUM APPARATUS FOR TREATING ARTICLES, PARTICULARLY A VACUUM EVAPORATOR

Otto Winkler, Balzers, Liechtenstein, assignor to Balzers Patent-und Beteiligungs-Aktiengesellschaft, Liechtenstein

Filed Sept. 20, 1976, Ser. No. 724,756
Claims priority, application Switzerland, Sept. 23, 1976, 012321/76
Int. Cl.² C23C *13/08*
U.S. Cl. 118—49.1 **3 Claims**



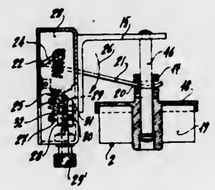
1. A vacuum apparatus for vapor deposition on articles, comprising a housing defining an interior treatment chamber with top, bottom and side walls, article support means in said chamber for supporting an article to be treated, evaporation material support means for supporting a substance to be evaporated spaced from said article support means, pump means connected to said housing for evacuating said housing chamber, a heatable vapor-deposit burner-foil material located in said chamber in spaced relationship to and shielding at least one of said walls, and support means for supporting said foil material within said chamber and for supplying electrical heating current thereto.

4,046,102

YARN PARAFFINING DEVICE

Mario Piro, Genoa, Italy, assignor to Nuova San Giorgio S.p.A., Genoa-Sestri, Italy

Filed Apr. 13, 1976, Ser. No. 676,469
Claims priority, application Italy, Apr. 14, 1975, 22307/75
Int. Cl.² B05C *11/00*
U.S. Cl. 118—78 **12 Claims**



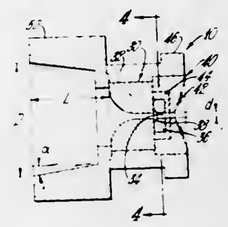
1. Apparatus for applying paraffin to a yarn filament comprising a frame, a longitudinally extending pin supportable in a fixed positional relationship to said frame, a paraffin block support member comprising a paraffin block support surrounding said longitudinally extending pin and being freely rotatable relative to the longitudinal axis of said pin, said paraffin block support being mounted for slidable movement longitudinally with respect to said pin, means for applying a force to said paraffin block support for urging said paraffin block support in a first longitudinal direction relative to said pin comprising a lever mounted for pivotal movement about a pivot axis which is fixed with respect to said pin, said lever having a portion engageable with a portion of said paraffin block support, spring means for urging said lever in a forward rotational direction about said pivot axis for applying a force couple to said lever arm for urging said paraffin block in said first longitudinal direction, said spring means including means for maintaining a substantially constant force couple about said pivot axis for all operative pivotal movements of the lever arm about said pivot axis.

4,046,103

IMPREGNATING DIE

Paul D. Yakuboff, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 29, 1976, Ser. No. 671,654
Int. Cl.² B05C *11/02, 11/10*
U.S. Cl. 118—125 **5 Claims**



1. A die comprising:
   a. a die insert having a bore with a tapered entrance, said bore tapering to a minimum inside diameter *d;* and,
   b. an inlet duct having a frustro-conical inner surface, said inlet duct opening into said bore, said surface sloping inwardly at an angle about 8°, said inlet duct having a length L, said length L being defined by the relation

$$L = rd$$

wherein *r* is a parameter having a value within the range of from about 10 to about 25, and said inlet having a maximum inside diameter D, said diameter D being defined by the relation

$$D = sd$$

wherein *s* is a parameter having a value within the range of from about 15 to about 35.

4,046,104

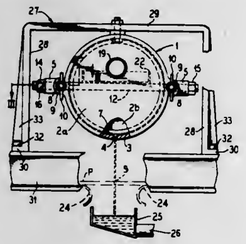
FLOW COAT HEAD FOR CURTAIN COATING MACHINES

Frank Stuhlman, Rte. 126 East, Plainfield, Ill. 60544

Filed June 22, 1976, Ser. No. 698,347
Int. Cl.² B05B *1/30*
U.S. Cl. 118—300 **13 Claims**

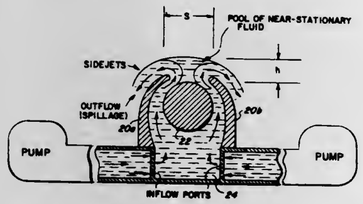
1. A flow coat head for curtain coating, particularly of sheet material, comprising a container for the coating material having a pair of end walls, and a pair of walls extending therebetween and connected to one another to form a relatively rigid body, said walls having spaced opposed edges, defining an elongated longitudinally extending slot therebetween at the bottom of the container, which slot forms the material discharge opening of the head, the end edges of at least one of said oppositely disposed walls being laterally movable, adjacent said slot, relative to the adjoining portions of said walls, said slot, in an unstressed condition of said body, having a transverse width equal to at least the maximum desired operating

width, and means engaged with said laterally movable wall for applying pressure thereon, relative to the other of said oppositely disposed walls, greater than the normal inherent rigidity



between said opposed walls, to relatively move the edges of said slot toward one another and thereby vary the effective width thereof.

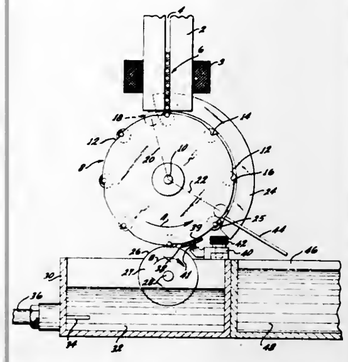
4,046,105
LAMINAR DEEP WAVE GENERATOR
Nicolas Gueco Gomez, Cerritos, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed June 16, 1975, Ser. No. 587,946
Int. Cl.² B05C *5/02*
U.S. Cl. 118—429 **6 Claims**



1. Apparatus for generating a near stationary central pool of liquid in a wave generator comprising
means for imparting a motive force to a liquid,
a first generally cylindrical support means positioned transverse to the flow of the liquid for dividing the moving flow of liquid,
a vertically disposed conduit means for constraining the flow of liquid to the shape of said first support means so as to generate first and second side jets of liquid, said conduit means being higher at the upper extremities thereof than the first support means and spaced apart from said first support means to form an opening for the outflow of said liquid, said liquid flowing out and over the sides of said conduit means due to the force of gravity, the pool of liquid formed at the center of the outflow opening being nearly stationary.

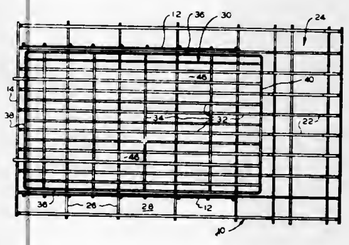
4,046,106
APPARATUS AND METHOD OF FORMING SELF-LOCKING FASTENER
James Lee Bowman, Cincinnati, Ohio, assignor to Long-Lok Fasteners Corporation, Cincinnati, Ohio
Filed May 8, 1975, Ser. No. 575,972
Int. Cl.² B05C *1/02*
U.S. Cl. 118—620 **14 Claims**

1. An apparatus for forming a self-locking patch type fastener comprising:
carrier means for moving a plurality of threaded metal fasteners along an arcuate path in a continuous manner;
clamping means associated with said carrier means to clamp said fasteners to said carrier means during said movement of the fasteners along an arcuate path;
movable resin transfer means having a fastener contact surface to transfer resin to a fastener;
said transfer means being positioned to move said contact surface into contact with a fastener as said fastener moves in an arcuate path past said transfer means while the fastener is clamped to said carrier means;
said transfer means providing movement of said contact surface along an arcuate path with the arcuate path of movement of said contact surface being substantially tangential to the arcuate path of movement of said fasteners during contact of said contact surface with a portion of the threads of a threaded fastener;
the speed and direction of movement of said contact surface relative to said carrier means during contact between said



contact surface and said fastener providing an even transfer of resin from said contact surface to a portion of the threads of said fastener to deposit a plastic patch on the portion of the fastener threads contacted by the contact surface;
said plastic patch being in intimate contact with the roots and flanks of the thread portion contacted by said contact surface;
unclamping means positioned with respect to said carrier means to unclamp said threaded fasteners after the deposit of a plastic patch on the portions of the threads of the fasteners contacted by said transfer means, and
conveyor means to convey the fasteners away from said carrier means after unclamping of the fasteners from the carrier means by said unclamping means.

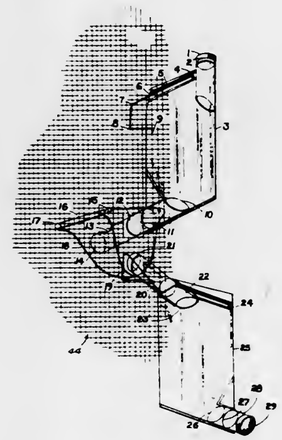
4,046,107
LAYING CAGE SUBFLOOR
Herman A. Kuster, 916 Eden Road, Camden, Mich. 48232
Filed July 14, 1976, Ser. No. 705,287
Int. Cl.² A01K *31/16*
U.S. Cl. 119—17 **9 Claims**



1. A laying cage for fowl comprising, in combination, an enclosure defined by side walls, end walls and a floor, said floor consisting of an open grate defined by a plurality of

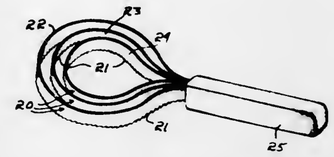
longitudinal elements affixed to a plurality of transverse elements, said longitudinal elements being transversely spaced from each other and direction of said longitudinal elements whereby said elements define openings therebetween permitting droppings to readily pass therethrough, a subfloor directly supported upon said floor, said subfloor comprising a plurality of longitudinal members affixed to a plurality of transverse members, said longitudinal members being transversely spaced from each other a distance substantially equal to the spacing between said longitudinal elements and said transverse members being spaced from each other a distance substantially equal to the spacing between said transverse elements, and means locating said subfloor upon said floor whereby said longitudinal members are disposed above and substantially equidistant between adjacent longitudinal elements and said transverse members are disposed above and substantially equidistant between adjacent transverse elements.

4,046,108
FEEDING DEVICE
Dennis Erwin Balgemann, and Michael Wong, both of 954 Cookane Ave., Elgin, Ill. 60120
Filed Feb. 12, 1976, Ser. No. 657,591
Int. Cl.² A01K *5/00*
U.S. Cl. 119—18 **3 Claims**



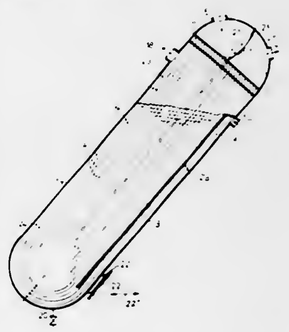
1. A feed dispenser, spillage collector and recycling device comprising a storage bag for feed having a upper sleeve and a lower sleeve, a rigid filling tube received in said upper sleeve having a closure on the outer end of said tube, a rigid feed tube received in said lower sleeve extending downwardly from said storage bag, means to support said storage bag from the wall of a cage, a dorsal opening at the lower end of said feed tube for access by a bird to feed located in said feed tube, a stiff collector chute arranged to close the lower end of said feed tube and surround said dorsal opening for catching spillage resulting from a bird removing feed from said opening, said collector chute having means for attachment to a cage wall located on the upper portion of the rear wall of said chute, perches attached to the upper edges of the front and side walls of said chute, a rigid spill return tube attached at an upper end to the lower end of said collector chute, a collector bag having an upper sleeve and a lower sleeve, said upper sleeve receiving the lower end of said spill return tube, said collector bag having a slopped bottom with a rigid emptying tube received in said lower sleeve, means to support said collector bag from the wall of a cage, closure means over the lower end of said emptying tube for periodic removal of the contents therein, thus allowing recycling of the contents, before or after winnowing, and replacement of the useable contents into said upper storage bag.

4,046,109
IMPLEMENTS FOR SUCH USES AS ANIMAL GROOMING, FISH SCALING, AND VEGETABLE GRATING
Harry R. Miller, 751 Potomska Road, and Paul A. Borba, 626 Smith Neck Road, both of South Dartmouth, Mass. 02748
Filed Feb. 27, 1975, Ser. No. 553,670
Int. Cl.² A01K *13/00*
U.S. Cl. 119—92 **3 Claims**



1. An implement such as an animal grooming, fish scaling, and vegetable grating implement, said implement including a plurality of blades of the band saw type, each blade including a loop portion and outwardly flared tail portions, one loop portion within another and its tail portions between the tail portions thereof, and a handle having a slot-shaped socket in one end receiving all of said tail portions as a force fit assembly and with the socket side walls holding said tail portion tightly compressed with their teeth in engagement with an end wall of the socket, the handle of a material that is cut by said teeth, said tail portions shaped and dimensioned to provide that the free end of the assembly may be held for free entry into the socket, the frictional resistance of said assembly to movement lengthwise of said socket increasing towards the other end of the assembly.

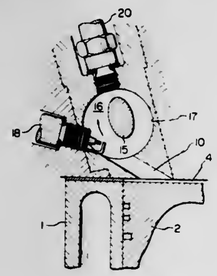
4,046,110
STEAM GENERATORS
Kurt Fritz, Klosterneuburg, and Georg Beckmann, Vienna, both of Austria, assignors to Waagner-Biro Aktiengesellschaft, Austria
Filed Apr. 24, 1975, Ser. No. 571,357
Claims priority, application Austria, Apr. 25, 1974, 3405/74
Int. Cl.² F22B *1/06*
U.S. Cl. 122—32 **6 Claims**



1. In a steam generator, an elongated vessel having opposed upper and lower ends, said vessel carrying a tube plate extending transversely across the interior of said vessel adjacent said upper end thereof and said vessel carrying in its interior above

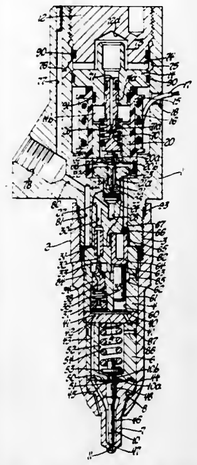
said tube plate a partition means dividing the space in said vessel above said tube plate into heating-medium receiving and discharge chambers, heating-medium supply means communicating with said heating-medium receiving chamber for supplying a fluid heating medium thereto, heating-medium discharge means communicating with said discharge chamber for discharging the heating medium therefrom, a bundle of tubes situated in said vessel and extending from said tube plate to the region of the lower end of said vessel, each of said tubes having an inlet end communicating through said tube plate with said receiving chamber and an outlet end communicating through said tube plate with said discharge chamber while each tube has a substantially U-shaped end situated at the region of said lower end of said vessel, so that the heating medium delivered to said receiving chamber flows through said inlet ends of said tubes along the interior thereof to said outlet ends thereof before reaching said discharge chamber, feedwater supply means communicating with the interior of said vessel below said tube plate for supplying to the interior of said vessel a liquid which occupies a region of the interior of said vessel situated below said tube plate to be heated by the heating medium flowing through said tubes and to be converted by the heating medium into steam, said vessel having a steam chamber situated in its interior above the liquid supplied by said feedwater supply means and defined at least in part by a lower surface of said tube plate which is directed toward said lower end of said vessel, and steam-discharge means communicating with the interior of said vessel at said steam chamber thereof for the discharging steam from said steam chamber, said vessel having a longitudinal axis with said upper end of said vessel being situated along the latter axis at an elevation higher than said lower end of said vessel, and support means supporting said vessel at an inclined attitude with said lower end of said vessel situated at an elevation lower than but out of line with said upper end of said vessel, and with said tube plate extending transversely across said axis and also being inclined with respect to a vertical plane so that on one side of said axis said tube plate is higher than at an opposite side of said axis.

4,046,111
COMBUSTION CHAMBER OF INTERNAL COMBUSTION ENGINE
Tetsuro Nagano, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Feb. 5, 1976, Ser. No. 655,474
Claims priority, application Japan, Feb. 20, 1975, 50-020330
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 SP **9 Claims**



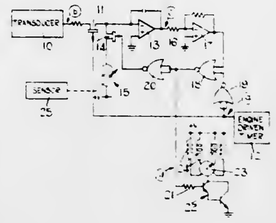
1. In a combustion chamber structure for an internal combustion engine, comprising a main combustion chamber supplied solely with air, an auxiliary combustion chamber having a fuel injection nozzle and a spark ignition device communicating therewith, a transfer passage which interconnects said main and auxiliary combustion chambers and which is substantially tangential to said auxiliary combustion chamber at its point of communication, and an obstacle positioned in said auxiliary combustion chamber so that said auxiliary combustion chamber is shaped as an annulus, said obstacle having a smooth and continuous rounded outer surface, the improvement wherein said spark ignition device communicates directly with said auxiliary combustion chamber, wherein the distance between the interior wall of the auxiliary combustion chamber and the outer surface of the obstacle varies along the periphery of the obstacle, and wherein said spark ignition device is positioned where said distance is large.

4,046,112
ELECTROMAGNETIC FUEL INJECTOR
John I. Deckard, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 20, 1975, Ser. No. 623,947
Int. Cl.² F02M *39/00*
U.S. Cl. 123—32 JV **3 Claims**



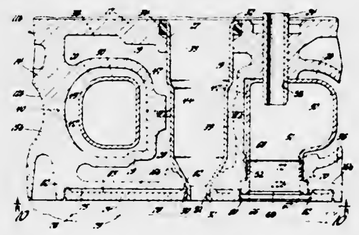
1. A fuel injector for an internal combuation engine, said fuel injector including a housing means having a spray tip outlet means at one end thereof, a spring-biased injector valve slidably mounted in said housing means for controlling flow through said spray tip outlet means, said injector valve providing with said injector housing a tip passage means in communication with said spray tip outlet means as controlled by said injector valve, said housing having an inlet port for connection to a source of high pressure fuel, a return port for connection to a low pressure fuel reservoir and, a control chamber, passage means including a check valve controlled orifice passage operatively connected at one end to said inlet port and at its other end to said tip passage and a charge orifice passage also operatively connected at one end to said inlet port and at its other end to said control chamber, a bleed return passage means including a bleed orifice connected at one end to said control chamber and at its other end to said return port, a stepped booster pump cylinder means in said housing defining a secondary pump chamber in fluid communication with said tip passage means and a primary pump chamber of larger diameter than said secondary pump chamber, a fuel charge passage means including a control orifice in communication at one end with said control chamber and at its opposite end with said primary pump chamber, a stepped piston means reciprocably received in said booster pump cylinder means and a solenoid actuated valve means positioned in said injector housing for movement between a first position to control the flow of fluid through said charge orifice passage into said control chamber for flow to said primary pump chamber while blocking flow of fluid from the said control chamber through said bleed orifice and a second position blocking flow of fluid through said charge orifice passage into said control chamber while permitting flow of fluid from said control chamber through said bleed orifice, said control orifice being of smaller size than the size of said bleed return orifice, said bleed orifice and said charge orifice passage being axially aligned in spaced apart relation to each other and, said solenoid actuated valve means including a solenoid having a movable armature supporting a retractor valve and an opposed axially aligned control valve for movement therewith relative to said bleed orifice and said charge orifice passage.

4,046,113
INTERNAL COMBUSTION ENGINE FUEL INJECTION CONTROL SYSTEM
John Howard Moore, Redditch, England, assignor to The Lucas Electrical Company Limited, Birmingham, England
Filed Feb. 5, 1976, Ser. No. 655,657
Claims priority, application United Kingdom, Feb. 12, 1975, 5884/75
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 EA **7 Claims**



1. An internal combustion engine fuel injection control system comprising a corona-discharge type air mass flow transducer, together with an injection control circuit and means sensitive to the humidity of air aspirated into the engine, said injection control circuit including a first circuit part which is responsive to the output of the transducer to generate a control signal and a second circuit part which is sensitive to said control signal and to the output of the humidity sensitive means to generate a signal dependent on the humidity of air aspirated into the engine.

4,046,114
INSULATED, HIGH EFFICIENCY, LOW HEAT REJECTION, ENGINE CYLINDER HEAD
Nahan Hamparian, Brighton, and Michael Bandrowski, Jr., Milford, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 6, 1975, Ser. No. 619,799
Int. Cl.² F01P *3/14*; F02F *1/26*; F01N *3/02*
U.S. Cl. 123—41.76 **4 Claims**



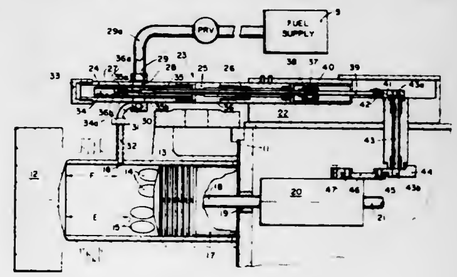
1. A cylinder head for an internal combustion engine having a lower wall adapted for mounting opposite the end of an associated engine cylinder, said head defining a coolant jacket extending along said lower wall, a recess in the outer surface of said lower wall and means defining an exhaust port extending through said coolant jacket and said lower wall within said recess,

a combined valve seat and exhaust port insert in said exhaust port and extending inwarding from said lower wall adjacent said coolant jacket, said insert having an annular ring portion seated in said lower wall and protruding therefrom into said recess and a reduced diameter tubular passage portion extending into said port and at least partially spaced therefrom to form an insulating space around the insert that is effective to limit heat transfer from exhaust gases in said insert passage portion to the adjacent cylinder head coolant jacket and

a high temperature metal alloy fire deck insert received in and substantially filling said lower wall recess, said fire deck insert having an outer surface engagable with and adapted to close the end of such associated engine cylinder and having an exhaust opening in alignment with said exhaust port and encircling the protruding end of said valve seat and port insert,

said fire deck insert including an inner surface in opposed relation to the outer surface of said lower wall recess and means separating said opposing surfaces to provide an insulating clearance between said insert and said head over a major portion of said fire deck insert inner surface, thereby limiting heat flow from the associated engine cylinder to the cylinder head coolant jacket.

4,046,115
FREE PISTON ENGINE FUEL FEEDING APPARATUS
Anton Braun, 6421 Warren Ave., Minneapolis, Minn. 55435
Filed June 16, 1975, Ser. No. 586,963
Int. Cl.² F02B *71/00*; F02D *39/10*
U.S. Cl. 123—46 R **9 Claims**

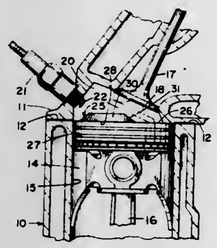


1. In a two-cycle free piston engine the combination comprising a valve body having an inlet adapted to be connected to a source of fuel and an outlet adapted to be connected to an engine cylinder, a first valve head member moveable in said body and arranged to permit or to prevent fuel flow through said body, a second valve head member moveable in said body and arranged to permit or to prevent fuel flow through said body, lost-motion connection means between said first and second valve head members and arranged to cause the combined action of said members to prevent fuel flow through said body when they both are moved by said means when said means moves in one direction and to re-arrange and to move said valve head members so as to permit fuel to flow through said body during a portion of the reverse movement of said means, and means for operably connecting said lost-motion connecting means to a portion of the engine that moves in synchronism with the engine's piston.

4,046,116
INTERNAL COMBUSTION ENGINES

William E. Burnham, 812 Riverview Drive, Leavittsburg, Ohio 44485

Filed Mar. 26, 1976, Ser. No. 670,720
Int. Cl.² F02B 75/04
U.S. Cl. 123—48 R 5 Claims



1. In an overhead valve internal combustion engine, including an engine block having at least one cylinder in which a piston is reciprocable along an upright axis between upper and lower positions, said engine also including a head connected to said block to overlie the upper end of said cylinder and to cooperate therewith to form a compression chamber, and intake and exhaust valves mounted on said head for reciprocation along respective axes, each of which is at the same acute angle to the axis of reciprocation of said piston, each of said valves having a flat head movable into said compression chamber when the valve is open, the improvement for increasing the compression ratio of said cylinder, comprising:

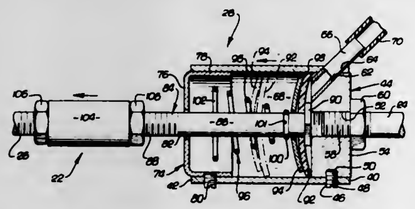
a separate metal plate adapted to be attached to the upper face of said piston, said plate being of a peripheral size to lie within the confines of the piston periphery and of a thickness to extend upwardly from said piston face a predetermined amount,

said plate having an inclined surface which, when said plate is attached to said piston, is disposed in confronting relation with said valve heads to provide adequate clearance for the latter during opening movement of respective valves.

4,046,117
VACUUM SUBJUGATED ACCELERATOR

Homer L. Brinlee, 21330 S. Vermont Ave., Torrance, Calif. 90502

Filed Jan. 2, 1976, Ser. No. 646,246
Int. Cl.² F02D 11/08; G05G 1/14
U.S. Cl. 123—103 C 4 Claims



1. A vacuum subjugated accelerator apparatus for use with an internal combustion engine interposed in control linkage between a foot accelerator and carburetor throttle for modulating the flow of gasoline to said carburetor and in turn achieving an optimum vacuum within an intake manifold of said engine for motor efficiency and gas savings comprising:

an annular housing having forward and rearward ends and a horizontal axis, said housing including an end wall closing said forward end of said housing;

a removable cap sealing said rearward end of said housing, said cap having a bore extending therethrough on the horizontal axis of said housing;

said housing, end wall and cap means, defining a vacuum chamber;

coupling means associated with said end wall receiving a portion of said control linkage extending directly to said throttle of said carburetor whereby horizontal movement of said housing will impart direct opening and closing of said throttle;

a vacuum port extending through said end wall communicating with said vacuum chamber adapted to receive tubular means extending from said intake manifold of said engine to said vacuum port to create a vacuum within said vacuum chamber;

a slidable disc rod extending from within said chamber through said bore of said cap means axially aligned on said housing axis, said disc rod coupled to a portion of said control linkage extending directly to said foot accelerator whereby foot depression of said accelerator will impart direct rearward axial movement of said slidable disc rod, said disc rod including an enlarged head portion within said vacuum chamber;

annular flexible disc seal means mounted on said slidable disc rod with the central portion of said flexible disc bearing against said enlarged head of said sic rod;

a disc plate mounted on said disc rod rearwardly of said flexible disc, said plate being dished with a periphery thereof in contact with said flexible disc biasing said flexible disc in a concave position toward said front wall;

spring means including a portion locking said disc plate against said flexible disc and additionally extending rearwardly therefrom toward said cap means;

said flexible disc seal being adapted to be further peripherally curved away from the annular interior of said housing toward said end wall when a higher vacuum is produced through said vacuum port whereby drag on said flexible disc and in turn said disc rod and linkage extending to said accelerator is created yet said disc rod and flexible disc seal being movable from said end wall toward said cap means without directly affecting the opening of said throttle and said flexible disc seal yieldably returnable to a position wherein there is partial contact between said flexible disc and said end wall in an optimum position whereby direct movement of said control linkage and vacuum subjugated accelerator means can be achieved.

4,046,118
AIR FUEL MIXTURE CONTROL APPARATUS FOR CARBURETED INTERNAL COMBUSTION ENGINES

Shigeo Aono, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 7, 1975, Ser. No. 630,043
Claims priority, application Japan, Nov. 8, 1974, 49-128612
Int. Cl.² F02B 33/00; F02M 7/00
U.S. Cl. 123—119 EC 10 Claims

1. Air-fuel mixture control apparatus for an internal combustion engine having an induction pipe and an exhaust pipe the apparatus comprising:

an air-fuel mixing chamber for delivery of a mixture of air and fuel to the induction pipe;

a source of fuel at atmospheric pressure;

fuel supply conduit means for delivery of fuel from said source to said mixing chamber;

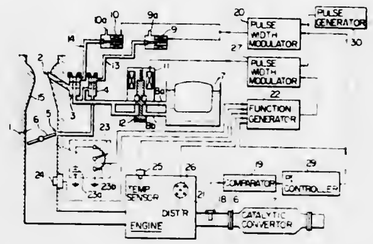
air bleed conduit means for delivery of air to said mixing chamber;

an exhaust composition sensor disposed in the exhaust pipe for detecting the concentration of a composition of the exhaust emissions from the engine to provide a concentration representative signal;

means for modulating the magnitude of the concentration representative signal in accordance with a predetermined control characteristic to generate a first error correction signal;

means for detecting an operating parameter of the engine to produce a parameter representative signal;

means for modulating the magnitude of the parameter representative signal in accordance with a predetermined characteristic as a function of the detected parameter of the engine for generating a second error correction signal;



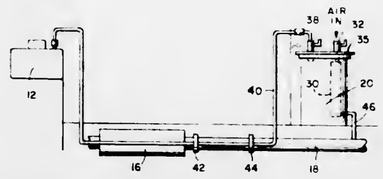
a first electromagnetic valve disposed in the air bleed conduit means to control the amount of air delivered to said mixing chamber in response to the first error correction signal; and

a second electromagnetic valve disposed in the fuel supply conduit means to control the amount of fuel delivered to said mixing chamber in response to the second error correction signal.

4,046,119
WATER VAPOR INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Frank Perry, 3295 W. 4th Ave., Hialeah, Fla. 33012

Filed Jan. 19, 1976, Ser. No. 650,363
Int. Cl.² F02M 25/06, 17/22; F02B 77/05
U.S. Cl. 123—119 A 3 Claims



1. Apparatus for injecting controlled amounts of water vapor into an internal combustion engine comprising in combination:

an internal combustion engine including an intake manifold for the introduction of a combustible gaseous mixture into the cylinders of said engine and an exhaust system for the discharge of combusted gases from said engine;

a receptacle for storing a supply of liquid water in fixed relation to said engine;

an air inlet in the upper portion of said water receptacle and first conduit means connected thereto having its air discharge end terminating at a lower level within said receptacle;

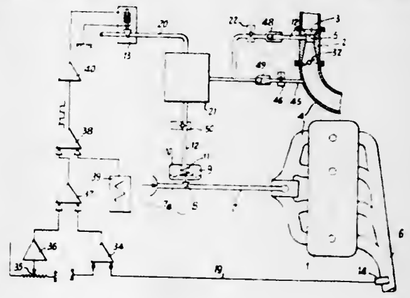
an outlet for water vapor in the upper portion of said water receptacle and second conduit means connected at one end thereto and at the other end to said intake manifold for withdrawing water vapor from said receptacle and for conducting same to said intake manifold by virtue of the suction forces created in said intake manifold;

and third conduit means connected at one end to said exhaust system and the other end extending into the discharge end of said first conduit for aspirating air from said air conduit in direct relation to the power output of the engine.

4,046,120
REGULATING SYSTEM WITH ELECTROMAGNETIC VALVE AND CONTROL VALVE

Bernard R. Laprade; Xavier J. Laprade, both of Arudy - 64 260, and Pierre J. Gele, 3, rue Vauquenat, Tarbes, all of France

Filed Sept. 11, 1975, Ser. No. 612,457
Claims priority, application France, Sept. 27, 1974, 74.32606; June 18, 1975, 75.19078
The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.
Int. Cl.² F02M 21/07
U.S. Cl. 123—120 10 Claims



1. An arrangement for correcting the proportion of the air and fuel mixture furnished to an internal combustion engine having an induction manifold containing a venturi and a butterfly valve for determining the air flow rate, and an exhaust manifold, said arrangement comprising:

means defining at least one gas inlet connected to the induction manifold downstream of the butterfly valve,

means responsive to the negative pressure prevailing at the throat of the venturi upstream of the butterfly valve for controlling flow through said gas inlet, said control means including a control valve having a preloaded diaphragm, a conduit connecting the throat of the venturi and said control valve for subjecting the diaphragm to the negative pressure at the venturi throat, and resilient return means for biasing said diaphragm, and

electric circuitry including a sensor disposed in the exhaust manifold of the engine for delivering an electric current which is variable as a function of the composition of the burnt gases, and an electromagnetic valve for modulating the negative pressure to which said diaphragm is subjected, said electromagnetic valve being regulated in response to the electric current delivered by said sensor.

4,046,121
FUEL SUPPLY DEVICES FOR INTERNAL COMBUSTION ENGINES

Michel E. Pierlot, Le Pecq, France, assignor to Societe Industrielle de Brevets et d'Etudes S.I.B.E., France

Filed July 25, 1975, Ser. No. 599,025
Claims priority, application France, Aug. 1, 1974, 74.26793
Int. Cl.² F02M 39/00
U.S. Cl. 123—139 AW 9 Claims

1. A device for supplying fuel to an internal combustion engine having an intake pipe, said device comprising:

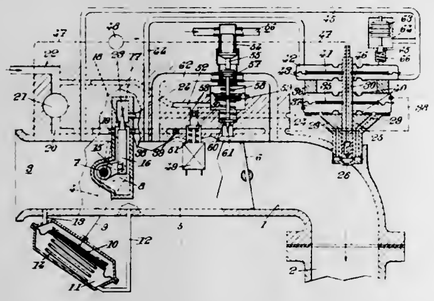
a source of fuel,

injector means for injecting fuel into the engine intake, said injector means including a fuel chamber and at least one injection orifice of adjustable cross-sectional area for fuel flow out of said chamber,

fuel conduit means receiving fuel from said fuel source and discharging fuel into said chamber,

an auxiliary throttle element located in the intake pipe of the engine and opening automatically and progressively in dependence upon the rate of engine intake air flow,

proportioning valve means disposed in said fuel conduit, said valve means being operatively connected to said auxiliary throttle element to proportion the cross-sectional area of the fuel conduit means available for fuel flow to the amount of opening of said auxiliary throttle element, and



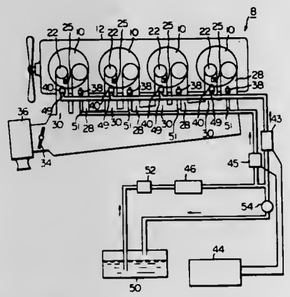
means for adjusting the cross-sectional area of said injection orifice, said adjusting means being controlled by means responsive to the amount of opening of said throttle element and by means responsive to the difference between the pressure upstream and that downstream of the auxiliary throttle element, whereby the cross-sectional area of said injection orifice is increased in proportion to the amount of opening of the auxiliary throttle element and to said pressure difference.

4,046,122

FUEL FEED CONTROL SYSTEM OF INTERNAL COMBUSTION ENGINE

Ryoichi Nakagawa, Tokyo; Shuya Nambu, Yokosuka, and Hidehiro Minami, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Division of Ser. No. 455,274, March 27, 1974, Pat. No. 3,980,058. This application Apr. 29, 1976, Ser. No. 681,376
Claims priority, application Japan, Mar. 28, 1973, 48-35444
Int. Cl.[2] F02B *19/10, 19/18*
U.S. Cl. 123—139 AW **5 Claims**



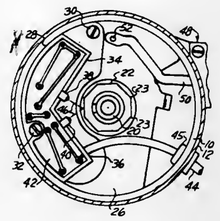
1. In a fuel supply system for supplying a predetermined amount of fuel to main combustion chambers as well as to auxiliary combustion chambers of a torch type internal combustion engine, said fuel supply system including a fuel injection pump for pumping the fuel into said main and auxiliary combustion chambers from a fuel tank; a plurality of main fuel injectors respectively mounted in a plurality of main branches which are respectively communicated with said main combustion chambers through main intake valves, said main fuel injectors being fluidly and parallelly connected to said fuel injector pump through a first common conduit; and a plurality of auxiliary fuel injectors respectively mounted in a plurality of auxiliary branches which are respectively communicated with said auxiliary combustion chambers through auxiliary intake valves, said auxiliary fuel injectors being fluidly and parallelly connected through a second common conduit to said fuel injection pump, the improvement comprising a plurality of first orifices associated with respective said main fuel injectors, each of said first orifices being disposed in a position immediately upstream of the corresponding main fuel injector in said first common conduit; a plurality of second orifices associated with respective said auxiliary fuel injectors, each of said second orifices being disposed in a position immediately upstream of the corresponding auxiliary fuel injector in said second common conduit; and means for controlling the amount of fuel led into said first and second fuel injectors in synchronism with the engine intake stroke.

4,046,123

CONTACTLESS PHOTOELECTRIC IGNITION SYSTEM

Richard J. Jordan, 15821 Chestnut, Roseville, Mich. 48066, and Charles W. Travis, 702 Satterlee, Bloomfield Hills, Mich. 48013

Filed Jan. 29, 1976, Ser. No. 653,368
Int. Cl.[2] F02P *1/00;* F02B *3/00*
U.S. Cl. 123—146.5 A **16 Claims**



1. In combination with an internal combustion engine distributor having a rotatable cam shaft and a breaker plate, a radiation source, a radiation sensitive element, means for mounting said radiation source and said radiation sensitive element on said breaker plate such that the radiation emitted by said radiation source impinging on said cam shaft is reflected onto said radiation sensitive element at a predetermined angular position of said cam shaft and means for connecting said radiation sensitive element to a utilization circuit.

4,046,124

HIGH PERFORMANCE IGNITION CIRCUIT

Leslie T. Long, 9016 A Canal St., Orange, Calif. 92665

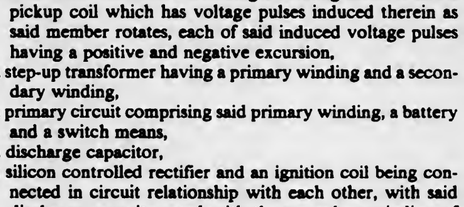
Filed Sept. 10, 1975, Ser. No. 612,200
The portion of the term of this patent subsequent to Sept. 30, 1992, has been disclaimed.
Int. Cl.[2] F02D *1/00*
U.S. Cl. 123—148 E **6 Claims**

1. In an ignition system for a multicylinder internal combustion engine having a source of electrical energy, a coil comprising primary and secondary windings, circuit means across said source and in series with said primary windings and including normally conducting switching transistor means, the improvement comprising:

a. voltage pulse generating means having a characteristic induced voltage pulse with a sharp voltage reversal inflection point;

b. high frequency pass RC filter means in circuit between said inductive coil means and the base of said switching means to pass only a high frequency voltage pulse responsive to the voltage reversal inflection point of the cyclic voltage induced in said inductive coil means; and

c. means including a driver transistor in emitter-base connection between said switching transistor and said filter



means to apply said high frequency voltage pulse to bias said switching means and momentarily open said circuit means of said primary windings for the time duration of the high frequency voltage pulse, corresponding to the time duration of said inflection of cyclic voltage in said inductive coil means.

4,046,125

CAPACITIVE DISCHARGE IGNITION SYSTEM

Ronald D. Mackie, 5500 Sea Spray Drive, Pensacola, Fla. 32507

Filed Oct. 17, 1975, Ser. No. 623,225
Int. Cl.[2] F22B *7/00*
U.S. Cl. 123—148 E **14 Claims**

1. A breakerless capacitive discharge ignition system, comprising,

a breakerless distributor including a rotating member and a pickup coil which has voltage pulses induced therein as said member rotates, each of said induced voltage pulses having a positive and negative excursion,

a step-up transformer having a primary winding and a secondary winding,

a primary circuit comprising said primary winding, a battery and a switch means,

a discharge capacitor,

a silicon controlled rectifier and an ignition coil being connected in circuit relationship with each other, with said discharge capacitor, and with the secondary winding of said transformer,

means for applying the voltage induced across said secondary winding of said transformer when said primary circuit closes to said discharge capacitor to charge it,

means for discharging said discharge capacitor through said silicon controlled rectifier and said ignition coil when said primary circuit opens to provide an ignition spark,

storage capacitor means for aiding said transformer in charging said discharge capacitor,

means for charging said storage capacitor when said primary circuit opens,

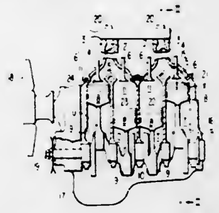
said switch means comprising means controlled by said induced voltage pulses for closing and opening said primary circuit for causing current to flow and stop flowing in said primary circuit, and including a first transistor switch means for closing said primary circuit during said positive excursions of said pulses for allowing current from said battery to flow through said primary winding of said transformer, the trigger path of said transistor switch consisting of at least a diode directly connected to said transistor in the base-emitter circuit thereof, said at least a diode having a short circuit voltage of a first predetermined amplitude level and means for closing said transistor switch means when said positive part of said pulse rises above said first amplitude level and for opening said transistor switch means when said positive part of said pulse falls below said first amplitude level, said at least a diode being effective to block the negative part of said pulses from said transistor switch means.

4,046,126

IGNITION APPARATUS

Takashi Takemoto, Nagaokakyo, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 4, 1975, Ser. No. 637,794
Claims priority, application Japan, Dec. 4, 1974, 49-140002
Int. Cl.[2] F02P *5/10*
U.S. Cl. 123—148 DS **6 Claims**



1. Ignition apparatus for use in a multi cylinder internal combustion engine having a first group of cylinders, means for supplying at least one cylinder of said first group of cylinders with an enriched air-fuel mixture relative to stoichiometric air-fuel ratio, a second group of cylinders, and means for supplying at least one cylinder of said second group of cylinders with a lean air-fuel mixture relative to stoichiometric air-fuel ratio, said ignition apparatus comprising ignition timing control means responsive to the rpm of the said engine for retarding the ignition timing of said second group of cylinders relative to the ignition timing of said first group of cylinders when the engine is operated at low and medium loads and for advancing the ignition timing of said second group of cylinders relative to the ignition timing of said first group of cylinders when said engine is operated at heavy loads.

4,046,127

SPARK BOOSTING DEVICE

Edgar Almquist, and Richard Almquist, both of Milford, Pa. 18337

Filed Jan. 5, 1976, Ser. No. 646,610
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 A **20 Claims**

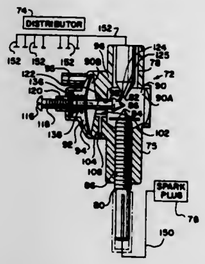
1. A spark booster for the ignition system of an internal combustion engine comprising

a housing, said housing being made of electrically non-conductive material;

first and second electrically conductive members supported by said housing, said members being in axial alignment and being longitudinally spaced from each other to define a spark gap,

an electrically conductive bimetallic element which moves

laterally and is disposed in said housing for axially varying the distance across said spark gap in response to variations



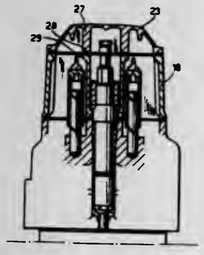
in the temperature in said housing so that increases in temperature causes said spark gap to be reduced.

4,046,128

CYLINDER HEADS FOR INTERNAL COMBUSTION COMPRESSION-IGNITION ENGINES

Antonio Formia, Turin, Italy, assignor to FIAT Societa per Azioni, Turin, Italy

Filed Oct. 16, 1975, Ser. No. 623,161
Claims priority, application Italy, Oct. 28, 1974, 70187/74
Int. Cl.² F02F 7/00; F02B 77/00
U.S. Cl. 123—195 C 2 Claims



1. In a diesel internal combustion engine of the type having a cylinder head having four valves and a fuel injector located between the four valves the improvement comprising a casing mounted on said cylinder head and surrounding said valves and injector, said casing having a pair of spaced apart vertical walls extending across said casing to divide the interior of said casing into three compartments with said injector located in a separate one of said compartments, a cover secured to said casing having a pair of spaced apart depending ribs disposed in engagement with said vertical walls and sealing means between said walls and said ribs so that said injector is disposed in a sealed compartment.

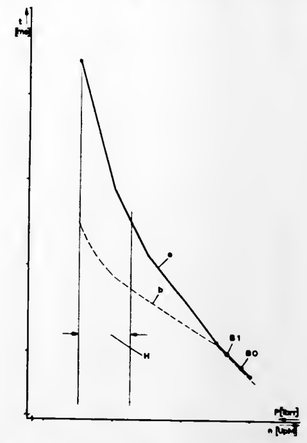
4,046,129

REGULATING ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES, ESPECIALLY THOSE WITH A FUEL INJECTION SYSTEM

Erhard Bigalke; Jürgen Wolf, both of Wolfsburg, and Günther Schmelzer, Klein-Schoppenstedt, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Continuation of Ser. No. 398,836, Sept. 19, 1973, abandoned, which is a continuation of Ser. No. 116,958, Feb. 19, 1971, abandoned. This application Mar. 16, 1976, Ser. No. 667,296
Claims priority, application Germany, Feb. 20, 1970, 2007855
Int. Cl.² F02D 1/04
U.S. Cl. 123—32 EA 12 Claims

1. In a device for regulating an internal combustion engine in which the variation of engine torque with respect to a controlled variable of the engine defines an engine torque curve which rises to a maximum and then decreases therefrom, including means operative under partial and full engine load operation for regulating the controlled variable in response to change in the suction pipe pressure of the engine and in accordance with a predetermined regulating relationship defining a first characteristic line, the improvement comprising means, operative during engine idling operation only, for modifying



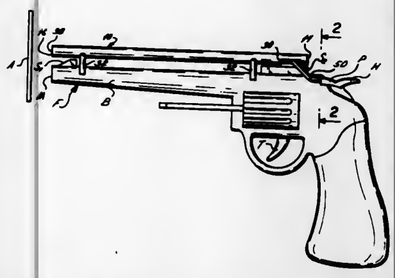
said first characteristic line into a second characteristic line at least a portion of which is of lesser slope than said first characteristic line, said second characteristic line having at least a point in common with said first characteristic line and having a porton which exhibits lower values than said first characteristic line such that the values of the controlled variable produced by the regulating means in response to operational disturbance variables during idling always lie in the rising portion of said engine torque curve.

4,046,130

TARGET PRACTICE ATTACHMENT FOR A FIREARM

George Najarian, 1956 Brown St., Brooklyn, N.Y. 11229

Filed Oct. 16, 1975, Ser. No. 615,142
Int. Cl.² F41B 7/00
U.S. Cl. 124—28 10 Claims



1. A target practice device for temporary attachment to a firearm, said firearm having a handle grip at one end, an elongated barrel extending along a longitudinal axis from the handle and terminating in a muzzle, a trigger and a displaceable hammer responsive to the pulling of the trigger for normally firing the firearm, said device comprising:

a. an elongated, tubular cylinder extending along a longitudinal axis and having an open, forward end;

b. mounting means for removably securing said cylinder on the outside surface of the elongated barrel of the firearm with the longitudinal axis of said cylinder being substantially parallel to the longitudinal axis of the firearm and with the open end of said cylinder being adjacent the muzzle of the firearm;

c. a captive elongated rod slidably mounted permanently contained within said cylinder, said rod having a forward end contained within said cylinder in a cocked position which extends from the said open end in a discharge position; and

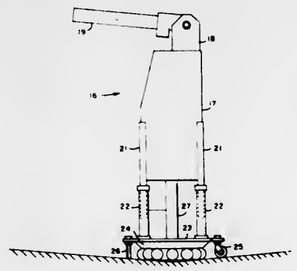
d. means movable in response to the pulling of the trigger and the consequent displacement of the hammer for axially displacing said rod along the interior of said cylinder whereby the forward end of said rod emerges from the open end of said cylinder and is thereby adapted to strike a practice target said means including a portion of said rod extending exteriorly of the cylinder to a position so located as to be struck by the hammer of the firearm.

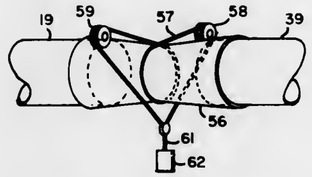
4,046,131

TENNIS BALL COLLECTION, PICK-UP AND PROPELLING SYSTEM

Thomas S. Clark, Palo Alto; William S. Kennedy, San Jose, and Robert L. Piziali, Stanford, all of Calif., assignors to American Tennis Systems, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 386,308, Aug. 7, 1973, abandoned. This application Dec. 15, 1975, Ser. No. 641,080
Int. Cl.² F02B 33/10
U.S. Cl. 124—71 9 Claims





4. A tennis ball retrieving and propelling device adapted to be supported on a firm, relatively smooth surface comprising:

a ball delivery tube through which balls can be propelled and, including an inlet and an exit end;

ball loading means having an opening near the surface for receiving and moving said balls individually into the inlet of the delivery tube;

a ball-queuing carrousel mounted on the device adjacent the supporting surface for rotation past the ball loading means for supplying one ball at a time thereto;

a ball release mechanism at the exit end for releasably constricting the effective internal area of the delivery tube and preventing passage of a tennis ball therethrough;

pneumatic means for creating a high air pressure between the inlet end and the ball release mechanism; and

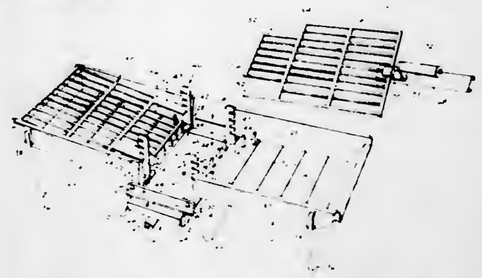
means for releasing the ball release mechanism and allowing the ball to be propelled through the tube exit end under force of the high air pressure.

4,046,132

SELF EXTINGUISHING, PORTABLE COOKING UNIT HAVING FOLDING FUEL TRAYS

Charles R. White, Sidney, Canada, assignor to Newco Fireplace Equipment Limited, Inc., Portland, Oreg.

Filed Nov. 10, 1975, Ser. No. 630,611
Int. Cl.² F24C 1/16; A47J 37/00; F24B 3/00
U.S. Cl. 126—9 R 22 Claims



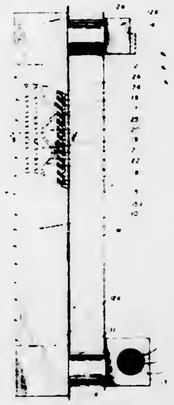
17. A solid fuel stove comprising in combination a base, a pair of fire pan means pivotally supported on the base and swingable between an open-face-to-open-face fuel-ignition-chamber-forming-relation and an end-to-end aligned open-face-up burning fuel holding relation, upper portions of the fire pan means in fuel-ignition-chamber-forming-relation forming an upright hollow enclosure having an upper open-mouth, there being air inlet means provided in the lower portions of each of fire pan means in fuel-ignition-chamber-forming-relation to permit entry of air into the enclosure.

4,046,133

SOLAR PANEL ASSEMBLY FOR FLUID HEATING AND METHOD

Thomas E. Cook, 3570 Maize Road, Columbus, Ohio 43224

Filed Mar. 10, 1976, Ser. No. 665,423
Int. Cl.² F24J 3/02
U.S. Cl. 126—270 6 Claims



1. A solar-heating panel assembly comprising a ray-absorbing inner panel and a ray-passing outer panel spaced outwardly therefrom to provide a fluid passageway therebetween through which the fluid to be heated is passed, said panels being formed relatively to provide successive restricted slots and expansion pockets along the passageway in the direction of and transversely of the flow of the fluid to be heated, and inlet and outlet means for said passageway to produce and flow; said

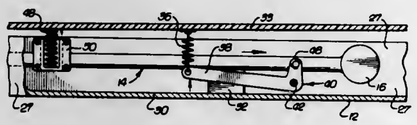
ray-passing panel being of corrugated diaphanous material with its corrugations extending transversely to provide alternating Venturi-like slots and expansion pockets transversely of the flow of fluid through the passageway, said inner panel being of black material and having ribs on its surface which extend longitudinally of the passageway and substantially at right angles to said corrugations of the ray-passing panel.

4,046,134

SOLAR HEATER WITH AUTOMATIC VENTING

Paul B. Scott, Topanga, Calif., assignor to Xonics, Inc., Van Nuys, Calif.

Filed Aug. 26, 1976, Ser. No. 717,607
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **8 Claims**



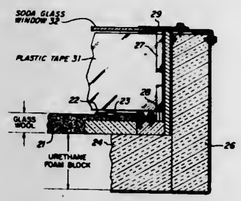
1. A solar heat collector having in combination:
a solar absorbing heat exchanger for exposure to solar radiation;
a housing enclosing said exchanger and having a movable wall portion of a material transparent to solar radiation;
means for the support for said exchanger within said housing,
said support means permitting heat induced expansion of a portion of said exchanger in respect to said housing;
means fixing a portion of said exchanger to said housing to prevent movement is respect thereto; and
means responsive to heat induced expansion and contraction of said exchanger for separation of said movable wall from said housing,
whereby to permit ambient air to circulate within said housing with resultant cooling of said exchanger.

4,046,135

HIGHLY EFFICIENT SOLAR COLLECTOR INCLUDING MEANS FOR PREVENTING COVER PLATE FLUID CONDENSATION

Ernest F. Root, Nashua, N.H.; Serge Kunica, Wellesley, and Harry M. Simmons, Reading, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Jan. 30, 1976, Ser. No. 653,819
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **4 Claims**



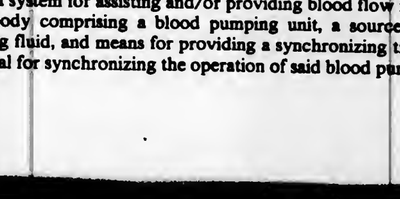
1. A solar energy collector comprising:
a. a heat trap member having cells therein of polyethylene terephthalate for preventing radiation losses, and convection currents from being produced in said cells, and yet permitting very high transmittance of solar radiation into said collector;
b. a window for covering said heat trap member, said window having high solar energy transmissivity while concurrently filtering out ultraviolet radiation;
c. a heat absorption member positioned under said heat trap member for absorbing said solar radiation;
d. a first heat insulating layer positioned under said heat absorption member; and
e. a second heat insulating layer made of polyurethane foam positioned under said first heat insulating layer, said second insulating layer having characteristics which cause said second insulating layer to produce vapor capable of producing condensation on the inside surface of said window should said second insulating layer assume a temperature exceeding a given temperature level, said first heat insulating layer being capable of preventing said second heat insulating layer from assuming a temperature higher than said given temperature level.

4,046,136

SOLAR ENERGY COLLECTING DEVICE

Takichiro Izumi, Yuki; Shigeo Chiba, and Kazumitsu Kobayashi, both of Shimodate, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Apr. 5, 1976, Ser. No. 673,489
Claims priority, application Japan, May 26, 1975, 50-70762[U]; May 26, 1975, 50-70763[U]
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **4 Claims**



1. A solar energy collecting device comprising:
a relatively flat housing box, having opposite side walls;
a pair of headers provided in said housing box to be substantially parallel to each other;
said headers each having a plurality of tubular studs extending substantially perpendicularly to the longitudinal axis thereof and a plurality of bellows portions arranged therealong;
opposite ends of said headers project out of said opposite side walls of said housing box;
a plurality of hollow plastic panels provided in said housing box to bridge said pair of headers;
said panels each having a substantially rectangular body and opposite ends which converge to provide tubular end portions each being inserted into and axially slidably supported by said tubular stud of said header;
union nuts each being screwed onto said tubular stud while said tubular end portion of said panel is passed through a central opening of said union;
annular elastic sealing elements each being fastened between said union nut and the end of said tubular stud; and
means to fix an end portion of each of said panels to said housing.

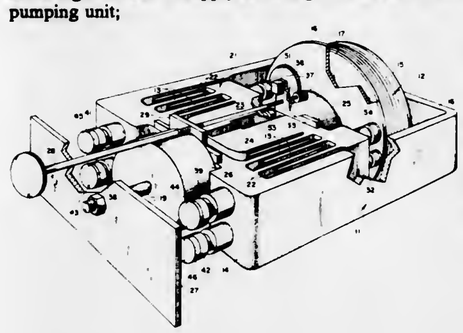
4,046,137

SOLENOID OPERATED BLOOD PUMP DRIVE SYSTEM

Richard W. Curless, Nabnasset, and Armando Federico, Needham, both of Mass., assignors to Avco Corporation, Greenwich, Conn.

Filed Aug. 11, 1976, Ser. No. 713,546
Int. Cl.² A61M *1/03*; F04B *9/10*
U.S. Cl. 128—1 D **15 Claims**

1. In a system for assisting and/or providing blood flow in a living body comprising a blood pumping unit, a source of actuating fluid, and means for providing a synchronizing trigger signal for synchronizing the operation of said blood pumping unit with the pumping action of the heart, an actuating unit for periodically supply operating fluid to actuate said blood pumping unit to produce an augmented stroke in synchronism with the diastolic period of the pumping action of the heart comprising:
a. a rigid frame member having an opening therein;
b. a carriage member movably disposed within said frame member opening;
c. a first solenoid carried by said frame member;
d. a second solenoid carried by said carriage member and oppositely disposed to said first solenoid;
e. bellows means carried by said frame member, said bellows means being adapted for connection to said source of actuating fluid and to supply actuating fluid to said blood pumping unit;



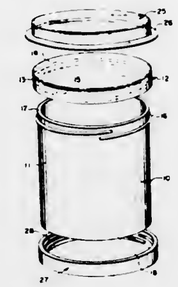
f. first and second movable plate members rigidly interconnected and operatively associated with said solenoids and bellows means whereby when current is sequentially supplied to said solenoids, said plates are magnetically attracted by said solenoids and said bellows mens ae actuated to vary the volumetric content thereof; and
g. means adapted to be actuated by said trigger signal for applying a series of two voltages comprising a first voltage and then a second lower voltage alternately to said first and second solenoids, said second voltage in each case being applied upon termination of said first voltage whereby upon actuation by said trigger signal, said augmented stroke is produced in synchronism with the diastolic period of the pumping action of the heart.

4,046,138

DIAGNOSTIC DEVICE FOR LIQUID SAMPLES

Gary Libman, Des Plaines; William J. Binard, McHenry, and Harish A. Patel, Oak Park, all of Ill., assignors to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 495,977, Aug. 29, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 660,529
Int. Cl.² A61B *10/00*
U.S. Cl. 128—2 F **2 Claims**



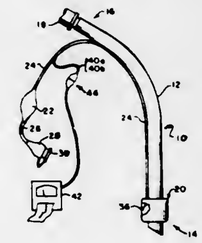
1. A diagnostic device for use with a sample of body fluid, said diagnostic device comprising a four-piece separable container including a cylindrical sidewall and open top and a closed bottom forming a receptacle, a first lid having a first side and a second side detachably secured to the top of said container, a second lid detachably secured to the bottom of said container, a cover detachably secured over the first side of said first lid, said first lid having an inner planar surface having upstanding annular ring and upstanding spaced prongs both extending from said second side for holding a culture medium on said planar surface, said ring being spaced inwardly from the periphery of said lid to provide an annular area around the circumference of said lid to receive the top of said cylindrical sidewall, said first lid being removable from the top of said container in order for the containers to receive the body sample and said container being adapted to be inverted when the first lid is secured to the top of said container to thereby contact said medium with said body sample to inoculate said culture medium, said first lid may be removed from the top of said container and said cover may be placed over the second side of said first lid after inoculation of said culture medium to form an incubation package and said second lid may be removed from the bottom of said container and secured to the top of said container to use said sample for further analysis.

4,046,139

MEDICAL TEMPERATURE MEASURING DEVICE

Bernard Horn, 7742 Terrace Drive, El Cerrito, Calif. 94530

Filed Aug. 23, 1976, Ser. No. 716,657
Int. Cl.² A61B *5/00*; A61M *25/00*
U.S. Cl. 128—2 H **2 Claims**



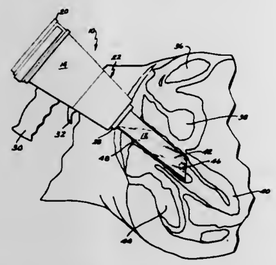
1. A medical temperature measuring device comprising
means defining a pliant flexible tube adapted to enter the trachea and permit respiratory function to continue, said tube having a tube wall portion, means defining an air channel, an exterior end and an interior end adapted to enter the trachea,
an inflatable cuff disposed proximate said interior end of said tube and adapted to engage the wall of the trachea when inflated,
means for inflating said cuff,
means defining a conduit connected to said tube in fluid communication with said cuff and said means for inflating said cuff,
a temperature sensor disposed on said cuff and adapted to be in thermal contact with the wall of said trachea when said cuff is inflated,
means for thermally insulating said temperature sensor from said air channel, said means for thermally insulating said temperature sensor disposed between said sensor and said air channel,
means for measuring temperature detected by said temperature sensor, and
means for operatively connecting said temperature sensor to said means for measuring temperature.

4,046,140

CERVIX PHOTOGRAPHIC METHOD

Grant R. Bora, 5180 Kalamazoo, SE., Grand Rapids, Mich. 49508

Division of Ser. No. 259,088, June 2, 1972, abandoned. This application Dec. 11, 1975, Ser. No. 639,854
Int. Cl.² A61B 1/00
U.S. Cl. 128—2 R 3 Claims



1. The method of photographing the cervix and using the photos so obtained for diagnostic and treatment purposes comprising the steps of:

providing an elongated, hollow, open-ended tubular member having a preselected length formed from transparent material;

inserting the member through the vaginal opening thereby dialating the walls thereof;

continuing the inserting step until the inner open end of the member surrounds the cervix;

providing a close-up, fixed focus camera having an annular flashlamp surrounding its lens, the diameter of said lamp being substantially equal to the diameter of said member, the focus of said camera being such as to produce a predetermined and subsequently reproducible subject-image ratio enabling photos taken through utilization of this, the preceding and following steps to be used for accurate and comparative measurements of lesions and other abnormalities throughout the course of treatment of a particular patient;

positioning said camera so that said flashlamp is in abutment and axially aligned with the exposed end of said member;

triggering said camera to cause its lens to open and its flashlamp to momentarily illuminate;

transmitting the illumination from said flashlamp along the sidewalls of said member and thereby concentrating the light from the flashlamp at the area immediately surrounding the cervix to expose the film;

removing the camera from abutment with the member removing the member and developing the film so exposed; and

using the photo so obtained for diagnostic and treatment purposes.

4,046,141

METHOD AND APPARATUS FOR INTERFACING TO ANATOMIC SIGNAL SOURCES

Carlo J. DeLaca, Newton, Mass., assignor to Liberty Mutual Insurance Company, Boston, Mass.

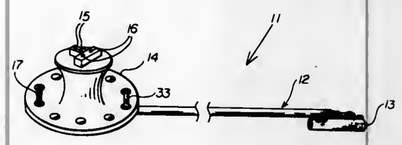
Filed July 14, 1975, Ser. No. 595,582
Int. Cl.² A61B 5/04
U.S. Cl. 128—2.1 R 11 Claims

1. An electrical system for interfacing to anatomic signal sources and comprising:

primary terminal means comprising a pair of spaced apart primary terminals for anatomic implantation, said primary terminals being electrically isolated from each other so as to receive a pair of primary signals generated physiologically, said primary signals comprising both a desired component derived from a primary tissue source and a noise component derived from an auxiliary tissue source;

auxiliary terminal means comprising a pair of spaced apart auxiliary terminals for anatomic implantation directly adjacent to said primary terminal means, said auxiliary terminals being electrically isolated from each other so as to receive a pair of auxiliary signals generated physiologically and derived from said auxiliary tissue source;

electrical lead means for anatomic implantation and connected to receive said primary and auxiliary signals; and



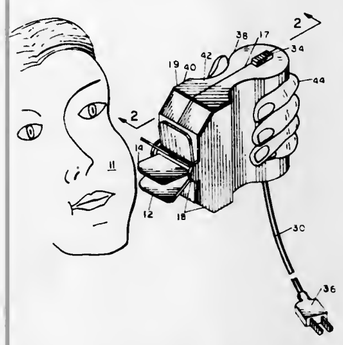
output circuit means connected to said electrical lead means and comprising primary processing means for differentially combining said primary signals to provide a single common mode rejected primary signal, auxiliary processing means for differentially combining said auxiliary signals to provide a single common mode rejected auxiliary signal, and output processing means for differentially combining said common mode rejected primary and auxiliary signals.

4,046,142

BEAUTY PADDLE

Dorothy Whitney, 1200 N. 33, Renton, Wash. 98055

Filed Apr. 9, 1976, Ser. No. 675,574
Int. Cl.² A61H 23/00
U.S. Cl. 128—55 6 Claims



1. A hand held beauty paddle for the stimulation of the skin and blood circulation comprising a rotatable multiple bladed paddle mounted to a housing having a contour with protuberances and hollows for easy manual retention and split into two parts and provided with electric motor driving means for the paddle via a power transmission belt twisted through an angle such as 90°.

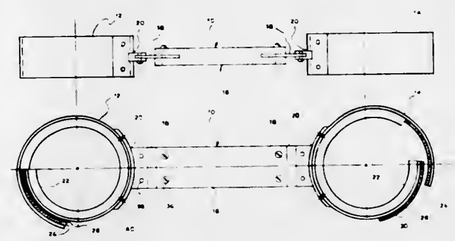
4,046,143

HEART PATIENT AID

Lawrence D. Bell, Hermitage Garden Apartments, Apt. C-204, Old Hickory, Tenn. 37138

Filed June 4, 1976, Ser. No. 692,794
Int. Cl.² A61F 13/00
U.S. Cl. 128—133 10 Claims

1. An article for holding legs of a heart patient apart near the ankles and preventing crossing of same comprising two circular members each having overlapping ends adapted to be pulled open outward upon exertion of slight force, said members being joined together by a connecting bar and having an



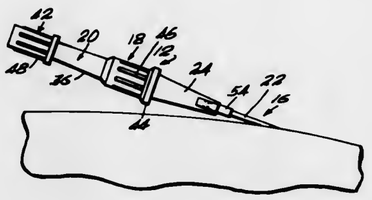
insulating layer on the inside thereof for preventing chaffing of a person's legs when said members are closed therearound.

4,046,144

CATHETER PLACEMENT ASSEMBLY

Richard H. McFarlane, 2571 Kaneville Court, Geneva, Ill. 60134

Filed Sept. 18, 1975, Ser. No. 614,707
Int. Cl.² A61M 25/00
U.S. Cl. 128—214.4 12 Claims



1. An improved catheter comprising, an axially aligned combination of

a hollow, rigid, elongate needle with a pointed distal end and a proximal end zone, and

a hub of rigid plastic material with a central zone secured about the proximal end zone of the needle,

said central hub zone having a distally-extending generally cylindrical skirt spaced from said needle defining an annular, distally opening, axially extending chamber with an exterior surface and said hub including an annular shoulder intermediate the end zones and forming a partial annular end wall of the chamber, and

said central hub zone having a proximally extending tubular wall defining a proximally opening flash chamber, the proximal end zone of said needle being in fluid communication with said flash chamber, and

a vented removable cap closing said flash chamber,

said distally opening chamber defining a mouth of said chamber in said hub with said hub being provided with rim means extending outwardly of said mouth and said rim means and exterior surface providing means to facilitate axial movement of advancement of the needle in a distal direction,

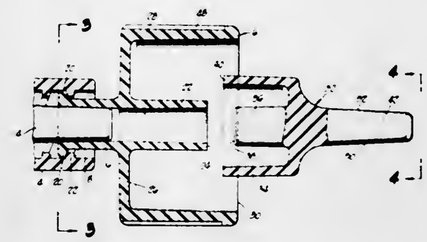
said improved catheter including a thin, flexible elongate jacket having a proximal end and a distal end snugly jacketing the needle from the zone of the pointed distal end along the intermediate length of the needle and including a rigid adapter having a first end zone and a second end and means fixedly connecting the first end zone of the adapter to the jacket, said adapter being sized for snug receipt within said skirt protectively within said chamber with said second end normally in abutting engagement with the end wall of said chamber.

4,046,145

SYRINGE CONNECTOR

Pradip Vinobchandra Choksi, Northridge, and Walter Seemayer, Burbank, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed June 29, 1976, Ser. No. 700,902
Int. Cl.² A61M 5/00
U.S. Cl. 128—215 18 Claims



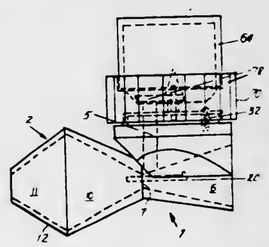
1. A connector for transfer of medical fluids comprising: a tubular coupler having an outer surface and including a front attaching means and a rear attaching means; a protector housing secured to the coupler, said housing having a collar with an inner surface which is spaced radially outward from the coupler, and the collar extends beyond a forward end of the front attaching means to protect it from contamination; and said protector housing including a spacer means fixedly connected to both the collar and tubular adapter to maintain the special relationship between the collar and tubular coupler.

4,046,146

APPARATUS FOR THE INHALATION OF MEDICINAL AGENTS

Gunter Rosskamp; Reiner Kolberg; Peter Gunsel, and Hans-Jurgen Porep, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Aug. 21, 1975, Ser. No. 606,737
Claims priority, application Germany, Aug. 22, 1974, 2440623; June 2, 1975, 2524902; June 30, 1975, 2529522
Int. Cl.² A61M 15/00
U.S. Cl. 128—266 15 Claims



1. Apparatus for the inhalation of medicinal agents in pulverulent form, comprising a housing having a venturi tube-shaped interior configuration including a diffuser zone and provided with an aerosol exhaust section; said housing including a dispensing opening having a delivery end which terminates upstream of the diffuser zone of the venturi-like housing, a container for the medicinal agent, means mounting said container on said housing for dispensing of the medicinal agent to said dispensing opening, and a collecting plate adjacent the delivery end of said dispensing opening and disposed longitudinally and transversely in close proximity to the venturi tube-shaped interior configuration of the housing.

4,046,147

SANITARY NAPKIN

Cecilia Berg, 26A S. Fogdelyckeg, Karlshamn, Sweden (S-292 00)

Filed Aug. 5, 1976, Ser. No. 712,117
Int. Cl.² A61F 13/16, 13/20
U.S. Cl. 128—290 R 4 Claims



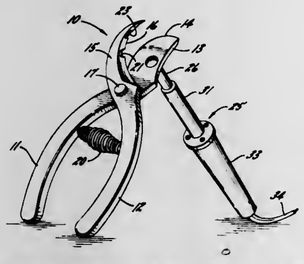
1. In a sanitary napkin of a soft, absorbent material and having a longitudinally extending hump portion with softly rounded edges the improvement that the napkin is manufactured of a single blank, that said hump portion if formed partly by folding opposite end portions of the blank to form in cross section an L-shape and partly by folding the middle portion of the blank to form a U-shape having its opening facing away from said hump portion, said U-shape fold being disposed between both L-shaped folds so as to define in the hump two spaced slits extending longitudinally of the napkin, said slits separating ridges cresting the hump shaped by the folded portions.

4,046,148

SEVERING AND CAUTERIZING INSTRUMENT FOR USE IN SEVERING TAILS AND NAVEL CORDS

Lawrence Dean Meador, R.R. 2, Lanark, Ill. 61046

Continuation of Ser. No. 565,448, April 7, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 761,771
Int. Cl.² A61B 17/32, 17/36
U.S. Cl. 128—303.1 5 Claims



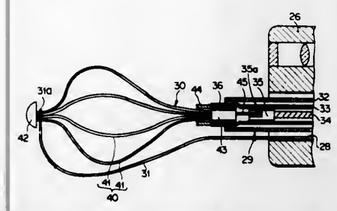
1. An instrument for severing and cauterizing an appendage of a pig, said instrument comprising a first handle having a first blade with a concave edge, a second handle having a second blade with a convex edge, means pivotally connecting said first handle and said first blade with said second handle and said second blade and enabling said blades to scissor across one another when said handles are squeezed toward one another, a notch formed in the edge of one of said blades for receiving an appendage of a pig and coacting with the edge of the other blade to sever the appendage when said blades are scissored across one another, an electric heating element connected to one face of one blade and operable to heat the latter blade whereby the appendage is cauterized as an incident to being severed, and a handle connected to said heating element and disposed at an angle relative to said first and second handles whereby the three handles define a tripod for supporting said instrument in a standing position.

4,046,149

INSTRUMENT FOR REMOVING A FOREIGN SUBSTANCE FROM THE BODY CAVITY OF HUMAN BEING

Osamu Komiya, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1976, Ser. No. 653,150
Claims priority, application Japan, Jan. 31, 1975, 50-14525; Jan. 31, 1975, 50-14526; Jan. 31, 1975, 50-14527; Jan. 31, 1975, 50-14528
Int. Cl.² A61B 17/22
U.S. Cl. 128—328 7 Claims



1. An instrument inserted through a channel of an endoscope for trapping a foreign substance, such as a polyp or stone, and removing it outside of the body cavity of a human being, comprising:

an elongated flexible instrument body having an outer tube, an inner tube, and a control wire axially and slidably inserted into the inner tube and having a hook member at one end thereof, said hook member having a cutout at its side;

trap means having a loop-like anchoring member releasably anchored within said cutout of the hook member, said anchoring member being detachable from the cutout of the hook member when the hook member is moved out of the inner tube, thereby releasing the trap means from the instrument body;

a ring member slidably moved and fitted over the trap means for squeezing the same; and

a supporting wire one end of which supports the trap means released from the instrument body, the other end of which passes through the channel of the endoscope and extends outside thereof.

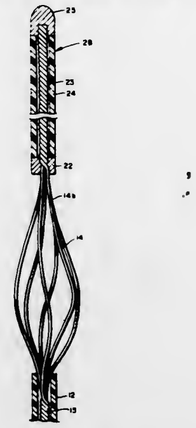
4,046,150

MEDICAL INSTRUMENT FOR LOCATING AND REMOVING OCCLUSIVE OBJECTS

Robert S. Schwartz, Boulder, and Ronald R. Pfister, Littleton, both of Colo., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed July 17, 1975, Ser. No. 596,811
Int. Cl.² A61B 17/22
U.S. Cl. 128—328 14 Claims

8. An instrument for use in locating occlusive objects in body passages and removing the same therefrom, comprising a transparent flexible sheath having proximal and distal ends and having a passage extending longitudinally therethrough; a flexible cable composed of a plurality of wires extending uninterruptedly from one end of said cable to the other; said cable being slidably disposed in said passage of said sheath and having a length greater than said sheath; said cable including an integral cage portion slidable between a first position wherein said cage portion is collapsed and retracted within said passage at the distal end of said sheath and a second position wherein said cage portion is expanded, extended, and exposed beyond the sheath's distal end; and handle means connected to said cable at the proximal end of said sheath for selectively shifting said cage portion between its first and second positions; said wires being twisted tightly together between said handle means and said cage portion.

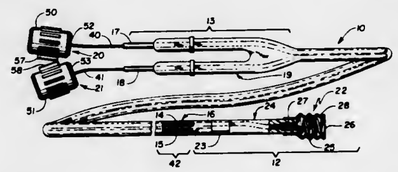


4,046,151

BODY IMPLANTABLE LEAD WITH STIFFENING STYLET

Maria M. Rose, Wayzata, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 30, 1976, Ser. No. 682,506
Int. Cl.² A61N 1/04
U.S. Cl. 128—404 15 Claims



12. A body implantable lead of material substantially inert to body fluids and tissue having a length of electrically insulated, flexible conductor, an electrode adapted to contact the tissue of a living animal body at the distal end of the conductor, and a lumen extending the length of insulated conductor, said lead further comprising:

stylet wire means for insertion into said lumen for stiffening said electrical conductor, said stylet wire means having a length exceeding the length of said lumen; and

means coupled to said stylet wire means for engaging with said lead and holding at least a portion of the excess length of said stylet wire means in said lumen for increasing the tension on said lead.

4,046,152

CIGAR-CIGARETTE PERFORATING DEVICES

Jac Eduard Pardon, 16934 Village Lane, Grosse Pointe, Mich. 48230

Filed Sept. 13, 1976, Ser. No. 722,782
Int. Cl.² A24F 13/00
U.S. Cl. 131—170 R 2 Claims

1. A device for perforating the paper wrapper of a tubular smoking item, comprising several spring biased, longitudinally movable, perforating means radially situated under tension in a mounting means; said mounting means having a centrally located opening for receiving a smoking item; said perforating means being held in position by a circumferential spring loaded band means, which is in turn held in position by an outer housing, whereby the circular shape of said circumferential band may be circumferentially reduced by finger pressure to reduce the perforating means radially inwardly into said opening.



4,046,153

CIGARETTE HOLDER

Paul Kaye, Farmington Hills, Mich., assignor to Aquafilter Corporation, Farmington Hills, Mich.

Filed Mar. 1, 1976, Ser. No. 662,565
Int. Cl.² A24F 13/62
U.S. Cl. 131—187 13 Claims



1. A cigarette holder construction having a casing with a mouthpiece and a cigarette receiving end,

a sleeve insert cigarette receiving end,

said sleeve comprising an annular wall having an inner surface and an outer surface, said outer surface having at least a portion thereof frictionally engaging the cigarette receiving end of the casing, and said inner surface having a plurality of rigid inwardly extending projections spacedly circumferentially disposed for engaging the tip of a cigarette inserted in said sleeve with the projections subscribing a circular locus having a diameter less than an outer diameter of the cigarette.

4,046,154

APPARATUS FOR CONTINUOUSLY REMOVING FILM COATING MATERIALS FROM FILM

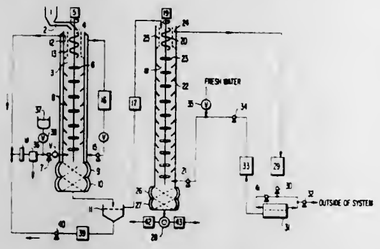
Sagihiko Tada; Setsuo Nakai; Kazuo Irie; Hirokazu Saito, and Hideaki Suzuki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 450,516, March 12, 1974, abandoned. This application Feb. 3, 1976, Ser. No. 654,829
Claims priority, application Japan, Mar. 12, 1973, 48-28707
Int. Cl.² B08B 3/08
U.S. Cl. 134—65 2 Claims

1. An apparatus for continuously removing a coating material on film chips comprising:

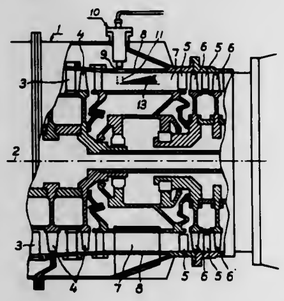
a. contacting means of a generally cylindrical shape for containing a removing liquid and including a rotatable shaft, said shaft having at least one screw and a plurality of stirring vanes, and said contacting means having a plurality of baffle plates attached to the inner wall of said contacting means and angled downwardly to urge film chips down said contacting means;

b. means for feeding film chips to an upper portion of said contacting means;
c. means for discharging said film chips from a lower portion of said contacting means;
d. means for feeding a removing liquid to said contacting means at a lower portion thereof;
e. means for withdrawing the removing liquid from said contacting means at an upper portion thereof;



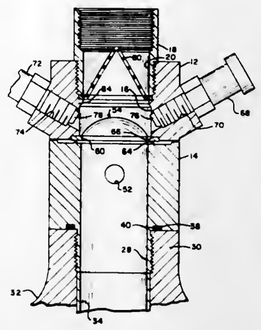
f. means for discharging a portion of the removing liquid to outside said apparatus;
g. means for supplying a fresh removing liquid to the remaining withdrawn removing liquid;
h. means for separating removing liquid from said discharged film chips; and
i. means coupled to the means of (e), (g) and (h) for feeding the removing liquid containing the fresh removing liquid to the feeding means of (d).

4,046,155
WASHING APPARATUS FOR A COMPOUND COMPRESSOR
Martin Mansson, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden
Filed Dec. 18, 1975, Ser. No. 642,110
Claims priority, application Sweden, Dec. 30, 1974, 7416342
Int. Cl.² B08B *3/02, 9/00*
U.S. Cl. 134—167 R **1 Claim**



1. Washing apparatus for a compound compressor of the type comprising a generally annular casing, at least one low pressure compressor, at least one high pressure compressor and at least one connecting channel therebetween, comprising:
a spray tube having a fluid inlet through which washing fluid is admitted under pressure at the time of a washing operation;
means for mounting said spray tube on said compound compressor externally of said casing and radially opposite an aperture defined in said casing, said aperture being so positioned along the axial length of said compound compressor that said aperture opens into said at least one connecting channel; and
means actuated by washing fluid pressure at said spray tube inlet for moving said spray tube radially inwardly through said aperture,
whereby said spray tube is normally positioned externally of said casing but is automatically moved inwardly of said casing through said aperture as washing fluid pressure is applied to said spray tube.

4,046,156
EXPLOSION DISCHARGE VALVE
Kenneth C. Cook, Walnut Creek, Calif., assignor to Systron-Donner Corporation, Berkeley, Calif.
Filed Dec. 4, 1975, Ser. No. 637,582
Int. Cl.² F16K *17/40*
U.S. Cl. 137—68 A **4 Claims**

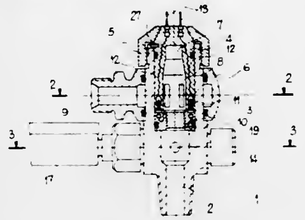


1. A valve for discharging pressurized fire extinguisher fluid from a container, including the combination of a valve housing formed with a passage communicating with the interior of the container, a diaphragm mounted in the housing across the passage, said diaphragm comprising a thin-walled cup-shaped center portion and an integral peripheral rim which includes a ring formed of a ductile metal, said center portion being positioned within the passage in a direction convex away from pressurized fluid of the container, means forming a hermetical seal about the rim for normally sealing fluid within the passage, said seal means comprising means in the housing forming an annular knife-shaped edge about the passage with the edge abutting the diaphragm rim on a side thereof which is normally exposed to pressurized fluid in the passage from the container, the housing including means for releasably urging the ring against the knife-shaped edge whereby the edge forms and seats into an annular groove in the metal of the ring and whereby the ring can be released for moving and replacing the diaphragm, and explosive charge means oriented toward the diaphragm center portion on the convex side thereof for rupturing the diaphragm and permitting discharge of fluid from the container along the passage.

4,046,157
ELECTRICAL CONTROL FOR INFLATING VALVE FOR CONTAINERS FOR COMPRESSED LIQUEFIED OR DISSOLVED GAS
Jean Michel Cazalas, 49 Av du Onze Novembre, 92190 Meudon; Alexandre Jean-Paul Barthe, 58 rue J.B. Baudin App. 14, 94800 Ville Juif, and André Robert Derrien, La Porte au Brun, 91160 Ballainvilliers, all of France
Filed Nov. 4, 1975, Ser. No. 628,767
Claims priority, application France, Nov. 5, 1974, 74.36744
Int. Cl.² F16K *17/40, 31/40*
U.S. Cl. 137—74 **3 Claims**

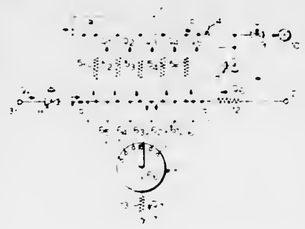
1. An electrical control device for an inflating valve comprising a cylindrical hollow passage for being connected with a container of gas under pressure, said device comprising:
a substantially cylindrical plug made of a fusible material in said passage for blocking and sealing same;

an electrical resistor embedded in said plug and wound in the shape of a cylinder having a longitudinal axis substantially parallel to the axis of the plug and a height substantially equal to the height of the plug;
an electrical source; and



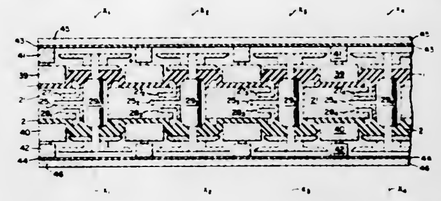
means for selectively connecting said electrical source with said resistor for heating and weakening locally the fusible material of said fusible plug at the level of the windings of the cylindrically wound resistor in order that a central portion of said fusible plug corresponding to the cylinder of said windings is separated from the rest of the plug and expelled under the pressure of the gas in said container.

4,046,158
APPARATUS FOR DILUTING GAS
Osamu Hayashi; Takahumi Inagaki, both of Kyoto, and Yoshio Yanagita, Otu, all of Japan, assignors to Standard Technology, Inc., Kyoto, Japan
Filed Aug. 27, 1976, Ser. No. 718,317
Claims priority, application Japan, Jan. 30, 1976, 51-9792
Int. Cl.² F16K *19/00*
U.S. Cl. 137—88 **4 Claims**



1. An apparatus for diluting gas comprising a primary passage having at opposite ends an inlet for a component gas and an inlet for a diluent gas, a secondary passage for collecting the mixture of the component gas and the diluent gas, a plurality of gas pressure reducing tubes each having the same structure for reducing the pressure of gas flowing therethrough by the same amount and which are connected in parallel between said primary passage and said secondary passage, an exhaust outlet, a changeover device connected to said exhaust outlet, a plurality of exhaust passages each having one end connected with said change-over device, one exhaust passage having the other end connected to said primary passage between one inlet and the next adjacent pressure reducing tube, another exhaust passage having the other end connected to said primary passage between the other inlet and the next adjacent pressure reducing tube, and the remaining exhaust passages having their other ends connected to said primary passage between respective pairs of pressure reducing tubes, a pressure control device connected to said secondary passage for making the pressure of the mixed gas in the said secondary passage a definite pressure, and a pressure difference control device connected between said primary and secondary passages for making the pressure difference between the said primary passage and the secondary passage a definite constant value.

4,046,159
PNEUMATIC LOGIC CIRCUITS AND THEIR INTEGRATED CIRCUITS
Jean-Pierre Pégourié, 3 Passage Bruyas, 34000 Montpellier, France
Filed Oct. 7, 1975, Ser. No. 620,257
Claims priority, application France, Oct. 8, 1974, 74.33822
Int. Cl.² F15C *1/10, 1/12*
U.S. Cl. 137—112 **11 Claims**



1. Pneumatic logic circuit of generally symmetrical structure around an axis and symmetrical with respect to a medium plane normal to this axis, comprising a median plate provided with an axial passage and with a duct opening into this passage, comprising on each side of the median plane a diaphragm made of a flat sheet of elastomer with, on its outer surface, a centering shoulder and with an axial cylindrical passage, comprising axially a piston rod, passing freely through said passage of the median plate and with fluid-tightness through said passages of the diaphragms and bearing two pistons, and comprising on each side of the median plane a bushing, bearing on the diaphragm and capping the centering shoulder thereof and allowing the piston to pass, each diaphragm being provided on its inner surface with an axial impression, comprising at the center a cylindrical chamber, whose diameter is a little greater than the diameter of said axial passage of the median plate, and a toric groove, separated from said cylindrical chamber by an annular lip with a flat profile capable of bearing against said median plate, and pistons each bearing against the outer surface of the corresponding diaphragm, said logic circuit comprising on each side of the median plane an elastic diaphragm and a base applied against the corresponding bushing, and on each side a duct passing through the median plate and opening into the corresponding toric groove.

4,046,160
TRANSMISSION CLUTCHES WITH SEQUENCE VALVE AND PISTON-CONTROLLED PRESSURE MODULATOR
Joachim Horsch, Lombard, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed Feb. 2, 1976, Ser. No. 654,427
Int. Cl.² B60K *41/00*; F16D *25/11*
U.S. Cl. 137—115 **4 Claims**

1. In transmission hydraulic controls mechanism wherein speed and direction clutch systems are provided, both disposed to receive modulated actuating hydraulic fluid, a valve assembly comprising:
a reducing valve disposed to receive actuating main rail hydraulic fluid, said reducing valve having a fluid output wherein the pressure of the fluid at the output is reduced at a range below main rail pressure;
a control piston associated with the reducing valve for increasing the actuating pressure of the fluid at the reducing valve output, with said increase at constant rate;
a valve bore in the assembly common to the valve and piston and coaxially slidably receiving same;
said assembly provided with an internal bypass around the piston including a bypass land and means affording there-

past bypass-blocked and direct bypass-open conditions, and having its opposite ends intersecting the bore at two points disposed hydraulically adjacent the respective opposite ends of the piston;

first means connected hydraulically to said bore effective during the bypass-blocked condition to introduce restricted flow of output fluid between the valve and piston to hydraulically cause relative separative movement therebetween from a reset position of the piston adjacent the valve;

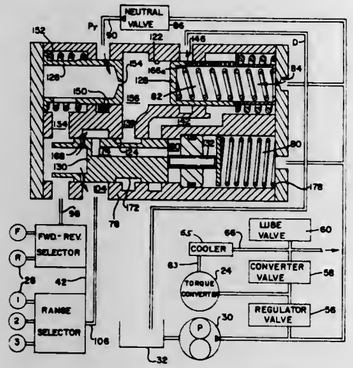
second means effective during the bypass-blocked condition for introducing resistance to relative separative movement by the piston, controlling speed of the latter and building up valve back pressure between the valve and piston; and

third means connected to the piston effective during the direct bypass-open condition so as to cause the piston to quickly reset to reset position by direct replenishment of the volume evacuated therebehind, with that fluid being immediately displaced ahead of the piston;

said coaxially slidably related valve and piston defining an intervening valve back pressure space in said common bore on the relatively adjacent side of the piston, said valve and piston being hydraulically connected by the fluid in said space;

said third means comprising a reset spring (158) connected to the piston on its relatively nonadjacent side.

4. In transmission hyraulic controls mechanism wherein



speed and direction clutch systems are provided, both disposed to receive modulated actuating hydraulic fluid, a valve assembly comprising:

a reducing valve disposed to receive actuating main rail hydraulic fluid, said reducing valve having a fluid output wherein the pressure of the fluid at the output is reduced at a range below main rail pressure;

a control piston associated with the reducing valve for increasing the actuating pressure of the fluid at the reducing valve output, with said increase at constant rate;

a valve bore in the assembly common to the valve and piston and coaxially slidably receiving same:

said assembly provided with an internal bypass around the piston including a bypass land and means affording therepast bypass-blocked and direct bypass-open conditions, and having its opposite ends intersecting the bore at two points disposed hydraulically adjacent the respective opposite ends of the piston;

first means connected hydraulically to said bore effective during the bypass-blocked condition to introduce restricted flow of output fluid between the valve and piston to hydraulically cause relative separative movement therebetween from a reset position of the piston adjacent the valve;

second means effective during the bypass-blocked condition for introducing resistance to relative separative movement by the piston, controlling speed of the latter and building up valve back pressure between the valve and piston, and comprising a drain port intersecting said bore intermediate said two points so as to lie along the path of sliding of the piston;

said piston having spill orifices (166) of graduated size along the side thereof, having decreasing size as they encounter the drain port during said relative separative movement of the piston from reset position; and

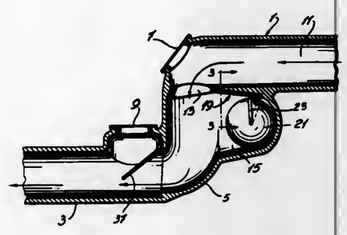
passage means (84) to introduce a body of fluid incoming into said bore ahead of the piston and not trapped because of its restrictive escape afforded by the piston itself through its spill orifices aforesaid.

4,046,161

NON-RETURN VALVE FOR PREVENTING BACK FLOW OF WASTE WATERS

Benoit Bonneau, 470 Roberval St., Roberval, Quebec, Canada

Filed Oct. 31, 1975, Ser. No. 627,910
Claims priority, application Canada, Oct. 29, 1974, 212602
Int. Cl.² F16K 9/00
U.S. Cl. 137—247.17 6 Claims



1. A waste waters non-return valve, comprising:

a drain pipe having a passageway for draining waste waters from an upstream to a downstream direction, a circular seat having a predetermined diameter transversely disposed in said pipe, and a housing contiguous to said seat downstream thereof and opening into said passageway, said housing extending laterally from said seat and said passageway and having an upper wall provided with a guiding strip extending transversely with respect to the pipe and being inclined in the upstream direction;

said passageway in the area of said housing being defined by a smooth inner wall portion whereby to prevent retainment along said wall portion of detritus carried by said waste waters;

a shutting ball having a specific gravity lower than the specific gravity of the waste waters and a diameter larger than the diameter of the seat, said housing having a size to completely contain said ball when such is in its inoperative position, whereby said ball does not then inhibit the flow of waste waters through said valve; and

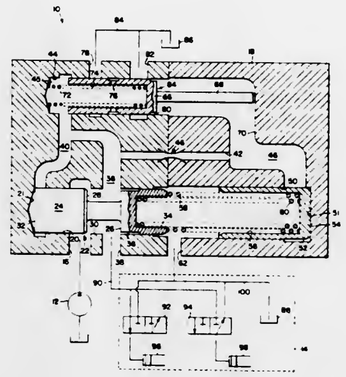
means carried by said shutting ball for slidably connecting said shutting ball with the guiding strip so that the shutting ball can be moved along said guiding strip out of said housing and brought in contact with the seat, in the operative sealing position thereof, by floating on the waste waters in the case of an inopportune upstream back flow. said shutting ball being held back into the housing in an inoperative position by said connecting means and by the waste waters when the waste waters are drained in the downstream direction past said housing.

4,046,162

MODULATION CONTROL VALVE FOR CLUTCHES

Reno Antonio Rodeghiero, Hudson, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 14, 1976, Ser. No. 686,566
Int. Cl.² F16K 31/12; F16D 25/00
U.S. Cl. 137—489 4 Claims



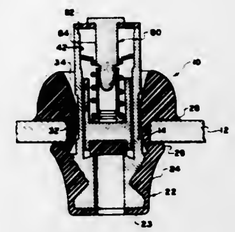
1. A modulation control valve comprising: a valve body having provided therein a modulating valve bore, an accumulator bore concentric with and connected at a first end to the modulating valve bore, and a reservoir valve bore; said valve body having inlet and outlet ports provided therein connected to the modulating valve bore between the ends and having a modulating passageway connecting the outlet port to a first end of the modulating valve bore and to the reservoir valve bore proximate a first end thereof; said valve body having an accumulator passageway provided therein connecting a second end of the accumulator bore with a second end of the reservoir valve bore and having an orificed passageway provided therein connecting the outlet port and the accumulator passageway; said valve body having a first and second reservoir ports provided therein connected to the reservoir valve bore between the ends thereof; a modulating spool slidably positioned in the modulating valve bore movable between a first and second positions wherein fluid communication between the inlet and outlet ports is respectively afforded and blocked; an accumulator piston slidably positioned in the accumulator bore and movable towards and away from the modulating spool; biasing means interposed between the accumulator piston and the modulating spool to urge the modulating spool to afford fluid communication between the inlet and outlet ports when the accumulator and piston is moved towards the modulating spool; and a reservoir valve spool slidably positioned in the reservoir valve bore and movable in response to fluid pressure in the modulating passageway to a first position wherein the modulating passageway is connected to the reservoir valve bore, the reservoir valve bore is blocked from the first reservoir port, and the accumulator passageway is blocked from the second reservoir port and movable in response to fluid pressure in the accumulator passageway to a second position wherein the modulating passageway is blocked from the reservoir valve bore, the reservoir valve bore is connected to the first reservoir port, and the accumulator passageway is connected to the second reservoir port.

4,046,163

RELIEF VALVE

Thomas A. Novak, Durham, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 610,796, Sept. 5, 1975, abandoned. This application Dec. 8, 1976, Ser. No. 748,618
Int. Cl.² F16K 24/04
U.S. Cl. 137—512.3 16 Claims



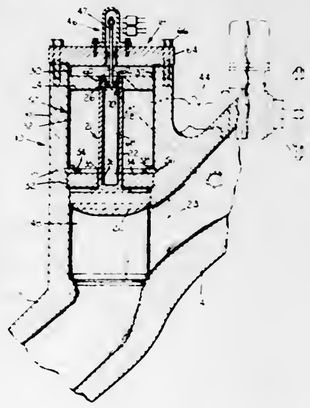
14. A pressure relief valve comprising a body mountable to a pressurized container, said body defining an axially extending passage therethrough having an inlet in fluid communication with the interior of the container and an outlet, said passage having a valve seat intermediate said inlet and said outlet, a poppet slidably mounted in said passage, said poppet having a surface biased to normally contact said valve seat to block the flow of fluid through said passage, and a cover member exterior of and coaxial with the outlet, said cover member generally rigidly mounted to said poppet causing said cover member to move axially therewith and preventing relative axial movement therebetween, said cover member axially spaced from the surface of said poppet designed to contact said valve seat by a distance substantially equal to the separation of said valve seat and said outlet, said cover being formed of resilient material such that said cover member is axially flexible in the regions adjacent the outer periphery thereof.

4,046,164

LIFT CHECK VALVE WITH DASHPOT

Eldert B. Pool, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 14, 1975, Ser. No. 622,007
Int. Cl.² F16K 15/06
U.S. Cl. 137—514.7 9 Claims



1. An improved check valve of the type having a valve body with a passage therethrough intersected by an operating chamber terminating at the passage with a valve seat and a disc movable in the chamber toward a closed position engaging the

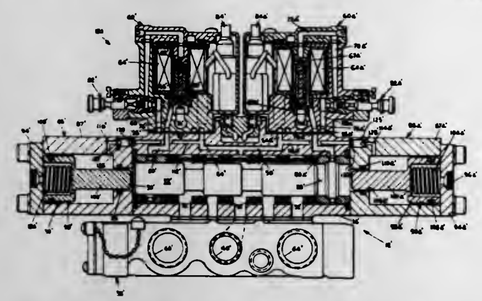
valve seat by fluid flow forces in one direction and an open position spaced therefrom by fluid flow forces in the other direction, the improvement comprising: a cylindrical member connected at one end to the disc and at the other end to a piston having a peripheral surface adjacent the interior surface of the operating chamber and defining thereabove an upper chamber; a baffle plate in the operating chamber axially between said piston and said disc and surrounding said cylindrical member at an axial opening whereby said piston, said baffle means, said interior surface and cylindrical member define therebetween a dashpot chamber having a predetermined volume of liquid therein in the open position; means for limiting the rate at which liquid leaves the dashpot chamber as the disc moves from said open position to the closed position and thereby the closing rate of said disc; and conduit means fluidly communicating the upper chamber with the passage at a location upstream of the valve seat when the flow is in said one direction, said conduit means establishing a pressure balance between the upper chamber and said location providing an upward biasing on the piston for flow in said other direction and preventing fluid conditions in the upper chamber from retarding the closing rate for flow in said one direction whereby the closing rate is prescribed by the rate at which the liquid leaves the dashpot chamber.

4,046,165

VALVE-POSITIONING APPARATUS

Robert C. Rose, Sr., and Harold H. McClelland, both of Akron, Ohio, assignors to IBEC Industries, Inc., New York, N.Y.

Filed June 4, 1975, Ser. No. 583,844
Int. Cl.² F15B 13/043
U.S. Cl. 137—624.27 16 Claims



11. In a spool valve including a housing having a bore therein and a plurality of fluid passageways interconnecting with said bore, an axially shiftable spool having opposite ends and mounted in said bore and adapted to be shifted to open and close various of said fluid passageways, means for axially shifting said spool to open and close said passageways, and means for inserting a fluid under pressure into at least one of said fluid passageways; the improvement comprising:

spool positioning means for shifting said spool to a predetermined axial position within said bore whenever fluid pressure fails or is absent in said one fluid passageway, said positioning means including an aperture axially aligned with one of said ends of said spool through at least one end of said housing; a generally closed fluid chamber mounted on at least said one housing end and generally covering said aperture; a piston mounted for movement in said fluid chamber in alignment with the axis of said spool between a first position in which said piston is withdrawn out of contact with said spool and a second position in which a portion of said piston extends through said housing aperture and contacts said one end of said spool to shift said spool to said predetermined axial position within said bore, the entirety of said piston being located beyond said one end of said spool at all times; sealing means for sealing said piston within said fluid chamber; biasing means for biasing said piston toward its second position; and a fluid passageway connected in fluid communcation with said fluid under pressure in said one fluid passageway for admitting a fluid under pressure against said piston within said chamber whereby whenever fluid pressure is present in said one fluid passageway, said piston is withdrawn to its first position against the force of said biasing means but when the fluid pressure fails or is absent, said piston is moved by said biasing means to its second position to contact said one end of said spool and shift said spool to said predetermined position;

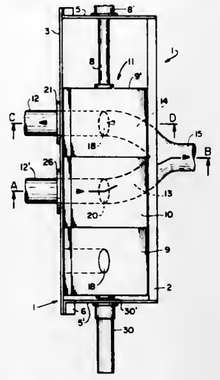
said means for axially shifting said spool being fluid operated; said sealing means including fluid seal means between said piston and said fluid-operated means for axially shifting said spool for allowing fluid movement therepast only to move said piston to its first position, and check valve means in said fluid passageway which admits pressure against said piston for preventing fluid passage to said piston through the said fluid passageway until after said spool is positioned in said predetermined axial position by fluid and fluid has moved past said fluid seal means to move said piston to its first position.

4,046,166

RECIPROCATING VALVE FOR A DOUBLE PISTON CONCRETE PUMP

Horst Bender, Biebergemuend, Germany, assignor to WIBAU (Westdeutsche Industrie- und Strassenbau-Maschinen Gesellschaft m.b.H.), Gruendau-Rothenbergen, Germany

Filed May 13, 1976, Ser. No. 685,999
Claims priority, application Germany, June 14, 1975, 2526767; Dec. 12, 1975, 2555947
Int. Cl.² F04B 7/00; F16K 11/06
U.S. Cl. 137—625.48 12 Claims



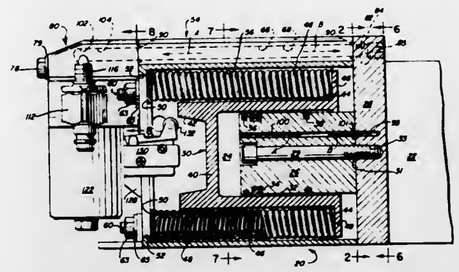
1. A valving apparatus for interconnecting a double piston pump having two cylinders with conveying conduit means and with supply means comprising a valve housing having a given length, said housing further having a first pair of aligned ports for connecting said valve housing to said two pump cylinders, a second pair of aligned ports for connecting the valve housing to conveying conduit means, and a third pair of aligned ports for connecting the valve housing to said supply means, said ports being aligned at a pair of planes extending transverse to the longitudinal axis of said housing with each port of each pair of ports being aligned with a separate one of said planes, a piston valve plug mounted solely for axial movement in said valve housing, said piston valve plug having a central plug section with a cylindrical central passageway extending through the valve plug and the valve housing in a direction to interconnect ports of said first and second pair in a common plane, a first outer plug section with a first outer bent cylindrical passageway and a second outer plug section with a second outer bent cylindrical passageway, said first and second outer plug sections and said central plug section having together a length shorter than the length of the valve housing to permit the axial displacement of the piston valve plug in said housing, said first and second outer plug sections extending on each side of said central plug section, each of said first and second bent outer passageways including an angle within the range of about 75° to less than 90° in a direction to interconnect ports of said first and third pairs of ports in a common plane, said passageways being axially spaced, whereby in one axial position, said central passageway interconnects one port of said first pair with one port of said second pair, while one of said outer bent passageways interconnects the other of said first pair with one of said second pair, and whereby in another axial position said central passageway interconnects the other ports of said first and second pairs, while the other of said outer passageways interconnects said one of said first pair of ports with the other of said third pair of ports, and means operatively connected to said valve plug for axially moving said valve plug in said valve housing so as to be compatible with the function of suction, pressure and suction in that order for each work cycle of the valve, wherein said valve housing comprises plane walls defining a plug chamber, said piston valve plug also having plane walls fitting into said plug chamber, and wherein at least two of said plane walls of said plug chamber and at least two respective plane walls of said piston valve plug respectively include an angle of up to 75°.

4,046,167

MECHANICAL ACCUMULATOR

Joseph Papp, South Bend, Ind.; Richard A. Meisterheim, Dowagiac, and S. Eugene Hubbard, Niles, both of Mich., assignors to Kawneer Company, Inc., Niles, Mich.

Filed Feb. 6, 1976, Ser. No. 655,724
Int. Cl.² F16L 55/04; F01B 15/02, 31/00
U.S. Cl. 138—31 3 Claims



1. A mechanical accumulator for holding and supplying a volume of fluid under pressure comprising:

a cylindrical hollow casing closed at one end with a fixed end wall and having an inwardly extending annular end wall adjacent an opposite end forming an open end of said casing;

a variable volume fluid pressure chamber formed by a cylindrical piston in coaxial alignment in said casing fixedly secured to said fixed end wall and an annular outer cylinder slidably mounted on said piston for reciprocal movement toward and away from said fixed end wall and closed adjacent an end opposite said fixed end wall,

said cylinder including a plurality of longitudinally extending recesses of substantially circular transverse cross-section positioned adjacent an outer wall surface in parallel, equilaterally spaced relation with respect to a central longitudinal axis of said piston, each of said recesses having a transverse end wall adjacent said fixed end wall of said casing;

a pair of coaxial coil springs mounted in each of said recesses acting in compression between said annular end wall of said casing and the end wall of the recess for biasing said cylinder toward said fixed end wall of said casing to minimize the volume of said pressure chamber;

a fluid conduit in said piston for directing pressurized fluid into and out of said chamber; and

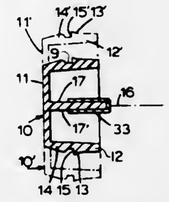
switch means externally of said fluid chamber actuated by movement of said cylinder in response to volume changes of said chamber for controlling the operation of a fluid device in fluid communication with said chamber.

4,046,168

CLOSURE PLUGS

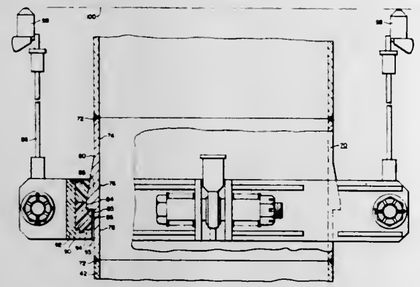
John D. Milne, Islington, Canada, assignor to MM Plastic (Mfg) Company, Inc., Toronto, Canada

Continuation of Ser. No. 539,334, Jan. 8, 1975, abandoned. This application Apr. 28, 1976, Ser. No. 681,044
Claims priority, application Canada, Sept. 30, 1974, 210412
Int. Cl.² F16L 55/10; B65D 59/02, 39/04
U.S. Cl. 138—89 1 Claim



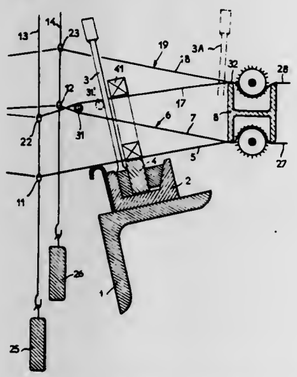
1. A resiliently deformable plug for closing an end of a tube, the plug comprising: a deformable circular disc portion; a deformable annular skirt portion of circular cross-section which projects from the periphery of the disc portion to one side thereof and substantially normal to the normal plane of the disc portion, the skirt portion presenting an outwardly directed annular closure member having an outer diameter which is reducible by resilient deflection of the disc portion to either side thereof; and a pin member which is integral with said disc portion and projects in the direction of the longitudinal axis of the plug from the center of the disc portion to said one side thereof, the pin member being circular in transverse cross-section throughout its entire length, the outer wall of said pin member being spaced from the inner surface of said annular skirt portion and concentric therewith with the portion of the circular disc portion disposed between the inner surface of the annular skirt portion and the outer surface of the circular base of the pin member comprising a flexible annulus of uniform width, the skirt portion having a terminal edge and said annular closure member comprising an outwardly projecting, annular sealing member of bulbous form as viewed in transverse cross-section disposed intermediate said circular disc portion and said terminal edge, an outwardly directed annular rim member projecting from the periphery of said annular skirt portion between said annular closure member and said terminal edge, said rim member having an annular abutment face extending normal to the axis of the plug and directed toward said disc portion, said annular skirt portion being formed with an annular groove between said annular abutment face and said annular closure member, at least one wall of said groove extending normal to the axis of said plug and being coextensive with said abutment face of the annular rim member, and axial movement of said pin member from its normal position resiliently deflecting said disc portion substantially symetrically about the center thereof and substantially uniformly reducing the outer diameter of said annular skirt portion and the outwardly directed annular closure member.

4,046,169
PIPE SUPPORT FOR USE IN A NUCLEAR SYSTEM
Louis P. Pollono, and Raymond M. Mello, both of Greensburg, Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed July 9, 1975, Ser. No. 594,477
Int. Cl.[2] F16L *3/00*; F21L *17/02*
U.S. Cl. 138—106 6 Claims



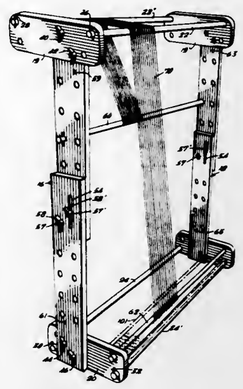
1. A pipe support system comprising:
a vertical pipe;
an integrally formed tubular pipe support structure having the same inside diameter as said pipe, said pipe support structure having the same wall thickness as said pipe, said pipe support structure having a generally triangularly shaped extension formed integral with and extending circumferentially around its outward side, the bottom side of said extension generally forming a ledge, said pipe support structure replacing a portion of said pipe;
an annular load-bearing insulation formed adjacent to said extension, said load-bearing insulation supporting said pipe support structure substantially through said ledge;
means for clamping said load-bearing insulation to said extension, said means for clamping said insulation being located such that a first space is maintained between said means for clamping and said pipe support structure; and
means for providing constant vertical support to said means for clamping.

4,046,170
LOOMS
Yves Juillard, and Victor Riner, both of Mulhouse, France, assignors to Societe Alsacienne de Constructions Mecaniques de Mulhouse, Mulhouse Cedex, France
Filed June 7, 1976, Ser. No. 693,185
Claims priority, application France, June 11, 1975, 75.18199
Int. Cl.[2] D03D *39/16*
U.S. Cl. 139—20 7 Claims



1. A loom comprising a shedding harness with heald frames for forming two superposed sheds in incoming warp, weft inserters for traversing weft through said sheds, a reed for beating up the weft whereby to form upper and lower fabrics, a breast beam having upper and lower edges over which said upper and lower fabrics are taken off, respectively, and a rectilinear elongate transverse member stationarily supported, through its two ends, across the space included, on the one hand between the two sheds and, on the other hand, between the heald frame nearest said reed and the location of the reed in the back position.

4,046,171
HAND LOOM
Kathleen V. Wilson, 3039 Calusa St., Coconut Grove, Fla. 33133
Filed June 30, 1976, Ser. No. 701,346
Int. Cl.[2] D03D *29/00*
U.S. Cl. 139—29 8 Claims

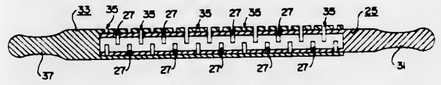


1. A hand-loom comprising (A) spaced posts defining a main normal weaving plane, each side post having an upper end and a lower end and said lower ends each including a portion extending outwardly in perpendicular relation to said plane a common distance and direction, (B) spaced stationary beams spanning the upper and lower ends of the posts and defining a loom frame, (C) means removably connecting the beams and posts together, (D) each of said posts having a surface with a pattern of recesses of common cross sectional area, said surfaces and the recesses of said patterns being in confronting relation with one another, and each of said posts includes a first and a second segment, each of said segment having an inner end and means connecting the inner ends in overlapped relation and said means removably connecting including means for adjusting the overall length of each of said posts by bypassing movement of the inner ends of each over one another, and (E) a pair of spaced movable dowels spanning the posts, each of said dowels having opposite end zones and said end zones being sized for receipt in said recesses.

4,046,172
WEAVING DEVICE
Carolyn G. Russell, 6015 Summer Trace Apt. 105, Memphis, Tenn. 38128
Filed Jan. 3, 1977, Ser. No. 756,486
Int. Cl.[2] D03D *29/00*
U.S. Cl. 139—33 8 Claims

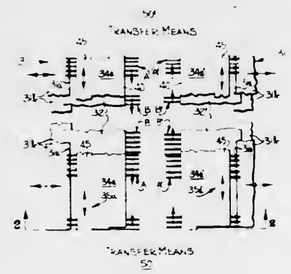
1. Spreader means for use with a weaving device of the type including a frame and means for mounting lengths of warp thread to said frame to allow lengths of weft thread to be woven through the lengths of warp thread, said spreader means comprising: an elongated bar member for being rotatably attached to said frame and for passage underneath said

lengths of warp thread, said bar member including a plurality of substantially transverse slots for receiving said lengths of warp thread, certain ones of said plurality of slots being substantially 180° opposed from other ones of said plurality of slots so that certain ones of said lengths of warp thread will be received in certain ones of said plurality of slots while other ones of said lengths of warp thread are held substantially on the outer circumference of said bar member to create a shed between certain ones of said lengths of warp thread and so that when said bar member is rotated substantially 180° upon said frame, certain ones of said lengths of warp thread that were held substantially on the outer circumference of said bar mem-



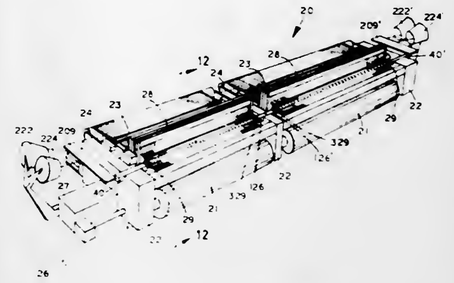
ber will be received in certain ones of said plurality of slots while certain ones of said lengths of warp thread that were received in certain ones of said plurality of slots will be held substantially on the outer circumference of said bar member; and an elongated hollow sleeve member for being attached to said frame and for substantially enveloping said bar member, said sleeve member including a plurality of substantially transverse slots, each of said plurality of slots being spaced apart from each adjacent one of said plurality of slots a distance substantially equal to the distance between each adjacent ones of said lengths of warp thread for selectively guiding said lengths of warp thread into said plurality of slots in said bar member.

4,046,173
TRIAXIAL WEAVING MACHINE WITH HEDDLE SHEDDING MEANS
Karol Kulczycki, Parsippany, N.J., assignor to Barber-Colman Company, Rockford, Ill.
Filed May 17, 1976, Ser. No. 687,012
Int. Cl.[2] D03C *13/00*
U.S. Cl. 139—48 12 Claims



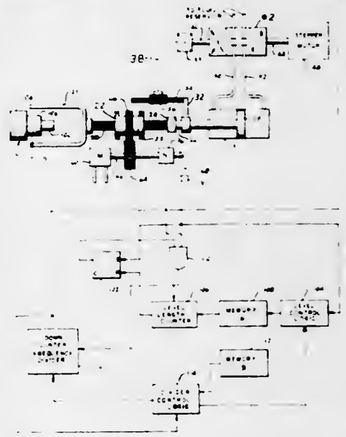
1. A weaving machine for making triaxial fabrics comprising a plurality of elongate heddles arranged in weftwise rows for guiding warp strands, each of said heddles having cutout means therein adapted to be engaged for imparting longitudinal movement thereto; means for shifting said heddles weftwise; stationary means extending weftwise of the weaving machine for guidingly supporting said heddles in said weftwise rows; and means movable to and from extended and retracted positions relative to said stationary means and engaging said cutout means of said heddles for moving said heddles longitudinally of themselves across said stationary means to and from extended and retracted positions for forming warp strands guided thereby into warp sheds.

4,046,174
PNEUMATIC LOOM
Karl W. Wenger, Ward St., North Brookfield, Mass. 01535
Filed Feb. 25, 1976, Ser. No. 661,159
Int. Cl.[2] D03D *47/24*
U.S. Cl. 139—437 10 Claims



1. A loom, comprising means for forming a warp shed, inserting means mounted at one end of said warp shed for inserting a filling pick into said warp shed, said inserting means including conduit means for holding and conveying a projectile, said conduit means being transferable from a first position to a second position, said conduit means being connected at one of said positions to a source of fluid under pressure, for propelling said projectile through the warp shed, and said conduit means being connected in at least one of said positions to means for disposing filling within said projectile, and further comprising a tubular fluid supply means connected tangentially to said conduit means at a point adjacent the connection to the filling disposing means, whereby fluid under pressure entering said conduit means via said fluid supply means creates a vortex through which said filling must pass prior to disposition in said projectile.

4,046,175
PRECISION LEVEL COIL WINDING APPARATUS
Alexander C. Gardner, and Ronald L. Gable, both of Dayton, Ohio, assignors to Machine Products Corporation, Dayton, Ohio
Filed Mar. 15, 1976, Ser. No. 666,871
Int. Cl.[2] B21F *3/04*
U.S. Cl. 140—92.1 16 Claims



1. In a coil winding system adapted to provide incremental

axial movement during mutual rotation and relative axial movement of a wire-laying device and a coil holder member, apparatus for effecting and controlling the incremental axial movement comprising:

A. motive means responsive to an increment input pulse for effecting a predetermined relative axial movement between the wire-laying device and the coil holder;

B. reference pulse generating means adapted to issue a predetermined number of reference pulses with each revolution of mutual rotation between the wire-laying device and the coil holder;

C. radial position pulse generating means adapted to issue a radial position pulse at a predetermined radial position during each revolution of mutual rotation between the wire-laying device and the coil holder;

D. a first memory for storing a binary representation of the length of a predetermined section of the coil holder;

E. a second memory for storing a binary representation of the number of turns to be laid on said predetermined section of the coil holder;

F. a first presettable counter adapted to receive the binary representation from said first memory and to be selectively preset thereby, said first counter further including a count input;

G. first decoding means connected to sense the count in said first presettable counter and responsive to a predetermined count therein for issuing an output pulse;

H. bistable means having first and second stable states, said bistable means being connected to said first decoding means and responsive to an output pulse therefrom for assuming said second state;

I. first gating means having an output, a first input connected to receive said reference pulses and a second input coupled to said bistable means whereby said reference pulses appear at the output of said gating means only when said bistable means is in said first state;

J. a second presettable counter adapted to receive the binary representation from said second memory and to be selectively preset thereby, said second counter including a count input;

K. second decoding means connected to sense the count in said second presettable counter and responsive to a predetermined count therein for issuing an output pulse;

L. second gating means having an output, a first input connected to receive the binary representation from said second memory, and a second input coupled to receive the output pulse from said second decoding means whereby said binary representation from said second memory is preset into said second presettable counter after said second decoding means issues an output pulse;

M. means coupling the output from said first gating means to said count input of said first presettable counter;

N. means coupling the output from said first gating means to said count input of said second presettable counter; and

O. means coupling the output of said second decoding means to said motive means whereby repetitive output pulses from said second decoding means serve as increment input pulses thereto.

4,046,176

WINDING MACHINE FOR CONTINUOUSLY MANUFACTURING CIRCULAR WAVEGUIDES

Jean C. Le Gall, Perros-Guirec, France, assignor to Etat Francais, Issy-les-Moulineaux and Societe Anonyme de Telecommunications, Paris Cedex, both of, France

Filed July 31, 1975, Ser. No. 600,567
Claims priority, application France, Aug. 2, 1974, 74.26959
Int. Cl.² B21F *3/04*
U.S. Cl. 140—92.1 **2 Claims**

1. A rotating winding machine for the continuous manufacture of a circular waveguide by the winding of an insulated metal conductor in the form of a wire around a spindle comprising:

an elongated frame for supporting a rotatable winder member;

a winder member for winding of said insulated conductor which is rotatably mounted within said frame having a longitudinal axis of rotation;

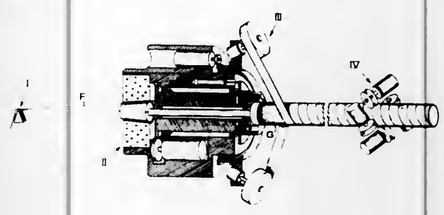
said rotatable winder member having an axial bore for passage of a spindle and a channel inclined with respect to the axis of rotation of said winder for the passage of a continuous length of said wire through said channel from a supply reel;

a wire tensioning device supplying said wire to said channel under a predetermined tension;

a wire guide means for said wire tensioning device to guide the wire at the intersection of the channel and the longitudinal axis of said winder member;

spindle having a first cylindrical portion centered in said axial bore of said rotatable winder member and a second cylindrical portion extending beyond said rotatable winder member in the direction opposite to said wire tensioning device and about which said wire is wound inside by side abutting relation;

spindle-support means for fixing said first cylindrical portion of said spindle with respect to said frame while allowing passage for said wire;



motor means to drive said winder member for winding around said second cylindrical portion of said spindle the length of wire continuously emerging from said inclined channel, the already formed turns of wire about, said second cylindrical portion being thus pushed in said direction by said length of wire;

capstan driver means bearing against said second portion of said spindle for supporting said second portion and applying to said already formed turns a compression stress in the direction of said rotatable winder member;

additional motor means for driving said capstan driver means and

control means for controlling said additional motor means, said control means comprising an axially movable winder head which is mounted in said rotatable winder member, sensing and signalling means for detecting the axial position of said winder head with respect to said frame and providing a winder head position signal and means for controlling said additional motor means responsive to said winder head position signal, whereby the capstan driver movement cooperates in maintaining a compression stress on said already formed turns.

4,046,177

MACHINE FOR STRAIGHTENING WIRES

Hans Louis, Weyerstrasse 213, D-565 Solingen-Wald, and Eberhard Leverkus, Katternberger Strasse, D-565 Solingen-1, both of Germany

Filed May 28, 1976, Ser. No. 690,947
Claims priority, application Germany, May 30, 1975, 2523831
Int. Cl.² B21F *1/02, 1/04*
U.S. Cl. 140—147 **1 Claim**

1. A machine for straightening wire, comprising:

a frame;

a hollow shaft rotatably supported on said frame;

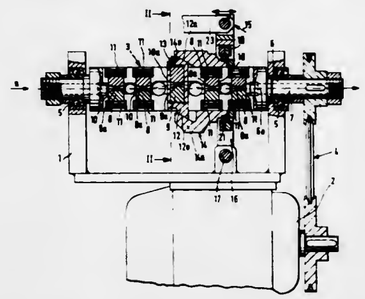
a motor connected to said shaft to drive the same;

at least three axially spaced dies mounted on said shaft and rotatable therewith, each of said dies having a central aperture through which the wire passes, and the end dies having their apertures located on the axis of rotation of the shaft;

the middle die being slidable radially with respect to the hollow shaft between a first position wherein its aperture is coincident with the axis of rotation of the shaft, and a second position displaced radially from said axis; said middle die having opposite plane surfaces that are parallel to one another and inclined with respect to the axis of rotation of the shaft;

a slotted link surrounding said middle die and slidable axially with respect to said shaft, said slotted link having opposed faces that are parallel to said plane surfaces on said middle die and in sliding contact therewith;

a ring surrounding said slotted link and having an inner



bearing connected with the link so as to rotate therewith, said ring being stationary while the shaft rotates;

an actuating fork having a pair of laterally spaced legs that straddle said ring and are swingably connected to said frame, said legs being connected to said ring whereby swinging movement of the fork about its pivot axis causes said slotted link to slide axially along said shaft, thereby shifting said middle die radially from one of said positions to the other, enabling said middle die to be shifted instantaneously from said second position to said first position when the wire is momentarily halted in its progress through the machine so as to prevent fatigue-stressing of the wire; and

link means connected to said actuating fork to actuate the latter in the direction to shift said middle die to said first position when the wire halts, and to said second position when the wire resumes its travel through the machine.

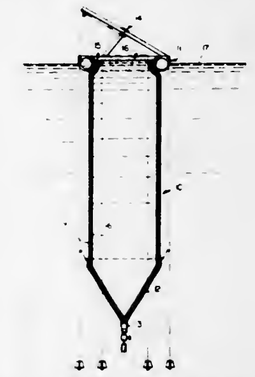
4,046,178

FLOATING BAG FOR POLLUTION STUDY

John N. Case, Victoria, Canada, assignor to Case Existological Laboratories, Ltd., Victoria, Canada

Continuation of Ser. No. 579,075, May 19, 1975, abandoned.
This application Oct. 6, 1976, Ser. No. 729,973
Int. Cl.² B65B *3/04*
U.S. Cl. 141—1 **3 Claims**

3. A method of deploying a fluid filled bag in a marine or like environment, comprising providing a bag of a flexible material hving a resistance to stretching, supporting the bag from the surface of the water by flotation means, and raising the level of the fluid within the bag to a level slightly above the level of the fluid in the bag at which the fluid within the bag and the water around the bag are in equilibrum for maintaining turgidity in the total structure so as to resist disturbance of the bag due to



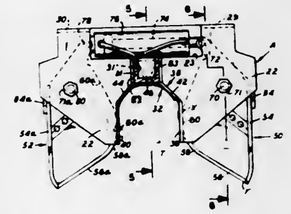
variations in the conditions in the environment in which the bag is deployed.

4,046,179

CROSS-CUT SHEAR FOR TREES

Patrick J. Crawford, 1013 S. Lincoln St., Shawano, Wis. 54166

Filed July 10, 1975, Ser. No. 594,694
Int. Cl.² A01G *23/08*
U.S. Cl. 144—34 E **10 Claims**



1. A cross-cut shear for trees comprising:

a. first and second cooperating blades, each blade having

b. a straight cutting edge portion terminating in

c. a convex arcuate cutting edge portion,

d. a first pivot pin and a second pivot pin spaced from the first pivot pin with the first and second pivot pins mounting each of said convex first and second blades, respectively, with said arcuate edge cutting portions directly opposed for first cutting when said blades are pivoted towards each other with the straight cutting edge portions subsequently cutting and abutting in closed relationship, and

e. means for pivoting each of said blades.

4,046,180

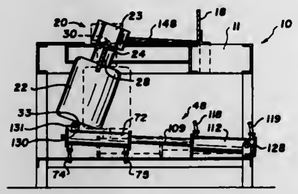
AUTOMATIC CONTROL APPARATUS FOR WANEY EDGE FORMING MACHINES

Henry James Marshall, Vancouver; Stuart Walter Windblad, and William Wagner, both of Surrey, all of Canada, assignors to Island Lumber Specialties Ltd., Richmond, Canada

Filed June 15, 1976, Ser. No. 696,185
Int. Cl.² B27C *5/00*
U.S. Cl. 144—117 B **18 Claims**

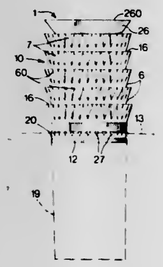
1. Apparatus for automatically controlling the cutter unit of a wood edging machine to produce waney edges on boards moving along a feed path and leaving knots at said edges substantially uncut, comprising a main control unit including means connected to a cutter unit of a wood edging machine and normally operable to cause swinging movement of said

cutter unit in accordance with a predetermined pattern, said movement enabling the cutter unit to cut into the edges of boards moving along a path in the edging machine past said unit, an overriding control unit including means connected to the main control unit means operable to cause said main control unit means to move the cutter unit in the direction away



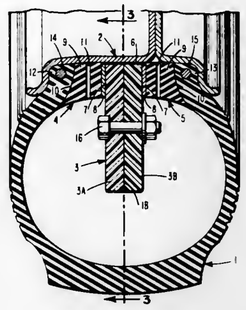
from boards moving along the path without interfering with the normal operation of the control unit means, and scanning means operatively connected to said overriding control unit means for detecting knots in the edges of boards moving along said path to cause the overriding control unit means to operate and move the cutter unit respectively to avoid said knots.

4,046,181
INSERT
Arthur Derrick Barnsdale, Alne Cote, Great Alne, Warwickshire, England
Filed July 8, 1976, Ser. No. 703,425
Int. Cl.² F16B *15/06*
U.S. Cl. 151—41.73 **2 Claims**



1. An insert comprising an exterior part thereof having a series of annular peripheral taper portions, each having the same diameter and each of which tapers down from a rear shoulder thereof in a direction towards the leading end of the insert so that said taper portions are in barb-like formation, each said taper portion being longitudinally serrated with serrations of V-form at its rear part to provide a plurality of projections for retention of the insert in a hole therefor in a parent material, the serrations running out with forward reduction of each taper portion; a reduced diameter cylindrical pilot portion at the leading end of the insert; an external annular lip about the pilot portion closely adjacent the leading end of said pilot portion and axially spaced along the pilot portion from the adjacent taper portion, which lip is of taper form tapering down towards the leading end of said pilot portion and is of substantially smaller diameter than that of the said series of serrated annular peripheral taper portions for wall engagement in a said hole in order to assist in maintaining initial axial alignment and contact of the insert with the hole at the commencement of and during installation of the insert therein; and a rear plain external annular peripheral taper portion behind the rearmost serrated taper portion and of substantially the same diameter thereof and also tapering down in a direction towards the leading end of the insert in order to close a said hole and retain parent material therein on complete installation of the insert.

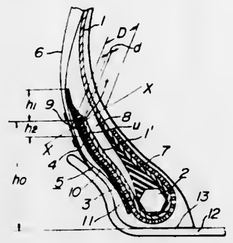
4,046,182
SAFETY TIRE AND WHEEL ASSEMBLIES
Frank Farnsworth, Sutton Coldfield, England, assignor to Dunlop Limited, London, England
Filed July 29, 1975, Ser. No. 600,129
Claims priority, application United Kingdom, Aug. 8, 1974, 34957/74
Int. Cl.² B60C *17/04*
U.S. Cl. 152—158 **14 Claims**



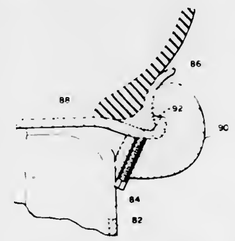
1. A safety tire and wheel rim assembly comprising a pneumatic tire, a wheel rim having a pair of bead retaining flanged, bead seats, and between the bead seats a substantially uniform diameter, a safety insert for carrying load between the wheel rim and the tire when the tire becomes deflated, the insert being mounted for circumferential slippage relative to the wheel rim when the assembly is used with the tire in a deflated condition and having a pair of spacers extending circumferentially around the rim on either side of said insert, with one surface of each spacer engaging the axially inner surface of the respective beads of the tire and the other surface of each spacer engaging the sides of said safety insert to provide axial location of said insert, the surface of each spacer engaging a bead having a high coefficient of friction with rubber and the surface of the spacer engaging the insert having a low coefficient of friction with the material of the insert with which it is in contact, to permit circumferential slippage of the insert on the rim relative to the tire beads.

4,046,183
RADIAL TIRE HAVING A HIGHLY DURABLE BEAD STRUCTURE
Hidenori Takahashi, Tokorozawa; Hiroshi Tamura, Kunitachi; Shigeo Watanabe, Kokubunji, and Toshiyuki Sogi, Higashi-Yamato, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Mar. 5, 1976, Ser. No. 664,229
Claims priority, application Japan, Mar. 19, 1975, 50-32159
Int. Cl.² B60C *9/04, 15/00*
U.S. Cl. 152—362 R **10 Claims**

1. A radial tire having a highly durable bead structure, comprising a carcass ply composed of a rubberized layer containing a plurality of cords parallel to one another and disposed in radial relationship with respect to the equatorial line of the tire and at least two inner reinforcing cord layers covering that portion of the carcass ply which is wound about a bead core from the inside toward the outside thereof and extended upwardly to form a turn up portion and each composed of a plurality of cords inclined with respect to tangential lines touching at a circle formed by the bead core, in the tire the upper end of at least one of the inner reinforcing cord layers is located at a position which is lower than the upper end of the turn up portion of the carcass ply by (1/10 to ½)h_0 where h_0 is a vertical height of the upper end of the turn up portion of the carcass ply measured from a base of the bead, a space formed between the turn up portion of the carcass ply and a reinforcing cord layer exclusive of said reinforcing cord layer has an interlayer gauge d measured on a line passing through the upper end of the turn up portion of the carcass ply and perpendicular to the carcass ply and defined by $d = (1/30 \text{ to } 1/5)D$ where D is a thickness of that portion of the bead which is measured on said line, where h_0, d and D are measured after the tire has been mounted and normally inflated, and a rubber having a modulus of elasticity of 20 to 100 Kg/cm² at 100% elongation is inserted into said space.



4,046,184
SAFETY MEANS FOR PREVENTING DEMOUNTING OF LOW OR FLAT TIRES FROM VEHICLE WHEELS
John A. Diehl, Apt. No. 305 S, 2111 Jefferson-Davis, Arlington, Va. 22202
Continuation-in-part of Ser. No. 494,163, Aug. 2, 1974, abandoned. This application June 27, 1975, Ser. No. 591,077
Int. Cl.² B60B *25/06*
U.S. Cl. 152—407 **1 Claim**



1. In a two-piece rim system for receiving and retaining a tire for a wheel of a motor vehicle, the tire including an outer bead portion, the system comprising:

A. a bowl-shaped disc-type body portion provided, at spaced circumferential locations, with openings adjacent to a rim thereof,

B. a rim base affixed to the rim of the body portion and including a circumferentially-extending upturned outer edge, and

C. a circumferentially-extending outer flange resting on the top surface of the rim base and engaged inside the upturned outer edge, the outer flange having an inner surface engaging the outer bead portion of the tire,

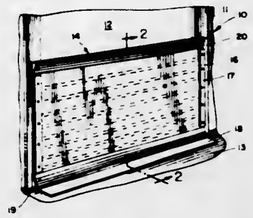
The improvement comprising:

D. a C-shaped clamp comprising a central portion and first and second end portions turned toward an inner side of the central portion, the clamp being positioned in the openings of the body portion, the inner side of the central portion being positioned over said outer edge of the rim base, the first end portion of the clamp forming a protuberance bearing against an outer surface of the tire-engaging outer flange, the second end portion of the clamp having an inner side of conforming shape to fit adjacently to the outer bottom surface of the rim base, and

E. a set screw threaded in the second end portion of the clamp and engaging the outer bottom surface of the rim base,

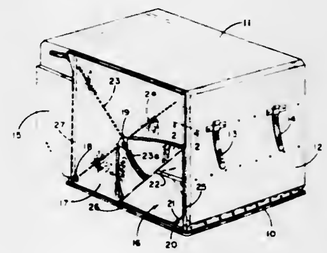
whereby the clamp is fixed in place to the rim base to prevent the outer flange and the tire from becoming detached from the rim if the tire is deflated.

4,046,185
TEMPORARY DOOR INSTALLATION FOR GRAIN CARRYING FREIGHT CAR
William E. Bruning, Omaha, Nebr., assignor to OMNI Corporation, Omaha, Nebr.
Filed Oct. 17, 1974, Ser. No. 515,573
Int. Cl.² E06B *3/00*
U.S. Cl. 160—368 G **2 Claims**



1. In combination, a freight vehicle having a floor and a wall having door posts defining a doorway opening, a flexible temporary door installed across said doorway interiorily of said vehicle and secured to said wall door posts, and an upwardly tapered pry-board mounted across said doorway adjacent said floor and secured to said wall door posts, between said wall door posts and said door whereby said door is relatively uncreased in the area adjacent the top of said pry-board and provides a door to door post seal.

4,046,186
CARGO CONTAINER OPENING COVER
Arnold B. Nordstrom, Torrance, Calif., assignor to Transequip Inc., El Segundo, Calif.
Filed Feb. 12, 1976, Ser. No. 657,607
Int. Cl.² A47H *3/00*
U.S. Cl. 160—368 R **10 Claims**



1. A cover for an opening in a cargo container comprising a curtain of flexible material, means for securing said curtain to said container along one side and on the outside of said opening, flanging means rigidly secured to said container for providing a flange around said opening substantially uninterrupted from one end to the other of said curtain securing means, said flange standing out away from said container and extending in a direction away from said opening, thereby providing a channel from substantially one end to the other of said curtain securing means, said curtain being of a size and shape to overhang said flange, and having along its edge a tunnel running

substantially uninterrupted from one end to the other of said curtain securing means, a cable inserted in said curtain tunnel, said cable having one end anchored at said one end of said curtain securing means, tensioning means anchored to said container at the other end of said curtain securing means for pulling said cable taut in said channel, and releasable latching means for latching said tensioning means with tension on said cable.

4,046,187

PROCESS OF MANUFACTURING KILLED STEEL INGOTS OF SUPERIOR QUALITY

Shigeru Matsuyama, Utsunomiya, and Hiroshi Mikami, Imaichi, both of Japan, assignors to Alkoh Co., Ltd., Tokyo, Japan

Filed June 16, 1975, Ser. No. 587,104
Claims priority, application Japan, June 24, 1974, 49-71428
Int. Cl.² B28B *7/36*
U.S. Cl. 164—53 **2 Claims**

1. In the process of manufacturing killed steel ingots by solidifying molten steel in a mold while covering the upper surface of said molten metal with a hot topping material, wherein the improvement comprises:

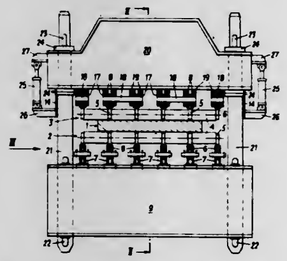
arranging on the upper surface of the molten steel immediately after pouring it into a mold in excess of 2 kg. per ton of molten steel of a board-like, heat-retaining material having (a) a layer of easily-flammable material consisting of a mixure of oxidizable metal, selected from the group consisting of aluminum, silicon and magnesium and mixtures thereof; an oxygen supplying agent selected from the group consisting of iron oxide, manganese oxide, alkali metal nitrate, and mixtures thereof; a burning modifier selected from the group consisting of, sodium fluoride, cryolite and mixtures thereof; and a binder and (b) a molded laminated layer of heat-insulating material consisting of (i) 30 to 77 percent by weight of charcoal particles having a particle size of from 1 to 10 mm, (ii) 20 to 50 percent by weight of a heat expansible refractory material selected from the group consisting of graphite, vermiculite, obsidian, perlite and mixtures thereof, and (iii) a binder, whereby the concentration of non-metallic inclusions in the bottom of the ingot formed are reduced.

4,046,188

ARCUATE SUPPORTING AND GUIDING CONSTRUCTION FOR CONTINUOUSLY CAST STRANDS

Franz Kagerhuber, Traun, and Werner Scheurecker, Linz, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Sept. 23, 1976, Ser. No. 725,717
Claims priority, application Austria, Oct. 1, 1975, 7486/75
Int. Cl.² B22D *11/12*
U.S. Cl. 164—282 **4 Claims**



1. In an arcuate supporting and guiding construction for continuously cast strands, in particular slabs, of the type including a stationary framework, a set of inner arcuate longitudinal carriers and a set of outer arcuate longitudinal carrier positioned within the framework, at least one of said sets of longitudinal carriers being elastically deformable and braceable relative to the framework for adjustment to various strand thicknesses, and a plurality of rollers connected to each of the sets of longitudinal carrier to support the strand on two opposite sides thereof, the improvement comprising

transverse carriers arranged at a distance from one another and connected to all the arcuate longitudinal carriers of at least one of said sets, and

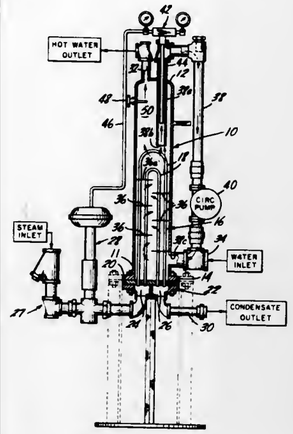
drawing anchors secured to the framework, the transverse carriers being guided on the drawing anchors and fixable relative thereto.

4,046,189

WATER HEATER

John A. Clark, Jr., East Stroudsburg, Pa., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Aug. 4, 1975, Ser. No. 601,348
Int. Cl.² B60H *1/00*
U.S. Cl. 165—39 **8 Claims**



1. A water heater comprising:

an elongated vessel having an open end and a closed end;

heat exchange means received within said open end and defining within the vessel a heat exchange zone occupying the major portion of the volume of the vessel and leaving the minor portion of the volume of the vessel for a storage and blending zone adjacent the closed end of the vessel, the heat exchange means including a bundle of elongated heat exchange elements spaced over substantially the full cross-sectional extent of the vessel, said cross section being perpendicular to the direction of elongation of the vessel, and extending from said open end towards said closed end over the major portion of the length of the vessel;

a cold water inlet located adjacent said open end of the vessel;

a hot water outlet located adjacent said closed end of the vessel in the storage and blending zone and remote from the heat exchange zone;

means for recirculating water through the heat exchange zone of the vessel including a recirculation conduit, the conduit having an inlet located within the vessel closely adjacent the inner end of the bundle of heat exchange elements for drawing water essentially solely from the heat exchange zone of the vessel and an outlet communicating with the vessel adjacent said open end thereof for conduction of water into and through the heat exchange zone; and

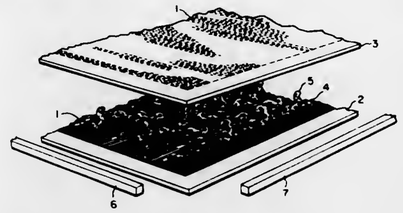
control means for controlling the input of heat to the heat exchange means in response to temperature changes in the water coming from the heat exchange zone of the vessel, the control means including a temperature sensor received entirely within the recirculation conduit such that it is responsive to a high velocity flow of water drawn essentially solely from the heat exchange zone of the vessel.

4,046,190

FLAT-PLATE HEAT PIPE

Bruce D. Marcus, Los Angeles, and George L. Fleischman, Inglewood, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 22, 1975, Ser. No. 579,989
Int. Cl.² F28D *15/00*
U.S. Cl. 165—105 **6 Claims**



1. A heat pipe device comprising:

i. two flat-plates in parallel planes having edges sealed and aligned normal to the parallel plates with capillary grooves in the facing surfaces at right angles to the grooves of the opposing plate; and

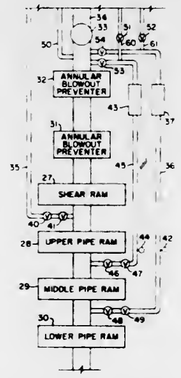
ii. metal wicking intersecting every groove.

4,046,191

SUBSEA HYDRAULIC CHOKE

Robert Arthur Neath, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed July 7, 1975, Ser. No. 593,419
Int. Cl.² E21B *7/12*
U.S. Cl. 166—.5 **12 Claims**



1. An apparatus for drilling a subsea well from a drilling platform at the surface of a body of water, which comprises

a riser conduit extending between the platform and the well;

at least one blowout preventer connected to said riser conduit near the lower end thereof;

at least one fluid bypass conduit providing at least one fluid flowpath from the well at a point below said blowout preventer to the lower interior portion of the riser conduit at a point above the uppermost blowout preventer; and

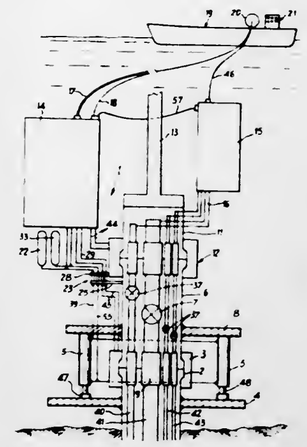
a means in said bypass conduit for regulating fluid flow through said bypass conduit.

4,046,192

METHOD AND APPARATUS FOR INSTALLING A CONTROL VALVE ASSEMBLY ON AN UNDERWATER WELL HEAD

Eric Daraborough, Chearn-Surrey, England, and Rene Henri Coulboy, Sanaset-les-Pins, France, assignors to Seal Petroleum Limited, London, England

Filed June 14, 1976, Ser. No. 695,718
Claims priority, application France, June 13, 1975, 75.18569
Int. Cl.² E21B *33/035*
U.S. Cl. 166—.6 **17 Claims**



1. A method of installing an underwater assembly comprising at least one master valve on an underwater oil well head, comprising the steps of: lowering in a non-rigid manner by remote guidance and propulsion means connected to a tool comprising a first connection means for connection of said tool to said assembly, second connections means for connecting said assembly to said well head, means for checking the sealing-tightness of any circuits required; controlling from the surface said first and second connection means, and for controlling any elements required inside said well; raising said tool after checking said circuits; and actuation of means for disconnection of said first connection means, wherein said operations are controlled from the surface by means of flexible connections providing the required power.

4,046,193

CLOSED ELECTRICAL APPARATUS CABINET EMBODYING A VAPORIZATION CHAMBER AND CABINET TOP THEREOF

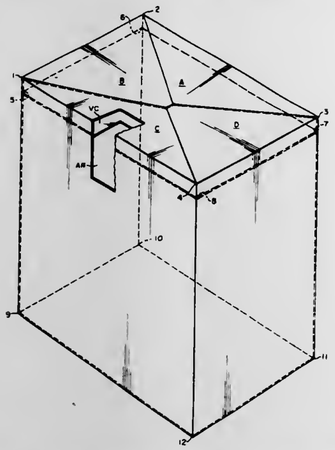
Michael L. Dougherty, Sanford, Fla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 18, 1976, Ser. No. 658,948
Int. Cl.² F28D *15/00*; H01L *23/42*
U.S. Cl. 165—105 **6 Claims**

1. A cabinet for electrical equipment comprising an enclosure having side walls and a bottom surface, a partition defining two compartments one on top of the other, the lower compartment containing electrical equipment and the top compartment being a sealed compartment forming a vaporization chamber defined between said partition as a heat sink and a heat dissipator serving as the top surface of said cabinet;

with said vaporization chamber containing liquid resting by gravity on said partition and having a vaporization temperature above 80° F and below 120° F; and

with said top surface being recessed from a horizontal plane



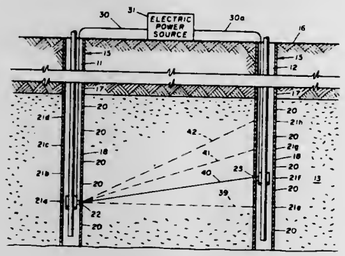
defined by the highest points of the side walls of said cabinet.

4,046,194

ELECTROLINKING METHOD FOR IMPROVING PERMEABILITY OF HYDROCARBON FORMATION

Wayne B. Cloud, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 3, 1976, Ser. No. 682,706
Int. Cl.² E21B *43/00, 43/26*
U.S. Cl. 166—248 **12 Claims**



1. A method of improving the permeability of a hydrocarbon bearing formation such as a coal seam or the like, said method comprising:

drilling a first well into said formation;

drilling a second well into said formation spaced from said first well;

completing each of said wells with a string of casing having a portion passing into said formation comprised of alternating sections of conduit made from electrically conductive material and electrically nonconductive material, said strings of casing each having more than one electrically conductive section lying within said formation;

lowering an electrode in said first well and into contact with one of said electrically conductive sections of casing within said formation;

lowering an electrode in said second well and into contact with one of said electrically conductive sections of casing within said second well; and

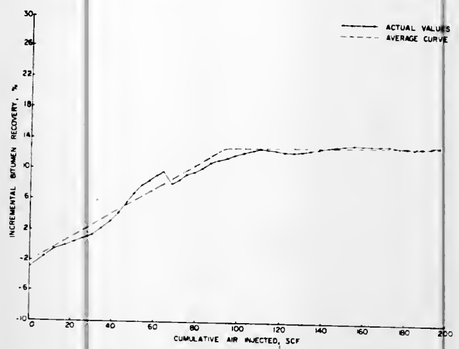
flowing electric current between said electrodes.

4,046,195

THERMAL RECOVERY OF HYDROCARBONS FROM TAR SANDS

Phillip J. Cram, Calgary, and David A. Redford, Fort Saskatchewan, both of Canada, assignors to Texaco Exploration Canada Ltd., Calgary, Canada

Filed June 18, 1975, Ser. No. 588,125
Int. Cl.² E21B *43/24*
U.S. Cl. 166—272 **7 Claims**



1. A method for the recovery of hydrocarbons from a subterranean hydrocarbon-bearing formation traversed by at least one injection well and at least one production well and having fluid communication therebetween comprising the steps of;

a. injecting via said injection well steam until steam is produced at said production well,

b. thereafter injecting via said injection well a mixture of steam and an oxygen-containing gas said mixture being injected at a temperature corresponding to the saturation temperature for saturated steam at the pressure of said formation whereby a low temperature oxidation is established in said formation until an optimum amount of said gas in the range of about 140 to 200 pore volumes at standard conditions has been injected simultaneously with said steam,

c. terminating injection of said oxygen-containing gas and continuing injection of said steam,

d. producing said hydrocarbons from said production well.

4,046,196

SECONDARY OIL RECOVERY PROCESS

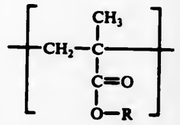
Alfred Brown; Stephen F. Hager, both of Houston, Tex.; Moutaz Chichakli, Dhahran, Saudi Arabia, and Ching H. Wu, Golden, Colo., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 18, 1976, Ser. No. 668,016
Int. Cl.² E21B *43/22*
U.S. Cl. 166—273 **19 Claims**

1. The process for recovering oil from an oil-bearing subterranean formation penetrated by an injection well and a production well which comprises:

a. injection into the formation via the injection well a solution of a normally solid, polymerized methacrylate in a water miscible solvent, and

b. recovering from the formation the oil displaced by the injected solution via the said production well, and wherein the said polymerized methacrylate is a homopolymer having recurring units of the formula:



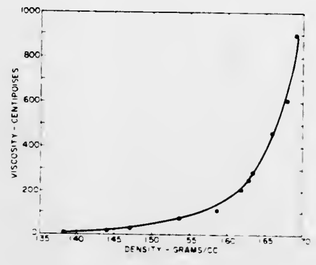
wherein R is alkyl of from 1 to about 5 carbon atoms.

4,046,197

WELL COMPLETION AND WORKOVER METHOD

Clay Gruesbeck, Jr.; Walter L. Peaberthy, Jr., and Thomas W. Muecke, all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed May 3, 1976, Ser. No. 682,008
Int. Cl.² E21B *21/00*; C09K *7/00*
U.S. Cl. 166—305 R **11 Claims**



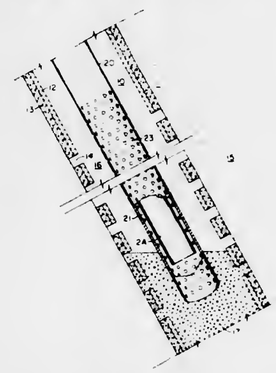
1. In a well completion and workover method wherein a subterranean formation is contacted with a treating fluid, the improvement wherein said treating fluid comprises a saturated aqueous saline solution having a density of at least about 1.2 g/cc at 10° C and having finely divided particles of a water soluble salt suspended therein, said particles of salt being present in sufficient quantities to substantially increase the density of said treating fluid, and minor amounts of xanthomonas gum and a polyphosphate acid ester to prevent settling of said salt particles.

4,046,198

METHOD AND APPARATUS FOR GRAVEL PACKING WELLS

Clay Gruesbeck; William M. Salathiel; Thomas W. Muecke, and Claude E. Cooke, Jr., all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Feb. 26, 1976, Ser. No. 661,662
Int. Cl.² E21B *33/00, 43/04*
U.S. Cl. 166—278 **7 Claims**



1. In a method of gravel packing a perforated liner opposite a subterranean formation in a well wherein a carrier liquid having gravel suspended therein is flowed downwardly along the outside of said liner and upwardly through a stinger pipe which extends substantially through the entire length of said liner, the improvement comprising said stinger pipe having an outside diameter large enough to substantially restrict the annular passage defined by said stinger and the interior of said liner so that the resistance to flow in said annular passage is increased sufficiently to maintain at least the minimum flow velocity of said carrier liquid along the outside of said liner necessary to prevent the premature settling of said gravel and formation of gravel dunes near the upper portions of said liner.

4. In a method of gravel packing a perforated liner opposite a subterranean formation in a well wherein a carrier liquid having gravel suspended therein is flowed downwardly along the outside of said liner and upwardly through a stinger pipe which extends substantially through the entire length of said liner, the improvement comprising:

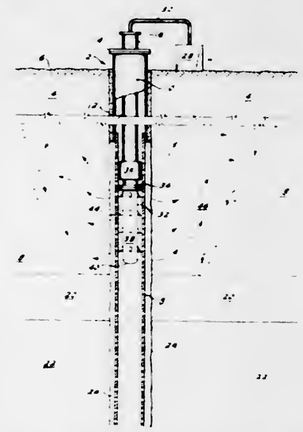
longitudinally restricting the annular passage defined by the exterior of said stinger pipe and the interior of said liner so that the resistance to flow in said annular passage is increased sufficiently to maintain at least the minimum flow velocity of said carrier liquid along the outside of said liner necessary to prevent the premature settling of said gravel near the upper portions of said liner.

4,046,199

STEAM INJECTION APPARATUS AND METHOD

Vincent G. Tafoya, Bakersfield, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed July 6, 1976, Ser. No. 703,053
Int. Cl.² E21B *43/24, 43/25*
U.S. Cl. 166—303 **15 Claims**



1. An apparatus for injecting steam into a subterranean formation via a tubing-containing well penetrating the subterranean formation comprising:

an elongated hollow housing having sidewalls, an open upper end an an open lower end, said open upper end being adapted to be attached to the lower end of the tubing;

coupling means for attaching the upper end of the elongated hollow housing to the bottom end of the tubing;

plug means to close the open lower end of the elongated hollow housing;

a plurality of circumferentially-spaced apertures in the sidewall of the elongated hollow housing;

a jet nozzle extending outwardly and downwardly from each aperture at an angle of from 20° to 40° from the axis of the well;

a steam source means located at the earth surface for generating steam; and

a steam conduit means connecting the said steam source

means and the said upper end of the elongated hollow housing for conducting steam to the said housing;

whereby steam injected down the tubing enters the elongated hollow housing, passes through the jet nozzles and is injected into the subterranean formation.

12. A method of injecting steam into a first selected strata of a subterranean formation penetrated by a conduit-containing well comprising:

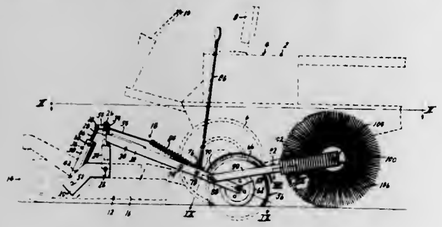
positioning the conduit so that the lower end thereof is just above the base of the first selected strata, and

passing steam down the conduit, into an elongated closed-bottom-ended elongated housing attached to the bottom of the conduit, out apertures in the sidewall of said housing, through jet nozzles extending beyond each aperture, said jet nozzles pointing outwardly and downwardly from said housing at an angle of from 20° to 40° with respect to the axis of the well and against and into the first selected strata opposite the jet nozzles.

4,046,200
LAWN EDGER ATTACHMENT

David L. Mallet, Hesston; Raymond J. Rilling, Moundridge, and Elmer D. Voth, Newton, all of Kans., assignors to Excel Industries, Inc., Hesston, Kans.

Filed Oct. 28, 1975, Ser. No. 626,032
Int. Cl.² A01B 45/00; A01G 3/06
U.S. Cl. 172—14 9 Claims



1. A lawn edging device adapted to be carried by a powered vehicle moving parallel to the lawn border to be edged, said device comprising:

a. a coulter arm adapted to extend generally forwardly and rearwardly of said vehicle,

b. attaching means adapted to mount the forward end of said coulter arm to said vehicle for pivotal movement on a generally vertical axis, said arm normally trailing behind said pivotal axis, said attaching means comprising a bracket adapted to be affixed to said vehicle, a stub shaft generally upright but pivoted at its lower end to said bracket on a horizontal axis which is transverse to said vehicle when said bracket is affixed to said vehicle, said coulter arm being pivoted on said stub shaft, and

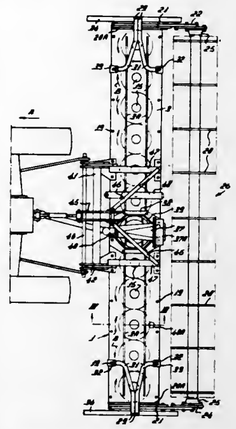
c. power means operable to pivot said stub shaft relatively to said bracket, whereby said coulter arm may be pivoted vertically upwardly or downwardly.

4,046,201
SOIL CULTIVATING IMPLEMENTS OR ROTARY HARROWS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Dec. 3, 1973, Ser. No. 421,111
Claims priority, application Netherlands, Dec. 4, 1972, 7216407
Int. Cl.² A01B 33/06, 23/02
U.S. Cl. 172—59 10 Claims

1. A cultivating implement comprising a plurality of soil-working members positioned in a row that extends transverse to the direction of travel, each of said soil-working members having a substantially horizontal support mounted for rotation on an upwardly extending shaft and driving means connected to rotate said soil-working members each support having at least one holder comprising a downwardly extending portion that is spaced from said shaft and fitted with soil-working means that is rotatable about said shaft, said soil-working means including a lower soil-working portion and an upper fastening portion having a cavity, the lower part of said holder being received in said cavity and fastening means connected to said holder for releasably retaining the holder in said cavity and preventing relative turning, the lower part of said holder which is received in said cavity having a cross-section which is

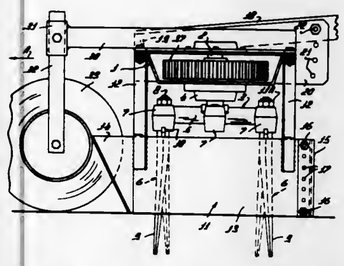


smaller than the cross-section of the remainder of said holder and extending substantially parallel to the axis of rotation of the soil-working member, said holder including an abutment surface above its lower end that engages a cooperating abutment surface of the fastening portion of soil-working means, said fastening means being received in cooperating bores in said upper fastening portion and the lower part of said holder, said upper fastening portion comprising an inverted frusto-conical portion that merges into the lower soil-working portion.

4,046,202
CULTIVATORS

Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Continuation of Ser. No. 473,572, May 28, 1974, abandoned.
This application Sept. 29, 1975, Ser. No. 617,419
Claims priority, application Netherlands, May 28, 1973, 7307376
Int. Cl.² A01B 33/12
U.S. Cl. 172—72 17 Claims



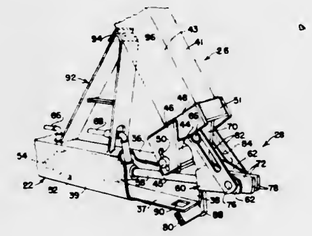
1. A cultivator comprising a frame and a plurality of power driven soil-working members rotatably mounted on corresponding upwardly extending axes supported on said frame,

said axes being positioned in a row that extends transverse to the direction of travel and at least one of said soil-working members including downwardly extending soil-working means, a screen supported on said frame and said screen having side and rear parts that extend upwardly around the sides and the rear of said one soil-working member, said side parts being substantially vertical and extending generally parallel to the normal direction of travel, the leading ends of said side parts having outwardly and forwardly divergent portions, the leading edge of each divergent portion being inclined downwardly and rearwardly from its uppermost extremity to the lowermost extremity thereof. said screen being located adjacent said soil-working means and cooperating therewith; said screen in combination with the soil-working means producing finely divided soil within the screen during operation, the rear part of said screen having a substantially vertical surface positioned to gradually release finely crumbled soil to the rear of said one soil-working member, said rear part being connected to said side parts and means selectively positioning said screen into the soil together with said soil-working means, whereby the rate of discharge of worked soil beneath said rear part and behind said screen with respect to the direction of travel, is controlled.

4,046,203
FOLDING TOOL BAR FOR AGRICULTURAL IMPLEMENTS

Gerald G. Ward, Naperville, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Jan. 19, 1976, Ser. No. 649,931
Int. Cl.² A01B 15/14
U.S. Cl. 172—456 29 Claims



12. A folding tool bar for agricultural implements and including a normally horizontal inner hollow tubular section and an outer wing section, an offset hinge connecting said sections in end-to-end relationship for swinging movement of the wing section between a normal lowered operative earth-working position and a raised inoperative parked position, a crank arm on said wing section which normally extends into the adjacent open end of the inner section when the sections are in alignment, a hydraulic cylinder pivotally mounted within the inner section and having a normally retracted plunger, a draw link having a forward end pivoted to the outer end of the plunger and a rear end pivoted to said crank arm in reentrant fashion relative to the plunger whereby, upon projection of the plunger, the draw link will function in tension to swing the crank arm forwardly and out of the inner section for wing section raising purposes, the effective length of said plunger, less the effective length of the draw link, is such that when the plunger is fully projected, the wing section is moved beyond its 90° position relative to the inner tubular section and thus overlaps the latter.

4,046,204
CONTROLLED DIRECTIONAL DRILLING TOOL

Sabro Takaoka; Akira Shimoda, and Hideo Kobayashi, all of Tokyo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Nov. 23, 1976, Ser. No. 744,393
Claims priority, application Japan, Nov. 25, 1975, 50-140915
Int. Cl.² E21B 7/08, 3/08
U.S. Cl. 175—76 4 Claims



1. A controlled directional drilling tool comprising in combination:

a drilling rod,

a joint freely flexibly connected to one end of said drilling rod,

a drilling head connected to the remaining end of said joint and provided at the leading end thereof with a drilling bit and in the interior thereof with a driving means for said drilling bit,

a pair of cylinder means and a pair of piston members both disposed inside said drilling head, said piston members each possessed of an inclined portion at the leading end thereof,

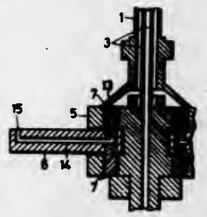
a pair of rollers disposed in contact with the inclined portions of said pair of piston members, said pair of rollers being disposed on the lateral sides of the drilling head opposite each other across the axis of said drilling head at positions separated by a prescribed distance and said rollers being freely protrusibly drawn in below the surrounding surface of the drilling head, and

means for delivering compressed fluid to the cylinder means.

4,046,205
EARTH AUGER AND METHOD FOR DRIVING PILES AND THE LIKE BY MEANS OF SAID EARTH AUGER

Kingo Asayama, Hirakata, Japan, assignor to Kabushiki Kaisha Takechi Koumusho, Osaka, Japan

Division of Ser. No. 465,091, April 29, 1974, Pat. No. 3,938,344.
This application Nov. 6, 1975, Ser. No. 629,329
Int. Cl.² E21B 9/26; E21C 13/04; E02D 5/46
U.S. Cl. 175—292 3 Claims



1. An auger for driving piles, said auger having a shaft and a boring head, said auger characterized in that said head has

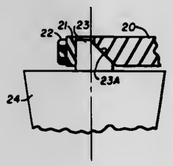
ground formation cutting blades and means pivotally mounting said blades to pivot between retracted and extended positions; stop elements on said head engaging said blades and limiting further pivotal movement when said blades are pivoted to their fully extended position; said head, including said blades when contracted, having a diameter less than that of the pile to be driven; said shaft being hollow and having a passage therethrough; said head having a first conduit opening therein communicating with said passage; a channel in each of said blades communicating with said conduit; the end of said channels extending parallel to said shaft; an upwardly opening discharge port adjacent the end of each of said blades and connected to said end of each of said channels for discharging materials in a flowable state.

4,046,206

LOCKING APPARATUS FOR EARTH BORING CUTTER OR STABILIZER

Howard Earl Mitchell, Duncanville, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 14, 1976, Ser. No. 676,956
Int. Cl.² E21B 9/24
U.S. Cl. 175—364 5 Claims



3. A locking apparatus for a rotary head of an earth boring machine, said rotary head having a longitudinal axis of rotation and including a saddle with at least one support arm, a support shaft positioned on said support arm and a rolling cutter mounte on said support shaft, with said rolling cutter adapted to receive an expected radial load and an expected tangential load as said rotary head is rotated, comprising:

a support surface on said support arm for supporting said support shaft, said support surface being positioned so that it forms an acute angle to a plane passing through said longitudinal axis of rotation measured in the directon of rotation of said rotary head, said support surface being substantially perpendicular to the resultant of said expected radial load and said expected tangential load; and

cap means removeably affixed to said support surface, thereby locking said shaft on said support arm.

4,046,207

EARTH DRILLING TOOLS

Thomas Lee Taylor, Box 6048, Odessa, Tex. 79760

Filed Sept. 1, 1976, Ser. No. 719,620
Int. Cl.² E21B 9/22
U.S. Cl. 175—391 9 Claims

1. An auger comprising an elongated axial hub member which terminates in a chuck at the upper end thereof and which terminates in a pilot bit at the lower end thereof;

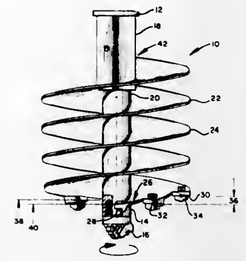
two spaced flights each having an inner edge affixed to said hub, with said flights radiating from said hub to form a spiraling outer rim; each of said flights having an upper end which terminates adjacent to said chuck and a lower end which terminates adjacent to said pilot bit, the lower end of each of said flights being in the form of a leading cutting edge;

the leading edge of one flight commencing at a different vertical elevation respective to said pilot bit as compared to the leading edge of the remaining flight;

the leading cutting edge of each of said flights having a plurality of cutouts formed therein with each cutout being spaced circumferentially, vertically, and radially from one another, means mounting a tooth receiving pocket within each said cutout, thereby enabling a plurality of spaced digging teeth to be received by the leading edge of each flight;

said teeth on one flight being arranged with an innermost tooth located adjacent to said hub, and an outermost tooth located near the outer rim of said flight;

said teeth on the remaining flight being arranged with an



innermost tooth located adjacent to said hub and an outermost tooth located near the outer rim of said remaining flight;

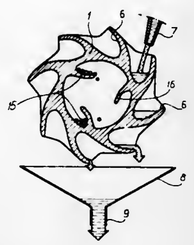
each successive tooth of a flight being progressively spaced circumferentially, radially, and vertically respective to said innermost tooth; the innermost tooth of one flight being disposed 180° from the innermost tooth of the remaining flight, and each of said innermost teeth lying at different radii respective to the axial centerline of said hub.

4,046,208

APPARATUS FOR WEIGHING A FLOWING MATERIAL

Lennart Arvid Stenstrom, Haddinge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Dec. 1, 1975, Ser. No. 636,376
Claims priority, application Sweden, Dec. 12, 1974, 7415587
Int. Cl.² G01G 1/00; G01F 3/28
U.S. Cl. 177—19 2 Claims



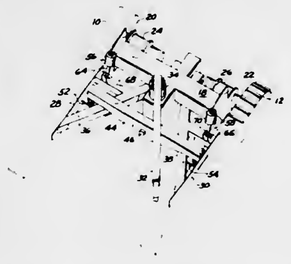
1. Apparatus for determining the quantity of a flowing material, which comprises a drum mounted for rotation about an axis through its center of gravity, said drum being a hollow cylinder having two spaced circular end walls to form a closed chamber, the drum having on the outside wall thereof between said end walls a plurality of troughs located in a circle concentric to said axis, means for charging the troughs at a certain level with flowing material, the quantity of which is to be determined, so that the drum is influenced by a driving moment from substantially the weight of the charged material, the troughs being arranged to discharge, after a certain rotation of the drum, the charged material at a level lower than said charging level, and means for counteracting rotation of the drum by said driving moment thereon, said counteracting means comprising only three interconnected scoops located within said closed chamber between said end walls and in a circle concentric to an axis through the common center of gravity of the scoops, the last-mentioned axis forming an angle with a vertical line, the drum being arranged to rotate the scoops around said last-mentioned axis, a predetermined amount of a second material in the closed chamber, the scoops being arranged to successively elevate the second material from a certain level and discharge substantially all of it at a higher level which is at least at the level of said drum axis, the closed chamber being free of any surface which can contact the second material as it falls from a scoop at said higher level to the lowermost part of the chamber during rotation of the drum, whereby the second material falls freely and directly from said higher level to the lowermost part of the chamber and an accurate measurement of the weight of the flowing material is effected regardless of changes in the density of the material.

4,046,209

OSCILLATION LOCKOUT SYSTEM FOR TRACK MOUNTED ROCK DRILL

George N. LaCasse, Holyoke, Mass., assignor to Worthington Compressors, Inc., Holyoke, Mass.

Filed Dec. 11, 1975, Ser. No. 639,755
Int. Cl.² B62D 55/08
U.S. Cl. 180—9.52 1 Claim



1. An oscillation control system for a track type vehicle having a main frame, a pair of endless track assemblies pivotally connected to said main frame on opposite sides thereof, and walking beam means having a first end coupled to one of said track assemblies, a second end coupled to the other of said track assemblies, and an intermediate portion pivotally connected to said main frame, said system comprising:

first single acting fluid actuated cylinder and piston means pivotally connected between said main frame and said one track assembly;

second single acting fluid actuated cylinder and piston means pivotally connected between said main frame and said other track assembly;

fluid conduit means interconnecting the cylinders of said first and second cylinder and piston means for fluid transfer between the cylinders, said first and second cylinder and piston means and said first conduit means forming a closed hydraulic circuit; and

valve means in said fluid conduit to control the transfer of fluid between the cylinders;

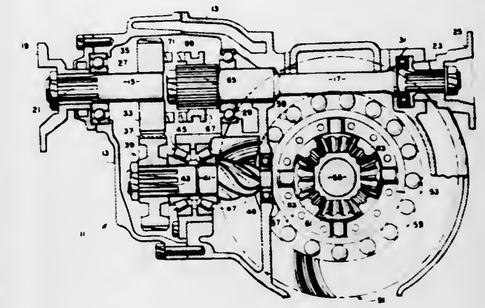
said valve means being variably adjustable between an open position and a closed position, the cylinder and piston of each of said cylinder and piston means being movable relative to each other to transfer fluid between the cylinders when said valve means is in a position other than said closed position to permit relative pivotal movement between said main frame and said track assemblies, and the cylinder and piston of each of said cylinder and piston means forming a rigid connection between said main frame and each of said track assemblies when said valve is in the closed position to prevent relative pivotal movement between said main frame and each of said track assemblies, said valve means in positions between full open and full closed varying the rate of oscillation of said track assemblies.

4,046,210

MULTIPLE DRIVE AXLE ASSEMBLY

Robert K. Nelson, Shaker Heights, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed May 22, 1975, Ser. No. 580,002
Int. Cl.² B60K 41/02
U.S. Cl. 180—24.1 10 Claims



1. A drive axle assembly for selectively transmitting torque from a main drive shaft to one of a first drive axle and a second drive axle and to both the first and second drive axles, comprising:

a. input shaft means in driving engagement with said main drive shaft;

b. output shaft means in driving engagement with said second drive axle, said output shaft coaxial with said drive shaft;

c. gear means associated with one of said input shaft means and said output shaft means, said gear means being in driving engagement with said first drive axle;

d. clutch means in relatively non-rotatable engagement with the other of said input shaft means and said output shaft means and operable to be shifted into engagement with said gear means to divide the torque from said main drive shaft between said first drive axle and said second drive axle;

e. means for shifting said clutch means into engagament with said gear means;

f. means for sensing the rotational speed difference between said first drive axle and said second drive axle; and

g. means for actuating said shifting means in response to said rotational speed difference exceeding a predetermined limit.

4,046,211

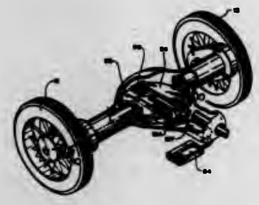
WHEEL-SUPPORT STRUCTURES FOR VEHICLES

Carling D. Allen, 581 N. 640 West, Orem, Utah 84057

Continuation-in-part of Ser. No. 545,192, Jan. 29, 1975, Pat. No. 3,964,563. This application June 8, 1976, Ser. No. 693,845
Int. Cl.² B60G 19/02
U.S. Cl. 180—41 4 Claims

1. In a vehicle having a motor, a transmission coupled to said motor, a differential having oppositely extending axle shafts and coupled to said transmission, axle shaft housing means encasing said axle shafts and nominally horizontal when said vehicle is erect, a pair of opposite wheels, and side-opposite lever structures pivotal with respect to said axle shaft housing means for supporting said wheels and also for operatively coupling said wheels to said axle shaft; an improvement comprising intercoupling means intercoupling said side-opposite lever structures for effecting corresponding counter-movements in said lever structures and said wheels, and power

balance means coupled to said intercoupling means and responsive to any tilt from the horizontal of said axle shaft housing means for actuating said side-opposite lever structures to reorient said wheels such as to reorient to an essentially horizontal



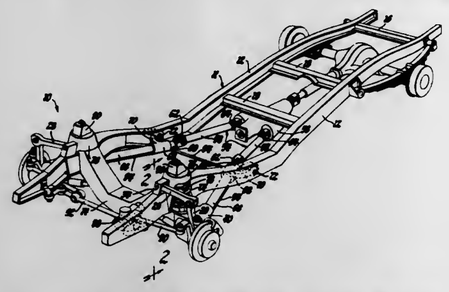
position said axle shaft housing means, and means for selectively disengaging said power balance means, and wherein said intercoupling means includes a pair of gear elememts mutually pivoted together and provided with shock absorbing resilient means disposed between said gear elements.

4,046,212

STEERABLE FRONT WHEEL DRIVE TRANSMITTING MECHANISM

Kai H. Hansen, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 9, 1976, Ser. No. 656,115
Int. Cl.² B60K *17/30*
U.S. Cl. 180—44 R **3 Claims**



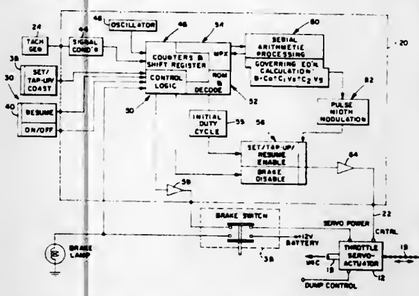
1. In a vehicle having a sprung mass portion including a vehicular frame, and an unsprung mass portion including steerable road wheels, each of said wheels being drivingly attached to a drive spindle rotatably supported on a steering knuckle, a suspension system for said steerable road wheel comprising a steering knuckle support member including a vertical extension, said steering knuckle being pivotally connected to said steering knuckle support member so as to define a generally vertically-oriented steering axis therewith, an upper laterally extending control arm pivotally connected at the ends thereof between said frame and said vertical extension of said steering knuckle support member, a lower laterally extending control arm pivotally connected at the ends thereof between said frame and said steering knuckle support member, a drive-transfer case centrally disposed on said sprung mass portion, an angle-drive case rigidly attached to an inner surface of said steering knuckle support member, aligned openings formed in said angle-drive case and said steering knuckle support member, a drive shaft rotatably supported in said angle-drive case and extending therefrom through said aligned openings, a first universal joint located on said vertically-oriented steering axis operatively interconnecting said drive shaft and said drive spindle, bevel gear means formed on said drive shaft within said angle-drive case, a two-section drive transfer shaft interconnected by a second universal joint intermediate the overall length thereof, the rear section thereof being operatively connected by a third universal joint to said drive-transfer case, and the forward section thereof being operatively connected to said bevel gear means in said angle-drive case for effecting driving rotation of said steerable road wheel via said drive shaft, a tubular torque reaction member encasing said forward section of said two-section drive transfer shaft and secured at the forward end thereof to said angle-drive case, a bracket secured adjacent the rear end of said forward section, an arcuate-shaped arm fixedly secured at one end thereof to said bracket and pivotally secured at the other end thereof by pivot pin means to said side rail, the axis of said pivot pin means extending through the center of said second universal joint, a retainer cup fixedly secured to said frame, and a shock absorber disposed between said retainer cup and flange means formed on one of said angle-drive case and said steering knuckle support member rearwardly of said vertically oriented steering axis and rearwardly of said upper control arm for effecting primary suspension of said sprung mass portion relative to said unsprung mass portion.

4,046,213

CONTROL SYSTEM AND METHOD FOR CONTROLLING VEHICLE SPEED

Gerald L. Larson, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 23, 1976, Ser. No. 660,290
Int. Cl.² B60K *31/00*
U.S. Cl. 180—105 E **16 Claims**



1. A control system for a vehicle road speed regulator of the type having an actuator connected to the vehicle throttle for controlling the vehicle about a speed selected by the vehicle operator, said control system comprising:

a. means operable upon actuation by the vehicle operator to activate the regulator;

b. means operable in response to said activating means to sense vehicle speed;

c. means responsive to said speed sensing means and operable upon selective actuation by the vehicle operator to register said sensed speed to provide said selected speed;

d. means operable to generate a control signal having certain characteristics thereof varied in response to deviation of the vehicle speed from said selected speed;

e. said means operable to register said selected speed includes means operable upon selective actuation by the vehicle operator to increment said sensed speed a predetermined increment and means responsive to said incrementing means operable to register said incremental speed as said selected speed; and,

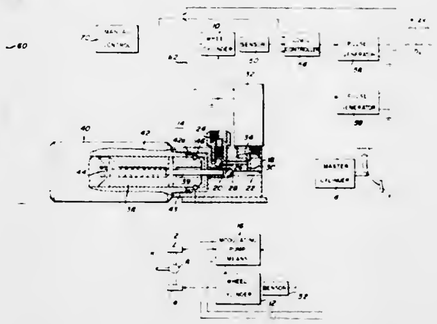
f. means responsive to said control signal and adapted to move the vehicle throttle upon connection thereto for controlling the vehicle speed above said selected speed.

4,046,214

BRAKE PRESSURE MODULATOR AND SYSTEM

Carmeli Adahan, Berkeley, Calif., assignor to Aspro, Inc., Westport, Conn.

Filed Aug. 13, 1976, Ser. No. 713,799
Int. Cl.² B60T *8/02*
U.S. Cl. 180—109 **34 Claims**



1. Solenoid-operated modulator means for modulating the brake pressure of a motor vehicle having a master cylinder, and a plurality of wheel brake cylinders associated with the wheels, respectively, of the vehicle, comprising

a. a valve body containing a pumping chamber and including inlet and first outlet ports communicating with said pumping chamber, said inlet and first outlet ports being adapted for communication with said master cylinder and with one of said wheel cylinders, respectively, said valve body also including a normally open first by-pass passage directly connecting said inlet and first outlet ports to by-pass said pumping chamber;

b. first check valve means normally isolating said first outlet port from said pumping chamber, and second check valve means normally isolating said pumping chamber from said inlet port;

c. a reciprocatory pumping member extending at one end through a bore contained in said valve body and terminating in said pumping chamber;

d. main solenoid means alternately operable between energized and de-energized conditions for reciprocating said pumping member, said main solenoid means including

1. a stator rigidly connected with said valve body;

2. a linearly movable armature connected with the other end of said pumping member for linear displacement relative to said stator between first and second end positions, thereby to effect relatively large stroke pumping operation;

3. main spring means biasing said armature toward one of said end positions; and

4. resilient abutment means arranged for compression by said armature when said armature is in its other end position, thereby to increase the pumping pressure produced by said pumpig member with relatively small stroke operation of the armature when the pressure of said main spring means is overcome by the fluid back pressure appearing at the outlet port;

e. first by-pass control means for closing said first by-pass passage; and

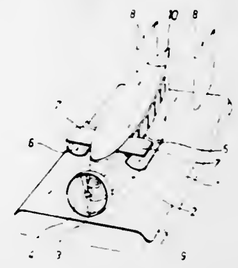
f. means for alternately energizing and de-energizing said solenoid means, thereby to reciprocate said pumping member, whereby when said by-pass is in the closed condition, fluid is pumped from said inlet port to said first outlet port.

4,046,215

VESSEL MOBILE ON AIR CUSHION OR THE LIKE

Esko Hietanen, Paattistentie 141, Turku, Finland; Ari Hietanen, deceased, late of Turku, Finland, and by Margo-Riitta Hietanen, heiress, Ristojankatu 1 aA 183, Turku, Finland

Filed Sept. 30, 1975, Ser. No. 618,140
Claims priority, application Finland, Oct. 4, 1974, 2905/74
Int. Cl.² B60V *1/00*
U.S. Cl. 180—116 **6 Claims**



1. An air cushion vehicle comprising

a. a hull;

b. means for supporting said hull on an air cushion;

c. a cabin having vertical side walls mounted on said hull, said side walls being curved in a longitudinal direction to form a teardrop shape for said cabin;

d. a propeller arranged in front of said cabin, said side walls guiding the flow of air from said propeller rearwardly; and

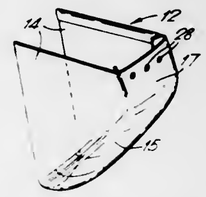
e. at least one obstructing plate pivotally mounted on each said side wall for movement between a horizontal and vertical position, each said plate when moved from said horizontal position capable of disturbing the flow of air around the respective side wall to cause a pressure differential on said cabin to assist in steering the vehicle.

4,046,216

SEGMENT FOR SEGMENTED SKIRT OF A GAS CUSHION VEHICLE

Robert Alastair Cook, Southampton, England, assignor to Mackley Ace Limited, Brighton, England

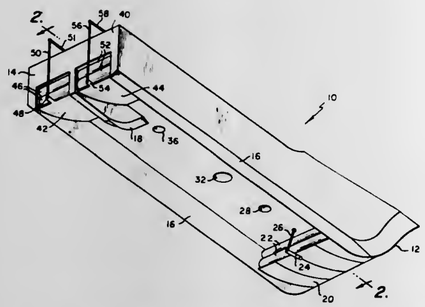
Filed Mar. 11, 1976, Ser. No. 665,942
Claims priority, application United Kingdom, June 10, 1975, 24818/75
Int. Cl.² B60V *1/16*
U.S. Cl. 180—127 **21 Claims**



1. A point for forming part of a segmented flexible skirt for use on craft, vehicles or devices which can be supported on a cushion of pressurized fluid, comprising a sheet of flexible material folded into a substantially U-shape in plan view to form a curved front wall portion having an upper end and side wall portions having an upper end and a bottom end, said wall portions in side elevation tapering from their said upper end towards their said bottom end, an upper portion of said front wall portion which extends from said upper end of the front wall portion being in a plane which lies at an angle relative to

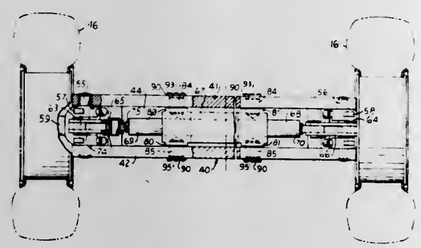
the remainder of the front wall portion, each side wall being provided adjacent its upper end with a pleat or tuck to bring said upper portion of the front wall portion into said plane, said pleat or tuck having overlapping portions which are secured together.

4,046,217
ROLL, PITCH, AND HEAVE STABILIZATION DEVICE FOR AIR-CUSHION-BORNE VEHICLES
Allen H. Magnuson, 2014 Hanover St., Silver Spring, Md. 20910
Filed Mar. 19, 1976, Ser. No. 668,370
Int. Cl.[2] B63B *1/36*
U.S. Cl. 180—126 11 Claims



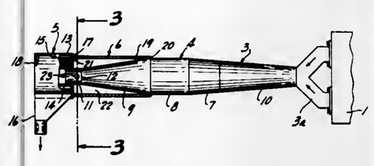
1. In an air cushion vehicle having a main air cushion enclosed by an upper platform, fixed side walls and inflatable planing seals at the ends, a system for stabilizing the vehicle comprising:
a source of pressurized air;
means within said vehicle for distributing the air from said source to maintain said main air cushion and to inflate said planing seals, said inflated planing seals exerting a force between the water surface and the upper platform proportional in strength to the air pressure within the seal;
control means responsive to the position of a trailing edge of each of said planing seals to control the relative air pressure between the inside of said planing of said planing seals and said main air cushion in such a manner that the vertical and rotational movements of the vehicle relative to the water surface as a whole over the area underneath said vehicle are dampened and minimized.

4,046,218
FLOATING STEERING AXLE
Donald S. Blaisdell, Dallas, Oreg., and Llewellyn L. Walter, Perry, Ohio, assignors to Towmotor Corporation, Mentor, Ohio
Filed Aug. 23, 1976, Ser. No. 716,741
Int. Cl.[2] B62D *5/10*
U.S. Cl. 180—155 12 Claims



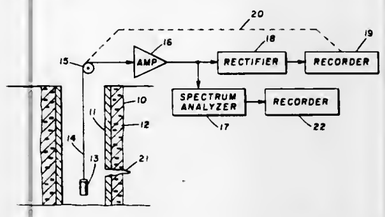
1. In a steering axle for a vehicle, said steering axle having a frame with an upper member, a lower member and front and rear web members joining said upper and lower members, a king pin at each end portion of said frame extending between said upper and lower members, a steering knuckle pivotally mounted on each of said king pins and having a wheel rotatably mounted on an outwardly projecting spindle portion thereof, a tag link connected to an extended portion of each of said knuckles, a steering cylinder carried between said upper and lower members, a double ended rod extending from said cylinder and having ends connected to said tag links, and means on said frame for supporting said cylinder for vertical movement in a self-aligning relationship relative to said tag links.

4,046,219
EXHAUST SILENCER APPARATUS FOR INTERNAL COMBUSTION ENGINE
Nisar Shaikh, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed Mar. 20, 1975, Ser. No. 560,148
Int. Cl.[2] F01N *5/00, 5/02*
U.S. Cl. 181—211 13 Claims



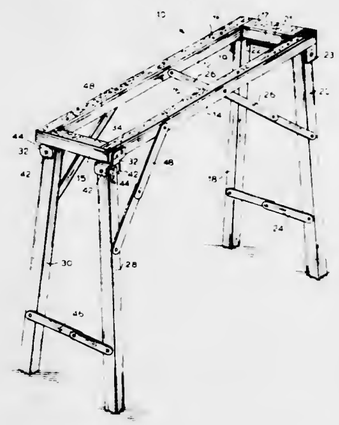
1. An exhaust system for an internal combustion engine operating at an RPM in excess of about 6000 revolutions per minute, comprising an exhaust passageway means having an exhaust pipe means with a large inlet end portion and a progressively reduced passageway section to a small discharge end portion, a conduit secured to said small discharge end portion, a cylindrical cavity means secured in encircling relation to said reduced passageway section and said conduit, and a common input and output coupling passageway means between said conduit and said cavity means and providing the only flow into and out of the exhaust passageway means to the cavity means, said coupling passageway means being defined by openings in the conduit, said openings having a length of the thickness of the conduit and selected of a selected area and being located at essentially the smallest cross-section of the passageway means whereby said cavity means defines a dead-ended resonant cavity operable to attenuate noise frequencies of the exhaust gas pressure waves.

4,046,220
METHOD FOR DISTINGUISHING BETWEEN SINGLE-PHASE GAS AND SINGLE-PHASE LIQUID LEAKS IN WELL CASINGS
Edwin E. Glenn, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York City, N.Y.
Filed Mar. 22, 1976, Ser. No. 668,895
Int. Cl.[2] G01V *1/40;* E21B *47/12*
U.S. Cl. 181—105 15 Claims



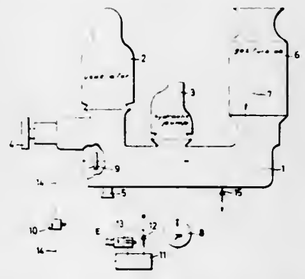
1. A method of distinguishing between single-phase gas and single-phase liquid leaks through or behind the casing of a well, comprising the steps of:
a. monitoring acoustic noise generated by a casing leak within a well,
b. producing an electrical signal representative of said monitored acoustic noise,
c. measuring the frequency spectrum of said electrical signal,
d. selecting a reference frequency within said measured frequency spectrum above which a single-phase gas leak exhibits at first select frequencies noise peaks having decrease in amplitude from the amplitude of the noise peak at said reference frequency and a single-phase liquid leak exhibits at second select frequencies noise peaks having no change or an increase in amplitude from the amplitude of the noise peak at said reference frequency,
a. comparing the amplitudes of the noise peaks of said acoustic noise at said reference frequency and at said first and second select frequencies above said reference frequency,
f. identifying said casing leak as a single-phase gas leak if the amplitude of the noise peaks at said first select frequencies are decreased from the amplitude of the noise peak at said reference frequency, and
g. identifying said casing leak as a single-phase liquid leak if the amplitude of the noise peaks at said second select frequencies is the same or is increased from the amplitude of the noise peak at said reference frequency.

4,046,221
SADDLE SUPPORT
Neal M. Edenfield, Rte. 1, Box 178, Grand Ridge, Fla. 32442
Filed Mar. 17, 1976, Ser. No. 667,603
Int. Cl.[2] F16M *11/00*
U.S. Cl. 182—155 8 Claims



1. A support for saddles or the like comprising:
a pair of rails, one rail extending substantially parallel with respect to the other rail;
a first pair of support legs;
a first foldable brace between said first pair of legs;
means connected to both of said rails for sliding and pivoting said first pair of legs together, such that said first pair of legs are foldable into a first plane adjacent to said two rails;
a second pair of support legs, a first one of said second leg pair coupled to an end of one of said rails and the other of said legs in said second pair coupled to an end of said other rail, said second leg pair coupled to said rails and ends thereof opposing said first leg pair;
a second foldable brace between said second pair of legs;
a double-action pivot hinge connecting each leg of said second pair to the corresponding rail for pivoting each said leg of said second pair both in a second plane transverse to said first planes, each leg of said second leg pair being pivotable in said second plane about a pivot axis passing through the corresponding rail; and wherein
said second pair of support legs are foldable into said first plane with said first leg pair positioned there between, both said leg pairs and said second brace being dimensioned such that said second brace overlies said first leg pair when said leg pairs are folded in said first plane, whereby said first leg pair must be folded into said first plane prior to folding of said second leg pair into said first plane.

4,046,222
PRESSURE SYSTEM FOR A TRANSMISSION, ESPECIALLY FOR AN AUXILIARY GEARBOX FOR DRIVING AUXILIARY DEVICES IN AIRCRAFT
Karl Skrivanek, Oberursel, and Klaus Janek, Bad Homburg, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany
Filed June 9, 1975, Ser. No. 585,302
Claims priority, application Germany, June 7, 1974, 2427634
Int. Cl.[2] F01M *1/00*
U.S. Cl. 184—6.11 6 Claims



1. In combination with a transmission and a housing containing the latter, especially an auxiliary gearbox for driving auxiliary devices in aircraft, an inlet pressure chamber, check valve means connected to said inlet pressure chamber and operable in open condition to establish communication of the atmosphere with said inlet pressure chamber, compressed air generating means having a suction side adapted to communicate with said inlet pressure chamber and also having a pressure side adapted to communicate with the interior of said housing, separating means operable to separate oil from air associated therewith, conduit means having said separating means interposed therein and leading from said housing to said inlet pressure chamber, a pressure holding valve interposed in said conduit means between said separating means and said inlet pressure chamber, and safety valve means communicating with said housing means and being operable in response to an excessive pressure within said housing means to establish communication between the interior of said housing means and the atmosphere.

4,046,223
BEARING SUMP COOLING ARRANGEMENT
James D. McHugh, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Oct. 15, 1975, Ser. No. 622,628
Int. Cl.[2] F01M *9/10*
U.S. Cl. 184—6.11 3 Claims

1. A turbomachine having a shaft, a journal bearing rotatably supporting said shaft, housing means enclosing and supporting said journal bearing and having an inner wall defining a sump chamber around said journal bearing, meand for delivery of a flow of lubricating fluid to said journal bearing and for

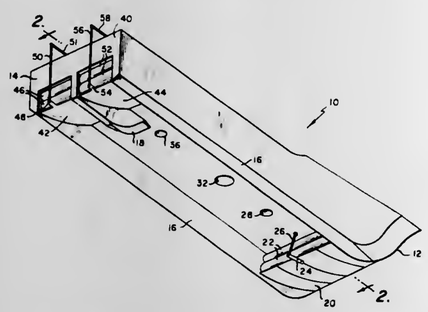
the remainder of the front wall portion, each side wall being provided adjacent its upper end with a pleat or tuck to bring said upper portion of the front wall portion into said plane, said pleat or tuck having overlapping portions which are secured together.

4,046,217

ROLL, PITCH, AND HEAVE STABILIZATION DEVICE FOR AIR-CUSHION-BORNE VEHICLES

Allen H. Magnuson, 2014 Hanover St., Silver Spring, Md. 20910

Filed Mar. 19, 1976, Ser. No. 668,370
Int. Cl.² B63B *1/36*
U.S. Cl. 180—126 11 Claims



1. In an air cushion vehicle having a main air cushion enclosed by an upper platform, fixed side walls and inflatable planing seals at the ends, a system for stabilizing the vehicle comprising:

a source of pressurized air;

means within said vehicle for distributing the air from said source to maintain said main air cushion and to inflate said planing seals, said inflated planing seals exerting a force between the water surface and the upper platform proportional in strength to the air pressure within the seal;

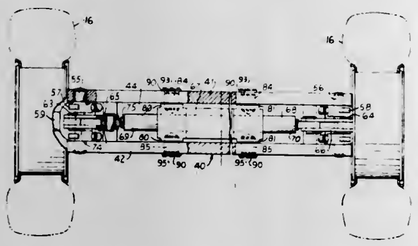
control means responsive to the position of a trailing edge of each of said planing seals to control the relative air pressure between the inside of said planing of said planing seals and said main air cushion in such a manner that the vertical and rotational movements of the vehicle relative to the water surface as a whole over the area underneath said vehicle are dampened and minimized.

4,046,218

FLOATING STEERING AXLE

Donald S. Blaisdell, Dallas, Oreg., and Llewellyn L. Walter, Perry, Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Aug. 23, 1976, Ser. No. 716,741
Int. Cl.² B62D *5/10*
U.S. Cl. 180—155 12 Claims



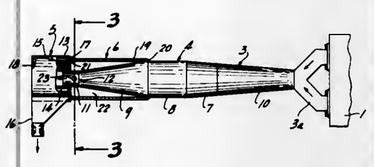
1. In a steering axle for a vehicle, said steering axle having a frame with an upper member, a lower member and front and rear web members joining said upper and lower members, a king pin at each end portion of said frame extending between said upper and lower members, a steering knuckle pivotally mounted on each of said king pins and having a wheel rotatably mounted on an outwardly projecting spindle portion thereof, a tag link connected to an extended portion of each of said knuckles, a steering cylinder carried between said upper and lower members, a double ended rod extending from said cylinder and having ends connected to said tag links, and means on said frame for supporting said cylinder for vertical movement in a self-aligning relationship relative to said tag links.

4,046,219

EXHAUST SILENCER APPARATUS FOR INTERNAL COMBUSTION ENGINE

Nisar Shaikh, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Mar. 20, 1975, Ser. No. 560,148
Int. Cl.² F01N *5/00, 5/02*
U.S. Cl. 181—211 13 Claims



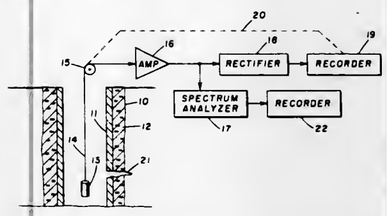
1. An exhaust system for an internal combustion engine operating at an RPM in excess of about 6000 revolutions per minute, comprising an exhaust passageway means having an exhaust pipe means with a large inlet end portion and a progressively reduced passageway section to a small discharge end portion, a conduit secured to said small discharge end portion, a cylindrical cavity means secured in encircling relation to said reduced passageway section and said conduit, and a common input and output coupling passageway means between said conduit and said cavity means and providing the only flow into and out of the exhaust passageway means to the cavity means, said coupling passageway means being defined by openings in the conduit, said openings having a length of the thickness of the conduit and selected of a selected area and being located at essentially the smallest cross-section of the passageway means whereby said cavity means defines a dead-ended resonant cavity operable to attenuate noise frequencies of the exhaust gas pressure waves.

4,046,220

METHOD FOR DISTINGUISHING BETWEEN SINGLE-PHASE GAS AND SINGLE-PHASE LIQUID LEAKS IN WELL CASINGS

Edwin E. Glenn, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York City, N.Y.

Filed Mar. 22, 1976, Ser. No. 668,895
Int. Cl.² G01V *1/40;* E21B *47/12*
U.S. Cl. 181—105 15 Claims



1. A method of distinguishing between single-phase gas and single-phase liquid leaks through or behind the casing of a well, comprising the steps of:

a. monitoring acoustic noise generated by a casing leak within a well,

b. producing an electrical signal representative of said monitored acoustic noise,

c. measuring the frequency spectrum of said electrical signal,

d. selecting a reference frequency within said measured frequency spectrum above which a single-phase gas leak exhibits at first select frequencies noise peaks having decrease in amplitude from the amplitude of the noise peak at said reference frequency and a single-phase liquid leak exhibits at second select frequencies noise peaks having no change or an increase in amplitude from the amplitude of the noise peak at said reference frequency,

a. comparing the amplitudes of the noise peaks of said acoustic noise at said reference frequency and at said first and second select frequencies above said reference frequency,

f. identifying said casing leak as a single-phase gas leak if the amplitude of the noise peaks at said first select frequencies are decreased from the amplitude of the noise peak at said reference frequency, and

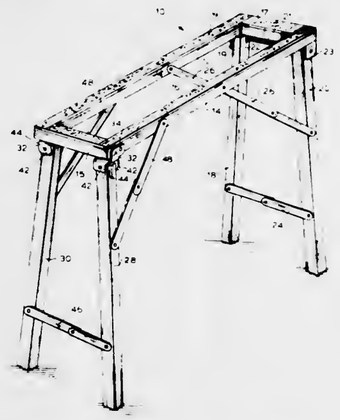
g. identifying said casing leak as a single-phase liquid leak if the amplitude of the noise peaks at said second select frequencies is the same or is increased from the amplitude of the noise peak at said reference frequency.

4,046,221

SADDLE SUPPORT

Neal M. Edenfield, Rte. 1, Box 178, Grand Ridge, Fla. 32442

Filed Mar. 17, 1976, Ser. No. 667,603
Int. Cl.² F16M *11/00*
U.S. Cl. 182—155 8 Claims



1. A support for saddles or the like comprising:

a pair of rails, one rail extending substantially parallel with respect to the other rail;

a first pair of support legs;

a first foldable brace between said first pair of legs;

means connected to both of said rails for sliding and pivoting said first pair of legs together, such that said first pair of legs are foldable into a first plane adjacent to said two rails;

a second pair of support legs, a first one of said second leg pair coupled to an end of one of said rails and the other of said legs in said second pair coupled to an end of said other rail, said second leg pair coupled to said rails and ends thereof opposing said first leg pair;

a second foldable brace between said second pair of legs;

a double-action pivot hinge connecting each leg of said second pair to the corresponding rail for pivoting each said leg of said second pair both in a second plane transverse to said first planes, each leg of said second leg pair being pivotable in said second plane about a pivot axis passing through the corresponding rail; and wherein

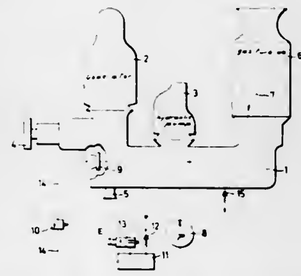
said second pair of support legs are foldable into said first plane with said first leg pair positioned there between, both said leg pairs and said second brace being dimensioned such that said second brace overlies said first leg pair when said leg pairs are folded in said first plane, whereby said first leg pair must be folded into said first plane prior to folding of said second leg pair into said first plane.

4,046,222

PRESSURE SYSTEM FOR A TRANSMISSION, ESPECIALLY FOR AN AUXILIARY GEARBOX FOR DRIVING AUXILIARY DEVICES IN AIRCRAFT

Karl Skrivanek, Oberursel, and Klaus Janek, Bad Homburg, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed June 9, 1975, Ser. No. 585,302
Claims priority, application Germany, June 7, 1974, 2427634
Int. Cl.² F01M *1/00*
U.S. Cl. 184—6.11 6 Claims



1. In combination with a transmission and a housing containing the latter, especially an auxiliary gearbox for driving auxiliary devices in aircraft, an inlet pressure chamber, check valve means connected to said inlet pressure chamber and operable in open condition to establish communication of the atmosphere with said inlet pressure chamber, compressed air generating means having a suction side adapted to communicate with said inlet pressure chamber and also having a pressure side adapted to communicate with the interior of said housing, separating means operable to separate oil from air associated therewith, conduit means having said separating means interposed therein and leading from said housing to said inlet pressure chamber, a pressure holding valve interposed in said conduit means between said separating means and said inlet pressure chamber, and safety valve means communicating with said housing means and being operable in response to an excessive pressure within said housing means to establish communication between the interior of said housing means and the atmosphere.

4,046,223

BEARING SUMP COOLING ARRANGEMENT

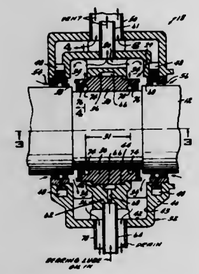
James D. McHugh, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 15, 1975, Ser. No. 622,628
Int. Cl.² F01M *9/10*
U.S. Cl. 184—6.11 3 Claims

1. A turbomachine having a shaft, a journal bearing rotatably supporting said shaft, housing means enclosing and supporting said journal bearing and having an inner wall defining a sump chamber around said journal bearing, meand for delivery of a flow of lubricating fluid to said journal bearing and for

sequentially spraying said flow of lubricating fluid against the inner wall of said housing means defining said sump chamber in a manner whereby the inner surface of said sump chamber is continuously wetted and thereby cooled by the lubricant flow, said means for delivery of lubricating fluid to the bearing and for sequentially spraying the lubricant flow including means for collecting the lubricant flow after use for lubricating purposes and before exiting said bearing, and a plurality of spray passageways formed in said bearing and communicating with said collection means,

said journal bearing comprising an annular liner carried by said housing means and extending around a journal formed on said shaft,



said lubricating fluid delivery and spray means including at least one radially inwardly facing distribution groove formed in said journal bearing liner for distributing the lubricating fluid along a central portion of the journal bearing, said collection means comprising a radially inwardly facing annular slot formed adjacent each axial end of said journal bearing liner and axially outwardly of said distribution grooves,

said spray passageways being formed only through the upper portion of said journal bearing liner so as to spray the flow of lubricating fluid on the upper portions of the inner wall, the lower portions of the inner wall being bathed by gravity flow of said lubricating fluid.

4,046,224

APPARATUS FOR LUBRICATING THE GRIPPER BAND OF A SHUTTLELESS LOOM

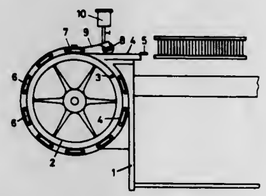
Viktor Sauter, Wetzikon, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, ZH, Switzerland

Filed Dec. 9, 1975, Ser. No. 639,186

Claims priority, application Switzerland, Dec. 24, 1974, 17253/74

Int. Cl.² F16N 7/12, 7/24

U.S. Cl. 184—15 R **4 Claims**



1. Apparatus for lubricating a gripper band carrying an oscillating weft yarn inserting element for weft yarn insertion in the shed of a shuttleless loom, comprising a roller body of absorptive material suitable for impregnation with lubricant, a shaft supporting said roller body, said shaft being hollow and provided with radial holes, said lubricant being fed to said hollow shaft and therefrom through said holes to said absorptive material, said shaft being disposed transversely to the direction of movement of the gripper band, and said roller body being adapted to be operatively connected to the loom, resiliently biased against the upper side of the gripper band and driven by it.

4,046,225

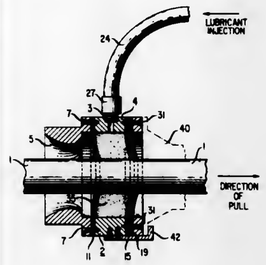
CABLE LUBRICATION METHOD

Walter James Sheak, Millington, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 11, 1975, Ser. No. 603,279

Int. Cl.² F16N 7/00

U.S. Cl. 184—15 R **5 Claims**



1. A method for applying lubricant to the surface of a cable comprising the steps of attaching spaced first and second flexible annular discs each having a plurality of radial slits cut therethrough disposed along its inner circumference to a housing forming a chamber between said discs, the inner circumferences of said discs defining a cable passageway through said chamber; attaching at least one additional annular disc of greater flexibility than said second flexible annular disc having a plurality of radial slits cut therethrough disposed along its inner circumference adjacent to said second annular disc so that the radial slits of said additional disc are rotatably displaced from the radial slits of said second disc; feeding said cable of greater diameter than said cable passageway in said discs into said chamber through said passageway from said first disc to said third disc; and injecting lubricant into said chamber through an inlet in housing, said lubricant beads being deposited on said cable through the radial slits of said second annular disc and said lubricant being uniformly spread onto the surface of said cable by said additional greater flexibility annular disc.

4,046,226

ELEVATOR SYSTEM FOR TRANSPORTING WHEELCHAIR PATIENTS

Henry K. Flinchbaugh, York, Pa., assignor to Flinchbaugh-Murray Corporation, York, Pa.

Filed July 8, 1976, Ser. No. 703,636

Int. Cl.² B66B 9/08

U.S. Cl. 187—12 **12 Claims**

1. An elevator system comprising:

a. at least one track means including,

i. a first tubular member having a longitudinal slot along an upper first surface, and

ii. a lower second tubular member within and along a second surface of said first member opposite said first surface;

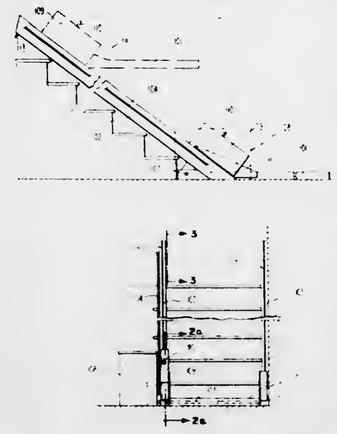
b. trolley means within the first tubular member of said track means, said trolley means having an upper roller means bearing against the inside of said first surface of said first tubular member, and a lower roller means bearing against an upper outer surface of said second tubular member;

c. an elevator platform connected to and movable with said trolley means through said slot in said first tubular member; and

d. a continuous chain drive including,

i. drive means at an extremity of said track means, and

ii. a chain, powered by said drive means and having its ends respectively connected to opposite ends of said



trolley means, said chain passing through said second tubular member and providing upward and downward movement for said platform.

4,046,227

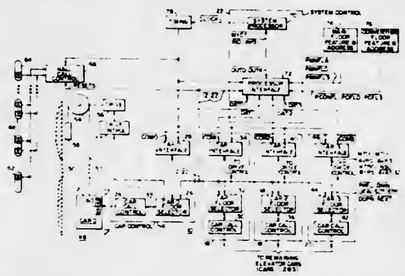
ELEVATOR SYSTEM

Andrew F. Kirsch, Edison, N.J., and Charles L. Winkler, Worthington, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 503,146, Sept. 4, 1974, abandoned. This application May 5, 1975, Ser. No. 574,662

Int. Cl.² B66B 1/20

U.S. Cl. 187—29 R **34 Claims**



1. An elevator system for a structure having a plurality of landings, comprising:

a plurality of elevator cars,

means mounting said plurality of elevator cars for movement relative to the landings,

up and down hall call registering means for registering calls for elevator service in the up and down directions, respectively, from at least certain of the landings,

averaging means providing a first average responsive to the number of registered up and down hall calls in the structure and the number of in-service elevator cars, and a second average responsive to the number of up and down hall call registering means in the structure and the number of in-service elevator cars,

and control means for assigning service directions from landings to said elevator cars, said control means making a general assignment to at least certain of said elevator cars which starts at a car and proceeds in a selected direction therefrom, assigning unassigned service directions from landings only to this car until the second average is met, skipping landings having registered hall calls if the first average is met before the second average.

4,046,228

ELEVATOR SYSTEM

Bruce A. Powell, Franklin Borough, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 5, 1975, Ser. No. 574,663

Int. Cl.² B66B 1/18

U.S. Cl. 187—29 R **11 Claims**



1. A method of controlling a plurality of elevator cars to provide service for a plurality of floors of a building, comprising the steps of:

providing means for registering up and down hall calls from at least certain of the floors of the building,

assigning the various up and down service directions of the floors by dividing them among all of the in-service elevator cars according to a predetermined strategy,

periodically clearing those assigned up and down service directions of the floors which do not have a registered hall call associated therewith, and also an assigned up or down service direction of a floor which has a hall call associated therewith which is located behind the advanced position of the elevator car it is assigned to,

and reassigning the up and down service directions from the floors cleared in the clearing step, by dividing them among all of the in-service elevator cars according to the predetermined strategy.

4,046,229

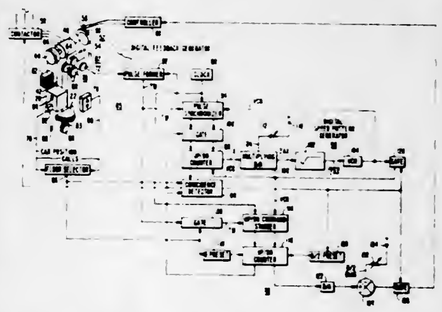
ELEVATOR SYSTEM

Andreas Kernick, Murrysville, Pa., and Manvel A. Geyer, Severna Park, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 12, 1975, Ser. No. 640,303

Int. Cl.² B66B 1/30

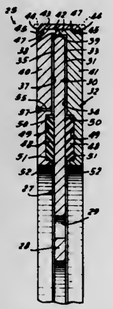
U.S. Cl. 187—29 R **12 Claims**



1. An elevator system, comprising:

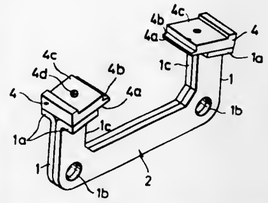
an elevator car to be stopped at a predetermined stopping point,
first means providing a first train of pulses responsive to the movement of the elevator car, with each pulse indicating a predetermined increment of car movement,
second means providing a second train of pulses responsive to the desired movement of the elevator car from increment to increment up to the stopping point,
counter means responsive to said first and second trains of pulses such that its output count indicates which pulse train has produced the greater number of pulses, and the precise number of the difference, to provide both a qualitative and a quantitative indication of error, respectively, and
control means for controlling the deceleration of the elevator car in response to the count on said counter means, with the control means selecting one of at least first and second deceleration efforts, with the first deceleration effort being selected when the count indicates the number of pulses in the first pulse train exceeds those in the second pulse train, and with said second deceleration effort being selected when the count indicates the number of pulses in the second pulse train exceeds those in the first pulse train.

4,046,230
TUNED TORSIONAL VISCOUS DAMPERS
William J. Troyer, Orchard Park, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.
Filed July 14, 1976, Ser. No. 705,158
Int. Cl.² F16F *15/12*
U.S. Cl. 188—1 B **28 Claims**



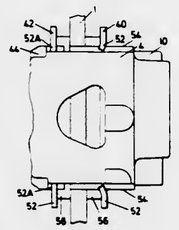
22. A tuned torsional viscous damper, comprising:
supporting disk means having a radially extending circular body with a radially inner hub portion adapted to be secured to a rotary member such as a crankshaft subject to vibrations to be damped by the damper;
a ring shaped inertia mass having a radially inwardly opening annular working chamber within which said body is received;
a viscous damping medium in said chamber;
said body and said inertia mass having parallel confronting working surfaces in shear film spaced relation having regard to the viscosity of said damping medium;
said inertia mass having coaxial annular grooves facing axially toward said body adjacent to the radially inward chamber opening;
elastic tuning spring, spacing and sealing rings engaging said inertia mass in said grooves and engaging with surfaces on said body;
generally axially extending retaining flange means at the radially inner sides of the grooves assuring concentricity and protective enclosure of said elastic rings;
said circular body having axially extending flange means;
and said inertia mass having axially extending groove extension from said working chamber into which said flange means project;
said flange means and said groove extensions having confronting surfaces in shear film spaced relation.

4,046,231
DISC BRAKE
Harumi Ohori, and Juichi Shibatani, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Apr. 14, 1976, Ser. No. 677,002
Claims priority, application Japan, Nov. 17, 1975, 50-137248
Int. Cl.² F16D *65/02*
U.S. Cl. 188—71.1 **3 Claims**



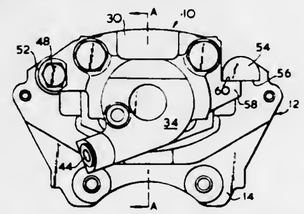
1. In a disc brake of the type in which floating type calipers urge friction members against a brake disc for a braking action with said friction members being located on the opposite sides of said brake disc and in which said friction members receive a torque from said brake disc during braking and are supported on a fixing member so as to be movable in the direction perpendicular to the plane of brake disc, the improvement in the fixing member comprising:
a pair of U-shaped steel plates fixedly joined back-to-back and fixedly mounted adjacent, and in a plane substantially parallel, to said brake disc, said U-shaped steel plates each including a pair of legs surrounding at least a portion of said calipers, said legs being positioned proximate said friction members and interacting therewith for receiving torque during braking, the legs of each of the pairs of U-shaped steel plates terminating in a pair of end portions bent outwardly in opposing direction to form a pair of flanges in substantially the same plane, the outer surfaces of said flanges being substantially perpendicular to the plane of the plate, said joined pair of plates being fixedly mounted with a pair of like sides of said pair of flanges extending over said brake disc, guide members individually and rigidly secured to the outer surfaces of said associated pairs of said flanges covering substantially the entire transverse width of said outer surfaces of the flanges of said torque-receiving legs for supporting said calipers for movement perpendicular to the plane of said brake disc, said torque being received directly by at least one of said legs, and means for restraining radial movement of said calipers with respect to said disc, said restraining means being individual plates mounted rigidly on said guide members with said calipers being slidably movable between cooperating ones of said guide members and said plates.

4,046,232
DISC BRAKE SLIDING CALIPER ASSEMBLY WITH BRAKE PADS OF A COMMON PATTERN, AND METHOD OF CONSTRUCTION
George Edward Kellogg, Bougival, France, assignor to General Motors Corporation, Detroit, Mich.
Division of Ser. No. 562,850, March 27, 1975, Pat. No. 3,997,034. This application Aug. 30, 1976, Ser. No. 718,532
Claims priority, application United Kingdom, Mar. 28, 1974, 13743/74
The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.
Int. Cl.² F16D *69/04*
U.S. Cl. 188—73.1 **3 Claims**



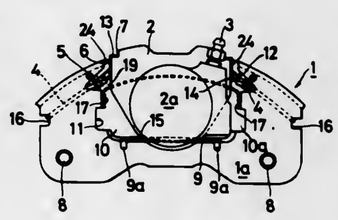
1. In a disc brake caliper assembly comprising:
a caliper body having a spaced pair of limbs joined by a bridge section, guide surfaces including ledges at either side of the caliper bridge section between said limbs, and a pair of brake pads of one pattern, said pads being supported by said ledges, each of said brake pads including a backing plate and a lining segment;
each of said backing plates having ears arranged to rest on said ledges with the space between said ears, when said ears are within the side surface planes of their respective backing plates, being such that said ears would have an interference fit with and therefore clinch tightly to said caliper bridge section; the ears of one of said brake pads being bent out of the planes of its backing plate side surfaces to permit sliding movement of said one brake pad on said guide surfaces, the ears of the other of said brake pads clinching tightly to said caliper bridge section at one limb with the backing plate thereof in brake applying force engagement with said one limb, said arrangement permitting the use of one brake pad pattern for both brake pads.

4,046,233
SLIDING CALIPER DISC BRAKE
Horst Willi Klaasen, St. Sebastian, Germany, assignor to Girling Limited, Birmingham, England
Filed Jan. 27, 1976, Ser. No. 652,737
Claims priority, application United Kingdom, Feb. 1, 1975, 4444/75
Int. Cl.² F16D *65/02*
U.S. Cl. 188—73.3 **6 Claims**



1. A sliding caliper disc brake comprising a torque member, a caliper member slidably mounted on the torque member for straddling a minor portion of the periphery of a rotatable disc, and an actuator for directly urging a friction pad against one side of the disc to cause the caliper member to slide relative to the torque member to apply by reaction an opposite friction pad onto the other side of the disc, the torque member having portions adapted to receive directly from both pads all circumferential drag forces experienced by the pads on brake actuation, connecting means between the caliper member and the torque member constructed and arranged to permit sliding of the caliper member only in a direction parallel to the axis of disc rotation and also pivoting of the caliper with respect to the torque member, means for restraining said pivoting comprising complementary sliding surfaces on the caliper member and torque member permitting relative sliding between the caliper member and the torque member in a direction parallel to the axis of disc rotation and in a direction perpendicular to said direction so as to accommodate deformation of the torque member during braking without transfer of drag forces to said connecting means, said complementary sliding surfaces being arranged to limit said pivoting of the caliper member in a direction radially outwardly of the disc, and means for resiliently biasing the complementary sliding surface on the caliper outwardly into direct sliding engagement with the complementary surface on the torque member.

4,046,234
DEVICE FOR GUIDING A CALIPER IN A DISK BRAKE
Masayuki Kurata, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan
Filed Nov. 6, 1975, Ser. No. 629,537
Int. Cl.² F16D *65/32*
U.S. Cl. 188—73.3 **1 Claim**



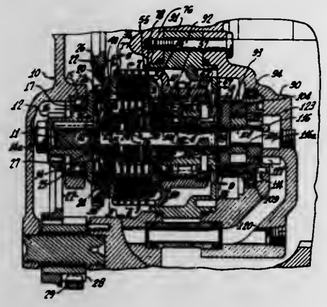
1. A disk brake comprising:
a rotatable brake disk having a front and a rear surface;
an inverted U type fixed member extending over an outer peripheral portion of said brake disk and having interconnected wall plates disposed parallel to said front and rear surfaces of said brake disk;
friction pads guided and supported on a bottom portion of a concavity formed on a middle portion along an upper edge of said fixed member, and concavity defining V-type notch grooves at upper portions of both side edges of said concavity;
a guide member retained in each of said notch grooves and having opposite ends, each of said ends laterally extending from said fixed member;
a caliper body having projections of a V-type in section and slidably supported within said V-type notch grooves, each of said projections defining an upper and a lower sliding surface;
a pair of associated springs retained by said fixed member to support said lower surface of each of said projections; and
an anticorrosive sliding metal plate fixedly placed on each of said projections, said sliding metal plate having a horizontal shoulder positioned on a shoulder portion formed on a top end of a side wall of said caliper body, a vertical sliding surface placed in abutment with said side wall of said caliper body, an inclined sliding surface placed on said upper surface of each of said projections and being in abutment with a bottom surface of said guide member and a pair of tongues downwardly extended from the opposite

edges of said inclined sliding surface to hold a front and a rear end of each of said projections of said caliper body.

4,046,235
AUTOMATIC LOAD BRAKE

Donald P. Shutt, Long Beach, Calif., assignor to Western Gear Corporation, Lynwood, Calif.

Filed Apr. 19, 1976, Ser. No. 677,879
Int. Cl.[2] B60T 7/12
U.S. Cl. 188—134 23 Claims



1. An automatic load brake of the Weston class, using a drive motor, and adapted for coupling to a load imposed as a torque, comprising:

an external casing,

an axially restrained output drive rotor journalled for rotation on a fixed axis relative to said casing, and adapted for coupling to a load applied as a torque,

an input drive rotor journalled for rotation in said casing about said fixed axis, said input rotor adapted for rotary drive by said motor, at least one of said rotors being adapted for axial travel along said fixed axis,

said output drive rotor and said input drive rotor having interengaging circularly disposed ramp formations on opposed faces thereof which interact to move said input drive rotor axially away from said output drive rotor in relative rotation in one direction of said rotors, and which allow said input drive rotor to return axially toward said output drive rotor in relative rotation in the opposite direction of said rotors,

opposed, longitudinally splined hubs on said rotors,

a plurality of brake plates, at least one of said plates being splined on said hub of said output rotor and at least one of said plates being splined on said hub of said input rotor,

means on the side of said input drive rotor, opposite from the side thereof having said ramps, providing a plane brake pressure surface facing toward said brake plates,

means on said output drive rotor providing a plane brake reaction surface facing toward said plane brake pressure surface,

friction brake disks intervening in spaces between, and engageable with, said brake plates, and intervening also between and engageable with the end brake plates and said brake pressure reaction surfaces,

disk guide means engaging and coacting with guide formations on said friction disks for guiding them generally axially;

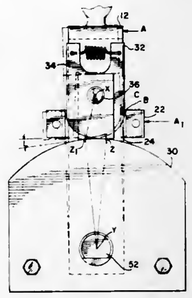
a one-way rotary holding means for reacting between said disk guide means and said casing to permit rotation of said friction disks and brake plates, in the incoming direction of rotation of said rotors, and to lock said disk guide means and friction disks and plates against rotation relative to said casing in the outgoing direction of rotation of said rotors; and

means for urging said rotors to return axially toward each other in response to said opposite rotation of said rotors.

4,046,236
LOCKING CONTROL DEVICE

Gordon L. Hershman, La Grange, and Arthur S. Datta, Willow Springs, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Apr. 1, 1976, Ser. No. 672,818
Int. Cl.[2] F16D 67/00
U.S. Cl. 192—8 R 2 Claims



1. A locking control device having an input arm and an output means for communicating motion irreversibly from the input arm to the output means further comprising:

an arcuate locking plate with a top edge, the locking plate having a plurality of apertures including mounting apertures and a central aperture;

an input arm having an aperture at a lower end thereof and further being formed at an upper end with a projection perpendicular to the major plane of the input arm, the upper end further equipped with an aperture for accommodating an operating handle;

a U-shaped bracket affixed to the input arm between the lower end thereof and the upper end thereof in position where the arms of the U-shaped bracket project perpendicularly from the input arm in the direction opposite the direction of the upper end of the input arm;

a first and a second output arm having an aperture at each end thereof with the aperture at the upper end thereof circular in shape and the aperture at the lower end thereof semicircular in shape;

a pivot assembly for receiving the first and second output arms, having an output shaft having a flat portion extending from a first end of the output shaft towards a second end of the output shaft compatible in shape with the semicircular aperture of the output arms, the output shaft further being threaded at the first end thereof as well as an aperture through the first end thereof, the pivot assembly further including a pivot support for supporting the output shaft and a hub to further support the output shaft as well as the pivot support, and a castellated nut carried on the threaded end portion to retain the output arms;

a locking cam assembly comprising an inboard cam having a central aperture and a small aperture, an outboard cam also having a central aperture and a small aperture pivotally mounted on a cam pivot pin passing through the central aperture of each cam which also passes into the upper apertures of the first and second output arm to allow the locking cam assembly to be pivotally mounted on the cam pivot pin between the output arms, the locking cam assembly further including a spring suspended from the small aperture of the output cam to the small aperture of the inboard cam for urging the small apertures of each cam towards each other and pivoting the cams around the cam pivot pin such that the lower portion of each cam will be in contact with the top edge of the arcuate locking plate;

a cam pivot pin retainer strip affixed to the outboard end of the legs of the U-shaped bracket to retain the cam pivot pin in the apertures of the output arms, whereby movement of the input arm will cause the U-shaped bracket to urge one of the cams out of contact with the arcuate locking plate and will then contact the output arms and displace them in accordance with the movement of the input arms.

4,046,237
CLUTCH WITH TORQUE LIMITING BRAKE

Robert S. Root, Syracuse; Frederick P. Taylor, Bridgeport, and William J. MacKendrick, Syracuse, all of N.Y., assignors to Lipe-Rollway Corporation, Syracuse, N.Y.

Filed Sept. 11, 1975, Ser. No. 612,374
Int. Cl.[2] F16D 7/06, 67/02
U.S. Cl. 192—13 R 5 Claims

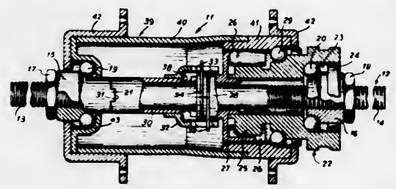


1. In a friction clutch for connecting driving and driven shafts, the clutch including a release mechanism for effecting disengagement of the clutch, a clutch brake cooperable with the release mechanism and a stationary surface adjacent the clutch comprising an inner annular plate having an aperture, the plate being keyed to the driven shaft, means encircling the inner annular plate and arranged to be moved by the release mechanism into engagement with the stationary surface during disengagement of the clutch, the encircling means including a flexible annular plate having a ring of apertures on the same radius as the inner annular plate aperture, and means yieldably connecting the encircling means to the inner annular plate including at least one ball positioned in the inner plate aperture, the diameter of the ball being greater than the thickness of the inner plate whereby the ball projects into one of the apertures in the flexible annular plate of the encircling means, the ball being movable from one flexible plate aperture to another to permit relative movement between the encircling means and inner annular plate when the force applied to the encircling means by the release mechanism exceeds a predetermined amount.

4,046,238
FREE-WHEELING MECHANISM FOR BICYCLES

Hector Mendoza-Orozco, Adolfo Prieto 1709, Mexico 12, D. F., Mexico

Filed Feb. 3, 1976, Ser. No. 655,033
Int. Cl.[2] F16H 15/00
U.S. Cl. 192—45 4 Claims

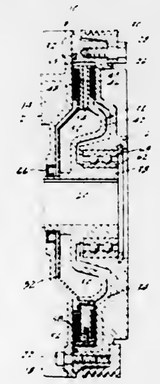


1. A free wheeling mechanism for a bicycle comprising an axle; first and second fixed bearing cones mounted on respective end portions of said axle; a movable cone formed with a recess accommodating said first cone, said movable cone and said first fixed cone defining a first raceway; a hub through which said axle extends and which surrounds said second fixed cone and said movable cone, said hub and said second fixed cone defining a second raceway and said hub and said movable cone defining a third raceway; ball bearings running in said raceways, whereby the movable cone is rotatable with respect to the axle and the hub is rotatable with respect to both the axle and the movable cone; rollers positioned between the movable cone and the hub and displaceable between a position in which they couple the movable cone to the hub and a position in which they do not couple the movable cone to the hub; a guide device for retaining said rollers between the movable cone and the hub, said guide device having an annular portion defining an opening through which the axle extends; holding means having a sleeve mounted on the axle with one end coupled to one of said fixed cones, a cup fixed to the other end of the sleeve, which cup houses the annular portion of said guide device, and resilient connecting means for connecting said cut with said annular portion; and a helical spring urging the annular portion of said guide device towards the movable cone.

4,046,239
VISCOUS DRIVEN OVERRUNNING CLUTCH

Thomas H. Tinholt, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 6, 1976, Ser. No. 683,852
Int. Cl.[2] F16D 31/00
U.S. Cl. 192—58 B 7 Claims



1. A viscous drive coupling comprising:

a housing member defining a working chamber;

a circular member rotatably mounted within the working chamber;

opposed surfaces located on the housing member and circular member and defining a shear space therebetween;

a fluid shear means within the coupling to cooperate with the opposed surfaces to provide a fluid shear-type drive between the housing member and circular member;

a fluid reservoir located within one of the members and in fluid communication with the shear space;

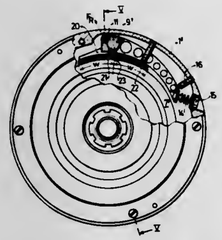
flow directing means on one of the members adapted to draw fluid out of the reservoir into the working chamber when the angular velocity of the reservoir containing member in one rotating direction exceeds the angular velocity of the other member in the same direction and to pump fluid into the reservoir when the angular velocity of the reservoir containing member in the one rotating direction is less than the angular velocity of the other member in the same direction.

4,046,240

CENTRIFUGAL FRICTION CLUTCH

Walter Schlagmuller, Schwieberdingen, and Rudolf Babitzka, Kirchberg, Murr, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Mar. 30, 1976, Ser. No. 671,829
Claims priority, application Germany, June 27, 1975, 2528719
Int. Cl.² F16D *43/14*
U.S. Cl. 192—104 C **6 Claims**



1. Centrifugal friction clutch having a drive rotary element (1) adapted for connection to a drive shaft (4) and a driven element (7), a lever shaped centrifugal element (9) subjected to centrifugal force upon rotation of the clutch, said lever shaped element (9) being a double-arm lever pivoted to rock about a pivot axis (11) essentially parallel to the drive shaft (4) and having one arm (10) facing the rotary surface of the driven element (7):

a spring (14) engaging the double-arm lever (9)

the pivot axis (11) being located a small distance (c) in advance — with respect to the direction of rotation of a location of a resultant force vector (F_R) resulting from a perpendicular force (F_N) exerted by said one arm (10) against the rotary surface (8) of the driven element (7) and the circumferential frictional force (F_U) between the engagement surface (17, 22) of said one arm and the rotary surface (8) of the drive element (7) when the clutch is engaged so that said one arm (10) of the lever (9) is in engagement with the driven element (7), resulting in self-binding, locking transmission of torque, deflection of said one arm (10) counter the force of the spring (14) upon rapid rotation of the clutch and due to increased centrifugal force (F_C) acting on said centrifugal double-arm lever (9) causing the resultant vector (F_R) to shift from behind the pivot axis (11) through the pivot axis in advance of the pivot axis and thus cause disengagement of the engagement surfaces of said arm and the circumference of the driven element upon transition from locking engagement to disengagement of the clutch;

a clutch shoe or pad (20, 22) forming the engagement surface for said one arm (10) of the lever (9);

and a floating connection (21) including a pin (21) between the shoe (20, 22) and said one arm (10) of the lever, the center line 23 of the shoe (20) parallel to the axis of rotation of the clutch being positioned between the floating pin (21) and the engagement point of the spring (14) on the lever (9).

4,046,241

OVER-RIDE MECHANISM FOR SCREW DRIVE ACTUATOR

Reginald D. Furtah, Jr., Livonia, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Mar. 24, 1976, Ser. No. 669,942
Int. Cl.² F16P *3/00*
U.S. Cl. 192—150 **5 Claims**

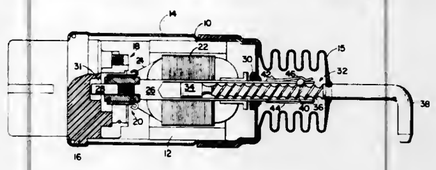
1. A mechanism for converting rotary motion into linear motion, comprising:

a housing;

a tubular member having a plurality of spaced apart apertures therein, said tubular member being mounted for rotatable movement in said housing;

a helically threaded rod member extending axially into said tubular member;

means occupying said apertures and engaging the threads on said helically threaded rod member linearly driving said rod member when said tubular member is rotated; and



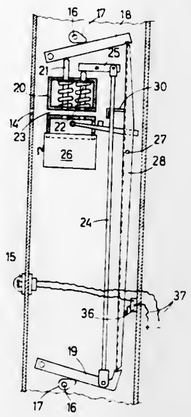
a unitary spring clip member attached to said tubular member, said spring clip member normally biasing said driving means into engagement with the threads on said rod member, said spring clip member further being yieldable so as to allow said driving means to disengage from the threads in the event said rod member jams or is over-ridden.

4,046,242

VENDING MACHINE OPERATED BY A CHECK TICKET TO RECORD USE THEREON

Allan Ahlström, Mahults Herrgard, Simlangsdalen, Sweden (31038)

Filed May 26, 1976, Ser. No. 690,198
Claims priority, application Sweden, June 2, 1975, 7415451
Int. Cl.² G07F *7/08*
U.S. Cl. 194—4 R **5 Claims**



1. A vending machine having a number of compartments arranged in at least one row and a release mechanism box to one side of said at least one row,

a blocking means at each compartment,

an individual shaft extending from each of said compartments into said release mechanism box and being rotatably mounted in said machine,

means for fixedly attaching each blocking means to its corresponding shaft, an embossing mechanism within said box containing axially displaceable embossing stamps corresponding to the number of compartments,

levers within said box for operating said stamps and means at each of said shafts for actuating a particular lever,

a catching device setable in either of two positions, and adapted in one position to prevent movements of said lever,

a passage in said box adapted to permit the insertion of a check ticket having a portion of magnetically attractible material across the path of the axial movement of said embossing stamps, and

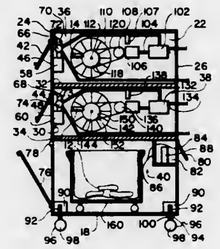
a release mechanism for said catching device including a detent being magnetically attractible by said check ticket.

4,046,243

DISPOSABLE DIAPER DISPENSER VENDING UNIT

Sandra Valentine, R.R. No. 1, Norland, Ontario, Canada

Filed Aug. 3, 1976, Ser. No. 711,119
Int. Cl.² G07F *11/52*
U.S. Cl. 194—10 **8 Claims**



1. A disposable diaper dispenser vending unit adapted to dispense disposable diapers or plastic bags and to receive for storage said diapers or bags, which comprises:

a. a housing having an upper, a middle, and a lower chamber therein, and a vertically placed front wall, said front wall having a pair of apertures therein, one said aperture communicating with said upper chamber and said other aperture communicating with said lower chamber;

b. a pair of transparent doors having handles thereon, each said door hinged to said front wall within one said aperture;

c. a bin door hinged within said front wall, said bin door communicating with said lower chamber;

d. a bin member contained in said lower chamber, said bin member adapted to receive said used diapers and bags;

e. means for deodorizing said lower chamber;

f. one assembly of a coin slot, coin box, coin chute and electro-mechanical coin counter contained in each said upper and middle chambers;

g. one solenoid contained in each said upper and middle chambers;

h. one said electric motor with associated drive shaft contained in each said upper and middle chambers;

i. a clutch assembly communicating with each said drive shaft, each said solenoid communicating with each said clutch assembly;

j. a drum type dispenser assembly contained in each said upper and middle chamber;

k. each said dispenser assembly mounted for rotation on a shaft;

l. a large tooth gear mounted on each said shaft;

m. a small tooth gear mechanically communicating with each said clutch assembly;

n. a chain joining each said set of said small and large tooth gears; and
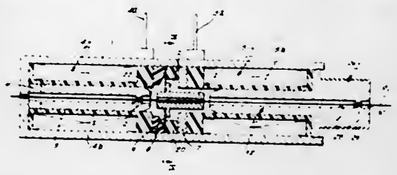
o. two electric series circuits, each said circuit consisting of one said electric motor, a power source, one said solenoid, and one said electro mechanical coin counter.

4,046,244

IMPACT MATRIX PRINT HEAD SOLENOID ASSEMBLY

Juan F. Velasquez, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Filed Aug. 6, 1975, Ser. No. 602,202
Int. Cl.² B41J *3/04*
U.S. Cl. 197—1 R **12 Claims**



1. A printing head driver comprising:

a printing element and a magnetically responsive armature for moving such element in response to magnetic force;

means for exerting a first force on said printing element, of a magnitude and direction to hold said element in a non-printing rest position;

spring means for providing a force directed to move the printing element away from said rest position and toward a printing position;

magnetic means for applying an actuating magnetic force to said armature, said actuating force when applied to said armature effectively counteracting said first force and additionally impelling the printing element toward a printing position in cooperation with said spring force, said actuating magnetic force and said spring force cooperatively having an effective combined force exceeding the magnitude of the first force by an amount greater than the magnitude of the spring force alone; and

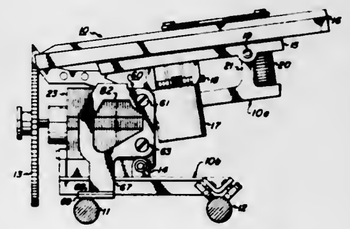
means for retracting the printing element from a printing position and back to said rest position upon removal of said actuating magnetic force.

4,046,245

CARRIAGE STABILIZATION MEANS FOR A SERIAL PRINTER

Kenneth R. Frechette, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 12, 1975, Ser. No. 640,125
Int. Cl.² B41J *19/00*
U.S. Cl. 197—60 **5 Claims**



1. In a serial printer having carriage mounting means enabling lateral movement of a carriage assembly along a predetermined path, located in a first plane, the carriage assembly having a first carriage section mounted to said carriage mounting means and a second carriage section pivotally mounted to said first carriage section about a pivot line wherein said second carriage section is pivotable in a second plane substantially perpendicular to said first plane, the improvement comprising:

a first member carried by a first side of said second carriage section,

a second member carried by a second and opposite side of said second carriage section, and

said first and second members engaging said carriage mounting means at respective locations which are laterally spaced from each other in the direction of said predetermined path,

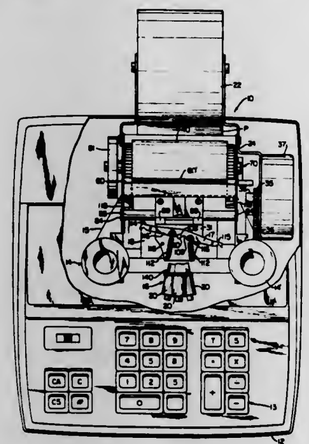
whereby unwanted pivotal movement of said carriage assembly with respect to an axis in the second plane is reduced while enabling pivoting of the second carriage section in the second plane when desired.

4,046,246

SERIAL IMPACT CALCULATOR PRINTER

Nicholas Kendar, Jr., Riverton, Wyo., assignor to LRC, Inc., Riverton, Wyo.

Division of Ser. No. 527,603, Nov. 27, 1974, Pat. No. 3,986,594. This application Oct. 14, 1976, Ser. No. 732,473
Int. Cl.² B41J *33/40*
U.S. Cl. 197—160 9 Claims



1. In a printing apparatus having a frame, a print head selectively actuated by actuating means associated with said head to impress characters on a recording medium, a pair of record medium advancing rollers mounted for rotation on spaced parallel axes with the external roller surfaces engageable with one another to define a common guide path for advancement of the recording medium therebetween and advancing means associated with said print head drive means to incrementally drive one of said print medium advancing rollers in a direction causing advancement of the recording means, the improvement comprising:

print head drive means rotatable to reversibly drive said print head in a print and return direction transversely of the direction of advancement of the recording medium,

a pair of ribbon spools disposed for rotation at opposite ends of travel of said print head, a print ribbon wound on said spools for passage between said print head and recording medium, each spool including ratchet means thereon to cause each spool to undergo rotation when said ratchet means are positively advanced, and

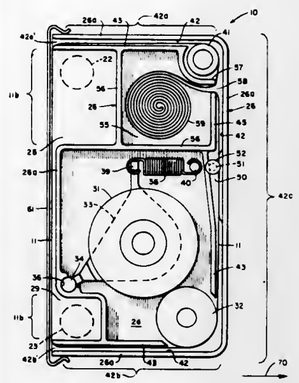
ratchet drive means pivotally mounted on said print head for travel therewith, said ratchet drive means alternately movable into engagement with one of said spools to wind said printing ribbon onto one spool and responsive to resistance of the one spool to rotation to pivot away from engagement with the one spool and into engagement with the other spool to reverse the travel of said printing ribbon whereby to unwind it from the one spool and wind it onto the other spool.

4,046,247

PRINTER RIBBON CARTRIDGE

Richard E. LaSpesa, Chicago, and Alfred Z. Purzycki, Arlington Heights, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Jan. 26, 1976, Ser. No. 652,363
Int. Cl.² B41J *33/10*
U.S. Cl. 197—168 10 Claims



3. An improved cartridge for a printer ribbon of the type in which an endless band of the ribbon is storable prior to use of the ribbon in a printer, the cartridge being mountable in the printer at a location remote from printer-mounted ribbon guide means so that a length of the ribbon spans a platen of the printer between the cartridge and the guide means during both the print strokes and the return strokes of a print head in the printer, wherein the improvement comprises:

A. within the cartridge

1. means responsive to the return strokes of the head for guiding the ribbon along a substantially unconvoluted, U-shaped path interior of the cartridge;
2. means responsive to the ribbon movement for re-inking the ribbon; and
3. means for storing a portion of the ribbon in a convolute prior to the mounting of the cartridge to the printer, the length of ribbon stored in the convolute being sufficient only to span the platen and guide means with no ribbon stored in the convolute after the mounting of the cartridge to the printer; and

B. means

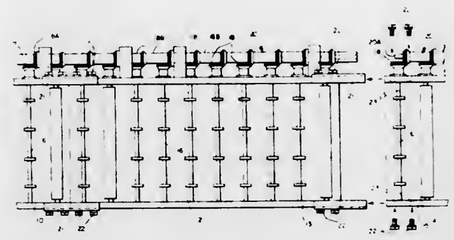
1. for maintaining a segment of the non-convoluted ribbon portion exteriorly of the cartridge and
2. for permitting engagement of the segment with the printer-mounted guide means so that, after such engagement, movement of the cartridge toward the remote location and away from the guide means draws all of the ribbon from the convolute and extends the ribbon out of the cartridge to effect the spanning of the platen by a length thereof.

4,046,248

CONNECTING AND ALIGNMENT MEANS FOR MODULAR CHEMICAL TREATMENT SYSTEM

Daniel L. Goffredo, Riverton, N.J., and Conrad Dale Shakley, Spring Mills, Pa., assignors to Chemcut Corporation, State College, Pa.

Continuation of Ser. No. 433,490, Jan. 15, 1974, abandoned, which is a continuation of Ser. No. 303,251, Nov. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 198,622, Nov. 15, 1971, abandoned. This application Oct. 23, 1975, Ser. No. 625,172
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.² B65G *15/60*
U.S. Cl. 198—583 8 Claims



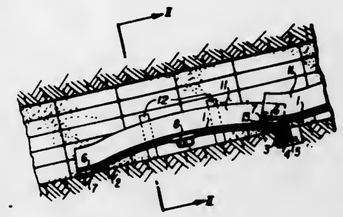
1. An apparatus for use in the treatment of articles as part of an overall etching or other chemical treatment operation, said apparatus including a plurality of serially connected modules, each such module comprising a module body having spaced parallel sidewalls, means for conveying articles through the module body and for defining a longitudinal path of movement of articles through the module body, drive means for said conveying means in driving engagement therewith, and sidewall connecting and alignment means carried by at least one end of each of said spaced parallel sidewalls of said module bodies for connection of said spaced, parallel sidewalls of said module to and for transversely aligning said module with the spaced parallel sidewalls of a longitudinally adjacent module, said connecting and alignment means of at least one of said spaced, parallel sidewalls comprising a connecting means carried by a sidewall of said module and by a mating and abutting sidewall of said longitudinally adjacent module, said connecting means comprising at least one planar surface overlying and held in intimate contact with at least a portion of a longitudinal, vertical planar surface of at least one of said longitudinally adjacent sidewalls, by fastening means penetrating at least one of said parallel sidewalls normally to said longitudinally path, wherein said means for conveying articles includes transversely disposed rotatable shaft members with driven gear means carried at one thereof, along one side of said module, and with said drive means including drive gear means carried on drive rod means that extends along said one side of said module, with the drive gear means being in driving engagement with said driven gear means, and with said drive gear means comprising a plurality of individual gears having gear spacer means disposed therebetween and disposed end-to-end over said drive rod means, with adjacent said gears being longitudinally spaced from each other by said gear means an amount corresponding to the longitudinal spacing of adjacent said driven gear means.

4,046,249

VIBRATION CONVEYOR APPARATUS HAVING CAMBERED TROUGH

Vladimir Isakovich Kreimer, ulitsa Derzhavina, 46, kv. 52; Anatoly Yakovlevich Tishkov, ulitsa Derzhavina, 19, kv. 67; Vitaly Markovich Grigoriev, ulitsa Tankovaya, 49, kv. 7; Ljudmila Ivanovna Gendlina, ulitsa Pisareva, 4, kv. 64, and Leonid Vasilievich Zimonin, ulitsa Borisa Bogatkova, 247, kv. 10, all of Novosibirsk, U.S.S.R.

Continuation of Ser. No. 530,411, Dec. 6, 1974, abandoned. This application May 3, 1976, Ser. No. 682,635
Int. Cl.² B65G *27/34*
U.S. Cl. 198—758 3 Claims



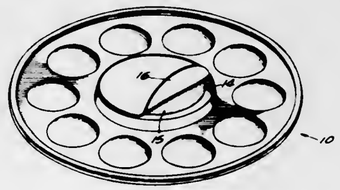
1. A vibration conveyor apparatus for feeding granular materials along inclined channels comprising a flexible resiliant working member in the form of a trough having a loading end portion, a central portion, and an unloading end portion, said central portion being cambered up in the longitudinal direction from the loading end portion towards the unloading end portion, said working member being anchored in at least one point of said inclined channel; and a vibrator connected to said working member.

4,046,250

PAINTING PALETTE

Saul Ortega Ameacua, Col. Condesa, Mazatlan 118 Mexico City, 11, Mexico

Filed Aug. 26, 1976, Ser. No. 717,577
Int. Cl.² B44D *3/02*
U.S. Cl. 206—1.7 1 Claim



1. A painting palette, comprising:

a molded plastic member having a plurality of concavities on one surface for receiving painting materials therein and corresponding convexities on the opposite side, said member further including a well located among the concavities with a convex portion thereof on the same side as said first mentioned convexities, with the outermost extensions of said convexities and well convex portion lying in the same plane;

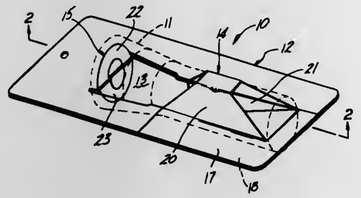
a second surface of said member serving as a supportive base;

a quantity of adhesive on at least a part of said second surface; and

a plurality of sheetlike covers having adhesive on their major surfaces and adhered together to form a stack thereof on the member second surface, whereby a corresponding plurality of adhesive covers are provided for

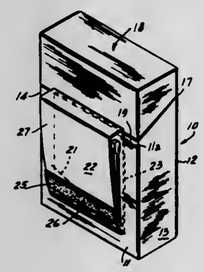
securingly mounting the member to another surface by peeling off the outermost covers one at a time.

4,046,251
DISPLAY PACKAGE
Norman A. Bruml, 24 Donnybrook Road, Montvale, N.J. 07645
Filed Jan. 9, 1976, Ser. No. 648,043
Int. Cl.² B65D *5/50*
U.S. Cl. 206—45.14 12 Claims



1. A display package for a longitudinally extended product comprising a rectangular, planar base possessing a central opening therein, said base comprising a pair of substantially rectangular flaps of identical size and shape in overlapping relation to each other, said central opening conforming in outline to the longitudinal configuration of said product, a collar integral with said base which completely surrounds a major portion of the lateral perimeter of said product, said collar comprising opposed harness member respectively integral with corresponding flaps at said opening, said harness members comprising, respectively, paired, opposed trapezoidal supports extending from said flap and in contact therewith along the major portion of the lateral perimeter of said central opening, and rectangular bridge portions linking said trapezoidal supports at the apical ends thereof, and an anchor member integral with said base and located at one or more ends of said opening to secure said product in position within said package.

4,046,252
CIGARETTE PACK
Leonard A. Korby, 12411 S. 76th Ave., Palos Heights, Ill. 60463, and Norris K. Heard, P.O. Box 432, Channahon, Ill. 60410
Filed Apr. 16, 1976, Ser. No. 677,789
Int. Cl.² A24F *15/10*; B65D *85/10*
U.S. Cl. 206—95 4 Claims



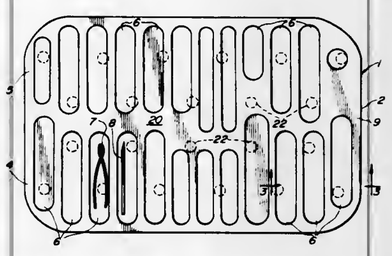
1. In a cigarette pack of the crushproof type having vertical front and back walls joined by side walls into a substantially rigid package, said pack having a top hinged at the back wall and cooperating with the front wall to form a cover for the pack, said cover having a bottom edge spaced from the upper edge of said front wall, the improvement which comprises means defining a straight line slot near the bottom of said front wall extending at an acute angle greater than 0° to the transverse dimension of said front wall and being spaced from said upper edge of said front wall a distance sufficient to accommodate the back of a book of matches when said back is received through said slot and extends behind said front wall, the slot being proportioned such that its lower end is wedged behind the matches in a book of matches when the back of said book is received through said slot.

4,046,253
SHIRT PACKAGE
Mark Weaver, Pottsville, Pa., assignor to Phillips-Van Heusen Corporation, New York, N.Y.
Filed Sept. 26, 1975, Ser. No. 617,099
Int. Cl.² B65D *85/18*
U.S. Cl. 206—278 6 Claims



1. A shirt package comprising:
a rectangular shirt supporting plane shirt board;
a shirt having a collar with the collar lying over one end of said shirt board and upstanding therefrom;
an envelope receiving said shirt board with the shirt folded thereabout, said envelope having a narrow end slightly larger than the width of the shirt board in which the end of the shirt wrapped board remote from the collar of the shirt is received, and a wide end remote from said narrow end slightly larger than the width of the shirt board plus the height of the shirt collar upstanding from the board such that the collar supporting portion of the shirt board with the collar upstanding therefrom is received in the envelope with the envelope snugly engaging the shirt wrapped shirt board.

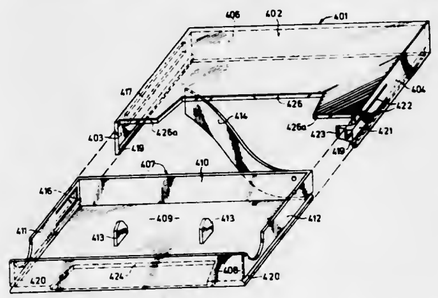
4,046,254
SURGICAL TRAYS
Steven G. Kramer, 355 Serrano Drive, San Francisco, Calif. 94132
Filed Sept. 19, 1973, Ser. No. 398,684
Int. Cl.² B65D *83/10*
U.S. Cl. 206—370 3 Claims



1. A surgical instrument tray comprising
a. a base having
1. an upper face, and
2. a plurality of spaced, upwardly opening compartments in said upper face for receiving and removably storing individual surgical instruments in respective ones of said compartments,
b. each of said compartments having
1. a compressible, resilient bottom wall portion, and
2. a compressible, resilient, upstanding peripheral sidewall portion, and
c. a cover removably mounted on top of said base,
d. said cover having compressible, resilient portions extending across the tops of said compartments in closing relation thereto,
e. said base including a sheet member

1. having openings therethrough corresponding to said compartments, and
2. disposed between said bottom wall portions and said sidewall portions with said openings defining the lower end portions of respective ones of said compartments.

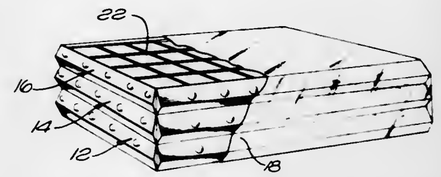
4,046,255
CONTAINER FOR STANDARD MAGNETIC TAPE CASSETTE
Peter Ackeret, Kusnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Lauzerheide, Switzerland
Filed Nov. 24, 1975, Ser. No. 634,622
Claims priority, application Germany, May 14, 1975, 2521371
Int. Cl.² B65D *85/672*
U.S. Cl. 206—387 9 Claims



1. A container for accommodating a standard magnetic tape cassette which has a longitudinal edge adjoining a pair of opposite broad sides each of which has a broad trapezoidal rib-like boss extending along said longitudinal edge, comprising a housing and a carrier slide in the housing, the housing and slide cooperatively defining an interior chamber having a shape similar to the shape of the cassette to confine the cassette in close fitting relation, spring means urging the slide out of the housing, locking means releasably holding the slide in the housing, the housing and slide cooperatively defining cassette-confining top and bottom walls to confront the broad sides of the cassette and also elongate front and back walls and side walls to substantially entirely close the cassette, the front wall being on the slide to form a closure for the open front of the housing, the slide being movable transversely of the front wall out of and into the housing, one of said top and bottom walls having an elongage opening adjacent to and extending along the front wall to receive the trapezoidal boss of the cassette and to accommodate movement of the cassette with the slide relative to the housing, the slide having side portions located beyond the ends of said opening, and guide means on the side portions of the slide and on adjacent portions of the housing to retain and guide the slide in predetermined orientation in the housing during sliding thereof and without interfering with the trapezoidal bosses of the cassette.

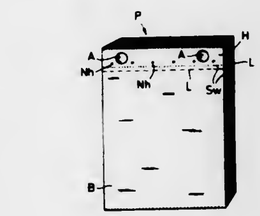
4,046,256
CONTAINER CONSTRUCTION
Wayne L. Congleton, Whittier, Calif., assignor to Dolco Packaging Corporation, Burbank, Calif.
Continuation of Ser. No. 434,179, Jan. 17, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,321
The portion of the term of this patent subsequent to Sept. 10, 1991, has been disclaimed.
Int. Cl.² B65D *65/02, 21/00*
U.S. Cl. 206—497 9 Claims

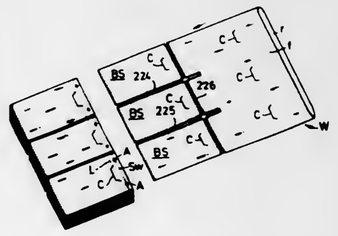
1. A tray-like container formed of foamed polystyrene, which can be stacked with unassembled in a generally planar configuration prior to use, comprising:
a bottom wall of generally planar configuration having a bottom surface and a floor surface upon which items to be packaged can be placed;
a plurality of side walls surrounding said bottom wall each being formed so as to lie in a plane parallel to said floor surface when open, each of said side walls being contiguously connected to one edge of said floor surface of said bottom wall by hinge lines therebetween and having an upward extent substantially smaller then the smallest lateral extent of said bottom wall;



abutment means formed on said container adjacent said hinge lines positioning said side walls over said bottom wall at a predetermined acute angle with respect to said floor surface and disposing free outer corner edges of said side walls in a single plane; and
plastic film shrunk-fit across the top of said container enclosing articles therein and forming a planar sheet across said free outer corner edges of said side walls.

4,046,257
PAD-STACKED BAGS OR SIMILAR PACKAGING, AND APPARATUS AND METHOD FOR FABRICATING THE SAME FROM PLASTIC FILM
Hans Lehmacher, Niederkassel-Mondorf, Germany
Continuation-in-part of Ser. No. 282,193, Aug. 17, 1972, Pat. No. 3,966,524. This application Apr. 10, 1975, Ser. No. 567,073
Claims priority, application Germany, Apr. 13, 1974, 2418233; Sept. 11, 1974, 2443448; Nov. 22, 1974, 2455322; Aug. 17, 1971, 2141045; June 19, 1972, 2229728; July 7, 1972, 2233408; July 26, 1972, 2236523
Int. Cl.² B65D *85/54*
U.S. Cl. 206—544 12 Claims





1. A pad of tear-off bags or like packaging of thermoplastic synthetic plastic film and constituted of a stack of bag sections

comprised of said film, said sections each corresponding to a respective bag, each bag section comprising a front wall and a back wall coextensive with the front wall, each section including a tear-off portion and a transverse suspension portion, the suspension portion having hanger holes, the portions of each section being separable along a line of perforations through both said walls, the said sections being connected at the suspension portions thereby to form the pad with a pad suspension portion, with the improvement comprising:

a continuous padding welding seam extending in over substantially the entire width of each suspension portion whereby the sections are connected into a pad unit.

5. A pad as described in claim 1, wherein

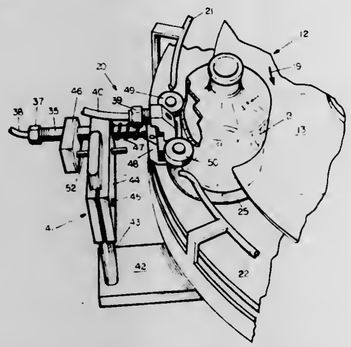
said padding welding seams are located along the free edge of each respective suspension portion.

4,046,258

METHOD AND APPARATUS FOR MEASURING THE ECCENTRICITY OF CONTAINERS

David A. Dumm, Swanton, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed July 2, 1976, Ser. No. 701,771
Int. Cl.[2] B07C 5/34
U.S. Cl. 209—111.5 8 Claims



1. A method of inspecting cylindrical articles formed of dielectric material for out-of-round characteristics, comprising the steps of:

supporting a radio frequency probe having a generally planar face in predetermined proximity to the side wall of said article;

rotating the article about its axis;

permitting said probe to move toward or away from said article wall as a preselected arcuate distance of said side wall changes in curvature; and

indicating the output of said probe as a function of the out-of-roundness of said container wall passing said probe face.

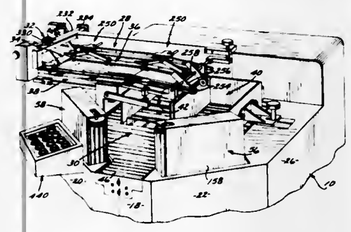
4,046,259

STACKING METHOD

Clifford E. Dunlap, Pasadena, Calif., assignor to W. A. Krueger Co., Scottsdale, Ariz.

Division of Ser. No. 457,367, April 2, 1974, abandoned. This application Dec. 4, 1975, Ser. No. 637,525
Int. Cl.[2] B65H 33/14; B07C 5/342
U.S. Cl. 209—111.7 R 4 Claims

1. The method of diverting labeled objects moving rapidly in succession in a continuous stream to form a plurality of streams for stacking purposes, comprising employing an electrical shift signal from the sensing of indicia upon predetermined labels to divert said objects selectively to one of said plurality of



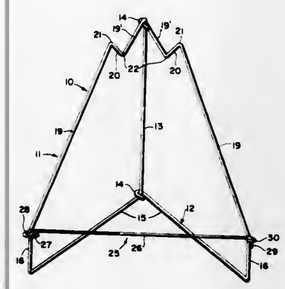
streams, and locating the label a fixed number of labels behind the label in line to be first diverted by the corresponding shift.

4,046,260

DISPLAY STAND

James I. Tallon, Cuyahoga Falls, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed May 27, 1975, Ser. No. 580,923
Int. Cl.[2] A47F 5/13
U.S. Cl. 211—24 10 Claims



1. An erectable display stand for a generally toroidal article capable of folding into a single plane comprising:

a first side member forming an endless essentially planar configuration;

said first side member having a supporting leg;

a second side member pivotally connected to said supporting leg of said first side member;

a base leg on each of said first and second side members for engaging a resting surface for the stand when erected;

a carriage arm portion of said first and second side members disposed at an angle to said base leg of the respective of said first and second side members for supporting the article to be displayed;

a dogleg offset in said carriage arm portion of each of said side members to positively retain the article to be displayed;

riser posts on each of the said first and second side members connecting said base leg and said carriage arm portion thereof; and

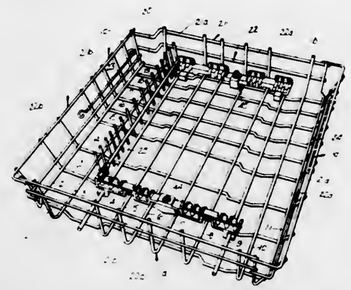
a locking member extending between said first and second side members to effect pivotal placement of said first side member and second side member in spaced angularity, said locking member being a crossbar which effects positive locking by hook and loop means on said crossbar and eye means on said side members at the point where said riser posts merge into said carriage arms whereby said crossbar is substantially coplanar with said carriage arms and is maintained in locking position by the article in engagement therewith.

4,046,261

DISHWASHER RACK

William H. Yake, Connersville, Ind., assignor to Design & Manufacturing Corporation, Connersville, Ind.

Filed Feb. 5, 1976, Ser. No. 655,454
Int. Cl.[2] A47G 19/08
U.S. Cl. 211—41 17 Claims



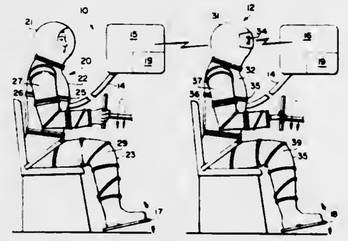
1. A rack structure for an automatic dishwasher comprising a plurality of wire members welded together to form a rectangular openwork rack having a bottom and upstanding front, rear and longitudinal side walls, at least one removable fence, means to detachably mount said removable fence within said rack in parallel spaced relationship to said longitudinal side walls of said rack, said fence mounting means comprising a forward fence mounting bracket and a rearward fence mounting bracket, said forward and rearward fence mounting brackets being affixed to said rack bottom in parallel spaced relationship to each other and to said front and rear walls of said rack, said forward and rearward fence mounting brackets having opposed faces in parallel spaced relationship, said opposed faces having at least one pair of corresponding slots for said at least one removable fence, said at least one removable fence having end portions receivable in said at least one pair of corresponding slots in said forward and rearward fence mounting brackets.

4,046,262

ANTHROPOMORPHIC MASTER/SLAVE MANIPULATOR SYSTEM

Hubert C. Vykukal, Los Altos; Reginald F. King, San Francisco, and Wilbur C. Vallottton, Los Gatos, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 24, 1974, Ser. No. 436,313
Int. Cl.[2] B25J 3/04
U.S. Cl. 214—1 CM 26 Claims



1. A master/slave manipulator system, comprising:

master arm means including first and second master tubular portions, each master tubular portion defining an axis centrally therethrough, said first and said second master portions each having a first end lying in a plane substantially perpendicular to the axis of the respective portions and a second end lying in a plane transverse to the plane defined by said first end, said second ends being adjacent one another such that when said first ends are parallel to one another the respective axes are colinear, said first and said second master portions being relatively rotatable at said adjacent second ends;

master transducing means responsive to the relative rotation between said first and said second tubular portions and operative to provide a driving signal;

slave arm means comprising first and second slave tubular portions, each slave tubular portion defining an axis centrally therethrough, said first and said second slave portions each having a first end lying in a plane substantially perpendicular to the axis of the respective portion and a second end lying in a plane transverse to the plane defined by said first end, said second ends being adjacent one another such that when said first ends are parallel to one another the respective axes are colinear, said first and said second slave portions being relatively rotatable at said adjacent second ends;

slave transducing means responsive to said driving signal and operative to drivingly rotate said first slave tubular portion relative to said second slave tubular portion through an angle that corresponds to the relative rotation between said first and said second master tubular portions; and

communication means linking said master transducing means and said slave transducing means for applying said driving signal to said slave transducing means;

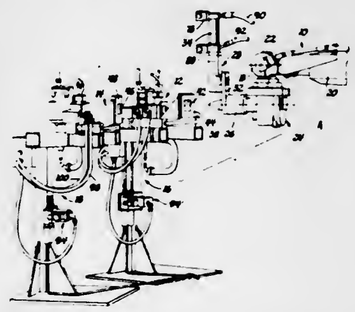
whereby rotation between said first and said second master tubular portions of said master arm means causes a corresponding rotation between said first and said second slave tubular portions of said slave arm means.

4,046,263

TOOL CHANGING APPARATUS FOR A MULTI-AXIS MANIPULATOR

Walter Cwycyshyn, Detroit, and Floyd M. Holroyd, Farmington Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 29, 1976, Ser. No. 709,800
Int. Cl.[2] B23K 9/12
U.S. Cl. 214—1 BC 3 Claims



1. A support assembly for a work tool that is movable by a multi-axis manipulator having an elongated arm provided with a wrist assembly that includes a gear unit that serves to pivot a carrier about a horizontal axis and rotate an output shaft about an axis lying in a vertical plane passing through the longitudinal axis of said arm, the work tool having an upstanding plate member secured thereto, said support assembly including a mounting plate member connected to said output shaft, one of said plate members formed with an aperture defined by a plurality of straight sides lying in converging planes, the other of said plate members being formed with a tapered projection having a slot therein, said tapered projection capable of pro-

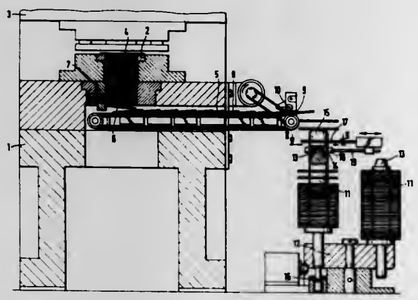
jecting through said aperture and having a plurality of sides corresponding to the number of sides in said aperture with a portion thereof adapted to mate therewith, an actuator fixedly attached to said mounting plate member, and a wedge member carried by said actuator and movable thereby into said slot formed in a portion of the tapered projection which has passed through the aperture for clamping the upstanding plate of the work tool to the mounting plate member after the tapered projection is projecting through the aperture.

4,046,264

APPARATUS FOR STACKING ARTICLES IN SHEET FORM FOR ELECTRICAL MACHINES

Ewald Bergmann, Rechberghausen; Alfred Bareis, Uhingen; Karl Dangelmaier, Holzheim, and Alfred Kottmann, Donzdorf, all of Germany, assignors to L. Schuler GmbH, Germany

Filed Mar. 8, 1976, Ser. No. 664,693
Claims priority, application Germany, Mar. 6, 1975, 2509709
Int. Cl.² B65G *57/16*; B65H *31/32*
U.S. Cl. 214—8 **13 Claims**



1. Apparatus for stacking and intermittently discharging stacks of sheet material for electrical machines and the like, said apparatus comprising:

a plurality of mandrels configured for accepting a plurality of said sheets in stacked form thereon,

mandrel-moving means for successively moving said mandrels into and out of a sheet receiving position at a delivery zone of conveyor means successively supplying said sheets, whereby a mandrel with a stack of sheets formed therein is movable away from the sheet receiving position and an empty mandrel is movable into said sheet receiving position to effect a mandrel exchange,

a mandrel tip selectively positionable on respective ones of said mandrels at said delivery zone when said mandrels are in said sheet receiving position for accommodating stacking of said sheets on said mandrels over said mandrel tip,

means for engaging and holding said mandrel tip in position at said delivery zone during a mandrel exchange such that an intermediate stack of sheets can be accommodated on said mandrel tip during said mandrel exchange,

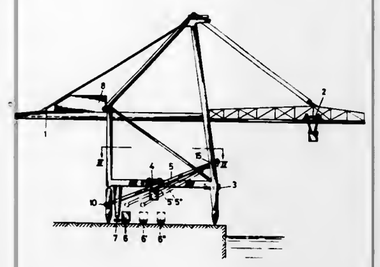
and transfer means for accommodating transfer of said intermediate stack to an empty mandrel after said mandrel exchange.

4,046,265

LOADING AND UNLOADING BRIDGE FOR CONTAINERS

Gerhardus J. Wormmeester, Zwijndrecht, and Joannes C. Rijsenbrij, Boskoop, both of Netherlands, assignors to Europe Container Terminus B.V., Rotterdam, Netherlands

Filed Mar. 2, 1976, Ser. No. 663,137
Claims priority, application Netherlands, Mar. 4, 1975, 7502542
Int. Cl.² B63B *27/00*
U.S. Cl. 214—14 **5 Claims**



1. A portable container crane moveable along the ground comprising a horizontal main girder adapted to extend over a ship, a first trolley moveable along said main girder, a supporting platform mounted in a fixed position on said portable crane beneath said main girder and adapted to support at least one container, an inclined beam mounted in a fixed position on said portable crane extending from a position above said supporting platform to a position above and near the ground, a second trolley moveable along said inclined beam, said first trolley having hoist means for transporting containers between said ship and said supporting platform, said second trolley having hoist means for transporting containers from said supporting platform and a carriage on the ground, the inclination of said inclined beam serving to facilitate rapid transfer of containers from said supporting platform to a carriage on the ground.

4,046,266

RETRACTABLE CARGO TRANSFER APPARATUS

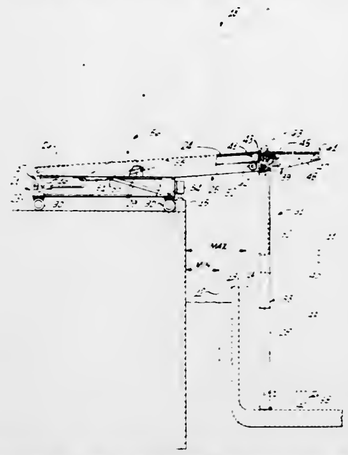
Allan R. Ide, 10066 Bloomfield, Cypress, Calif. 90630

Filed June 17, 1976, Ser. No. 697,219
Int. Cl.² B65G *63/00*
U.S. Cl. 214—14 **9 Claims**

1. In a cargo transport system for transferring discrete cargo loads from a cargo terminal into a vessel displaced laterally therefrom and located below the level thereof, the improvement comprising:

a powered endless conveyor means carried on a support rotatably mounted at an end and secured with respect to said cargo terminal and having a free end for extension beyond said cargo terminal into vertical alignment with said vessel;

an elevator mechanism depending from the free end of said support and having guideways formed of longitudinally extending telescoping elements and having a cargo receptacle positioned for longitudinal movement along said guideways between a lowered position and an upper position in lateral alignment with said powered endless conveyor means at said free end of said support;



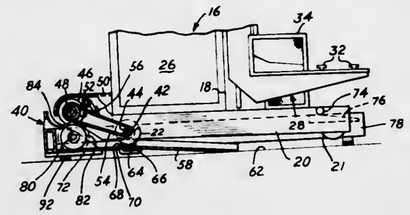
and a winch mechanism for raising and lowering said cargo receptacle longitudinally along said guideways.

4,046,267

WAREHOUSE STORAGE SYSTEM WITH A MULTIVEHICLE ARRANGEMENT HAVING POWER COUPLING MEANS

Paul E. Redelman, South Holland, and Donald H. Busam, Hometown, both of Ill., assignors to Interlake, Inc., Oak Brook, Ill.

Continuation of Ser. No. 336,887, Feb. 28, 1973, abandoned.
This application Oct. 29, 1975, Ser. No. 626,769
Int. Cl.² B65G *1/06*
U.S. Cl. 214—16.4 B **9 Claims**



1. A multivehicle arrangement comprising

a first vehicle including load handling means mounted thereon operative to transfer a load to and from said first vehicle,

a second vehicle supported for movement on a substantially horizontal surface for transporting said first vehicle over and parallel to said surface when said first vehicle has been positioned in a transport position on said second vehicle, said first vehicle also being movable on said surface when off of said second vehicle and movable in a given direction onto and off of said vehicle,

first drive means for propelling said first vehicle when said first vehicle is not in said transport position on said second vehicle, said first drive means including first support means for drivingly supporting said first vehicle for movement upon said surface,

second means for propelling said second vehicle, said second means for propelling including second support means for drivingly supporting said second vehicle for movement upon said surface,

first and second ends on said first vehicle, said ends being spaced from each other in said given direction of movement,

first and second elevation means adjacent said first and second ends of said first vehicle and mounted in spaced relation to each other on said first vehicle for elevating said first vehicle above said surface as said first vehicle is being propelled by said first drive means to move onto said second vehicle, third and fourth elevation means spacedly mounted on said second vehicle and operably engageable with a respective one of said first and second elevation means, said third elevation means including means engaged by at least a portion of said first support means as said first vehicle is moved onto said second vehicle and gravitational elevation assist means distinct from said first support means of said first vehicle and adjacent said first end of said first vehicle when said vehicle is in said transport position, said elevation assist means gravitationally assisting the elevation of said second end of the first vehicle by moving said first end of said first vehicle downwardly as said second end is moved upwardly on said fourth elevation means, and

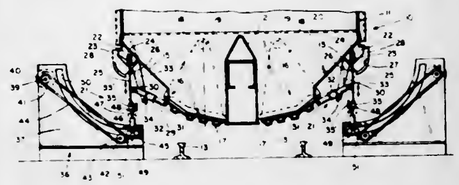
power coupling means, also distinct from said first support means of said first vehicle, coupling said first and second vehicles together automatically in response to the action of said first elevation means and said gravitation assist means and when said first vehicle is in said transport position for transferring power from said first drive means to said second means for propelling said second vehicle.

4,046,268

HOPPER DOOR ACTUATING MECHANISM

Franklin P. Adler, Michigan City, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed July 19, 1976, Ser. No. 706,868
Int. Cl.² B65G *67/24*
U.S. Cl. 214—58 **12 Claims**



1. A railway hopper car having a pair of laterally spaced bottom discharge openings,

doors pivotally connected to said car for swinging movement from a closed position over said openings outwardly to an open position, the improvement of a door actuating and locking mechanism for each door comprising;

an arm including means pivotally connecting said arm to said car for swinging movement from a vertically extending lock position laterally outwardly to an unlock position,

a link pivotally connected to said arm and to said door.

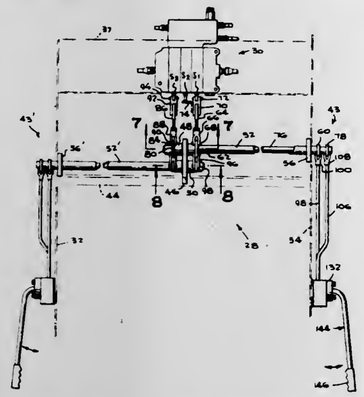
said link having a stop element connected thereto,

a stop bracket supported on said car engaged by said link stop in the lock position to lock said door against outward swinging movement,

said means pivotally connecting said arm to said car providing for limited vertical movement thereof, and

actuating means operable to move said arm verticaly thereby disengaging said link stop from said stop bracket and to swing said arm and door outwardly to an open position.

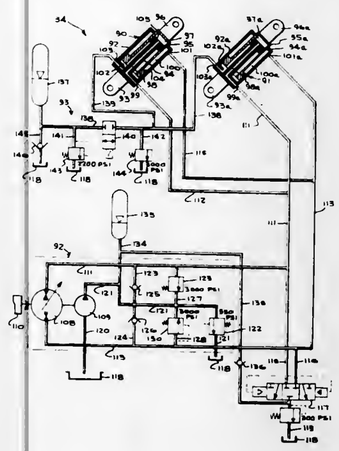
4,046,269
CONTROL ASSEMBLY FOR REFUSE VEHICLE
Roland W. McKenzie, Culpeper, Va., assignor to City Tank Corporation, Culpeper, Va.
Filed Oct. 14, 1976, Ser. No. 732,436
Int. Cl.² B65F 3/00
U.S. Cl. 214—83.3 10 Claims



1. In a refuse collection vehicle including a refuse storage body, a refuse receiving hopper mounted on said refuse storage body and communicating interiorly with said storage body and a fluid actuated mechanism mounted in said refuse receiving hopper for transferring refuse deposited in said hopper into said storage body and compacting the refuse therein, said fluid actuating mechanism including a control valve having a first slidable spool and a second slidable spool, a control mechanism for operating said control valve comprising a first control rod mounted on the refuse hopper for rectilinear motion along its axis, a second control rod mounted on the refuse hopper support structure for rectilinear motion along its axis, means operatively interconnecting the first control rod and the first valve spool for translating the rectilinear movement of the first control rod to rectilinear movement of the first valve spool, means operatively interconnecting the second control rod to the second valve spool for translating the rectilinear movment of the second control rod to rectilinear movement of the second valve spool, a control handle mounted on said hopper, means for pivotal movement of said control handle about a first axis and means for a pivotal movement of said control handle about a second axis generally perpendicular to said first axis, and means operatively interconnecting the control handle and the first control rod for translating the pivotal movement of the control handle about the first axis to rectilinear movement of the first control rod and means operatively interconnecting the control handle and the second control rod for translating the pivotal movement of the control handle about the second axis to rectilinear movement of the second control rod.

4,046,270
POWER SHOVEL AND CROWD SYSTEM THEREFOR
George B. Baron, and Paul W. Padrutt, both of Marion, Ohio, assignors to Marion Power Shovel Company, Inc., Marion, Ohio
Continuation of Ser. No. 477,022, June 6, 1974, abandoned. This application July 12, 1976, Ser. No. 704,935
Int. Cl.² E02F 3/32
U.S. Cl. 214—138 R 44 Claims

1. A power shovel comprising a body; a front end assembly mounted on said body including a stiffleg pivotally connected to said body, a dipper handle operatively connected to said stiffleg and a dipper operatively connected to said dipper handle; means mounted on said body and operatively connected to said front end assembly for hoisting said dipper; and means mounted on said body and operatively connected to said front end assembly for crowding said dipper; said crowding means including at least one fluid actuated, working piston and cylinder assembly operatively interconnecting said body of said front end assembly whereupon selectively supplying fluid under pressure to opposite ends of said cylinder, said front end assembly correspondingly will be caused to be lowered or raised, means for selectively supplying fluid under pressure to opposite ends of said cylinder, and an energy regeneration system including an energy storing means and means actuated by a predetermined movement of at least one component of



said front end assembly for charging said energy storing means, said energy storing means providing the charged condition a force applicable to a component of said front end assembly for biasing said component toward a predetermined movement wherein said crowd system includes a mast pivotally connected at a lower end thereof to said body and a connecting link pivotally connected at opposite ends thereof to said mast and said front end assembly; and wherein said working piston and cylinder assembly operatively interconnects said body and said mast.

4,046,271
METHOD FOR COLLECTING, HANDLING AND DISPOSAL OF WASTE MATERIALS
Lawrence Klesk, 3977 Sedgwick Ave., Bronx, N.Y. 10463
Continuation-in-part of Ser. No. 576,869, May 12, 1975, abandoned. This application Oct. 27, 1976, Ser. No. 736,216
Int. Cl.² B65F 3/00
U.S. Cl. 214—152 3 Claims

1. A method for collecting and transporting to a disposal site, waste materials deposited in a coverable container within a permanently affixed housing, at a location comprising the steps of:

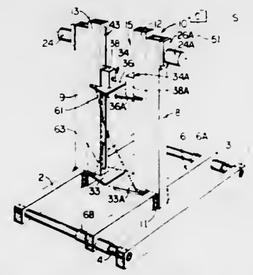
a. uncovering an empty container and inserting same within the housing by means of an openable side thereon;
b. placing empty containers on an intermediate collection vehicle;
c. bringing said empty containers to said location on said vehicle;
d. removing a filled container from said housing through said openable side, covering same and placing the covered container on said intermediate collection vehicle;
e. replacing said filled container within said housing with an empty uncovered container carried to said housing by said vehicle;
f. transporting said filled container to a transfer site;

g. removing said filled container from said vehicle at said transfer site and emptying each into a final collection vehicle; and



h. transporting said waste materials on said final collection vehicle to a disposal site.

4,046,272
DEVICE FOR UPENDING A CERAMIC MOLD
Donald J. Hayward, 318 S. Grove St., Delton, Mich. 49046
Filed Sept. 15, 1976, Ser. No. 723,237
Int. Cl.² B28B 21/08
U.S. Cl. 214—312 6 Claims



1. In a device for dumping a liquid from a mold, such as for dumping slip from a mold, the combination comprising:

support structure comprising a base and a pair of upstanding support posts positioned rigidly thereon;
lift structure comprising a pair of parallel arranged lifting posts connected in vertically movable, and pivotal, relationship with said support posts and including clamp means for holding a mold on and between said lifting posts;
operator controllable means for lifting said lifting posts with respect to said support posts, and pivot means fixedly mounted on said support posts constantly maintaining said pivotal relationship between said lifting posts and support posts;
whereby so long as the center of gravity of said support posts and the means associated therewith is below the pivotal axis of said pivot means a mold held within said clamp means will remain in liquid holding position but upon lifting of said support structure above said axis such mold will be automatically dumped.

4,046,273
CANOE LOADING APPARATUS
Douglas W. Hughes, R.R. 2, Kenyon, Minn. 55946
Filed Nov. 17, 1975, Ser. No. 632,285
Int. Cl.² B60R 9/00
U.S. Cl. 214—450 1 Claim



1. An apparatus to assist in loading and at least partially supporting a canoe for transport on an automotive type vehicle, including:

a generally upright frame having a pair of horizonal, spaced apart side bars, a top cross bar disposed between and connected to the upper ends of the side bars, and an intermediate cross bar disposed between and connected at an intermediate location on said side bars;
adustable clamp means on the frame to secure the frame to a bumper of an automotive type vehicle, said clamp means including first and second clamp assemblies, one of said clamp assemblies disposed at the lower end of each of said side bars of the frame, each said clamp assembly including upper and lower clips having reverse turn lips adapted to engage upper and lower edges of the bumper of an automotive type vehicle, bolt means assembling the clips to the side bars of the frame, each side bar being provided with a plurality of vertically aligned holes to accommodate the bolt means and permit adjustment of the location of the first and second clips of each clamp assembly;
a hollow tubular member vertically mounted on said frame being connected to said top cross bar and said intermediate cross bar at a location approximately midway between the side bars;
a carrier member for supporting an end section of a canoe, said carrier member having a normally vertical shaft with a lower end in telescopic engagement with said tubular member, said shaft end being axially rotatable in said tubular member and vertically movable therein;
said carrier member having a fork portion for engagement of a canoe end section, said fork portion including a horizontal cross piece secured to the upper end of said shaft to engage and support a canoe gunnel, and a pair of parallel spaced apart arms extending generally upward from either end of said cross piece, said arms being disposed at an inclination relative to said vertical shaft and spaced apart a sufficient distance to intercept and accommodate diverging side walls of an end section of a canoe to snugly engage said side walls with the canoe gunnel resting on said cross piece;
each of said arms and said cross piece of the carrier member being approximately the same length;
said shaft being vertically movable in said hollow tubular member to move said fork portion of the carrier member between a first, lower canoe loading position and a second, elevated canoe transport position;
releasable lock means to lock the carrier member in the elevated transport position, said lock means including a locking pin, a plurality of vertically spaced openings in the tubular member, said locking pin selectively engageable in one of said openings to support the end of said shaft with the carrier member in the elevated position, and removable from said opening to permit movement of the carrier member to the lower position;

a pair of horizontally aligned bicycle tongs for transport of at least one bicycle, one of said tongs being assembled to the lower portion of each of said side bars, said bicycle tongs having aligned, upwardly open loops for receipt of the cross bar of at least one inverted bicycle to locate the bicycle sufficiently below the forked member of the carrier to avoid interference with a canoe loaded thereon; and

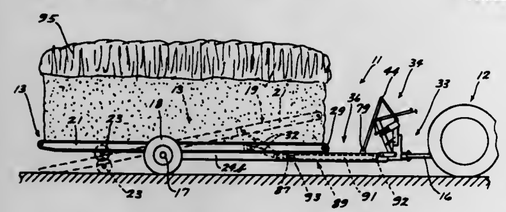
a canoe loading handle usable by a canoeist to load an end section of a canoe in the fork of said carrier member when the carrier member is in the lower position, said handle having a curved body portion generally contoured to substantially conform to the side walls of a canoe, a hook portion at the lower end of the body portion for engagement of the gunnel of a canoe, and a grip member at the upper end of the body portion for gripping and lifting by a canoeist to lift said canoe end section and position it in engagement with the fork portion of the carrier member.

4,046,274

POWER ASSIST HITCH FOR A HAY TRANSPORT

Kenneth E. Libersky, 303 E. 1st St., St. Ansgar, Iowa 50472

Filed Oct. 12, 1976, Ser. No. 731,785
Int. Cl.² B60P *1/16, 1/38*
U.S. Cl. 214—506 **4 Claims**



1. A power assist hitch for use with a tractor and a transport for loading and moving stacks, the transport having a bed pivotable by a tilt cylinder, said hitch comprising:

support means including a main support, the tractor being detachably hitched to said main support;

cylinder means including an external shaft, an internal shaft and a hitch cylinder, said internal shaft being affixed to said main support, said external shaft being attached to the transport, said internal shaft being slidably received within said external shaft, said hitch cylinder being attached at one end to said main support, at the other end to said transport, and disposed within said internal and external shafts; and

control means for selectively actuating said cylinder means and the tilt cylinder, said control means including first means for locking said shafts against relative movement and second means for selectively operating said hitch cylinder and the tilt cylinder, said control means being attached to said main support and having couplings to the tractor, the tilt cylinder and said cylinder means.

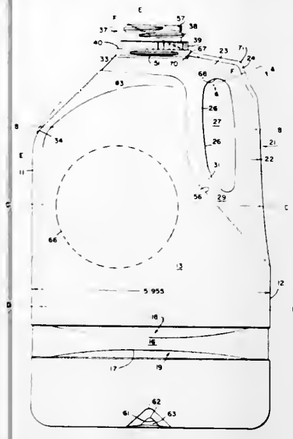
4,046,275

MILK BOTTLES

John J. Virog, Jr., Massapequa Park; Leo Von Hagel, North Massapequa, both of N.Y., and Richard L. Platte, Ann Arbor, Mich., assignors to Honeywell Farms Inc., New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,294
Int. Cl.² B65D *23/00*
U.S. Cl. 215—1 C **15 Claims**

1. A blow-molded light-weight thin-walled plastic milk bottle having a volume of substantially three quarts and weighing less than 60 grams, having a substantially rectangular 4 inch by 6 inch cross-section having a 4 inch wide front wall, a 4 inch wide lower rear wall parallel to said front wall and two parallel 6 inch wide side walls at right angles to said front and lower rear walls, said front, lower rear and side walls being substantially vertical and substantially planar, said container having a central squat generally cylindrical upright spout, said spout having an upper mouth opening and having a screw thread therebelow, said mouth opening being adapted to be tightly closed by a correspondingly threaded plastic cap, said bottle having an integral continuously hollow handle centrally positioned, with respect to said lower rear wall, and an upper rear wall spaced horizontally from said handle, said handle having a substantially vertical main upright portion whose base is adjacent to said lower rear wall, said upright portion being



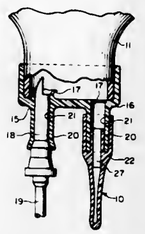
spaced from said upper rear wall sufficiently to provide space for the four fingers of a hand, side-by-side in vertical array, the top of said upright handle portion communicating with a gently sloping upper generally horizontal handle portion which communicates with the bottle just below said spout, said bottle having an inclined top wall which intersects said front wall and said side walls, the inclination of said top wall being such that the imaginary diametral line from the pouring edge of said spout to the point where said front wall meets said inclined top wall makes an angle of about 40° to the vertical.

4,046,276

PORT PROTECTOR CAP FOR A CONTAINER

David A. Winchell, Twin Lakes, Wis.; Joe A. Miller, Lake Zurich, Ill., and Jerry D. Martin, Kenosha, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed July 14, 1976, Ser. No. 705,211
Int. Cl.² B65D *41/20*
U.S. Cl. 215—250 **8 Claims**



5. A container for injectable fluids comprising:

a housing forming a sealed container for said fluids having a puncturable wall section;

a cylindrical tube segment projecting from said wall section and defining a passageway in communication therewith; and

a removable protector cap including a first sleeve portion dimensioned to be slidably received at one end within said tube segment,

a second sleeve portion dimensioned to be slidably received at one end over said tube segment,

said sleeve portions being concentric and joined at their other ends to form an annular recess for slidably receiving said tube segment in pressure-sealing engagement, and

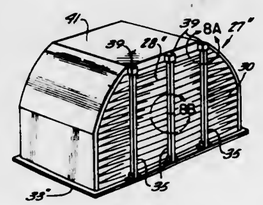
a grippable handle portion including a side wall portion extending in an axial direction from the other ends of said sleeve portions and a transverse end wall portion extending across the end thereof, said handle portion defining in conjunction with said first sleeve portion a chamber in pressure communication with said tubular passageway when said protector cap is inserted on the end of said tube segment, said sidewall being radially-inwardly compressible by the opposing applied external forces to reduce the volume of said chamber upon insertion of said protector cap to form a partial vacuum within said chamber.

4,046,277

FLEXIBLE BOTTOM CONTAINERS

Hadley F. Morrison, Downey, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Sept. 24, 1975, Ser. No. 616,492
Int. Cl.² B65D *87/14*
U.S. Cl. 220—1.5 **3 Claims**



1. An enclosed solid four-sided cargo container comprising:

a top,

a bottom,

a first set of two rigid opposing walls attached to said top and bottom providing support for the top,

a second set of two opposing walls attached to the top and to the bottom comprising distortable pleats which vary in width, said pleats having their greatest width at the center of the wall, the width of the pleats decreasing in both directions toward the side edge of the wall to zero depth, providing a flat surface at the edge of the wall, said pleats orientated parallel to the bottom to impart pliability to said second set of walls in a direction perpendicular to said bottom, whereby said walls permit incremental flexure of the bottom of the container along the line of contact between the second set of walls and the bottom of the container.

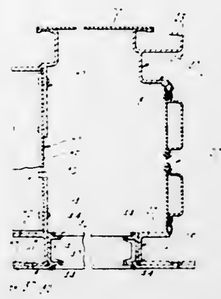
4,046,278

AIR CARGO CONTAINER

George Chleger, Birmingham; Robert B. Schwartz, Harper Woods, and Tara N. Banerjea, Warren, all of Mich., assignors to Fruehauf Corporation, Detroit, Mich.

Continuation of Ser. No. 449,638, March 11, 1974, abandoned. This application Sept. 19, 1975, Ser. No. 615,124
Int. Cl.² B65D *87/00*
U.S. Cl. 220—1.5 **4 Claims**

1. In a cargo container or the like including spaced parallel walls and frame means supporting the same in fixedly spaced relation, a floor assembly extending between said walls and comprising box section planking having spaced top and bottom webs, said frame means including a bottom rail structure extending along the base of at least one of said walls and said rail structure including a U-channeled portion having a vertical bight part, a flange formed as an integral upward extension of the bight part, the wall being secured to said flange, said web flanges of said U-channeled portion extending horizontally outwardly under the bottom of said wall, said structure also



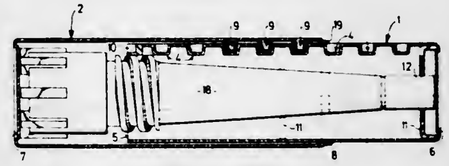
having additional flanges extending horizontally inwardly in the opposite direction from said side web flanges and telescopically fitted between and welded to said top and bottom webs of said planking to support said floor assembly, the floor assembly comprising hollow planks having internal reinforcing ribs extending longitudinally therein perpendicularly to said top and bottom webs and to said wall and recessed to accommodate said additional flanges.

4,046,279

PACKING CONTAINER FOR OBJECTS OF VARIABLE LENGTHS

Peter Röuler, Berlin, Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Continuation-in-part of Ser. No. 568,386, April 16, 1975, abandoned. This application Feb. 27, 1976, Ser. No. 662,264
Claims priority, application Germany, Apr. 19, 1974, 2418846
Int. Cl.² B65D *7/04, 7/30*
U.S. Cl. 220—8 **27 Claims**



1. Container of adjustable length for packing elongated objects of variable lengths, comprising a first elongated cylindrically shaped tubular body and a second elongated cylindrically shaped tubular body, each of said first and second bodies being closed at one end and open at the other end, said first and second bodies arranged to be fitted one into the other in a telescoping fashion and said first and second bodies being rotatable relative to one another about their longitudinal axes, wherein the improvement comprises that the open end of said first body fits within the open end of said second body with its outer surface in juxtaposition to the inner surface of said second body, said first body has a first groove formed inwardly into its outer surface and disposed parallel to its longitudinal axis and extending from its open end toward its closed end, a plurality of second grooves formed inwardly from the outer surface of said first body and extending transversely of and opening from said first groove with said second grooves spaced equidistantly apart along said first groove, said first

groove having a pair of longitudinally extending sides and a bottom extending between said sides, said second groove each having a pair of sides and a bottom extending between said sides of said second groove and at least one detent projecting inwardly from the inner surface of said second body adjacent the open end thereof and said detent shaped and arranged to pass in sliding relationship through said first groove in said first body when said first and second bodies are fitted together in a telescoping fashion and upon relative rotation of said first and second bodies about their longitudinal axis to pass into one of said second grooves in interlocking engagement therewith for effecting a locking engagement of said first and second bodies so that a variable overall length of the packing container can be provided by selectively engaging said detent of said second body into one of said second grooves of said first body so that the overall length between the closed ends of said first and second bodies corresponds closely to the length of the object to be packaged, means formed in said first body at the openings between said first groove and said second grooves for providing a resistance for the movement of said detent into and out of said second grooves and said sides and bottom of said second grooves having a shape complementary to the shape of said detent for gripping said detent when it is moved into one of said second grooves.

4,046,280

DIRECT MOUNTING REVERSE BUCKLING DISC

Franklin A. Hansen, Raytown, Mo., assignor to Continental Disc Corporation, Riverside, Mo.

Filed July 6, 1976, Ser. No. 702,734
Int. Cl.² B65D *25/00*; F16K *17/14*
U.S. Cl. 220—89 A 6 Claims

1. In combination, an inlet pipe flange and an outlet pipe flange and a safety pressure relief device mounted directly between said flanges:

a. said inlet and outlet flanges respectively having radially projecting opposed, flat annular clamping faces, said inlet and outlet flanges each having a bore extending through said flange to said clamping face,

b. said relief device comprising a rupture disc arrangement having a flange portion extending therefrom, said rupture disc arrangement being of the reverse buckling type having a bulged central portion with a convex side,

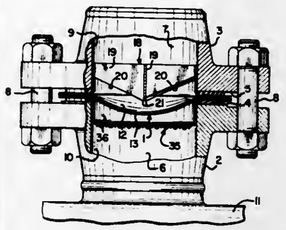
c. a first centering ring comprising a tubular wall portion and a flange portion, and puncturing means mounted at least partially within said first centering ring tubular wall portion, said bulged central portion being directed away from said puncturing means,

d. said first centering ring tubular wall portion being telescopically received into said outlet bore,

e. means cooperating between said first centering ring flange portion and disc arrangement flange portion whereby said last named flange portions are radially coaxially retained with respect to each other in absence of said pipe flanges,

f. a second centering ring comprising a tubular wall portion surrounding said bulged central portion and a flange portion, said second centering ring tubular wall portion forming a mouth and being telescopically received into said inlet bore, means cooperating between said second centering ring flange portion and disc flange portion whereby said last named flange portions are radially coaxially retained with respect to each other in absence of said pipe flanges, and

g. means clamping said first and second centering ring flange portions and rupture disc flange portion in sandwiched arrangement between said pipe flanges.

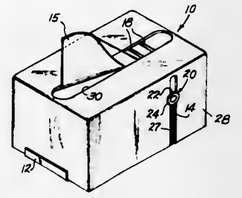


4,046,281

METHOD AND APPARATUS FOR DISPENSING FLEXIBLE MATERIALS

Henry C. Voegeli, 918 Gibbs Rd., Venice, Fla. 33595

Filed Apr. 19, 1976, Ser No. 677,866
Int. Cl.² B65G *59/02*
U.S. Cl. 221—23 8 Claims



1. Apparatus for dispensing individual sheets of flexible materials from an interleaved stack of folded sheets whereby the ultimate sheet in said stack is presented in a partially upstanding position to facilitate grasping and dispensing thereof, said apparatus comprising:

a. base means for supporting an interleaved stack of folded sheets;

b. gravitational frictional engaging means for contacting the exposed face of the ultimate sheet in said stack intermediately along the length thereof permitting withdrawal of said ultimate sheet and for constantly frictionally engaging the exposed face of the penultimate sheet in said stack and restraining same once the exposed face of said ultimate sheet has passed whereby said penultimate sheet is then presented in partially upstanding position beyond contact with said frictional engaging means defining a static dispensing plane intersected by said engaging means.

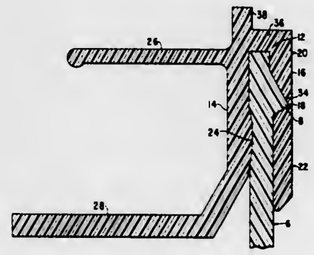
4,046,282

MOLDED PLASTIC COVERS FOR CONTAINERS

Heinz Ruch, Basel, Switzerland, assignor to Albert Obrist & Co., Basel, Switzerland

Division of Ser. No. 591,102, June 27, 1975, Pat. No. 4,005,101, which is a division of Ser. No. 349,256, April 9, 1973, Pat. No. 3,915,613. This application Nov. 2, 1976, Ser. No. 737,799
Int. Cl.² B65D *41/32*
U.S. Cl. 220—270 10 Claims

1. In a relatively flexible one-piece molded plastic cover for an open mouthed container, wherein said container has a circumferential extending projection on its outer wall in the region of the edge of said container, wherein said cover has an inverted U-shaped rim in the form of a pair of upstanding circumferential sidewalls, and wherein the outer sidewall of said cover has a circumferential weakening line which subdivides the cover into a first cover member reusable as a cover and a second cover member being a tear-off end portion, the improvement comprising means for providing firm clamping and contact pressure between the upper edge of said container and the sidewalls of said cover by having the inner sidewall of



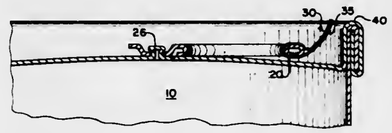
said cover with a circumferential extending bulged portion tc maintain pressure contact with the inner wall of said container, said bulged portion being disposed approximately on the level of said projection, and having the outer sidewall of said cover shaped to engage the edge of said container firmly above said projection, and a recess in said outer sidewall of said cover shaped to form said weakening line and to engage the projection on said container for locking said cover to said container, the outer surface of said outer sidewall being substantially straight line in cross-section.

4,046,283

FINGERNAILESS TAB FOR RING-PULL CAN OPENERS

Frank J. Lockwood, 7011 W. Archer Ave., Chicago, Ill. 60638

Filed May 30, 1975, Ser. No. 582,162
Int. Cl.² B65D *41/32*
U.S. Cl. 220—270 5 Claims



1. A ring-pull opener for a can containing beverages and the like comprising a cover having a tear portion and a ring attached to said tear portion, a flexible upstanding tab attached to said ring at a point on said ring diametrically opposed to said tear portion and at an acute angle to said cover to permit said tab to be easily grasped to elevate said ring, whereby said ring may be grasped to open said can, said tab having an adhesive on the one side thereof, said adhesive permitting said ring and tear portion upon removal from said can to be adhesively secured to any desired portion of said can to maintain the ring tear portion and can together for ease of disposal.

4,046,284

TENNIS BALL CONTAINER INDICATING PLAYERS TURNS

Frank A. Samuelson, 738 Ruby St., Redwood City, Calif. 94061

Continuation of Ser. No. 513,098, Oct. 8, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,896
Int. Cl.² B65H *1/00*
U.S. Cl. 221—45 2 Claims



1. A tennis ball container for indicating players' turns wherein a player deposits a tennis ball having distinguishing characteristics in the top of the container and later withdraws the ball from the bottom of the container after other players have withdrawn previously deposited balls, whereby the order of balls in the container from bottom to top indicates players' turns, said container comprising a cylindrical member of a length at least as great as the diameter of two balls having an inside diameter slightly greater than the normal diameter of the balls to be contained, the top of said cylindrical member being open and unobstructed for deposit of balls, the bottom of said cylindrical member being open, and attachment means rigidly fixed to said cylindrical member to mount said cylindrical member in upright position, at least a portion of said cylindrical member being apertured so that view of all the balls in the interior of said cylindrical member is unobstructed from approximately 300° angle about the axis of said cylindrical member so that players may observe all the balls within said container, said attachment means being unitary and comprising a rigid vertical elongated metal bracket and a stop comprising an outwardly bent rigid lower end of said bracket bent downwardly-outwardly relative to said bracket, said stop being fixedly secured below said cylindrical member with a fixed gap between the lower end of said cylindrical member and said stop which is at no position greater than said normal diameter, the width of said stop being approximately one-third the diameter of said cylindrical member so that a ball may be withdrawn from said container by pulling said ball from the front or from either side, the ball distorting in shape so as to be pulled through said gap, said attachment means further comprising a clamping plate adapted to be positioned on the side of a wire fence opposite said bracket and bolts connecting said bracket and plate and passing through said fence to secure said bracket and clamping plate together to mount said container on said fence.

4,046,285

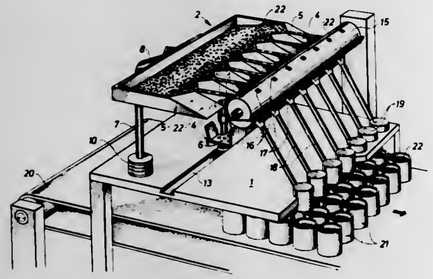
METHOD AND APPARATUS FOR PRODUCING SINGLE FLOWS OF GRAINS

Karl Leonart Wendt, Box 60, S-910 26, Stockaja, Sweden

Filed May 12, 1976, Ser. No. 685,687
Claims priority, application Sweden, June 5, 1975, 7506449
Int. Cl.² B65G *47/14*
U.S. Cl. 221—157 7 Claims

1. A method of diverting from a supply of grains a plurality of parallel intermittent single flows of grains, comprising the steps of: moving the grains of the supply in a definite direction

on a plane support by utilizing vibration feed, dividing the resulting wide grain flow into a plurality of parallel single-row flows by guiding said wide grain flow into a corresponding number of grain paths connected to said plane, each grain path being designed so as to be able to convey only a single row of grains, adjusting the vibration feed to cause the grains on said paths to turn by mutual action to a uniform orientation, transferring the grains from said grain paths one by one to means



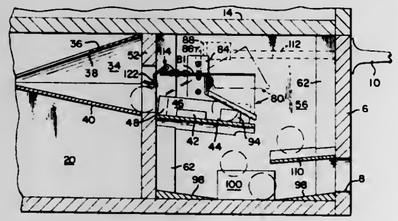
rotating about an axle and discharging the grains at predetermined time intervals from said rotating means in accurately determined positions, wherein said rotating means is a rotary cylinder, and further including the steps of: feeding per time unit more grains into said paths than are removed by said rotary cylinder for forming in each path a string of grains abutting each other and the envelope surface of the cylinder, permitting excess grains to be pressed out of said paths and collected and later on returned to the grain supply.

4,046,286

TAMPER-PROOF BALL DISPENSING MECHANISM

Eugene Lee Peppard, 3537-46th Northeast, Seattle, Wash. 98105

Filed June 9, 1976, Ser. No. 694,312
Int. Cl.² B65H *33/14*
U.S. Cl. 221—251 11 Claims



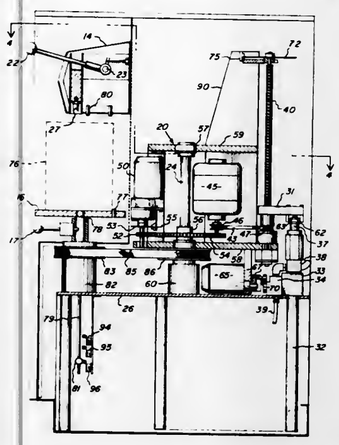
1. A tamper proof dispensing mechanism for use in conjunction with game tables or the like comprising:
a first storage area inaccessible to the player to receive game elements ejected from the playing surface and store them prior to dispensing;
a combination measuring and dispensing apparatus adjacent the first storage area and inaccessible to the player, said measuring and dispensing apparatus interconnected with the first storage area and comprising a sloping floor member for supporting the playing pieces prior to dispensing and an elongated gate member including a downwardly extending side element running substantially the entire length of the gate member, said side element serving to both contain the game elements prior to dispensing, and to restrict the elements to a simple line along the gate member said gate member pivotable to permit the simultaneous dispensing of the playing pieces
means preventing movement of playing pieces from the first storage area during the dispensing process;
means exterior of the table to actuate the measuring and dispensing apparatus, and
a second storage area accessible to the player for holding the playing pieces prior to use.

4,046,287

AUTOMATIC METERING AND DISPENSING SYSTEM

Joop Frans Hoekstra, Medfield, Mass.; Donovan Harold Lumby, Minneapolis, and William Duncan Vork, Edina, both of Minn., assignors to Graco Inc., Minneapolis, Minn.

Filed May 10, 1976, Ser. No. 684,680
Int. Cl.² B67D *5/10*
U.S. Cl. 222—16 41 Claims



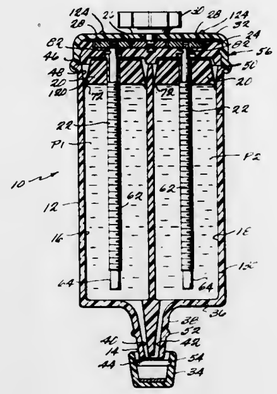
1. A fluid component selection and metering apparatus for selecting prestored fluid component formulations and metering fluid components proportioned according to the selected formulations into a receptacle, comprising:
a. means for retaining a plurality of fluid formulations;
b. a plurality of fluid component reservoirs for storing fluid components;
c. a plurality of positive displacement fluid metering pumps arranged along a circular arcuate path, each pump having a vertically movable plunger;
d. a fluid flow valve attached to each of said pumps, said valve having a first fluid flow connection to a fluid component reservoir, a second fluid flow connection to said pump, and a third outlet fluid flow connection;
e. a fluid dispensing housing having fluid flow connections to all of said flow valves' third outlet fluid flow connection;
f. a rotatable scanner having a pivot point radially centered relative to said circular arcuate path and having thereon a metering pump drive system and a fluid flow valve drive system, and also having means for positively coupling said drive systems respectively to a fluid metering pump and a fluid flow valve; and
g. means for selecting a fluid formulation and controlling said scanner for selective rotatable connection to positive displacement fluid metering pumps and fluid flow valves corresponding to said selected fluid formulation, and for activating said metering pump drive system and said fluid flow valve drive system to controllably dispense said fluid components through said fluid dispensing housing.

4,046,288

PLURAL CHAMBER DISPENSER

Carl Bergman, 2316 NE. 28th Court, Lighthouse Point, Fla. 33064

Filed Feb. 6, 1976, Ser. No. 656,087
Int. Cl.² B67D *5/42*
U.S. Cl. 222—135 15 Claims



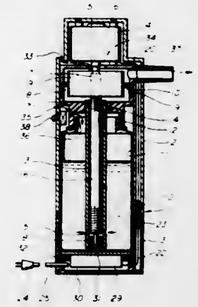
9. A dispenser, comprising:
a body having side wall means defining at least one generally cylindrical chamber for containing a fluid product, each chamber having one end wall with a dispenser spout extending therethrough;
an operator assembly fitted on the opposite end of the body,
the operator assembly uniting: a cap; a rotatable operator outside the cap, a helically threaded rod for each chamber, an internally threaded piston mounted on each rod for longitudinal travel therealong upon rotation of the rod; a plate; means received on said plate and rotatively connecting the operator through the cap, with each rod, so that as the operator is rotated, each piston is advanced;
and means on the cap and body securing the operator assembly on the body with each depending in a respective said chamber:
the operator assembly being a prefabricated unit, wherein:
each said rod having a threaded main section flanked at the upper end by a smaller diameter unthreaded section and terminating at the upper end in a non-circular peg; each piston being initially borne upon the respective said unthreaded section and the plate being provided with at least one opening, into which each respective said peg upwardly protrudes; a recess formed in the upper side of the plate; the rotatively connecting means being deposited in said recess; the rotatively connecting means having a non-circular opening formed centrally therethrough; the operator including a handwheel having a shaft extending coaxially therefrom, said shaft having a portion of non-circular section, said shaft portion being inserted in the non-circular opening of said rotatively connecting means to key the operator to that means; said peg of said rod being received in the non-circular opening to key the rods to the rotatively connecting means.

4,046,289

LATHERING DEVICE

Akihiko Teranishi, Nagoya, Japan, assignor to Kabushiki Kaisha Teranishi Denki Seisaku-Sho, Japan

Filed May 24, 1976, Ser. No. 688,953
Claims priority, application Japan, May 30, 1975, 50-64150; Dec. 27, 1975, 50-156999; Oct. 24, 1975, 50-144248[U]; Nov. 7, 1975, 50-150738[U]; Dec. 29, 1975, 51-178759[U]; Mar. 11, 1976, 51-28077[U]; Nov. 7, 1975, 50-150739
Int. Cl.² B67D *5/62*
U.S. Cl. 222—146 HE 16 Claims



1. A lathering device comprising
an outer casing;
a first chamber disposed within said outer casing, for storage of liquid soap;
one or more second chambers disposed within said outer casing and above said first chamber;
heater means for heating said liquid soap;
an elongated hollow means having two ends, one end being closed with an opening near the end and the other end being open, said hollow means disposed to connect said first chamber and said second chamber with said one end disposed with the closed end toward the bottom of said first chamber thereby providing a path for passage of said liquid soap through said opening at the closed end, through said hollow means and into said second chamber;
outlet means located at said second chamber;
motor means having a shaft, disposed above said second chamber;
agitating means disposed within said second chamber;
screw means disposed within said hollow means and extending through a substantial portion thereof;
joining means connecting said motor shaft, to said agitating means and to said screw means; and
air passage means for enabling air to controlledly travel into said first and second chambers from outside of said outer casing, whereby operation of said motor turns concurrently both said agitating means and said screw means to cause said screw means to lift up said liquid soap through said hollow means from said first chamber into said second chamber to cause said agitating means to effect foaming of said liquid soap and ejection of said foamed liquid soap through said outlet means.

4,046,290

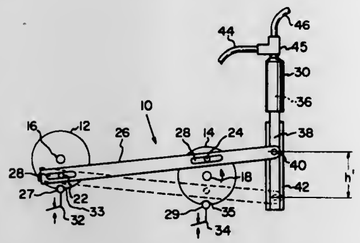
DISPENSER SYRINGE APPARATUS HAVING ALTERNATELY DRIVEN CAMS

Nevitt M. Loader, Verona, Pa., assignor to Fisher Scientific Company, Pittsburgh, Pa.

Filed July 6, 1976, Ser. No. 702,408
Int. Cl.² F16H *28/08*
U.S. Cl. 222—267 18 Claims

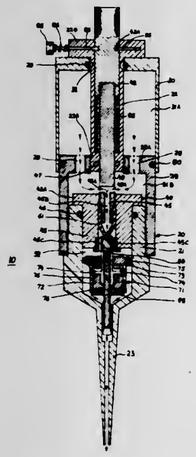
1. A dispensing apparatus comprising:
A. a syringe having a plunger therein and fill means and discharge means associated therewith;

B. first and second cams positioned in spaced relationship;
C. a connecting rod joining the two cams and the plunger; and



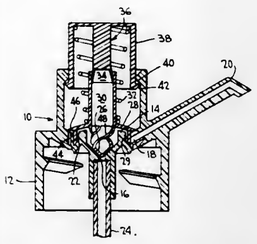
D. means to rotate the first cam while the second cam acts as the fixed pivot to move the plunger through a first distance and to rotate the second cam while the first cam acts as the fixed pivot to move the plunger through a second distance.

4,046,291
DEVICE FOR PIPETTING AND/OR DILUTING
George Goda, 390 First Ave., New York, N.Y. 10010
Filed Jan. 7, 1976, Ser. No. 647,106
Int. Cl.² G01F 11/06
U.S. Cl. 222—309 19 Claims



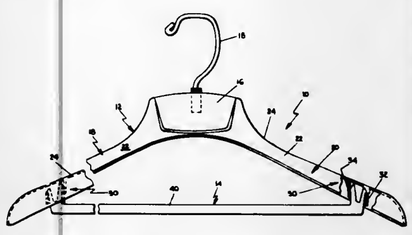
1. A pipetting/diluting device, comprising:
a tubular body having front and rear ends, said body having a central bore which narrows at the front end thereof to form a tip;
a plunger slideable in said bore and extending from the rear thereof for manual activation, said plunger having a front portion which conforms circumferentially to at least a portion of the inner surface of said body, the bore space in said body forward of the plunger defining a front chamber,
an enclosure defining a back chamber, said enclosure being mounted on said body rearwardly thereof and surrounding said plunger;
said plunger having a communicating passage between said back and front chambers;
first one-way valve means restricting flow in said communicating passage to occur only from said back chamber toward said front chamber; and
second one-way valve means restricting flow as between said front chamber and said tip to occur only from said front chamber toward said tip.

4,046,292
MANUAL CONTAINER MOUNTED PUMP
Douglas F. Corsette, 6559 Firebrand St., Los Angeles, Calif. 90045
Filed Aug. 31, 1976, Ser. No. 719,234
Int. Cl.² B05B 11/00
U.S. Cl. 222—383 11 Claims



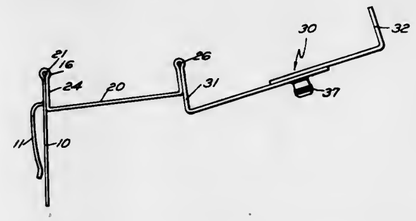
1. A dispensing pump of the pressure accumulating type comprising;
a pump housing defining a cylindrical pressure accumulation chamber having in inlet port at one axial end thereof for communication with a source of flowable product to be dispensed, and an outlet port opening radially from said chamber;
an inlet check valve controlling said inlet port;
a centrally apertured outlet valve disposed for axial movement in said chamber from a closed position adjacent said one axial end of the chamber in which it blocks communication between said inlet and outlet ports to an open position remote from said one axial end in which it establishes communication between said inlet and outlet ports;
resilient means normally urging said outlet valve toward its closed position;
a pump cylinder carried by said outlet valve coaxially to said pressure accumulation chamber and in constant communication with said chamber through the central aperture of said valve;
a pump piston reciprocable in said cylinder independently of the movement of said outlet valve;
and means for manually reciprocating said piston.

4,046,293
DETACHABLE BAR FOR GARMENT HANGER
Judd F. Garrison, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.
Filed July 28, 1976, Ser. No. 709,460
Int. Cl.² A47J 51/097
U.S. Cl. 223—88 13 Claims



1. In combination, a garment hanger and an improved detachable pants bar, said garment hanger including a central head portion and outwardly extending arms, the arms including means defining a socket adjacent the end thereof for receipt of the pants bar, and wherein said pants bar comprises:
an elongated support bar; and
upstanding locking means at each end of said support bar and extending generally perpendicular to said support bar for positively and detachably locking said pants bar to said hanger at said sockets, each of said locking means including
an upstanding resilient detent finger positioned adjacent each end of said pants bar, said hanger arms further defining a detent aperture at said sockets, said resilient detent finger having a portion received in said aperture so that said pants bar is positively and rigidly locked to said hanger but may be detached therefrom upon manual shifting of said resilient detent finger, and wherein said socket defining means of said arms each includes a pair of spaced, generally vertical walls, said socket opening downwardly.

4,046,294
ELECTRICAL INSTRUMENT HOLDER
Raymond O. Morin, 20 Eddy St., North Providence, R.I. 02911
Filed Oct. 28, 1975, Ser. No. 626,483
Int. Cl.² A45F 5/00
U.S. Cl. 224—5 H 3 Claims



1. A body mounted electrical instrument holder comprising a support plate having a flat surface with edges, means for supporting said plate from a person's body so that one edge defines an upper edge, an arm having legs at its ends extending at generally right angles thereto, one of the legs hinged at its free end to the upper edge of said support plate to rest against said support plate when the arm and legs are relatively swung in an arc of approximately 270° about the support plate, an electrical meter clamp having a generally flat inner body portion to receive a meter, said body portion having a leg at one end thereof extending at generally right angles to the flat body portion and hinged at its free end to the free end of the other of the legs of said arm to rest against said other leg and support the meter clamp in generally horizontal extension of said arm, said support plate after removal from the supporting position on the body portion swinging in an arc of approximately 270° to collapse the holder whereby the support plate may be swung over the arm and the meter clamp swung over the plate and arm from the other end of the arm into folded position.

4,046,295
CARRYING DEVICE FOR PORTABLE ARTICLE
Jay H. Eichler, Boca Raton, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 31, 1975, Ser. No. 563,946
Int. Cl.² A45C 11/24
U.S. Cl. 224—5 H 8 Claims

1. A carrying device for an elongated portable article of a predetermined height which has a ledge thereon intermediate its ends and a surface at a fixed position with respect to the ledge, such carrying device including in combination:
a supporting plate having a surface adapted to be engaged by the article, said plate further having a slot therein and a recess adjacent said slot,
means secured to said plate forming a loop having open-ended top and bottom and a lateral dimension less than the height of the article, said loop being adapted to receive the article therein whereby the article extends above and below the lateral dimension of the loop, said loop having a stop surface in the interior thereof intermediate the top and bottom to be engaged by the ledge on the article,
latch means including an arm extending into said slot and recess of said plate and further including means fastening said latch arm to said plate at said recess, said latch means being secured to a top portion of said plate and having a portion operating to overlie the fixed position surface of the article when the article is received in said loop to hold the article in position with the ledge thereon against said stop surface, and
means secured to said plate for supporting the carrying device and the article.

5. A carry holder for a portable radio of a predetermined height having a top with controls extending therefrom, a side with a switch actuator and a ledge below the actuator which is



at a given spacing from the top, and a front with a grille in the top portion thereof, said carry holder including in combination:
a back plate and means extending forwardly thereof to form a loop having open-ended top and bottom and a lateral dimension less than the height of the radio, said lateral dimension of the loop being adapted for receiving the portable radio, said loop further having a more narrow lateral measurement at at least one point, said top of said more narrow lateral dimension comprising a stop surface to be engaged by the ledge on the side of the radio to support said radio, with the radio extending above and below the lateral dimension of said loop,
latch means secured to a top portion of said back plate and having a portion for extending over the top of a radio positioned in said loop, and
means secured to said back plate for supporting the carry holder.

4,046,296
BELT HOLSTER PURSE ASSEMBLY
Anna McGhee, 2541 Oaklea Way, Forestville, Md. 20028
Filed Aug. 3, 1976, Ser. No. 711,160
Int. Cl.² A45C 1/04
U.S. Cl. 224—26 D 7 Claims

1. A belt holster purse comprising in combination:
an elongated belt element having end portions adapted to be releasably connected;
at least one longitudinally extending reinforced slot formed in said belt element;
and at least one purse member slideably mounted in selected ones of said slots, each said purse member including top, bottom, front and rear walls, a stud member being carried by said rear wall adapted to project through said slot and slidable in said slot a first fastening element being provided on the outer free end of said stud member, the top

wall of said purse member having a free end extending downwardly in overlying relation to at least the upper portion of said rear wall and being provided with a second fastening element cooperable with said first fastening



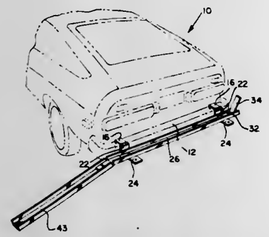
element for simultaneously closing said purse member and releasably locking same to said belt element, said free end concealing said slot when said fastening elements are engaged.

4,046,297

VEHICLE BUMPER MOUNTED CARRIER FOR CYCLES

Herbert Bland, 133 N. Arbor Trail, Apt. 603, Park Forest, Ill. 60466

Filed Jan. 7, 1976, Ser. No. 647,135
Int. Cl.² B60R 9/10
U.S. Cl. 224—42.03 B 2 Claims



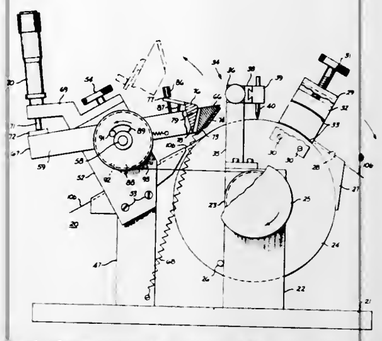
1. A cycle carrier, comprising a pair of hinge brackets, mounted in horizontally aligned and spaced relation along the upper marginal edge of a vehicle bumper, each bracket having hingedly connected upper and lower plates, the free end of each of the upper plates being turned into a hook adapted to engage the upper edge of a vehicle bumper and providing the sole attachment for the carrier to the bumper, the lower plate of each bracket being turned into an angularly disposed flange, means for adjusting the pivotal connection of said plates so that said angularly disposed flanges are in substantially the same horizontal plane, a channel member carried on said flanges for supporting a cycle thereon, said channel members being adjustably mounted longitudinally on said flanges, said pivotal adjusting means including a pad screw threadedly mounted in said depending plate, to prevent contact of said plate with said bumper.

4,046,298

METHODS AND APPARATUS FOR STRIPPING OPTICAL FIBER RIBBONS

Charles Martin Schroeder, Jr., Hamilton Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 645,145
Int. Cl.² B26F 3/00
U.S. Cl. 225—2 4 Claims



1. A method of removing a portion of a protective coating from a planar multi-conductor optical fiber ribbon and breaking the fibers, comprising the steps of:

a. clamping the ribbon to a section of the periphery of a rotatable cylinder;

b. additionally clamping the ribbon at a location remote from the rotatable cylinder;

c. moving a cutting tool, in a controlled manner, to penetrate the coating to a predetermined depth;

d. rotating the cylinder to simultaneously remove the portion of the protective coating with the cutting tool while longitudinally stressing and exposing the optical fibers and bending the exposed fibers to a predetermined radius of curvature conforming to the periphery of the cylinder; and

e. scoring the exposed optical fibers to cause them to break.

4,046,299

GLASS CUTTING METHOD

John G. Swartzfager, 9381 SW. Taylor, Portland, Oreg. 97225

Filed June 7, 1976, Ser. No. 693,645
Int. Cl.² B26F 3/08
U.S. Cl. 225—3 2 Claims



1. The method of lengthwise severing a glass tube of rectangular section, said method consisting of the steps of,

lengthwise scoring the minor sides of the tubular member,

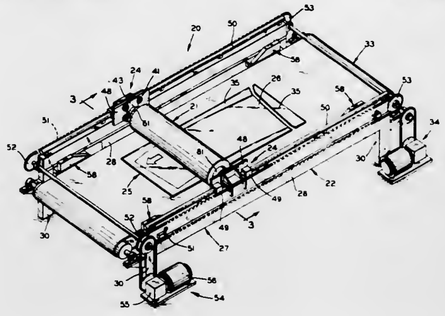
applying inward pressure to a major side of the rectangular member to impart both tension and compression forces to glass zones located adjacent the lengthwise scorings to separate the glass tube into boat shaped pieces.

4,046,300

SCORED GLASS BRACKET BREAKING APPARATUS

Robert H. Welker, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed June 1, 1976, Ser. No. 691,903
Int. Cl.² C03B 33/04
U.S. Cl. 225—103 8 Claims



1. In a glass pattern breaking apparatus of the type having a press roll rollably movable across a prescored pattern glass bracket supported on an aligned template for breaking out the prescored pattern, the improvement comprising

a. a press roll including:

1. an elongate rigid core shaft, and

2. a resilient pliable body covering said core shaft, and

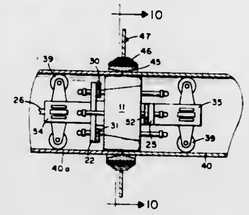
b. means for floating said press roll in a plane substantially perpendicular to said template so that its weight freely bears against the glass bracket supported on said template to cleanly break out the prescored pattern.

4,046,301

PROCESS FOR EXPLOSIVELY JOINING TWO PIPE SECTIONS

Robert H. Wittman, Littleton, and William G. Howell, Lakewood, both of Colo., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 489,523, July 18, 1974, Pat. No. 3,987,952, which is a continuation-in-part of Ser. No. 252,641, May 12, 1972, abandoned. This application Aug. 2, 1976, Ser. No. 711,015
Int. Cl.² B23K 21/00
U.S. Cl. 228—108 3 Claims



1. A process for explosively joining two pipe sections arranged in end-to-end abutting relationship comprising:

positioning around the joint of said abutting pipe section a metal collar having a central portion and end portions which taper radially outwardly from said center portion to their respective outer ends, the outer surface of said collar being substantially cylindrical such that said center portion is the thickest portion of said collar;

placing around said collar a ring of high explosive which is shaped to have a greater radial thickness adjacent the central portion than adjacent the end portions of said collar, said high explosive having a detonation velocity of between about 15,000 and 30,000 feet per second; and

simultaneously detonating said explosive at a plurality of locations which are radially aligned with the joint of said abutting pipe sections and which are circumferentially spaced about said ring.

4,046,302

METHODS OF MANUFACTURING BODIES OF CONGLOMERATED PARTICLES

Hermann J. Schladitz, 74 Placentschweg, Munich, Germany

Filed May 18, 1976, Ser. No. 687,512
Claims priority, application Germany, May 26, 1975, 2523249
Int. Cl.² B23P 3/22; B22F 1/02
U.S. Cl. 228—121 15 Claims

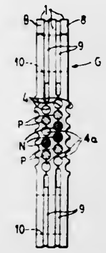
1. A method of manufacturing a body of conglomerated particles, comprising coating the particles with a network of polycrystalline metal whiskers with a diameter in the range 0.05 to 1 μm, heating the coated particles to a temperature at which the whiskers sinter together at their areas of contact, mixing the coated particles with filaments, and metallically bonding the filaments and the coated particles at their areas of contact.

4,046,303

METHOD OF MAKING NEEDLE GUIDE DEVICES FOR MOSAIC PRINTERS

Richard Reier, Taufkirchen, and Peter Kielser, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 25, 1975, Ser. No. 598,926
Claims priority, application Germany, July 31, 1974, 2436970
Int. Cl.² B41J 3/04
U.S. Cl. 228—173 14 Claims



1. A method of making a guide device for printer needles used in printer heads of mosaic printers, such guide device being adapted to guide the needles adjacent to the printing area of a printing head, the method comprising:

providing members of rolled or drawn material;

stamping or embossing guide grooves in said members;

forming openings in said members across said grooves to interrupt the grooves so that the grooves provide spaced aligned sections;

assembling said members with said guide grooves in complementary cooperaing confronting relation and thereby forming needle guideways; and

securing the members in assembly to provide said device.

4,046,304

PROCESS FOR PRODUCING METAL COMPOSITE MATERIAL

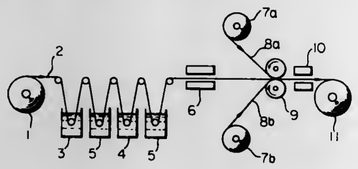
Sanetoshi Tabata, Hirakata, and Toshiaki Takeuchi, Neyagawa, both of Japan, assignors to Teikoku Piston Ring Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 476,225, June 4, 1974, abandoned. This application Oct. 8, 1975, Ser. No. 620,716

Claims priority, application Japan, Sept. 12, 1973, 48-102211; Nov. 8, 1973, 48-124930

Int. Cl.² B23K *19/00*

U.S. Cl. 228—187 **1 Claim**



1. A process for producing metal composite material comprising the steps of:
   1. forming an aluminium layer bonded to a surface of a substrate material consisting of a metal other than aluminium by (a) superimposing an aluminum foil on the surface of the substrate material, (b) cold pressure bonding the foil and substrate at a draft of from 5 to 22.7 % (c) subjecting said bonded material to a diffusion heat treatment at a temperature of 200° to 400° C and then
   2. bonding an aluminum material to the bonded material produced by step (1) by (d) superimposing the aluminum material on said aluminium foil layer surface and (e) hot pressure bonding said superimposed aluminium material to said metal substrate material through said aluminium foil layer at a draft of said superimposed material of from 5 to 60% and at a temperature lower than the metling point but not lower than the recrystalizing point of said aluminium material, to thereby produce a composite material.

4,046,305

METALLIC BONDING METHOD

Dennis Cockburn Brown, and Reginald Murray, both of Leamington Spa, England, assignors to Associated Engineering Limited, England

Filed Oct. 28, 1975, Ser. No. 626,126

Claims priority, application United Kingdom, Nov. 15, 1974, 49480/74

Int. Cl.² B23K *35/30*

U.S. Cl. 228—194 **22 Claims**



1. A method of bonding together at least two pieces of aluminium alloy by eutectic diffusion bonding using, between the surfaces to be joined, an interlayer selected from the group consisting of copper and copper-rich alloys including at least about 95% copper and in which said pieces are heated and said surfaces to be joined are pressed together to form a metallurgical bond therebetween, characterized in that at least one of said pieces is of high silicon aluminum alloy and at least one other of said pieces is of an aluminium alloy having a melting point not lower than that of said high silicon aluminum alloy and in that said one piece of high silicon aluminum alloy and said other piece of aluminium alloy are heated to a temperature in the range of about 515° to about 530° C, whereby to form between the joined surfaces a metallurgical bond consisting of a complex alloy of at least said high silicon aluminum alloy and said interlayer.

4,046,306

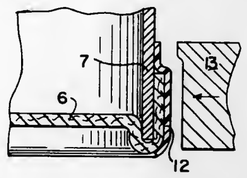
COMPOSITE END PANEL FOR CAN OR SIMILAR CONTAINER

Ann E. Cass, Argo, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Jan. 2, 1976, Ser. No. 645,966

Int. Cl.² B65D *3/10*; B21D *31/00*

U.S. Cl. 229—5.7 **10 Claims**



1. An improved method of fastening a paper laminate panel to the body of a can or similar container comprising the steps of:
   - cutting the end panel, having interior and exterior surfaces, from a sheet of laminate material,
   - applying an adhesive sealant to the interior surface periphery of said end panel.
   - securing said adhesive-covered end panel to an end of said container body with at least a portion of said interior surface periphery overlying the outer surface of said body,
   - applying an annular band or hoop of heat-shrinkable plastic over the exterior surface periphery of said end panel, and
   - heating said band or hoop to shrink the same, thereby further securing said end panel to said body and preventing end panel delamination and separation.

4,046,307

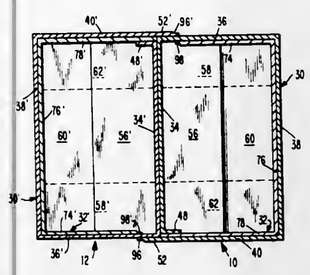
TWO CELL BULK CONTAINER

Vernard S. Booth, and Billy W. Oswalt, both of Albany, Ga., assignors to Olinkraft, Inc., West Monroe, La.

Filed June 10, 1976, Ser. No. 694,756

Int. Cl.² B65D *5/72, 5/48*

U.S. Cl. 229—15 **9 Claims**



1. A two cell bulk container body comprising
   - a pair of sleeves each formed from four serially joined sleeve wall panels and an inside joint flap on one end panel of said series of sleeve panels,
   - said one panels of the pair of sleeves being bonded together face to face to form opposite side seams between the sleeves,
   - a pair of liners formed from three serially joined liner wall panels bonded on the inside of the other wall panels of the respective sleeves,
   - each of said pair of sleeves including an integral outside joint flap on the other end panel of the series of four sleeve panels, and
   - said outside joint flaps extending over the opposite side seams between the pair of sleeves and being secured to the wall panels adjoining the one panels of the opposite sleeves.

4,046,308

PACKAGING

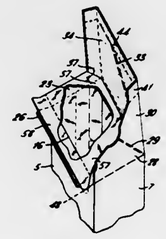
Stanley Milton Silver, London, England, assignor to Paxall, Inc., Chicago, Ill.

Filed Mar. 13, 1972, Ser. No. 234,105

Claims priority, application United Kingdom, Mar. 24, 1971, 7709/71; Apr. 21, 1971, 10351/71; Apr. 21, 1971, 10352/71; June 9, 1971, 19550/71

Int. Cl.² B65D *5/72, 5/02*

U.S. Cl. 229—17 R **10 Claims**



1. A generally tubular package formed from a blank with heat-sealable characteristics, which blank is formed from laminated material comprising a substratum and sheeting de-laminably adhered to said substratum by a heat-weakenable laminant, said sheeting having a stretchable thermoplastic surface,
   - said blank having parallel fold lines which define front and rear body walls and a pair of opposed body side walls and having end closure panel means hingedly connected to one end of each body wall,
   - said blank also having a flange panel hingedly connected to one said body wall at a lateral edge of said blank, said flange panel being connected to another part of said blank at the other lateral edge to form said blank into a tubular package,
   - said end closure panel means including a main closure panel hinged to said rear wall closing the opening at said one end of said tubular package, including flanking gusset panels hinged respectively to said main closure panel and to one of said body side walls and being outfolded to lie in the plane of said main closure panel, and including a flange closure panel hinged to said front wall,
   - tab means connected to the front edge of said main closure panel and lying in said plane of said main closure panel, and
   - corner panels disposed between said gusset panel means and said tab means,
   - said sheeting surface of said blank between each of said outfolded gusset panel means and said flange closure panel being stretched outward therebetween,
   - the sheeting surface of said outfolded gusset panel means being heat-sealed to itself, the sheeting surface of said tab means being heat-sealed to the sheeting surface of said flange closure panel, and said outward stretched sheeting surface being heat-sealed to the sheeting surface of said corner panels to totally seal the end of said closed tubular package, and
   - said main closure panel and its attached gusset panel means and tab means being delaminated from the respective sheeting surfaces thereof.

4. A blank with heat-sealable characteristics suitable for packaging, said blank being formed from laminated material comprising a substratum and sheeting de-laminably adhered to said substratum by a moisture-resistant heat-weakenable laminant, said sheeting surface having cohesive characteristics when heated; said blank having parallel fold lines defining at least two pairs of opposable body walls and having end closure panel means hingedly connected to one end of each body wall along a line perpendicular to said parallel fold lines, additional parallel fold lines at both lateral edge areas of the blank defining flange panels which are hingedly connected to said body wall portions of said blank, said blank being proportioned so that when it is folded into flattened tubular shape said flange panels can be disposed in surface-to-surface contact with each other at a substantial angle to the plane of said flattened tube to create a fin-type side seam by the application of heat and pressure, which side seam forms said blank into tubular configuration.

4,046,309

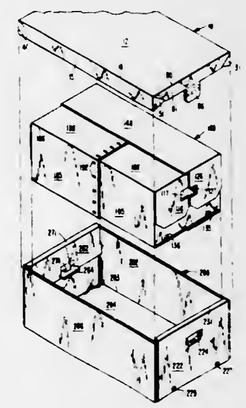
SHIPPING BOX

Lewis D. Poggiali, West Chester, Ohio, assignor to Olinkraft, Inc., West Monroe, La.

Filed July 8, 1976, Ser. No. 703,708

Int. Cl.² B65D *5/24, 5/22*

U.S. Cl. 229—23 R **7 Claims**



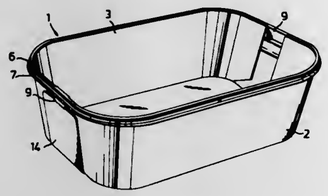
1. In a shipping box, the combination comprising
   - a generally rectangular inner container having a bottom panel, side and end panels integral with the bottom panel, and a top panel integral with the side panels,
   - said top panel including a pair of left and right parts folded toward each other and a pair of folded end portions integral with said pair of parts and overlying said end panels,
   - interlocking means between said end portions and said end panels to latch said inner container in a closed position,
   - said interlocking means including an opening in each pair of said portions and a folded section on each end panel extending through said opening adjacent thereto,
   - said bottom panel including a pair of panel elements folded toward each other and having edges which overlap each other,
   - a generally rectangular outer container having a bottom wall, spaced side walls integral with the bottom wall, and spaced end walls integral with the bottom wall,

each end wall including three sections disposed in juxtaposition to each other,
a handle opening in each of said three sections and in alignment with each other,
locking tab means on one of said three sections and extending through the openings of the other two sections to lock all three sections together as a unit,
said one section including a folded panel portion disposed contiguous another of said three sections,
a flap projecting from said panel portion and engaging said locking tab means to keep the same in a locked position,
a lid covering top portions of said inner and outer containers, and
a handle extension on each end of said lid extending into the handle opening of its adjacent end wall.

4,046,310
CONTAINER

Nils-Ake Gustafsson, Halmstad, Sweden, assignor to Sprinter Pack AB, Halmstad, Sweden

Filed June 14, 1976, Ser. No. 695,978
Claims priority, application Sweden, June 17, 1975, 7506938
Int. Cl.² B65D *5/56, 5/20*
U.S. Cl. 229—30 **5 Claims**



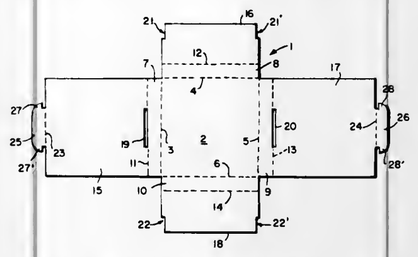
1. A nestable, stackable container comprising a generally conical-shaped tray (2) of a carton provided with a tray (3) of plastic film which is in contact with the interior of the carton tray (2), said plastic tray (3) being deep drawn into the carton tray (2) and extending over and around the upper edge (8) of the carton tray (2) and a short distance downwardly along the exterior of the carton tray (2), characterized in that each end wall (5) of the carton tray (2) comprises a centrally situated cut-away portion (4) at the upper edge (8) of said end walls (5), through which portions of material from said plastic tray (3) are pressed outwardly so as to extend beyond the exterior of the carton tray (2) and thereby form a stacking lip (9), said stacking lip (9) being adapted to engage the upper edge (8) of a like container (1) situated there-below when stacking a number of such containers (1) such that a space is provided between the bottom walls (11) of adjacent containers to thereby prevent the container from becoming wedged or jammed when nested into another container.

4,046,311
RETURN MAIL CONTAINER

Joseph Voyko, Lakewood, Ohio, assignor to Westvaco Corporation, New York, N.Y.

Filed July 16, 1976, Ser. No. 705,774
Int. Cl.² B65D *5/10*
U.S. Cl. 229—40 **1 Claim**

1. A tamperproof return mail container for packaging a generally flat object, formed from a one-piece blank of paperboard or the like comprising a centrally located quadrilateral main panel of substantially the same dimensions as the packaged object, a plurality of side wall panels foldably attached to the edges of said main panel, said side wall panels each having a width substantially equal to the width of its attached main panel edge and a length substantially equal to the height of the packaged object, a first pair of top closure flaps designated respectively a mailing address flap and a return address flap foldably attached to two opposed side wall panel, said first pair of top closure flaps each having a width substantially equal to the width of its attached side wall panel and a length substantially equal to the full size of the first dimension of the packaged object wherein said first pair of top closure flaps are adapted to alternately overlap one another to cover the packaged object, said first pair of top closure flaps each farther including at least one locking tab foldably attached along an outer free edge thereof and at least one tab receiving slot located substantially along the foldable connection between said top closure flap and side wall and opposite the locking tab attached to the outer free edge thereof, wherein said locking tabs have a nominal width substantially equal to the length of the attached foldable connection with integral locking ears projecting from each side thereof, and said tab receiving slots each have a length substantially equal to the nomimal width of said locking tabs and a width substantially equal to the thickness of the blank material from which the container is formed, and a second pair of top closure flaps foldably attached to the remaining opposed side wall panels, said second pair of top



closure flaps each having a width substantially equal to the width of its attached side wall panel and a length no greater than about one-half the size of a second dimension of the packaged object, said second pair of top closure flaps each including notched portions at each side thereof near their free ends for accomodating an unused locking tab, wherein the container is prepared for mailing when the return address flap is folded over the packaged object and second top closure flaps to place the unused locking tab thereon in the region provided by the notched portions at one side of said second top closure flaps, and the mailing address flap is folded over the return address flap and the locking tab attached thereto is inserted in the tab receiving slot of said return address flap so as to position the integral locking ears thereof beyond the ends of said tab receiving slot, and the container is prepared for return mail, after severing the locking tab from the mailing address flap to open the container, with a reverse folding sequence wherein the return address flap is folded over the mailing address flap and the locking tab attached thereto is locked in the tab receiving slot of said mailing address flap.

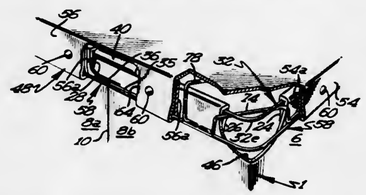
4,046,312
SECURITY TOTE BOX

Bradford J. Krizan, Plymouth, Minn., assignor to Liberty Carton Co., Minneapolis, Minn.

Filed Feb. 25, 1976, Ser. No. 661,346
Int. Cl.² B65D *45/00*
U.S. Cl. 229—45 R **5 Claims**

1. A tote box with a security lid comprising:
a container comprised of four upstanding sidewalls disposed in a generally rectangular configuration;
a bottom wall extending between the bottom edge portions of said sidewalls;
a rigid reinforcing rim extending around the top periphery of said container;
means holding said rim in engagement with top edge portions of said sidewalls;

at least one exposed, horizontal locking segment of said reinforcing rim;
a lid positioned on top of said sidewalls in covering relation to said container, said lid being formed from bendable material and having side panels depending downwardly over the top ends of said container sidewalls and folded upwardly on themselves to define pockets around the periphery of said lid within which a strengthening rim is contained;
a locking tongue on said lid strengthening rim in alignment with said locking segment of said reinforcing rim, said locking tongue projecting unwardly and being biased under said locking segment of said container rim in re-

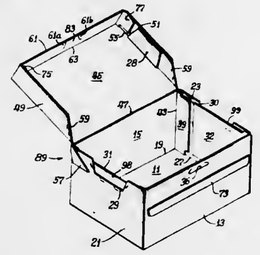


straining engagement therewith to secure said lid on top of said container sidewalls; and
means holding said lid in engagement with top portions of said container peripherally spaced apart from said container rim locking segment comprising two exposed corner segments of said container reinforcing rim, and corner retention bar members extending angularly across two corners of said lid strengthening rim, said retention bar members being positioned under said container reinforcing rim corner segments in restraining engagement therewith to biase said locking tongue when said locking tongue is in engagement with said locking segment of said container reinforcing rim.

4,046,313
ICE CREAM CARTON

George S. Perry, Nashua, N.H., assignor to Kraft, Inc., Glenview, Ill.

Filed Feb. 4, 1976, Ser. No. 655,231
Int. Cl.² B65D *5/48, 5/54*
U.S. Cl. 206—611 **10 Claims**

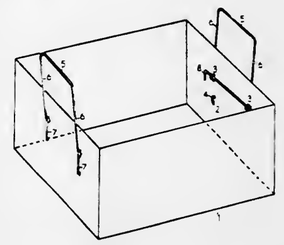


1. A carton for packaging ice cream or the like comprising connected front, bottom and rear body panels; a cover panel hinged to said rear body panel; a closure flap depending from the front edge of said cover panel, an end flap depending from both end edges of said cover panel; two inner end flaps extending toward one another but terminating in spaced apart relation, said inner end flaps being hinged to the end edges of said front and rear body panels; an outer end wall panel hinged at both ends of said bottom body panel; and a removable section generally defined by a severance line and located adjacent the upper edge of each said outer end wall panel, each cover end flap overlying and being adhesively joined to the adjacent removable section and each said removable section being readily yieldable to detachment along the severance line from the outer end wall panel and remaining affixed to the cover end flap when said carton is opened.

4,046,314
HANDLES FOR CARDBOARD OR CORRUGATED PAPER BOXES

William L. Hill, 1219 Seventh St., San Fernando, Calif. 91340

Filed Mar. 2, 1976, Ser. No. 663,114
Int. Cl.² B65D *5/46, 25/22*
U.S. Cl. 229—52 AW **2 Claims**



1. A pair of carrying handles for attachment to opposite sides of cardboard boxes and the like each of which comprises a first wire member having a generally U-shaped configuration with an essentially straight center section as a hand-contacting member and a pair of leg sections extending at approximately right angles from said center section for attachment to an associated box, said leg sections being of essentially identical configuration and each including a first straight section adjacent said center section, a small-radius U-shaped bend portion therealong at the oposite end of said first straight section, a second straight section continuing from the opposite side of said U-shaped bend portion at a slight angle with respect to said first straight section, and an offset portion just short of the end of said leg section terminating in an additional generally downwardly extending straight section at an angle with respect to said second straight section, said leg sections having sharp ends such that, under load, they tend to penetrate the inside surface of the box;
and second elongated members each of which comprises an essentially straight wire member of greater length than the length of the center section of said handle;
the ends of each of said leg sections and said U-shaped bend portions being insertable through the side of said box,
and said second elongated members being insertable through said U-shaped bend portions on the inside of said box to secure said handle to said box, said U-shaped bend portion extending essentially perpendicularly from said straight sections at a distance only slightly greater than the thickness of said associated box such that said second elongated member may be secured tightly between the inside surface of said bend portions and the inside surface of said associated box.

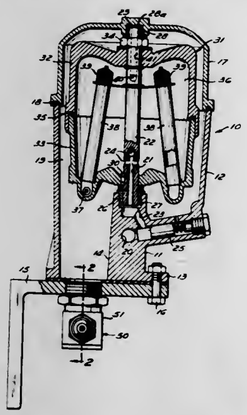
4,046,315
CENTRIFUGAL SEPARATOR WITH DISCHARGE PUMP

James C. Klingenberg, Painesville; Hiralal V. Patel, Euclid, and Philip W. Morse, Cleveland Heights, all of Ohio, assignors to The Weatherhead Company, Cleveland, Ohio

Filed Oct. 23, 1975, Ser. No. 625,128
Int. Cl.² B04B *9/06, 11/02*
U.S. Cl. 233—4 **6 Claims**

1. A centrifugal separator for separating contaminants from contaminated fluids and which may be mounted in a variety of positions relative to an engine block, comprising shroud means defining a first chamber, a vertically extending spindle within

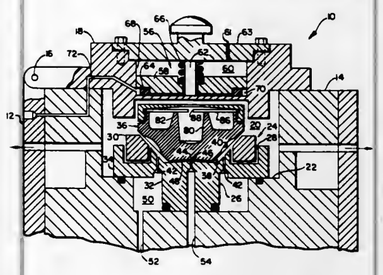
said shroud means and having a hollow rotor mounted thereon for axial rotation within said shroud means, said hollow rotor defining a second chamber for receiving contaminated fluids to be separated, fluid inlet means through said spindle for conducting such contaminated fluids to said second chamber, first pump means in fluid communication with said fluid inlet means to pump fluids to said fluid inlet means, means to rotate said rotor and thereby cause said contaminants in contaminated fluids within said chamber to migrate toward a sidewall of said second chamber under the influence of centrifugal force and to be separated from such contaminated fluids, said means to rotate said rotor comprising tangentially mounted outlet port means on said rotor to cause said rotor to rotate upon dis-



charge of fluid from said second chamber to said first chamber, second pump means comprising a jet pump having a pump chamber in fluid communication with said first chamber to prevent excess fluid buildup in said first chamber which would inhibit rotation of said rotor, a nozzle projecting into said pump chamber, an outlet from said pump chamber aligned with said nozzle, and a passageway communicating with said fluid inlet means, said passageway in turn being in fluid communication with said first pump means and with said nozzle, whereby a portion of said fluid will be delivered by said first pump means to said second chamber and a portion of said fluid will be delivered by said first pump means to said second pump means.

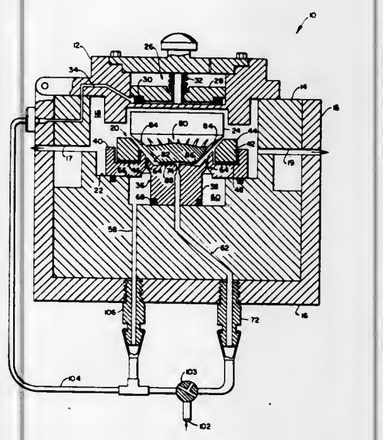
4,046,316
SNAP RING MAGNETIC STOPPING SYSTEM FOR AN AIR DRIVEN CENTRIFUGE
George Norton Hein, Jr., 331 Chesham Ave., San Carlos, Calif. 94070
Filed Apr. 29, 1976, Ser. No. 681,311
Int. Cl.² B04B 9/14
U.S. Cl. 233—23 R 5 Claims

1. An air driven centrifuge comprising:
a rotor;
air jet means for rotatably driving said rotor;
levitation air jet means for supporting said rotor on a cushion of air when said air jet means is not operating;
means mounted adjacent said rotor for producing a magnetic field; and
a ferrous metal element located within said rotor and acting cooperatively with said magnetic field producing means



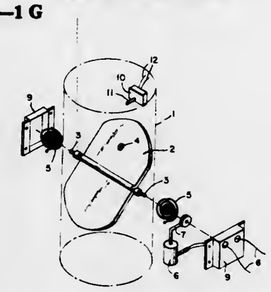
for completely stopping the rotation of said rotor subsequent to the operation of said driving means.

4,046,317
AIR LEVITATION DEVICE FOR AN AIR DRIVEN CENTRIFUGE
George Norton Hein, Jr., 331 Chesham Ave., San Carlos, Calif. 94070
Filed Apr. 29, 1976, Ser. No. 681,313
Int. Cl.² B04B 9/14
U.S. Cl. 233—23 R 11 Claims



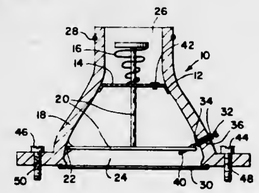
1. An air driven centrifuge comprising:
a rotor;
a rotor seat for receipt of the lower portion of said rotor;
driving air jet means for rotating said rotor on a cushion of air;
a central recessed portion in the bottom of said rotor;
a projecting central portion in the bottom of said rotor seat, said central recessed portion and said projecting central portion having similar shapes and dimensions, so that said central recessed portion of said bottom of said rotor and said projecting central portion of said bottom of said rotor seat cooperatively establish a specific confined flow path between said rotor and said rotor seat along said central recessed portion of said rotor; and
means located in said projecting central portion of said rotor seat acting in conjunction with said flow path for introducing a supply of supporting air into said flow path with sufficient velocity, so that the air pressure within said flow path is below atmospheric pressure to hold said rotor within said rotor seat and allow said rotor to decelerate to a stable stop when said driving air jet means is not rotating said rotor.

4,046,318
AUTOMATIC BOILER DAMPER
Mervyn Ripley, 24 Canton Court, Brooklyn, N.Y. 11229
Filed Feb. 18, 1976, Ser. No. 659,112
Int. Cl.² G05D 23/00
U.S. Cl. 236—1 G 1 Claim



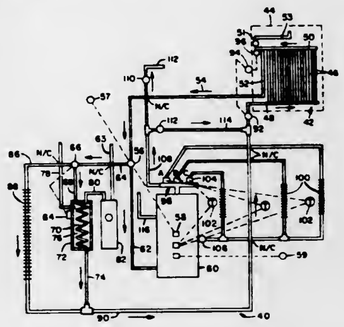
1. The combination of a heating system, a stack venting said heating system, a vane-type damper pivotably secured to said stack about an axle passing through the surfaces of said stack, the improvement comprising an automatic boiler damper having an electrically operated solenoid coil adapted to manipulate said vane into an open position, venting means adapted to permit a small amount of stack gases to emerge through said vane when said vane is in a closed position, temperature sensing means, said temperature sensing means including a temperature sensing element adapted to sense the temperature of said small amount of stack gases, said temperature sensing means adapted to supply energizing power to said solenoid coil upon reaching a pre-determined temperature level thereabout, said temperature sensing means including a pair of normally open contacts, said pair of normally open contacts being disposed in electrical touching engagement to each other when the temperature of said temperature sensing element reaches a preset temperature level, said pair of normally open contacts in a series electrical circuit with said solenoid coil, said series electrical circuit provided with operating power derived from said heating system when said heating system is electrically operated to produce heat.

4,046,319
ADJUSTABLE AUTO THERMOSTAT
David C. Myers, West Nyack, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Nov. 20, 1975, Ser. No. 633,662
Int. Cl.² F01P 7/02
U.S. Cl. 236—34.5 3 Claims



1. A thermostat with external adjusting means for varying the temperature sensitivity thereof comprising housing means, influent means and effluent means in said housing means for directing the flow of a fluid into and out of said housing means, valve means in said housing means for controlling the flow of fluid through said housing means, temperature response means operatively connected to said valve means for controlling the opening and closing of said valve means in response to a change of temperature of a fluid in said thermostat, said temperature response means comprising means that expand in response to an increase in temperature and contracts in response to a decrease in temperature, said temperature response means being arranged to bias said valve means into valve seat means mounted in said housing when fluid in said housing drops in temperature and to bias said valve means out of said valve seat means in response to an increase in temperature of fluid in said housing, adjusting means for said temperature response means to increase or decrease the sensitivity thereof to a change of temperature of a fluid in said thermostat, said adjusting means comprising shaft means passing through said housing, said shaft means operatively connected to said temperature response means, whereby adjustment of said adjusting means may be made externally of said housing, said shaft means engaging support means for supporting said temperature response means and which is adjustable through said shaft means for moving said temperature response means towards and away from said valve means, said support means comprising lever means and a first shaft member angled to intersect said lever means, secured to said lever means with said shaft member supporting said valve member and temperature response means, one end of said lever means being pivotally secured to the side of said housing, the other end of said lever means receiving said shaft means at an angle sufficient to move said lever means towards and away from said valve means when said shaft is moved in and out of said housing.

4,046,320
FIREPLACE BOILER HEATING SYSTEM FOR HOT WATER TYPE FURNACES
William A. Johnson, 12406 Taylorsville Road, Louisville, Ky. 40299, and Roy O. Johnson, 12015 Donohue Ave., Louisville, Ky. 40243
Continuation-in-part of Ser. No. 573,897, May 2, 1975, abandoned. This application May 21, 1976, Ser. No. 688,619
Int. Cl.² F24D 3/02; F24B 9/04
U.S. Cl. 237—8 C 8 Claims



1. A system for heating homes and other buildings comprising a fireplace water boiler,
a furnace having a water boiler,
means for conveying relatively hot water from said fireplace boiler to said furnace boiler,
radiating means for dissipated heat from water introduced therein,
valve means for diverting said relatively hot water from said furnace boiler to said radiating means when the temperature of the water in said furnace boiler is at least equal to a first preselected value,
cold water return means for conveying relatively cold water from said radiating means to said fireplace boiler, and
a water pump connected between said cold water return means and said fireplace water boiler adapted to forceably circulate water through said system when the temperature

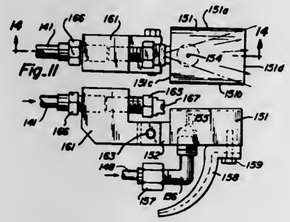
of the water in said fireplace boiler is at least equal to a second preselected value.

4,046,321

HIGH PRESSURE SPRAY CLEANING HEAD

Charley L. Hewett, Northglenn, Colo., assignor to Kem-O-Kleen, Inc., Englewood, Colo.

Division of Ser. No. 564,858, April 3, 1975, Pat. No. 3,997,114.
This application July 26, 1976, Ser. No. 708,721
Int. Cl.² B05B 7/08
U.S. Cl. 239—420 6 Claims



1. A spray head operated by a fluid under pressure for spray cleaning a surface comprising:

a distributor body of a cleaning chemical corrosion-resistant material having a top surface and a front surface substantially normal to said top surface, said front surface and top surface meeting at a deflecting edge and having a discharge aperture in said top surface through which a jet of a cleaning chemical fluid is delivered under pressure; and

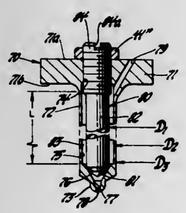
spray nozzle means adjacent the distributor body having an inlet adapted to receive a supply of heated carrier fluid under pressure, said spray nozzle means having a tip located at the rear of and above the top surface of said distributor body and said discharge aperture for producing a substantially horizontal, generally planar, fan-like pattern of heated carrier fluid and directing said spray pattern at a slight angle to said top surface toward and against said deflecting edge whereby the jet of chemical cleaning fluid is emitted into the spray of heated carrier fluid prior to striking said deflecting edge and whereby the cleaning chemical fluid and heated carrier fluid are intimately mixed and the mixture is deflected from said edge as a mixed spray in a concentrated form that is directed toward a surface to be cleaned.

4,046,322

FUEL INJECTION NOZZLE ASSEMBLY WITH STRETCH ELEMENT

Richard S. Knape, Grand Rapids, and Robert D. Straub, Westland, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 21, 1976, Ser. No. 688,695
Int. Cl.² B05B 1/30; F02M 61/16
U.S. Cl. 239—533.7 3 Claims



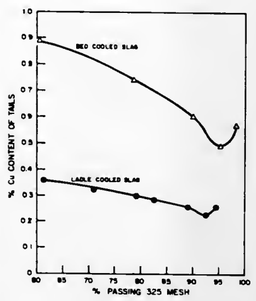
1. In an injector nozzle assembly, a nozzle body having a spray tip at one end thereof, the nozzle body having a stepped bore extending from the opposite end of the nozzle body from said spray tip to communicate with the spray tip and providing at the spray tip an annular valve seat concentric with said stepped bore, a valve having a valve head and a stem extending therefrom said valve being positioned to extend through said stepped bore in said nozzle body with said valve head normally positioned in loaded abutment against said valve seat, the end of said stem opposite said valve head being connected to said opposite end of said nozzle body to prevent axial movement of said end of said stem in at least one direction relative to said nozzle body, said valve stem forming with an inner annular wall in said nozzle body as provided by said stepped bore an annular fuel chamber in communication at one end with said valve seat as controlled by said valve head of said valve, said nozzle body further including a fuel inlet passage means connected at one end to said annular fuel chamber and connectable at its other end to a source of pressurized fuel, said nozzle body including an annular body portion next adjacent said spray tip encircling said valve stem to provide therewith at least part of said annular fuel chamber, said body portion being of a predetermined inside diameter and outside diameter providing a thin wall of reduced cross sectional area compared to the remaining portions of the nozzle body and of a predetermined longitudinal length whereby, when fuel at a predetermined pressure is in said annular fuel chamber, said body portion is stretched to effect unseating of said valve seat from said valve head and, when the pressure of fuel in said annular fuel chamber decreases, said body portion contracts so that said valve head is again seated against said valve seat.

4,046,323

PROCESS FOR CONTROLLED SLOW COOLING OF NON-FERROUS SMELTING SLAGS

George C. McKerrow, Toronto; Albert Pelletier, and Christopher J. Newman, both of Noranda, all of Canada, assignors to Noranda Mines Limited, Toronto, Canada

Filed May 12, 1976, Ser. No. 685,907
Claims priority, application Canada, Feb. 9, 1976, 245274
Int. Cl.² B02C 23/10; C03B 17/00
U.S. Cl. 241—23 13 Claims



1. Process for controlled slow cooling of copper smelting slags for promoting growth or coagulation of copper particles in the slag and so enhance the recovery of copper contained therein by subsequent crushing, milling and flotation operations, comprising the steps of:

a. pouring the molten slag into a ladle having a capacity of greater than about 10 tons

b. allowing the slag to cool slowly and solidify in the ladle at least to a point where the temperature at its center is below about 1800° F and a shell is formed which is strong enough to withstand dumping from the ladle;

c. dumping the slag from the ladle as a single piece;

d. allowing the dumped slag to cool until its center is substantially solidified;

e. breaking the dumped slag into small pieces to enhance further cooling of the slag;

f. crushing the small pieces of slag to approximately 0.25 inch;

g. feeding the crushed slag to a grinding mill; and

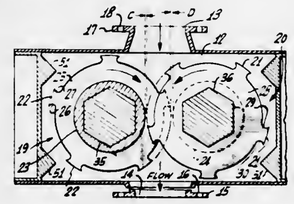
h. feeding the ground slag to a flotation circuit to recover copper.

4,046,324

SOLID WASTE COMMINUTOR

Joseph W. Chambers, P. O. Box 2449, Huntington Beach, Calif. 92647

Continuation-in-part of Ser. No. 372,818, June 22, 1973. This application Feb. 4, 1976, Ser. No. 655,094
Int. Cl.² B02C 13/06, 23/36
U.S. Cl. 241—46.06 10 Claims



1. Apparatus for comminuting solid waste material comprising:

a casing defining therein a comminution chamber with inlet and outlet ports thereto disposed on opposing sides of said comminution chamber and adapted for connection in a solid waste disposal line;

a comminutor assembly including cooperating substantially parallel first and second shredding stacks located in said comminution chamber and respectively having a plurality of first concentric laminar cutting elements mounted on a first shaft is interspaced relationship with a plurality of second laminar cutting elements mounted concentrically on a second shaft, each cutting element having teeth shaped for cutting in both of two opposite directions of rotation, and wherein the cutting elements of each stack are positioned between and separated in an axial direction by laminar spacers which are coplanar with the elements of the other stack whereby a cutting element from one shredder and a spacer from the other shredder form a pair of interactive shredding members, wherein the teeth of said cutting elements differ in their maximum radial dimensions, whereby the minimum clearance between the teeth of a cutting element and the opposing spacer within a pair of interactive shredding members differs as between different ones of said teeth, and wherein said first and second stacks are compressed between first and second distally opposed bearing plates which receive said first and second shafts, said bearing plates being secured to said casing in compression against said stacks;

means for securing said first and second bearing plates to said casing;

gearing means disposed on adjacent ends of said first and second shafts for coupling the rotations thereof in common, to thereby effect counter-rotation of said shafts; and

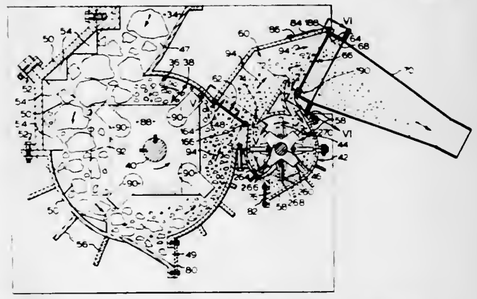
drive means comprised of a power source and a system of meshed gears arranged as a speed reducing system and adapted for connection to an end of said first shaft for driving said first shaft in rotation.

4,046,325

APPARATUS FOR CRUSHING ROCK, STONE AND LIKE MATERIAL

Steve Tucsok, 104-43 Suncrest Dr., Delta, British Columbia, and Elemer Fogarassy, 6519 Markay Avenue, South Burnaby, British Columbia, both of Canada

Continuation of Ser. No. 594,378, July 9, 1975, abandoned. This application June 1, 1976, Ser. No. 691,642
Int. Cl.² B02C 13/09
U.S. Cl. 241—73 17 Claims



1. Apparatus for crushing rock, stone and like material, the apparatus being operable selectively in a mode for crushing dry material or in a mode for crushing wet material, and the apparatus comprising:

a casing defining:

a. a primary crushing chamber having an inlet to receive material to be crushed, and first and second outlets, said first outlet being adapted to receive first screening means for controlling the size of material delivered through said first outlet when the apparatus is operating in said dry mode, and said first outlet being adapted to be closed when the apparatus is operating in said wet mode, said second outlet opening to the exterior of the casing and being adapted to be closed when the apparatus is operating in said dry mode;

b. a secondary crushing chamber having an inlet and first and second outlets, said second outlet opening to the exterior of the casing and being adapted to be closed when the apparatus is operating in said dry mode; and,

c. a passageway disposed above said secondary crushing chamber, said passageway communicating with said first outlet of said primary crushing chamber and with said inlet and first outlet of said secondary crushing chamber, said passageway defining an opening to the exterior of the casing and being adapted to receive, adjacent said opening, second screening means for controlling the size of material delivered outwardly through said opening when the apparatus is operating in said dry mode;

a rotary impactor mounted for rotation in said primary crushing chamber;

means for adjusting the position of said impactor in said primary crushing chamber between a first position in said dry mode of operation of the apparatus and a second position in said wet mode of operation of the apparatus; and,

a rotary hammer mill mounted for rotation in said secondary crushing chamber.

4,046,326

SHELL LINER ASSEMBLY

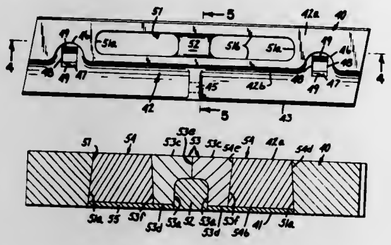
Darrell R. Larsen, Salt Lake City, Utah, assignor to Minneapolis Electric Steel Castings Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 629,503, Nov. 6, 1975, Pat. No. 4,018,393. This application July 19, 1976, Ser. No. 706,739
Int. Cl.² B02C 17/22
U.S. Cl. 241—182 24 Claims

1. A removeable liner assembly for the shell of an ore grind-

ing machine, the assembly including a plurality of liner segments each of which comprises:

a. a segment body of predetermined size and configuration, the segment body being formed from a first material and defining a mounting surface and a grinding surface;
b. means for connecting the segment body to the shell of the ore grinding machine;



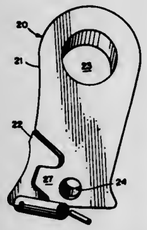
c. an opening formed entirely through the segment body and disposed wholly within the segment body, the opening defined by a wall surface that converges from the mounting surface to the grinding surface;
d. and insert means formed from a second material and conforming generally to the shape and size of the opening, the insert means being disposed in the opening in wedging relation for retaining engagement thereby.

4,046,327

RELEASABLE LOCK

Dennis A. Cramer, Milwaukie, Oreg., assignor to ESCO Corporation, Portland, Oreg.

Filed Mar. 19, 1976, Ser. No. 668,478
Int. Cl.² B02C 13/28
U.S. Cl. 241—197 4 Claims



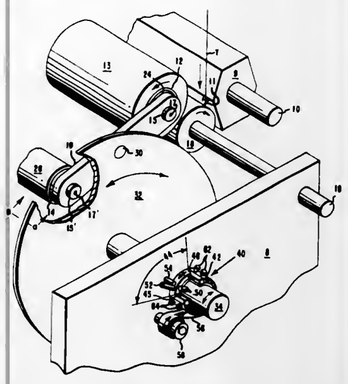
1. A releasable lock for securing together two parts of a wearable device comprising first and second parts, aligned through passages in said parts for receiving a locking pin, a pin in said passages maintaining said parts in coupled relation, one of said parts being equipped with an exterior surface, a bore in said one part communicating with said exterior surface and extending inwardly therefrom transversely to and communicating with the passage in said one part, said pin having a transverse bore alignable with said one part bore when said pin is maintaining said parts in coupled relation, and a ductile, elongated rivet mounted in said bores having inner and outer ends, the inner end of said rivet being the end first introduced into said bores, one of said pin and said one part being equipped with a counter bore receiving said rivet inner end and adapted to accommodate deformation of said rivet inner end resulting from force applied to said outer end, said rivet being more ductile than said pin whereby an axial force applied to said pin preferentially shears said rivet, said rivet prior to deformation having a length greater than the sum of the lengths of said bores whereby said rivet outer end, prior to inner end deformation, protrudes outwardly of said exterior surface.

4,046,328

APPARATUS TO ASSIST DOFFING PACKAGES IN A YARN WINDUP

Nathan Cloud, Wilmington, Del., and James Edwin Smith, Waynesboro, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 10, 1976, Ser. No. 684,932
Int. Cl.² B65H 67/04
U.S. Cl. 242—18 A 1 Claim



1. In a yarn winding apparatus that includes a frame, a pair of windup chucks cantilevered from opposite ends of an arm attached to a plate rotatably supported from the frame by a shaft, a drive roll positioned to contact yarn on one package support on one of the chucks in a winding position while the other chuck carrying another support is in a doffing position, said arm being attached to said plate in a fixed relationship during winding and being pivotally attached to said plate for relative rotary movement thereto during doffing, the improvement comprising: a collar rotatable on said shaft, said collar having a portion of its periphery cut out to provide an open section over part of its circumference, said open section being defined by two radial faces, a pin extending radially outward from said shaft into said open section; a constant force extension spring connected at one end to the periphery of said collar and at its other end to said frame, said spring leading partially around the periphery of said collar to said frame for applying a constant torque in one direction to said collar whereby said pin engages one of said two radial faces and means located near said one of said two radial faces to limit rotation of said collar with respect to said frame in said one direction whereby said shaft is free from the influence of said spring to rotate in said one direction until said pin contacts the other of said two radial faces.

4,046,329

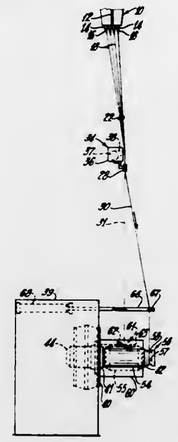
METHOD AND APPARATUS FOR PACKAGING LINEAR MATERIAL

Arnold J. Eisenberg, and Jerome P. Klink, both of Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed June 26, 1975, Ser. No. 590,741
Int. Cl.² B65H 54/02
U.S. Cl. 242—18 G 14 Claims

1. The method of collecting linear material on wound packages including the steps of:

a. supplying linear material;
b. rotating a first collet having a package collection region and a temporary collection region;
c. winding the linear material on the collection region of the first collet;
d. rotating a second collet having a package collection region and a temporary collection region, the second collet including in the temporary collection region a fixed member and a circumferential groove having a generally frusto-conical guide surface adapted to guide the linear material to the fixed member for engagement thereon during transfer of the material from the first to the second collet;
e. laterally moving the advancing material along the first collet from the package collection region to the temporary collection region;



f. contacting the linear material advancing to the first collet with the second rotating collet in the circumferential groove of the temporary collection region such that the material is guided by the guide surface into engagement with the member so that the linear material is moved with the member to thereby begin collection of the material in the temporary collection region of the second collet and
g. laterally moving the material along the second collet from the temporary collection region to the collection region to begin package formation.

4,046,330

STRAND COLLECTING APPARATUS AND METHOD

Dale R. Mueller, Toledo, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sept. 20, 1976, Ser. No. 724,826
Int. Cl.² B65H 54/00, 54/38
U.S. Cl. 242—18 G 9 Claims

1. Apparatus for collecting a strand on a rotating collet comprising:

a strand traverse for traversing a strand linearly of the axis of rotation of said collet;
means for oscillating said strand traverse linearly of said axis;
strand guide means for guiding said strand into engagement with said strand traverse;
means for oscillating said strand guide means linearly of said axis;
means for sensing the oscillation of said strand traverse and said strand guide means; and,
means for altering the rate of oscillation of said strand traverse or said strand guide means responsive to said sensing means to maintain the oscillation of said strand traverse in phase with the oscillation of said strand guide means.

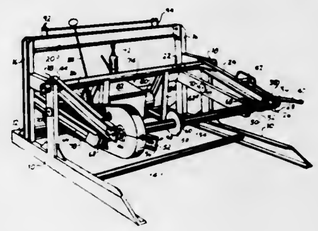


4,046,331

WIRE ROLLER

William Springall Decker, Sr., P.O. Box 671, Stanton, Tex. 79782

Filed Oct. 27, 1976, Ser. No. 736,128
Int. Cl.² B65H 54/00
U.S. Cl. 242—54 R 10 Claims

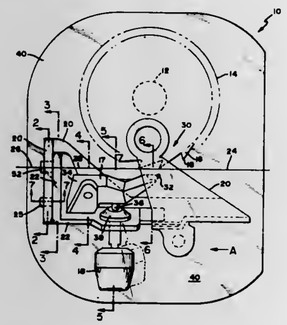


1. A wire roller comprising:

a. a frame,
b. a horizontal beam on the frame,
c. a main axle horizontally mounted on the frame parallel to and forward of the beam,
d. a spindle arm journaled on one end of the main axle with a distal end forward thereof,
e. a power arm journaled on the other end of the main axle with a distal end forward thereof,
f. a spindle mounted for rotational and axial movement parallel to the axle on the distal end of the spindle arm,
g. spool lug means mounted on the distal end of the power arm for drivingly engaging a spool,
h. a hollow spool shaft extending from said spindle to said spool lug means so that a spool may be mounted thereon,
j. driving means mounted on main axle and connected to said power arm for rotating said spool lug means,
k. a U-shaped lift bracket journaled to the frame by
m. trunnions below the main axle,
n. said U-shaped bracket having
i. a bight under the beam and
i. lift arms under the spindle arm and power arms and

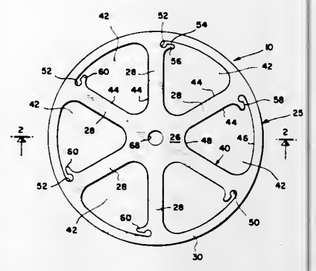
o. a jack between the bight and beam.

4,046,332
SUPPORT FOR SAFETY BELT RETRACTOR INERTIA MECHANISM
Walter Morris Wheeler, Fraser, and Klaus Frederick Ocker, Mount Clemens, both of Mich., assignors to Allied Chemical Corporation, Morris Township, N.J.
Filed May 2, 1975, Ser. No. 574,230
Int. Cl.[2] A62B *35/00;* B65H *75/48*
U.S. Cl. 242—107.4 A 4 Claims



1. In a safety belt retractor having a reel for winding a safety belt thereon, biasing means for biasing the reel in a belt retraction direction, means to lock the reel and thereby restrain an occupant of a vehicle during dangerous situations, said means to lock the reel including a ratchet wheel disposed in a plane and connected to said reel for rotation therewith, said ratchet wheel having ratchet teeth, each of said ratchet teeth having an engagement edge, said ratchet wheel having a ratchet tooth engagement position in which a ratchet tooth is positioned for engagement, a vehicle sensitive inertia mechanism, a support means mounted on said retractor for supporting the inertia mechanism, and an actuating means responsive to said inertia mechanism for engaging said rathcet tooth in said ratchet tooth engagement position to lock the reel; the improvement wherein said support means comprises:
a first member mounted on said retractor;
a second member mounted on said first member, means for adjustably, pivotally mounted said second member during assembly with reference to said first member by pivoting said second member in one plane with reference to said first member, said inertia mechanism and said actuating means being supported on said second member and pivotally movable therewith; and
a fastening means on said first member and on said second member for pre-aetting said second member during assembly with reference to said first member after pivoting movement of said second member with reference to said first member, whereby said second member supports said inertia mechanism in a desired position when the retractor is tilted for installation in a vehicle; and wherein:
said actuating means has a locking end for engagement with said ratchet teeth of said ratchet wheel, said locking end disposed adjacent to said ratchet teeth of said ratchet wheel prior to engagement thereof, said locking end being pivotally movable with respect to said first member, said locking end of said actuating means having motion in a plane approximately perpendicular to said ratchet wheel plane, said locking end having motion in a circumferential arc, said locking end during said pivoting movement remaining at approximately the same distance from said engaging edge of said ratchet tooth which is in said ratchet tooth engagement position for uniform sensitivity.

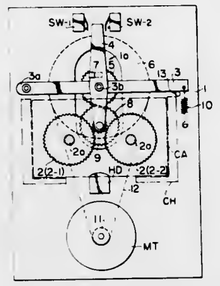
4,046,333
YARN MINDER AND ORGANIZER
Walter Kirk, 18 Saucier St., Acushnet, Mass. 02743
Filed July 8, 1976, Ser. No. 703,694
Int. Cl.[2] B65H *49/18*
U.S. Cl. 242—137.1 4 Claims



1. A holder adapted to be used in conjunction with skeins in a container, comprising:
a. cover means adapted to extend across one end of the container;
b. coupling means operatively connected to said cover means to retain said cover means in a relatively fixed position with respect to the container;
c. access means including a plurality of spaced apart openings extending through said cover means to permit the user to view the skeins positioned in the container;
d. guide means operatively associated with each of said access means to permit the user to withdraw yarn from each skein independently;
e. said cover means includes:
1. a hub portion centrally located on said cover means;
2. a plurality of integrally formed sprockets extending outwardly from said hub portion; and
3. a rim portion integrally formed with said sprockets, said spacing between said respective sprockets defining said access means in the form of said openings to view the skeins positioned in the container;
f. said coupling means includes a circumferentially downwardly extending lip portion adapted to extend in telescoping relationship to the open end of the container, and
g. said guide means includes:
1. a plurality of apertures, each aperture associated with a respective sprocket; and
2. a passageway communicating between each said aperture and said opening of said access means to permit yarn to be substantially retained within said aperture and removed through said passageway by the user.

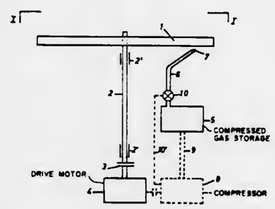
4,046,334
AUTOMATIC REVERSAL MECHANISM
Saburo Kato, and Takeshi Takemoto, both of Yokohama, Japan, assignors to Ricoh Co., Ltd., Japan
Filed Nov. 3, 1975, Ser. No. 628,118
Claims priority, application Japan, Nov. 6, 1974, 49-127664
Int. Cl.[2] G03B *1/04;* B65H *17/02*
U.S. Cl. 242—201 8 Claims

1. An automatic reversal mechanism comprising, in combination,
a. a pair of rotatable driven members disposed in a common plane with their axes parallel to each other each;
b. a rotatable drive member movable between said driven members and in a direction perpendicular to a line connecting their axes, to peripherally engage either driven member to transmit a driving force thereto;
c. reversible drive means connected to said drive member to rotate said drive member in a selected direction;
d. means operable, in accordance with the direction of rotation of said drive member, to move said drive member into peripheral driving engagement with a respective one of said driven member;
e. means biasing said drive member toward said connecting line; said driving member responsive to the reaction force exerted thereon by the then-engaged driven member, moving away from said connecting line against the force of said biasing means until such reaction force biases the force of said biasing means; said drive member, responsive



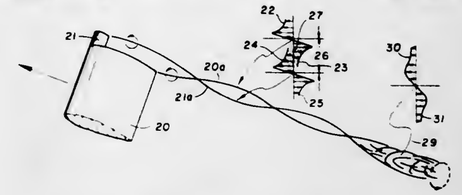
to an increase in such reaction force beyond a predetermined value, due to an increased load on the then-engaged driven member, being displaced further from said connection line;
f. switching means operative, responsive to such further displacement of said drive member, controlling said drive means to interrupt rotation of said drive member in its then effective direction of rotation.

4,046,335
HELICOPTERS SAFETY DRIVE
Helmut Osberger, A 3491 Strass bei Krems, Niederosterreich, Austria
Filed June 26, 1975, Ser. No. 590,531
Int. Cl.[2] B64C *27/18*
U.S. Cl. 244—17.19 2 Claims



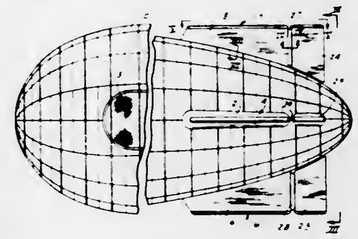
1. A helicopter comprising:
at least one rotor;
clutch means operatively declutchably coupled to said rotor for operatively disengaging with said rotor in an emergency;
main motor means for directly driving said rotor via said clutch means;
a storage of compressed gas adapted to contain a supply of compressed gas;
at least one emergency drive means for directly rotating said rotor and for starting and being operated in event of emergency by means of said compressed gas from said storage of compressed gas;
said emergency drive means comprising nozzles and supply ducts connected to said storage of compressed gas, said nozzles being directed from below the rotor angularly upwardly and radially outwardly toward the rotor so that said compressed gas is discharged from said nozzles to set the rotor into rotation when said emergency drive means is operated; and
said clutch means for disengaging said main motor means from said rotor in said emergency.

4,046,336
VORTEX DIFFUSION AND DISSIPATION
James L. Tangler, Fort Worth, Tex., assignor to Textron, Inc., Providence, R.I.
Continuation-in-part of Ser. No. 577,024, May 13, 1975, abandoned. This application June 23, 1975, Ser. No. 589,053
Int. Cl.[2] B64C *3/26*
U.S. Cl. 244—198 12 Claims



12. An aircraft lifting structure which comprises:
a main blade structure adapted to be secured in lifting relation to an airframe at the root thereof and having a vortex forming tip, and
a single sub-wing structure rigidly fixed from said tip with the absolute angle of attack of the sub-wing structure equal to the absolute angle of attack of the main blade with a discrete streamwise junction with the tip of said blade structure for dividing said vortex into two vortices of about same strength separated spanwise by a distance greater than about one-quarter of the blade chord but not greater than about one-half of the blade chord in the tip region.

4,046,337
HINGED CONTROL SURFACES FOR PRESSURIZED HOT AIR AIRSHIP
Roger R. Parsons, Sioux Falls, S. Dak., assignor to Raven Industries, Inc., Sioux Falls, S. Dak.
Filed Jan. 23, 1976, Ser. No. 651,911
Int. Cl.[2] B64B *1/02*
U.S. Cl. 244—96 5 Claims



1. A collapsible storable hot air airship comprising in combination;
a horizontally extending elongate aerodynamic shaped hot air envelope for forming an airship;
pressure hot air generating means carried on the envelope for pressurizing the envelope with heated air during flight;
a collapsible storable inflatable hollow first tail member at the aft end of the airship extending radially therefrom for stabilizing the flight of the airship and being in hot air communication with the interior of the hot air envelope to be inflated by the hot air within the envelope;
a collapsible storable hollow inflatable second tail member positioned at the aft end of the first tail member;
flexible hot air communication conduit having spaced paral-

lel walls extending between said first tail member and said second tail member for inflating the second tail member from the hot air of the first tail member;
and pilot operated control means for changing the position of said second tail member relative to the envelope and the first tail member for controlling the direction and elevation of flight of the hot air envelope.

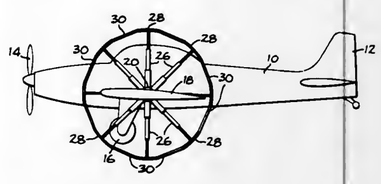
4,046,338
AIRFOIL FOR AIRCRAFT HAVING IMPROVED LIFT GENERATING DEVICE
Richard L. Kline, 10 Wright Place, Scarsdale, N.Y. 10583, and Floyd F. Fogleman, 14 Drumlin Drive, Morris Plains, N.J. 07950
Filed Oct. 14, 1975, Ser. No. 622,097
Int. Cl.² B64C 3/38
U.S. Cl. 244—213 7 Claims



1. An airfoil comprising:
a. a first surface extending between the leading edge and the trailing edge of said airfoil;
b. a second surface joined to said first surface along said leading edge and projecting rearwardly in the direction of said trailing edge, said first and second surfaces being in diverging relation to each other;
c. said second surface terminating materially in advance of said trailing edge to define a step-like discontinuity representing a riser portion of said airfoil, said riser portion projecting in the direction of said first surface and terminating in advance thereof; and
d. a third surface connecting the terminal end of said riser portion to the trailing edge of said airfoil;
e. lift generating means pivotably mounted on the terminal end portion of said second surface and projecting rearwardly of said step-like discontinuity, said means comprising a member disposed for movement between a first position in which the outer surface of said member forms a smooth continuation of said second surface and a second position in which said outer surface projects outwardly of said airfoil in the direction away from said third surface; and
f. said lift generating means being spaced from said third surface to define an open zone of said airfoil bounded by the inner surface of said member, said riser portion and said third surface; said zone being open in all positions of said member.

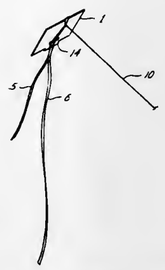
4,046,339
LANDING GEAR FOR AN AIRCRAFT INCLUDING EXPANSIBLE WHEELS
Floyd S. Stancliffe, 5584 Sunny Oaks, San Jose, Calif. 95123
Filed May 5, 1976, Ser. No. 683,270
Int. Cl.² B64C 25/36
U.S. Cl. 244—103 R 3 Claims

1. Aircraft landing gear for an aircraft having a fuselage and attached wing which comprises
a pair of wheels mounted for rotation on opposite sides of the aircraft fuselage,
each of said wheels being expansible from a relatively small diameter to an expanded diameter whereat the lower most peripheral edge of each wheel is below the aircraft in its normal landing disposition,
each of said wheels including a plurality of telescopic spokes,
each spoke mounting a curved rim section at its outermost



extremity and including a resilient strap joining the extremities of adjacent rim sections.

4,046,340
BOX TOP KITE, AND METHOD OF MAKING SAME
John W. Jordan, 208 Wellington, Houston, Tex. 77076
Filed Feb. 7, 1977, Ser. No. 766,768
Int. Cl.² B64C 31/06
U.S. Cl. 244—153 R 5 Claims



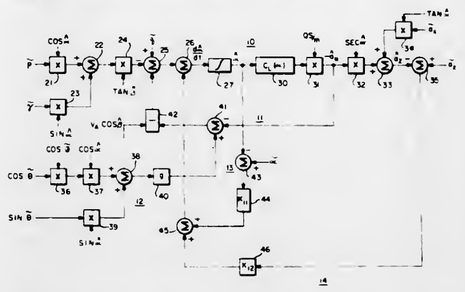
1. In a kite, a substantially rectangular member of light rigid material, flagging mounted on said member midway of the ends thereof so that said flagging wraps around the upper and lower surfaces of said member, said flagging being secured adjacent the peripheral margins on one of said surfaces, and adjacent one peripheral margin of the other surface of said surfaces, and a string attached to said flagging adjacent the peripheral margin opposite said one peripheral margin of said other surface.

5. The method of making kites comprising removing the top from a substantially rectangular plastic foam container, forming a tail and a pig tail of unequal lengths by folding over about one sixth of a length of Engineer's flagging at one end and securing said flagging to said top at points adjacent the peripheral edges of one surface of said top wrapping the flagging around the top midway of the edges of said top and securing said flagging on the opposite surface of the top adjacent the edge from which the tails depend, leaving a slack in the flagging and fastening one end of the thread of a spool of thread to the slack portion of the flagging.

4,046,341
AIRCRAFT ANGLE-OF-ATTACK AND SIDESLIP ESTIMATOR
Richard Paul Quinlivan, Binghamton, N.Y., assignor to General Electric Company, Binghamton, N.Y.
Filed Mar. 30, 1976, Ser. No. 672,028
Int. Cl.² G05D 1/08
U.S. Cl. 244—181 3 Claims

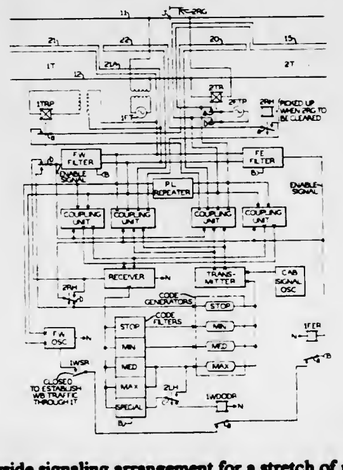
1. In an estimator network for estimating aircraft parameters, such as angle of attack or sideslip angle from measured aircraft parameters such as pitch, roll, speed, acceleration and gravity forces,
a. a network including:
1. means for producing in response to measured aircraft

angular pitch and roll measurements a signal proportional to the rate of change of the aircraft parameter to be estimated,
2. means for integrating the rate of change signal to produce a signal proportional to the estimated parameter, and



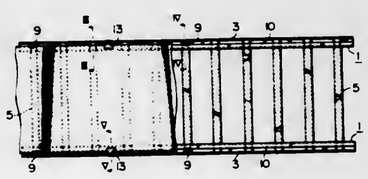
3. means simulating aircraft dynamic response to linear velocities, acceleration and angular body rates along given aircraft axes including a Kalman filter configuration responsive to said integrated rate of change signals from said means for integrating to produce a signal representative of the aircraft dynamic response so as to produce an estimated acceleration signal with respect to given aircraft axes.

4,046,342
WAYSIDE SIGNALING SYSTEM FOR RAILROAD CAB SIGNALS AND SPEED CONTROL
Kenneth J. Buzzard, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.
Filed Aug. 31, 1976, Ser. No. 719,337
Int. Cl.² B61L 21/06, 21/08
U.S. Cl. 246—34 R 9 Claims



1. A wayside signaling arrangement for a stretch of railroad track for controlling train carried cab signal apparatus on trains traversing the stretch in either direction, said stretch divided into a plurality of sections between station locations, comprising in combination,
a. a plurality of wire loops laid between the rails of each section and positioned in a predetermined pattern to inductively couple with said train carried apparatus to transmit cab signal commands thereto,
b. a cab signal command transmitter means at each junction location between adjoining sections selectively coupled to the wire loops in an adjoining approach section, in accordance with the established traffic direction, for transmitting cab signal commands selected in accordance with advance traffic conditions,
c. a receiver means at each junction location, selectively coupled to the wire loops in an adjoining advance section in accordance with the established traffic direction and always to the section loops other than those to which the associated transmitter means is coupled, for receiving the cab signal command transmitted by the transmitter means at the next junction in advance,
d. cab signal command selection means at each location coupled between the associated receiver and transmitter means and responsive to the cab signal commands received by said associated receiver means from the advance section loops for activating said associated transmitter means to transmit a cab signal command into the approach section loops in accordance with the advance traffic conditions represented by the received cab signal commands, and
e. traffic direction register means at each junction location coupled to the loops in each adjoining section and responsive to the reception of a unique signal from one approach direction loop for registering the established traffic direction,
f. said traffic direction register means responsive to the registration of a traffic direction for enabling the coupling of the associated transmitter and receiver means to the correct loop pattern in accordance with the traffic direction established.

4,046,343
CABLE TRAY
Kyosaku Kambara, Tokyo, Japan, assignor to Tokyo Tekko Kabushiki Kaisha, Tokyo, Japan
Filed July 1, 1976, Ser. No. 701,813
Claims priority, application Japan, Dec. 5, 1975, 50-164626
Int. Cl.² H02G 3/04; F16L 3/22
U.S. Cl. 248—49 1 Claim



1. A cable tray comprising:
a cover plate having downwardly depending side portions;
a pair of side plates arranged opposite to each other, the upper end of each of said side plates being bent outwards and at a right angle to form a flange on which a side portion of the cover plate is overlapped, the lower end of each of said side plates being bent outwards and at a right angle to form a supporting face, the outer end of said supporting face being further bent upwards to form an engaging face, both of said side plates being provided with openings at their lower sides, said openings being arranged to have a predetermined distance therebetween in the longitudinal direction of the side plates, the openings provided on one said side plates corresponding to the openings provided on the other of said side plates;
supporting frames having both ends thereof inserted into registering openings in said side plates and each end of a supporting frame resting on a supporting face;
means for fixing at least some of said supporting frames to said supporting faces;
and fastening means comprising a first fastening member of which one end is bent at right angle to form a pressing face and of which the other end is slanted to form a sliding

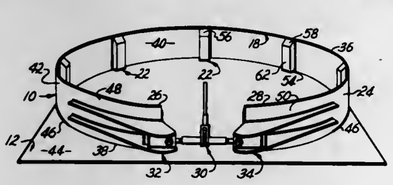
face, a second fastening member similar to said first fastening member and having a pressing face and a sliding face, and a fastening screw passing through a hole provided in said first fastening member and being screwed into a hole in said second fastening member, the overlapped cover plate and flange being sandwiched between the pressing faces of said first and second fastening members.

4,046,344

CONDUIT CLAMPING DEVICE

Robert J. Scanlan, 16350 Woodlawn East Drive, South Holland, Ill. 60473

Filed Oct. 30, 1975, Ser. No. 627,220
Int. Cl.² F16L 3/24
U.S. Cl. 248—72 9 Claims



1. A clamping device for securing a conduit to a support channel having a pair of spaced legs interconnected by a web with the conduit being disposed transversely to said channel and substantially adjacent the web thereof, comprising

first and second straps each having a curved portion for engaging a side of said conduit, a leg extending from one side of said curved portion, and a fastening element at the opposite side thereof;

said leg of each strap having a generally U-shaped end for engaging the end of a respective one of said channel legs;

an abutment flange extending from each strap leg such that when said straps are mounted on said channel on opposite sides of a conduit to be secured said abutment flanges are positionable in side by side abutting relation with the abutment flange of said first strap being on an opposite side of said second strap flange than the curved portion of said first strap is located with respect to the curved portion of said second strap whereby said strap legs are prevented from moving outwardly relative to each other and the conduit therebetween; and

means for securing said strap fastening elements to rigidly clamp said conduit between said strap curved portions and hold said abutting flanges in rigid engagement.

4,046,345

RETENTIVE BASE FOR SHIPPING CASK

George F. Boyd, Sr., Dunnweg, Mo., assignor to Tri-State Motor Transit Company, Dunnweg, Mo.

Filed July 31, 1975, Ser. No. 600,816
Int. Cl.² A47G 23/02
U.S. Cl. 248—154 8 Claims

1. A retentive base for a shipping cask comprising:

a plate adapted to be secured in a horizontal position on the bed of a supporting vehicle;

a ring carried by said plate and receiving said cask within the confines thereof, said ring having a vertical sidewall perpendicular to said plate, said sidewall being transversely split whereby to present a pair of opposed, free end lips, said sidewall having an upper and a lower edge, the major portion of said lower edge of said sidewall being directly affixed to said plate;

means on said ring and within the confines thereof for retentively engaging the cask; and

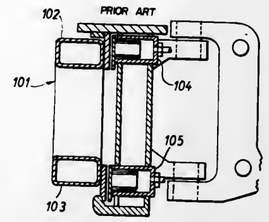
means for shifting certain of said engaging means into and out of engagement with said cask.

4,046,346

SLIDE MECHANISM HAVING MEANS FOR FIXING MOVABLE FRAMES

Katsuhiko Iijima, Sagamihara, and Katsuhiko Yoshida, Tokyo, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1975, Ser. No. 621,562
Claims priority, application Japan, Nov. 14, 1974, 49-131690
Int. Cl.² B61H 7/00
U.S. Cl. 248—298 11 Claims



1. A slide mechanism comprising a movable frame mounted for generally horizontal longitudinal movement along a support frame, the movable frame comprising first and second projections which extend transversely of the support frame adjacent an upper portion and a lower portion respectively of the support frame, and a slide member releasably mounted in a first groove formed in the under side of the first projection and having a second groove arranged for sliding movement along a guide rail disposed longitudinally on the upper side of the said upper portion of the support frame, wherein one of the first and second grooves has a wedge shaped cross-section and the other groove has a semi-cylindrical cross-section, there being provided means for urging together an inclined face on the second projection and an inclined face on a downward projection of the said lower portion of the support frame which is disposed in a recess in the second projection.

4,046,347

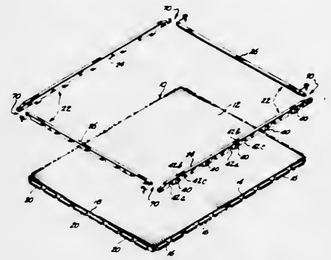
ADAPTOR ASSEMBLY

Darold Ray Bryan, Baghdad, Iraq, assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 13, 1976, Ser. No. 723,039
Int. Cl.² B65D 19/00
U.S. Cl. 248—346 10 Claims

1. An adaptor for use with a cargo pallet having first and second sides, first and second ends, and a bottom, said first and second sides having a plurality of outwardly extending, lateral projections thereon adjacent said bottom for use in tieing said pallet down in a first cargo tiedown system, said adaptor for removable interconnection with said pallet for use in tieing said pallet down in a second cargo tiedown system, said adapter comprising:

first and second longitudinal frame members each having an inner side and an outer side, each said longitudinal frame member being positionable adjacent a respective side of said pallet and having a first plurality of recess means on the inner side thereof for receiving said plurality of lateral projections on said pallet, said first plurality of recess means being spaced along the inner side of each said longitudinal frame member at distances corresponding to the longitudinal spacing of said lateral projections on said pallet, each said longitudinal frame member having second recess means extending laterally into said longitudinal frame member from the outer side thereof for receiving a



movable tiedown member forming part of said second cargo tiedown system, and

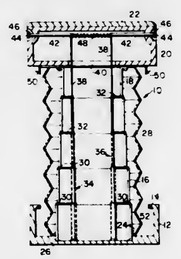
connecting means associated with said pallet and said first and second longitudinal frame members for securing said first longitudinal frame member to said pallet, for securing said second longitudinal frame member to said pallet, and for cooperating with said pallet and said longitudinal frame members to prevent longitudinal and lateral movement of said first and second longitudinal frame members relative to said pallet.

4,046,348

ADJUSTABLE HEIGHT STOOL

John E. Goodwin, 201 W. 157th St., Harvey, Ill. 60426

Filed Nov. 2, 1976, Ser. No. 738,036
Int. Cl.² A47C 3/40
U.S. Cl. 248—423 7 Claims



1. A stool comprising:

a hollow base,

a seat,

vertical telescoping support means between the interior of said base and the bottom of said seat for adjustably moving said seat relative to said base, and

means between said base and seat for retaining said telescoping support means in a plurality of adjusted vertical positions,

said telescoping support means including a plurality of cylindrical telescoping sections, the lowermost of said sections being fixed to the interior of said base, the uppermost of said sections being fixed to the bottom of said seat,

said retaining means including

a pair of substantially parallel, vertical telescoping rods connected to said base and accessible through said seat housed within the interior of said cylindrical telescoping sections,

means between said rods urging said rods away from each other, and

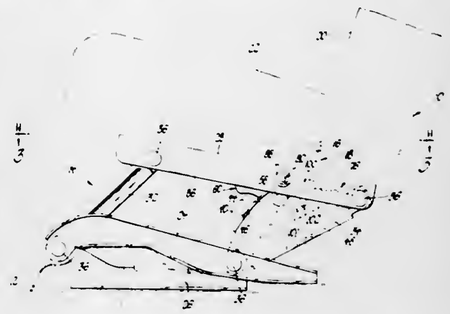
a plurality of vertically spaced lugs on each of said rods received within diametrically opposed slots in the sidewall of said telescoping cylindrical sections.

4,046,349

SUPPORT ASSEMBLY FOR FORWARDLY SHIFTABLE VEHICLE SEAT

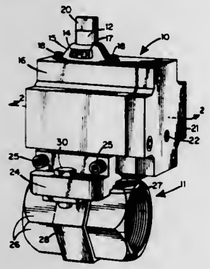
James E. MacAfee, Grosse Isle, Mich., assignor to American Motors Corporation, Southfield, Mich.

Filed June 7, 1976, Ser. No. 693,613
Int. Cl.² B60M 1/08
U.S. Cl. 248—424 19 Claims



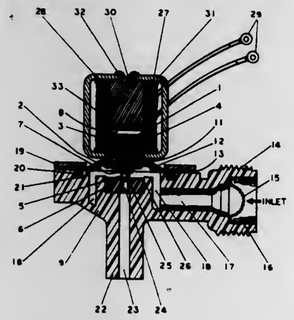
1. A vehicle seat support assembly for mounting a seat on a vehicle floor laterally adjacent a side door of the vehicle, the support assembly comprising: a lower frame for mounting on the vehicle floor; an upper frame for supporting the seat; front and rear links associated with inboard and outboard sides of the assembly and having opposite ends respectively pivoted to the upper and lower frames such that the upper frame is movable between a rearward seating position and a forward easy-enter position where the area rearward of the seat supported by the assembly is accessible to adjacent the door for entry into and exit from the vehicle; the frames each having an outboard rear extremity; the opposite ends of the rear link at the outboard side of the assembly being pivotally connected to the outboard rear extremities of the upper and lower frames such that a straight line therebetween with the upper frame in the easy-enter position extends upwardly and forwardly from the lower frame to the upper frame through open space adjacent the rear outboard portion of the assembly; the outboard rear link having an intermediate portion connecting the opposite ends thereof with a curved shape that is located downwardly and forwardly with respect to the straight line between the opposite ends thereof when the upper frame is positioned in the forward easy-enter position whereby the location of pivotal link connection to the outboard rear frame extremities increases the space between the door area and the rearward of the seat supported by the assembly and thus affords a passenger convenient access during entrance into or exit from the vehicle; and a latch mechanism for maintaining the upper frame in the rearward seating position and for selectively releasing the upper frame for movement to the forward easy-enter position.

4,046,350
POWER ACTUATED VALVE
Roger G. Massey, Exeter, and David G. Holloway, Concord, both of N.H., assignors to The Parker & Harper Manufacturing Company, Inc., Worcester, Mass.
Filed July 26, 1976, Ser. No. 708,698
Int. Cl.² F16K 31/16
U.S. Cl. 251—58 10 Claims



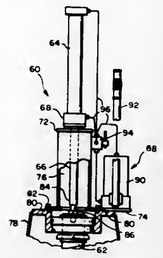
1. In a power actuated valve comprising a valve operable from fully open to fully closed position by ninety degree rotation of a valve stem, a power actuator for rotating said valve stem and coupling means to couple said actuator to said valve stem, the combination in said coupling means comprising:
a. a washer having at least one laterally protruding lug fitted over said valve stem;
b. a nut threaded over said valve stem on top of said washer;
c. a socket connected to said actuator for rotation thereby having at least one slot in its sidewall for receiving said lug and a series of points on its inner sidewall for engaging said nut; and,
d. means to clamp said actuator to said valve to secure said socket over said stem.

4,046,351
SOLENOID FLUID VALVES
Gregor L. Lang, 295 East St., Suffield, Conn. 06078
Continuation of Ser. No. 215,052, Jan. 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 830,342, June 4, 1969, Pat. No. 3,647,177. This application May 9, 1975, Ser. No. 576,167
Int. Cl.² F16K 31/06; H01F 7/13
U.S. Cl. 251—129 11 Claims



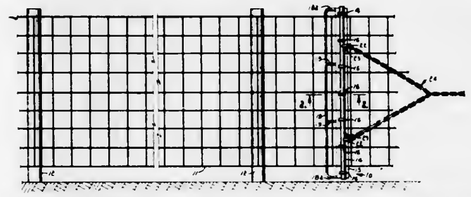
1. A solenoid fluid valve including in combination;
valve body means having a fluid duct therethrough, annular valve seat means intermediate said duct having a flow restricting passage therethrough forming a sealable fluid orifice; and
adjacent solenoid means having a ferrous core and a spring biased ferrous plunger armature extending within a coil, a ferrous structure exterior of said coil forming with said core and said armature a loop magnetic circuit, said armature arranged for operative motion axially coextensive of said core and having an outwardly extending portion adapted for sealing engagement with said orifice thereby defining the deenergized limit of motion of said armature;
the improvement thereof comprising,
a unitary housing for said armature including a tubular portion of substantially the same wall thickness throughout the tubular length thereof having one end closed by a transverse diaphragm portion and extending within said coil, said diaphragm substantially abutting an end of said core and defining the energized limit of motion of said armature; and
said ferrous structure comprising a unitary member formed from a strip of ferrous material of elongate rectangular plan and being in substantially gapless assembly with an end of said core thereby enabling a substantially closed loop magnetic circuit comprising only said three specified ferrous magnetic elements.

4,046,352
HYDRAULIC APPARATUS FOR RAISING AND LOWERING AN IMPELLER SHAFT
William J. Montagno, Rochester, and Allan L. MacIntyre, Lima, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.
Filed Oct. 14, 1976, Ser. No. 732,245
Int. Cl.² E21B 19/00
U.S. Cl. 254—29 R 1 Claim



1. A hydraulic apparatus for raising and lowering the shaft of an impeller apparatus comprising:
a. a hydraulic cylinder including a piston and a piston rod, said piston rod extending downward beyond one end of said cylinder;
b. support means including a top portion, a base portion and a hollow interior portion, said base portion including means for detachably securing said support means to the top of said impeller apparatus, said cylinder being secured to the top portion of said support means, and said piston rod extending downward into said hollow interior portion, and wherein said means for detachably securing said support means to the top of said impeller apparatus comprises a plurality of mounting holes in said base portion and a plurality of bolts adapted to threadingly engage the top of said impeller apparatus;
c. means for securing said piston rod to the end of said shaft, and
d. hydraulic circuit means in fluid communication with said hydraulic cylinder for activating said hydraulic cylinder to raise and lower said shaft, said hollow interior portion of said support means comprising means for receiving the end of said shaft when said shaft is in the raised position said hydraulic circuit means including a manual pump assembly having a lever actuator connected thereto, said pump assembly being affixed to the base portion of said support means.

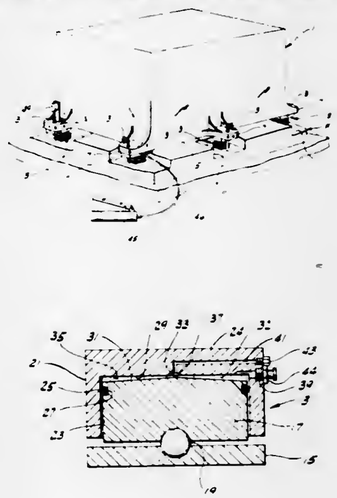
4,046,353
FENCE WIRE STRETCHING DEVICE
Sylvester Buschmann, Maries Valley View, Vienna, Mo. 65582
Filed Oct. 26, 1976, Ser. No. 735,383
Int. Cl.² B66F 19/00
U.S. Cl. 254—83 8 Claims



1. In a device for use in stretching fence wire, the improvement comprising:
a base presenting a substantially flat surface for receiving the fence wire;
a plurality of spaced fingers projecting from said base, said fingers each having an end portion spaced outwardly of said flat surface and generally parallel thereto;
a substantially round bar member adapted for insertion between said base and the end portions of said fingers with the fence wire located between said bar member and base; and
means presenting a plurality of spaced grooves in said bar member extending in a generally circumferential direction therein and arranged eccentrically with respect to the longitudinal axis thereof, said grooves extending only partially around said bar member, said grooves being located to register with the respective fingers and being sized to closely receive same,
whereby rotation of said bar member effects camming action of said fingers within said grooves to press said bar member tightly against said base with the fence wire clamped therebetween.

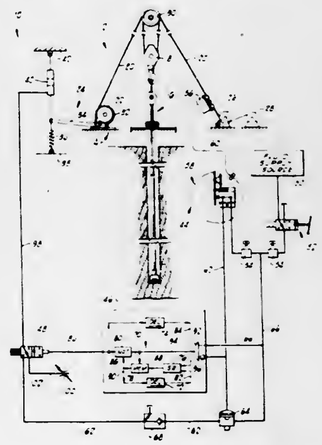
4,046,354
APPARATUS FOR POSITIONING AND SUPPORTING A MACHINE
Morris Randall Stith, Jr., R.R. No. 1, Box 13, Webster, Ky. 40176
Division of Ser. No. 607,921, Aug. 26, 1975, Pat. No. 3,978,574. This application July 6, 1976, Ser. No. 702,440
Int. Cl.² B66F 3/24
U.S. Cl. 254—93 R 2 Claims

1. A jack comprising a cylinder and piston defining an expansible chamber having opposed cylinder and piston faces and being adapted to receive a pressurized, hardenable liquid, such as an epoxy resin mixed with a suitable hardener or catalyst, for relative extension of the cylinder and piston, said piston face protruding outwardly beyond the body of said piston with the outermost protruding portion of said piston face being at the center thereof, said cylinder face having a pocket therein in line with said outermost portion of said piston face, the latter being surrounded by a space for said liquid when said cylinder and piston faces are relatively retracted, said space constituting a portion of said chamber, said jack further having an inlet for the flow of said liquid to said space and an outlet eftending from said pocket for exit of air from said chamber as said liquid enters said space, and means for closing said inlet and said outlet whereby with said cylinder and piston pressurized by said liquid and with said cylinder and piston in a selected relative extended position said closing means is operable to entrap said liquid within said chamber to hold said cylinder and piston at their said extended position



and to permit said liquid to harden thereby to fix said cylinder and piston in their said extended position.

4,046,355
DRAWWORKS CONTROL APPARATUS
T. Edward Martin, 3624 NW. 19th, Oklahoma City, Okla. 73107
Filed Dec. 8, 1975, Ser. No. 638,836
Int. Cl.² B66D 1/48
U.S. Cl. 254—173 R 5 Claims



1. In combination with a drawworks assembly having a work piece suspended from, and applying tension to, a cable, one end of the cable being wound on a drum, the rotation of which is controlled by a power brake mechanism, a control apparatus comprising:
a cable tension sensing means connected to the cable, the cable tension sensing means sensing the tension in the cable and producing a tension signal the level of which is proportional to the sensed cable tension;
pulse generating means for producing a pulsed control signal comprising:

pulse producing means for receiving a pulse-initiate signal and a pulse-terminate signal, initiating the production of a pulse of the control signal in response to receiving the pulse-initiate signal, and terminating the production of the pulse of thhe control signal in response to receiving the pulse-terminate signal;

pulse initiate means connected to the pulse producing means, the pulse initiate means sensing the termination of production of the pulse of the control signal and producing the pulse-initiate signal for application to the pulse producing means a predetermined time period after sensing the termination of production of the pulse of the control signal; and

pulse terminate means connected to the pulse producing means, the pulse terminate means sensing the initiation of production of the pulse of the control signal and producing the pulse-terminate signal for application to the pulse producing means a predetermined time period after sensing the initiation of production of the pulse of the control signal;

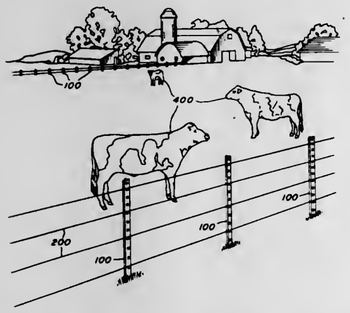
brake control means connected to the pulse generating means and to the cable tension sensing means, the brake control means receiving the control signal and the tension signal and applying the tension signal to the power brake mechanism in response to the pulses of the control signal, whereby the power brake mechanism is actuated in a pulsed manner, the strength of the pulses being proportional to the tension in the cable.

4,046,356

PLASTIC FENCE POSTS AND ENCLOSURES

Byron W. Rose, Circleville Township, Pickaway County, Ohio, assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 17, 1975, Ser. No. 623,299
Int. Cl.² A01K *3/00*
U.S. Cl. 256—10 **13 Claims**



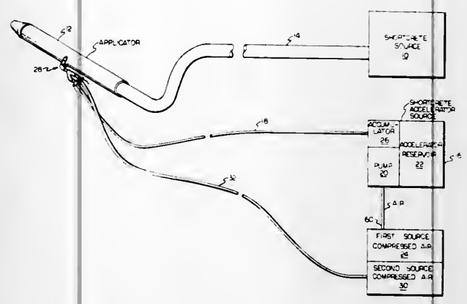
1. A releasable and reusable fence post capable of returning to an upright position when deflected after implantation comprising an injection molded thermoplastic resin member having a top section extending more than half the length of the member, and a bottom section, the sections of said member being constructed with a front flange, a rear flange parallel to the front flange, a web intersecting the flanges, and a plurality of wire engaging members projecting forwardly from the front flange, the intersecting web extending laterally from the front flange to a short distance beyond the rear flange, the vertical extent and thickness of said web being greater than said flanges and the width of said front flange being greater than said rear flange, the bottom of said web being a point, at least one of said flanges includes an outwardly extending support plate in the bottom section of the member, said integral support plate having a rectangular section and an adjacent trapezoidal section converging towards the nearer end of said flange, the cross-sectional area of said integral support plate being sufficient to support said member in an upright position.

4,046,357

SHOTCRETE ACCELERATOR INJECTION APPARATUS AND METHOD

F. Shawn Twitchell, Salt Lake City, Utah, assignor to Construction Systems & Equipment, Inc., Salt Lake City, Utah

Filed Dec. 3, 1976, Ser. No. 747,387
Int. Cl.² B28C *1/02, 5/46*
U.S. Cl. 259—147 **12 Claims**



1. A method of injecting shotcrete accelerator into a flowing shotcrete slurry prior to application thereof by and through a shotcrete applicator connected to receive said shotcrete slurry under pressure, said method being comprised of:

supplying shotcrete accelerator to said applicator at a pressure in excess of the pressure of said shotcrete slurry as it passes through said applicator;

supplying compressed air to said applicator at a pressure in excess of the pressure of said shotcrete slurry as it passes through said applicator;

intermixing said shotcrete accelerator and said compressed air together in the vicinity of said applicator; and

injecting the mixture of said accelerator and said compressed air into the shotcrete slurry in said applicator to intermix therewith as said shotcrete passes through said applicator.

8. Apparatus for applying shotcrete comprised of:

a source of shotcrete under pressure;

a source of shotcrete accelerator;

first and second sources of compised air;

an air driven positive displacement pump connected to said first source of compressed air to be driven thereby and positioned and connected to take a suction from said source of shotcrete accelerator and to supply shotcrete accelerator under pressure at its output;

an accumulator having an inlet and an outlet, said inlet being connected to receive the output of said pump;

a shortcrete applicator connected to the source of shotcrete to receive shotcrete under pressure therefrom;

an accelerator injection manifold positioned along the length of said applicator, said manifold having:

a first inlet connected to the outlet of said accumulator to receive shotcrete accelerator therefrom,

a second inlet connected to said second source of compressed air to receive compressed air therefrom,

a body in which said compressed air and said shotcrete accelerator are intermixed, and

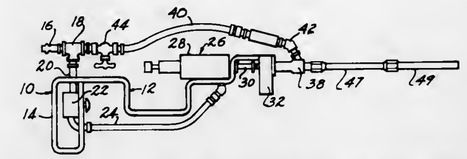
a plurality of outlets connected to said applicator to inject the mixture of compressed air and shotcrete accelerator into the shotcrete in said applicator.

4,046,358

METHOD AND APPARATUS FOR MIXING AND DISPENSING MATERIAL

Charles Grimes, Decatur, Ga., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed May 10, 1976, Ser. No. 685,086
Int. Cl.² B28C *5/06*
U.S. Cl. 259—147 **15 Claims**



1. Apparatus for mixing and dispensing two or more chemical compounds comprising:

a gun frame having means thereon for receiving two or more separate chemical components and for mixing same together,

means on said frame for delivering said components under pressure,

a mixing chamber on said frame into which said mixed components are discharged from said means for mixing, said mixing chamber having an inlet end and an outlet end,

means on said frame comprising air under pressure in communication with and introduced into said mixing chamber forwardly of the discharge of said mixed components from said means for mixing same for producing a suction in the inlet end of said mixing chamber and pressure in the outlet end,

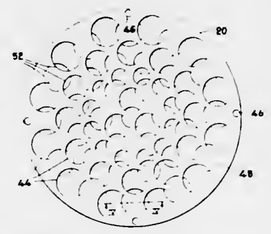
and a discharge barrel on said gun frame in communication with said mixing chamber and into which said mixed components are forced by air to exit from said barrel.

4,046,359

INJECTION MOLDING FILTER ASSEMBLY

Jobst Ulrich Gellert, 11 Newton Road, Brampton, Ontario, Canada

Filed May 17, 1976, Ser. No. 687,258
Claims priority, application Canada, Mar. 24, 1976, 248735
Int. Cl.² B01D *35/28*
U.S. Cl. 259—193 **3 Claims**



1. An injection molding filter assembly to be located in a passage between a molding machine and a mold to filter pressurized melt flowing therethrough comprising:

a. a first upstream plate having a plurality of circular openings extending therethrough and a flat downstream face;

b. a second downstream plate having a plurality of circular openings extending therethrough and a flat upstream face, the first and second plates being located transversely in said passage with the flat upstream face of the second plate abutting in an abutment plane on the flat downstream face of the first plate, and

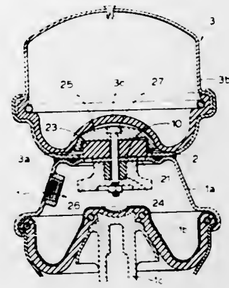
c. means to secure the first and second plates against relative rotation therebetween; the circular openings in the first and second plates being arranged in concentric circles with the openings of each circle being of equal size with each of the openings in each plate partially overlapping at least two openings in the other plate to provide a plurality of eye-shaped openings through the filter assembly in the abutment plane.

4,046,360

RUBBER FLAP DAMPER VALVES

Anthony Best, Westbury, and Harold Harmsa, Bradford-on-Avon, both of England, assignors to Moulton Developments Limited, England

Filed July 9, 1976, Ser. No. 703,944
Claims priority, application United Kingdom, July 11, 1975, 29263/75
Int. Cl.² F16F *5/00*
U.S. Cl. 267—65 B **7 Claims**



1. A flap type damper valve for use in controlling liquid flow in a hydraulic suspension unit, comprising: an apertured port plate having a plurality of bump ports and a plurality of rebound ports therethrough, each of said ports having a predetermined maximum diameter; a pair of elastomeric flap valves secured on opposite sides of the port plate with one of the flap valves disposed in overlying relation to the bump ports and the other of said flap valves disposed in overlying relation to the rebound ports, to thereby obturate flow in one direction through the respective ports and to enable flow in the opposite direction through the respective ports, the predetermined maximum diameter of the ports being such that the flap valves are not extruded into the ports at the pressures encountered; rigid flap valve retaining means engaged with a part of the external surface of each flap valve and precompressing each flap valve into engagement with the port plate to cover the respective, associated ports in the plate, the rigid retaining means in conjunction with the port plate engaging and confining a major part of the external surface of the flap valves so that when the flap valves deform in response to liquid pressure to at least partially uncover their associated ports, such deformation takes place primarily in compression; and the port plate contacting surface of said flap valves being irregularly shaped to provide a multiplicity of contact points with the plate, whereby some lamination of flow past the contact surfaces of the flap valves with the plate is obtained, thus reducing the tendency of the flap valves to vibrate during operation.

4,046,361

IMPACT ENERGY ABSORPTION DEVICE

Robert L. Morse, Crossett, Ark., assignor to Mechanisms, Inc., Crossett, Ark.

Filed July 28, 1975, Ser. No. 599,782
Int. Cl.² F16F *7/10*
U.S. Cl. 267—139 **7 Claims**

1. Device for cushioning the impact of a first article against a second article when said articles approach each other along a predetermined straight path, said first article having a sub-

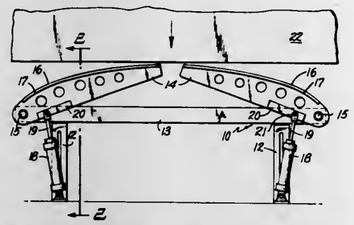
stantially straight leading edge substantially perpendicular to said path, and said device comprising:

a lever arm having a curved surface,

energy absorbing means,

pivot means intermediate the ends of said lever arm connecting said lever arm to said energy absorbing means,

means for pivotally connecting a first end of said lever arm to said second article with the lever arm extending transversely across said path and said curved surface facing said first article so that said leading edge contacts a point



on said curved surface as said articles approach each other and swings said lever arm against the resistance of said energy absorbing means between a first position in which said point of contact is closer to the other end of said lever arm than to said intermediate pivot means and a second position in which it is not and thereby causes absorption of energy by said energy absorbing means,

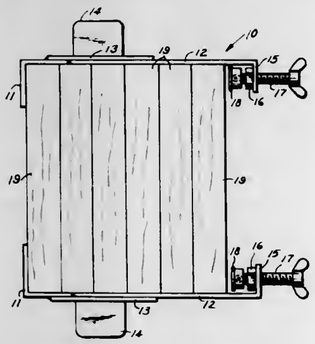
the curvature of said curved surface being such that the contact between said leading edge and curved surface is essentially a rolling contact as said lever arm moves from said first position to said second position.

4,046,362

BOARD HOLDING DEVICE

Milton L. Spillers, 310 S. River St., Newberg, Oreg. 97132

Filed July 6, 1976, Ser. No. 702,706
Int. Cl.² B25B 1/20
U.S. Cl. 269—43 1 Claim



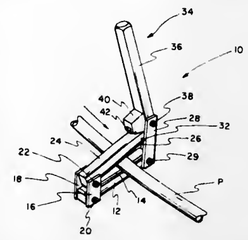
1. A board holding device, comprising in combination, a pair of clamp units secured around opposite ends of a plurality of same-length boards stacked in a row with flat sides thereof abutting each other; each of said clamp units being comprised of an angle iron having a pair of legs at right angles to each other, an L-shaped plate comprised of a wide panel and a narrow panel at right angles to each other, and end edge of said plate wide panel abutting an end edge of one of said angle iron legs and being secured thereto, one flat side of said plate wide panel and one flat side of said angle iron leg abutting said board ends, an overlapping plate having one flat side abutting an opposite flat side of said L-shaped plate wide panel and an opposite flat side of said angle iron leg and being welded thereto, said overlapping plate bridging said welded, abutting end edges of said plate wide panel and said angle iron leg, an opposite side of said overlapping plate having a U-shaped handle grip welded thereto; said narrow panel of said L-shaped plate having a nut fastener welded thereto, an opening of said nut fastener being aligned with an opening through said narrow panel, a bolt extending through said narrow panel opening being threadingly engaged in said nut fastener, the other of said angle iron legs abutting with one endmost of said plurality of boards, while a pivotable portion on an end of said bolt abuts an opposite endmost of said plurality of boards when a winged head upon an opposite end of said bolt is manually turned.

4,046,363

PIPE CLAMPING TOOL ASSEMBLY

Gerald E. Whitley, P.O. Box 103, Bell Arthur, N.C. 27811

Filed Dec. 31, 1975, Ser. No. 645,840
Int. Cl.² B25B 1/14
U.S. Cl. 269—228 4 Claims



1. A pipe clamping tool assembly for clamping and effectively closing a pipe or the like, comprising: a generally elongated first member having an arcuate shaped upper pipe receiving surface for receiving a portion of a pipe to be clamped; first and second arm means secured to opposite portions of said first member and extending therefrom; a generally elongated second member having an arcuate shaped lower pipe engaging surface formed thereon and movably mounted to said first arm means and movable back and forth between a first pipe loading position where a pipe or a portion thereof can be easily placed adjacent the upper engaging surface of said first member and a second pipe clamping position generally overlying said first member such that in operation a pipe receiving area is defined between said first and said second members and the pipe to be clamped or a portion thereof is disposed between said first and second members; and pipe clamping lever means movably mounted to said second arm means and movable with respect thereto for engaging said second member and for pressing the same downwardly towards said first member such that said pipe or portion thereof lying in said defined pipe receiving area between said first and second members is clamped and effectively closed about the area thereof lying between said first and second members, said lever means having a pressing portion that includes a roller rotatively mounted in association therewith so as to engage a portion of said second member during the clamping operation and to press thereagainst as said lever means is actuated by pivoting the same towards said second member.

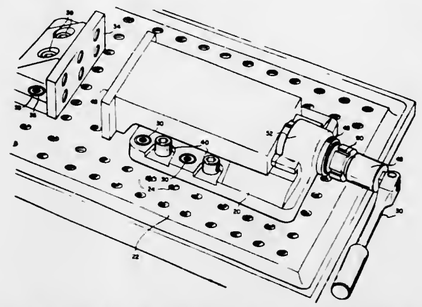
4,046,364

TORQUE LIMITING VISE FOR HOLDING WORK ON A MACHINE TOOL TABLE

Robert L. Coope, and Lowell W. Munson, both of Phoenix, Ariz., assignors to Stevens Engineering, Phoenix, Ariz.

Filed Oct. 1, 1976, Ser. No. 728,751
Int. Cl.² B25B 1/10
U.S. Cl. 269—244 4 Claims

1. A torque limiting vise for holding work on a machine tool table; means for fixing said vise on a machine tool table; said vise having a pair of holding jaws between which a part may be clamped and held during the performance of machine work thereon; means for forcing said jaws together with a predetermined amount of force which predetermines a precise degree of mechanical deflection of either or both of said jaws in response to pressure thereof against a part clamped between said jaws, whereby successively machined parts, held by said jaws, create precisely the same amount of deflection so that each successively machined part is held precisely in the same position relative to a cutting tool position of said machine tool; said means for forcing said jaws together comprising a rotatable jaw actuating shaft; screwthreaded means disposed for advancing one of said jaws toward the other one of said pair of jaws; and a torque limiting means coupling said shaft and said screwthreaded means; rotary force applied to said jaw actuating shaft is precisely limited by said torque limiting means, thereby precisely limiting force of said screwthreaded means



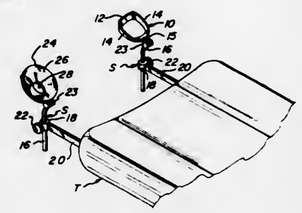
applied to said one of said jaws; said torque limiting means being a slippable clutch; said slippable clutch provided with a plurality of first discs coupled to said actuating shaft; said clutch having a plurality of second discs coupled to said screwthreaded means; said first and second discs disposed alternately between each other and in contigous relationship; said actuating shaft and said screwthreaded means being on a common axis; and said discs being free to move into pressure contact with each other in a direction longitudinally of said common axis; and adjustable resilient means adjustable to apply force in a direction longitudinally along said common axis and against said first and second discs to thereby cause frictional engagement therebetween and to provide for the adjustment of a predetermined amount of torque transmitting force between said actuating shaft and said screwthreaded means before said first and second discs slip relative to each other while said actuating shaft is being rotated to force one of said jaws toward said other one of said jaws.

4,046,365

STIRRUP GUARD FOR MEDICAL EXAMINATIONS

Shirley A. Dungan, 3370 W. Aksarben, Littleton, Colo. 80123

Filed June 28, 1976, Ser. No. 700,405
Int. Cl.² A61G 13/00
U.S. Cl. 269—328 9 Claims



1. In a foot support adaptable for use in medical examinations and the like wherein an examining table is provided with stirrups at one end of the table to support the patient's feet, each stirrup being characterized by having an outer surrounding, substantially rigid frame and inner hollow portion, the combination therewith comprising:

a protective pad defined by a normally flat body composed of a resilient material provided with a central opening therein, said body dimensioned to overlie and extend beyond the outer frame member, and

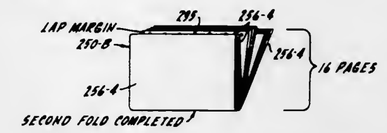
releasable fastener means at spaced intervals on said body adapted to releasably attach said pad in overlying relation to a stirrup with the central opening aligned with the inner hollow portion of said stirrup.

4,046,366

METHOD FOR PRODUCING BOOKS

William B. McCain, Hinsdale; James F. Cosgrove, Western Springs, and Arthur E. Eaves, Morton Grove, all of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed June 9, 1976, Ser. No. 694,221
Int. Cl.² B41F 13/56
U.S. Cl. 270—21 3 Claims



1. A method of making a book comprising:

a. juxtaposing webs of printed material and registering the webs in pre-paged relationship by register means located along one edge of the webs;

b. cutting the juxtaposed webs to produce juxtaposed sheets to be folded;

c. folding the juxtaposed sheets once along a first fold parallel to said one edge to dispose the register means at an extended lap margin;

d. folding the once-folded sheets along a second fold parallel to the first to locate the first fold adjacent the lap margin, thereby providing a group of signatures having a backbone afforded by the second fold;

e. stitching said backbone to join the signatures; and

f. separating the extended lap margin along a trim line which includes the fold line of the first fold, thereby to open the pages of the book.

4,046,367

MODIFIED HIGH SPEED PAPER INSERTING APPARATUS AND METHOD

George Merker, Fair Lawn; Menashe Navi, Lebanon, both of N.J., and Joseph Krupp, Bangor, Pa., assignors to American Newspaper Publishers Association, Incorporated, Easton, Pa.

Filed Nov. 10, 1975, Ser. No. 630,223
Int. Cl.² B65H 5/30
U.S. Cl. 270—55 10 Claims

1. A method of high speed in-line inserting of a supplement insert into a newspaper which is being rectilinearly conveyed in a forward direction, and comprising the steps of:

A. folding a newspaper to provide an extending lap on a first half of said folded newspaper with respect to a second half, conveying said folded newspaper as a folded jacket with the folded edge forwardly disposed to a speed up station, and

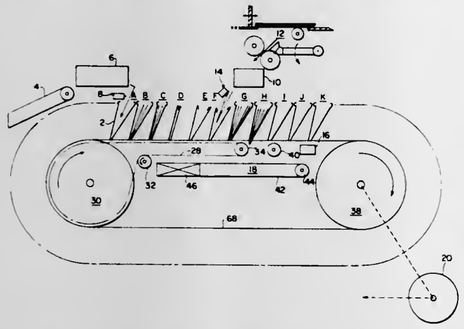
B. accelerating said folded jacket edge downwardly onto a horizontal plane for a first horizontal conveyance and for a rectilinear series of steps wherein said folded edge is rectilinearly conveyed in the plane of said first horizontal conveyance while maintained downwardly with respect to said extended lap, wherein the first half of said folded jacket is disposed in a leading direction with respect to the

forward direction of conveying, said rectilinear conveying steps further comprising in sequence:

i. supporting and conveying said folded edge in a forward direction as a rectilinear conveyance, while maintaining said extending lap in a first position inclined and upwardly disposed relative to said rectilinearly conveyed folded edge; and while so conveying said folded edge, further

ii. pivoting said extending lap in the trailing direction, relative to said direction of conveyance of said rectilinearly conveyed folded edge, to a second inclined position, and

iii. maintaining said second half of said folded newspaper at said second position, and



iv. forwardly pivoting only said first half of said folded newspaper towards said first position to thereby define an upwardly opening pocket between said second and first halves of said newspaper, and

C. impelling at least one insert downwardly into said upwardly opening pocket to thereby define a composite newspaper; and,

D. further rectilinearly conveying the folded edge of said composite newspaper to a downwardly directed discharge station, accelerating said composite newspaper downwardly, with respect to the plane of said first horizontal conveyance, to a second horizontal rectilinear conveyance which is below the plane of said first rectilinear conveyance and opposite in direction with respect to the direction of said first conveying.

4,046,368

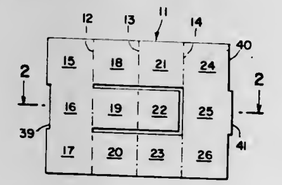
FOUR PAGE BOOKLET

Jack G. LeBreton, 83 DeNeubbi Drive, Streetsville, Canada

Filed Aug. 21, 1975, Ser. No. 606,577

Int. Cl.² B65H *45/00*

U.S. Cl. 270—61 R **1 Claim**



1. A four page booklet formed from the following steps, which comprises:

a. forming first second and third vertical fold lines in a rectangularly shaped planar member having a front face and back face.

b. subdividing each said front and said back faces of said rectangularly shaped member into twelve equal squares arranged in four vertical rows and three horizontal rows; said four vertical rows being arranged as first, second, third, and fourth rows respectively, partitioned by said first, second, and third fold lines and positioned consecutively from one vertical edge of said member to an opposite vertical edged thereof; said horizontal rows being arranged in a top, a center, and a bottom row; p1 c. cutting along a center portion of said third vertical fold line between center squares of said third vertical row and said fourth vertical row;

d. cutting along a horizontal line between said top and center squares of a second and third vertical row;

e. cutting along a horizontal line between said center squares and bottom squares of said second and said third vertical rows wherein steps c, d and e form a flap hinged along said first vertical fold line;

f. folding said flap of said center squares against the back face of a center square of said first vertical row and over said front face of said center square of said first vertical row;

g. folding said back face of said fourth vertical row against said back face of said third vertical row;

h. folding said front face of said fourth vertical row against said back face of said second vertical row; and

adhering together said center square of said first vertical row to said center square of said fourth vertical row.

4,046,369

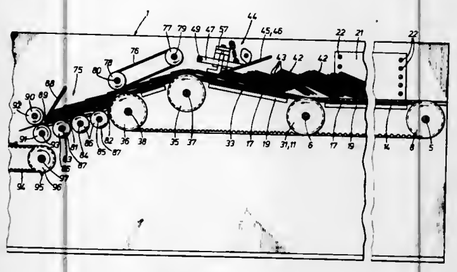
MACHINE FOR FEEDING INSERTS TO A SEPARATING DEVICE

Willi Kluge, and Reinhard Kluge, both of Kugelberg 55, 6300 Giessen, Germany

Filed May 5, 1976, Ser. No. 683,386

Int. Cl.² B65H *1/22, 1/30, 3/04, 3/06*

U.S. Cl. 271—3.1 **19 Claims**



1. In a machine for feeding overlapped inserts to a separating device for separating the inserts, said machine having conveyor means which carries said overlapped inserts and moves same to said separating device, the improvement comprising wherein at least one diaphragm plate is provided, a front side of said diaphragm plate facing said inserts and said conveyor means defining an acute angle therebetween, support means for supporting said diaphragm plate for oscillatory movement comprising, during each complete oscillation, a movement in a direction opposite the direction of movement of the conveyor means and an angular movement to vary the size of said acute angle and drive means for periodically oscillating said diaphragm plate in the flow path of said inserts, said oscillating diaphragm plate striking said inserts which accumulate at said front side thereof in a direction opposite to said direction of movement of said conveyor means, said striking of said inserts effecting a shifting between and an accurate control of the space between the leading edges of said inserts.

4,046,370

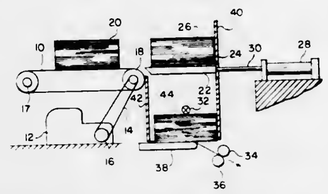
METHOD AND APPARATUS FOR INSERTING A BUNDLE OF NEWSPAPER INSERTS INTO A HOPPER

Menashe Navi, Lebanon, N.J., assignor to ANPA Research Institute, Easton, Pa.

Continuation of Ser. No. 599,227, July 25, 1975. This application Feb. 25, 1977, Ser. No. 772,174

Int. Cl.² B65H *5/22*

U.S. Cl. 271—3.1 **5 Claims**



1. Apparatus for inserting a bundle of newspaper inserts into a hopper comprising:

A. a frame;

B. an upwardly open, vertically disposed hopper for a first bundle of newspaper inserts supported at a lower point in said frame and including:

i. drive means for removing individual inserts from the bottom of said first bundle;

ii. a sensor positioned in the bottom of said hopper,

C. a horizontally disposed shovel platform positioned for a horizontal reciprocation in said frame above said hopper and in horizontal alignment with a belt conveyor, so as to support a second bundle of newspaper inserts vertically above said hopper in a first position; said shovel platform having a plurality of vertical heads extending vertically from the top surface of said platform, said shovel platform being horizontally reciprocable to a second platform position outside of said hopper to thereby drop said second bundle, as said sensor within said hopper senses a critical low number of inserts remaining in said first bundle in said hopper;

D. bundle vertical guide means supported in said frame above said hopper and adjacent and extending above said shovel platform top surface, so as to retain said second bundle for dropping downwardly into said hopper during a horizontal reciprocation of said shovel platform to said second position;

E. means responsive to said sensor for horizontally reciprocating said platform with respect to said hopper; and

F. said endless belt conveyor supported adjacent said platform, so as to advance a replenishment bundle of newspaper inserts onto said shovel platform as said shovel platform is reciprocated back to said first position above said hopper.

4,046,371

DOCUMENT STACKING DEVICE

Nitin M. Sevak, Westland, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 11, 1975, Ser. No. 630,914

Int. Cl.² B65H *29/40*

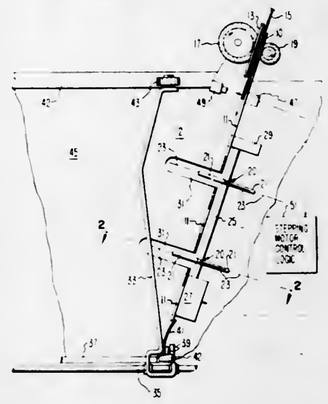
U.S. Cl. 271—178 **2 Claims**

2. A device for deflecting the trailing end of a document onto a stack as documents are serially transported on edge into the proximity of the stack, comprising:

a guiding plate having a front surface defining a portion of a transport path for directing the leading edge of a document into alignment with and onto a stack, said guiding plate having an opening formed therein communicating the back side of said guide plate with said front guide surface thereof;

deflecting means defining a paddle wheel having at least one paddle arm, rotatably disposed about an axis of rotation lying to said back side of said guide plate and subjacent thereto for carrying said paddle arm uniformly in one direction through said opening toward the stack;

control means responsive to a document passing a predetermined point en route to the stack for incrementally rotating said deflecting means in timed relation with the moving document for deflecting the trailing end of the document onto the stack, whereby the document is carried off the guide plate to clear the path of a subsequently transported document; and



spring means secured to the outer end of said paddles arm and cooperable therewith to deflect the documents onto the stack and for applying pressure to the last stacked document holding the same against the stack after the stacking of said last stacked document is completed, said spring means being so constructed for keeping the path of document travel along the guide plate unobstructed between stacking.

4,046,372

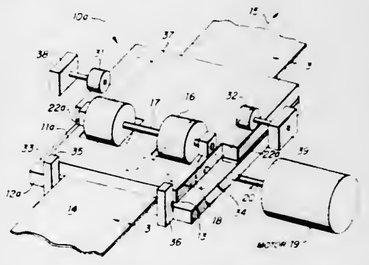
PHOTOTYPESETTER FILM FEED DEVICE

Peter R. Ebner, Nashua, NH, assignor to Itek Corporation, Lexington, Mass.

Filed Aug. 4, 1976, Ser. No. 711,657

Int. Cl.² B65H *29/20*

U.S. Cl. 271—273 **7 Claims**



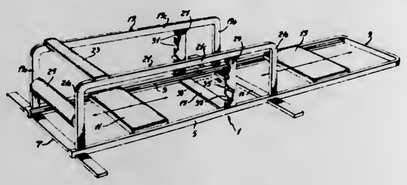
1. Sheet feeding apparatus comprising:

a. first and second guide means for defining a passageway therebetween through which a sheet is to be fed, said first and second guide means including first and second roller means, respectively, between which said sheet is to be passed for driving said sheet through said passageway, said first guide means comprising first guide plate means having an outer surface; and,

b. means for releasably securing said first and second guide means, said releasable securing means including:

1. hold-down means for pressing against said outer surface of said first guide plate means to press said first guide plate means toward said second guide means; and,
2. means for supporting said first guide plate means for lateral movement between a first position wherein said hold-down means is pressing against said outer surface of said first guide plate means for pressing said first guide plate means toward said second guide means for operation, and a second release position wherein said hold-down means is displaced from said outer surface of said first guide plate means whereby said first and second guide means may be separated from one another for loading said sheet into said apparatus.

4,046,373
MULTI-PURPOSE PARALLEL BAR EXERCISING APPARATUS
Choong Chan Kim, 1070 Voltaire, Brossard, Quebec, Canada
Filed Nov. 12, 1975, Ser. No. 631,116
Int. Cl.² A63B 3/00
U.S. Cl. 272—63 7 Claims



7. An exercise apparatus comprising:

guide frame means, said frame means including a pair of elongated side members, said side members being oriented substantially parallel to one another and being interconnected at their opposite ends by end members, said end members being substantially parallel and cooperating with said side members to define an elongated enclosed area;

first rail means mounted on one of said frame means side members and extending longitudinally therealong, said first rail means including a first pair of spatially displaced upwardly extending legs and a first longitudinal rail connected to and extending between said legs of said first pair, said first longitudinal rail being displaced above said frame means one side member;

second rail means mounted on the other of said frame means side members and extending longitudinally therealong, said second rail means including a second pair of spatially displaced upwardly extending legs and a second longitudinal rail connected to and extending between said legs of said second pair, said second longitudinal rail being generally coplanar and parallel with said first longitudinal rail;

first padded body support means extending between said frame means side members, said first support means being freely movable along said side members;

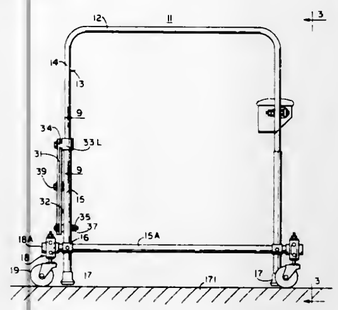
second padded body support means extending between said frame means side members, said second support means being freely movable along said side members independently of the movements of said first support means whereby the spacing between said body support means may be varied;

first vertical rod support means extending between one of said frame means side members and said first rail means longitudinal rail, said first vertical rod support means including a plurality of spatially displaced notches;

second vertical rod support means extending between the other of said frame means side members and said second rail means longitudinal rail, said second vertical support means including a plurality of spatially displaced notches, the notches of said second vertical rod support means being horizontally aligned with the notches of said first vertical rod support means; and

rod means adapted to be received by corresponding notches in said first and second vertical support means whereby the height at which said rod means is disposed is adjustable.

4,046,374
WALKING AID
Thomas E. Breyley, 3717 Hopper Hill Road, Cincinnati, Ohio 45230
Filed May 14, 1973, Ser. No. 360,084
Int. Cl.² A63B 23/04
U.S. Cl. 272—70.3 5 Claims



4. A walker which comprises a pair of side frames, means interconnecting the side frames to form an enclosure, each of the side frames including a pair of upright legs, a hand grip bar connecting upper end portions of the legs, there being an open space between the hand grip bars for a patient with hands on the hand grip bars and feet supported on a supporting surface, an elongated caster support frame linking the upright legs spaced below the hand grip bar and caster supports attached to opposite end portions of the caster support frame, the caster support frames being outboard of the vertical members and extending forwardly and rearwardly beyond the vertical members, the caster supports being mounted on the caster support frames forwardly and rearwardly of the vertical members, a caster mounted on each caster support, and a spring mounted in each caster support supported by the associated caster and urging the associated end portion of the caster support frame to a raised position in which the lower ends of the associated legs are spaced above the supporting surface on which the casters run, the springs yielding when weight is applied to the bars to permit the lower ends of the legs to engage the supporting surface, the legs engaging the supporting surface to prevent advance of the device when the support frame is in a lowered position.

4,046,375
ROTATABLE SWING
Marion Pasteur Lelong, 1308 Seaton Lane, Falls Church, Va. 22046
Continuation-in-part of Ser. No. 160,727, July 8, 1971, Pat. No. 3,829,086. This application Dec. 21, 1973, Ser. No. 427,059
The portion of the term of this patent subsequent to Aug. 31, 1991, has been disclaimed.
Int. Cl.² A63G 9/00
U.S. Cl. 272—95 24 Claims

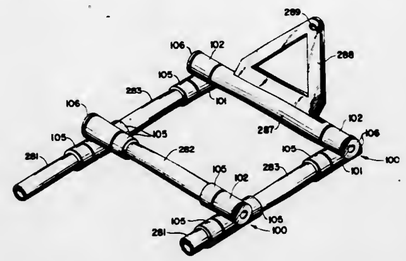
24. A swing for two riders in generally facing relationship, comprising:

A. at least one aligner shaft; and

B. a pair of assemblies, each adapted to support a person thereon, which:

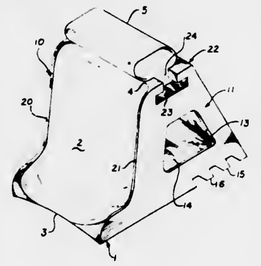
1. are disposed on opposite ends of and spaced apart in approximate alignment with said at least one aligner shaft,

2. are independently rotatable with respect to each other and to said at least one aligner shaft,
3. are interconnected by and rotatably attached to said at least one aligner shaft, and



4. each comprise a stabilizer means for limiting revolution of a person on said assembly about an axis substantially parallel to said at least one aligner shaft to less than an upside-down position when said swing is operably suspended from a pair of opposed support pivots.

4,046,376
BOWLING PRACTICE DEVICE
Leslie E. Harvey, 255 S. Reagstorff Ave., Mountain View, Calif. 94040, and Stephan D. Spiva, 670-C Danforth Drive, Sunnyvale, Calif. 94087
Filed June 23, 1976, Ser. No. 698,952
Int. Cl.² A63D 5/00
U.S. Cl. 273—54 D 8 Claims

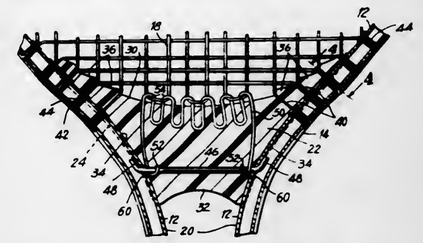


1. A bowling practice device comprising:

means forming an inclined ramp for receiving a rolling bowling ball delivered by a bowler, said ramp having a lower forward edge, a pair of spaced side edges and an upper edge and a generally upwardly sloping inclined surface extending from said lower forward edge to said upper edge, the lower half of said inclined surface being generally concave in that it is curved symmetrically upwardly from its midpoint toward each of said side edges along substantially its entire length and curved upwardly from said lower forward edge toward said upper edge with respect to at least the lower half thereof for centering a ball striking the device between said side edges; and

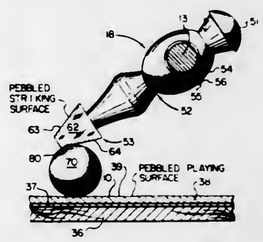
means forming a pad at said upper edge of said inclined surface for stopping the forward motion of said ball, and causing said ball to roll in a reverse direction down said ramp toward said bowler.

4,046,377
TENNIS RACQUET
Joseph N. Khazzam, Baldwin, N.Y., assignor to Regent Sports Corporation, Hauppauge, N.Y.
Filed Feb. 14, 1974, Ser. No. 442,369
Int. Cl.² A63B 49/02
U.S. Cl. 273—73 G 3 Claims



1. A strung racquet frame of elongated hollow tubing comprising a strung head portion, a throat portion, and a handle portion, the space between the frame sides at the throat portion being closed by a generally trapezoidal bridge member which is embraced by the frame sides and engaged by the frame stringing, a cross-bar embedded within and extending laterally of the bridge member, said cross-bar having arms extending outwardly therefrom, into, within, and only upwardly along the inner aspect of the hollow tubing, the bridge member and the interengagement of the cross-bar component thereof with the frame throat restraining the frame sides against lateral movements towards and away from each other, the bridge member and cross-bar being otherwise unsecured to the frame, and the stringing through the frame and the bridge member uring the bridge member upwardly and the embedded cross-bar and arms into more positive engagement with the frame sides.

4,046,378
TABLE SOCCER PLAYING FIGURE
Robert L. Furr, Dallas, Tex., assignor to Robert I. Hayes, Jr., Dallas, Tex., a part interest
Filed Apr. 12, 1976, Ser. No. 675,786
Int. Cl.² A63F 7/10
U.S. Cl. 273—85 D 10 Claims



6. An improved playing figure for a table soccer game structure of the type having a plurality of game figures mounted to rotationally and axially movable actuating rods and said playing figures each having a foot portion thereof depending from its associated rod adjacent a playing field portion and adapted to contact a ball thereon, each of said playing figure foot portions including flat side surfaces lying in a generally vertical plane and generally flat front and rear surfaces lying in different planes positioned at an angle with respect to the longitudinal axis of the figure with the thickness of said foot portion being less at the bottom thereof than at the top, wherein said improvement comprises:

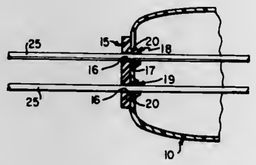
a control corner positioned along a bottom edge of a foot portion and lying in a plane generally parallel to the longitudinal and transverse axes of said playing figure to increase the degree of control said foot portion has over a playing ball while manipulating said ball.

4,046,379

SHUTTLE TOY HAVING TWO ORIFICES AND SHOCK ABSORBING MEANS

Ascher Chase, Virginia Beach, Va., assignor to General Foam Plastics Corporation, Norfolk, Va.

Filed Mar. 19, 1976, Ser. No. 668,614
Int. Cl.² A63H *33/00*
U.S. Cl. 273—95 AA **4 Claims**



1. A stabilized action mechanism comprising
a. first and second flexible track means each having free end portions;
b. a slide body means having forward and aft ends;
c. first and second orifices formed along a horizontal axis of said slide body means in said forward and aft ends;
d. said flexible track means being threaded respectively and independently through said first and second orifices;
e. an independent handle means associated with each of the free end portions of said track means,
f. an anchoring means fastening each of said free ends to said handle means; and
g. said handle means being in the form of a generally closed loop and including an integrally formed shock absorbing bellows means through which end portions of said track means adjacent said anchoring means are passed;
h. whereby said slide body means is adapted to be propelled along said track means in a substantially straight line course and in a stabilized attitude when a first pair of end portions of said track means is maintained in a substantial side-by-side relationship while the opposite pair of end portions is subjected to rapidly applied divergent tensioning forces.

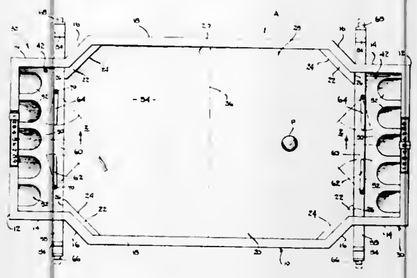
4,046,380

GAME APPARATUS WITH POSITIONAL STRIKERS

Adolph E. Goldfarb, Tarzana; Erwin Benkoe, Encino; Delmar K. Everitt, Woodland Hills; Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, all of Calif., assignors to Adolph E. Goldfarb and Erwin Benkoe, both of Northridge, Calif.

Filed Dec. 8, 1975, Ser. No. 638,550
Int. Cl.² A63F *7/00*
U.S. Cl. 273—119 R **17 Claims**

1. A game apparatus where a pair of opposed players attempt to propel a spherical playing piece toward and into a goal area at the opposite end of a playing surface, said apparatus comprising:
a. a game board defining a substantially solid playing surface having a goal area at each of a pair of opposed ends thereof,
b. said playing surface having a high section intermediate each of said goal areas and inclining downwardly from said high section toward each of said goal areas so that the spherical playing piece will always roll down one of said inclines toward one or the other of said goal areas,
c. rebound means surrounding said playing surface except at said goal areas to retain and repel a playing piece used on said playing surface,
d. a pair of support means disposed on said playing surface, each support means being located in relation to one of said goal areas being manually transversely shiftable in a direction generally normal to a line extending from one of said goal areas to the other of said goal areas,
e. at least one actuable striker means movable with each of said support means and being movable relative to said support means to engage the playing piece when actuated, and
f. means operatively associated with each support means and manually operable to actuate the striker element associated therewith, said support means being provided with portions which extend outwardly of said rebound means, said means to actuate the striker means being located at opposite ends of said support means, said striker actuating means comprising a pair of movable actuator members which each extend outwardly of one of the extended portions of the support means and are movable inwardly to actuate the striker means so that the user can grasp said extended portions with his hands and effect transverse movement of the support means while concurrently using the fingers of his hands to move the actuator members inwardly so as to actuate the striker means.



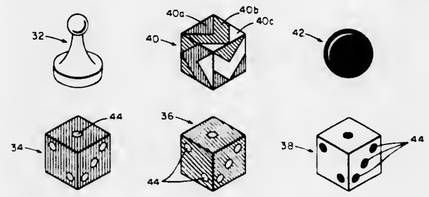
9. A method of playing a game where a playing piece can be moved across a substantially solid game board toward one or another of a pair of opposed goal areas by players actuating striker members, the game board being raised intermediate the goal areas and inclining downwardly toward said goal areas, said method comprising:
a. introducing a playing piece on said game board and causing said playing piece to move down an incline of the game board toward one or another of the goal areas,
b. attempting to engage and propel the playing piece approaching a goal area of a player by:
1. holding at least one outer end of a transversely movable support member associated with a goal area, and with said outer end being held with one of the individual hands of that player,
2. transversely shifting said support member associated with one of each of said goal areas in a direction generally transverse to a line extending between said goal areas by movement with said one hand of the player, and
3. generally contemporaneously with the transverse shifting movement of the support member actuating a striker element on the support member by manually actuating with said same one hand a striker actuator on the end of the support member in generally inward transverse movement from said end of said support member.

4,046,381

BOARD GAME WITH SELECTOR DIE

George E. Comeaux, 6 Brookside Circle, North Easton, Mass. 02356

Filed July 26, 1976, Ser. No. 708,733
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 AD **24 Claims**



13. A game for at least two players comprising in combination a board having a center section and at least one sector extending in a radial direction from said center section toward the periphery of said board, said sector being divided into a plurality of sections arranged in rows each extending in a direction generally transverse to said radial direction,
selector means for randomly generating an ordered sequence of digits,
a plurality of tokens each associated with one player and each occupying one of said sections, and
means for translating said ordered sequence of digits into movement of said tokens between sections of said board.

4,046,382

WORD GAME APPARATUS

George L. Ratzkoff, 6560 Racquet Club Drive, Lauderhill, Fla. 33319

Filed Apr. 28, 1976, Ser. No. 681,070
Int. Cl.² A63F *3/06*
U.S. Cl. 273—135 B **10 Claims**



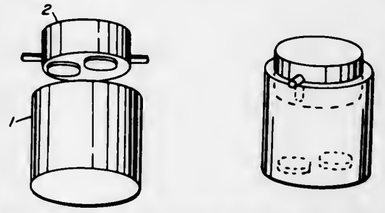
1. A game apparatus comprising:
a plurality of playing boards each having (comprising) a series of words (pertaining to the same topic) listed in a plurality of rows horizontally (and) disposed on the front face thereof, said words all comprising an equal number of letters and arranged in columns with said letters which occupy the same serial position in each of said words falling in the same column, each of said columns labelled with a numerical value, the rear face of said boards having said words and the definitions thereof disposed thereon the playing boards being divided into a plurality of sets wherein the playing boards within a set contain words pertaining to one specific topic, each playing board within a set having a unique arrangement of words;
a master board comprising a plurality of juxtaposed (justaposed) columns each having one of said numerical values at the top of each of said columns and the letters of the alphabet in sequential order listed in each column;
a score board with a grid disposed thereon the vertical rows thereof labelled with said topics (categories) and horizontal rows adapted to receive therein the players names, the vertical column furthermost from said names labelled "total";
a plurality of markers; and
a plurality of cards comprising random combinations of said numerical values and the letters of the alphabet disposed thereon.

4,046,383

MAGNETIC COLLECTION DEVICE FOR BINGO CHIPS AND SIMILAR GAME PARTS

Sam S. Vidnovic, 2803 Lafayette St., McKeesport, Pa. 15132

Filed Apr. 7, 1976, Ser. No. 674,485
Int. Cl.² A63F *9/00*
U.S. Cl. 273—148 R **2 Claims**



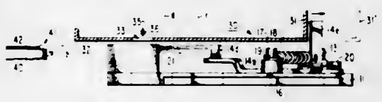
1. An apparatus for collecting game playing markers comprising:
a. a plurality of markers of material which is attracted by a magnetic force;
b. a magnet;
c. a hollow non-magnetic housing adapted to receive said manget,
1. said housing having sufficient interior dimension to allow said magnet to be moved a significant distance away from the interior surface of the bottom of said housing, and
2. said magnet being normally disposed against said interior surface of the bottom of said housing whereby said markers are attracted to and held against the exterior surface of the bottom of said housing;
d. means for moving said magnet within said housing away from the interior surface of the bottom of said housing whereby said markers are released; and
e. a container of non-magnetic material having a fixed bottom, sides and open top, said container being adapted to engage and activate said magnet moving means when said housing is inserted in said open top to move said magnet away from the interior surface of the bottom of said housing to release the markers into said container.

4,046,384

STYLUS CLEANING SYSTEM FOR DISC RECORD PLAYER

Thomas Francis Kirschner, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 16, 1976, Ser. No. 667,386
Claims priority, application United Kingdom, Dec. 8, 1975, 50279/75
Int. Cl.² G11B *3/58*
U.S. Cl. 274—47 **9 Claims**



1. In a disc record player including a turntable for rotatably

supporting a disc record during playback; and a pickup stylus subject to engagement with a record surface during said playback, said stylus being mounted at one end of a pickup arm, the opposite end of said pickup arm being pivotally mounted in a housing which is subject to translatory motion between a rest position clear of said turntable and playback positions over said turntable; apparatus comprising the combination of:

a brush comprising a holder, and a plurality of bristles secured in said holder;

means for fixedly supporting said holder in a location in proximity to said turntable and beneath the path of travel of said housing between said rest and playback positions; and

means for controlling the rotation of said stylus arm about an axis substantially parallel to the disc supporting surface of said turntable in a manner causing said stylus to protrude from said housing to a degree sufficient to engage said bristles and to be supported thereby, during occupancy of said rest position by said housing, and during travel of said housing between said rest position and an intermediate position between said rest position and said playback positions;

the elevation of said holder in its supported location being so related to the elevation of said disc supporting turntable surface that said stylus is supported by said bristles, during housing occupancy of said rest position, at an elevation substantially corresponding to the elevation of said stylus obtained during said record surface engagement.

4,046,385

RECORD PLAYERS

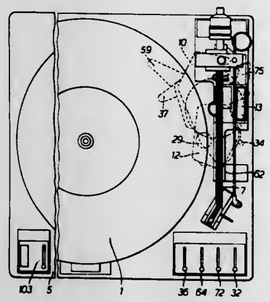
Brian Keith Hunt, Highworth, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Dec. 10, 1975, Ser. No. 639,479

Claims priority, application United Kingdom, Dec. 18, 1974, 54817/74

Int. Cl.² G11B *17/12*

U.S. Cl. 274—10 R 9 Claims



1. A control mechanism for use in a disc-record player having a unit plate, a motor-driven turntable mounted on said unit plate for rotation about an axis perpendicular thereto and having a record-supporting surface, a pickup arm, a pickup-arm carrier structure on which said pickup arm is mounted for pivotal up and down movement away from and towards said surface of the turntable, said pickup-arm carrier structure being equipped with a pickup-arm spindle extending through the unit plate for pivotal operation to move the pickup-arm across the turntable surface, and a pickup-arm lifting element, also extending through the unit plate, for operation to produce such pivotal up-and-down movement of the pickup arm; said control mechanism comprising: a cam gear having a ring of teeth and two cam surfaces which are rotatable with the cam gear and include a first cam surface controlling such up-and-down pivotal movement of the pickup arm and a second cam surface controlling such pivotal movement of the pickup arm across the turntable surface; a pinion rotatably mounted for driving engagement with said ring of teeth, the ring of teeth having, at a predetermined point of its circumference, a gap between successive teeth, wide enough to allow said pinion when facing said gap to rotate without driving the cam gear, said gap determining a position of rest for the cam gear; means for driving said pinion in a predetermined direction determining a forward direction in which the cam gear is driven by said pinion; trip means operable to produce movement of the cam gear in said forward direction from said position of rest through an angle sufficient to ensure engagement of said pinion with the teeth of said ring of teeth; and indexing means for opposing movement of the cam gear from said position of rest, - wherein the said first cam surface has a first ramp, operative, during the initial part of the forward rotation of the cam gear from a said position of rest, for lifting the arm away from said surface of the turntable to a raised position, a holding portion, following this first ramp and operative, during a subsequent part of such forward rotation, to maintain the arm in said raised position, and a second ramp, following said holding portion and operative after said holding portion, during a final part of the cam-gear movement before said position of rest is reached again, to allow the arm to move down from said raised position towards the turntable surface, the said first cam surface being so arranged that when the cam gear is in said position of rest, its said first cam surface can, while said pinion faces said gap, be rotated from said position of rest in a reverse direction, opposite to said forward direction, by an amount sufficient for said second ramp to move the pickup arm to said raised position, the mechanism further including a cueing member operable when the cam gear is in said position of rest, to produce such rotation of said first cam surface in said reverse direction; return spring means for returning said first cam to the said position of rest in said forward direction when said cueing member is released; and damping means operative to damp such return movement.

4,046,386

CONTROL DEVICE

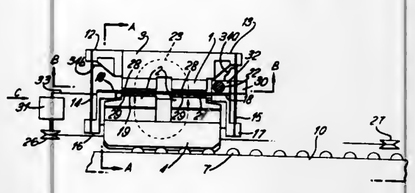
Alexander Bennett Gosling; Keith Douglas Ridler; Frederick James Easthope, and Colin Howard Stanwell-Smith, all of Cambridge, England, assignors to Stratheara Audio Limited, Belfast, Northern Ireland

Filed Feb. 27, 1976, Ser. No. 661,983

Claims priority, application United Kingdom, Feb. 28, 1975, 8501/75

Int. Cl.² G11B *3/38*

U.S. Cl. 274—23 A 5 Claims



1. A phonograph including a pick-up arm, a first carrier member, the pick-up arm being mounted on the first carrier member, a second carrier member, the second carrier member being mounted for movement along a predetermined straight path, resilient means mounting the first carrier member upon the second carrier member for movement of the first carrier member relative to the second carrier member in directions parallel to the said path, electric motor means for moving the second carrier member along the path, electro-magnetic coupling means between the first and second carrier members, the electro-magnetic coupling means being constituted by a magnet attached to one of the carrier members and a coil attached to the other carrier member, and sensor means for detecting any displacement of the arm from a desired position, a control circuit coupled to the output of the sensor means and means to couple from the control circuit a first electric signal in a first higher frequency band to the coil and a second electric signal in a second lower frequency band to the motor means to move the first and second carrier members in such a way as to tend to compensate for any displacement of the arm from the desired position.

4,046,387

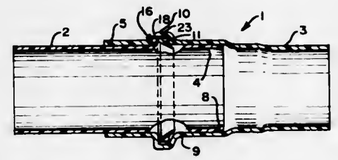
DEVICE FOR INDICATING THE PRESENCE OF A GASKET

Dalton I. Lee, 900 DeLaird Drive, St. Louis, Mo. 63137

Filed Sept. 16, 1976, Ser. No. 723,991

Int. Cl.² F16J *15/00*

U.S. Cl. 277—2 9 Claims



1. In a plastic pipe system including a first pipe, a second pipe, said second pipe having a first end formed to receive an end of said first pipe, said first end having a groove formed in it for receiving a gasket for sealing the joint between said first and said second pipes, the improvement comprising means for indicating proper placement and presence of the gasket after joining of said first and said second pipes, said gasket present indicating means comprising a tab extending axially outwardly from said gasket, said second pipe having an opening in it along said groove for permitting passage of said tab, said tab extending in a direction generally parallel to the axis of said first and said second pipe.

4,046,388

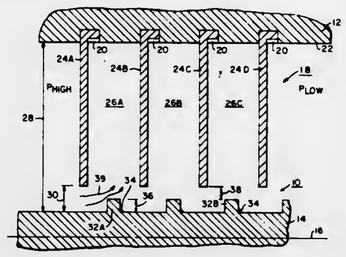
SEAL ARRANGEMENT UTILIZING DEFLECTOR SEALS OF REDUCED RADIAL DIMENSION

Charles A. Meyer, Upper Providence, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 9, 1976, Ser. No. 665,347

Int. Cl.² F16J *15/50*

U.S. Cl. 277—53 1 Claim



1. A seal arrangement between a stationary member and a rotatable member disposed therein so as to have a predetermined gap therebetween defining an annular space for reducing the flow of fluid across said annular space from a high pressure to a low pressure region, said seal arrangement comprising:

a plurality of spaced apart circumferential seal strips extending generally radially into said annular space from one of said members and having distal margins spaced from the other of said members;

a plurality of spaced apart circumferential deflector strips extending generally radially into said annular space a distance that is generally 50% to 75% of the distance from the distal margin of the seal strip to the other member and the deflector strips having distal margins spaced from said one member;

said seal and deflector strips being spaced apart axially generally on the same pitch and disposed generally one-half pitch out of phase with respect to the other so that if extended radially, they would interdigitate and each strip extends into said space a distance such that the sum of the radially extending distance of adjacent opposing strips is less than the gap between the stationary and rotatable members.

4,046,389

STUFFING BOX

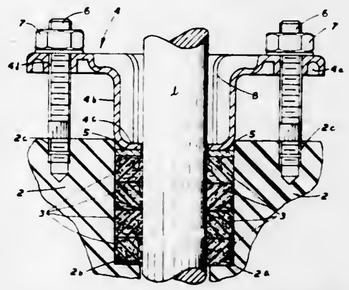
Kurt Holzenberger, Frankenthal, Pfalz, Germany, assignor to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Germany

Filed July 8, 1976, Ser. No. 703,631

Claims priority, application Germany, Aug. 2, 1975, 2534651

Int. Cl.² F16J *15/18*

U.S. Cl. 277—113 6 Claims



1. In a stuffing box wherein a receptacle surrounds a portion of a movable member and confines at least one packing which surrounds the movable member and is urged against the periphery of such member and against the internal surface of the receptacle by a gland which is adjustable axially of the movable member to thereby select the extent of deformation of the packing, the improvement which consists in that said gland comprises an annular first section comprising a substantially flat washer spacedly surrounding the movable member and abutting against the packing in the receptacle, and a cupped second section consisting of deep drawn metallic sheet material adjustably secured to the receptacle and engaging with the first section opposite the packing, said second section spacedly surrounding the movable member and having reinforcing means consisting of longitudinal ribs which prevents permanent deformation of said second section under the action of forces which develop when said first section is biased against the packing by said second section.

4,046,390

DEAD STOP STEP CHUCK

Russell H. Dunham, New Fairfield, Conn., assignor to The Dunham Tool Company, Inc., New Fairfield, Conn.

Filed Feb. 27, 1976, Ser. No. 662,198

Int. Cl.² B23B *31/20*

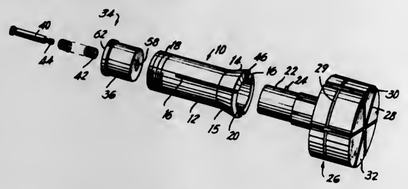
U.S. Cl. 279—1 S 6 Claims

1. A dead stop chucking assembly for collets, comprising

a. a chucking body comprised of soft metal with a plurality of circumferentially spaced longitudinally extending slots therein;

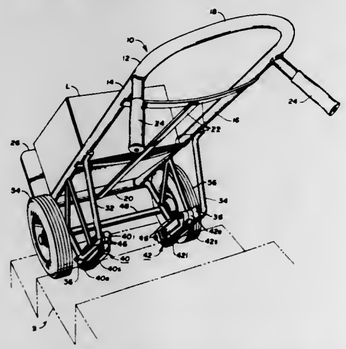
b. a tubular shank extending from the rear face of said body, adapted to be received into the front of a collet bore;

c. a spring collar adapted to be received into the rear end of said collet bore;
d. spring biased screw means adapted to extend through said collar and engage said shank portion in a collet in which it is inserted; the improvement characterized by
e. said chucking body being enlarged to provide a rear spindle engaging surface;
f. said spring collar having an annular abutment defining the extent of insertion thereof into the rear of a collet bore;
g. a radially extending locating pin on said shank portion for longitudinal sliding engagement with a slot in a collet engaged by said assembly;



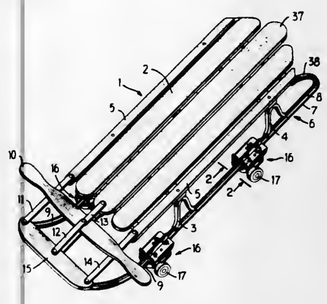
h. an axial bore extending from the rear face of said chucking body shank forwardly to a point spaced from the front face of said chucking body;
i. an elastomer plug received in said axial bore;
j. said spring biased screw means and said annular abutment cooperating at the rear end of a collet in which they are inserted, for biasing the front face of said collet against the rear face of said enlarged chucking body; and
k. said rear face of said enlarged chucking body cooperating with the front face of a spindle upon which it is mounted, preventing axial movement of said chucking body upon closure of said collet.

4,046,391
STAIR CLIMBING AND DESCENDING ATTACHMENT FOR A HAND TRUCK
Everett L. Rostad, Faribault, and Roger W. Pitan, Medford, both of Minn., assignors to Nutting Truck and Caster Company, Faribault, Minn.
Filed June 14, 1976, Ser. No. 695,582
Int. Cl.² B62B *1/04*
U.S. Cl. 280—5.24 **6 Claims**



1. A stair climbing and descending attachment for use with a hand truck to support the hand truck slidably on the edge of a stair, the attachment comprising:
frame means for rigid attachment to the hand truck; and
slide means including a low-friction material secured to said frame means for slidably engaging the stair edge;
said slide means including a pair of elongated rail members secured to said frame means;
each said elongated rail member including an elongated slide secured thereto, which elongated slide is comprised of said low-friction material for slidably engaging the stair edge;
said frame means further including two truss members each having one of said elongated rail members secured thereto;
said elongated rail members being substantially identical and each comprising two substantially identical half members, each of which is symmetrical about a plane bisecting it transversely, secured together with a face of one half member in contact with a face of the other half member to capture one of said elongated slides therebetween; and
said elongated slides, each of which is symmetrical about a plane bisecting it transversely, being substantially identical.

4,046,392
ROLLER SLED
Edward Dredger, 2752 E. 22nd St., and Thomas Passantino, 26-42 E. 7th St., both of Brooklyn, N.Y. 11235
Filed July 12, 1976, Ser. No. 704,412
Int. Cl.² B62B *13/18*
U.S. Cl. 280—8 **6 Claims**

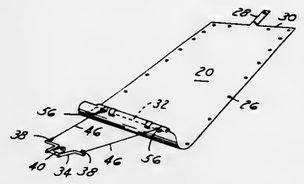


1. A roller sled comprising a bed, a pair of forward and rearward braces attached adjacent each side of said bed and extending downwardly therefrom, an inverted T-shaped runner formed of a lower runner blade and an upper ridge attached to each pair of braces and having a flexible portion forward of said forward brace, a steering bar linkably connected to said bed and to said flexible portion of each runner, and removable clamping means for mounting roller wheels onto said runners forward of each of said forward braces and adjacent said rearward braces; said removable clamping means comprising an upper member and a lower member having at least one roller wheel rotatably mounted thereon, said upper member having a longitudinal central groove closely fitting said runner ridge and a downwardly extending flange at the rear end thereof having a central notch, said lower member having a longitudinal central groove closely fitting said runner blade and an upwardly extending flange at the forward end thereof having a central notch, said rear flange of the upper member abutting against the rear end of said lower member and said forward flange of the lower member abutting against the forward end of said upper member, one of said two members having means along each side thereof for lockably engaging the corresponding side of the other member.

4,046,393
PORTABLE SLED
Kenneth Vadnais, 20322 Beatrice, Livonia, Mich. 48152
Filed Mar. 4, 1976, Ser. No. 663,771
Int. Cl.² B62B *15/00*
U.S. Cl. 280—19 **19 Claims**

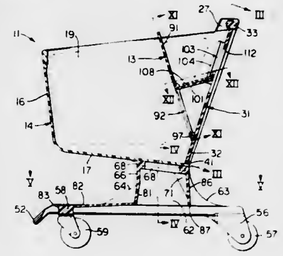
1. A portable sled comprising, an oblong flexible plastic sheet having a front end and a back end, a bar extending transversely along at least a portion of the front end of the sheet and

fastened thereto, the bar including engagement means at one end thereof, a separate crankhandle, engagement means on the crankhandle adapted to engage the engagement means on the bar thereby permitting rotation of the crankhandle to tightly



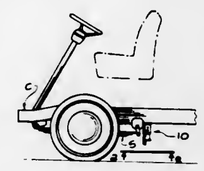
roll up the sled, and, separate attachment means on the sled and separate attachment means on the crankhandle to permit at least one alternative attachment of the crankhandle with the sled.

4,046,394
SHOPPING CART
William A. Thompson, Jr., Toms River, N.J., assignor to Roblin Industries, Inc., Battle Creek, Mich.
Filed Oct. 3, 1975, Ser. No. 619,298
Int. Cl.² B67B *3/02*
U.S. Cl. 280—33.99 B **19 Claims**



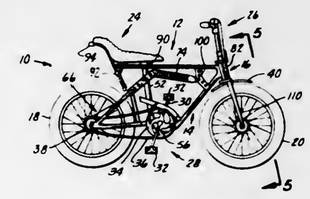
1. In a basket having a collapsible baby seat assembly mounted on one wall thereof, comprising the improvement wherein:
said one wall of said basket has a pair of substantially vertically extending rails fixedly mounted thereon and disposed in spaced parallel relationship, said one wall being molded in one piece of a plastics material and said rails being an integral molded part of said one wall, said pair of rails defining a pair of grooves which extend longitudinally of the rails and open in opposite relationship to one another, said rails also having stop means associated therewith for effectively closing off the lower ends of said grooves;
said baby seat assembly including a backrest member hingedly mounted on said one wall, said backrest member being molded in one piece of a plastics material and including a substantially planar platelike back portion and a pair of substantially parallel support arms fixed to one edge of said back portion and projecting downwardly therefrom substantially within the plane defined by said back portion, said arms having the lower free ends thereof hingedly connected to said one wall in the vicinity of the lower edge thereof; and
said baby seat assembly also including a substantially planar seat member hingedly connected adjacent one edge thereof to said backrest member in the vicinity of the junction between the back portion and the support arms, said seat member also being molded in one piece of a plastics material and including a pair of guide means which project into and are slidably and rotatably received within the grooves formed in said rails.

4,046,395
METHOD AND APPARATUS FOR REDUCING VEHICLE SIDE SWAY
Paul W. Smith, III, P.O. Box 868, Burbank, Calif. 91503
Filed Oct. 29, 1975, Ser. No. 626,900
Int. Cl.² B62D *21/00*
U.S. Cl. 280—106.5 R **12 Claims**



1. An arm adapted to substantially reduce the side sway of a vehicle due to twisting of the vehicle frame side-rails where such vehicle utilizes leaf springs and spring shackle plates secured to the side-rails of the vehicle frame, said side-rails having a bottom flange, comprising:
a rigid arm rigidly connected at opposite ends to the rear shackle plates of the front leaf springs at or immediately rearward of the vertical center line of said shackle plates, said shackle plates being secured to straightened frame side-rails; and,
means for connecting the arm to the bottom flanges of the respective side-rails to prevent said flanges from twisting.

4,046,396
HEAVY DUTY DIRT BICYCLE AND FRAME THEREFOR
James Michael Morrison Taylor, 3404 Castor St., Santa Ana, Calif. 92704, and Gene R. Troke, 15343 Illinois Ave., Paramount, Calif. 90723
Filed Feb. 25, 1976, Ser. No. 661,362
Int. Cl.² B60K *25/04*
U.S. Cl. 280—281 R **1 Claim**



1. A heavy-duty bicycle which comprises:
a. front and rear wheels,
b. handlebars,
c. a bicycle seat,
d. frame means for mounting said front and rear wheels, said handlebars and said seat, said frame means including a continuous main frame member, said member having an elongate, upwardly and rearwardly projecting first portion, an elongate upwardly and forwardly projecting second portion and an arcuate intermediate portion joining lower ends of the first and second portions into a planar, generally broad V-shaped structure,
a front wheel fork swivel socket and means fixing the socket to an upper end of the second main frame portion, the axis of the socket being in the plane of the frame member,
a front wheel fork having a pivot tube pivotally received

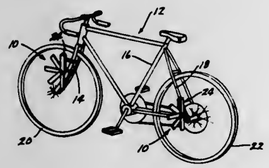
by the swivel socket, and having a pair of mutually spaced, opposing elongate tubular front wheel mounting members, and including reinforcing elements disposed within at least upper portions of the mounting members,

the reinforcing elements each comprising an elongate formed metal angle configured to tightly engage inner surfaces of the mounting members when inserted thereinto, thereby being retained in the installed position by spring action of the angle, the angle formed by the legs of the reinforcing elements being about 60° and wherein, upon installation, the apexes of the elements are directed generally forwardly.

e. drive means cooperating with said frame means for causing movement of the bicycle, said drive means including a pedal crank hub, and

f. means joining said hub to a generally forward facing surface of the said main frame member relatively adjacent the intersection of the first and intermediate portions and relatively remote from a lowest point of the intermediate portion, with the axis of the hub orthogonal to the plane of the frame member, the hub being thereby positioned within the boundaries of the frame member and being protected thereby from damage during use of the bicycle.

4,046,397
REFLECTOR DEVICE FOR BICYCLES
John V. Kitrell, 1830 N. 49th, Lincoln, Nebr. 68504
Filed June 1, 1976, Ser. No. 691,822
Int. Cl.² B62J 5/20
U.S. Cl. 280—289 R 9 Claims



1. A safety reflector device, comprising, a support means,

and a plurality of flat, substantially rectangular members having opposite ends and opposite sides, said members being selectively pivotally secured, at one end thereof, to said support means,

said members having a light reflective surface on at least one side thereof,

said members being selectively pivotally movable from a superimposed stored position to a fan-shaped operative position,

said members having substantially their entire lengths spaced from each other, when in said operative position, so that the device will present a large reflective mass when viewed from a distance and so that the device will become a distinguishable object as the light source approaches the device from said one side.

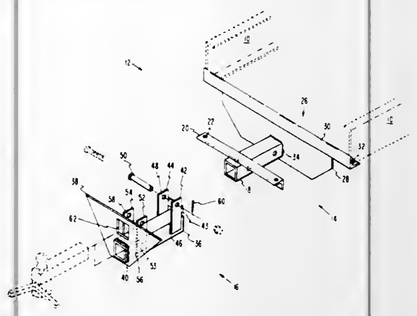
4,046,398
HIGH CLEARANCE VEHICLE HITCH
George O. Dunwoody, 62 E. 106th Place, North Glenn, Colo. 80233
Filed May 26, 1976, Ser. No. 690,008
Int. Cl.² B60D 1/16
U.S. Cl. 280—415 R 8 Claims

1. A vehicular hitch for use with a high clearance vehicle and having multiple hitch placements comprising:

a. a first hitch assembly rigidly attached to a vehicular frame and positioned at essentially the height of said vehicular frame;

b. said first hitch assembly comprising a first tubular rectangular cylinder adapted to receive a hitch and a first support securing a first end of said first tubular rectangular cylinder to the said vehicular frame and a second support securing a second end of said first tubular rectangular cylinder to said vehicular frame;

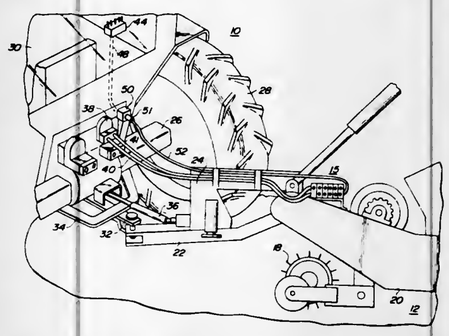
c. a second hitch assembly removably attached to said first hitch assembly and positioned generally vertically removed from said first hitch assembly in a downward direction;



d. said second hitch assembly being removable in such a way that upon removal of said second hitch assembly, essentially no part of said vehicular hitch extends vertically below said first hitch assembly; and

e. said second hitch assembly comprising a second tubular rectangular cylinder adapted to receive a hitch and a plate secured to a first end of said second tubular rectangular cylinder and containing an opening therethrough adapted to interact with said first end of said first tubular rectangular cylinder.

4,046,399
ELECTROHYDRAULIC SYSTEM FOR TOWED VEHICLE
Kenneth W. Zeuner, Newtown, and Alonzo B. Jarman, Wrightstown, both of Pa., assignors to Control Concepts, Inc., Newtown, Pa.
Filed Nov. 5, 1975, Ser. No. 628,967
Int. Cl.² B60D 1/08
U.S. Cl. 280—420 14 Claims



1. In a vehicle towed by a tractor having a cab, the towed vehicle having a frame and hydraulic functions powered by a plurality of hydraulic devices to be controlled in which the improvement combination comprises:

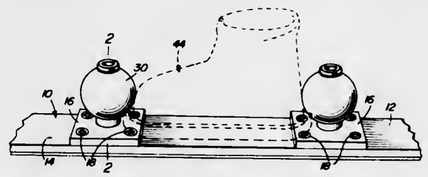
an electrohydraulic valve assembly having solenoid operated valves, said electrohydraulic valve assembly being hydraulically coupled to said plurality of hydraulic devices and rigidly secured to said frame of said towed vehicle,

a switching assembly comprising a plurality of switching devices adapted for electrically switching said solenoid operated valves thereby to control said plurality of hydraulic devices, said switching assembly disposed within said cab for easy access of said plurality of switching devices to the operator of said tractor,

electrical cable means coupled between said switching assembly within said cab and said electrohydraulic valve assembly secured to said towed vehicle frame, and

means directly electrically connecting each of said switching devices to an individual pair of said solenoid valves, said valve assembly including an unload valve normally maintained open and hydraulically coupling the pressure and tank of said tractor whereby upon actuation of each switching device one solenoid valve of the respective pair is energized and said unload valve is switched to the valve closed state.

4,046,400
BALL SKI BINDING
Felix A. Viletto, 116 Ford City Road, Freeport, Pa. 16229
Filed May 12, 1976, Ser. No. 685,883
Int. Cl.² A63C 9/08
U.S. Cl. 280—626 19 Claims



1. In combination, a horizontal ski defining a ski boot sole receiving area, a ski boot disposed on said ski in said area, and first and second coacting means on said ski and boot releasably retaining said boot on said ski, said boot including toe and heel portions defining upwardly and outwardly opening oppositely inclined V-shaped notches defining said second means, said first means including a pair of abutment members having adjacent portions defining downwardly facing partial spherical abutment surfaces opposing and seated in said notches, support means supporting said abutment members in predetermined positions on said ski and for limited shifting of each abutment member upwardly away from said ski in all directions within an inverted conical zone thereabove, said support means including shifting resisting means yieldingly resisting shifting of said abutment members from said predetermined positions.

4,046,401
FOLDING BABY CARRIAGE
Kenzou Kasai, Higashihimiru, Japan, assignor to Kasai Kabushikikaisha, Osaka, Japan
Filed May 24, 1976, Ser. No. 689,463
Claims priority, application Japan, Dec. 4, 1975, 50-145550
Int. Cl.² B62B 11/00
U.S. Cl. 280—650 1 Claim

1. A folding baby carriage comprising:

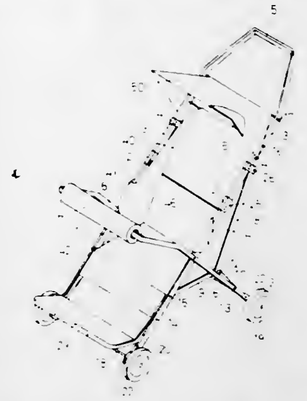
a pair of front leg members provided with front wheels rotatably mounted on lower ends thereof;

a pair of rear leg members pivotally connected to said front leg members and provided with rear wheels rotatably mounted on lower ends thereof, said rear legs being a first U-shaped bar having a center portion which forms a protecting portion;

a pair of supporting bars which are connected backwardly rotatable to upper ends of said front leg members by rotatable joints, said supporting bars being a second U-shaped bar having a center portion which forms a handle;

a pair of first connecting bars respective first ends of which are pivotally connected to said front leg members by a first reinforcement bar positioned transversely between said front leg members;

a pair of second connecting bars respective first ends of which are pivotally connected to said rear leg members by

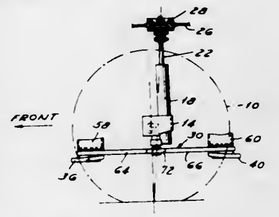


a second reinforcement bar positioned transversely between said rear leg members;

a pair of third connecting bars and attachment means, first ends of said pair of said third connecting bars being pivotally connected to said pair of supporting bars by said attachment means; and

a pivoting bar pivotally connecting all other ends of said pairs of first, second and third connecting bars.

4,046,402
BALL JOINT SUSPENSION FOR A MOTOR VEHICLE
William D. Allison, Grosse Pointe Farms, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed July 7, 1975, Ser. No. 593,802
Int. Cl.² B60G 11/18
U.S. Cl. 280—674 4 Claims



1. A ball joint suspension for a motor vehicle having a vehicle frame;

a wheel positioning member connected to said vehicle frame;

a wheel support member constructed to rotatably support a road wheel;

said wheel positioning member having fore and aft branch portions connected to said vehicle frame and a laterally extending portion comprising parallel rods that are interconnected at their outer ends by a loop;

said loop defining a small opening in which the socket of a ball joint is secured by a press fit;

reinforcing means engaging said parallel rods adjacent said loop;

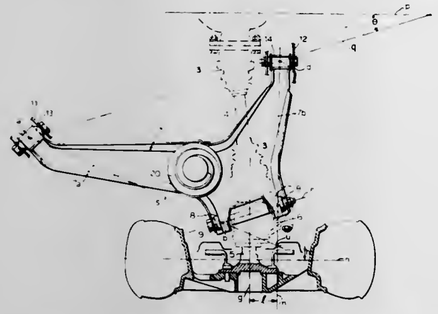
said joint having a stud connected to said wheel support member.

4,046,403

STRUT TYPE INDEPENDENT SUSPENSION SYSTEM FOR AUTOMOBILES

Hiroshi Yoshida, Toyokawa, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1976, Ser. No. 656,696
Claims priority, application Japan, Feb. 17, 1975, 50-18766; Dec. 22, 1975, 50-153115
Int. Cl.² B60G 3/06
U.S. Cl. 280—701 18 Claims



1. A strut type independent suspension system for a non-steerable wheel of a road vehicle, comprising a unitary suspension arm having two vehicle body pivotal support points thereon spaced generally in the direction of the length of the vehicle and two axle housing pivotal support points spaced generally in the direction of the length of the vehicle, an axle housing mounted on said suspension arm for rotation only around an axis between said axle housing pivotal support points, an axle on said axle housing extending perpendicular to the length of said vehicle, the vehicle body pivotal support point and the axle housing support point which are farthest from the middle of the vehicle body along the length thereof when viewed on a horizontal projection lying on a line parallel to said axle, said vehicle body support points when viewed on a horizontal projection lying on a line which is at an angle to the axis of said axle with the vehicle body support point of said line parallel to said axle lying closer to the center of the vehicle than the other vehicle body support point, said axis between said axle housing support points when viewed on a horizontal projection being parallel to said line on which said line between said vehicle body support points, and support means having one end connected to said axle housing and having the other end for connection to the vehicle body.

4,046,404

CARBONLESS PAPER FOR USE IN ELECTROSTATOGRAPHIC COPIERS

George Treier, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 26, 1976, Ser. No. 744,917
Int. Cl.² B41L 1/36; B32B 3/00
U.S. Cl. 282—27.5 17 Claims

1. A carbonless paper sheet suitable for imaging in electrostatographic copiers which comprises a base sheet of paper making fibers having uniformly distributed therein from about 0.05 to 10 weight percent of hollow, generally spherical particles ranging in diameter from ¼ to about 200 microns, said carbonless paper also containing a color forming material encapsulated in discrete capsules and/or a color developing material.

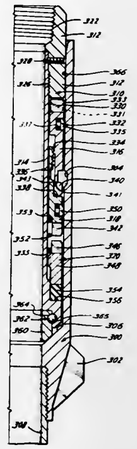
6. The paper sheet of claim 1 wherein a color forming material encapsulated in discrete capsules is coated on one side thereof along with a binder to hold the capsules in place.

4,046,405

RUN-IN AND TIE BACK APPARATUS

James Vaull Bonds, Houston, Tex., assignor to McEvoy Oilfield Equipment Co., Houston, Tex.

Continuation of Ser. No. 253,516, May 15, 1972, abandoned. This application Jan. 22, 1975, Ser. No. 543,123
Int. Cl.² F16L 35/00
U.S. Cl. 285—3 61 Claims



1. A casing hanger in combination with a second tool for supporting conduit and for connecting such conduit to a riser having righthand rotated engageable connections, comprising:
a tubular body;
means for supporting such conduit from said tubular body;
fastening means for unfastening a first tool attached to such riser from said tubular body; said fastening means permitting the unfastening of said first tool from said tubular body upon a righthand rotation of such riser;
connecting means for connecting a second tool attached to such riser to said tubular body; said connecting means permitting the connecting of said second tool to said tubular body upon a righthand rotation of such riser, and
said second tool including means for disconnecting said second tool from said connecting means upon a downward force on a portion of said second tool and then an upward lift on said second tool.

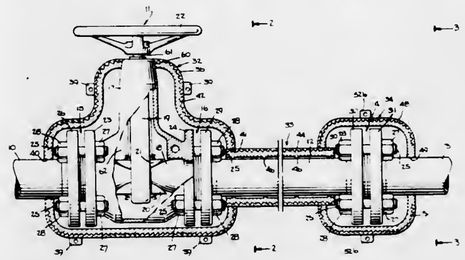
4,046,406

FIRE-SAFE JACKET FOR FLUID PIPING COMPONENTS

Irving D. Press, West Orange; Helm A. Rink, North Haledon, and Harvey R. Nickerson, Roseland, all of N.J., assignors to Resistoflex Corporation, Roseland, N.J.

Filed May 15, 1975, Ser. No. 577,849
Int. Cl.² F16L 59/16
U.S. Cl. 285—47 12 Claims

10. A fire-safe plastic-lined fluid piping component comprising a metal piping component lined with a heat softenable plastic material, and a jacket surrounding said component with a predetermined air gap between the exterior of said component and the interior of said jacket, said jacket comprising a layer of metallic skeletal material disposed within a body of fibrous refractory material united with an inorganic bonding material to form a substantially impact and crush resistant enclosure and cooperating with adjacent piping portions to contain a substantially fixed air volume therebetween, said fibrous material being capable of withstanding a flame temperature in excess of 1200° F., and all surfaces of said jacket are sealed with a coating layer of a liquid-impermeable material.

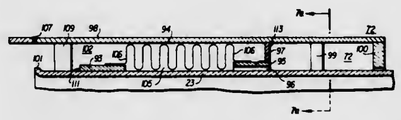


4,046,407

ELONGATED CRYOGENIC ENVELOPE

Tom Porreco, Denver, Colo., assignor to Cryogenic Technology, Inc., Denver, Colo.

Filed Apr. 18, 1975, Ser. No. 569,474
Int. Cl.² F16L 39/00
U.S. Cl. 285—133 R 4 Claims



1. A cryogenic structure comprising a plurality of elongated cryogenic envelope sections, each section including:
an inner tube;
an outer tube generally coaxial with said inner tube;
means for supporting said inner tube within said outer tube, said means for supporting including a means for providing a vacuum in at least a portion of the volume between said inner tube and said outer tube; and, wherein:
the outer tubes of said sections are joined together to form a continuous outer tube, but the inner tubes of at least two of said sections are unjoined so that fluid passing through the inner tubes is permitted to pass between said unjoined portions and said unjoined portions are permitted to move relative to each other during contraction or expansion, the adjacent ends of said inner tubes being flared outwardly toward said outer tube to allow objects to be pulled through said inner tubes without snagging thereon.

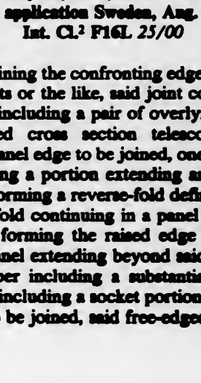
4,046,408

OMNI-DIRECTIONAL FASTENER

Steven Aumit, 124 E. 61st. St., New York, N.Y. 10021

Continuation of Ser. No. 385,408, Sept. 3, 1973, abandoned. This application Aug. 20, 1975, Ser. No. 605,984
Int. Cl.² F16L 25/00; A44B 17/00
U.S. Cl. 285—188 4 Claims

1. A fastener assembly comprising in combination:
first and second interlockable resiliently flexible fastener strips each having a continuous sheet form longitudinally extending web portion and each having a resiliently flexible longitudinally extending locking portion;
each of said fastener strips having said web and locking portions thereof integrally connected in substantially a common plane, and said web portion providing connecting means;
each locking portion having a first two continuous shaped locking profile ribs extending therealong and projecting a first lateral direction;
each locking portion having a second two shaped locking profile ribs extending continuously therealong projecting in a second opposite direction;
each of said ribs projecting individually from its locking portions
each of said first and second two shaped ribs of each locking portion having a continuous locking groove therebetween interlockingly receptive of the locking profile of sid ribs and either of said two ribs of either locking portion being adapted to interlock into either of the grooves of the other locking portion;
said grooves being of the same size on both sides of said locking portions and said ribs being of the same sized on



both of said locking portions so that said fastener strips may be interlocked from either lateral direction;
each web portion extending in a respective plane which is substantially parallel to the plane of the other web portion when the ribs and grooves are interlocked;
each of said ribs being individually resiliently flexible and being arrow shaped with a central tip and barbs extending laterally at each side of the tip so that in the interlocked relation of the fastener strips two selected ribs of the first strip will be interlocked with two selected ribs of the second strip;
and the distance between said barbs at each groove being less than the width of each rib between its barbs so that the ribs can snap into interengagement andthe barbs will retain the locking portion interlocked.

4,046,409

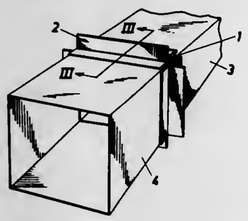
JOINING ARRANGEMENT FOR VENTILATION DUCTS AND THE LIKE

Eskil Virgin, Kungalv, Sweden, assignor to Vavra Plat AB of Kungalv, Sweden

Filed July 14, 1976, Ser. No. 705,017
Claims priority, application Sweden, Aug. 13, 1975, 7509047
Int. Cl.² F16L 25/00
U.S. Cl. 285—305 2 Claims

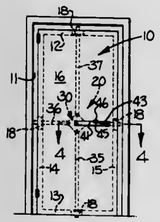
1. A joint for joining the confronting edge portions of panels of ventilation ducts or the like, said joint comprising:
a first member including a pair of overlying legs defining a flat, U-shaped cross section telescopically receiving therein one panel edge to be joined, one leg of said pair of legs comprising a portion extending angularly from said one leg and forming a reverse-fold defining a raised edge, said reverse-fold continuing in a panel portion overlying said one leg forming the raised edge and comprising a free-edged panel extending beyond said one leg; and
a second member including a substantially flat, S-shaped cross section including a socket portion receiving another panel edge to be joined, said free-edged panel of the first

member extending into a second socket portion of said S-shaped cross section, said second socket portion of the S-shaped cross section continuing in a reverse-folded stiffening portion extending outwardly from said S-shaped



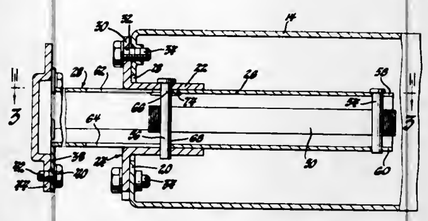
cross section, said stiffening portion including a laterally projecting portion extending away from the stiffening portion and overlying the U-shaped cross section and including a depending hook portion snappingly-engaged onto said raised edge.

4,046,410
FOUR WAY SECURITY DOOR
Robert I. Connell, 896 S. Main St., Mount Holly, N.C. 28120
Filed May 27, 1976, Ser. No. 690,566
Int. Cl.² E05C *1/12*
U.S. Cl. 292—36 10 Claims



1. A security door assembly adapted for securing the sides of a door in locking engagement with an adjacent door jamb structure, said door assembly comprising a rectangular frame having interconnected upper, lower, and opposing side members which collectively define the respective peripheral edges of the door; front and rear substantially rectangular panels mounted on opposite sides of said rectangular frame coextensive therewith and defining the front and rear faces of the door with a hollow interior portion located therebetween; respective openings provided in medial portions of each of the upper, lower, and opposing side members of said frame and communicating with the hollow interior portion of the door; respective guide means provided within the hollow interior portion of the door and adjacent the respective openings in the upper, lower and opposing side frame members of said door, rotatable plate means located within the hollow interior portion of the door; means cooperating with said rotatable plate means and with said frame and mounting said plate means for rotatable movement about a predetermined axis located medially of the plate means; four elongate locking members positioned within the hollow interior portion of the door, a distal end portion of each of said locking members cooperating with a respective one of said guide means and being positioned for protruding through a respective peripheral edge of the door; means cooperating with the proximal end portions of the respective elongate locking members for pivotally connecting the same to said rotatable plate means at locations radially spaced from said predetermined medial axis thereof so that when the plate means is rotated, the respective locking members are moved longitudinally to protrude from the respective peripheral edges of the door and engage the adjoining door jamb structure to lockingly secure the door in place; an operating lever located on the rear face of the door and cooperating with said rotatable plate means so as to permit manually rotating the same; and a pair of hasp means carried respectively by the rear face of said door and by said operating lever, said pair of hasp means having portions thereof overlying one another with an opening therethrough adapted for receiving a padlock so as to lockingly secure the door in locked position with the locking members extending from the peripheral edges of the door in locking engagement with the adjoining door jamb structure.

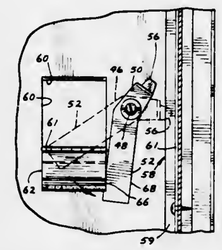
4,046,411
IMPACT ENERGY ABSORBING MOUNTING UNIT FOR MOUNTING AN AUTOMOTIVE VEHICLE BUMPER ASSEMBLY
Raymond L. Richard, Jr., Port Clinton, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 1, 1976, Ser. No. 746,421
Int. Cl.² B60R *19/06*
U.S. Cl. 293—88 2 Claims



1. An impact energy absorbing unit mounting a bumper assembly to a support on an automotive vehicle comprising a one piece hollow cylindrical body terminating at one end in a plurality of integral mounting straps that extend radially outwardly of said body for attachment to said bumper assembly, means attaching each of said straps to said bumper assembly, said straps being arcuately spaced from one another, said cylindrical body having diametrically aligned notches formed in the other end thereof and further having a pair of aligned elongated tracks extending along opposite sides of said body, a bracket for attachment to said vehicle supporting said body for longitudinal movement therethrough, a first pin mounted in said notches and a second pin extending through said bracket and received in one end of said elongated tracks, resilient energy absorbing means disposed in said cylindrical body and extending around said first and second pins and yieldable in response to an impact load applied to said bumper assembly causing said body to longitudinally move in said bracket to extend said energy absorbing means which dissipates the energy of said impact load, said energy absorbing means providing a force restitution to return said body toward an original pre-impact position in response to removal of the impact load from said bumper assembly.

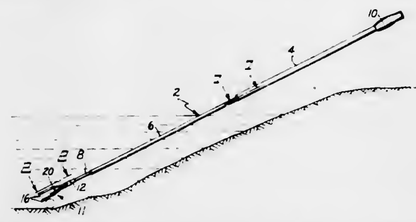
4,046,412
CABINET WITH LOCK RELEASE
Walter F. Lee, Bloomington, Minn., assignor to J. N. Johnson Company, Inc., Minneapolis, Minn.
Filed Jan. 30, 1976, Ser. No. 653,942
Int. Cl.² E05C *3/08*
U.S. Cl. 292—200 3 Claims

1. A cabinet with lock release comprising:
a. first and second sidewalls connected to
b. a bottom wall and
c. a top wall,
d. a door pivotally connected to a sidewall,
e. a lock mounted on said door and extending within said cabinet,
f. a latch arm pivotally connected to the inner end of said lock for operation by said lock and including a lip at one end engageable with
g. catch means carried by a wall of said cabinet internally thereof,
h. said latch arm including a leg portion at the other end,
i. said door having an opening formed therein adjacent said lock,



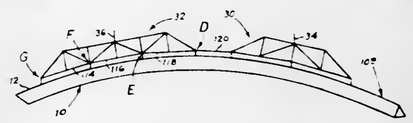
j. a plate pivotally mounted on the door at the edge of the opening and forming a closure for the opening,
k. said plate pivotally movable from the opening into the cabinet with the edge of the plate contacting and pivoting said leg portion of said latch arm independent of said lock for disengagement of said lip of said latch arm from said catch means to allow opening of said door.

4,046,413
GOLF BALL RETRIEVER
John Jeninga, Delavan, Wis., assignor to Atlantic Products Corporation, Trenton, N.J.
Filed Sept. 14, 1976, Ser. No. 723,598
Int. Cl.² A63B *47/02*
U.S. Cl. 294—19 A 5 Claims



1. In a golf ball retriever having an elongated handle, a ball retainer secured to said handle, an opening in one side of said retainer large enough to pass a golf ball therethrough and a pivoted gate within said retainer freely swingable to but not through said opening to hold a golf ball in said retainer and swingable away from said opening to admit a golf ball therethrough and past said gate, the improvement comprising:
said retainer being in the form of two spaced loops lying in planes generally parallel to the axis of said handle and extending from one end thereof, said gate being pivoted to said handle between said loops and swingable to but not through either of said loops whereby a golf ball may enter said retriever through either one of said loops and be discharged therefrom through the other loop by merely inverting said retainer.

4,046,414
APPARATUS FOR HOISTING A STRUCTURAL MEMBER
Arthur M. James, 2475 NW. 150th, Beaverton, Oreg. 97005, and Charles J. Coulee, 6938 SW. 8th., Portland, Oreg. 97219
Filed May 3, 1976, Ser. No. 682,220
Int. Cl.² B66C *1/10*
U.S. Cl. 294—81 R 4 Claims



1. In combination with a structural member, where said member includes an upper surface expanse and a lower surface expanse and truss A-frames interconnecting the expanses with the expanses spaced from each other and with the truss A-frames imparting rigidity to the structural member, said truss A-frames having apexes joined to and adjacent the upper surface expanse of the structural member,
an elongate load-distributing device spaced above such structural member, and hoist means connected to the device operable to lift the device,
multiple elongate strands connected to and depending from the base of the load-distributing device at points distributed along the length thereof, and
means connecting a bottom end of a strand to said structural member including a hanger with structure straddling the apex of an A-frame and engaging the A-frame adjacent its apex in a manner enabling the imparting of a lifting force thereto.

4,046,415
BODY MOUNT SYSTEM FOR A MOTOR VEHICLE
Gerard T. Klees, Rochester; Robert A. Meacham, St. Clair Shores; Harry M. Ruby, Walled Lake, and Edward Sich, St. Clair Shores, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Apr. 8, 1976, Ser. No. 675,174
Int. Cl.² B62D *23/00*
U.S. Cl. 296—35 R 2 Claims



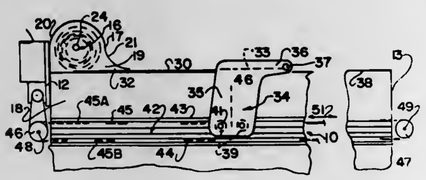
1. A motor vehicle comprising: a unitary frame-body defining a passenger compartment and having a front bulkhead structure, reinforced front fenders attached to the front bulkhead structure of the unitary frame-body, a radiator support member extending transversely between the reinforced front fenders at their forward ends, reinforcement members extending between the bulkhead structure and the radiator support member and attached to their respective lower ends to stiffen the fenders and the radiator support against motion relative to the unitary frame-body, a sub-frame having laterally spaced side rails extending from the radiator support to generally midway the length of the unitary frame-body, first body mounts acting between the radiator support and the side rails at

the forward ends thereof, second body mounts acting between the bulkhead structure of the unitary frame-body and the side rails of the sub-frame, and third body mounts acting between the unitary frame-body and the side rails of the subframe at the rearward end thereof, each of the body mounts having an elastomeric means subjected to substantially pure shear deformation in the longitudinal direction and a combination of shear and compression deformation in the lateral and vertical directions so as to lessen ride harshness in the longitudinal direction by providing relatively less stiffness in the longitudinal direction than in the lateral and vertical directions, and a shock absorber acting between each side rail of the sub-frame and the reinforcement members to control longitudinal motion of the frame and dampen resonant shake.

4,046,416
TRUCK COVER AND MECHANISM FOR OPERATING SAME

Jacob Penner, 335 - 47th Ave., SW., Calgary, Alberta, Canada (T2S 1C1)

Filed Mar. 11, 1976, Ser. No. 665,923
Claims priority, application Canada, Apr. 25, 1975, 225840
Int. Cl.² B60J *11/00*
U.S. Cl. 296—98 7 Claims

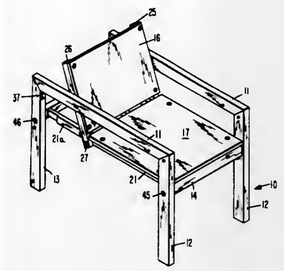


1. In a truck which includes a cab, an open top body including a pair of spaced and parallel sides and spaced and parallel rear and front ends, and a source of electrical power in said truck; a truck body cover assembly, said assembly comprising in combination a substantially rectangular flexible cover movable between a fully extended, truck body covering position and a retracted position and any position therebetween, roller means mounted at one end of said truck body adjacent the upper side thereof, said cover being secured by one end thereof to said roller means, and adapted to be rolled upon and dispensed from said roller means, spring return means in said roller means normally urging said roller means to rotate in one direction thereby rolling said cover on said roller means as aforesaid, horizontal rail means on each side of said truck body, mounting means journalled for longitudinal horizontal movement in each of said rail means, means connecting the other end of said cover between said mounting means, means operatively connected to said mounting means whereby said cover is extendible from said roller means against pressure of said spring return means, across the open top of said truck body when said cover is in a truck body covering position and is retracted upon said roller means when in a cover storage position and an endless chain operatively connected between said mounting means upon each side of said truck body and said source of power, each of said chains including an upper run and a lower run, said upper runs being connected to said mounting means, said horizontal rail means including an upper horizontal channel and a lower horizontal channel spaced and parallel to said upper horizontal channel, said upper runs engaging through said upper horizontal channels, and sprockets mounted adjacent each end of said horizontal rail around which said chains extend.

4,046,417
FOLDING FURNITURE PIECE

Charles R. Beckley, 2708 Woodley Place, NW., Washington, D.C. 20008

Filed July 20, 1976, Ser. No. 707,085
Int. Cl.² A47B *85/04*
U.S. Cl. 297—16 14 Claims



1. A seat comprising:
a pair of armrests having front and rear ends, said armrests defining two sides of the seat;
a back pivoted to said armrests at points intermediate the ends of said armrests;
a bottom;
means for pivotally connecting said bottom to said back, wherein said bottom can pivot to be coplanar with said back and to be at an angle with said back;
spacer means extending between the two sides of the seat below the level of the armrests;
support means for supporting releasably the front end of the bottom at a level below the level of the armrests;
front and rear legs pivoted adjacent to the front and rear ends of each armrest, respectively, wherein the legs fold along the arms when the back and bottom are coplanar with one another to form a folded seat;
rigid bracing means, secured to and coextensive with said bottom for engaging adjacent to said front and rear legs on each side of said chair to keep said legs from folding; wherein the bottom and back cooperate to form a seat when the front end of the bottom is supported by said support means and wherein the bottom pivots relative to the back, as the back pivots relative to the armrests, so that the back and bottom become coplanar with one another and with the armrests.

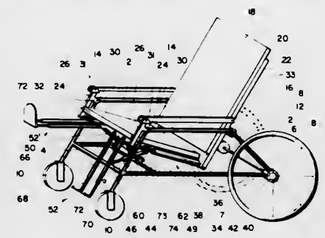
4,046,418
WHEELCHAIRS

Royal Smith, 4646 Dover St., NE., St. Petersburg, Fla. 33703, and Edward H. D. Carson, 200 Country Club Drive, Largo, Fla. 33540

Filed July 21, 1976, Ser. No. 707,203
Int. Cl.² A47C *13/00*
U.S. Cl. 297—118 5 Claims

1. A wheelchair convertible into a wheeled stretcher, comprising:
a pair of wheeled support frame members horizontally spaced from one another, each having a corresponding rearwardly positioned first pivot and a forwardly positioned second pivot at substantially the same elevation;
a pair of first levers, each having a first length and pivotally mounted on a respective one of said first pivots;
a chair back support having two lateral sides each proximate to a respective one of said support frame members, each rigidly mounted to the free end of a corresponding one of said first levers;
a pair of second levers, each having substantially said first length and pivotally mounted on a respective one of said second pivots;

a pair of front arms, each rigidly mounted at an intermediate point to the free end of a respective one of said second levers;
a pair of linkages, each having a first end pivotally connected to a respective one of said front arms at a point a second length above said intermediate point and a second end pivotally connected to a corresponding one of said lateral sides of said back support at substantially said second length above said mounting point for the corresponding one of said first levers;
a pair of extendable chair seat supports, each proximate to a respective one of said support frame members, each comprising a first and second portions which slideably engage

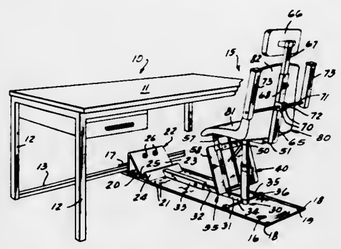


one another with the free end of said first portion pivotally connected to a corresponding one of said lateral sides of said back support at a third length below said mounting point for the corresponding one of said first levers and with the free end of said second portion pivotally connected to a corresponding one of said front arms at a fourth length below said intermediate point, said third length being greater than said fourth length;
whereby a chair seat supported by said pair of extendable seat supports, will assume a comfortable angle with respect to the horizontal when the chair is in a seating position, and will assume a horizontal position coplanar with the back of the chair when the chair is in a stretcher position.

4,046,419
SWIVEL CHAIR

Karl Schmitt, Rangstrasse 39, 64 Fulda, Germany

Filed Apr. 14, 1976, Ser. No. 676,680
Claims priority, application Germany, Apr. 21, 1975, 2517578
Int. Cl.² A47B *83/02*
U.S. Cl. 297—153 11 Claims

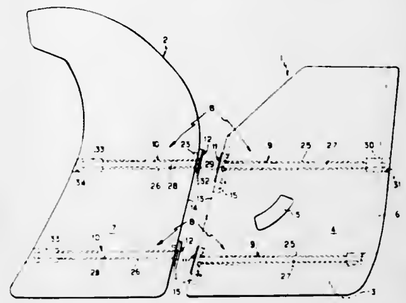


1. A swivel chair assembly comprising, in combination:
an elongate, flat baseplate with raised longitudinal edges and a front portion adapted to be captured beneath a horizontal traverse of a work station fixture;
a hollow, rectangular guide tube affixed longitudinally to said baseplate adjacent the front portion thereof and having an opening to the rear;
an undercarriage means for supporting said chair upon said baseplate, comprising:
a rectangular guide bar receivable telescopically on bearings in said guide tube and extending longitudinally of said baseplate,
an axle portion received on a rear end of said guide bar and extending transversely of said baseplate between said raised edges thereof, and
a roller received rotatably on each end of said axle portion inwardly of said raised edges of said baseplate and oriented to rotate as said undercarriage is translated along said baseplate;
first and second telescopable columns, said first column being carried on said undercarriage at the rear end of said guide bar and extending vertically therefrom, and said second column being received rotatably in said first column and being adjustable vertically with respect thereto;
chair means having a backrest portion and a seat portion carried on an upper end of said second telescopable column;
a transverse tube on an upper end of said second column, the tube having ends pivotally connected to said chair means;
said backrest portion spaced from and parallel to said transverse tube,
said backrest portion including a longitudinal tube affixed thereto and a pivotable axle transversely connected thereto; and
said axle having stop means limiting its pivotable orientation and carrying an armrest on either end thereof for selective storage in a substantially vertical position and use in a forwardly-pivoted position parallel to said seat portion of said chair means.

4,046,420
CHILD'S SAFETY CHAIR

Olivier de la Taille, Etampes; Armand Bernard, Mespuits, and Jean-Francois Labadie, Etampes, all of France, assignors to Societe Industrielle Bertrand Faure, Etampes, France

Filed Nov. 7, 1975, Ser. No. 630,048
Claims priority, application France, Nov. 18, 1974, 74.37989
Int. Cl.² B60R *21/00*
U.S. Cl. 297—216 7 Claims



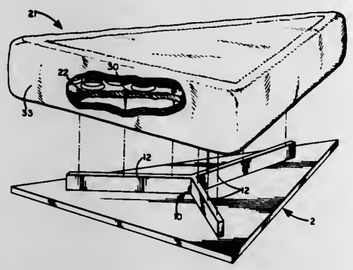
1. A child's safety seat comprising: a seat body part adapted to be firmly connected to a vehicle seat; a child-retaining means, the side walls of which bear against the side walls of the seat body part; and energy-absorbing means interposed between the seat body part and the retaining means for protecting a child in the seat in the event of sudden deceleration of the vehicle, said energy-absorbing means comprising at least two similar assemblies, each of which includes two energy-absorbing members, one of which members is housed in a side wall of the seat body part and the other in the corresponding side wall of the child-retaining means, each of said two members being

provided with coupling means for coupling them together and said coupling means being located at the bearing faces of the associated side wall of the seat body part or child-retaining means.

4,046,421
MODULAR ARTICLE OF FURNITURE

Albert M. Speond, Boston, and Robert C. Day, Princeton, both of Mass., assignors to Charlton Company, Inc., Leominster, Mass.

Filed Apr. 21, 1976, Ser. No. 678,961
Int. Cl.[2] A47C *15/00*
U.S. Cl. 297—232 14 Claims

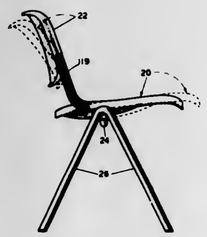


1. A modular article of furniture comprising:
a base of predetermined geometric configuration;
a seat support of predetermined geometric configuration;
means for supporting said seat support above said base in confronting spaced relationship to define a continuous, predetermined gap between the upper peripheral edge of said base and the lower peripheral edge of said seat support;
at least one upper body support having a lower support member;
means for supporting said seat support configured to allow selective insertion of said lower support member of said upper body support into said continuous, predetermined gap at any one of a plurality of positions along the peripheral edge of said base; and
means within said gap for releasably securing said lower support member to said base.

4,046,422
CHAIR

Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Netherlands Antilles

Division of Ser. No. 721,164, Sept. 7, 1976, which is a continuation-in-part of Ser. No. 586,794, June 13, 1975, abandoned. This application Jan. 13, 1977, Ser. No. 759,077
Int. Cl.[2] A47C *15/00*
U.S. Cl. 297—248 8 Claims

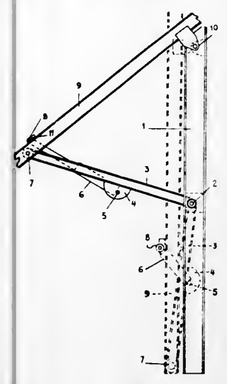


1. A chair adapted to be ganged in coupled relation side by side with similar chairs comprising a seat, a back and a pair of armrests, each armrest being supported in cantilevered relation at one end from an armrest support in outwardly offset relation to the armrest support, the two armrests being at substantially the same vertical elevation and said one end of one of the armrests being located forward of said one end of the other armrest such that when two such chairs are ganged, adjacent armrests of the ganged chairs interlock laterally with said one ends abutting back to front and the armrests engaging inside to inside.

4,046,423
LIFTING MEMBERS FOR TRUCK BODIES AND SIMILAR UNITS

Marino Paseda Ordonez, C[s] de Oviedo, Pumarin, Gijon, Spain

Filed Mar. 18, 1976, Ser. No. 667,852
Claims priority, application Spain, Apr. 3, 1975, 436287
Int. Cl.[2] B65G *67/30*
U.S. Cl. 298—22 D 3 Claims

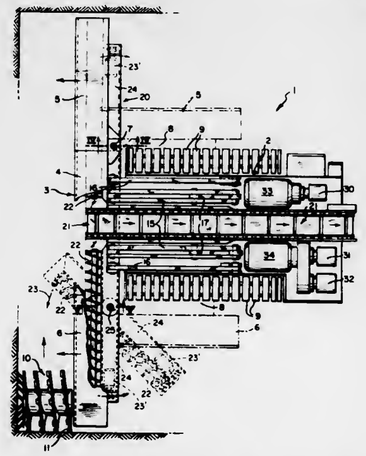


1. A lifting mechanism for truck bodies and the like in combination with a pair of laterally spaced longitudinal stationary frame members, a dump frame pivotally connected to said stationary frame members adjacent one end thereof, said dump frame including a pair of laterally spaced longitudinal track members disposed in a plane immediately above and parallel to the plane of said longitudinal stationary frame members, a rectangular frame lifting stabilizer assembly positioned between and spanning substantially the entire lateral distance between said stationary frame members and said track members, a pair of pivot connections connecting the inner end of said rectangular frame lifting stabilizer assembly to said pair of laterally spaced stationary frame members, a pair of connectors on the opposite end of said rectangular frame lifting stabilizer assembly engaged for sliding movement in said pair of laterally spaced longitudinal track members, said rectangular frame lifting stabilizer assembly having side frame members, a pair of longitudinally extending brace portions positioned between and extending parallel with said side frame members only at the medial portion of said rectangular frame lifting stabilizer assembly, a pair of diagonally extending brace portions connected to the opposite ends of each of said longitudinally extending brace portions and diverging laterally into connection with the opposite ends of the adjacent side frame member, said pair of longitudinally extending brace portions being laterally spaced to form a longitudinal channel therebetween, an extensible lift cylinder-piston assembly positioned in the longitudinal channel between said pair of longitudinally extending brace portions, a cross-member extending at substantially right angles between and connecting said pair of longitudinally extending brace portions and pivotally connecting one end of said extensible lift cylinder-piston assembly to a medial portion of the length of said rectangular frame lifting stabilizer assembly, a support member connected laterally of said dump frame in a longitudinal position between said cross member and said pivot connections connecting the inner end of the rectangular frame lifting assembly to said stationary frame members when the dump frame is in a horizontal position, said lift cylinder-piston assembly having a longitudinal axis diagonally intersecting the planes of said rectangular frame lifting assembly and said dump frame when the latter is in a horizontal position, and the other end of said lift cylinder-piston assembly pivotally connected to said support member, said lift cylinder-piston assembly being contained within the length of said rectangular frame lifting stabilizer assembly when the dump frame is in a horizontal position, whereby upon extension of said extensible lift cylinder-piston assembly said dump frame is moved about its pivot connection with said stationary frame members from a horizontal position to a raised dump position and simultaneously said lifting stabilizer assembly is moved about its pivot connection with said stationary frame members and carries said lift cylinder-piston assembly therewith.

4,046,424
CONTINUOUS MINING MACHINE WITH HINGED CUTTER GUIDE EXTENSIONS

Warren G. Montgomery, 2 Berwood Drive, Rte. 8, Morgantown, W. Va. 26505

Continuation-in-part of Ser. No. 647,343, Jan. 8, 1976, abandoned. This application Oct. 8, 1976, Ser. No. 731,043
Int. Cl.[2] E21C *35/12*
U.S. Cl. 299—56 6 Claims

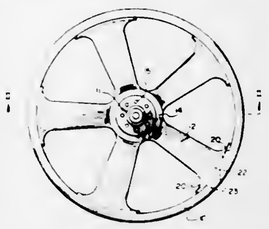


1. a continuous mining machine having a moveable carrier, a cutter head, a horizontal support guide extending across the front end of said carrier for supporting said cutter head for slideable movement thereon, a gathering conveyor extending across the front end of said carrier parallel to and beneath said support guide, and a flight conveyor extending over the length of said carrier to convey material received from said gathering conveyor; the improvement comprising in that a guide end portion of said support guide is adapted to extend over a side edge of said carrier, and in having a guide hinge with a pivot point positioned beyond the side edge of said carrier for supporting said guide end portion whereby said guide end portion may be moved from a position extending across the carrier to a position extending along a side of the carrier.

4,046,425
WHEEL

Manuel Domingos Sardinha, 337 Palmerston Blvd., Toronto, Canada

Filed Oct. 3, 1975, Ser. No. 619,208
Claims priority, application Canada, June 30, 1975, 230514
Int. Cl.[2] B60B *23/00*
U.S. Cl. 301—12 R 1 Claim

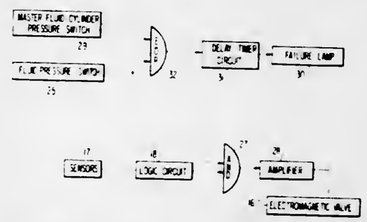


1. A bicycle wheel, comprising a metal rim of radially outwardly open, generally U-shaped cross-section, a central portion extending around a hub, a plurality of spoke portions extending radially outwardly from the central portion to the rim, each of the spoke portions having a closed, hollow transverse cross-section, a plurality of curved metal strips contiguous with the inner periphery of the rim, the strips being secured to the radially outermost ends of the spoke portions within the spoke portions, and a plurality of releasable threaded fasteners securing the rim to the curved metal strips, said threaded fasteners extending radially inwardly through said rim into threaded engagement with said metal strips, the central portion and the spoke portions each being formed of two halves joined together in a plane transverse to the axis of the hub of the wheel, and each half of the central portion being integral with a respective half of each of the spoke portions, and the central portion and the spoke portions being made of lightweight metal.

4,046,426
ANTISKID DEVICE

Katsuya Miyake, Ageo, Japan, assignor to Akebono Brake Industry Co., Ltd., Nihonbashi, Japan

Filed Feb. 5, 1976, Ser. No. 655,598
Int. Cl.[2] B60T *8/02*
U.S. Cl. 303—100 3 Claims



1. In an antiskid device for preventing wheels from skidding, said device being of the type having, sensor and logic means for developing a braking pressure reducing signal when said wheels are in a skid condition, a braking system having a master cylinder and wheel cylinders for applying braking pressure to said wheel cylinders, a modulator for reducing the braking pressure to said wheel cylinders when actuated, the improvement comprising, pressure sensor means responsive to the braking pressure at said wheel cylinders for providing a braking pressure minimum signal when the braking pressure in said wheel cylinders is above a predetermined minimum which is set nearly at zero where the braking pressure will be ineffective, and circuit means responsive to said braking pressure

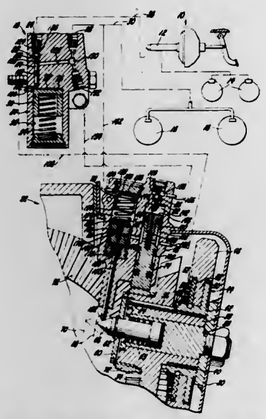
reducing signal and said braking pressure minimum signal for actuating said modulator only when both said signals are in coincidence, said pressure sensor means comprising a pressure switch actuated when said minimum pressure is exceeded, and said circuit means comprising a transistor having base, collector, and emitter electrodes, said base being connected to receive said braking pressure reducing signal, and said collector and emitter forming an output circuit in combination with a control coil for said modulator, said pressure switch being electrically connected in said circuit to prevent actuation of said circuit when said switch is open, wherein said switch is in series with said coil.

4,046,427

MECHANICAL WHEEL LOCK CONTROL

Gene P. Baynes, Kettering, and Frank W. Brooks, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed June 21, 1976, Ser. No. 697,870
Int. Cl.² B60T 8/093
U.S. Cl. 303—115 1 Claim



1. A wheel lock control system in a vehicle having wheel means to be braked and a source of brake actuating pressure, said system comprising:

drive mechanism responsive to wheel deceleration and acceleration and including first control means actuatable from a first position to a second position while wheel deceleration is greater than a predetermined value and actuatable to said first position when wheel deceleration is less than a predetermined value, and pump drive means driven in accordance with wheel speed;

a fluid pump driven by said pump drive means and having a fluid input and a fluid output;

first conduit means connecting said source of controlled brake actuating pressure with wheel brake means for said wheel means and having therein a first check valve spring biased closed to prevent pressure from being delivered from said source;

first valve opening means normally holding said first check valve open;

a fluid pressure accumulator having a pressure movable spring biased wall therein having an uncharged position and movable by fluid pressure to a charged position, said wall being operatively connected to said first valve opening means to allow movement thereof as said wall moves toward the charged position to permit said first check valve means to close, and upon return of said wall to said uncharged position moving said first valve opening means to open said first check valve;

a normally closed second check valve and a first restrictive orifice in fluid series and connecting said pump output with said first conduit means intermediate said first check valve and said wheel brake means, said second check valve permitting fluid flow only from said pump to said first conduit means;

second conduit means fluid connecting said pump input with said first conduit means intermediate said first check valve and said wheel brake means;

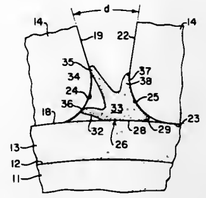
a restrictive orifice — surge dashpot permitting fluid flow therethrough and a third check valve in series therewith said orifice — dashpot and third check valve being in said second conduit means, said third check valve being biased closed to prevent fluid flow from said first conduit means and said orifice — dashpot to said pump input.

4,046,428

TRACTION SHOE SEAL

John R. Bauer, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 5, 1976, Ser. No. 646,437
Int. Cl.² B62D 55/24
U.S. Cl. 305—11 8 Claims



1. A removable track for an annular resilient tire comprising an annular belt having a radially outer surface, a plurality of track members mounted on said radially outer surface at circumferentially spaced-apart positions, sealing members disposed between said track members, each of said sealing members including an elongated body of resilient material having a longitudinal base with a belt-engaging surface engageable with said radially outer surface of said belt, said base having transversely extending edge portions, said edge portions being disposed between said track members and said outer surface of said belt, and a longitudinally extending rib portion of said sealing member extending radially outward from said base for engagement with the surface of at least one of said track members.

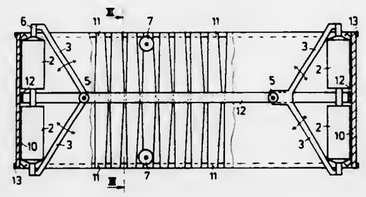
4,046,429

STEERING MECHANISM FOR ENDLESS TRACK VEHICLES

Jorma Toivo Tapani Pohjola, Haravatie 6, 90530 Oulu 53, Finland

Division of Ser. No. 438,191, Jan. 31, 1974, Pat. No. 3,934,664.
This application Nov. 4, 1975, Ser. No. 628,773
Claims priority, application Finland, Feb. 1, 1973, 292/73; Jan. 7, 1974, 40/74; Feb. 1, 1973, 293/73
Int. Cl.² B62D 55/24
U.S. Cl. 305—35 EB 9 Claims

1. In a vehicle, endless elongated track means extending longitudinally in the general direction of the travel of the vehicle for assuming at either one of a pair of opposed side regions of the endless track means a contracted condition while assuming an expanded condition at the other side region when executing turns with the side region which contracts and the side region which expands being determined by the direction of turning and with said endless track means assuming in its entirely a curvature corresponding to the direction of turning of the vehicle, a pair of end roll means partially surrounded by and engaging said endless track means at opposed ends thereof for guiding said endless track means during travel of the vehicle with turns of the vehicle being brought about by turning of at least one of said end roll means about an upright axis, and length-limiting means forming part of said endless track means for limiting the arcuate lengths of those portions of said endless track means which at any given instant extend around said pair of end roll means for engaging said end roll means with portions of said endless track means which do not slip with respect to said end roll means and in effect form substantially rigid entities therewith, said track means assuming said contracted and expanded conditions with its own inherent structure, said length-limiting means including an elongated substantially non-stretchable endless band extending centrally along and fixed to said endless track means substantially midway between said opposed side regions thereof to provide said endless track means with taut arcuate portions extending around and engaging said end roll means, said non-



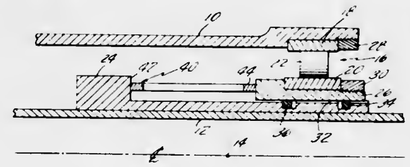
stretchable band being flexible in a substantially vertical plane for conforming with the remainder of said endless track means to the curvature of said end roll means, said endless track means including transversely extending elongated track elements having central portions fixed to said band which forms said length-limiting means, said transversely extending track elements each having opposed elongated edge regions extending transversely of said track means and respectively overlapping preceding and following track elements and said overlapping track elements engaging each other at opposed edge regions thereof at the arcuate portions of said track means which at any given instant extend around said pair of end roll means for contributing to the rigidity of the endless track means at its portions which extend around the end roll means.

4,046,430

DAMPED INTERSHAFT BEARING AND STABILIZER

Dennis F. Buono, East Hartford; Nils G. Carlson, Glastonbury; David H. Hibner, Colchester, and Donald C. Moringiello, Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 12, 1976, Ser. No. 666,530
Int. Cl.² F16C 35/08
U.S. Cl. 308—26 11 Claims



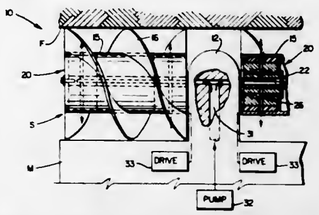
1. Damping means for an inner shaft and outer shaft mounted in coaxial relation, bearing means mounted between said inner shaft and said outer shaft, a fluid damper mounted under the bearing and includes an annular groove surrounding at least one of said shafts which is filled with a viscous fluid, radial restraint means mounted on said one of said shafts in parallel with the viscous damper means to impart a load to the other of said shafts to change its critical speed to a value above the maximum rotational speed of said one of said shafts and stabilize the viscous damper.

4,046,431

WATER LUBRICATED BEARING ASSEMBLY FOR MINING MACHINE

Robert D. Harris, Belmont, Pa., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sept. 10, 1975, Ser. No. 611,952
Int. Cl.² F16C 37/00
U.S. Cl. 308—76 10 Claims



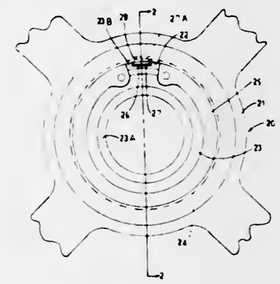
1. A water lubricated bearing assembly and rotary water joint for a rotary drilling tool comprising: a shaft, an inner and an outer race located concentrically about said shaft and having respective annular bearing surfaces, annular channel means formed between said races to confine a flow of lubricating water in a single stream, at least one bearing member confined in said channel means, a water passageway formed within said shaft and communicating with said channel members, means to supply a pressurized flow of water through said passageway and said channel means sufficient to lubricate said bearing member, and to establish a flow of water to said channel means via said passageway, and transfer means in communication with said channel means to drain the water radially outwardly from said bearing assembly and feed the same to the drilling face of the tool, whereby lubrication, tool cooling function and transfer of water to the drilling face may be combined from a single stream of water.

4,046,432

BEARING ASSEMBLY AND ANCHOR THEREFOR

Charles J. Hofmann, and Frederick F. Suess, both of Lancaster, Pa., assignors to Fidelity Electric Company, Incorporated, Lancaster, Pa.

Filed June 9, 1976, Ser. No. 694,364
Int. Cl.² F16C 19/14
U.S. Cl. 308—189 R 7 Claims



1. A bearing assembly comprising:

a bearing bracket housing,

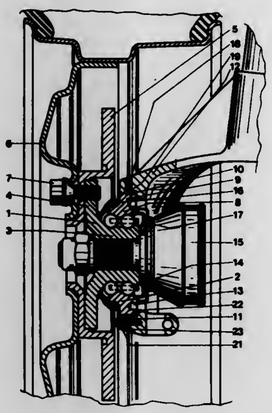
a bearing means having a bearing race fitted in said bearing bracket housing,

means for retaining said bearing means within said housing, and means for anchoring said bearing race to said housing so as to prohibit relative motion therebetween while permitting limited axial movement therebetween,

wherein said anchoring means comprises,

an axial notch formed on said race,
an anchor plate fitted in said notch,
said anchor plate having an angularly disposed tip at one end thereof,
and means for securing said tip relative to said housing.

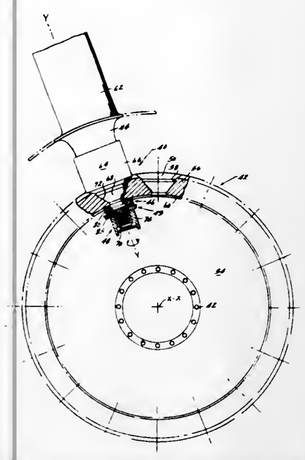
4,046,433
WHEEL BEARING UNIT FOR MOTOR VEHICLES
Heinz Kiener, Walgalshausen, Germany, assignor to SKF Industries, Inc., King of Prussia, Pa.
Filed Mar. 22, 1976, Ser. No. 668,870
Claims priority, application Germany, Mar. 22, 1975, 2512827
Int. Cl.² F16C *33/00*
U.S. Cl. 308—191 8 Claims



1. In a wheel bearing unit for motor vehicles with two bearing parts which can rotate relative to one another, between which at least two rows of rolling elements are arranged, said bearing parts each having an outer flange-like portion, a first of said outer portions being fastened to said vehicle, the other of said outer portions being fastened to said wheel, the improvement comprising a screw thread formed on an outer periphery of said first of said outer portions and running essentially axially, connecting means for connecting said first of said outer portions to said vehicle, said connecting means having a corresponding screw thread mating with the screw thread formed on said first of said outer portions, whereby said first outer portion may be affixed to said connecting means by relative rotation therebetween, and means for securing said mated connection against becoming loose.

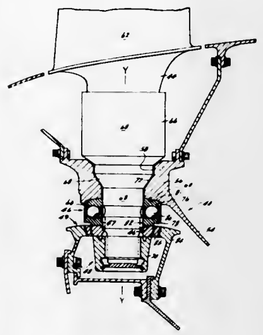
4,046,434
DEFORMABLE BEARING SEAT
Otis S. Moreman, III, Cincinnati, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed July 14, 1975, Ser. No. 595,747
Int. Cl.² F16C *13/00*
U.S. Cl. 308—195 5 Claims

1. A deformable bearing seat for seating a bearing assembly in a housing, said seat comprising:
a deformable seating surface having a predetermined spheroidally contoured surface adapted to engage a first portion of said bearing assembly when said housing is in an undeformed mode, said seating surface deformable to a predetermined spherically contoured surface adapted to



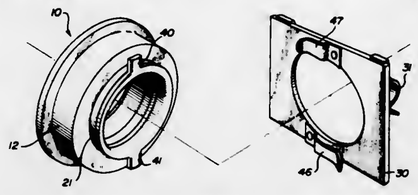
engage a second portion of said bearing assembly when said housing is in a deformed mode.

4,046,435
BEARING SEAT USABLE IN A GAS TURBINE ENGINE
Otis S. Moreman, III, Cincinnati, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed July 14, 1975, Ser. No. 595,745
Int. Cl.² F16C *13/00*
U.S. Cl. 308—195 4 Claims



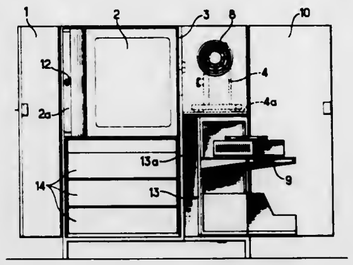
1. In combination with a gas turbine engine having a rotating blade and mounting ring assembly adapted for rotation about a first axis, the assembly including a plurality of blades, each of said blades being rotatably mounted on said ring for rotation about a second axis, said assembly further including a plurality of bearing assemblies each associated with one of said blades and disposed around the periphery of said rotating ring, the improvement comprising:
a substantially continuous seating surface on said ring, said seating surface adapted to engage and seat said plurality of bearing assemblies.

4,046,436
ARTICULATED THRUST BEARING
Villy Brown, Chicago, Ill., assignor to Aetna Bearing Company, Chicago, Ill.
Filed July 28, 1976, Ser. No. 709,327
Int. Cl.² F16C *19/00*
U.S. Cl. 308—233 15 Claims



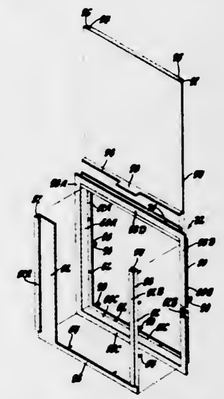
1. An articulated bearing assembly comprising at least two relatively rotatable races, and a mounting assembly for mounting the bearing on a shaft or the like, the mounting assembly including an axially elongated sleeve adapted for slidable connection with the shaft and fixed relative to one race, a carrier plate adapted for engagement by a clutch fork or the like for moving the bearing axially upon the shaft, articulating fulcrum means for permitting the carrier plate to rock relative to the sleeve about an axis perpendicular to the shaft, and retainer means for retaining the carrier plate on the sleeve in contact with the fulcrum means.

4,046,437
COMBINATION CABINET FOR AUDIO-VISUAL TEACHING
Aristide Leon Caron, and Paulette Marie Laure Caron, both of 10, rue de Limoges, 78000 Versailles, France
Filed Nov. 14, 1975, Ser. No. 632,115
Claims priority, application France, Nov. 19, 1974, 74.38044
Int. Cl.² A47B *81/06*; G03B *21/28*
U.S. Cl. 312—20 2 Claims



1. An audio-visual teaching apparatus comprising a cabinet, a projector mounted in said cabinet, a projecting screen mounted on said cabinet for movement between a stored position and a use position projecting forwardly from the facade of said cabinet, a mirror mounted within said cabinet and so oriented with respect to said projector as to reflect luminous rays emitted therefrom onto said screen in its use position, said screen being of a sufficient size to be seen from all points of a room such as a classroom in which the apparatus is used and being supported for pivotal movement about a vertical axis in the upper part of said cabinet for limited pivotal movement out of said cabinet to said use position to thereby increase the optical path of the luminous rays emitted by said projector and thereby increase the size of the image projected without increasing the size of said cabinet, said mirror being positioned in said cabinet so that all rays emitted from said projector pass through paths of substantially equal length to said screen in said use position, audio means including a speaker mounted within the upper portion and on the facade of said cabinet and a record player and amplifier, a console concealable in the lower portion of said cabinet and mounted for pivotal movement between a stored position and a use position, said pivotal movement of said console being about a vertical axis, said console having a facade which is in alignment with the facade of the cabinet when the console is in its stored position, said facade of the console projecting outwardly from the cabinet when the console is in its use position, said record player and amplifier and the controls therefor being mounted on said console for pivotal movement therewith between a stored position within said cabinet and a use position wherein the controls therefore are in close proximity to the controls for said projector and wherein there is provided in the rear of said console a space permitting a teacher to simultaneously operate the controls of the audio means and projector while facing the audience and remaining rearward of the facade of the cabinet so that the vision of the images projected on said screen is not obstructed and a commentary thereon is possible.

4,046,438
VERTICAL SLIDING CLOSURE PANEL FOR REFRIGERATION DOOR
Louis D. Benasutti, Fairborn; Jerry L. Neuhaser, Dayton, both of Ohio, and Ronald E. Meyer, Troy, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Aug. 30, 1976, Ser. No. 718,754
Int. Cl.² A47F *3/00*; E06B *3/00*
U.S. Cl. 312—138 A 3 Claims



1. In a refrigerator cabinet having an insulated door for closing a compartment, said door comprising an outer shell and an inner liner with the space therebetween filled with insulation material, said door having a rectangular-shaped opening formed in said shell defining a recessed service area, a sliding panel assembly in said outer shell providing access to the service area, comprising in combination, a main frame section and a sub-frame mounted thereon, said main frame having an outwardly directed flange around the periphery of said opening, said sub-frame having a horizontally extending bottom cross member and a pair of vertically extending side members, said sub-frame section side members having outer opposed return flanges coextensive with said sub-frame side members defining vertical guide rails, a vertically sliding panel having inner L-shaped flanges on its inner face adjacent its side edges defining channels coextensive with its vertical side edges, said sub-frame guide rails positioned with their associated channels for guiding said panel during vertical movement between its lower closed position and its raised open position in which it underlies a portion of said outer shell, and a plurality of resilient sheet metal clips for positioning on said panel offset flanges, each said clip having body portion including a pair of spring biasing fingers, means on each said clip body portion

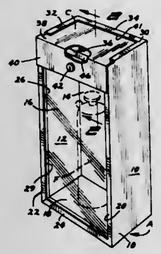
resiliently engaging one of the panel L-shaped flanges for retention thereon, the clip spring fingers each formed with an arcuate bowed portion for resiliently biased location between its associated L-shaped flange and the opposed outer surface of said sub-frame adjacent side member, whereby the clips provide smooth sliding movement of said panel in said sub-frame while imparting positioned stability thereto so that said panel can be resiliently retained in any desired vertical position.

4,046,439

CABINET FOR A FIRE EXTINGUISHER WITH LOCKING CLOSURE MEMBER

Walter Lee, 4450 W. 78th St., Bloomington, Minn. 55435

Filed Jan. 30, 1976, Ser. No. 653,941
Int. Cl.² A62C *27/16*; A47B *96/06*; B65D *25/54*
U.S. Cl. 312—138 R 3 Claims



1. A cabinet for a fire extinguisher and the like comprising:
a. a first sidewall,
b. a second sidewall,
c. a bottom wall, and
d. a back wall, connected to said sidewalls
e. a closure member having
f. a flat top portion having a rear edge and a front edge and
g. a flat front portion depending from the front edge,
h. a partial transparent front wall,
i. means slidably mounting said front wall between said sidewalls at the front of said cabinet,
j. means for slidably mounting said top portion of said closure member at the top of said cabinet to a position with the top portion closing off the top of the cabinet and said depending front portion overlying a portion of said front wall, and
k. a lock carried by said depending front portion of said closure member engageable with
l. means carried by said cabinet.
m. said means for slidably mounting said top portion of said closure member includes a slotted supporting structure into which said closure member is slid, and
n. said slotted supporting structure includes spaced protrusions connected to said cabinet between which said top portion of said closure member slides.

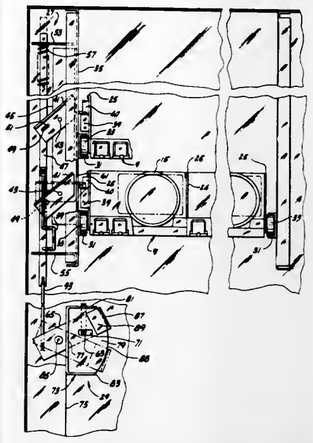
4,046,440

VENDOR WITH DOOR AND SHELF INTERLOCK

Robert N. Cox, Bridgeton, and Melvin G. Grober, Mountain Grove, both of Mo., assignors to UMC Industries, Inc., Stamford, Conn.

Continuation of Ser. No. 511,986, Oct. 4, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 676,215
Int. Cl.² A47F *1/00*; G07F *11/00*
U.S. Cl. 312—215 10 Claims

1. In a vendor comprising a cabinet having a front door, a plurality of shelves in the cabinet for holding items to be vended, each shelf being mounted for sliding movement in rear-to-front direction for being slid out from a vending position within the cabinet to a loading position extending forward from the cabinet when the door is opened, and means for dispensing items from the shelves: means for locking the shelves in said vending position within the cabinet comprising latch means movable between a position for latching the shelves in said vending position and a retracted position freeing the shelves to be pulled out, holding means on each shelf engageable by the latch means when the shelf is pulled out to any extended position within a predetermined range of extension from its vending position for holding the latch means in retracted position, means for locking the door in an open position wherein the door is open to the extent of enabling the shelves to be slid out without striking the door comprising latch means movable between a position for latching the door



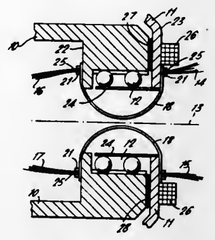
in its said open position and a door unlatching position, said shelf latch means and said door latch means being so interconnected for movement one with the other that the shelf latch means must move out of its said retracted position toward its shelf latching position for the door latch means to move to its door unlatching position, said door latch means thereby being held in its door latching position by engagement of the shelf latch means with said holding means on any shelf which is in said extended position whereby the door is latched in its open position and thereby prevented from being closed and striking said shelf.

4,046,441

ASSEMBLIES INCLUDING ELECTRICAL INTERCONNECTIONS

David Murray Harley, Edinburgh, Scotland, assignor to Ferranti Limited, Hollinwood, England

Filed Nov. 23, 1976, Ser. No. 744,348
Claims priority, application United Kingdom, Nov. 26, 1975, 48699/75
Int. Cl.² H01R *39/00*
U.S. Cl. 339—8 R 15 Claims



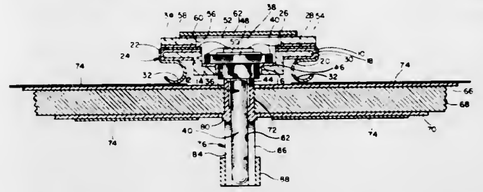
1. An assembly including two members capable of limited relative rotation about a common axis and an electrical interconnection at least including a flexible conductor strip secured to two positions, one on each of the two members, and spaced from the common rotational axis, in relation to the axis of the strip extending between said securing positions on the two members, the strip having a mean width greater than its thickness, and with the members at one particular orientation in relation to each other, intermediate between their limits of relative rotation, the axis of the strip lying in a plane and wholly extending towards the common rotational axis of the members.

4,046,442

PLUGGABLE SEMICONDUCTOR DEVICE PACKAGE

Robert V. Hutchison, Oceanside, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 575,180, May 7, 1975, Pat. No. 3,984,166.
This application May 3, 1976, Ser. No. 682,311
Int. Cl.² H05K *1/12*
U.S. Cl. 339—17 CF 2 Claims



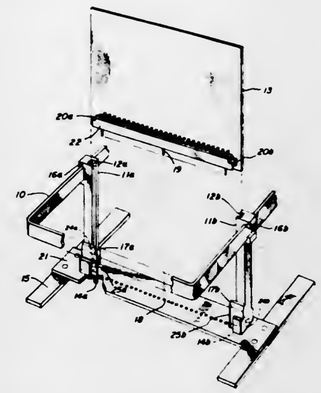
1. An assembly for a semiconductor device which provides excellent heat dissipation and which is readily connectable without requiring intermediate connectors or soldering, said assembly comprising in combination:
a substrate having an upper major surface, side portions, and a lower surface, said substrate having an opening therein extending orthogonally to the major surface;
a thermally conductive stud mounted in the substrate opening, said stud having an upper end face for receiving a semiconductor device and lower body portions extending from the substrate lower surface;
a semiconductor device mounted on said stud face;
a conductive lead frame having a plurality of mutually spaced finger members, each finger member having integral inner, intermediate, and outer portions; said inner portions being on said substrate upper surface and converging on said openings, said intermediate portions being on said substrate upper surface and radially extending from said inner portions towards the side portions of the substrate, said outer portions extending around said substrate side portions and forming spring contacts projecting from the lower surface of the substrate;
said semiconductor device being electrically connected to the inner portions of the lead frame finger members;
means for covering said semiconductor device, said means being attached to said substrate upper surface so that the lead frame inner portions are enclosed while leaving the outer portions unenclosed;
a printed circuit board having upper and lower insulative layers with a metallic layer interdisposed therebetween, said circuit board having a plurality of conductors corresponding with said spring contacts on at least an outer surface of the upper layer, said circuit board having an aperture therein extending through said layers for receiving a receptacle;
a metallic annular receptacle mounted in said circuit board aperture and having outer side walls contacting said metallic layer in the circuit board, said receptacle extending below the circuit board and including a longitudinal bore therein for receiving the body portion of the stud;
said stud body portion being removably secured in the bore of the receptacle to thereby engage said spring contacts with the corresponding conductors on the circuit board; and
a ferrule of thermally deformable material surrounding the receptacle below the circuit board for clamping said receptacle securely around the stud body portion to thereby prevent any movement which may deleteriously effect the electrical connection between the spring contacts and their corresponding circuit board conductors.

4,046,443

PRINTED CIRCUIT CARD GUIDE

Patrick Joseph Champagne, Edina, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed May 27, 1976, Ser. No. 690,698
Int. Cl.² H01R *13/20*; H05K *1/04*
U.S. Cl. 339—66 M 10 Claims



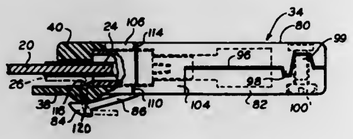
1. An improved card rack/circuit card assembly allowing easy insertion and removal of individual circuit cards, comprising
a. a frame including first and second parallel spaced-apart members;
b. a circuit card having a connector end carrying a plurality of spaced-apart electrical contacts, and side edges intersecting the leading edge and spaced from each other a distance less than that separating the frame's parallel spaced-apart members;
c. a connector block adapted to mate with the card's electrical contacts and form electrical connection with the contacts;
d. first and second card guides each having first and second ends and a slot adapted to receive a card edge, and at least one guide having a guide surface adjacent the second end and facing the direction of the adjacent slot, said first and second card guides attached at their first ends respectively to the first and second parallel spaced-apart members and each attached to an end of the connector block at their second end in facing slot relationship in a precise preselected position and spaced to allow the card to enter both slots and slide connector end first into mating position with the connector block, said guide surface positioned to engage a portion of the card connector end prior to initial engagement of the contacts in the connector block and the circuit card connector end, and constrain the connector end of the card to a precise predetermined path during a portion of its travel preceding its arrival at its final mating position, said guide further including a ramp surface faired into the guide surface end nearer the first end of said guide, said ramp surface sloping generally away from the opposing guide and toward the first end of said guide.

4,046,444

CONNECTOR FOR USE WITH PRINTED WIRING CIRCUITS

William J. Brorein, Whippany, N.J., assignor to General Cable Corporation, Greenwich, Conn.

Filed Oct. 14, 1975, Ser. No. 622,064
Int. Cl.² H01R 13/54; H05K 1/07
U.S. Cl. 339—91 R 10 Claims



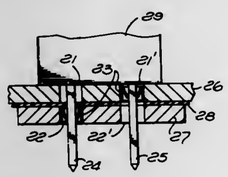
1. An electrical cable connector for connecting a multiplicity of separately insulated conductors, of a multi-conductor cable, to the corresponding edge contacts of printed wiring cards, including in combination a connector body which houses parallel rows of electrical contacts and circuits connecting said rows of electrical contacts with the respective conductors of said cable, a shell that encloses the connector body, the shell having an open space at the front end thereof for admitting into the connector the edge of a printed wiring card that carries said edge contacts, a tongue extending forward from the connector in position to cooperate with complementary means extending from the card to insure proper polarization of the connector and the contact carrying edge of the wiring card, and a latch extending forward from the connector in position to engage an extension projecting from a wiring card, an attachment forming the latch to the connector by structure that yields as the latch moves with respect to the connector when the latch passes the said extension as the connector is brought into working relation with the card, the attachment being resilient whereby the latch snaps over the back of the extension when the tongue is in cooperating relation with said complementary means of the wiring card for securing the connector to the wiring card with the edge contacts of the printed wiring cards in engagement with the contacts in the connector body.

4,046,445

SPRING BUSHING FOR CONDUCTIVE BACK-PLANE CONNECTION

John W. Anhalt, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,822
Int. Cl.² H01R 9/06
U.S. Cl. 339—95 D 6 Claims



1. A bushing for providing electrical and mechanical contact between an elongated conductive terminal member and a bore in a conductive plate member through which said terminal member passes, comprising:

a generally cylindrical, relatively thin-walled first member of a conductive material having a substantial spring characteristic, said cylindrical first member being open at its opposite ends;

a generally coaxial re-entrant portion integral with one end of said first member, said re-entrant portion extending axially within said first member toward the other end thereof for a distance at least part of the axial length of said first member and having an elbow in axial cross-section at said one end corresponding to the inward bend of said re-entrant portion, said re-entrant portion including a second generally cylindrical portion extending from said elbow within the inside of said first member;

a plurality of spring fingers formed by axially slotting said re-entrant portion through the material thickness, said spring fingers rooting at said elbow and having a rest position radially inward from the inside surface of said first cylindrical member, said spring fingers being capable of resiliently deflecting radially outward against the surfaces of a terminal member axially inserted through said bushing; and

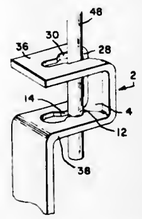
means including at least one axially extending open cut extending throughout at least the axial length of said first member, the width of said cut being reduced when said bushing is inserted in said bore, the resilience of said material providing radially outwardly acting force to tend to retain said insert within said bore.

4,046,446

ELECTRICAL TERMINAL FOR JOINING TWO WIRES

Robert Philmore Reavis, Jr., Statesville, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 13, 1976, Ser. No. 685,963
Int. Cl.² H01R 13/38
U.S. Cl. 339—99 R 10 Claims



1. An electrical terminal for establishing a resilient electrical contact with two locally parallel and adjacent wires, said terminal comprising:

first and second spaced-apart slots, each slot being defined by adjacent linear surfaces on an integral metallic terminal member,

a relatively narrow contact slot section adjacent the top in said first slot and a similar contact slot section adjacent the bottom of said second slot, and

a relatively wider slot section adjacent the bottom of said first slot and a similar relatively wider slot section adjacent the top of said second slot, whereby positioning said two wires, one above the other, in both slots results in the primary electrical contact with said top wire being formed by said first slot and the primary electrical contact with said bottom wire being formed by said second slot.

4,046,447

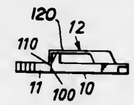
CONTACT DEVICE

Jan Ake Sigfrid Petersson, Solna, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 5, 1975, Ser. No. 629,099
Claims priority, application Sweden, Nov. 26, 1974, 7414824
Int. Cl.² H01R 13/58
U.S. Cl. 339—103 M 2 Claims

1. A connector comprising a planar shell (10) of insulating material, a plurality of adjacent and parallel contact pins (21) fixed in said planar shell, each of said pins extending beyond a first edge (100) of said planar shell, a cap (11), one end of said cap being provided with a plurality of open-through passageways (312) for accommodating said contact pins, a first edge

(110) of said cap abutting said first edge of said planar shell, one of said first edges being provided with cutouts for exposing along the abutting region a portion of each contact pin whereby access is provided for attaching signal leads to said contact pins, the ends of said through passageways remote from said first edges being open wherein electrical connections



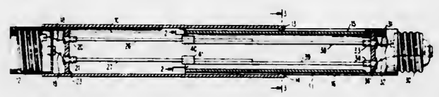
can be made via said passageways to said contact pins, said cap having a flexible clamp member (12) extending from said first edge of said cap displaced from and parallel to said plane shell in a direction opposite to said contact pins, and interengaging means near the end of said flexible clamp member and said plane shell remote from said contact pins for removably connecting said cap to said plane shell.

4,046,448

LIGHTING FIXTURE ACCESSORY

Keith G. Miller, 88 Carroll St., Binghamton, N.Y. 13902

Continuation-in-part of Ser. No. 497,654, Aug. 15, 1974. This application Nov. 11, 1975, Ser. No. 631,194
Int. Cl.² F21V 21/12, 21/22
U.S. Cl. 339—153 2 Claims



1. A lighting fixture accessory device extensible to various lengths comprising:

an inner tubular housing and an outer tubular housing of predetermined length, said inner tubular housing being of such diameter as to telescopingly fit within said outer housing, said outer housing terminating at a first end in at least two spaced, inwardly extending lips, said lips being slidably retained in at least two grooves extending longitudinally from a first end of said inner housing, along a portion of said inner housing, said lips and grooves cooperating to prevent relative rotation of said inner and outer housings during telescoping movement thereof;

an outwardly extending threaded standard male fitting adapted to fit a standard electrical receptacle extending from a second end of one of said tubular housings;

a standard female threaded electric socket extending outwardly from a second end of said other housing and connectable to the male fitting of a similar accessory device whereby a plurality of such devices may be releasably coupled together;

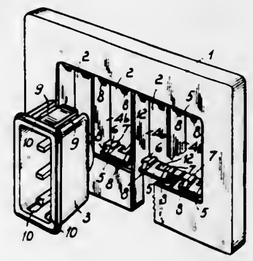
electrically conductive interconnections within said inner and outer telescoping housings extending between said fitting and said socket, said interconnections comprising a first pair of rectangular metallic bars affixed at one end in a cantilever manner to an insulated support adjacent said fitting, said first bars having free ends and extending in parallel relation within one of said housings, and a second pair of rectangular metallic bars affixed at one end in a cantilever manner to an insulated support adjacent said receptacle, said second bars having free ends and extending in parallel relation within the other of said housings, said first bars each having their free end portions formed into a sleeve for sliding contact with one of said second bars, said electrical interconnection being prevented from losing contact with each other during rotation of said device due to said cooperation of said lips and grooves.

4,046,449

SYSTEM FOR INTERCHANGEABLE ATTACHMENT OF ELECTRICAL EQUIPMENT

Pierluigi Rannaigo, Via Cave 68, Brescia, Italy

Continuation of Ser. No. 605,177, Aug. 15, 1975, abandoned, which is a continuation of Ser. No. 428,405, Dec. 26, 1973, abandoned. This application Oct. 28, 1975, Ser. No. 626,561
Claims priority, application Italy, Dec. 29, 1972, 33882/72
Int. Cl.² H01R 13/54
U.S. Cl. 339—126 R 9 Claims



1. A system for interchangeable mounting of electrical equipment, comprising a mounting plate having a front and rear surface and bounding an aperture extending between said surfaces; at least one item of electrical equipment including an electrically insulating frame insertable into said aperture in direction from said front to said rear surface; and means for guiding said frame during the insertion thereof and for releasably arresting the same in a fully inserted position thereof, including at least one pair of long and one pair of short walls which are rigid with said mounting plate and extend rearwardly from said rear surface thereof to bound with one another at least one cavity constituting a continuation of said aperture, at least one detent projection rigid with each of said short walls and extending therefrom into said cavity, and at least one pair of elongated grooves on opposite sides of said frame in positions corresponding to those of said detent projections and parallel to said direction of insertion, each of said grooves having a leading guiding portion of a first depth, and a trailing detaining portion of a second depth exceeding said first depth, said short walls being resiliently yieldable to be deflected by said frame upon contact thereof with said detent projections during the insertion so that said detent projections enter said guiding portions of said grooves to guide said frame in said direction of insertion and snap into said detaining portions upon juxtaposition therewith in said fully inserted position to thereby prevent undesired extraction of said frame from said aperture of said mounting plate.

4,046,450

ELECTRICAL TERMINAL WITH RETRACTED LATCH AND ELECTRICAL CONNECTOR HAVING SAME

John A. Yurtin, Southington, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1976, Ser. No. 738,462
Int. Cl.² H01R 9/08
U.S. Cl. 339—217 S 4 Claims

1. An electrical terminal for:

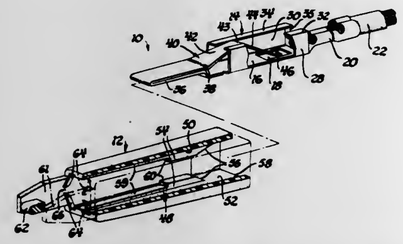
a connector body having a longitudinal cavity having a rearward opening for receiving the electrical terminal and retaining the same in the cavity which is defined in part by a pair of laterally spaced longitudinal walls, one wall of which has means providing a forward facing latch shoulder for cooperative engagement with a projecting latch portion of the terminal,

said electrical terminal comprising a floor portion having an aperture extending therethrough, and a smooth projectionless bottom surface, and

a resilient latch arm extending rearwardly in cantilever

fashion from support means at the forward end of said floor portion,

said latch arm having a forward portion diverging away from said floor portion in the rearward direction, a rearward portion extending toward said floor and a latch portion at its free end which is aligned with said aperture,



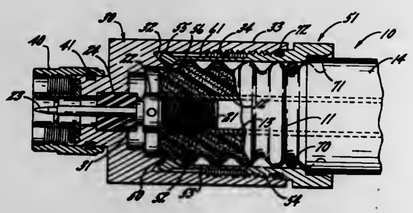
said latch arm in its free unstressed state having said latch portion located in a retracted position whereat said latch portion is no lower than portions of the floor portion adjacent the aperture therethrough, and said forward portion of the latch arm having an exposed upper surface for moving said latch arm to a position whereat said latch portion projects below the floor portion.

4,046,451

CONNECTOR FOR COAXIAL CABLE WITH ANNULARLY CORRUGATED OUTER CONDUCTOR

Richard C. Juds, Dolton, and Dennis M. Healy, Oak Lawn, both of Ill., assignors to Andrew Corporation, Orland Park, Ill.

Filed July 8, 1976, Ser. No. 703,462
Int. Cl.² H01R *17/18*
U.S. Cl. 339—177 R **14 Claims**



1. A connector assembly for a coaxial cable having an annularly corrugated outer conductor, said connector assembly comprising the combination of

a. a first unitary clamping member adapted to fit over the end of the coaxial cable and forming an inwardly extending bead at one end thereof for meshing with the last valley in the corrugated outer conductor and thereby locking the clamping member to the cable in the axial direction,

said bead forming a first conically beveled clamping surface for engaging the outer surface of the last crest in the corrugated outer conductor,

said first clamping member having a plurality of longitudinal slits formed in the beaded end thereof and extending through and beyond said inwardly extending bead to form a plurality of resilient segments that can be displaced outwardly to permit said bead to pass over the crest of the corrugated outer conductor as the clamping member is advanced longitudinally over the end of the cable, the portion of said first clamping member extending beyond the ends of said slits having an inside diameter at least as great as the outside diameter of the crests of said outer conductor so that the solid portion of said first clamping member fits over said outer conductor,

b. a second clamping member forming a second conically beveled clamping surface for engaging the inner surface of the last crest in the corrugated outer conductor of the cable,

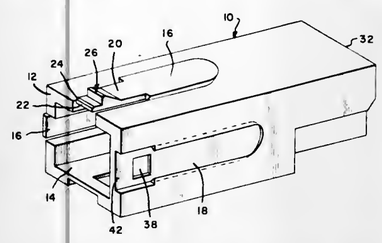
c. and means for drawing and holding the two clamping surfaces together against opposite surfaces of the outer conductor of the cable.

4,046,452

ELECTRICAL CONNECTOR HOUSING HAVING AN IMPROVED LOCKING MEANS

James William Cassarly, Lewisberry, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 16, 1975, Ser. No. 568,545
Int. Cl.² H01R *9/02*
U.S. Cl. 339—198 H **2 Claims**



1. An electrical connector housing, generally rectangular in cross-section, having a passage extending longitudinally through for housing an electrical contact member, an elongated dovetail tongue positioned externally on at least one side of said housing, said tongue being positioned intermediate the two ends of the housing, a notch in each said side extending from the housing rear face forwardly to the tongue, a flexible beam integral with and extending rearwardly from said tongue in alignment with the notch, said beam having an outwardly projecting boss thereon with a straight side face rearwardly, a groove positioned on at least a second side of said housing, which is opposed to said first side, extending inwardly from the housing rear face and adapted to slidingly receive a tongue on an identical housing therein, further including an opening in the floor of said groove adjacent the housing rear face, whereby

as the tongue on an identical housing slides into said groove, the flexible beam thereon becomes resiliently depressed into the notch until the boss thereon enters the opening thereby holding the two housing in the laterally assembled relation.

4,046,453

PLUG CONNECTION FOR OPTICAL FIBERS

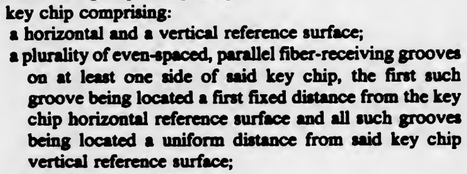
Klaus Dieter Fiebelkorn, Niederlauterbach, France, and Gunther Spitzer, Oberweier, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 27, 1974, Ser. No. 483,515
Claims priority, application Germany, July 5, 1973, 2334286
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96 C **4 Claims**

1. A plug connection for cables made of optical fibers, the connector being of the type having capillary tubes for accepting the ends of the optical fibers to be coupled together comprising:

a. first and second connectors each including a guide member having a plurality of longitudinal holes therein, a cable containing fibers to be connected being attached to said connector with the individual fibers inserted through said holes and supported therein in a longitudinally movable manner, with a space provided between the point of connection of said cable to said connector and said guide member;

b. a coupling member having a plurality of longitudinal holes matching the longitudinal holes in said guide member;



c. means for coupling said first and second connectors and said coupling member; and

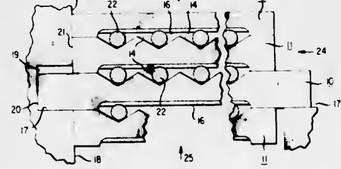
d. fiber ends protruding from each of said connectors a distance which is greater than the length assigned to them within said coupling member.

4,046,454

OPTICAL FIBER CONNECTOR

William Edward Pugh, III, Lilburn, Ga., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 18, 1976, Ser. No. 687,463
Int. Cl.² G02B *5/16*
U.S. Cl. 350—96 C **6 Claims**



1. Apparatus for assembling a first group of optical fibers into a fixed fiber end configuration preparatory for splicing to a second such group, comprising:

a key chip comprising:

a horizontal and a vertical reference surface;

a plurality of even-spaced, parallel fiber-receiving grooves on at least one side of said key chip, the first such groove being located a first fixed distance from the key chip horizontal reference surface and all such grooves being located a uniform distance from said key chip vertical reference surface;

a standard chip comprising:

a horizontal and a vertical reference surface;

a base including a recess;

a plurality of evenly-spaced, parallel fiber-receiving grooves on at least one side, the first such groove being located a second fixed distance from the standard chip horizontal reference surface and all such grooves being located a uniform distance from the standard chip vertical reference surface;

said second fixed distance being less than said first fixed distance; and

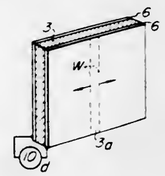
compliant means comprising compliant fiber-contacting material recessed in said base of said standard chip.

4,046,455

IRREGULAR FERROELECTRIC ELEMENT DEVISED FOR MOTION OF PLURAL DOMAIN-WALLS

Akio Kumada, Kodaira; Hiroshi Takano; Yoshizumi Eto, both of Hachioji, and Masao Hibi, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 16,199, March 3, 1970, Pat. No. 3,936,146.
This application Oct. 29, 1975, Ser. No. 626,995
Claims priority, application Japan, Mar. 15, 1969, 44-19912
Int. Cl.² G02F *1/05*
U.S. Cl. 350—150 **4 Claims**



1. An optical slit unit which employs an irregular ferroelectric element comprising:

a crystal Z-plate of irregular ferroelectric material having a pair of opposing surfaces bounded by the sides of the plate, at least a pair of which sides opposing one another being cut in the <110> direction; and

means, coupled to said pair of opposing surfaces, for reversing the state of polarization of said plate; and wherein

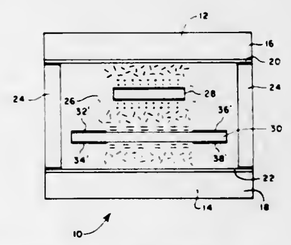
said plate has a domain configuration such that said plate includes a central nucleus-region of a prescribed polarity and two side nucleus-regions having a polarity opposite that of said central nucleus-region and being disposed on opposite sides of said central nucleus-region, with a respective domain growth wall interposed between said central nucleus-region and each of said side nucleus-regions.

4,046,456

ELECTRO-OPTIC CELL WITH TRANSVERSE ELECTRIC FIELD

Ulrich Bonne, Hopkins, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 22, 1976, Ser. No. 679,280
Int. Cl.² G02F *1/28*; H01V *7/00*
U.S. Cl. 350—160 R **5 Claims**



1. A light controlling device comprising:

a pair of spaced transparent plates presenting a light path through said plates;

a transparent fluid suspending medium between said plates;

a plurality of elongated dipoles freely carried within the fluid medium;

first means for applying an electric field in a direction parallel to said light path to orient said dipoles parallel to said light path, thereby rendering transparent said light controlling device; and

optically transparent piezoelectric transformer means in said

fluid between said plates, and connection means from said transformer means adapted for connection to a source of electrical power for energizing said piezoelectric transformer means, said transformer means being so oriented in said fluid that when energized generating a transverse electric field and motion to orient said dipoles orthogonal to said light path to render opaque said light controlling device.

4,046,457

POLYMERIC FILM BASE CARRYING FLUOROPOLYMER ANTI-REFLECTION COATING

Edwin H. Land, Cambridge; Stanley M. Bloom, Waban, and Howard G. Rogers, Weston, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 428,368, Dec. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 276,979, Aug. 1, 1972, Pat. No. 3,793,022. This application Aug. 6, 1975, Ser. No. 602,462

The portion of the term of this patent subsequent to Dec. 19, 1991, has been disclaimed.

Int. Cl.² B05D 7/04, 5/06; G02B 1/08; B32B 27/08

U.S. Cl. 350—164 26 Claims

1. A transparent element comprising an organic polymeric film base having an index of refraction of at least 1.6, said polymeric film base having coated directly on at least one surface thereof an anti-reflection coating comprising a fluorinated polymer, said anti-reflection coating having an index of refraction of about 1.3 to 1.45 and a quarter wave optical thickness, the index of refraction of said anti-reflection coating being at least 0.2 less than that of said organic polymeric film base.

4,046,458

CENTERING OF LENSES

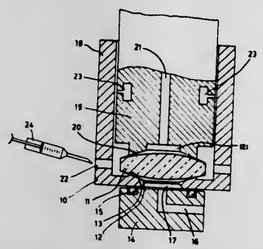
Hendricus Franciscus Gerardus Smulders, and Adrianus Jacobus Josef Franken, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,349

Claims priority, application Netherlands, Feb. 15, 1974, 7402076

Int. Cl.² G02B 7/02; B29D 11/00

U.S. Cl. 350—178 9 Claims



1. A method of optically centering at least one lens in a lens mount, comprising:

a. placing a lens mount having a bearing face against which the lens is to be located and an interior space on a centering device having means for admitting a medium under pressure to said interior space,

b. placing the lens between said bearing face and a facing bearing face of a clamping pipe having an interior space,

c. admitting a medium to the interior spaces of the clamping pipe and the lens mount respectively,

d. moving at least one of said pipe and said lens mount toward each other until a bearing gap is formed between each lens surface and the corresponding bearing face,

e. then further moving at least one of said pipe and said lens mount toward each other with a greater force than the recovery force of the bearing gap formed in step (d) so that the lens is fixed between the bearing surfaces of the pipe and the mount, and then

f. securing the lens in the mount.

4,046,459

RETROFOCUS WIDE ANGLE OBJECTIVE LENS SYSTEM

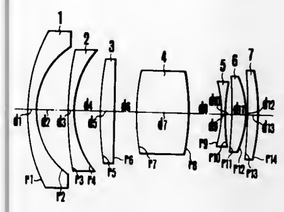
Naoto Kawamura, Inagi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1975, Ser. No. 607,915

Claims priority, application Japan, Sept. 4, 1974, 49-101709

Int. Cl.² G02B 13/04

U.S. Cl. 350—214 8 Claims



1. A retrofocus wide angle objective lens system comprising seven axially aligned lenses including, in the order of the entrant light beam:

negative meniscus first and second lenses of forward convexity;

a positive third lens;

a bi-convex fourth lens;

a bi-concave fifth lens; and

positive sixth and seventh lenses; and

wherein axial air space between said third lens and said fourth lens is larger than the axial thickness of said third lens, said third lens having a diameter larger than the fourth lens.

4,046,460

OBJECTIVE FOR VIDEO DISKS

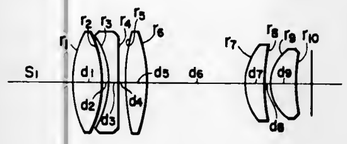
Toshimichi Koizumi, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed June 11, 1976, Ser. No. 695,037

Claims priority, application Japan, June 14, 1975, 50-72285

Int. Cl.² G02B 9/60

U.S. Cl. 350—216 5 Claims



1. An objective for video disks comprising a front lens group and rear lens group, said front lens group comprising a first, second and third lens components, said rear lens group comprising a fourth and fifth lens components, said first lens component being a biconvex lens, said second lens component being a negative lens concave toward said first lens component, said third lens component being a biconvex lens, said fourth lens component being a positive meniscus lens convex toward said third lens component, said fifth lens component being a positive meniscus lens convex toward said fourth lens component, said objective for video disks satisfying the following conditions:

$$1.19 \geq d_4/f \geq 0.62 \quad (1)$$

$$3.7 \geq f_R/f \geq 2.7 \quad (2)$$
$$0.29 \geq f_R/f_F \geq 0.19 \quad (3)$$
$$0.86 \geq |r_3|/|r_2| \geq 0.6 \quad (4)$$
$$0.15 \geq d_2/f \geq 0.11 \quad (5)$$

wherein reference symbol f represents the focal length of the lens system as a whole, reference symbol f_F represents the total focal length of the front lens group, reference symbol f_R represents the total focal length of the rear lens group, reference symbols r_2 represents the radius of curvature of the rear surface of the first lens component, reference symbol r_3 represents the radius of curvature of the front surface of the second lens component, reference symbol d_2 represents the airspace between the first and second lens components, and reference symbol d_4 represents the airspace between the front and rear lens groups.

4,046,461

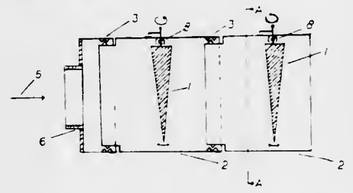
PRISMATIC PERSPECTIVE CONTROL DEVICE

Kenneth F. Cherry, 1533 Eastgate, Toledo, Ohio 43614

Filed July 23, 1975, Ser. No. 598,333

Int. Cl.² G02B 7/18

U.S. Cl. 350—287 2 Claims



1. A prismatic perspective control device comprising a prism system and mounting means for said prism system providing connection to a lens and adjustment of said prism system position relative to said lens and means of ascertaining the position of said prism system relative to said lens wherein said mounting means comprises at least two tubular structures connectable to each other with slip ring interlocking means providing rotation of said tubular structures relative to each other; further each said tubular structure having means for mounting at least one prism therein and for providing independent movement of said prism within said tubular structure; one of said tubular structures is provided with means for attachment to a lens, said means for attachment comprising a third tubular structure having slip rings similar to said slip ring interlocking means between said tubular structures and a connective ring providing mounting means for connection to a lens.

4,046,462

THREE-DIMENSIONAL TRACKING SOLAR ENERGY CONCENTRATOR AND METHOD FOR MAKING SAME

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Charles G. Miller, Pasadena, and Jess G. Pohl, San Luis Obispo, both of Calif.

Filed Apr. 28, 1976, Ser. No. 681,017

Int. Cl.² G02B 5/10; E04G 11/04

U.S. Cl. 350—295 9 Claims

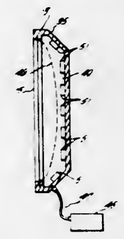
1. A three-dimensional tracking solar energy concentrator, comprising:

a support member in the form of a circular dish;

a flexible aluminized polymeric or elastomeric membrane fastened to said dish along its circular edge, forming a sealed interior;

means for creating a differential pressure in the sealed interior formed by said support member and said flexible membrane; and

means adjacent to and out of contact with said flexible membrane as shaped by the differential pressure created in the sealed interior for exerting localized filed forces at selected locations on said membrane, thereby modifying the curvature of the shaped membrane.



4,046,463

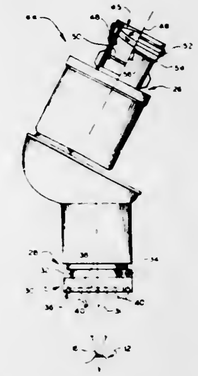
INDICATING AN ASPHERICITY OF THE CORNEA OF AN EYE

Joseph A. La Russa, Yorktown Heights, and Richard C. Troutman, New York, both of N.Y., assignors to Surgical Microsystems, Inc., New York, N.Y.

Filed July 17, 1974, Ser. No. 489,149

Int. Cl.² A61B 3/10; G01B 9/00

U.S. Cl. 351—13 7 Claims



1. Apparatus for providing an indication of an asphericity of the cornea of an eye viewed through a binocular microscope of the type used for ophthalmic surgery, comprising:

a housing adapted for connection around the head of said microscope;

a plurality of light sources connected to said housing along a circle around said head, light from said sources being transmitted to said eye; and

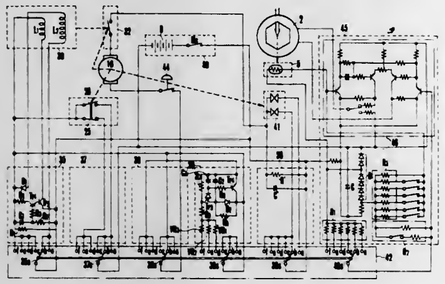
a rotatable reticle disposed within the focal plane of an objective of said microscope, said reticle having a pair of concentric circles whereby said asphericity is indicated by said view being of a reflection of said sources disposed along an acircular path having a portion which is not intermediate to said concentric circles.

4,046,464

EXPOSURE CONTROL SYSTEM AND A MOTION PICTURE CAMERA USING THE SAME

Mamoru Shimazaki, Tokyo; Masamichi Toyama, Machida; Toshikazu Ichiyanagi, Tokyo, and Hideto Iwama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 20, 1975, Ser. No. 588,896
Claims priority, application Japan, June 25, 1974, 49-72656; June 25, 1974, 49-72657; July 23, 1974, 49-84433; Apr. 25, 1975, 50-50475
Int. Cl.² G03B 7/08, 21/38
U.S. Cl. 352—141 11 Claims



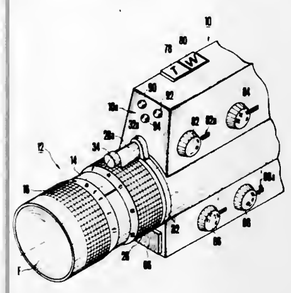
1. A motion picture camera, comprising:
a. photographic optical system,
b. exposure adjusting means having:
an exposure correction circuit having a photoelectric conversion means to generate an electric signal corresponding to the amount of light passing through the photographic optical system, said circuit producing a signal corresponding to the output of said photoelectric conversion means, and
a diaphragm aperture means coupled to said circuit to control the amount of light passing through said photographic optical system corresponding to the output of said exposure correction circuit,
c. a rotary shutter,
d. driving means coupled to the shutter to revolve said shutter, repeatedly past the optical system,
e. switching means coupled to said driving means to control the driving and the stopping of said driving means,
f. stopper means rotatable in cooperation with the rotation of the shutter, wherein said stopper means has a first stopper to help the shutter to be stopped at a position to allow passage of light, and a second stopper means to help the shutter to be stopped at a light blocking position to block the passage of light,
g. release means having:
blocking means coupled to said switching means and shiftable to an engaging position at which it engages the stopper means and forcibly stops the revolution of the shutter and at the same time retains the switching means in an open state, and to a non-engaging position which allows rotation of the shutter and retains the switching means in a closed state, and
electromagent means coupled to said blocking means to control said shifting of the blocking means,
h. control means to control said electromagnet means, and having:
signal generating means responsive to control from without the camera and coupled to said electromagnet means to generate an electric signal for controlling the magnetization of the electro-magnet means,
first shutter position detection means coupled to said signal generating means and responsive to the shifting of the shutter to said exposure position to stop the generating of the signal from the signal generating means which causes said blocking means and said first stopper means to engage each other, said detection means having a timer circuit coupled to said signal generating means to again cause the generation of said signal by the signal generating means after a lapse of a prescribed period of time, and
photographic mode selector means switchable between an ordinary photographic mode to photograph by continuously revolving the shutter and a long time photographing mode to stop the shutter temporarily at said exposure position and expose for a long period of time, said selector means nullifying said shutter position detection means at a time of ordinary photographing, and
i. timer means to set the time of said timer circuit, said timer means being electrically connected to said timer circuit and said exposure correction circuit and controlling said timer circuit and the correction of said exposure correction circuit during the setting operation.

4,046,465

SELF-TIMER DEVICE FOR MOTION PICTURE CAMERA

Masamichi Toyama; Tomoshi Takigawa, both of Machida; Mamoru Shimazaki, Tokyo; Hidekazu Okajima, Kawasaki; Toshikazu Ichiyanagi, Tokyo, and Hideto Iwama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1975, Ser. No. 624,340
Claims priority, application Japan, Oct. 24, 1974, 49-122803
Int. Cl.² G03B 1/00
U.S. Cl. 352—175 15 Claims



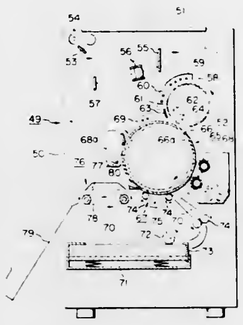
1. In a motion picture camera having a film feeding device, a shutter device, a first motor driving means which is provided for driving at least either the film feeding device or the shutter device, a zoom lens system and a second motor driving means which is provided for driving the zoom lens system; a self-timer device for automatic control of the photographing operation of the camera, comprising:
first switching means which is electrically coupled to said first motor driving means for controlling the starting and stopping of said first motor driving means;
second switching means which is electrically coupled to said second motor driving means for controlling the changing of the operation of the second motor driving means beteen a zooming operation and an automatic photographing control operation;
controlling means for controlling said first and second switching means, the controlling means having a first control portion for restricting said first motor driving means constantly to an operative condition, a second control portion for restricting the first motor driving means to an inoperative condition during a first predetermined period of time, a third control portion for restricting the first motor driving means to an operative condition during a second predetermined period of time, a fourth control portion for restricting said second motor driving means to the zooming operation, the fourth control portion corresponding to said first control portion, and a fifth control portion for restricting the second motor driving means to the automatic photographing control operation, the fifth control portion corresponding to the second and third control portions; the first switching means being operatively associated with said controlling means so as to be controlled by the first, second and third control portions of the controlling means; the second switching means being operatively associated with said controlling means so as to be controlled by the fourth and fifth control portions of the controlling means; and said controlling means being connected to said second motor driving means to be driven thereby in acting on said first and second switching means; and
releasable connecting means for operatively connecting said zoom lens system with said second motor driving means, said connecting means being disposed between the zoom lens system and the second motor driving means and operable to release the operative connection therebetween for automatic photographing control.

4,046,466

METHOD AND APPARATUS FOR ELECTROPHOTOGRAPHY

Yujiro Ando, Yokohama; Katsunobu Ohara, Kawasaki, and Yukimasa Shinohara, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1975, Ser. No. 632,697
Claims priority, application Japan, Nov. 22, 1974, 49-134923
Int. Cl.² G03G 15/00
U.S. Cl. 355—3 R 16 Claims



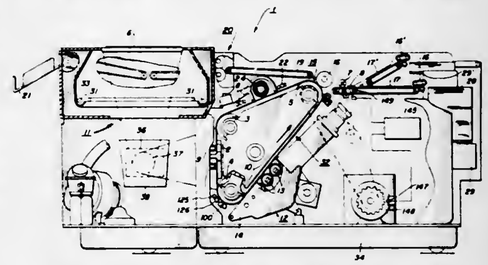
13. An electrophotographic apparatus for use in forming an image by modulating ion current through a photosensitive screen having a multitude of openings therein, and comprising a rotatable drum having an electrically conductive member, a photoconductive member to cover said electrically conductive member, and an insulating member on said photoconductive member;
means for forming a primary electrostatic latent image including corona discharge means and optical means for image irradiation, both of which are provided in close proximity to the outer peripheral surface of said drum-shaped screen;
means disposed within said drum-shaped screen for applying a first corona ion flow repeatedly to said screen wherein said corona ion flow is modulated by the same primary electrostatic latent image on said screen to form a plurality of secondary latent images, and for applying a second corona ion flow to said screen for adjustment to eliminate electric charge adhered onto the screen by the corona ion flow for modulation.

4,046,467

ZOOM LENS COPIER

Kenneth W. Laskowski, Fairport, and Edward L. Steiner, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 14, 1975, Ser. No. 577,379
Int. Cl.² G03G 15/00; G03B 27/34
U.S. Cl. 355—3 R 14 Claims



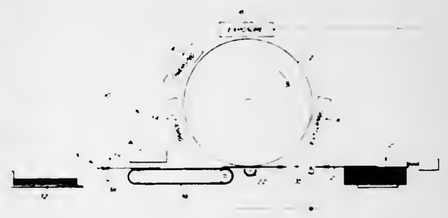
1. In an electrostatic reproduction apparatus having a movable photosensitive member on which latent electrostatic images of originals being reproduced are formed; means to charge the member in preparation for imaging; exposure means for generating the image; developing means to develop the images; said exposure means including a movable lens means; drive means to operate said lens means and vary the lens setting and the size of the images produced; and control means for controlling said drive means and the setting of said lens means; the improvement wherein said lens means includes means for providing images of infinitely variable sizes, with said control means including a first control adapted when actuated to energize said drive means to set said lens means at predetermined settings whereby to produce images of preset size on said photosensitive member, and a second control adapted to override said first control and energize said drive means to change the setting of said lens means whereby to produce different size images on said photosensitive member of non-preset sizes.

4,046,468

METHOD AND APPARATUS FOR CLEANING FUSING MEMBERS OF ELECTROGRAPHIC COPIERS

Walter A. Stryjewski, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 510,847, Sept. 30, 1974, abandoned. This application Jan. 16, 1976, Ser. No. 649,779
Int. Cl.² G03G 15/00
U.S. Cl. 355—3 R 14 Claims



1. An electrographic copying apparatus comprising
means for forming a toner particle image on a surface of a sheet of a support material,
a pressure member for fusing the toner particle image onto the support material, and
depositing means for distributing fusible, relatively dry, finely-divided resinous powder onto at least a portion of the support material surface before the support material surface contacts the pressure member,

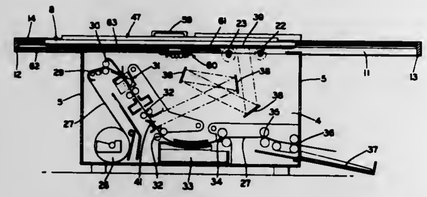
whereby the powder melts and fuses to the support material, carrying contaminants left on said pressure member with the powder to clean said pressure member.

4,046,469

PHOTOCOPY MACHINE HAVING PHOTOELECTRIC PAPER CUT-OFF SENSOR

Thomas E. Frank; Roy E. Gum; J. T. Shoupe, all of Canton, Ohio, and Dennis L. Warner, Baltimore, Md., assignors to Graphic Enterprises, Canton, Ohio

Filed Aug. 10, 1976, Ser. No. 713,193
Int. Cl.² G03G *15/00*
U.S. Cl. 355—13 15 Claims



1. A photocopy machine of the type having an original document carrier mounted for reciprocating movement on the top of a housing for moving the document across an external exposure station for reproduction of the document on a traveling web of copy paper fed from a supply roll of said paper located within the housing, said carrier having a lid and a transparent platen between which the document is placed; knife means for cutting the traveling web from the supply roll; and means controlling the reciprocating movement of the carrier and for controlling operation of the knife means; the improvement including:

a. photoelectric means mounted beneath the transparent platen of the carrier rearwardly of the external exposure station and having light emitting means and light sensing means;

b. a reflecting surface provided on the bottom of the carrier lid in alignment with the photoelectric means and adapted to pass over said photoelectric means upon forward movement of the carrier;

c. electrical circuit means operatively connecting the photoelectric means with the knife means operating control means; and

d. the light emitting means adapted to project a beam of light upwardly through the transparent platen of the carrier toward the carrier lid, with said light beam being blocked by a document in the carrier until passage of the trailing end of the document whereupon said light beam is reflected by the reflective surface of the lid and sensed by the light sensing means to actuate the knife means through the electrical circuit means to cut the traveling copy paper web to a length in direct relationship to the length of the original document.

4,046,470

PRINTING PAPER CUTTING DEVICE FOR AN ELECTRICAL COPIER

Shunji Yamamoto, Shinshiro, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sept. 6, 1974, Ser. No. 503,922
Claims priority, application Japan, Sept. 29, 1973, 48-109767
Int. Cl.² G03G *15/00*
U.S. Cl. 355—13 6 Claims

1. A copy paper cutting device for use in an electrophotographic copying apparatus which uses roll-type copy paper on which the image of the object to be reproduced is printed, said device comprising:

transparent platform means for supporting the object to be copied;

optical projecting means beneath said transparent platform means for projecting the image of the object to be copied on said transparent platform means to an exposure position;

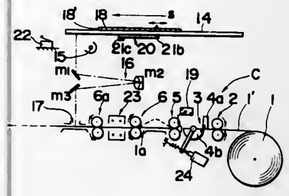
roller means positioned adjacent the copy paper fed from the roll of copy paper, on both sides of the copy paper along the path of the copy paper as it passes through the device, said roller means comprised of:

a first pair of rotating rollers positioned on both sides of the copy paper as it is fed from said roll of copy paper;

a second pair of rotating rollers adjacent and spaced from said first pair of rollers on both sides of said copy paper, said second pair of rollers rotating at a speed at least as fast as said first pair of rollers, whereby the copy paper is stretched between said first and second pairs of rollers; and

a third pair of rotating rollers adjacent and spaced from said second pair of rollers on both sides of said copy paper, said third pair of rollers rotating at a speed slower than said second pair of rollers, whereby a predetermined amount of loop of copy paper is formed between said second and third pairs of rollers;

cutting means located between said first and second pairs of rollers for cutting said copy paper to the size of said object to be copied;



first switch means between said cutting means and said second pair of rollers for actuating said optical projecting means in response to said copy paper passing between said cutting means and said second pair of rollers;

rotating means operatively connected to said roller means for rotating said roller means;

second switch means operatively connected to said cutting means and to said first and second pairs of rollers for deactuating said first and second pairs of rollers and for actuating said cutting means; and

control means adjacent said second switch means for contact therewith and for controlling the size of copy paper cut from said copy paper roll in relation to the size of the object being copied, said control means comprised of:

a scale member graduated with a contracted scale marked with a plurality of scale marks corresponding to the sizes of the objects to be copied on said transparent platform means;

a pointer bar fitted in a slot adjacent said scale member, said pointer bar movably slidable to the desired scale mark on said scale member corresponding to the size of the object to be copied, and

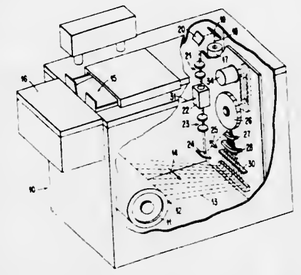
a first actuating member attached to said pointer bar and movable therewith for contacting said second switch means.

4,046,471

DUAL MODE ELECTROPHOTOGRAPHIC APPARATUS HAVING DUAL FUNCTION PRINTING BEAM

Charles Escom Branham, Boulder; Thomas Dean Steury, Longmont, and John Maury Woodward, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,034
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 9 Claims



1. In an electrophotographic copier/printer apparatus having a copier illumination station operable to image an original document onto a photoconductor, having a printing beam scanner station operable to raster scan said photoconductor as said beam scanner is controlled by a data-defined image, and having a copy sheet supply station operable to supply copy sheets, said copy sheets being synchronously fed to a transfer station adjacent said photoconductor as said apparatus selectively operates in the copier or printer mode; the improvement comprising:

border erase means operable in the copy mode to cause said beam scanner station to erase the area of said photoconductor bordering an image area equal to the sheet size; and

electrical image processing means operable in the print mode to erase all areas of said photoconductor with the exception of said data-defined image.

4,046,472

ELECTROSTATIC IMAGING APPARATUS

Roger H. Elchorn, deceased, late of Webster, N.Y.; Morton Silverberg, Rochester, N.Y., and by Russell J. Mandrino, executor, Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 18, 1975, Ser. No. 569,338
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 36 Claims

1. An imaging apparatus employing an electrically insulating web member comprising:

a. an elongate platen for supporting a receiving medium;

b. an elongate electrically photosensitive member;

c. charging means to deposit a substantially uniform electrostatic charge on one surface of said electrically photosensitive member;

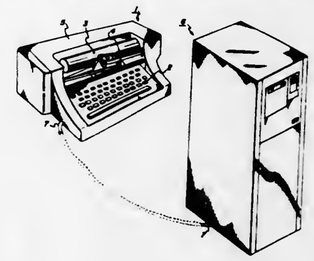
d. means to suspend the insulating web member in a plane substantially parallel to the axis of said platen, and to transport the insulating web member from a position adjacent said platen to a position contacting said one surface of said electrically photosensitive member

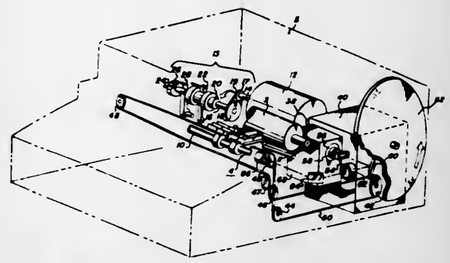
e. an exposure means for creating an electrostatic latent image on the electrically photosensitive member and the insulating web member, said exposure means further including a movable exposure head mounted for translation along a path parallel to the axis of said platen and means to advance said exposure head;

f. development means for depositing marking material on the electrostatic latent image on the insulating web member;

g. transfer means for transferring the marking material image from the insulating web member to the receiving medium on said platen; and

h. control logic circuitry for controlling and coordinating the operation of said means to suspend and transport,





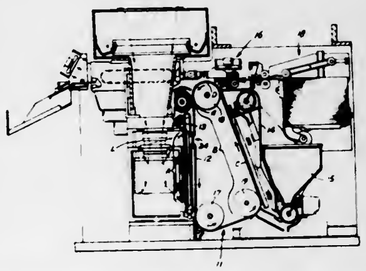
charging means, exposure means, means to advance said exposure head, development means and transfer means whereby an image is created, developed and transferred to a predetermined position on the receiving medium.

4,046,473

PHOTORECEPTOR METHOD AND SYSTEM

John W. Trainor, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 7, 1975, Ser. No. 575,304
Int. Cl.² G03G *15/00*
U.S. Cl. 355—16 18 Claims



1. A photoreceptor system for a photocopy apparatus including flexible endless photoreceptor means, and drive means for driving said photoreceptor means through processing and imaging stations, wherein the improvement comprises in combination therewith

velocity control means for controlling the velocity of said photoreceptor means such that the velocity thereof at said processing station is substantially constant and the veloc-

ity thereof at said imaging station may simultaneously be less than said substantially constant velocity,

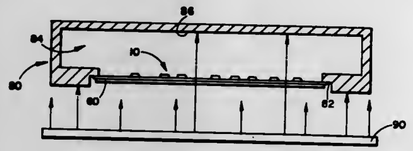
said velocity control means comprising means for simultaneously storing and dispensing portions of said photoreceptor means.

4,046,474

BLACK-BODY WAFER SUPPORT FIXTURE FOR EXPOSURE OF PHOTORESIST

Soo N. Lee, Irvine, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 17, 1975, Ser. No. 632,736
Int. Cl.² G03B 27/52, 27/32, 27/04
U.S. Cl. 355—43 13 Claims



1. A fixture suitable for supporting a photoresist coated wafer during back exposure of said photoresist to photoresist-activating radiation which passes through said wafer prior to entering said photoresist for exposing said photoresist in a pattern determined by the shadowing characteristics of said wafer and any other material through which said radiation passes prior to entering said photoresist, said wafer having first and second sides, said first side including a utilizable area having said photoresist coating thereon, said wafer including at least a portion which is transmissive of photoresist-activating radiation, said fixture comprising:

housing means having upper and lower surfaces, said upper surface adapted to face a source of said photoresist-activating radiation during the exposure of said photoresist;

said housing means including support means for supporting said wafer with said first side of said wafer down for back exposure of said photoresist by photoresist-activating radiation which passes through said transmissive portion of said wafer prior to entering said photoresist;

said support means and said housing means spaced at least a predetermined distance from said photoresist disposed on said utilizable area of said wafer when said wafer is supported by said support means with said first side of said wafer down, said predetermined distance sufficient to assure that any photoresist-activating radiation which passes through said photoresist coated wafer during normal exposure of said photoresist is not reflected back into said photoresist by said support means or said housing means in photoresist-activating quantities, and;

said housing means including shield means for preventing an exposure-producing quantity of photoresist-activating radiation from entering said photoresist coating except from said wafer.

4,046,475

EXPOSURE CONTROL SYSTEM FOR PHOTOCOMPOSITION MACHINES

Thomas Allan Booth, Flanders, N.J., and Frank Lynn Scholten, Katonah, N.Y., assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

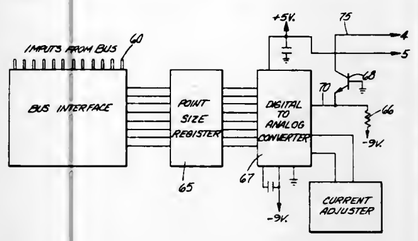
Filed Feb. 3, 1976, Ser. No. 654,930
Int. Cl.² G03B 27/76
U.S. Cl. 355—69 2 Claims

1. In a photocomposition machine, an exposure control system for providing irradiance of an optically projected image, of an intensity which will provide full exposure of a photosensitive receptor for a selected area of the image in a predetermined time on an image plane, comprising:

a font means for providing at least one font of characters to be projected and presenting individual characters at a projection location;

a projection light source to illuminate said font of characters;

a variable magnification lens system for producing the desired projected size of the character and for projecting the illuminated character from said font means to an image plane;



said light source being a high-intensity and short-duration flash coordinated to fire when a selected character of the font reaches a projection position relative to said lens system;

a register for storing a digital number representative of the particular point size to be projected;

a controller means for accepting input coding impelling the register to output to a digital-to-analog converter; and

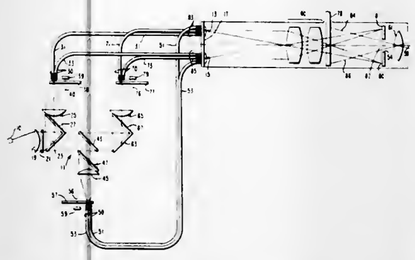
means for utilizing the analog output to supply a corresponding level of electrical energy to said projection light source.

4,046,476

COLOR DESIGN METHOD

John Barrie Charamella, Port Washington, N.Y.; John Warren Long, Freehold, N.J., and Jerry Lloyd Stone, Boothwyn, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 29, 1975, Ser. No. 645,215
Int. Cl.² G03B 27/32; G03G 5/12, 13/01
U.S. Cl. 355—77 10 Claims



1. An on-line method of obtaining color copies of a color variable image comprising;

a. independently changing and viewing the colors of individual components of a color variable image until a desired color combination of the image is obtained;

b. projecting the colored image from (a) onto the input of an electrophotographic fast multi-color reproduction copier;

c. making a copy of the image in a visual match of the colors projected; and

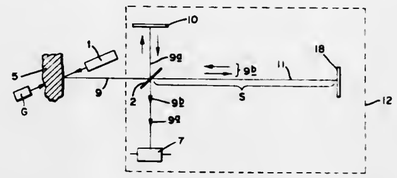
d. repeating steps (a), (b) and (c) any desired number of times to obtain fast copies of the image in a multiplicity of color combinations.

4,046,477

INTERFEROMETRIC METHOD AND APPARATUS FOR SENSING SURFACE DEFORMATION OF A WORKPIECE SUBJECTED TO ACOUSTIC ENERGY

Walter Kaule, Cologne, Germany, assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Nov. 5, 1975, Ser. No. 629,062
Claims priority, application Germany, Dec. 4, 1974, 2457253
Int. Cl.² G01B 9/02
U.S. Cl. 356—109 18 Claims



1. The method of sensing by optical interference the deformation of a workpiece surface resulting from transmitting acoustic energy into the workpiece comprising:

applying to a workpiece acoustic wave energy for causing surface deformation on such workpiece;

transmitting a monochromatic beam of light upon the surface of the workpiece for sensing such deformation;

splitting said beam after reflection at said workpiece surface into a measuring beam portion and a reference beam portion;

transmitting said measuring beam portion to photoelectric sensing means, and

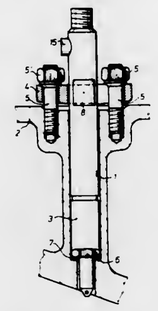
transmitting said reference beam portion over a delay path and thereafter bringing said reference beam to coincidence with said measuring beam portion at said photoelectric means.

4,046,478

SECURING MEANS FOR FUEL INJECTION NOZZLES

Friedrich Messerschmidt, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Continuation of Ser. No. 231,115, March 2, 1972, abandoned.
This application Oct. 28, 1975, Ser. No. 626,182
Claims priority, application Germany, Mar. 2, 1971, 2109727
Int. Cl.² F16B 9/00
U.S. Cl. 403—262 3 Claims



1. Means for securing a fuel injection nozzle body to the cylinder head of an internal combustion engine, the body having a generally circular cross section, a flattened area provided on the outer surface of the nozzle body along a portion thereof and a shoulder forming part of the nozzle body and bounding the flattened area, with the shoulder extending radially inwardly towards the flattened area, said securing means comprising

A. a separate flange having:

1. a first opening of a diameter at least as large as the diameter of the nozzle body for permitting the latter to pass through said flange;

2. a second opening extending from said first opening and having a width sufficiently large to receive the thickness of the nozzle body at the flattened area thereof;

3. a third opening extending from said first opening for receiving therethrough bolt means;

4. a fourth opening separate from said other openings for receiving therethrough bolt means; and

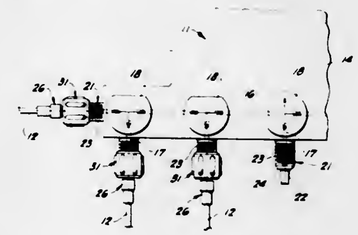
B. bolt means dimensioned for reception within said third and fourth opening for tightening said flange to the cylinder head, whereby said flange engages the shoulder of the nozzle body with a flange portion immediately adjacent and along said second opening and thereby clamps the nozzle body to the cylinder head.

4,046,479

REMOVABLE LOCKING CONNECTOR FOR LUER FITTINGS

Hyman W. Paley, 20 Broadmoor Drive, San Francisco, Calif. 94132

Filed Apr. 23, 1976, Ser. No. 679,835
Int. Cl.² B25G 3/00
U.S. Cl. 403—306 6 Claims



1. In apparatus for interconnecting medical appliances: a male Luer fitting having a body with an axially extending tapered portion and an external thread of a first pitch on the body toward the base of the tapered portion, a female Luer fitting having an axially extending tapered bore receiving the tapered portion of the male fitting and an external thread of a second pitch, and a connector sleeve removably mounted on the male fitting and having internal threads of the first and second pitches engaging the corresponding threads on the Luer fittings.

4,046,480

MOUNTING DEVICE FOR VEHICLE SHOCK ABSORBER

John R. Leonsvaart, 17632 Wellington, Tustin, Calif. 92680

Filed Feb. 2, 1976, Ser. No. 654,348
Int. Cl.² F16B 39/36
U.S. Cl. 403—398 1 Claim

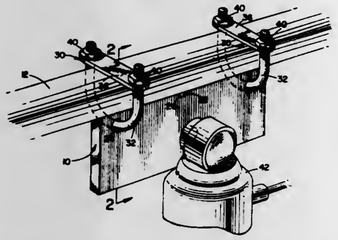
1. A mounting device for special types of vehicle shock absorbers which because of various difficulties cannot be conventionally mounted, wherein the device is mounted to the axle of the vehicle thereof, the device comprising:

a substantially rectangular truss plate having upper and lower longitudinal edges;

the upper edge being formed with a longitudinal arcuate plane to receive said axle thereon in direct engagement;

a transverse notch centrally disposed between the ends of such longitudinally arcuate upper edge to receive a nob formed in said axle, thereby preventing longitudinal movement of said truss plate;

a plurality of holes disposed on said plate, wherein at least two holes are horizontally aligned in parallel relation to said upper edge thereof disposed adjacent each end of said truss plate, and a third hole centrally disposed between and below said first two holes and adjacent said lower edge of said truss plate, whereby the shock absorber is secured to said truss plate; and



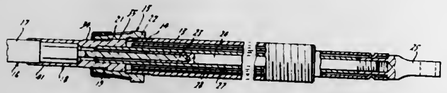
a clamping means formed by a "U"-shaped clamp having threaded, extending free ends, said clamp beirg received in said first two holes and positioned about the axle of the vehicle, and including a cross bar arranged to be disposed over each free end of said clamp having nuts threadably received on each threaded free end of said clamp.

4,046,481

GLAND NUT RETAINING MEANS

Louis T. Horvath, Solon, Ohio, assignor to Detroit Marine Engineering Corporation, Detroit, Mich.

Filed Nov. 22, 1976, Ser. No. 743,950
Int. Cl.² B25G *3/00*; F16B *7/18, 39/32*
U.S. Cl. 403—320 3 Claims



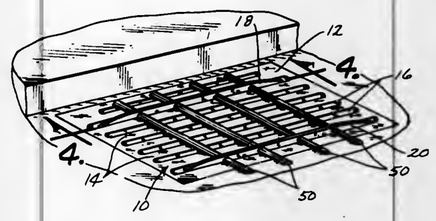
1. In combination, a gland nut and a tubular conduit fitting, said gland nut having a bore threaded at one end and a square internal shoulder engaging a square external shoulder on said conduit fitting, an outer surface on said nut having a pluraliy of circumferentially spaced axially extending portions which are at greater distances from the axis than the remaining area of the outer surface, a retainer of spring-like material having an annular flat main portion surrounding said fitting adjacent the other end of the nut and a plurality of inwardly extending locking fingers tightly engaging said fitting, the inner edges of said locking fingers being on a diameter slightly less than the external fitting surface whereby slipping said retainer axially onto said fitting causes said fingers to slightly flex in a direction preventing backward movement of the retainer and frictionally holding the retainer against rotation, and a plurality of circumferentially spaced axially extending tabs on the outer edge of said flat main portion, said tabs having portions engaging the outer surface of said nut, said last-mentioned portions being engageable by said nut surface portions upon forced rotation of said nut whereby said tabs will be temporarily spread apart to allow said portions to pass thereunder, said tabs having sufficient inward spring-like engaging force to prevent said portions from passing thereunder in response to vibration of the nut.

4,046,482

PROTECTIVE COVER FOR SEWER GRATES

Harold R. Paasch, 405 Sharon Drive, Ankeny, Iowa 50021

Continuation-in-part of Ser. No. 552,258, Feb. 24, 1975, and Ser. No. 408,161, Oct. 19, 1973, Pat. No. 3,914,911. This application Aug. 13, 1975, Ser. No. 604,304
Int. Cl.² E01C *11/22*
U.S. Cl. 404—4 6 Claims



1. In combination with a horizontally disposed sewer grate having a plurality of longitudinally extending spaced apart bars defining elongated openings therebetween, the invention comprising,

a bicycle wheel protective cover secured to said sewer grate,

said protective cover having at least first and second elongated bar members, said bar members having a length substantially the same as the elongated openings in said sewer grate and being at least partially positioned within two of such openings,

a plurality of spaced apart support bars secured to said bar members and extending in a lateral direction with respect thereto over the longitudinally extending bars on said sewer grate and over the elongated openings in said grate to prevent a bicycle wheel from moving downwardly through the elongated openings in said grate,

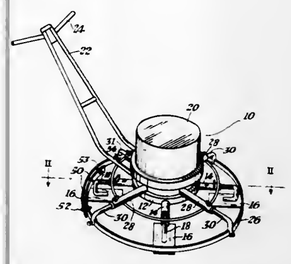
said support bars being selectively adjustably secured to said first and second bar members to permit the cover to be secured to sewer grates having various grate dimensions, and securing means rigidly securing said protective cover to said sewer grate to prevent relative movement therebetween.

4,046,483

TROWELING MACHINE

John W. Sutherland, P.O. Box 5050, Jacksonville, Fla. 32207

Filed Nov. 18, 1976, Ser. No. 742,858
Int. Cl.² E01C *19/22*
U.S. Cl. 404—112 42 Claims



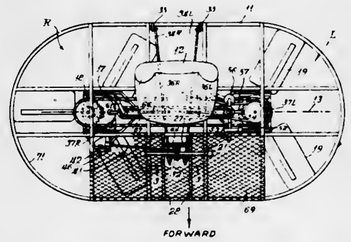
7. In a troweling machine having a housing, a rotatable shaft extending downwardly therefrom, a plurality of troweling blades having outer ends, means for mounting said troweling blades to said shaft, a guard ring for shielding the outer ends of said blades from contact with obstacles, said guard ring having a circumference, a stabilizer arm connecting said guard ring to said housing, the improvement comprising, in combination, said mounting means including adjustable means for adjusting the distance between said shaft and the outer ends of said blades, said stabilizer arm including length adjusting means for adjusting the distance between said shaft and said guard means, and said guard ring including adjustable means for adjusting the circumference of said guard ring.

4,046,484

SPACED-ROTOR RIDE-TYPE SURFACE WORKING MACHINE WITH SINGLE-STICK CONTROL OF ALL MOVEMENTS

Orville H. Holz, Sr., Palm Harbor, and Norbert J. Holz, Spring Hill, both of Fla., assignors to Orville H. Holz, Jr., Roselle, Ill., a part interest

Filed Nov. 15, 1976, Ser. No. 741,610
Int. Cl.² E01C *19/22*
U.S. Cl. 404—112 10 Claims



7. A ride-type surface-working machine including a frame carrying an operator's seat and carried by a pair, only, of surface-working rotors having generally vertical axes spaced apart in a biaxial plane to provide a working zone equal in width to approximately their joint diameters; a power plant for driving said rotors; and means for applying tilting forces to said rotors with selective angularity about each rotor to propel the machine by selectively increased traction of the rotors on the work, said means including a universally pivotal mounting between one of the rotors and the frame and means for applying a tilting force transversely of the biaxial plane between that rotor and the frame; the other rotor having a mounting to the frame which is transversely rigid with respect to said plane so that the reaction resulting from applying the tilting force to the transversely pivotable rotor is transmitted through the frame and the transversely rigid mounting to the rotor thereof, whereby rotation of the two rotors in opposite directions will propel the machine approximately along said plane; said power plant and said seat both having gravity centers, including the operator in the case of the seat, approximately in the biaxial plane and approximately centered between the rotor axes so that evenness of weight distribution will not be impaired by differing operator weights.

4,046,485

EARTH AND ROAD ROLLER WITH OPPOSITELY SKEWED TANDEM STEERING DRUMS

Hartley P. Dermond, S. Venice, Fla., assignor to William H. Clark, Sharon, Pa., a part interest

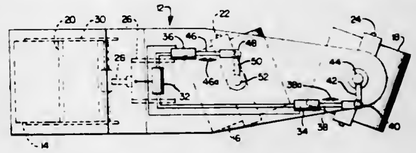
Filed Dec. 9, 1975, Ser. No. 639,113
Int. Cl.² E01C *19/26*
U.S. Cl. 404—123 5 Claims

1. A roller for treating surfaces, comprising:

two surface-treating drums operatively connected to a frame structure and arranged one behind the other, each drum mounted on an independent, horizontal axle to permit rotation about their respective axes across the surface to be treated, the drums being disposed at a positively-selected skew angle relative to each other and in opposite directions relative to the normal direction of movement of the roller, the skew angle being positively selected from a range of between 2°–10° to adapt the roller to different surfaces to be treated;

vertical axle means connected to said frame structure and to the horizontal axle of each of the two drums so that each drum can be turned about a vertical axis, said vertical axle means being aligned along the normal direction of movement to the roller;

steering means on said frame structure for simultaneously turning both of said vertical axle means to maintain the positively-selected skew angle between the two drums during curvilinear movement of the roller, said steering means including steering control means coupled to said



vertical axle means and actuation means operatively coupled to said steering control means;

adjustment means operatively connected to said steering means for adjusting the angle of skew of each drum relative to the normal direction of movement of the roller and relative to each other; and

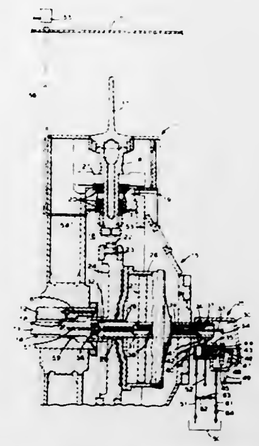
moving means connected to said frame structure for causing the drums to roll across the surface to be treated, including a third surface-treating drum rotatably mounted on a horizontal axis and disposed in tandem relative to said two drums and motor means operatively connected to said third drum.

4,046,486

LUBRICATION OF FAN BLADE BEARINGS

Werner Bernard Kolb, Zweibruecken, Germany, assignor to Turbo-Lufttechnik GmbH, Zweibruecken, Germany

Filed Aug. 6, 1975, Ser. No. 602,358
Claims priority, application Germany, July 8, 1974, 2437932
Int. Cl.² F04D *29/36*
U.S. Cl. 416—157 R 6 Claims



1. In combination with an axial flow fan having a housing, at least one rotor disposed within said housing and secured to a rotatable drive shaft formed with a center bore, a control shaft extending through the bore in spaced relation to the drive shaft, wall means defining a cavity within said rotor, blades

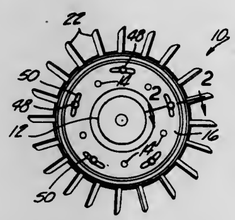
mounted on the rotor, each of said blades being adapted to be angularly shifted about its central axis and including being fitted with a shank extending through a peripheral section of said wall means, bearing means interposed between said shank and peripheral wall section, a hydraulic device for shifting said blades, and wherein the control and drive shafts and the hydraulic device define a means for conveying a fluid lubricant into said cavity, the conveying means including the hydraulic device having an inlet and an outlet chamber, a fixed open ended tubular member interposed between and communicating with said inlet and outlet chambers, the outlet chamber having a perforated wall, and the control and drive shafts being formed with passages communicating with the center bore and with the rotor cavity and through the perforated wall with said outlet chamber, and valved conduit means connecting the inlet chamber with a source for supplying lubricant through the conveying means to said cavity, said lubricant being centrifugally displaced during rotation of the rotor to form a fluid layer against said peripheral wall section thereby providing a continuous supply of lubricant for said bearing means.

4,046,487

TURBINE BLADE INDEXING ASSEMBLY

Herman N. Lenz, Lambertville, Mich., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Aug. 20, 1975, Ser. No. 606,071
Int. Cl.² F01D 5/30
U.S. Cl. 416—208 2 Claims



1. A device for testing the characteristics of a turbine assembly with the turbine blades adjusted through a wide range of pitches and with different numbers of turbine blades, said devices comprising:

a turbine hub adapted to be rotated,

a housing provided with a plurality of circumferentially spaced radially extending bores, each of said bores having an inwardly extending shoulder portion intermediate the ends of said bores,

a plurality of turbine blades, each being provided with a shank portion adapted to be received within said bores with an end extending beyond said bore, said shank portion having an enlarged abutment surface which seats against said shoulder formed in said bore when said shank portion is inserted radially inwardly into one of said bores,

a retainer ring for each of said turbine blades, each of said retainer rings having an axial bore of substantially the same diameter as the end of said shank portion whereby said retainer ring will fit over the end of said shank portion,

said retainer rings and said ends of said shank portion each having a diametrical bore therethrough and a pin member receivable in said diametrical bores to thereby lock said ring member to said shank portion and thus said turbine blade to said housing,

said pin members each having a spherical head portion,

an indexing ring detachably mounted to said housing and provided with a plurality of actuator slots disposed to receive the head portions of said pin members,

means for selectively rotating said indexing ring to thereby move said head portions of said pin members whereby said turbine blades will be rotated about their axis to change the pitch thereof,

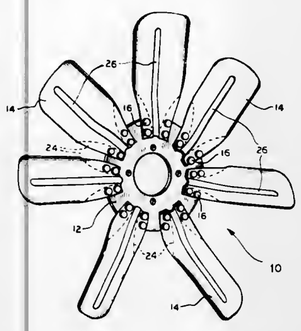
said housing with said turbine blades being detachably mounted to said hub whereby said housing and said turbine blades can be removed as a unit from said hub to permit individual removal of said turbine blades from said housing for replacement or testing purposes or to permit said housing to be replaced by a similar housing having different turbine blade spacings to thereby permit the testing of the effect of different blade spacings on the operation of said turbine assembly.

4,046,488

RADIATOR COOLING FAN

Robert G. Wickham, 3643 Jefferson, Clarklake, Mich. 49234

Filed Nov. 7, 1975, Ser. No. 629,719
Int. Cl.² F04D 29/34
U.S. Cl. 416—210 R 1 Claim



1. In a vehicle cooling system, the combination comprising:

a vehicle engine and a radiator system for cooling said engine; and

a spiderless fan associated with said radiator including a substantially planar, annular mounting hub;

a plurality of elongated fan blades, each of said fan blades being twisted, having a radially extending reinforcing rib formed (therein) therein and being folded upon themselves along a portion less than the entire length of both the leading and trailing edges and being riveted to said hub through both of said folded edges, said folded edges extending radially beyond said hub and radially within said hub.

4,046,489

AERODYNAMIC FAN BLADE

Jack E. Fairchild; Bruce E. Maurer, both of Fort Worth, and Robert L. Woods, Mesquite, all of Tex., assignors to Engle Motive Industries, Inc., Fort Worth, Tex.

Filed Oct. 8, 1975, Ser. No. 616,867
Int. Cl.² F04D 29/38
U.S. Cl. 416—223 R 22 Claims



1. In a multi-blade fan assembly for effecting flow of air in heat exchange relationship with a contained fluid responsive to a driving assembly for effecting rotation, and including:

a. a central hub having means for being attached to the driving assembly; and

b. a plurality of fan blades connected with said central hub and extending radially therefrom; the improvement comprising:

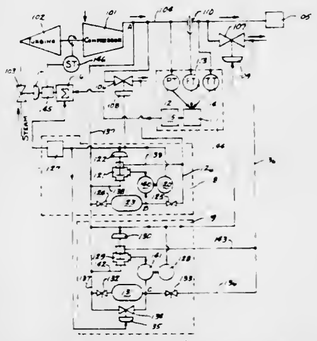
c. having said fan blades manufactured in accordance with modified subcritical aerodynamic airfoil criteria so as to be efficient for moving ambient air at low relative speeds between said fan blade assembly and air and for minimum power consumption at high relative said speeds; each said fan blade having a length to width ratio L/W within the range of 1–9, where L is the length of the blade from its base to its tip and W is the width of the blade at its widest point; each said fan blade having a length L within the range of 6–18 inches; having thin airfoil leading and trailing edges; said leading edge being sufficiently thin that said blade does not stall due to the high degree of separation of said air stream encountering the leading edge of said blade; and having a chord that is totally contained within a planar cross section of the blade at said chord, each said cross section being substantially symmetrical respect to its chord with minimum camber and lift on said blade and having its maximum thickness t to its length l ratio t/l within the range of 0.03–0.12; each said fan blade having a center of mass located at a position in the range of (0.2–0.3) X (length of the chord at the respective location), as measured from the forward end of the chord; each said fan blade having a chord taper throughout the range of taper in the range of 0.25–0.75; and having a twist within the range of 10°–20° for obtaining a substantially uniform flow of air throughout the length of said blade; each said fan blade having a positive angle of attack throughout said length of said blade and having a pitch angle with respect to the central plane of said hub within the range of 25°–45° at the end adjacent said hub and within the range of 10°–30° at the outer radial end farthest from said hub.

4,046,490

METHOD AND APPARATUS FOR ANTISURGE PROTECTION OF A DYNAMIC COMPRESSOR

Alexander Rutshtein, and Naum Staroselsky, both of West Des Moines, Iowa, assignors to Compressor Controls Corporation, Des Moines, Iowa

Filed Dec. 1, 1975, Ser. No. 636,803
Int. Cl.² F04B 49/00; F03B 15/00
U.S. Cl. 417—28 4 Claims



1. A method of integrated antisurge control of a controlled object including a dynamic compressor having a discharge and a suction port, a driver for said compressor, a pipeline connecting the discharge port of the compressor to a user of compressed gas, a quick-acting on-off fluid relief means connected to said pipeline, and a control means for controlling a main controlled parameter, said parameter being one of (a) the mass flow rate of a gas to the user, (b) the discharge pressure of the compressor, (c) the suction pressure of the compressor and (d) the speed of rotation of the compressor, said method comprising:

measuring one of the speed of pressure drop in the discharge port of the compressor and the speed of flow drop in the suction port of the compressor;

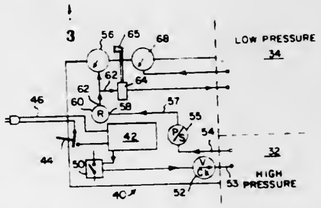
simultaneously operating two different means, one of said two means being said fluid relief means, the other of said two means being a means operatively connected to the compressor for changing the flow rate of a gas through the compressor, said operation further comprising two simtultaneous actions, one of the actions being the full automatic opening of the fluid relief means when the rate of one of the pressure drop in the discharge port of the compressor and the flow drop in the suction port of the compressor and the flow drop in the suction port of the compressor reaches a magnitude corresponding to the beginning of surge, the time of said full opening of the fluid relief means being chosen so as to prevent the developing of surge as indicated by said one of the speed of pressure drop in the discharge port of the compressor and the speed of flow drop in the suction port of the compressor, and the other of said actions being acting on the means for changing the flow rate through the compressor to compensate for the decrease of the flow rate to the user caused by the outflow of the compressed gas through the opened relief means so as to insure the invariability of one of said main controlled parameters.

4,046,491

TENNIS BALL PRESERVER

Malcholm O. Roeder, 402 S. Wayne St., Danville, Ind. 46122

Filed Jan. 22, 1976, Ser. No. 651,513
Int. Cl.² F04B 49/00; B65D 85/00
U.S. Cl. 417—44 4 Claims



4. An apparatus for storing tennis balls in a pressurized environment to preserve their pressurization comprising a tank defining an interior, a bulkhead for dividing the interior into a high pressure reservoir and a lower pressure storage chamber having an access door for entry and removal of tennis balls therefrom, a compressor for supplying compressed air to said reservoir, means for providing compressed air flow from said reservoir to said storage chamber and means for regulating said flow to insure substantially constant pressure in said storage chamber, said storage chamber being proportioned and designed to batch process tennis balls and said reservoir and compressor means having capacities sufficient to maintain said constant pressure in said storage chamber.

4,046,492

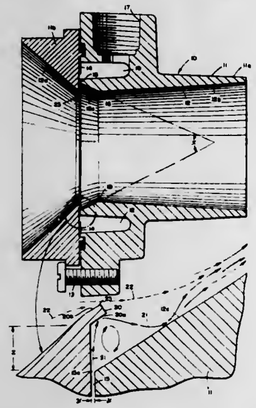
AIR FLOW AMPLIFIER

Leslie R. Inglis, Cincinnati, Ohio, assignor to Vortec Corporation, Cincinnati, Ohio

Filed Jan. 21, 1976, Ser. No. 651,193
Int. Cl.² F04F 5/00
U.S. Cl. 417—197 11 Claims

1. A fluid flow amplifier of relatively high amplification ratio, comprising a body having surfaces defining an axial flow passage therethrough; said passage including an inlet section, an outlet section, and an intermediate section therebetween;

the surface of said intermediate section being frusto-conical in shape and terminating at said outlet section in a throat opening of reduced cross section; said body also having means defining a constantly open annular nozzle between said inlet and intermediate sections for injecting a thin continuous film of pressurized fluid inwardly into said passage along a transverse plane; and a deflector ring disposed within said passage and intersecting said transverse plane; said ring having an outer surface spaced inwardly from said nozzle for contacting the film of pressurized fluid discharged transversely inwardly by said nozzle and for deflecting said film axially towards the frusto-conical surface of said intermediate section; said ring also having an inner surface adjoining the surface of said inlet section and defining an opening substantially larger than said throat opening.

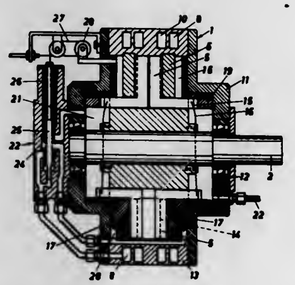


4,046,493

SLIDING VANE MACHINE

Torsten Ålund, Peragatan 9 B, Goteborg, Sweden (416 58)

Filed Apr. 20, 1976, Ser. No. 678,495
Claims priority, application Sweden, Apr. 21, 1975, 7504554
Int. Cl.² F04B *49/08;* F03C *3/00*
U.S. Cl. 417—220 4 Claims



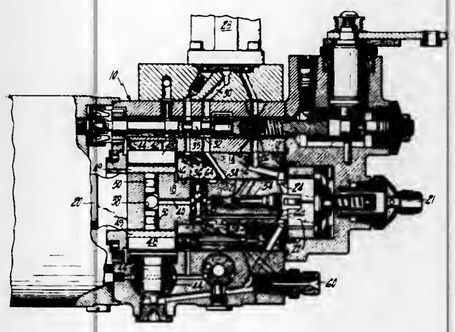
1. A sliding vane machine comprising in combination a housing, a rotor being rotatable therein, a plurality of axial grooves spaced evenly along the circumference of said rotor, each one of said grooves supporting two vanes, which vanes are axially displaceable in said groove, between a first position in which they are entirely contained inside said groove, to a second position in which each separate vane projects axially from the rotor, a number of radially extending partition walls fixed in the housing and dividing the interior thereof into a plurality of pressure chambers, guide means in the housing adapted to bring said vanes to said first position when a groove, during the rotational movement of the rotor, passes one and each of said partition walls, a fluid inlet in each one of said pressure chambers, a fluid supply line common for all fluid inlets, a fluid outlet in each one of said pressure chambers, a fluid discharge conduit common for all fluid outlets, a pressure plate arranged axially displaceable at each axial side of said rotor and in engagement with the ends of the said vanes projecting from the said groove when the vanes are in their said second position, a number of slots arranged in said pressure plates for said partition walls, the axial position of said pressure plates being adjustable following pressure variations in a fluid-containing first space between the pressure plate surface remote from the said vanes and the adjacent end wall of the housing, and a pressure-actuated sliding valve body, slidingly arranged in a valve housing provided with a first conduit between the interior of the valve housing and said fluid-containing first space, a second conduit between the interior of the valve housing and a second low pressure space and a third conduit between the interior of the valve housing and a third, high pressure space connected to said supply line, said sliding valve body being displaceable in said valve housing to alternatively connect the said first conduit with either one of said second and said third conduits, for controlling fluid pressure in said first space.

4,046,494

FUEL INJECTION PUMP AND REPLACEABLE CHECK VALVE THEREFOR

Daniel Edwin Salzgeber, Windsor; Robert Ranfelsen, and Charles W. Davis, both of Simsbury, all of Conn., assignors to Stanadyne, Inc., Hartford, Conn.

Filed Aug. 20, 1975, Ser. No. 606,058
Int. Cl.² F04B *25/00, 29/00, 27/08*
U.S. Cl. 417—253 6 Claims



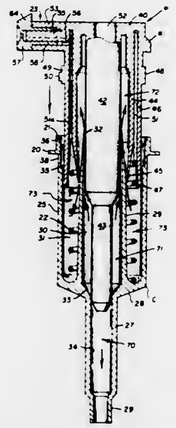
1. A liquid fuel injection pump for supplying measured charges of fuel to an internal combustion engine comprising a distributor rotor having a transverse bore extending therethrough and a pump chamber in which the charges are pressurized to high pressure for injection into the cylinders of said engine, a transfer pump, a passage for delivering the output of said transfer pump to said pump chamber through said transverse bore, and a replaceable check valve cartridge slidably mounted in said transverse bore, said check valve cartridge comprising a prefabricated integral check valve assembly comprising a cylindrical barrel having a single diameter, a hollow valve seat secured to said barrel at one end thereof, a stop secured to the barrel at the other end thereof, a ball for seating on said valve seat, a chamber in said barrel between said valve seat and said stop, a closure piston slidably mounted within said stop and engageable with said ball for seating the ball following the filling stroke of the pump chamber, means for connecting the output of said transfer pump to a cavity at the end of said piston to urge the piston in a direction to seat the ball and means engaging both ends of said barrel for resiliently retaining said cartridge in said transverse bore without transmitting any transverse forces to said distributor rotor.

4,046,495

DISPENSER PUMP

Bruce F. Grimm, Jr., 119 Pine Way, Broomfield, Colo. 80020

Filed Sept. 30, 1976, Ser. No. 727,992
Int. Cl.² B67D *5/40*
U.S. Cl. 417—268 8 Claims



1. A fluid dispenser pump having a piston extending from one end of a cylinder with resilient means urging the piston from the cylinder to its extended position for manual movement into the cylinder to its retracted position, said piston and cylinder being elastomeric plastic members with complementary cylindrical walls forming a sequence of chambers, which include:

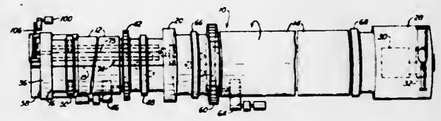
a. an inlet chamber to communicate with a fluid supply;
b. an auxiliary pressure chamber normally sealed from the inlet chamber but communicating with the inlet chamber whenever the piston is at its fully extended position;
c. an operating chamber communicating with the auxiliary pressure chamber and a first check valve means between the operating and auxiliary pressure chambers which permits flow from the auxiliary pressure chamber to the operating chamber but prevents a reversal of such flow;
d. a discharge chamber communicating with the operating chamber and a second check valve means between the discharge and operating chambers which permits flow from the operating chamber to the discharge chamber but prevents a reversal of such flow; and
e. an outlet from the discharge chamber; wherein
f. said auxiliary pressure chamber and said operating chamber increase in volume when the piston is being extended and decrease in volume when the piston is being retracted whereby reciprocation of the piston into the cylinder pumps fluid past the check valve means and through the pump; and
g. said check valve means are formed as thinwall sleeve members embracing stem portions, said sleeve members expanding responsive to fluid pressure, to move away from the stem portions to permit fluid flow therepast.

4,046,496

APPARATUS FOR AGGLOMERATING FINELY DIVIDED AGGLOMERATIVE MATERIALS IN A ROTATING DRUM

Everett Gorin, Pittsburgh; William A. Jasulaitis, Bridgeville; George E. Wasson, and Frank William Theodore, both of Pittsburgh, all of Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Division of Ser. No. 627,687, Oct. 31, 1975, Pat. No. 3,988,114, which is a continuation of Ser. No. 466,832, May 3, 1974, abandoned. This application June 21, 1976, Ser. No. 698,223
Int. Cl.² B01J *2/12;* B29B *1/02*
U.S. Cl. 425—222 6 Claims



1. Apparatus for agglomerating finely divided agglomerative material comprising,

a cylindrical rotary drum having a longitudinal axis and an inner wall,
means to rotate said cylindrical drum about said drum longitudinal axis at a preselected speed and deposit a layer of finely divided agglomerative material on said drum inner wall,
an elongated rotary scraper having a body portion with a longitudinal axis, said rotary scraper positioned in said cylindrical drum in spaced relation to said cylindrical drum inner wall with said rotary scraper body portion longitudinal axis spaced from said drum longitudinal axis,
blade means extending radially outwardly from said scraper and extending lengthwise thereon,
means to rotate said rotary scraper in the same direction of rotation as said drum in fixed timed relation to the rotation of said drum to form a plurality of elongated alternating and longitudinally extending ridges and valleys in said layer of agglomerative material deposited on said drum inner wall according to the following formula:

$N = (b\ U_2/U_1)$

N = a whole number and number of ridges formed
b = number of scraper blades
U_1 = drum speed, rpm
U_2 = scraper speed, rpm and,

said rotary scraper arranged to remove other finely divided agglomerative material deposited on the surface of said longitudinally extending ridges and valleys formed in said layer of agglomerative material.

4,046,497

CUTTING APPARATUS

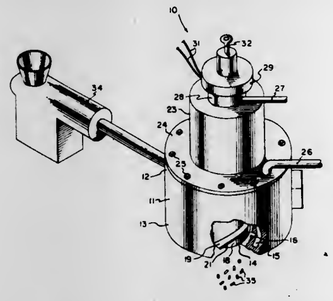
Ritchey O. Newman, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 525,895, Nov. 21, 1974, abandoned. This application Mar. 26, 1976, Ser. No. 670,788
Int. Cl.² B29C *17/14*
U.S. Cl. 425—313 2 Claims

1. In a polymer severing apparatus which comprises a housing, the housing defining a generally annularly disposed extrusion face, the extrusion face having a plurality of generally radially inwardly extruding extrusion orifices, the housing defining a polymer receiving cavity, the polymer receiving cavity surrounding the extrusion face, the polymer receiving cavity being in communication with the extrusion orifices and the housing defining a polymer supply passage in communication with the polymer receiving cavity, the polymer supply passage being adapted to be in communication with a source of heat plastified synthetic resin polymer, a cutter having a generally circular configuration and being rotatably mounted and

coaxially disposed within a cavity defined by the housing, the cutter having at least a cutting blade adapted to pass by the extrusion orifices of the housing and sever strands which may emerge from the extrusion orifices,

the improvement which comprises the extrusion orifices being disposed in a generally frustoconical surface defined by the housing, the cutter having a generally corresponding frustoconical configuration, the cutter having an end of larger diameter and an end of smaller diameter,



the cutter having at least one locating surface disposed at the smaller end thereof and adapted to engage adjacent generally like frustoconical surfaces of the housing, the locating surface on projection toward the larger end of the cutter encircling but not contacting terminal portions of the cutting blade,

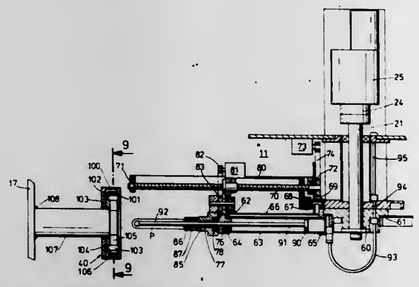
the cutter being rotatably mounted upon a hollow shaft, the shaft having fluid cooling dispersing means positioned on the shaft at a location generally adjacent to the end of the larger diameter of the cutter.

4,046,498

APPARATUS FOR BLOW-MOLDING HOLLOW ARTICLES, IN PARTICULAR BOTTLES

Adolf Appel, Egestorf-Nordheide, and Wolfgang Reymann, Hamburg, both of Germany, assignors to Gildemeister Corpoplast GmbH, Hamburg, Germany

Filed Oct. 1, 1976, Ser. No. 728,809
Claims priority, application Germany, Oct. 8, 1975, 2545131
Int. Cl.² B29C *17/07*
U.S. Cl. 425—526 **7 Claims**



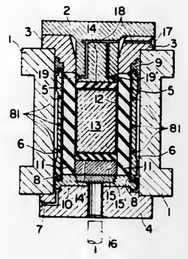
1. A machine for blow molding articles from blowable parisons, comprising a rotatable shaft, means for rotating said shaft in stepwise fashion, a plurality of work stations located concentrically about said shaft at which various heating and blowing operations are carried out, at least one of said stations being positioned further from the shaft than others of said stations, a plurality of radial arms carried by said shaft for rotation therewith, each such arm comprising telescopic inner and outer sections movable relative to one another to vary the radial length of the arm, the inner of said sections being secured to the shaft and the outer of said sections carrying at its outer end an adapter for retaining a parison, fixed actuating means located adjacent said at least one station, said actuating means engaging only the outer section of that arm positioned at said at least one station, and means for actuating said actuating means to telescopically extend said arm sufficiently to position said adapter at said at least one station.

4,046,499

DRY RUBBER COMPRESSION MOLDING APPARATUS

Shiaroku Saito, Yokohama, Japan, assignor to Shinagawa Firebrick Co., Ltd., Tokyo, Japan

Division of Ser. No. 389,053, Aug. 16, 1973, Pat. No. 3,956,452. This application Jan. 14, 1976, Ser. No. 648,858
Int. Cl.² B30B *5/02, 11/02;* B28B *7/12, 7/06*
U.S. Cl. 425—405 H **4 Claims**



1. In a dry type isostatic molding apparatus comprising a rigid cylindrical metallic spacer disposed coaxially inside of a cylindrical high pressure container, said spacer having a plurality of holes in its cylindrical surfaces for allowing pressurized liquid to enter the inside of the spacer, an isostatic liquid chamber being defined between the outer cylindrical surface of said spacer and the inner wall face of said container, a shaping rubber mold disposed coaxially inside said spacer, and lids firmly fixed at the upper and lower parts of said container, said upper and lower lids and said shaping rubber mold defining a sealed molding chamber for housing powders which are formed into a molded body by the apparatus, the improvement wherein said apparatus is provided with means for introducing and supplying pressurized gas between the inner peripheral surface of said shaping rubber mold and the outer peripheral surface of said molded body.

4,046,500

PRESS SPAR FOR HEATED PANEL PRESS

Heinrich Pfeiffer, Eppingen, Germany, assignor to Maschinenfabrik J. Dieffenbacher & Co., Eppingen, Germany

Continuation-in-part of Ser. No. 486,375, July 8, 1974, Pat. No. 3,998,580. This application Dec. 29, 1975, Ser. No. 645,213
Claims priority, application Germany, Dec. 30, 1974, 2431862
Int. Cl.² B29C *3/00*
U.S. Cl. 425—407 **17 Claims**

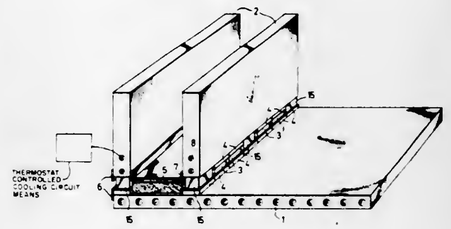
1. In a heated panel press for the production of pressed, composite panels such as chipboard panels, fiber panels and the like, in which the work is pressed between opposing, heatable and coolable horizontal pressure plates mounted on upper and lower press spars, respectively, of which at least one is vertically movable, a press spar structure comprising in combination:

at least two upright press spar members to which the associated horizontal pressure plates are operatively connected;

a heat barrier in the form of a pressure resistant insulating bank interposed between the back surface of each pressure plate and a pressure transmitting end face of the associated upright press spar member; and

at least one metallic shroud member encasing the insulating bank where it engages the pressure plate, so that relative horizontal displacements between the upright member and its pressure plate which are generated during operation take place between said shroud members and the pressure plate; and wherein

each insulating bank includes a succession of insulating pressure blocks and at least one steel pressure block interposed between insulating pressure blocks, for the transmission of elevated pressures between the pressure plate and the press spar structure.

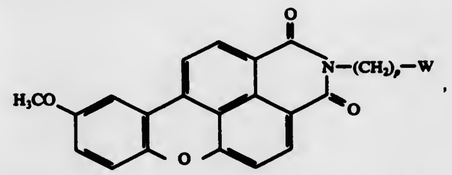


4,046,501
PROCESS FOR THE DYEING AND PRINTING OF SYNTHETIC POLYAMIDES

Joachim Otten, Offenbach am Main, and Helmut Troster, Konigstein, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 30, 1975, Ser. No. 618,221
Claims priority, application Germany, Oct. 2, 1974, 2446909
Int. Cl.² D06P *1/382*
U.S. Cl. 8—1 E 4 Claims

1. A process for the dyeing and printing of a fiber material on the basis of synthetic polyamides, which comprises using a dyestuff of the formula



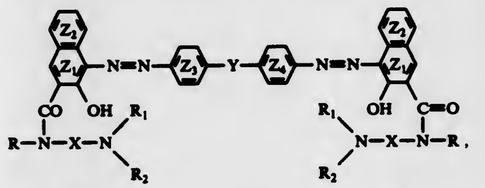
wherein *p* is 1, 2, 3, 4, 5 or 6, W is sulfo, sulfato, thiosulfato, carboxy, phosphato, $PO(OH)_2$ or —PO(OR)(OH), wherein R is alkyl of 1 to 4 carbon atoms.

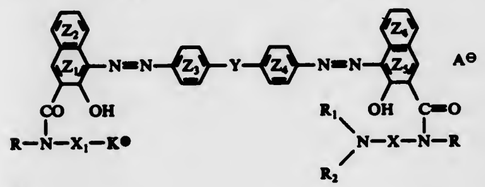
4,046,502
BASIC DISAZO DYES HAVING TWO 2-HYDROXY-3-SUBSTITUTED CARBAMOYLNAPHTHYL-1-AZOPHENYL GROUPS FOR DYEING PAPER

Helmut Moser, Reinach, and Hans von Tobel, Riehen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

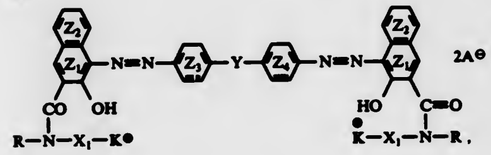
Division of Ser. No. 418,451, Nov. 23, 1973, abandoned, which is a continuation of Ser. No. 95,336, Dec. 4, 1970, abandoned. This application Dec. 17, 1975, Ser. No. 641,485
Int. Cl.² D21H *1/46*
U.S. Cl. 8—7 18 Claims

1. In a process for the production of colored paper comprising (A) incorporating a dye composition into paper stock and forming paper from said paper stock or (B) applying a dye composition to paper sheet, the improvement wherein said dye composition is or comprises a dye of the formula





or



wherein each

R, R_1 and R_2 is independently hydrogen, hydrocarbyl or substituted hydrocarbyl or

R_1 and R_2 taken together and with the nitrogen atom to which they are joined form a saturated or partially saturated heterocyclic group,

each K^+ is independently an ammonium, substituted ammonium, hydrazinium, substituted hydrazinium, cycloimmonium or substituted cycloimmonium group,

each X is independently a direct bond or a divalent radical,

each X_1 is independently a divalent radical, Y is a direct bond, alkylene, substituted alkylene, —S—, —O—, —NH—CO—NH— or —CH=CH—, and

each A^- is independently an anion,

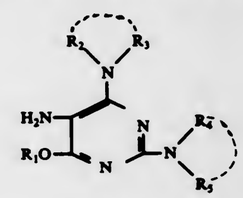
wherein each of Rings Z_1, Z_2, Z_3, Z_4, Z_5 and Z_6 is independently further unsubstituted or further substituted.

4,046,503
DEVELOPER-COUPLER HAIR DYES BASED ON ALKOXY-TRIAMINO-PYRIMIDINES

Hans Peter Kabersky, Solingen, Germany, assignor to Henkel & Cie GmbH, Duesseldorf, Germany

Filed Apr. 5, 1976, Ser. No. 673,457
Claims priority, application Germany, Apr. 12, 1975, 2516117
Int. Cl.² A61K *7/13*
U.S. Cl. 8—10.2 15 Claims

1. A composition of the developer-oxidizer type for the dyeing of hair, consisting essentially of, as developer, a water-soluble triamino C_{1-4} alkoxy pryrimidine of the formula:



wherein R_1 represents C_{1-4} alkyl; R_2, R_3, R_4 and R_5 each represent the same or different substituents selected from the group consisting of hydrogen, C_{1-4} alkyl, C_{1-4} hydroxyalkyl, phenyl, C_{1-4} alkylphenyl, phenyl-C_{1-4} alkyl, and C_{1-4} alkoxyphenyl, and wherein R_2 and R_3, or R_4 and R_5 together form a divalent linking member selected from the group consisting of butylene, pentylene, azabutylene, and oxabutylene, or the water-soluble salts thereof, and a water-soluble coupler therefor, said developer and said coupler being present in the molar range of 2:1 to 1:2.

2. An aqueous emulsion for the dyeing of hair having a content of 0.2% to 5% by weight of the developer-coupler composition of claim 1.

4,046,504
PROCESS FOR PREPARATION OF COLORED SUEDE SHEET MATERIALS

Osamu Fukushima, Okayama, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Filed Oct. 20, 1975, Ser. No. 624,133
Claims priority, application Japan, Oct. 23, 1974, 49-122233
Int. Cl.² D06P *7/00*
U.S. Cl. 8—17 11 Claims

1. A process of preparing suede sheet materials having desirable tactile characteristics and good coloring comprising the steps of:

a. coloring fibers throughout with dope dyes;

b. forming said colored fibers into a fibrous mat;

c. impregnating said mat with a binder composed mainly of an elastomer;

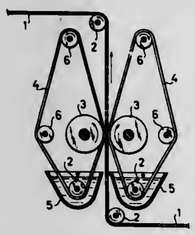
d. treating said impregnated mat to form a napped surface

thereon, the size of the fibers in the resulting nap ranging from 0.1 to 0.0005 denier; and
e. dyeing the napped sheet material.

4,046,505
POST DYEING RESIN PARTICLES FIXED TO RESIN BASE
Malcolm Carnie Cobb, and Pamela Elliott, both of Pontypool, England, assignors to Imperial Chemical Industries Limited, London, England
Continuation of Ser. No. 813,741, April 4, 1969. This application July 31, 1972, Ser. No. 276,294
Claims priority, application United Kingdom, Apr. 8, 1968, 16855/68; Aug. 16, 1968, 39269/68
Int. Cl.² D06P *1/52*
U.S. Cl. 8—18 R 3 Claims

1. A process for producing a decorative structure which comprises applying thermoplastic polymer particles to a polymeric substrate material having a different dye substantivity from said particles, heating to fix the particles to said material and subsequently dyeing the resulting product to colour the polymer particles and give the same a different colour effect from said substrate material.

4,046,506
PROCESS AND DEVICE FOR THE CONTINUOUS DYEING OF TEXILE WEBS OF SYNTHETIC OR MOSTLY SYNTHETIC FIBRE MATERIALS
Erich Feess, Hofheim, Taunus, and Hans-Peter Maier, Sulzbach, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Filed Jan. 16, 1975, Ser. No. 541,564
Claims priority, application Germany, Jan. 18, 1974, 2402328
Int. Cl.² D06P *3/82*
U.S. Cl. 8—21 R 3 Claims

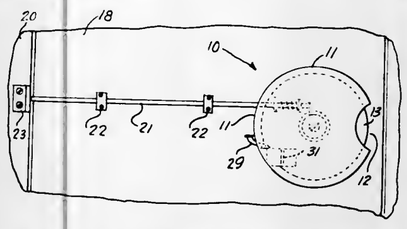


1. A process for the continuous dyeing of a textile web consisting of or containing a major portion of synthetic fibers, by padding the fibrous material with an aqueous dye liquor followed by reducing the moisture content of the web so treated and subsequently fixing the dyestuff, which comprises contacting said textile web soaked with dye liquor, while said web passes through the nip of a pair of squeezing rollers of a padding apparatus in a sandwich-like manner with two endless belts of an absorbent fiber material which envelop the said textile web from both sides and are likewise soaked by dye liquor, squeezing the web between said two layers of absorbent fiber material and continuing said sandwich contact between web and absorbent fiber material for a further time before proceeding with said dyeing operation.

4,046,507
COMMERCIAL PACKAGES CONTAINING DYESTUFFS
Hans Heini Zweifel, Binningen; Arthur Buehler, Rheinfelden, and Alfred Fasciati, Bottmingen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland
Continuation of Ser. No. 294,036, Oct. 2, 1972, abandoned, which is a continuation of Ser. No. 112,807, Feb. 4, 1971, abandoned. This application Sept. 12, 1975, Ser. No. 612,820
Claims priority, application Switzerland, Feb. 6, 1970, 1776/70
Int. Cl.² D06P *3/66*
U.S. Cl. 8—79 6 Claims

1. A process for the preparation of an aqueous dyebath or aqueous printing paste, comprising the step of adding to the aqueous medium a dry pulverulent, water-soluble, fiberreactive dyestuff wrapped in a water-soluble foil material selected from the group consisting of mucin, hydroxyalkylcellulose, carboxymethylcellulose, polyvinylmethylether/maleic anhydride copolymer and polyvinylalcohol.

4,046,508
SANITARY HANDLE
William M. McDonald, 7116 Woodmore Oaks, Citrus Heights, Calif. 95610
Filed June 16, 1976, Ser. No. 696,553
Int. Cl.² A61L *3/00*
U.S. Cl. 21—77 4 Claims

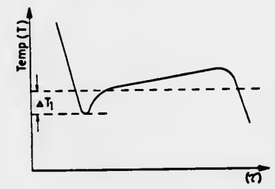


1. A sterilized door handle apparatus comprising a housing secured to a door and having an aperture in one side thereof, a wheel rotatably mounted in said housing and having a portion thereof graspable through said aperture for opening the door, means in said housing engaging said wheel for coating said wheel with sterilizing liquids, means in said housing adjacent said last named means for removing excess liquid from said wheel, and means on said door engaging means on its door frame for rotationally advancing said wheel each time the door is opened.

4,046,509
METHOD FOR CHECKING AND REGULATING THE CONDITIONS OF CRYSTALLIZATION IN THE SOLIDIFICATION OF MELTS
Stig Leonart Backerud, Valhovagen 3, Akersberga, Sweden
Continuation of Ser. No. 137,260, April 26, 1971, abandoned. This application Mar. 15, 1976, Ser. No. 666,582
Claims priority, application Sweden, Apr. 28, 1970, 5755/70
Int. Cl.² G01N *31/00, 33/00*
U.S. Cl. 23—230 A 4 Claims

1. A method for checking and regulating the crystallization conditions in the solidification of a melt comprising
a. transferring a sample from the melt to a test vessel maintained at a uniform temperature greater than the nucleation temperature of the melt with the melt having a volume of 5 to 50 cm³ and a vessel heat conductivity such that the sample after removal from the melt will solidify in a period of time from 5 seconds to 5 minutes in said vessel,
b. measuring the change in temperature with time with temperature sensing means in said test vessel,
c. recording said change with recording means, to form a temperature-time solidification curve,

d. comparing at least one of the following characteristic conditions in the recorded temperature-time solidification curve with a corresponding temperature-time solidification curve obtained by the solidification of a melt with known crystallization conditions of morphology and size and substantially the same chemical composition, viz.,
1. the slope of the temperature-time solidification curve at the primary plateau temperature,



2. the area under positive values of the derivative of the solidification curve at multi-phase eutectic solidification,
e. analyzing said corresponding solidification curve and at least one of the characteristic conditions to determine deviations and
f. correcting said melt from which the sample is taken if (e) reveals an unacceptable deviation from said corresponding solidification curve.

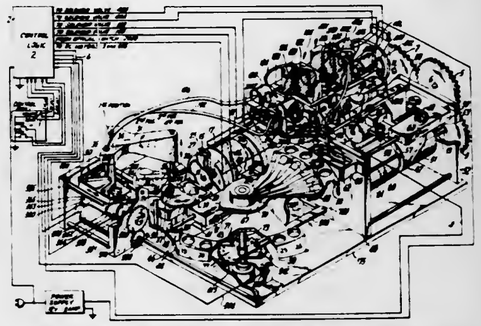
4,046,510
METHOD AND AN APPARATUS FOR DETERMINING THE INORGANIC CARBON CONTENT OF A LIQUID
Wolf-Jurgen Becker, Leverkusen; Jacques Deprez, Frechen, and Horst Lehnert, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed July 27, 1976, Ser. No. 708,945
Claims priority, application Germany, Aug. 2, 1975, 2534620
Int. Cl.² G01N *31/12, 33/18*
U.S. Cl. 23—230 R 8 Claims



1. A method for determining the inorganic carbon content of aqueous liquids, wherein a sample of the liquid to be analysed, together with a carbon dioxide-free carrier gas, is introduced into a heated reaction chamber containing as a reagent crystalline potassium bisulphate and/or a mixture of equal parts of potassium bisulphate and potassium sulphate, with which the sample is reacted to form carbon dioxide and water and the carbon dioxide is fed to a carbon dioxide analyser.

4,046,511
PIPETTOR APPARATUS
James Stabile, Scarsdale, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed June 16, 1975, Ser. No. 587,202
Int. Cl.² G01N *33/16, 1/14*
U.S. Cl. 23—259 3 Claims

1. Apparatus for loading liquid materials into a rotatable disc having a plurality of cavities adapted to contain liquid and arranged in a plurality of radially aligned rows said apparatus comprising:
i. a first horizontally disposed cam shaft,
ii. a second horizontally disposed cam shaft arranged parallel to and horizontally separated from said first cam shaft,
iii. electrically actuatable motor means engaged to said first and second cam shafts,
iv. a first vertically disposed shaft arranged at a position substantially in-line with the axis of rotation of said second cam shaft and spaced adjacent from said first cam shaft, said first vertically disposed shaft being rotatably moveable about its vertical axis,
v. a disc member removeably affixed to said vertical shaft and rotatable therewith, said disc member having a plurality of cavities adapted to contain liquid, said cavities being arranged in a plurality of equi-spaced radial rows,
vi. reservoir means adapted to contain liquid reagent positioned adjacent said disc member,
vii. an annular ring member fixedly positioned with respect to and surrounding said disc member, said ring member having a plurality of receptacles adapted to contain serum, said receptacles being in radial alignment with said radial rows of said disc member,
viii. a second vertically disposed shaft arranged adjacent said first vertically disposed shaft, said second vertically disposed shaft being reciprocally rotatably moveable about its vertical axis and being vertically moveable up and down,
ix. a first probe supporting arm fixedly attached to said second vertically disposed shaft, said first probe supporting arm being arranged such that a probe supported thereon can be moved from a position above said reagent liquid reservoir to a position above an initial selected radial row of said disc member and back to a position



above said liquid reagent reservoir upon reciprocal rotatable movement of said second vertically disposed shaft,
x. a first cam mounted on said first cam shaft and engaged to said second vertically disposed shaft to lower and raise said shaft and said first probe supporting arm when the probe supported by said arm is positioned over said reagent reservoir to cause said probe, when lowered, to be immersed in liquid reagent in said reagen reservoir and to subsequently lower and raise said first probe supporting arm when the probe supported by said arm is positioned over said initial selected radial row of said disc member to cause said probe, when lowered, to be within a cavity of said selected radial row,
xi. a second cam member mounted on said first cam shaft and engaged to said second vertically disposed shaft to reciprocally rotate said second vertically disposed shaft and said first probe supporting arm from an initial position in which the probe supported by said arm is above said liquid reagent reservoir to a second position in which said probe is above said initial selected radial row of said disc member and back to its said initial position,
xii. a horizontally, moveably mounted block arranged above said second cam shaft,
xiii. a second probe supporting arm pivotally mounted on said horizontally moveable block and arranged to be rotatably moveable up and down in a vertical plane,
xiv. a rinse liquid containing reservoir arranged adjacent said second cam shaft,
xv. a third cam mounted on said second cam shaft and en-

gaged to said horizontally moveable block to move said second probe supporting arm such that the probe supported thereby is moved in sequence from (*a*) an initial position in said rinse liquid reservoir to (*b*) a position within a said receptacle of said ring member to (*c*) a position within a cavity of a radial row of said disc member and (*d*) back to its initial position within said rinse liquid reservoir,

xvi. a fourth cam mounted on said second cam shaft and engaged to said pivotally mounted second probe supporting arm to move said second probe supporting arm such that the probe supported thereby is raised during sequence (*a*) of (xv) above, lowered during sequence (*b*) of (xv) above, raised subsequent to sequence (*b*) lowered during sequence (*c*) of (xv) above raised subsequent to sequence (*c*) of (xv) above and lowered during sequence (*d*) of (xv) above,

xvii. first syringe pump means arranged adjacent said first cam shaft and communicating with a said probe supported by said first probe supporting arm,

xviii. fifth cam means mounted on said first cam shaft and engaged to said first syringe pump means to cause relative movement of the syringe of said first syringe pump means such that liquid reagent is drawn into a said probe of said first probe supporting arm when said probe is immersed in liquid reagent in said reagent reservoir and dispensed from said probe when said probe is within a cavity of a selected radial row of said disc member,

xix. second syringe pump means arranged adjacent said first cam shaft and communicating with said probe supported by said second probe supporting arm,

xx. sixth cam means mounted on said first cam shaft and engaged to said second syringe pump means to cause relative motion of the syringe of said second syringe pump means such that serum is drawn into said probe of said second probe supporting arm when said probe is within a said receptacle of said ring member and dispensed from said probe when said probe is within a cavity of a radial row of said disc member,

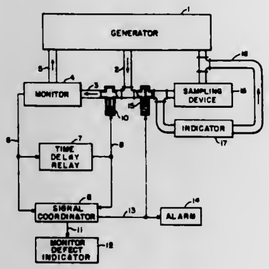
xxi. seventh cam means mounted on said first cam shaft and engaged to said first vertically disposed shaft to rotate said shaft by an increment corresponding to one radial row of cavities of said disc member subsequent to the dispensing of liquid from the probes supported by said first and second probe supporting arms.

4,046,512

DEVICE FOR INDICATING OVERHEATING IN GENERATORS

Thomas D. Kaczmarek, and David C. Phillips, both of Penn Hills, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 20, 1976, Ser. No. 659,868
Int. Cl.² B01D *50/00*; G01N *31/22*
U.S. Cl. 23—253 TP **7 Claims**



1. In combination,

A. a generator having a cooling gas stream passing therethrough;

B. an indicator device for indicating the presence of particulates in said gas stream comprising

1. a filter holder having a gas inlet and a gas outlet, connected so that at least a portion of said cooling gas stream can pass therethrough;

2. a gas-permeable, particulate-collecting filter within said filter holder, the surface of said filter which faces said gas inlet being divided into at least two areas; and

3. at least two different chemical indicators, each on a different area of said filter, each chemical indicator producing a visual effect when contacted by particulates; and

C. a valve between said generator and said cooling gas stream for controlling its flow through said indicator device, whereby particulates in said gas stream can collect on said filter producing a visual effect.

4,046,513

PRINTED REAGENT TEST DEVICES AND METHOD OF MAKING SAME

Leighton Clifford Johnson, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed June 30, 1976, Ser. No. 701,403
Int. Cl.² A61K *9/70*; B05D *5/00*; G01N *31/22, 33/16*
U.S. Cl. 23—253 TP **12 Claims**



1. In a test device for determining the presence of a constituent in a sample in which a carrier matrix is incorporated with a reagent system capable of interacting with the constituent to produce a detectable response, said system comprising at least two reactants, the improvement wherein at least two of the reactants are printed separately from each other in substantially discrete, non-contacting, substantially coplanar areas of the carrier matrix.

4,046,514

TEST DEVICE AND METHOD FOR DETERMINING A COMPONENT IN A SAMPLE

Katharine Gentry Johnston, Elkhart, and Melvin Dee Smith, Wakarusa, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 24, 1976, Ser. No. 744,703
Int. Cl.² G01N *33/16, 31/14, 21/06*
U.S. Cl. 23—253 TP **29 Claims**



1. In a test device for determining a component in a sample, wherein a carrier matrix is incorporated with a reactant system comprising at least one ingredient, said reactant system being capable of producing a detectable response upon contact with said sample component,

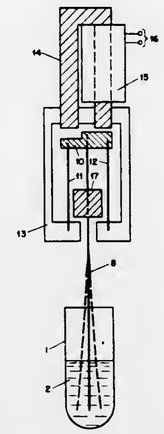
the improvement in which said matrix is a cloth comprising longitudinal and transverse filaments, at least an effective number of said transverse filaments being the only filaments in the matrix incorporated with at least one of said reactant system ingredients.

4,046,515

DILUTING AND AGITATING DEVICE

Jan de Leeuw, Mistelvagen 9, Akersberga, Sweden

Filed Mar. 9, 1976, Ser. No. 665,291
Claims priority, application Sweden, Mar. 27, 1975, 7503588
Int. Cl.² B01F *11/04*
U.S. Cl. 23—259 **3 Claims**



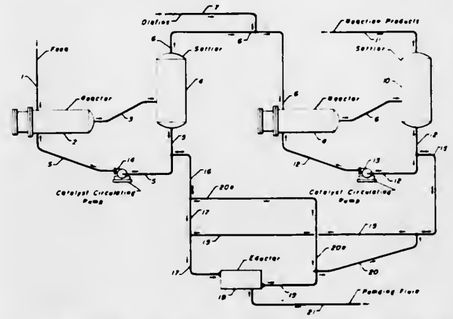
1. Apparatus for dispensing a liquid into a succession of test tubes, or similar vessels, and for agitating liquid in the test tubes, comprising a pipette and an elongated wire agitator, supporting means for the pipette and said agitator including driving means and journalling means for positioning one end of the agitator for transverse vibratory movement in the liquid in a test tube, said one end being disposed below the level of the discharge end of the pipette, whereby only said one end of the agitator is immersed in the liquid while in a test tube.

4,046,516

HYDROGEN FLUORIDE-CATALYZED ALKYLATION APPARATUS

Vance P. Burton, Arlington Heights, and Michael Z. Mikulicz, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1975, Ser. No. 645,122
Int. Cl.² B01J *1/00*; C07C *3/54*
U.S. Cl. 23—288 E **1 Claim**



1. An alkylating apparatus comprising a first reactor and a first settler communicating therewith, a second reactor, a second settler communicating with the second reactor, means for passing liquid from the upper portion of the first settler to the second reactor, a first catalyst recirculating conduit between said first settler and said first reactor, a second catalyst recirculating conduit between said second settler and said second reactor, an eductor, first conduit means connecting said first recirculating conduit with the inlet end of said eductor, second conduit means connecting the outlet end of the eductor with said second recirculating conduit, an additional conduit connecting said second conduit means with said first conduit means, and a separate conduit connecting said second conduit means with said first conduit means, whereby said additional conduit and said separate conduit provide means by which catalyst may be moved from said first catalyst recirculating conduit to said second catalyst recirculating conduit, or vice-versa, to enable selective adjustment of the catalyst inventory in the first and second reactor-settler circuits.

4,046,517

CEMENTED CARBIDE MATERIAL FOR CUTTING OPERATION

Yasuyuki Soga, Kobe, Japan, assignor to Ltd. Dijet Industrial Co, Osaka, Japan

Filed May 30, 1975, Ser. No. 582,334
Claims priority, application Japan, Feb. 14, 1975, 50-18981
Int. Cl.² C22C *29/00*; C04B *35/56, 35/58*
U.S. Cl. 428—539.5 **11 Claims**

1. A cemented carbide material for cutting operations consisting essentially of 10 to 60% by weight of tungsten carbide, 5 to 40% by weight of titanium carbide, 5 to 30% by weight of tantalum carbide, 3 to 20% by weight of titanium nitride and 5 to 20% by weight of an iron family metal selected from the group consisting of cobalt, nickel and iron.

4,046,518

SOLID FUEL ELEMENT AND PROCESS OF MANUFACTURING

Charles J. Dalzell, 920 N. 6th Ave., Yakima, Wash. 98902

Filed Mar. 22, 1976, Ser. No. 668,942
Int. Cl.² C10L *5/00, 11/00*
U.S. Cl. 44—10 B **3 Claims**

1. A method for producing a solid fuel element useful as an igniter in a solid fuel package comprising the steps of: blending approximately equal parts by weight of dry powdery wood particles at room temperature derived from the sawdust of cell bound moisture free compressed wood with refined liquid paraffin wax having a melting point of approximately 125° F. preheated to approximately 350° F. to an ultimate blended material temperature of approximately 250° F., thereby ridding the wood particles of free moisture and activating the molecules of the wood particles and liquid wax sufficiently to cause the wood particles to be completely saturated with the liquid wax, cooling the blended material while conveying it in a thin layer slowly through a cooling chamber until the blended material is at a temperature of approximately 56° F., milling the blended and cooled material, and then compacting the material in a rigid compression chamber under a pressure of approximately 22,000 psi to form a dry solid fuel element.

4,046,519

NOVEL MICROEMULSIONS

Alfred B. Piotrowski, Woodbury, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

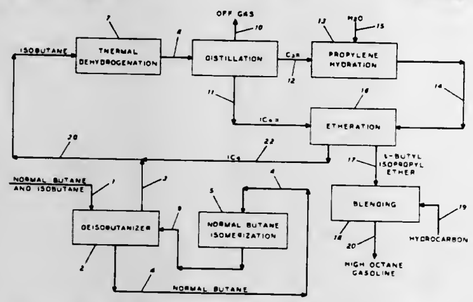
Filed Oct. 31, 1975, Ser. No. 627,725
Int. Cl.² C10L *1/32*
U.S. Cl. 44—51 **2 Claims**

1. A microemulsion comprising a mixture of gasoline, methanol and water and a surfactant blend having a hydrophile-lipophile balance value of about 4 wherein the surfactant blend comprises, by weight, a 9:1 mixture of mono and diglycerides of oleic acid: bis (2-hydroxyethyl)stearylamine oxide.

4,046,520
GASOLINE PRODUCTION

Jacob D. Kemp, El Cerrito, and Robert P. Sieg, Piedmont, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 306,117, Nov. 13, 1972, Pat. No. 3,904,384, which is a continuation-in-part of Ser. No. 31,300, April 23, 1970. This application June 9, 1975, Ser. No. 585,412
The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.
Int. Cl.² C10L *1/02*
U.S. Cl. 44—56 1 Claim



1. In a process for producing a high-octane gasoline by blending a hydrocarbon mixture of the gasoline range with an ether, the improvement which comprises:
a. thermally dehydrogenating-cracking isobutane to obtain a mixture of propylene and isobutene;
b. separating the mixture into an isobutene-rich stream and a propylene-rich stream;
c. hydrating with a solid acidic hydration catalyst the propylene-rich stream to obtain isopropanol;
d. etherating the isopropanol with the isobutene-rich stream to obtain t-butyl isopropyl ether; and
e. blending the t-butyl isopropyl ether with gasoline-boiling-range hydrocarbons.

4,046,521
DISTILLATE FUEL CONTAINING DEHAZING COMPOSITIONS

Donald U. Bessler, and Kenneth J. Tacchi, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Mar. 31, 1975, Ser. No. 563,649
Int. Cl.² C10L *1/18*
U.S. Cl. 44—62 11 Claims

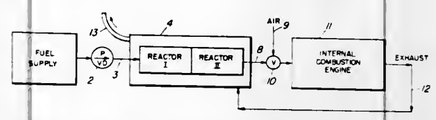
1. A fuel composition comprising a distillate fuel and a dehazing amount of the product of the process which comprises reacting a phenol-formaldehyde resin with an α-olefin epoxide having at least four carbon atoms and then reacting the product so obtained with a member of the group consisting of ethylene oxide, glycidol, propylene oxide and mixtures thereof, the reaction of said phenol-formaldehyde resin with said α-olefin epoxide and the reaction of the product so obtained with said member being carried out by heating the respective reaction mixtures.

4,046,522
PRE-ENGINE CONVERTER FOR USE WITH FUELS CONTAINING OXYGENATED COMPOUNDS

Nai Yuen Chen, Titusville, and Heinz Heinemann, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed June 25, 1976, Ser. No. 699,811
Int. Cl.² C10G *13/02*
U.S. Cl. 48—102 A 9 Claims

1. A pre-engine converter comprising:
a. two sequential reaction chambers;
b. a catalytic material in the first of said chambers that is effective to catalytically decompose oxygen-containing organic compounds to carbon monoxide and hydrogen;
c. a catalytic material in the second of said chambers that comprises a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least 12, a constraint index of 1 to 12, and a crystal density of not substantially below about 1.6 grams per cubic centimeter and is effective for catalytically cracking low octane normally liquid hydrocarbons to higher octane normally gaseous hydrocarbons;
d. means for introducing into said first chamber a liquid fuel comprising a low octane normally liquid hydrocarbon in mixture with one or more low molecular weight, high octane value, oxygen-containing organic compounds;
e. means for passing the effluent from said first chamber into said second chamber;

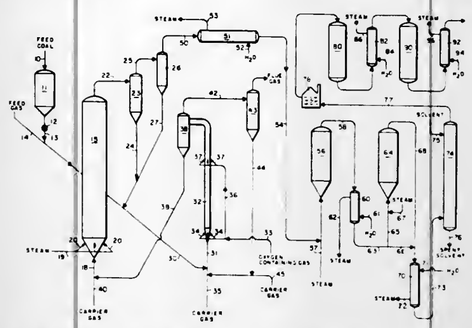


f. means for removing from said second chamber an effluent comprising carbon monoxide, hydrogen and higher octane normally gaseous hydrocarbons;
g. means for mixing air with the gaseous effluent from said second chamber;
h. means to introduce into an internal combustion engine the mixture of air and said gaseous effluent;
i. means to pass the hot exhaust gases from said engine into indirect heat exchange relationship with said pre-engine converter;
j. means enclosing said first and second reaction chambers and connected to said exhaust means whereby the heat from said hot exhaust gases emitting from said engine is transferred to said reaction chambers and the catalysts contained therein; and
k. means for venting said exhaust gases from said heat transfer means.

4,046,523
SYNTHESIS GAS PRODUCTION

Theodore Kalina, Morris Plains, N.J., and Roger E. Moore, El Paso, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 7, 1974, Ser. No. 512,592
Int. Cl.² C07C *9/04*
U.S. Cl. 48—197 R 3 Claims



1. A method for the removal of condensable tar-forming constituents from a hot mixture of hydrogen, carbon monoxide, carbon dioxide, methane, condensable tar-forming constituents, and steam withdrawn from a high temperature gasification zone without scrubbing said mixture with water or oil which comprises cooling said hot mixture of gases to a steam reforming temperature below the gasification temperature, contacting the cooled gases at said reforming temperature with a steam reforming catalyst under low severity steam reforming conditions in a steam reforming zone in the presence of sufficient steam to reform said tar-forming constituents, withdrawing a hot gas stream substantially free of said tar-forming constituents from said reforming zone, and thereafter further treating said gas by shifting the hydrogen-to-carbon monoxide ratio and methanating the shifted gas.

4,046,524
LAPPING COMPOSITIONS COMPRISING AN ALUMINUM, DIALKYL ORTHOPHOSPHATE GELLING AGENT

Jan Willem van Heeden, Baulkham Hills, Australia, assignor to Borg-Warner Corporation, Chicago, Ill.

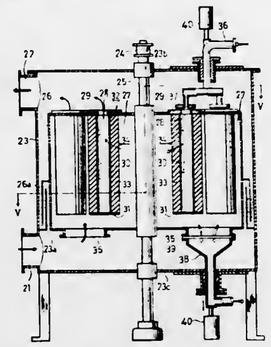
Filed Nov. 6, 1975, Ser. No. 629,340
Int. Cl.² C09K *3/14*; C10M *1/46*
U.S. Cl. 51—306 7 Claims

1. A gelled hydrocarbon composition for use in lapping operations comprising a liquid hydrocarbon having a Brookfield viscosity of less than about 200 cps and a flash point above about 100° F, from about 0.1 to about 10% by weight based on liquid hydrocarbon of the pseudo double salt of an alkyl orthophosphoric acid as a gelling agent, said pseudo double salt being the product of the neutralization of an acidic non-stoichiometric aluminum salt of an alkyl orthophosphoric acid with a base selected from the group consisting of ammonia and basic compounds of alkali metals and alkaline earth metals, and from about 0.1 to about 20 lbs. of a lapping abrasive per gallon of liquid hydrocarbon.

4,046,525
METHOD FOR ADSORBING HARMFUL SUBSTANCE

Tatsuki Matsuo, and Teruo Kohata, both of Otsu, Japan, assignors to Toyobo Co., Ltd., Osaka, Japan

Filed July 31, 1975, Ser. No. 600,788
Claims priority, application Japan, Feb. 26, 1975, 50-24393
Int. Cl.² B01D *53/00*
U.S. Cl. 55—59 6 Claims

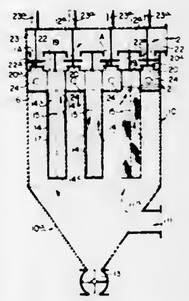


1. A method for treating gases containing harmful substance by using an apparatus provided with at least two adsorptive units composed of at least one adsorptive tubular element made of a fibrous sheet of adsorptive material having a 0.1 m/second pressure loss of not more than 15 mm Aq/cm, said adsorptive material consisting predominantly of active carbon fibers having an equilibrated adsorption amount of benzene of not less than 300 mg/g and an adsorption rate constant of benzene of not less and 0.2 /minute, and the ratio of the area of said adsorptive material to the area of the unit frame being not less than 2, which comprises
passing gases contaminated with the harmful substances through the adsorptive element in one of said adsorptive units, thereby adsorbing the harmful substances with said adsorptive material to recover a purified gas, and
forcibly passing a heated purging gas through the adsorptive element in another one of the adsorptive units where the harmful substance had been previously adsorbed, said heated purging gas being jetted from a heated purging gas jetting device provided at the upper part of the adsorptive element in said another adsorptive unit, whereby the harmful substance-adsorbed by the adsorptive element is heated and desorbed,
said adsorptive units being sequentially used for adsorption and desorption, respectively

4,046,526
BAG COLLECTOR FOR DIRT WITH SELECTIVE HALF-BAG CLEANING

John F. Phillippi, Mentor, Ohio, assignor to Aerodyne Development Corporation, Cleveland, Ohio

Filed Jan. 12, 1976, Ser. No. 648,093
Int. Cl.² B01D *46/04*
U.S. Cl. 55—96 13 Claims



1. A method of cleaning bag collectors of dirt particles wherein a plurality of elongated tubular porous bags are arranged in a bag housing with their longer dimensions parallel and in a straight line side by side with means for passing a dirty stream of gas simultaneously through said bags radially inwardly, thus collecting dirt on the outer faces of said bags, means for discharging the clean stream of gas at an open end of said bags, A substantially impervious linear partition in the middle of each bag normal to said straight line dividing the inside of each bag into two non-communicating half portions extending from end to end of each bag and beyond said open ends of said bags to said means for discharging said clean stream of gas; comprising selectively closing said clean gas discharging means of two adjacent half portions of two of said bags, and selectively passing a cleansing stream of gas into the interior of said selected two adjacent half portions under sufficient pressure to pass outwardly through said two adjacent half portions and dislodge the dirt collected on the outer faces of said two adjacent half portions, while continuing to collect dirt particles on the other half portions of said two bags whereby the space between said two selected half portions is relatively quiescent and said dislodged dirt falls downwardly.

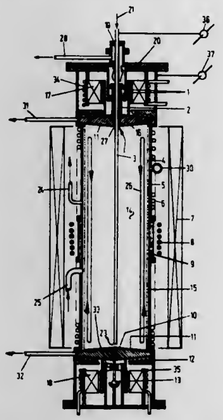
4,046,527
APPARATUS FOR THE STABLE CONFINEMENT OF AN IONIZED GAS COLUMN INSIDE A MAGNETIC FIELD

Jacob Kistemaker, Amsterdam, Netherlands, assignor to Ultracentrifuge Nederland N.V., The Hague, Netherlands

Filed Feb. 8, 1974, Ser. No. 440,752
Claims priority, application Netherlands, Feb. 15, 1973, 7302102
Int. Cl.² B03C *1/00*
U.S. Cl. 55—100 8 Claims

1. Apparatus for the stable confinement of a fast rotating gaseous mixture of heavy gas component and a light gas component comprising: an elongated vessel having a wall of circu-

lar cross section; means for cooling the vessel; at least one supply pipe for supplying a gaseous mixture of heavy and light components to the interior of the vessel; means spaced from the vessel wall for imparting rapid rotation to the gas in the center of the vessel so that the heavy gas component, by means of a high pressure gradient caused by centrifugal forces, moves to the inside of the vessel wall and so that the light gas component forms a central gas column extending axially in the vessel, means in said vessel for ionizing the gas column, means about said vessel for inducing an axial stationary magnetic field ex-



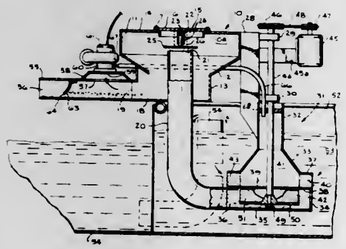
tending the length of the vessel so that the gas in the vessel is subjected to the field, and means within the vessel including an electrode electrically insulated from and adjacent the vessel wall for producing a radial electrical potential between the ionizing means and the vessel wall by rendering the gas column anodic and the vessel cathodic; means for flowing the heavy gas component in the form of a gas envelope axially along the vessel wall and then a gas column axially in an opposite direction; discharge pipes adjacent the ends of the vessel for separately removing the heavy and light component respectively.

4,046,528

DEGASSING SYSTEM

Walter E. Liljestrand, Midland, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Apr. 28, 1975, Ser. No. 572,220
Int. Cl.² B01D *19/00*
U.S. Cl. 55—160 **17 Claims**



1. In a system for degassing fluids, the combination comprising:

a degassing vessel having an inlet and an outlet, said outlet being disposed substantially at the bottom of said vessel and including an outlet conduit forming a common discharge from said vessel for said fluid and gas disengaged in said vessel;

means connected to the inlet of said degassing vessel for introducing fluid under pressure into said vessel;

means connected to said outlet conduit for exhausting gas disengaged from said fluid in said vessel; and

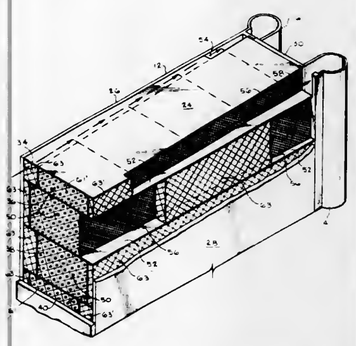
means for substantially preventing introduction of air into said vessel through said outlet conduit.

4,046,529

REGENERABLE DEVICE FOR SCRUBBING BREATHABLE AIR OF CO_2 AND MOISTURE WITHOUT SPECIAL HEAT EXCHANGER EQUIPMENT

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Edward H. Tepper, Granby, Conn.

Filed May 21, 1976, Ser. No. 688,854
Int. Cl.² B01D *53/02;* **F28F** *3/02*
U.S. Cl. 55—179 **4 Claims**



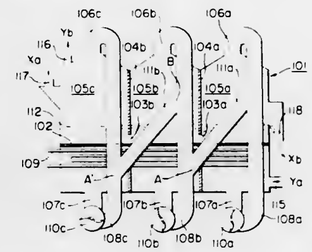
1. In a breathable air circulation system a module for the control and purification of air, said module comprising an array of cells in which every other cell is connected in common to a first pair of opposed manifolds in said circulation system while the intermediate cells are connected to a second pair of manifolds in said circulation system, said cells in the array being separated from their neighbors only by an airsealing parting sheet of high thermal conductivity, each said cell being filled with a foamed metal comprising a continuous phase of metal wire of high heat conductivity defining a mass of sub-cells or small spaces forming a second continuous phase, a filling of granular material in at least the major portion of said foamed metal, such that the air flowing through said cell must flow through said granular material within the foamed metal, said granular material being sorbent to carbon dioxide at standard temperature and pressure but not to other gases in the air other than water vapor and also being desorbent to carbon dioxide and moisture at standard temperatures and vacuum pressures, and means in each cell between the connections of each cell to said manifolds to present the untoward leakage of said granules into said manifolds, said foamed metal in each cell contacting said parting sheets for the passage of heat therethrough and providing the principal structural strength for the cell.

4,046,530

MULTI-STAGE FLUIDIZED-BED ACTIVATED CARBON REGENERATION APPARATUS

Masanori Izumo, Neyagawa, and Sigeru Nakakita, Takatsuki, both of Japan, assignors to Daikin Kogyo Co. Ltd., Osaka, Japan

Filed Mar. 31, 1976, Ser. No. 672,482
Claims priority, application Japan, Apr. 4, 1975, 50-41503; Apr. 18, 1975, 50-47852
Int. Cl.² B01J *9/18;* **B01D** *53/08*
U.S. Cl. 55—181 **10 Claims**



1. An apparatus for the fluidizing regeneration of activated carbon having adsorbed organic contaminants therein comprising:

a housing;

a horizontal grid disposed within said housing;

a port for supplying activated carbon to be treated and a regenerating gas discharged port, both of which are provided in the upper portion of one end wall of said housing;

a regenerating gas supply port provided in a lower portion of the other end wall of said housing;

a regenerated activated carbon discharge port provided in a lower portion of the other end wall and at a higher portion than said grid;

a plurality of chambers defined by one or more vertical partitioning walls each having an opening through which activated carbon flows, said opening being above said grid and said plurality of chambers each having a top outlet port and a bottom inlet port;

a circulating path joining said top outlet port and said bottom inlet port of each of said plurality of chambers, thereby constituting a regeneration gas circulating system for each respective chamber, said circulating system being equipped with a blower and a heat exchanger whereby a portion of said regenerating gas is recirculated within the chamber; and

a gas passage for communicating each of the neighboring circulating systems whereby a portion of said regenerating gas is introduced directly from one chamber to the neighboring chamber.

8. An apparatus for the fluidizing regeneration of activated carbon having adsorbed therein organic contaminants comprising;

a housing;

a horizontal grid disposed in said housing;

a port for supplying activated carbon to be treated and a regenerating gas discharge port, both of which are provided in upper portions of one end wall of said housing;

a regenerating gas supply port provided in a lower portion of the other end wall of said housing;

a regenerated activated carbon discharge port provided in a lower portion of the other end wall of said housing and at a higher portion than said grid;

one or more vertical partitioning walls extending from the ceiling of the housing to the bottom thereof, thereby partitioning the interior of the housing into a plurality of chambers, said partitioning walls each having an opening through which activated carbon flows, each opening being above said grid and a regenerating gas passage in a portion near the top of the housing;

a top outlet port and a bottom inlet port both provided in each of said plurality of chambers;

a plurality of regenerating gas circulating path provided outside of the housing and respectively connecting the top outlet port and the bottom inlet port of respective chamber to constitute a circulating system; and

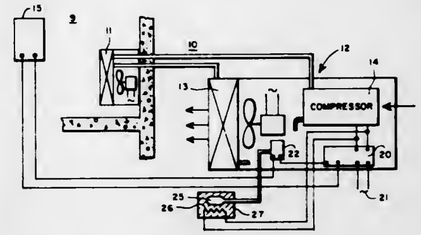
a blower and a heat exchanger both provided in every circulating system consisting of one chamber and one circulating path.

4,046,531

REFRIGERATION LOAD SHEDDING CONTROL DEVICE

Lorne W. Nelson, Bloomington, and David J. Sutton, Minneapolis, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed July 14, 1976, Ser. No. 704,880
Int. Cl.² G05D *23/30*
U.S. Cl. 62—202 **3 Claims**



1. A control device for selectively disconnecting an electrical temperature conditioning load apparatus from a source of electrical energy to reduce the use of energy by the apparatus as the temperature conditioning load increases, comprising

temperature responsive means adapted to be responsive to outdoor temperature, the magnitude of which determines the electrical load of the apparatus as upon an increase in the level of said outdoor temperature the use of electrical energy from the source by the electrical load apparatus increases,

control means connected to said temperature responsive means, said control means being adapted to terminate the operation of the electrical load apparatus when the temperature reaches a predetermined value, and

means connected to affect the output of said temperature responsive means to reset said control means depending upon the operation of the electrical load apparatus to terminate the operation of the electrical load apparatus at a different value of the outdoor temperature whereby as the electrical load apparatus operates a larger percentage of time due to a change in said outdoor temperature, said last mentioned means being affected when electrical load apparatus is energized.

4,046,532

REFRIGERATION LOAD SHEDDING CONTROL DEVICE

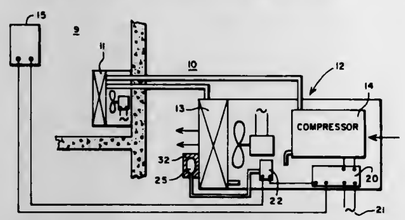
Lorne W. Nelson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 14, 1976, Ser. No. 705,214
Int. Cl.² F25B *1/00*
U.S. Cl. 62—215 **6 Claims**

1. A control device for selectively disconnecting an electrical temperature conditioning apparatus from a source of electrical energy to reduce the use of energy by the apparatus as the temperature conditioning load of a building increases, comprising

temperature responsive means adapted to be responsive to outdoor temperature, the magnitude of which primarily determines the electrical load of the temperature conditioning apparatus as upon a change in the level of said outdoor temperature the use of electrical energy from the source by the temperature conditioning apparatus increases,

control means connected to said temperature responsive means, said control means being adapted to terminate the operation of the electrical temperature conditioning apparatus when the temperature of said temperature responsive means exceeds a predetermined value, and



means adapted to reset said temperature responsive means to terminate the operation of the electrical temperature conditioning apparatus at a different value of the outdoor temperature depending upon the operation of the electrical temperature conditioning apparatus whereby as the temperature conditioning apparatus operates a larger percentage of operating time due to an increase in the temperature conditioning load, said means to reset changes the relation of said temperature responsive means on said control means to reduce said percentage of operating time as the temperature conditioning load increases.

4,046,533

REFRIGERATION WORKING FLUID CONTAINING BRANCHED CHAIN ALKYLBENZENE LUBRICANT

Sven A. Ohsol, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 423,835, Dec. 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 317,318, Dec. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 213,174, Dec. 28, 1971, Pat. No. 3,733,850, which is a continuation-in-part of Ser. No. 3,523, Jan. 16, 1970, Pat. No. 3,642,634. This application Jan. 26, 1976, Ser. No. 652,581
Int. Cl.² F25B 9/00; C09K 5/04
U.S. Cl. 62—468 4 Claims

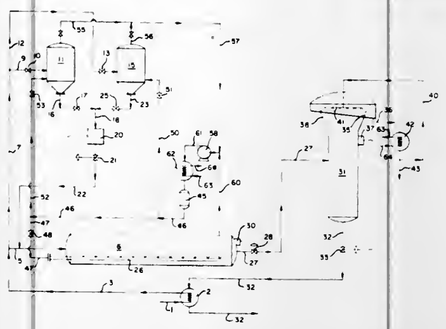
1. In a refrigeration apparatus containing a working fluid consisting essentially of a refrigerant and a chemically inert, wax-free lubricant, said refrigerant being a halo-substituted hydrocarbon having from 1 to 3 carbon atoms and at least about 40% by weight of fluorine and said lubricant being an alkylbenzene, the improvement which comprises using as a lubricant a mixture of mono-substituted, branched chain alkylbenzenes having an average molecular weight in the range of about 300 to about 470, the alkyl groups of said alkylbenzenes being at least about 60% by weight polypropylene and having an average of at least 1 branch for every 4 carbons in the alkyl group, there being from 10 to 100 parts by weight of refrigerant per part by weight of lubricant and said polypropylene alkylbenzene mixture being produced by HF alkylation of benzene with mixed polypropylenes.

4,046,534

METHOD FOR RECOVERING FRESH WATER FROM BRINE

James B. Maguire, Sr., P.O. Box 795, Oceanside, Calif. 92054

Filed Apr. 26, 1973, Ser. No. 354,677
Int. Cl.² B01D 9/04
U.S. Cl. 62—534 9 Claims



1. A process for recovering fresh water from brine comprising:

A. cooling brine to about the freezing temperature,

B. maintaining two, batch nucleus-forming zones,

C. inoculating the brine with a predetermined number of nuclei of ice crystals, alternately from said two nucleus-forming zones,

D. passing the inoculated brine through an elongated crystal growth zone from an inlet at one end thereof to an outlet at the other end thereof,

E. supplying refrigerant to the crystal growth zone along substantially the entire path of flow of inoculated brine through the crystal growth zone at a rate such that the brine temperature in the crystal growth zone is from about 0.2° to about 3.0° F lower than the equilibrium freezing point of the brine at that point in the flow path, whereby crystal growth is effected substantially without the formation of nuclei,

F. passing the resultant brine-ice mixture from the outlet of the crystal growth zone to a separation zone wherein ice crystals are separated from brine,

G. washing the separated ice crystals with fresh water, and

H. recovering fresh water from the ice crystals.

4,046,535

GLASS MELTER HAVING REFLECTIVE TOP WALL AND METHOD FOR USING SAME

Charles J. Stalego, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 463,472, April 24, 1974, abandoned. This application Sept. 24, 1975, Ser. No. 616,119
Int. Cl.² C03B 37/02
U.S. Cl. 65—1 6 Claims

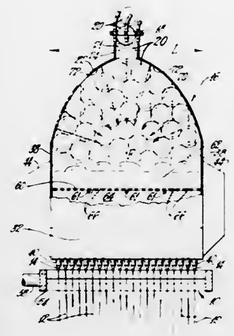
1. A feeder for supplying molten glass comprising:

a. sidewalls;

b. a bottom wall having at least one orifice for discharging molten glass;

c. a resistance element within said feeder to convert unmelted glass to a molten condition;

d. a top wall adapted to reflect vertically upwardly moving heat from molten glass in said feeder to a single focal point in said feeder above said resistance element; and,



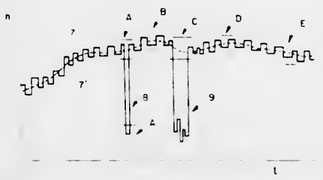
e. conduit means for introducing unmelted glass into said feeder.

4,046,536

MONITORING AND CONTROL OF OPTICAL FIBER DIAMETERS

David Harry Smithgall, Sr., East Windsor Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,148
Int. Cl.² C03B 37/02
U.S. Cl. 65—2 6 Claims



4. A method of monitoring the diameters of successive axial portions of an optical fiber, the method comprising the steps of:

a. illuminating the fiber with a radially directed beam of coherent, monochromatic radiation so as to create a forward scattering pattern;

b. advancing the fiber relative to the beam along the direction of the axis of the fiber;

c. generating a succession of counts of numbers of interference fringes within a predetermined portion of said pattern, each succeeding count being indicative of the diameter of a different axial portion of the fiber advanced relatively across said beam;

d. comparing the difference between each successive count and a last previous count which has been indicated as valid, with a predetermined, maximum allowable value of said difference for validity of said successive count; and

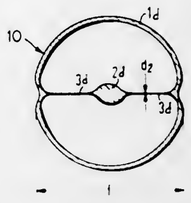
e. for each successive difference which is not greater than said maximum allowable value, indicating as valid the successive count associated with said difference.

4,046,537

METHOD FOR THE PRODUCTION OF ONE-MATERIAL OPTICAL FIBERS

Ulrich Deserno, and Franz Auracher, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 14, 1976, Ser. No. 676,678
Claims priority, application Germany, Apr. 15, 1975, 2516387
Int. Cl.² C03B 37/00, 23/04, 23/20, 21/00
U.S. Cl. 65—2 6 Claims
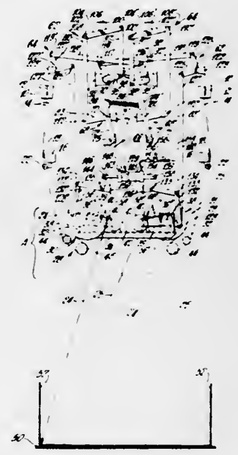


1. A method of producing a one-material optical fiber comprising a light conducting core supported in a protective sleeve by at least one support component, said method comprising the steps of providing a blank having a core and at least one supporting component disposed within a sleeve, heating the blank to a drawing temperature, drawing the blank into a fiber having a drawn core supported in a protective sleeve by a support component integral with both the sleeve and drawn core, and applying a stretching force to the support component in a direction transverse to the axis of the drawn core of the fiber to reduce the thickness of the support component and to reduce the ratio of the thickness of the support component to the thickness of the core of the fiber.

4,046,538

OSCILLATING MECHANISM AND METHOD OF AND MEANS FOR PROMOTING MOTION ACCURACY OF THE MECHANISM IN A FIBER FORMING OPERATION

David Whitfield Thomas, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 19, 1976, Ser. No. 678,505
Int. Cl.² C03B 37/02
U.S. Cl. 65—4 A 7 Claims



1. The method of distributing a linear group of fibers onto a moving collector including engaging the group of fibers with

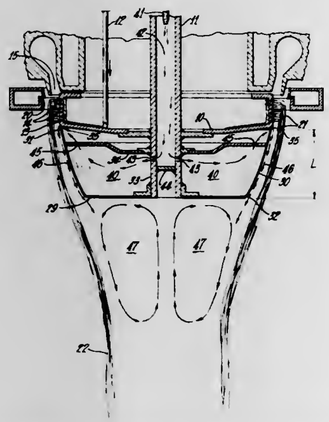
a rotating pull wheel, disengaging the group of ffibers from the rotating pull wheel by an oscillating and rotating member associated with the pull wheel, oscillating the member by a cam-actuated linkage system to effect distribution of the group of fibers onto an area of the collector, and applying pressure on the linkage system opposing the operation of the linkage system to substantially eliminate lost motion in the linkage system and thereby promote oscillatory motion accuracy of the fiber disengaging member.

4,046,539

METHOD AND APPARATUS FOR PRODUCING GLASS FIBERS

Richard E. Pitt, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 473,466, May 28, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,433
Int. Cl.² C03B *37/04*
U.S. Cl. 65—6 12 Claims



9. In the process of forming fibers by centrifuging molten glass into streams, engaging sid streams by a high molten glass into streams, engaging said streams by a high velocity high temperature annular gaseous blast positioned about the centrifuge periphery thereby attenuating the streams into fine fibers and conveying said fibers axially away from the centrifuge as a cylindrical veil flowing over a coaxial body of revolution immediately downstream of said centrifuge, the method of reducing heat transfer from the high temperature gases within said veil to said body by injecting a continuous flow of gas as mass addition to the boundary layer existing over the surface of said body of revolution.

4,046,540

GLASS INJECTION MOULDING PROCESS

Cyril John Lewis; Neil Carter, and Neil Hunter Ray, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 436,350, Jan. 24, 1974, abandoned. This application June 16, 1975, Ser. No. 586,918
Claims priority, application United Kingdom, Feb. 19, 1973, 7992/73; Apr. 12, 1973, 17615/73
Int. Cl.² C03B *5/00*
U.S. Cl. 65—18 8 Claims

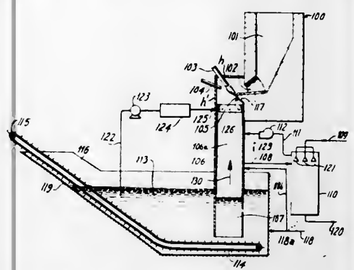
1. A process for the production of shaped glass articles which comprises charging a particulate phosphate glass having a P_2O_5 content of 25 mole % or greater having a transformation temperature of not greater than 300° C to an injection moulding machine, converting the glass to the molten state in the barrel of the machine, the barrel temperature being in the range from the temperature at which the glass becomes molten up to a temperature of 600° C injecting the molten glass into a mould on the machine, the temperature of the mould being maintained at a temperature in the range from the transformation temperature to 100° C below the transformation of said glass; and removing the molded article from said mould.

4,046,541

SLAG QUENCHING METHOD FOR PYROLYSIS FURNACES

John Erling Anderson, Katonah, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 26, 1976, Ser. No. 690,184
Int. Cl.² C03B *37/00*
U.S. Cl. 65—19 13 Claims



1. In a process for quenching molten residue discharged from a furnace hearth, through a non-submerged taphole, including the steps of: (a) providing a vertical slag duct communicating in a sealed manner at the top thereof with said taphole, and sealed at the bottom by being immersed a substantial distance into water in a quench tank, (b) flowing the molten residue from the hearth by gravity to and then down the central axis of said slag duct and quenching said residue in the water contained in the submerged portion of said slag duct, said water being at a temperature sufficiently high to prevent slag explosions, the improvement comprising:

substantially reducing cooling of the tap and hearth areas of said furnace by (1) removing sufficient hot fluid from said duct generated by quenching of said molten residue in the water contained in the submerged portion of said duct and (2) replacing said removed hot fluid with cooler water, thereby maintaining the temperature of the water in said duct between about 150° F and the boiling point of the water and substantially preventing steam from entering said tap and hearth areas.

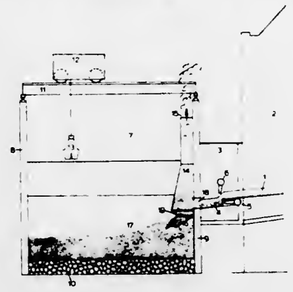
4,046,542

METHOD AND DEVICE FOR GRANULATING BLAST FURNACE SLAG

Kees J. Schmidt, Castricum, Netherlands, assignor to Hoogovens IJmuiden B.V., Ijmuiden, Netherlands

Filed Apr. 1, 1976, Ser. No. 672,619
Claims priority, application Netherlands, Apr. 7, 1975, 7504082
Int. Cl.² C03B *5/22*
U.S. Cl. 65—19 6 Claims

2. A device for granulating blast furnace slag comprising an open explosion room, a first slag chute which debouches into said open explosion room, a second slag chute positioned lower than said first chute near the delivery point of said first chute, a spraying system, a closed vapour separating box positioned near the end of said second chute, an open granulating pit, into which the second chute debouches and a chimney, said granulating pit comprising a dewatering bed and conveying means for the dewatered granulate, said vapour separating box comprising an entrance opening into which the second chute debouches, an exit-opening in the bottom, directed towards the granulating pit, and an opening in the roof which connects to said chimney.

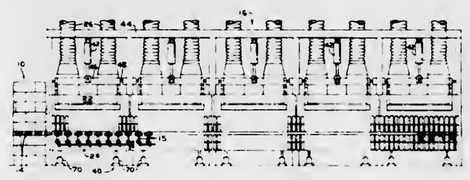


4,046,543

METHOD AND APPARATUS FOR TEMPERING MOVING GLASS SHEETS

George B. Shields, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 23, 1976, Ser. No. 679,523
Int. Cl.² C03B *27/00*
U.S. Cl. 65—25 A 34 Claims



1. An apparatus adjacent a furnace for tempering hot glass sheets by flowing cool streams of gaseous tempering medium against the opposite surfaces thereof comprising an upper elongated quench bed and a lower elongated quench bed in spaced, generally parallel relation to and facing said upper quench bed, each said quench bed including a series of modules adjacent said furnace, each provided with a flat glass sheet facing surface having a plurality of slots therethrough, each slot having an approximately uniform width of between about 1,100 inch (0.25 millimeter) and about 1/32 inch (0.8 millimeter) for applying thin streams of gaseous tempering medium against the surface of a succession of glass sheets conveyed longitudinally of said bed past said modules, said modules being spaced apart to provide therebetween longitudinally spaced exhaust passages extending transversly of said bed continuously across the entire width of said conveyed glass sheets, said elongated quench beds extending from an upstream end adjacent an exit of a furnace for heating said glass sheets to a temperature suitable for tempering and a downstream end spaced from said exit, the total area of said exhaust passages occupying at least about 20 percent of the area of said quench bed and the total area of said stream applying slots not exceeding about 6 percent of said quench bed area, and means to provide cool gaseous tempering medium at a rate sufficient to cause said gaseous tempering medium to flow through said slots at a rate sufficient to cool said glass sheets rapidly enough to temper said sheets and to be exhausted through said exhaust passages, wherein said elongated slots extend parallel to one another diagonally of the glass sheet facing surfaces of said modules disposed adjacent said furnace exit, and wherein adjacent elongated slots of each said module overlap one another along the length of said elongated bed, and said slots are directed diagonally through the thickness of said modules.

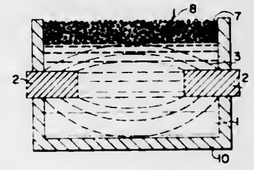
31. A method of tempering glass sheets to provide said sheets with a high temper and little surface distortion comprising heating each glass sheet in a series thereof to a temperature sufficient for tempering while conveying said sheets through a hot atmosphere, and cooling the opposite major surfaces of each of said heated sheets by passing each of said heated sheets between a pair of sets of streams of cool gaseous tempering medium, first directed at relatively large oblique angles relative to planes normal to the major surfaces of said sheets when the latter pass through a first region immediately downstream of said hot atmosphere, then to streams of cool gaseous tempering medium directed at relatively small oblique angles relative to said planes when said sheets pass through a second region downstream of said first region, and then subjecting said glass sheets to additional streams of cool gaseous tempering medium directed normal to the major surfaces of said sheets when the latter pass through a third region downstream of said second region.

4,046,544

ALKALINE GLASS MELTING WITH POROUS COVER

John Haines Wills, Box 37, Cheyney, Pa. 19319

Continuation-in-part of Ser. No. 331,963, Feb. 12, 1973, abandoned. This application Dec. 17, 1975, Ser. No. 641,400
Int. Cl.² C03B *5/16, 3/00, 32/32*
U.S. Cl. 65—27 3 Claims



1. In a process of melting soluble silicate glass in an electric resistance furnace, said soluble silicate glass having a ratio of below about 2.8 SiO_2/Na_2O wherein there is a tendency of the batch to produce escaping gas during sintering while the said batch is used as a heat insulating blanket over the melted glass, the improvement comprising forming the raw batch materials consisting essentially of silica, sodium oxide and an alkali metal alt which is decomposable by heat to a melt component and a gaseous component wherein the ratio of SiO_2 to Na_2O is below about 2.8, with a solution taken from the group consisting of water and dilute alkaline solutions, into particles having a mean diameter of about 0.04 cm and applying the formed particles over the melt as a porous blanket in the said electric resistance furnace to permit the escaping gases to pass through said cover during the melting process whereby volcano-like eruptions are avoided.

4,046,545

METHOD FOR MAKING MOLDED GLASS ARTICLES HAVING BULK HOMOGENEITY AND OPTICAL QUALITY SURFACE

Leon M. Sanford, and Cho-Kuang Wu, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 25, 1976, Ser. No. 689,791
Int. Cl.² C03B *23/00;* C03C *3/04*
U.S. Cl. 65—30 R 8 Claims

1. A method of preparing an optical glass article comprising the steps of

A. preparing a base anhydrous glass comprising in mole percent, on an oxide basis, 70 to 82% SiO_2, 10 to 17% Na_2O and/or K_2O, and 5 to 15% of an oxide or oxides selected from ZnO and PbO;

B. hydrating the base glass;
C. partially dehydrating the glass to a water content ranging from about 3 to 8 weight percent at a temperature above the softening point of the glass and, using an inert gas, at a total pressure above the vapor pressure of the water within the glass; and
D. preforming a sample of the glass of step (C) and then molding the preformed sample of the partially dehydrated glass against a die having a desired optical quality surface

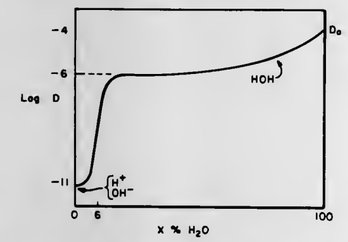


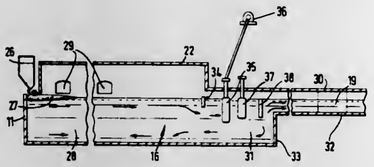
figure under conditions sufficient to impart to a surface of the glass the surface figure of the die, the molding being done under conditions sufficient to maintain the water content in the glass, to assure that at least one portion of the glass is capable of transmitting an amount of light about equal to the maximum amount theoretically possible, and to maintain or result in an optical quality surface on that portion of the glass surface to which the surface figure of the die is transferred.

4,046,546

METHOD AND APPARATUS FOR REFINING GLASS IN A MELTING TANK

William Christie Hynd, Lymm, England, assignor to Pilkington Brothers Limited, Merseyside, England

Filed Jan. 30, 1976, Ser. No. 653,827
Claims priority, application United Kingdom, Jan. 31, 1975, 4360/75
Int. Cl.² C03B *5/22*
U.S. Cl. 65—135 23 Claims



1. A glass melting apparatus comprising:
an elongated tank body for containing molten glass and having an inlet end for receiving glass forming material and an outlet end for glass leaving said tank body for use in a forming process, said tank body defining:
a. a melting region adjacent said inlet end for melting the glass forming material,
b. a refining region downstream of said melting region for refining the molten glass,
c. a conditioning zone adjacent said outlet end for conditioning the refined glass, and
d. an intermediate zone leading from said refining region to said conditioning zone;
said intermediate zone and said conditioning zone being substantially narrow relative to said refining region;
flow control means for physically slowing up the forward flow of the upper levels of glass out of said refining region and into said narrower intermediate and conditioning zones;
said refining region and said intermediate zone being sufficiently deep for forward and return flow of molten glass to take place;
said intermediate zone having a step at its downstream end adjacent said conditioning zone, and said conditioning zone having a raised base thereby providing a shallow conditioning channel along which molten glass may flow in the direction of said outlet with substantially no return flow.

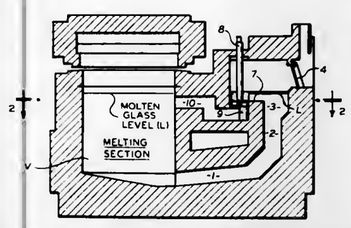
17. A method of manufacturing glass comprising feeding glass forming material into one end of a glass melting tank, melting the material in a melting zone of the tank adjacent an inlet end of the tank, refining the molten material at a refining zone downstream of the melting zone, and conditioning the molten glass in a shallow conditioning zone adjacent an outlet end of the tank so that the molten glass leaves the tank ready for use in a forming process, said method further comprising passing the molten glass from an inlet end of a glass melting tank through a wide body portion including said refining zone and subsequently through a substantially narrower channel, including said shallow conditioning zone and a deeper intermediate zone leading from said refining zone to said conditioning zone, towards the outlet end, said refining zone and said intermediate zone being sufficiently deep for forward and return flow of molten glass to take place, enforcing temperature gradients within the melting, refining and intermediate zones and enforcing forward and return flows of molten glass in the melting. refining and intermediate zones, limiting the downstream position of the return flow at a step in the base of the narrow channel at the juncture of said intermediate and conditioning zones, and further physically slowing up the forward flow of the upper levels of molten glass into the intermediate zone by flow control means, whereby the glass enters the shallow conditioning zone at a temperature suitable for conditioning and flows in the direction of the outlet with substantially no return flow in the shallow conditioning zone.

4,046,547

GLASS MELTING FURNACE AND PROCESS FOR IMPROVING THE QUALITY OF GLASS

Helmut Pieper, Lohr, Germany, assignor to Sorg GmbH & Co. KG, Plochsbach, Germany

Filed June 10, 1976, Ser. No. 694,863
Int. Cl.² C03B *5/26*
U.S. Cl. 65—135 9 Claims



1. In a method for operating a glass melting furnace having a melting zone and one or more processing zones disposed adjacent to said melting zone wherein a portion of the molten glass flowing from said melting zone to said processing zone is recirculated to said melting zone, the improvement which comprises recirculating said molten glass from said processing zone by withdrawing molten glass to be recirculated laterally in a surface flow from said processing zone and thereafter causing the withdrawn molten glass to flow downwardly while applying a submerged, downwardly directed impulse thereto.

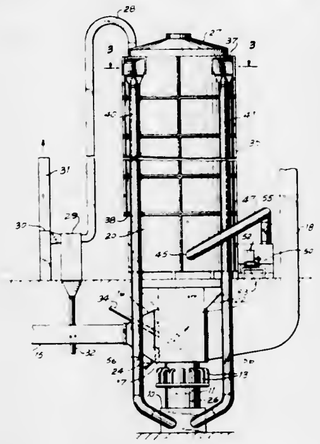
5. In a glass melting furnace having melting means and at least one processing tank means communicating with said melting means through passage means and recirculating passage means between said processing tank means and said melting means, the improvement which comprises means for establishing a recirculating flow of molten glass via said recirculating passage means including weir means positioned in said processing tank means upstream of the inlet to said recirculating passage means and a downwardly directed portion in the recirculating passage means having agitator means submerged therein to apply a downwardly directed impulse to the recirculating molten glass.

4,046,548

APPARATUS FOR PRODUCING SPHERICAL PARTICLES

Thomas K. Wood, Essex Fells, and Alan R. Margreither, Wyckoff, both of N.J., assignors to Potters Industries, Inc., Hasbrouck Heights, N.J.

Filed Apr. 28, 1976, Ser. No. 681,189
Int. Cl.² C03B *19/10*
U.S. Cl. 65—142 19 Claims



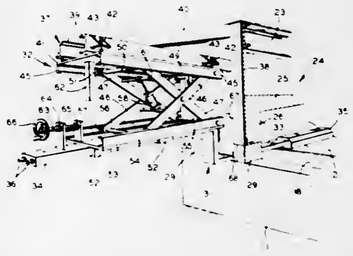
1. Apparatus for producing spherical particles comprising, in combination:
a vertical draft tube having an infeed opening adjacent its lower end;
heat source means disposed within said draft tube intermediate its ends
an expansion chamber communicating with and extending above said draft tube, said heat source means maintaining the interior of the expansion chamber at an elevated temperature;
means for introducing particles of sphere forming material into said draft tube above said heat source means, the introduced particles being carried upwardly into the expansion chamber by the heat from said heat source means and being shaped by surface tension into spherical form;
enclosure means disposed about the expansion chamber in spaced relationship therewith, the enclosure means having at least one infeed opening therein;
means for introducing combustion supporting gas into the infeed opening of the enclosure means, the gas introduced through said infeed opening flowing into the space between the enclosure means and the expansion chamber and being raised to an elevated temperature by the heat from said heat source means; and
means for withdrawing the heated gas from the space between the enclosure means and the expansion chamber and for feeding the withdrawn gas to the infeed opening of said draft tube.

4,046,549

RETRACTABLE SUPPORT FOR FLOAT GLASS APPARATUS

James W. Miller, Rossford, and Frederick D. Zarecky, Holland, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed May 21, 1976, Ser. No. 688,687
Int. Cl.² C03B *18/02*
U.S. Cl. 65—182 R 8 Claims



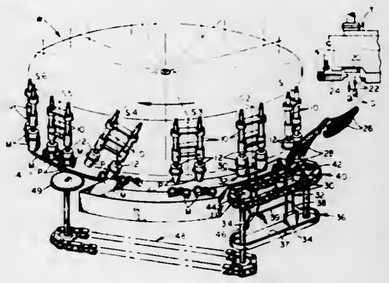
1. In apparatus for producing float glass including an elongated tank containing a bath of molten metal upon which the glass is floated in ribbon form, an enclosed chamber over said tank including a roof structure spanning opposite side walls, said opposite side walls being spaced above corresponding walls of said tank to define an access opening therebetween, and regulating means extending through said access opening into said enclosed chamber, the improvement comprising a retractable carrier suspending said regulating means entirely from above whereby said regulating means can be vertically raised while retaining its original attitude from a lowered operative position along said tank to an elevated storage position permitting unhindered access therebeneath to said chamber, and means defining an opening in the side wall communicating with the corresponding access opening and extending upwardly toward said roof structure for receiving said regulating means as it is raised to said elevated storage position.

4,046,550

GLASS CONTAINER MAKING MACHINE

George A. Thyoux, Soignies, Belgium, assignor to Durobor S.A., Soignies, Belgium

Filed June 18, 1975, Ser. No. 587,993
Claims priority, application Belgium, June 20, 1974, 145655
Int. Cl.² C03B *9/00*
U.S. Cl. 65—229 4 Claims



1. In a glass container forming machine comprising:
A. a circular horizontal frame rotatable about a vertical axis,
B. a plurality of vertically movable blowing spindles spaced at equal angular distances around the periphery of said frame, and

C. parison rim clamping means on each of said spindles, the improvement comprising:
D. a peripheral ring gear on said frame,
E. an endless parison mold conveyor of sprocket chain links having two substantially parallel oppositely moving reaches in the same horizontal plane, one reach adjacent the periphery of said frame and the other reach spaced outwardly therefrom,
F. gearing means driven by said ring gear for continuously moving said conveyor in synchronism with the periphery of said frame,
G. at least one vertically movable carrier mounted on a stem vertically slidable through a pivot of said conveyor chain link
H. a parison mold cooperable with the lower ends of said spindles supported by said carrier,
I. means for dropping a molten glass gob into said parison mold as it moves along said other reach of said conveyor,
J. cam track means along and vertically below the entire path of said conveyor,
K. a roller on the lower end of said stem engaging said track for supporting said carrier and guiding its vertical movements first toward and then away from the lower ends of said spindles when said mold moves along said one reach of said conveyor, and
L. plunger means on said spindles for vertical downward movement for forming a parison from said glob in said mold and attaching said parison to said clamping means while said mold moves along said other reach of said conveyor, whereby said parison is transferred from said mold to a spindle.

4,046,551

ORGANIC DIGESTER APPARATUS AND METHOD

Jay Anderson, P.O. Box 585, Elkhart, Ind. 46514

Filed July 11, 1975, Ser. No. 595,176
Int. Cl.² C05F *11/08*
U.S. Cl. 71—10 16 Claims

1. A method of anaerobically digesting organic material for the producing of fertilizer and methane gas, which comprises:
a. depositing a quantity of organic material into a collecting digester;
b. transferring the organic material from the collecting digester into a first stage digester that is substantially devoid of organic material, that is sealed against the entry of air, and that is filled with anaerobically generated methane gas;
c. transferring the organic material from the first stage digester to a final stage digester that is substantially devoid of organic material, that is sealed against the entry of air, and that is filled with anaerobically generated methane gas; and
d. removing liquid fertilizer from the final stage digester.

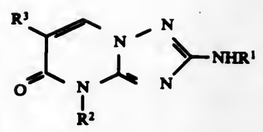
4,046,552

HERBICIDAL COMPOSITIONS OF BIPYRIDYLIUM QUATERNARY SALTS AND EMETIC AMOUNTS OF S-TRIAZOLO PYRIMIDINE DERIVATIVES

George Edward Davies, Wilmslow, and David Mackie Foulkes, Henley-on-Thames, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 23, 1976, Ser. No. 716,801
Claims priority, application United Kingdom, Apr. 15, 1976, 15584/76
Int. Cl.² A01N *9/22*
U.S. Cl. 71—92 14 Claims

1. A herbicidal composition of reduced health hazard comprising a herbicidally effective salt of a herbicidal bipyridylium quaternary cation and an effectively emetic amount of a s-triazolo pyrimidine derivative of the formula:



wherein R^1 is hydrogen, a C_{1-4} alkyl radical, or a COOEt radical; R^2 is a C_{1-4} alkyl radical or an allyl radical, and R^3 is a C_{1-4} alkyl radical, or a pharmaceutically acceptable emetically active addition salt thereof.

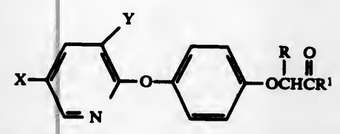
4,046,553

HERBICIDAL COMPOUND, HERBICIDAL COMPOSITION CONTAINING THE SAME AND METHOD OF USE THEREOF

Ryohei Takahashi, Kusatsu; Kanichi Fujikawa, Kyoto; Isao Yokomichi, Kusatsu; Yasuhiro Tsujii, Kusatsu, and Nobuyuki Sakashita, Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Oct. 17, 1975, Ser. No. 623,517
Claims priority, application Japan, Oct. 17, 1974, 49-118676; Mar. 13, 1975, 50-29556
Int. Cl.² A01N *9/32*; C07D *213/30*
U.S. Cl. 71—94 28 Claims

1. A compound having the general formula (I):



(I)

wherein X is a halogen atom; Y is a hydrogen atom, a halogen atom or a methyl group; R is a hydrogen atom or a straight or branched chain (C_1 – C_6)alkyl group; and R^1 is a hydroxy group; a (C_1 – C_9)alkoxy group in which the alkyl moiety thereof may be straight or branched chain and may be substituted with one or more of a halogen atom or a hydroxy group; a (C_2 – C_4)alkenyloxy group; a cyclohexyloxy group in which the cyclohexyl moiety thereof may be substituted with one or more of a halogen atom or a methyl group; a phenoxy group in which the aryl moiety thereof may be substituted with one or more of a halogen atom or a methyl group; a benzyloxy group in which the aryl moiety thereof may be substituted with one or more of a halogen atom an —OM group where M is a cation;

10. The herbicidal composition of claim 9, wherein R^1 is a hydroxy group, a (C_1–C_9) alkoxy group in which the alkyl moiety thereof may be straight or branched chain, or an —OM group where M is a cation.

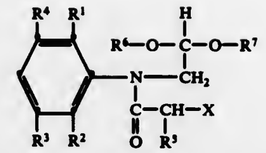
4,046,554

DIALKYL ACETALS OF ANILINOACETALDEHYDES

John Kreuzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 530,797, Dec. 19, 1974, Pat. No. 3,966,811. This application Apr. 23, 1976, Ser. No. 679,628
Int. Cl.² A01N *9/20*
U.S. Cl. 71—118 9 Claims

1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of the formula



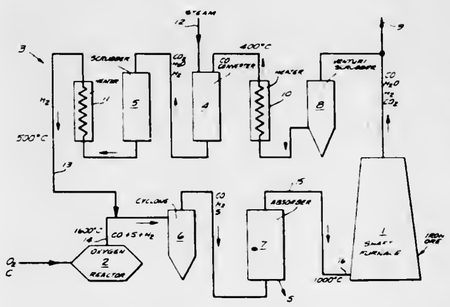
wherein R^1, R^6 and R^7 are each lower alkyl; R^2 is selected from the group consisting of hydrogen, lower alkyl, and lower alkoxy; R^3 and R^4 are each selected from the group consisting of hydrogen, lower alkyl, halogen, cyano, lower alkoxy, lower alkylthio, lower chloroalkyl, trifluoromethyl and lower alkoxyalkyl; R^5 is selected from the group consisting of hydrogen and lower alkyl; and X is selected from the group consisting of chlorine and bromine.

4,046,555

METHOD OF DIRECT REDUCTION OF IRON ORE

Georg Lange, Voerde, Germany, assignor to Thyssen Purofe GmbH, Duesseldorf, Germany

Filed Aug. 8, 1975, Ser. No. 603,196
Claims priority, application Germany, Aug. 13, 1974, 2438790
Int. Cl.² C21B *13/02*
U.S. Cl. 75—35 2 Claims



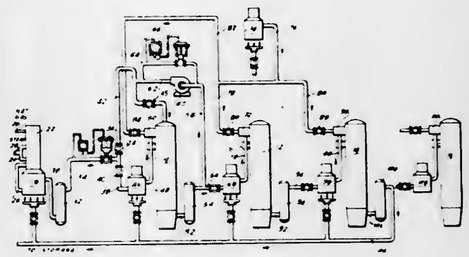
1. In the reduction of iron ore wherein the ore is subjected to a reducing gas and a stack gas is produced, the improvement comprising the steps of:
a. reacting coal and oxygen to make a producer gas of carbon monoxide and hydrogen in a volume ratio of at least 1.5:1 and sulfur and at a temperature of about 1600° C;
b. treating said stack gas with steam to convert said stack gas into a converter-gas mixture of carbon dioxide and hydrogen;
c. scrubbing said carbon dioxide out of the converter-gas mixture of step (b) to form a hydrogen-containing gas;
d. heating said hydrogen-containing gas to a temperature of about 400° C;
e. adding the producer gas of step (a) to the hydrogen-containing gas of step (d) to form a reducing gas having a volume ratio of carbon monoxide to hydrogen of at most 1:1
f. stripping sulfur from the gas produced in step (e);
g. reducing the iron ore with the reduction gas of step (f).

4,046,556

DIRECT GASEOUS REDUCTION OF OXIDIC METAL ORES WITH DUAL TEMPERATURE COOLING OF THE REDUCED PRODUCT

Juan Celada, and Patrick W. MacKay, both of Monterrey, Mexico, assignors to Fierro Esponja, S.A., Monterrey, Mexico

Filed Jan. 2, 1976, Ser. No. 646,379
Int. Cl.² C21B *13/02*
U.S. Cl. 75—35 11 Claims



1. In a process for the batchwise reduction of a metal oxide to sponge metal by contact with a hot reducing gas in a multiple unit reactor system of the type in which separate fixed beds of metal-bearing material are simultaneously treated in a plurality of reactors including at least one cooling reactor and at least one reduction reactor and a cool carbon-containing reducing gas is passed through a cooling reactor of said system, heated to a temperature of 950° to 1100° C. and then passed through a reduction reactor of said system, the method of cooling and carburizing a bed of metal-bearing material in said cooling reactor which comprises pre-heating a stream of said cool reducing gas to a temperature of 250° to 800° C. before it comes in contact with said metal bearing material, passing said preheated stream of reducing gas through said bed of metal-bearing material in said cooling reactor for a first period of time to carburize the metal thereof and reduce metal oxide present therein and thereafter passing a stream of said cool but not pre-heated reducing gas through said bed of metal-bearing material in said cooling reactor for a second period of time to complete the cooling of said material.

4,046,557

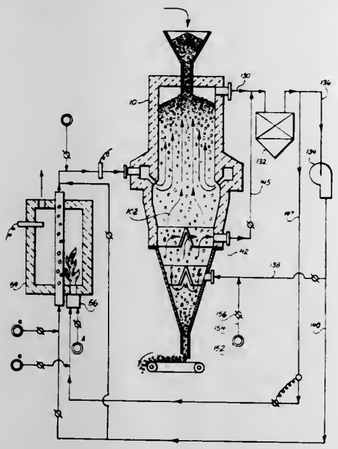
METHOD FOR PRODUCING METALLIC IRON PARTICLES

Donald Beggs, Charlotte, N.C., assignor to Midrex Corporation, Charlotte, N.C.

Continuation-in-part of Ser. No. 611,099, Sept. 8, 1975, which is a continuation-in-part of Ser. No. 578,477, May 19, 1975. This application Nov. 14, 1975, Ser. No. 632,137
Int. Cl.² C21B *13/02*
U.S. Cl. 75—35 13 Claims

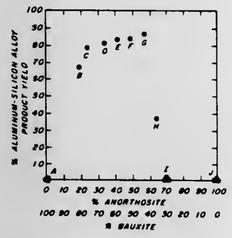
1. A method for producing a metallized product comprising:
a. establishing a gravitational flow of particulate metal oxide material by charging the particulate metal oxide material to the upper portion of a generally vertical furnace having an upper reducing zone and a lower cooling zone, and removing the metallized product from the bottom of the furnace;
b. introducing a reducing gas to the gravitational flow of material at a temperature sufficient to promote a reducing reaction between said reducing gas and said material at a first inlet intermediate the ends of the furnace;
c. causing said reducing gas to move countercurrent through the gravitational flow of material, react with and reduce a substantial portion of the metal oxide and form a top gas;
d. removing said top gas from the upper portion of the furnace;
e. cooling said top gas;

f. introducing a portion of said cooled top gas as cooling gas into a second inlet near the lower end of said furnace;
g. removing a first portion of said cooling gas from said furnace at a location intermediate said first and second inlets;
h. adding said removed portion of said cooling gas to said top gas prior to step (e); and



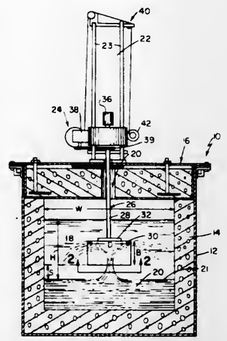
i. causing a second portion of said cooling gas to flow upwardly through the gravitational flow of material, become heated thereby, and act as a reducing gas in the reducing zone;
whereby that portion of said cooling gas flowing upwardly through the gravitational flow of material has a greater reducing potential than the spent top gas, and is thus an effective reductant.

4,046,558
METHOD FOR THE PRODUCTION OF ALUMINUM-SILICON ALLOYS
Subodh K. Das, Natrona Heights, and Richard A. Milito, Natrona, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Nov. 22, 1976, Ser. No. 744,154
Int. Cl.² C22B 21/02
U.S. Cl. 75—68 A **14 Claims**



1. A method of carbothermically reducing alumina and silica bearing materials to produce aluminum-silicon alloys comprising:
a. providing alumina and silica bearing materials in a mix having a weight ratio of silica to alumina in the range of 0.5 to 1.1;
b. providing in said mix a source of carbonaceous material for effecting reduction of said alumina and silica in said mix; and
c. carbothermically reducing alumina and silica contents of said mix to produce an aluminum-silicon alloy.

4,046,559
PYROMETALLURGICAL SYSTEM FOR LIQUID-LIQUID CONTACTING
Peter B. Crimes, Sudbury, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.
Filed Feb. 23, 1976, Ser. No. 660,020
Int. Cl.² C22C 9/00; B01F 9/10
U.S. Cl. 75—93 R **29 Claims**



1. The method of promoting a reaction between a first denser material and a second lighter material, the materials having specific gravities differing by at least about 0.5, the method comprising the steps of
maintaining both materials in a liquid state in a vessel defined by a square of side *W* or by a circle of diameter 1.13*W*, the second liquid having a depth *H*,
supporting a stirrer with a blade assembly immersed in the lighter liquid and having a diameter of *D* of approximately 0.1*W* to 0.4*W*, and
rotating said stirrer at a rate *N* (RPM) such that the lower liquid is drawn up to the blade assembly, is pumped radially outward therefrom, and is formed into droplets by shear forces developed by said rotating blade assembly, and such that the upper liquid is circulated through a cloud of droplets thus formed, whereby a large area of contact between the liquids is produced without emulsification.

4,046,560
NICKEL BASE ALLOY
John C. Freche, Fairview Park, and William J. Waters, Cleveland, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Dec. 30, 1975, Ser. No. 645,507
Int. Cl.² C22C 19/03
U.S. Cl. 75—170 **5 Claims**

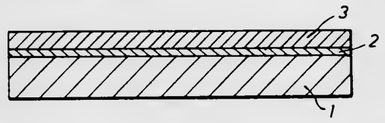
1. A nickel-base alloy adapted for use at elevated temperatures between about 2000° F and about 2200° F consisting essentially of from 15–17 percent tungsten, from 6.8–7.2 percent aluminum, from 0.8–1.8 percent molybdenum, from 1.8–2.2 percent columbium, from 0.2–0.4 percent zirconium, from 0.15–0.20 percent carbon, and the balance nickel.

4,046,561
DENTAL ALLOY OF USE IN THE ADHESION OF PORCELAIN
Emil M. Posea, Bala-Cynwyd, Pa., assignor to Neoloy Products, Inc., Posea, Ill.
Filed Sept. 1, 1976, Ser. No. 719,367
Int. Cl.² C22C 5/04
U.S. Cl. 75—172 R **5 Claims**

1. A precious metal alloy consisting essentially of, from 1–3% of boron, and a small percentage up to 31% of molybdenum and the balance palladium.

3. A precious metal alloy according to claim 1 adapted to have porcelain and like ceramics fused thereto which alloy contains a metal selected from the group consisting of nickel and a gallium in an amount of 5% or less.

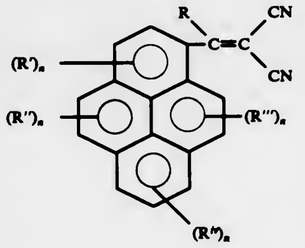
4,046,562
ELECTROPHOTOGRAPHIC RECORDING MATERIAL AND ITS METHOD OF MANUFACTURE
Wolf Glowinski, Warstein; Hartmut Dilkes, Belecke; Gottfried Guder, Belecke, and Karl-Heinz Kassel, Belecke, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany
Filed Dec. 19, 1974, Ser. No. 534,220
Claims priority, application Germany, Dec. 21, 1973, 2363738
Int. Cl.² G03G 5/04; C25D 5/00
U.S. Cl. 96—1.5 R **14 Claims**



1. Electrophotographic recording material comprising a photoconductive layer of selenium, selenium compounds or alloys with selenium, a conductive, flexible substrate, and an intermediate layer between said substrate and said photoconductive layer, said intermediate layer consisting of a metal having a modulus of elasticity of less than 6000 kp/mm² and a recrystallization temperature of less than 40° C.

4,046,563
PHOTOCONDUCTIVE COMPOSITION CONTAINING A TRICYANOPYRENE, ARTICLE AND PROCESS OF USE
James M. Pearson, Webster; David J. Williams, Fairport, and William W. Limburg, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Continuation-in-part of Ser. No. 454,487, March 25, 1974, abandoned. This application Feb. 10, 1975, Ser. No. 548,452
Int. Cl.² G03G 5/04
U.S. Cl. 96—1.5 R **12 Claims**

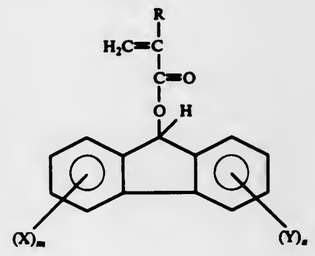
1. A photoconductive composition comprising a solid solution of at least one photogenerator compound of the formula



wherein
R is — H or —CN;
R', R'', R''' and R'' are independently selected from an aliphatic hydrocarbon radical having from about 1 - 10 carbon atoms; phenyl; or substituted phenyl wherein said substituents are capable of releasing electrons to relatively electron deficient centers within the compound; amino; diarylamino; dialkylamino or alkoxy; *n* can range from 0 up to the potential number of positions of substitution on the aromatic ring system
and an insulating polymeric matrix, said polymeric matrix being capable of rapid and efficient transport charge carriers of at least one polarity.

4,046,564
ELECTROPHOTOGRAPHIC IMAGING MEMBERS WITH PHOTOCONDUCTIVE LAYER CONTAINING ELECTRON ACCEPTOR MONOMERS OR POLYMERS
Sam R. Turner, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed July 16, 1975, Ser. No. 596,689
Int. Cl.² G03G 5/04
U.S. Cl. 96—1.5 R **4 Claims**

1. An electrophotographic imaging member having a conductive substrate and a photoconductive insulating layer comprising monomers of the formula



wherein
R is hydrogen or methyl;
X and Y are independently selected from the group consisting of NO_2, halogen, —CN and $—CF_3$; and
m and *n* can range from 0 to 3.

4,046,565
AMORPHOUS SELENIUM COATING
Norman Carlile Miller, Shaker Heights, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio
Filed Mar. 25, 1975, Ser. No. 561,702
Int. Cl.² G03G 5/04
U.S. Cl. 96—1.5 R **11 Claims**

1. A process for depositing a layer of photoconductive amorphous selenium upon a substrate which comprises evaporating amorphous selenium at a temperature in the range of about from 170° to 250° C at a pressure in the range of about from 1×10^{-4} torr to 6×10^{-2} torr, introducing an inert gas into an evacuated system having a pressure in the range of about from 1×10^{-7} torr to 1×10^{-6} torr, thus scattering said amorphous selenium and condensing amorphous selenium upon the entire surface of said substrate, the charge acceptance of the resulting selenium layer being in the range of about from 1/5 to ½ of the dielectric breakdown voltage.

10. A photoconductive selenium coated substrate produced by a process which comprises evaporating amorphous selenium at a temperature in the range of about from 170° to 250° C at a pressure in the range of about from 1×10^{-4} torr to 6×10^{-2} torr, introducing an inert gas into an evacuated system having a pressure in the range of about from 1×10^{-7} torr to 1×10^{-6} torr, thus scattering said amorphous selenium and condensing amorphous selenium upon the entire surface of said substrate, the charge acceptance of the resulting selenium layer

being in the range of about from 1/5 to 1/3 of the dielectric breakdown voltage.

4,046,566

PROCESS FOR THE PRODUCTION OF MASKED POSITIVE COLOR IMAGES BY THE SILVER DYE BLEACH PROCESS USING SILVER COMPLEX DIFFUSION

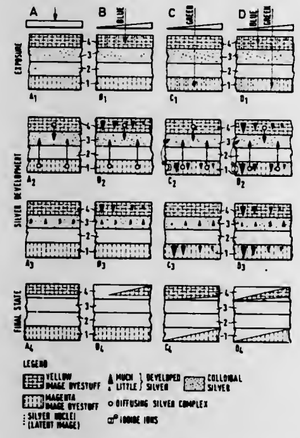
Max Marthaler, Marly, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 23, 1975, Ser. No. 625,235

Claims priority, application Switzerland, Oct. 28, 1974, 14401/74

Int. Cl.² G03C *7/04, 1/76, 3/00*

U.S. Cl. 96—7 **14 Claims**



1. Process for the production of masked subtractive positive colour images in accordance with the silver dye bleach process, by exposure, silver development, dye bleaching, silver bleaching and fixing, using a photographic material which contains, in each of at least two layers, a dyestuff which can be bleached imagewise, and of which the absorption maximum corresponds to one of the primary colours red, green and blue, with a silver halide emulsion layer sensitive to a particular spectral region being allocated to each dyestuff, which process comprises employing a photographic material in which

a. a silver halide emulsion layer consisting at least partially of silver iodide is allocated to the dyestuff, of which the undesired parasitic colour density is to be compensated,

b. in a further layer, at least one second dyestuff, of which the main colour density corresponds to a parasitic colour density, requiring compensation, of the first dyestuff, and a silver halide emulsion free from iodide ions, are present,

c. a further layer, which is adjacent to that containing the second dyestuff, contains colloidal nuclei which are capable of depositing metallic silver from soluble silver complexes,

d. a separating layer is present between the layer containing the nuclei and the dyestuff layer, of which the parasitic colour density is to be compensated,

and which process also comprises employing a silver devolper bath containing a ligand, which is able to produce water-soluble silver complexes which are capable of diffusion.

4,046,567

CHRISTIANSEN CELLS CONTAINING EPOXY GELLING AGENTS

Donald George Pye, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 2, 1976, Ser. No. 710,614

Int. Cl.² G03G *5/04*

U.S. Cl. 96—27 R **22 Claims**

1. In a Christiansen cell having as its operating element two constituents differing in optical dispersion but having identical refractive indices at a matching wavelength in or near the region of the visible spectrum, the constituents being a disperse phase dispersed in an optically homogeneous light sensitive medium whose refractive index is locally changed upon exposure to actinic light, the improvement wherein the medium contains the reaction product from (1) a multifunctional epoxy-containing compound and (2) a curing agent for the epoxy compound, said reaction product being optically homogeneous with the medium.

12. In a method of forming a colored image by projection of light through a Christiansen cell so that the light is separated into scattered and unscattered components either of which is focused on a viewing surface, said Christiansen cell having two constituents of different optical dispersion but having identical refractive indices at a matching wavelength in or near the visible spectrum, the constituents being a disperse phase dispersed in an optically homogeneous light sensitive medium whose refractive index is locally changed in accordance with a predetermined image upon exposure to actinic light, the improvement comprising: including in the medium an amount effective to gel the medium of the reaction product of (1) a multifunctional epoxy-containing compound and (2) a curing agent for the epoxy compound, said reaction product being optically homogeneous with the medium.

4,046,568

DISULFONYL SILVER HALIDE SOLVENTS SUBSTITUTED WITH PIPERAZINE AT ONE SULFONYL GROUP

Richard B. Greenwald, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 564,167, April 1, 1975, abandoned. This application July 19, 1976, Ser. No. 706,462

Int. Cl.² G03C *5/54, 5/38, 1/48, 1/40*

U.S. Cl. 96—29 R **49 Claims**

24. A diffusion transfer photographic process comprising the steps of:

1. reacting exposed silver halide of an imagewise exposed photosensitive silver halide emulsion layer carried on a support with a silver halide developing agent in aqueous alkaline solution;
2. reacting unreduced silver halide of said photosensitive emulsion with as a silver halide solvent, a compound of the formula

$$R^1-SO_2-\underset{\displaystyle R^2}{\underset{|}{CH}}-SO_2X$$

wherein R^1 is lower alkyl, R^2 is hydrogen, lower alkyl or $-(CH_2)_m-S-R^o$ wherein R^o is lower alkyl and m is a whole number 2 to 5; and X represents the residue of a 1-piperazine to form a complex silver salt that is soluble in said alkaline solution;

3. transferring said complex silver salt to a superposed image-receiving layer; and
4. reducing said transferred complex silver salt to provide a silver image.

4,046,569

PHYSICAL DEVELOPMENT OF PD(II) PHOTOSENSITIVE COMPLEXES WITH A LEUCOPHTHALOCYANINE DYE AND A REDUCING AGENT THEREFOR

Henry J. Gysling, and Mark Lelental, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,668

Int. Cl.² G03C *5/24, 1/48, 1/40*

U.S. Cl. 96—48 PD **32 Claims**

1. A process of preparing phthalocyanine dye image comprising imagewise forming palladium nuclei and catalytically reducing a leucophthalocyanine dye in contact with said palladium nuclei, with a reducing agent that does not spontaneously reduce the leucophthalocyanine dye.

3. A process of preparing a phthalocyanine dye image comprising forming a latent image of palladium nuclei by imagewise exposing to electromagnetic radiation one or more palladium complexes chosen from the group represented by the general formula:

$$[Pd(G)_a(J)_b(K)_c(N)_d]_eM_f$$

ps wherein

G, J, K and N are ligands selected from the group consisting of halogen ligands, carboxylic acid ligands, aromatic ligands, nitrogen ligands, phosphorous ligands and arsenic ligands;

M is selected from the group consisting of ions selected from the group consisting of hydrogen ions, inorganic acid ions, organic acid ions, and metal ions selected from the group consisting of sodium ions, potassium ions, calcium ions, strontium ions and aluminum ions and onium ions;

$a + b + c + d$ is an integer from 1 through 4;

e is 1 or 2; and

f is an integer from 0 through 8, and catalytically reducing a leucophthalocyanine dye in contact with said palladium nuclei, with a reducing agent which does not spontaneously reduce said leucophthalocyanine dye or said palladium complexes.

12. A photographic element comprising a photosensitive layer comprising one or more palladium complexes said complexes being capable of forming palladium nuclei on exposure to electromagnetic radiation, a layer comprising a leucophthalocyanine dye and a layer containing a reducing agent which does not spontaneously reduce said leucophthalocyanine dye or said palladium complexes and being capable of reducing said leucophthalocyanine dye to phthalocyanine dye in the presence of said palladium nuclei, said layers being in reactive association with one another.

28. A photographic element comprising a photosensitive layer comprising one or more palladium complexes capable of forming palladium nuclei on exposure to electromagnetic radiation, said; palladium complexes are chosen from the group represented by the general formula:

$$[Pd(L)_a(X)_b]_cY_j$$

wherein;

L is a sterically hindered polydentate nitrogen ligand,

X is a univalent anion chosen from the group consisting of chloride, bromide, azide, thiocyante, selenocyanate, tellurocyanate, nitrate, acetate;

Y is X or a tetraarylborate;

i g and h are 1 or 2;

$g + h$ is at least 2;

i is an integer from 1 through 4; and

j is an integer from 1 through 4; and a layer comprising a reducing agent which does not spontaneously reduce said palladium complexes and being capable of reducing a leucophthalocyanine dye to phthalocyanine dye in contact with said palladium nuclei, said reducing agent is chosen from the group consisting of amine boranes, phosphine boranes, arsine boranes, phosphite boranes, stibine boranes, boronium salts and cyanoborohydride ion, said layers being in reactive association with one another.

4,046,570

HARDENING FIXER FOR PHOTOGRAPHIC SILVER HALIDE MATERIAL

Marcel Robert Fierens, Duffel, and Renaat Frans Heylen, Deurne, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

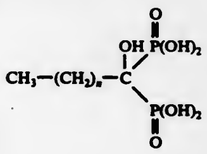
Filed May 27, 1976, Ser. No. 690,585

Claims priority, application United Kingdom, June 13, 1975, 25405/75

Int. Cl.² C03C *5/38*

U.S. Cl. 96—61 R **6 Claims**

6. In a method of processing an imagewise exposed photographic silver halide element comprising the steps of developing by means of a developer comprising a silver halide developing agent and treating the developed element with a hardening fixer comprising an aluminum hardener and a thiocyanate or thiosulphate silver halide solvent, the improvement which comprises using in the fixer composition a 1-hydroxy-alkylidene diphosphonic acid of the formula:



n being 0, 1, 2, or 3.

4,046,571

PROCESSING SOLUTION FOR USE AS PHOTOGRAPHIC DEVELOPER BATH AND REPLENISHER THEREFOR

John R. Mertz, Coaklia, N.Y., assignor to GAF Corporation, New York, N.Y.

Filed June 27, 1975, Ser. No. 591,093

Int. Cl.² G03C *5/26, 5/30*

U.S. Cl. 96—66 HD **8 Claims**

1. An aqueous photographic processing solution useful as a photographic developer bath for automatic processing of X-ray film and as a replenisher therefor, consisting essentially of, per liter:

A 1-phenyl-3-pyrazolidone photographic developer	0.8 to 1.8g
Hydroquinone or a derivative thereof	15 to 35g
Bromide ion	0 to 4g
Organic anti-foggant and film speed restrainer	7 to 26 mmol
Alkaline material and buffer to provide a pH at 25° C of 10.0 + 0.8 − 0.5	

4,046,572

SILVER HALIDE PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL

Masanao Hinata; Yuji Mihara; Akira Sato, and Tadashi Ikeda, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

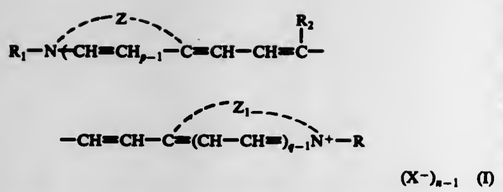
Filed June 30, 1976, Ser. No. 701,271

Claims priority, application Japan, June 30, 1975, 50-81182

Int. Cl.² G03C *1/76, 1/20*

U.S. Cl. 96—69 **28 Claims**

1. A silver halide photographic light-sensitive material comprising a support having coated thereon at least one photographic emulsion layer containing a dicarbocyanine dye represented by general formula (I):



wherein R represents a sulfo group-containing alkyl group or a carboxy group-containing alkyl group, R_1 represents an aralkyl group or an aryloxyalkyl group, R_2 represents a hydrogen atom, a halogen atom, an alkyl group or an aralkyl group, *p* and *q* represent 1 or 2, *n* represents 1 or 2 and when *n* equals 1 the dye forms an intermolecular salt, X represents an anion and Z and Z_1 each represent the non-metallic atoms necessary to complete a thiazole nucleus, selenazole nucleus, oxazole nucleus, quinoline nucleus, 3,3-dialkylindolenine nucleus, imidazole nucleus or pyridine nucleus.

4. A silver halide color photographic light-sensitive material defined by claim 1, wherein at least three light-sensitive emulsion layers are present: a red-sensitive emulsion layer, a green-sensitive emulsion layer and a blue-sensitive emulsion layer.

4,046,573

COLOR PHOTOGRAPHIC MATERIALS

Kozo Inoue; Kotaro Nakamura; Yukio Yokota; Kiyoshi Nakazyo, and Akio Okumura, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 24, 1976, Ser. No. 669,935

Claims priority, application Japan, Mar. 24, 1975, 50-35945

Int. Cl.² G03C *1/76, 1/00, 1/40*

U.S. Cl. 96—74 **15 Claims**

1. A color photographic material comprising a support having photographic silver halide emulsion layers and auxiliary layers thereon, with at least one of said photographic layers containing a non-diffusible colored coupler which releases, on coupling reaction with the oxidation product of a primary aromatic amino developing agent at development, a diffusible dye capable of being removed from the photographic layer, said non-diffusible colored coupler being represented by general formula (I):

$$A - O - SO_2 - R - B \qquad (I)$$

wherein R represents an alkylene group having 1 to 10 carbon atoms; A represents an image forming coupler residue containing a phenol nucleus or a naphthol nucleus, and wherein the —O-SO_2-R-B group is bonded to the coupling position of the coupler residue and the group can be released upon oxidative coupling with an aromatic primary amine developing agent to form a dye; and B represents a residue containing a chromophore which renders the coupler colored and which consists of a dye component having its spectral absorption in the visible region.

4,046,574

COLOR PHOTOGRAPHIC MATERIAL WITH HOMOPHTHALIMIDE THIOETHER DEVELOPMENT INHIBITOR

Heinrich Odenwalder, Cologne; Erwin Raaz; Walter Puschel, both of Leverkusen, and Hans Vetter, Cologne, all of Germany, assignors to AGFA-Gevaert, Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 20, 1976, Ser. No. 650,676

Claims priority, application Germany, Jan. 24, 1975, 2502892

Int. Cl.² G03C *1/10, 1/40, 1/48, 7/00*

U.S. Cl. 96—99 **6 Claims**

1. A light-sensitive color photographic material with at least one silver halide emulsion layer, containing at least one dye image producing compound and containing a development inhibitor releasing homophthalimide thioether compound capable of reacting with the oxidation product of an aromatic primary amino silver halide developing agent to form a releasable mercaptan capable of inhibiting photographic development the said homophthalimide thioether compounds are substituted with the sulfur of the thioether group in the 4-position and the nitrogen atom of the imido group in the 2-position of the homophthalimide is a tertiary nitrogen atom substituted with an alkyl, aryl, heterocyclic or an acylamino group.

4,046,575

COLOR PHOTOGRAPHIC MATERIAL CONTAINING 2-EQUIVALENT YELLOW COUPLERS

Immo Boie, Cologne, and Dieter Lowski, Bergheim, Erft, both of Germany, assignors to AGFA-Gevaert, Aktiengesellschaft, Germany

Filed June 5, 1974, Ser. No. 476,388

Claims priority, application Germany, June 9, 1973, 2329587

Int. Cl.² G03C *1/40*

U.S. Cl. 96—100 N **9 Claims**

1. In a light-sensitive photographic material containing at least one silver halide emulsion layer and a 2-equivalent yellow coupler having an activated open-chain ketomethylene coupler structure in which one hydrogen of the methylene group is substituted by the nitrogen or a nitrogen-containing 5-membered heterocyclic ring that is photographically relatively inert except that it splits off from the coupler structure during chromogenic development, the improvement according to which the splittable nitrogen-containing five-membered heterocyclic ring is a C=C—N—C chain cyclized with C or O, and a benzene ring is fused to two carbons of the five-membered ring, adjacent the N.

4,046,576

PROCESS FOR PREPARING SILVER HALIDE EMULSION USING A SULFUR-CONTAINING RIPENING AGENT

James P. Terwilliger; Anthony D. Gingello, and Jong-Shian Wey, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 7, 1976, Ser. No. 693,445

Int. Cl.² G03C *1/02, 1/28*

U.S. Cl. 96—108 **19 Claims**

1. In a process of continuously preparing a radiation-sensitive silver halide emulsion wherein

1. a silver salt and a halide salt capable of reacting to form radiation-sensitive silver halide grains are concurrently and separately continuously introduced into a reaction chamber in the presence of a peptizer and
2. radiation-sensitive silver halide emulsion is withdrawn continuously from the reaction chamber while silver halide grain formation is occurring under steady state operating conditions,

the improvement comprising

forming the silver halide grains in the presence of a sulfur-containing ripening agent chosen from the group consisting of thioether and thiocyanate ripening agents for silver halide grains, and

concurrently controlling and maintaining the total halide ion concentration at less than 0.01 molar.

4,046,577

PHOTOREACTIVE COMPOSITIONS COMPRISING POLYMERS CONTAINING ALKOXYAROMATIC GLYOXY GROUPS

Thaddeus M. Muzyczko, Downers Grove, and Thomas H. Jones, Naperville, both of Ill., assignors to The Richardson Company, Des Plaines, Ill.

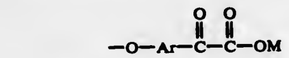
Continuation-in-part of Ser. No. 585,215, June 9, 1975, Pat. No. 3,969,119, which is a division of Ser. No. 267,475, June 29, 1972, Pat. No. 3,888,671. This application July 12, 1976, Ser. No. 704,384

The portion of the term of this patent subsequent to July 13, 1993, has been disclaimed.

Int. Cl.² G03C *1/68;* G03F *7/02;* G03C *5/00*

U.S. Cl. 96—115 R **63 Claims**

1. A light sensitive composition comprising a polymer which includes as a recurring structure:



wherein Ar is a bivalent aromatic radical and M is selected from the class consisting of hydrogen, alkali metal, ammonium and substituted ammonium.

4,046,578

TYPE OF ADHESIVE CEMENT AND CERTAIN IMPROVED PRODUCTS MADE POSSIBLE THEREBY

David F. Smith, 101 Briny Ave. No. 607, Pompano Beach, Fla. 33062

Filed July 7, 1975, Ser. No. 593,885

Int. Cl.² C09K *3/00*

U.S. Cl. 106—35 **10 Claims**

1. An intimate mixture of finely-divided, dry zinc oxide and a dry, solid, weak, powdered, unpolymerized polycarboxylic acid which acid is such as to rapidly wet and largely dissolve in water, said mixture being maintained dry and unreacted until use; its dry particles being bonded together by a dry, water-insoluble agent in the amount of the order of about 1–2% by anhydrous weight of the mix which bonding agent does not materially interfere with rapid wetting of said mixture when contacted with water and, when wetted, rapidly becomes adhesive and quickly sets to a strong, hard cement; the proportions of said oxide and said acid in said mixture being from 10 to 400 percent of their chemical equivalence, said cement being relatively resistant to distintegration in water when the proportion of said oxide is such as to be at least chemically equivalent to the acid in said mixture.

4,046,579

DISPOSABLE PATTERN COMPOSITION

Tom Martin, 50 W. Wrightwood, Glendale, Ill. 60137

Filed July 18, 1975, Ser. No. 597,211

Int. Cl.² C08L *91/06*

U.S. Cl. 106—38.8 **3 Claims**

1. In a thermoplastic pattern forming composition comprising a thermoplastic pattern material, the improvement comprising a thermoplastic pattern forming composition having two phases containing, in admixture, said pattern material and finely divided 4,4'-isopropylidene diphenol not exceeding 100 mesh in an amount of from about 20% to about 70% by weight of the pattern forming composition.

4,046,580

SILICON NITRIDE-BASED SINTERED MATERIAL AND METHOD FOR MANUFACTURING THE SAME

Takashi Ishii, Tokyo; Katsutoshi Nishida, Yokohama; Michiyasu Komatsu, Yokohama, and Akihiko Tsuge, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed June 25, 1975, Ser. No. 590,073

Claims priority, application Japan, June 28, 1974, 49-73283; July 5, 1974, 49-76430

Int. Cl.² C04B *35/50, 35/58*

U.S. Cl. 106—55 **9 Claims**

1. A silicon nitride-based sintered material containing silicon yttrium oxynitride crystal compounds prepared from silicon nitride and yttrium oxide, wherein the amount of yttrium present in said crystal compounds is 50 wt% or more based on the total amount of yttrium contained in said silicon nitride-based sintered material.

4,046,581

REFRACTORY BINDER

John Edward Cassidy, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 27, 1974, Ser. No. 483,906

Claims priority, application United Kingdom, July 17, 1973, 33916/73

Int. Cl.² C04B *19/00*

U.S. Cl. 106—85 **7 Claims**

1. A solution of an aluminium phosphate binder in a diluent the solution comprising aluminium ions and phosphate ions in a molar ratio of Al:P of substantially 1:1 and other inorganic acidic anions, other than oxyphosphorus acid anions, the molar ratio of other acidic anions:Al being in the range 1.3:1 to 2:1.

4,046,582

AIR-ENTRAINING WATER-REDUCING AGENTS FOR CEMENT COMPOSITION

Yuichi Kawamura; Goro Hirano; Makoto Nagai, and Yasunobu Miura, all of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

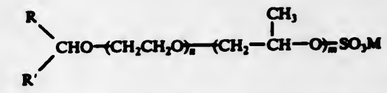
Continuation of Ser. No. 483,330, June 26, 1974, abandoned. This application Apr. 15, 1976, Ser. No. 677,187

Claims priority, application Japan, June 26, 1973, 48-71331; Feb. 13, 1974, 49-16828

Int. Cl.² C04B *15/02*

U.S. Cl. 106—88 **7 Claims**

1. A cement composition comprising a cement and an air-entraining water-reducing agent for the cement, comprising as an active ingredient a higher secondary alcohol oxyalkylene sulfate of the following general formula



wherein R and R' are alkyl groups with the sum of the total number of carbon atoms of both R and R' being about 10 to 20; *n* and *m* are each an integer of from 0 to 15, with *n*+*m* being 1 to 15, and M is an alkali metal atom, an ammonium group or an amine group.

4,046,583
METHOD OF PRODUCING EXPANSIVE AND HIGH STRENGTH CEMENTITIOUS PASTES, MORTARS AND CONCRETES
Mario Collepardi, Rome, Italy, assignor to Emesa Aktiengesellschaft, Eschen, Liechtenstein
Filed May 10, 1976, Ser. No. 684,727
Claims priority, application Italy, May 9, 1975, 84122/75
Int. Cl.² C04B 7/35
U.S. Cl. 106—90 14 Claims

1. A method for producing expansive and high strength cementitions pastes, mortars, and concretes, comprising adding to a mix of water, cement and aggregates a mixture containing: a compound selected from the group consisting of calcium oxide, magensium oxide or mixture thereof, and a water-reducing agent capable of reducing the water/cement ratio of the mix at least about 15% at constant workability.

4,046,584
LIQUID CONCRETE ACCELERATING MIXTURES AND METHODS FOR USE THEREOF
Raymond C. Snyder, 5131 Princeton, Westminster, Calif. 92684, and Paul F. Snyder, 14281 Hacienda Drive, Huntington Beach, Calif. 92647
Filed Apr. 29, 1976, Ser. No. 681,504
Int. Cl.² C04B 7/35
U.S. Cl. 106—90 9 Claims

1. An accelerated setting concrete which comprises:
1. a liquid concrete composition containing cement, aggregate and water; and
2. an accelerating additive therefore in an amount from 0.5 to 10 weight percent, sufficient to accelerate setting of said concrete and comprising on a weight basis:
a. from 15 to 40 percent alumina
b. from 10 to 25 percent sodium expressed as the oxide;
c. from 10 to 25 percent potassium expressed as the oxide; and
d. the balance being water.

4,046,585
COMPOSITION AND METHOD FOR BINDING LIGNOCELLULOSIC MATERIALS
Kuo-Cheng Shen, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada
Continuation-in-part of Ser. No. 338,562, March 6, 1973. This application Mar. 20, 1975, Ser. No. 560,131
Int. Cl.² C08L 97/02
U.S. Cl. 106—123 LC 9 Claims

1. A composition for binding lignocellulosic materials comprising a concentrate containing lignin sulfonate treated with sulfuric acid to provide a pH of not more than 1.5 measured as a 50% solids solution of the concentrate.

4,046,586
STABILIZED PHOTOCHROMIC MATERIALS
Donald R. Uhlmann, Newton; Elias Snitzer, Wellesley; Richard J. Hovey, Sturbridge; Nori Y. C. Chu, Southbridge, all of Mass., and Joseph T. Fournier, Jr., Storrs, Conn., assignors to American Optical Corporation, Southbridge, Mass.
Continuation-in-part of Ser. No. 498,506, Aug. 19, 1974, abandoned. This application Jan. 27, 1975, Ser. No. 544,078
Int. Cl.² C08L 1/10; G02B 5/23
U.S. Cl. 106—194 24 Claims

1. A photochromic particle for incorporation into a host for imparting photochromic properties thereto, said particle comprising:
an inorganic crystalline halide material selected from the group consisting of chloride, bromide, iodide, and mixtures thereof whose dimensions lie in the range between approximately 30 Angstroms and 10,000 Angstroms, said material being capable of changing to a higher energy, light absorbing state when exposed to activating radiation; and
a coating on the surface of said crystalline material said coating being an inorganic non-oxide coating, the coating volume being less than about 100 times the volume of said material and being effective to render the particle impervious both to halogen diffusion out of the crystal produced during photoactivation and impervious to host chemistry.

4,046,587
PRIMER COMPOSITION, PROCESS FOR USING SAME AND PRODUCT OBTAINED THEREBY
Richard J. Guglielmo, Sr., Lambs Lane, Cresskill, N.J. 07626
Filed Dec. 23, 1975, Ser. No. 643,699
Int. Cl.² C08K 5/02; C08L 9/06; C09D 3/393
U.S. Cl. 106—271 5 Claims

1. A primer composition for treating a polyolefinic-containing foam material to permit effective adhesion of a polyvinyl coating thereon which comprises:
a chlorinated hydrocarbon solvent in which there is admixed a resin material selected from the group consisting of a chlorinated paraffin wax, an acrylic type ester polymer and a vinyl copolymer, and mixtures thereof, said material constituting of from 2 to 10 percent by weight of said primer composition.

4,046,588
METHOD FOR THE MANUFACTURE OF A LEAD CHROMATE-CONTAINING PIGMENT HAVING A LOW ACID SOLUBLE LEAD CONTENT
Johan Jozef Einerhand; Gerardus Johannes Baptist Colbers, both of Maastricht; Wilhelmus Martha Andreas Huck, Elsloo, and Herman Jozef Johannes Maria Geurts, Kerkrade, all of Netherlands, assignors to Hercules Incorporated, Wilmington, Del.
Continuation-in-part of Ser. No. 647,953, Jan. 9, 1976, abandoned. This application Aug. 24, 1976, Ser. No. 717,414
Claims priority, application Netherlands, Jan. 13, 1975, 7500365
Int. Cl.² C09C 1/20
U.S. Cl. 106—298 9 Claims

1. A process for producing a lead chromate-containing pigment having an acid soluble lead content expressed as PbO of less than 5% by weight of the pigment and consisting essentially of mixed crystals of lead chromate and lead sulfate, said process comprising: forming an aqueous suspension of a lead chromate-lead sulfate precipitate by contacting under acid conditions in the presence of chloride and aluminum ions and in the absence of a buffering agent an aqueous chrome solution containing chromate and sulfate ions with an aqueous solution containing sufficient lead ions to provide an excess of 0.01 to 0.10 mole of lead ions per mole of chromate and sulfate ions present in said chrome solution; adding to the suspension a coating amount of a silicon compound and a trivalent antimony compound and precipitating said compounds as a surface coating on said precipitate; adjusting the pH of the resulting suspension to below 7; and recovering the coated precipitate as a pigment.

4,046,589
CALCIUM-SILICO-ZIRCONATE PRIMER PIGMENT
James Francis Higgins, Livingston, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Sept. 24, 1976, Ser. No. 726,292
Int. Cl.² C09C 1/28
U.S. Cl. 106—299 2 Claims

1. A method of imparting corrosion-inhibition to a primer by formulating into the primer from 0.1% to 65% by weight of calcium-silico-zirconate of the formula $xCaO.SiO_2.ZrO_2$, wherein x is from 2.75 to 3, based on the weight of the primer.

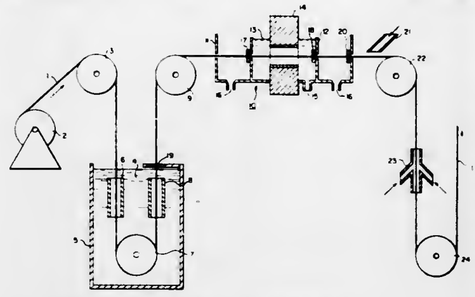
4,046,590
PROCESS FOR THE PRODUCTION OF A COLORLESS SUGAR SYRUP FROM CANE MOLASSES
Richard Riffer, Berkeley, Calif., assignor to California and Hawaiian Sugar Company, San Francisco, Calif.
Filed Sept. 8, 1976, Ser. No. 721,197
Int. Cl.² C13D 3/14, 3/12; C13J 1/06
U.S. Cl. 127—46 B 9 Claims

1. A process for producing a sugar solution from cane molasses comprising the steps of:
a. diluting said molasses with water,
b. heating said molasses,
c. centrifuging said molasses to remove insoluble solids,
d. acidifying said molasses to a pH of about 4,
e. immediately passing said acidified heated molasses through an ion-exclusion resin wherein sugars are adsorbed and impurities are excluded, and
f. passing water over said resin to elute and recover sugar solution from said resin.

4,046,591
METHOD FOR CLEANING THE EPIDERMIS USING A MAGNETIC FIELD
René Laguerre, 20 Allee du Mail, Meudon la Foret, France (92360)
Filed Apr. 21, 1975, Ser. No. 569,652
Claims priority, application France, Apr. 23, 1974, 74.14086; Apr. 9, 1975, 75.11101
Int. Cl.² B08B 7/00
U.S. Cl. 134—1 11 Claims

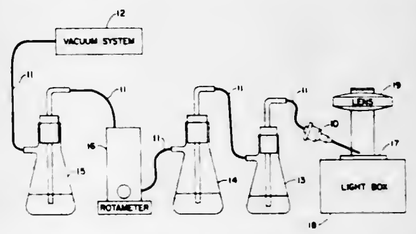
1. A method of cleaning the epidermis of the skin comprising the steps of
applying onto the epidermis a particulate substance comprising particles having a grain size between 10 and 80 microns and which can be displaced by the action of a magnetic field, the particles having a shape for penetrating the pores and hollows of the skin without injuring the skin;
causing by massaging said particulate substance to penetrate the pores and hollows of the skin and to insert between the dead cells of the skin and the waste products excreated by the skin;
applying and moving on the surface of the epidermis a magnetic field having its action concentrated on a width and length not exceeding a few millimeters, and retracting said particulate substance by action of said magnetic field, carrying therewith a part of said dead cells and waste products from the skin.

4,046,592
WIRE CLEANING SYSTEM
Dean C. Westervelt, Acme; Luciano C. Scala, Murrysville; Howard E. Saunders, Pittsburgh, and David F. Cliberti, Murrysville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Jan. 12, 1976, Ser. No. 648,431
Int. Cl.² B08B 3/10, 3/12; C25F 1/00
U.S. Cl. 134—1 11 Claims



1. A method of cleaning wire comprising
1. passing said wire through a graphite tube;
2. providing an alkaline aqueous solution between said tube and said wire;
3. passing an electric current which is at least half direct current between said wire and said graphite tube with said graphite tube as the anode; and
4. ultrasonically rinsing said wire.

4,046,593
METHOD FOR COLLECTING SPORES FROM A MOLD
Frederick H. F. Au, and Werner F. Beckert, both of Las Vegas, Nev., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Division of Ser. No. 615,962, Sept. 23, 1975, Pat. No. 3,983,007. This application June 17, 1976, Ser. No. 696,998
Int. Cl.² B08B 5/04
U.S. Cl. 134—21 1 Claim

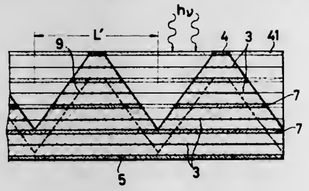


1. A method for collecting spores from a mold with essentially no contamination by mycelial fragments composed of the steps of: contacting the spores with a vacuum apparatus having therein a filter permeable to the passage of air therethrough, and controlling the airflow through the vacuum apparatus to about 1.6 liters per minute such that essentially only the spores are drawn thereinto and collected on the filter with essentially no contamination by mycelial fragments.

4,046,594
SOLAR BATTERY
Yasuo Tarui, Higashi-Kurume; Tsuneonri Sakamoto, and Yoshio Komiya, both of Tonashi, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan
Filed Mar. 26, 1976, Ser. No. 670,756
Claims priority, application Japan, June 19, 1975, 50-73658
Int. Cl.² H01L 31/06
U.S. Cl. 136—89 SJ 6 Claims

1. A solar battery of homoepitaxial or heteroepitaxial structure comprising a series connected stack of alternately arranged planar layers of p and n semiconductor material, each pair of adjacent layers of opposite conducting type forming a photovoltaic junction therebetween, each said junction being parallel to the plane of the layers, with ohmic electrodes lying between each said pair, said stack having top and bottom major surfaces and a plurality of grooves in the top major surface of said stack, said grooves extending through said planes of the said junctions, the exposed surfaces of said grooves being inclined to said junction planes for receiving impinging radiation.

2. A solar battery according to claim 1 wherein said stack has a plurality of grooves in the bottom major surface of said stack and extending through said planes of said junctions, the exposed surfaces of said grooves in the bottom surface of said



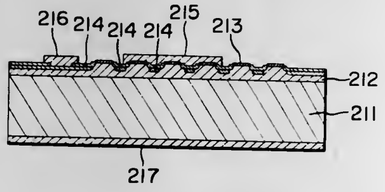
stack being inclined to said junction planes, the grooves in the top surface of said stack and the grooves in the bottom surface of said stack thereby providing a zig-zag appearance in longitudinal section.

4,046,595

METHOD FOR FORMING SEMICONDUCTOR DEVICES

Yoshio Ohkubo, Takatsuki, and Yoshichika Kobayashi, Ibaraki, both of Japan, assignors to Matsushita Electronics Corporation, Japan

Filed Oct. 14, 1975, Ser. No. 621,844
Claims priority, application Japan, Oct. 18, 1974, 49-120912
Int. Cl.² H01L *21/26*
U.S. Cl. 148—1.5 **4 Claims**



1. The method of forming semiconductor devices comprising:

forming at least one recess on a surface of a semiconductor substrate;

applying an etchable coating material on said surface of the substrate in such manner that the layer in the recess is thicker than that on the projecting portion; etching the layer of said coating material uniformly at the same rate until such time as the projecting portion is bared, whereas the recess is still covered with the coating material and stopping the etching of said coating material after said time and before the coating material in the recess has been removed;

forming one conductivity region in the projecting portion of said semiconductor substrate.

4,046,596

PROCESS FOR PRODUCING SPECTACLE FRAMES USING AN AGE-HARDENABLE NICKEL-BRONZE ALLOY

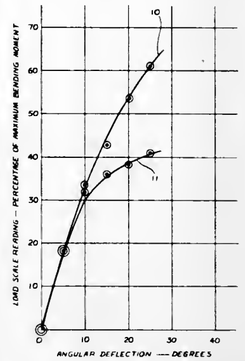
Richard T. Metcalfe; George A. Granitsas, both of Sturbridge, Mass., and Edgar H. Elliott, Woodstock, Conn., assignors to American Optical Corporation, Southbridge, Mass.

Filed June 27, 1975, Ser. No. 591,189
Int. Cl.² C22F *1/08*; G02C *13/00*
U.S. Cl. 148—2 **5 Claims**

1. In a process of making spectacle frames with high tensile strength and good resistance to permanent set of frame from a plurality of parts by brazing, the improvement comprising,

preparing a precursor alloy shape capable of subsequent working to make spectacle frame parts, said shape characterized by softness and being of a nickel bronze alloy, the alloy consisting essentially of about 2–10 percent tin, from about 3–26 percent nickel, with the rest being copper, there being minor amounts of manganese to impart ductility to the alloy, and less than about 1 percent of other elements, said shape having been rendered soft by subjecting the alloy thereof to prolonged heating in the range of about 600° C. to about 950° C. for a time period sufficient to obtain the easily workable soft condition,

forming a part of a spectacle frame from said alloy in the



course of which said shape is reduced on the order of 10–75 percent in area to thereby impart cold working characteristics and thus some hardening to the frame part being made,

brazing said part to another of said plurality of parts,

heating said frame part to age it at a temperature in the range of about 300° C. to about 450° C. for about 1 to 6 hours in order to promote precipitation of a phase in the alloy, which phase is characterized by the chemical formula Ni_2Sn, to thereby obtain a spectacle frame part characterized by high tensile strength and good resistance to permanent set.

4,046,597

VIBRATION DAMPING STEEL MATERIAL AND PROCESS FOR PRODUCING THE SAME

Hiroshi Takechi; Mitsunobu Abe; Matsuo Usuda, all of Kisarazu, and Kunihiko Komiya, Kimitsu, all of Japan, assignors to Nippon Steel Corporation, Japan

Filed Dec. 9, 1976, Ser. No. 749,082
Int. Cl.² C21D *7/14*
U.S. Cl. 148—12 R **3 Claims**

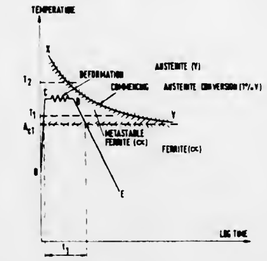
1. A vibration damping steel material consisting essentially of C ≦ 0.10% and Mn ≦ 0.40%, said material having a lower yield point or 0.2% proof stress of 7–28 kg/mm² with a d value of not less than 0.18 determined by the formula $d = (100 \times N)/(30 \times P)$ wherein when 30 fields for different steel surfaces extracted at random each are observed through a microscope at a magnification of 400 times with a glass plate having 20 lattice lines in each of the longitudinal and lateral directions and inserted in a space adjacent an eyepiece of the microscope, P is the total number of lattice points in one field and N is the total number of lattice points occupied by nonmetallic inclusions including carbide and summed up over the 30 fields, while still maintaining the specific gravity at a level of not more than 7.859 g/cm³ measured based on Archimedes' principle, said material produced by a process comprising the steps of forming a slab, billet or bloom, hot rolling and then annealing at a temperature of 680°–900° C for not less than 40 seconds but not more than 3 minutes.

4,046,598

PROCEDURE FOR MANUFACTURE OF STEEL BAND OR STRIP

Bo Leonart Janzon, Storfors, Sweden, assignor to Uddeholms Aktiebolag, Uddeholm, Hagfors, Sweden

Filed Jan. 22, 1976, Ser. No. 651,474
Claims priority, application Sweden, Jan. 22, 1975, 75006536
Int. Cl.² C21D *7/14*
U.S. Cl. 148—12 R **6 Claims**



1. A process for the manufacture of a band or strip of a steel comprising spheroidal carbide particles in a ferritic base which comprises heating a steel, the major part of which is, structurally, at least one carbonaceous ferritic austenite conversion product selected from the group consisting of lamellar perlite, granular perlite, sorbite, bainite and martensite, to a temperature which is above the A_{c1}-temperature for that steel and within the ferritic metastability range for that steel, rolling the steel at a temperature in the said metastable temperature range, and then cooling the steel to below the A_{c1}-temperature, the heating, rolling and cooling taking place in a time short enough to ensure that no substantial conversion to austenite occurs in the steel.

4,046,599

PROCESSING WIRE ROD

Mario Economopoulos, Liege, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Jan. 6, 1976, Ser. No. 646,887
Claims priority, application Belgium, Jan. 10, 1975, 824313
Int. Cl.² C21D *9/52*
U.S. Cl. 148—12 B **5 Claims**

1. In a method of processing steel wire rod leaving the last stand of a rolling mill, comprising the sequential steps of rapidly cooling the wire rod down to between 850° C and a temperature corresponding to the nose of the curve representing the start of transformation of austenite to ferrite-pearlite in a diagram in which curves representing the start and finish of transformations in the steel are plotted with respect to time and temperature, and subjecting the wire rod to a second cooling while the rod is in the form of loose turns passing along a given path, during which second cooling the steel completely transforms from austenite to ferrite-pearlite, the improvement comprising observing the variation of the temperature of the wire rod along the given path, detecting the position at which a temperature increase occurs owing to recalescence, and subjecting the wire rod to localized supplementary cooling at the position.

4,046,600

METHOD OF PRODUCING LARGE DIAMETER STEEL RODS

Noboru Yamakoshi, Kobe; Tsugio Kaneda, Akashi; Nobuyasu Hatsuoka, Gogatsuka; Shinichi Shimazu; Tatsu Fujita, both of Kobe; Yoshiro Yamada, Akashi; Tetsuo Yamada, and Atsuo Mizuta, both of Kobe, all of Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed Dec. 17, 1974, Ser. No. 533,508
Claims priority, application Japan, Dec. 17, 1973, 48-141691; Dec. 17, 1973, 48-141692
Int. Cl.² C21D *7/14*
U.S. Cl. 148—12.4 **1 Claim**

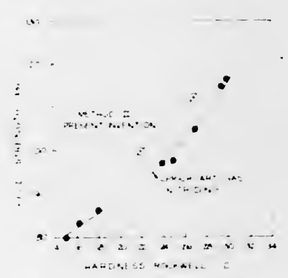
1. A method for producing a large gauge, high strength steel rod having a diameter of not less than 9 mm, which comprises subjecting a high carbon steel rod billet consisting essentially of from 0.65 to 0.9% C, from 0.15 to 1.5% chromium, less than 2.0% silicon, less than 1.5 manganese, at least one element from the group consisting of aluminum, niobium, vanadium zirconium and titanium in an amount of less than 0.3% in total, balance essentially iron, to hot rolling immediately followed by a controlled cooling treatment, by the use of an air cooling medium, so as to effect a phase transformation to obtain a structure consisting essentially of fine pearlite, whereby a steel rod having a tensile strength of above 115 kg/mm² is produced without any re-heating treatment, wherein the resulting steel rod has the mechanical properties such that it may subjected to a reduction in area is excess of 35% without requiring heat treatment.

4,046,601

METHOD OF NITRIDE-STRENGTHENING LOW CARBON STEEL ARTICLES

Rollin E. Hook, Dayton, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed June 1, 1976, Ser. No. 691,245
Int. Cl.² C21D *1/48*
U.S. Cl. 148—15 **14 Claims**



1. A method for internal strengthening of articles formed from a deep drawing quality steel sheet of strip stock, which comprises:

providing a vacuum decarburized and deoxidized steel melt containing, in weight percent, from about 0.002 to about 0.015% carbon, up to about 0.012% nitrogen, up to about 0.08% aluminum, about 0.05 to about 0.6% manganese, up to about 0.035% sulfur, up to about 0.01% oxygen, up to about 0.01% phosphorus, up to about 0.015% silicon, about 0.02 to about 0.3% titanium in solution, up to about 0.3% columbium in solution, and remainder iron except for incidental impurities, columbium when present being added in an amount of at least 0.025% in solution, with the sum total of titanium and columbium in solution not exceeding about 0.3%;

reducing said steel to final thickness by steps involving casting, hot rolling to strip thickness, removing the hot mill oxide scale, and cold rolling to strip or sheet thickness;

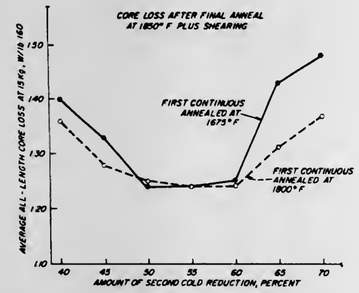
annealing to obtain a fully recrystallized, ductile, deep drawing steel strip or sheet;
forming said article from said annealed strip or sheet;
heating said article at a temperature of about 570° to about 580° C in a nitriding fluid chosen from the group consisting of a fused salt nitriding bath, and a gaseous nitriding atmosphere, whereby to form on the surfaces of said article an epsilon iron nitride layer, said heating being conducted in said fluid for a period of time, proportional to the thickness of said steel strip or sheet, sufficient to provide a total nitrogen concentration at least substantially equal to the amount theoretically required to combine completely with said titanium, aluminum and columbium in said steel; and
diffusion annealing said article in a non-nitriding fluid at a temperature of about 595° to about 815° C for a period of time, dependent on said strip or sheet thickness, sufficient to complete through-thickness strengthening by reaction of said nitrogen with said titanium, aluminum and columbium.

4,046,602

PROCESS FOR PRODUCING NONORIENTED SILICON SHEET STEEL HAVING EXCELLENT MAGNETIC PROPERTIES IN THE ROLLING DIRECTION

Edward B. Stanley, Washington Twp., Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 15, 1976, Ser. No. 677,200
Int. Cl.² H01F *1/04*
U.S. Cl. 148—111 **1 Claim**



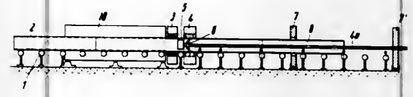
1. A process for producing thin-gage substantially non-oriented silicon sheet steel but nevertheless having a slight degree of orientation to provide superior magnetic properties in the rolling direction the steps comprising:
a. forming a steel slab consisting of 2.0 to 3.5% silicon, 0.30 to 0.45% aluminum, not more than 0.007% sulfur with the balance iron and usual impurities;
b. heating said slab to a temperature within the range 2150° to 2250° F;
c. hot rolling said slab to hot band gage;
d. pickling the hot rolled steel;
e. cold rolling said steel with a two step cold reduction wherein the second cold roll effects a thickness reduction of from 50 to 60% and the steel is given an intermediate anneal between the two cold rolls at a temperature of from 1625° to 1800° F;
f. annealing the cold rolled steel at a temperature of 1450° to 1500° F in a wet atmosphere sufficient to decarburize said steel; and
g. finally annealing the decarburized steel at a temperature of from 1700° to 1900° F in a nonoxidizing atmosphere to develop superior magnetic properties in the rolling direction; said final annealed steel, when rolled to 29-gage, characterized by an all length 15KG core loss of less than 1.50 w/lb/60 and permeability of more than 2200.

4,046,603

PROCESS FOR THE CONTINUOUS HARDENING OF TUBES

Helmut Landgraf, Rumeln-Kalden-hausen; Herbert Forster, Duesseldorf, and Karl Meurer, Krefeld, all of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Germany

Filed July 2, 1975, Ser. No. 592,784
Claims priority, application Germany, July 5, 1974, 2432923
Int. Cl.² C21D *9/08*
U.S. Cl. 148—144 **12 Claims**



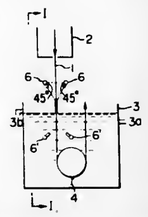
1. The process for the continuous hardening of thick-walled steel tubes, comprising the steps of:
horizontal supporting and helically advancing at a uniform speed a plurality of said tubes arranged end to end;
pre-heating said tubes to a temperature at which they still have sufficient shape-retaining ability in the range of about 500 to 600 degrees C.;
successively externally heating said tubes to an austenizing temperature by heating gas, flames, radiators, in inductive currents;
successively heating said tubes internally by radiation or electroinductively;
sucessively and simultaneously quenching said tubes externally and internally by a liquid cooling medium;
successively and temporarily accelerating the speed of advance of the tubes from time to time after hardening, dividing the substantially continuous line of tubes and longitudinally spacing the individual tubes;
and during external heating of the tubes, controlling the depth of heat penetration to less than the thickness of the tube wall.

4,046,604

METHOD FOR CONTINUOUSLY QUENCHING ELECTROLYTIC TIN-PLATED STEEL STRIP WHILE PREVENTING QUENCH STAINS

Hidehisa Yamagishi, and Mizuo Tanaka, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1976, Ser. No. 669,838
Claims priority, application Japan, Apr. 30, 1975, 50-52216
Int. Cl.² C21D *9/52*; C25D *5/50*
U.S. Cl. 148—156 **2 Claims**



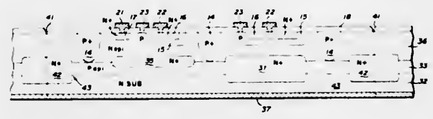
1. In a method for continuously quenching a moving, continuously electrolytic tin-plated steel strip while preventing quench stains, which comprises spraying streams of quenching liquid uniformly onto both surfaces of a continuously electrolytic tin-plated steel strip, having a tin-plated layer fused by heating in a heating furnace, and moving substantially vertically downward from said heating furnace, said streams of quenching liquid being sprayed on substantially the same horizontal level over the entire width of said strip, in the air below said heating furnace and above the surface of a quenching liquid in a quenching tank located below said heating furnace, thereby quenching said strip to solidify said fused tin-plated layer; and then, immediately, directing said strip further substantially vertically downward and passing said strip through the quenching liquid in said quenching tank, thereby further quenching said strip; the improvement which comprises: spraying the streams of quenching liquid uniformly onto both surfaces of said strip from two spray nozzles under the following conditions:
1. Spraying angle of the quenching liquid from said spray nozzles: from 45° to 75° downward against said strip,
2. Pressure of the quenching liquid sprayed from said spray nozzles: from 0.05 kg/cm² to 4.0 kg/cm², and
3. Position where the quenching liquid sprayed from said spray nozzles first comes in contact with said strip: in the air below said heating furnace and at least 25 mm above the surface of quenching liquid in said quenching tank;
said spray nozzles being of double-tube construction based on the concentric combination of an inner tube and an outer tube, said spray nozzles having a longitudinal slit of a length substantially equal to the width of said strip through which the streams of quenching liquid are sprayed onto said strip, and said spray nozzles being located one opposite the other symmetrically on both sides of said strip moving substantially vertically downward, in parallel therewith and on substantially the same horizontal level, in the air below said heating furnace and above the surface of quenching liquid in said quenching tank.

4,046,605

METHOD OF ELECTRICALLY ISOLATING INDIVIDUAL SEMICONDUCTOR CIRCUITS IN A WAFER

Carl T. Nelson, Sunnyvale, and Brian E. Hollins, Los Altos, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 432,853, Jan. 14, 1974, abandoned. This application July 31, 1975, Ser. No. 600,814
Int. Cl.² H01L *21/20, 21/66, 21/78*
U.S. Cl. 148—175 **9 Claims**



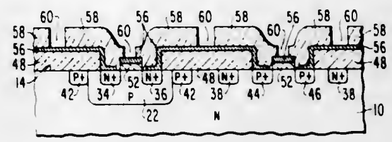
1. In a method of electrically isolating individual semiconductor circuits in a wafer having a plurality of said semiconductor circuits formed therein, said wafer being of the type having first and second layers of a first conductivity type separated by an intervening third layer of a second conductivity type, said transistor circuits to be separated from each other and from the wafer into individual semiconductor chips by severing the wafer along intersecting boundary lines defining the boundaries of individual semiconductor circuit chips, the steps of:
forming a lateral isolation region of first conductivity type passing through the third layer and extending along the boundary line between individual semiconductor circuit chip portions so as to form a buried P-N junction between said lateral isolation region and the third layer between the third layer and each of the first and second layers along the individual chip boundary lines, whereby undesired leakage current between individual ones of the semiconductor circuits is prevented in the wafer to permit probe testing of the individual semiconductor chips prior to separating the individual circuit chips from the wafer.

4,046,606

SIMULTANEOUS LOCATION OF AREAS HAVING DIFFERENT CONDUCTIVITIES

Herbert Paul Lambert, Morrisville, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 10, 1976, Ser. No. 684,967
Int. Cl.² H01L *21/225, 21/26*
U.S. Cl. 148—187 **7 Claims**



1. The process of introducing impurities into a substrate of material in the manufacture of a semiconductor device comprising the steps of:
a. forming a first layer of a first material over said substrate;
b. forming a second layer of a second material over said first layer, said second material being different from said first material;
c. preferentially etching portions of said second layer by an etchant which preferentially etches said second material with respect to said first material to expose the underlying portions of said first layer;
d. removing said exposed portions of said first layer to expose the underlying portions of said substrate;
e. forming a third layer of said second material over said exposed portions of said substrate;
f. simultaneously defining selected portions of said second and said third layers, then removing said selected portions of said third layer to expose the underlying portions of said substrate while simultaneously removing said selected portions of said second layer to expose the underlying portions of said first layer, the removal of said selected portions being accomplished by an etchant which preferentially etches said second material with respect to said first material;
g. depositing impurities of a first conductivity type onto the exposed portions of said substrate and introducing said impurities into said substrate
h. forming fourth layers of said second material only over the exposed portions of said substrate by reacting said exposed portions of said substrate;
i. removing the remaining said exposed portions of said first layer to expose the underlying portions of said substrate; and
j. depositing impurities of a second conductivity type different from said first conductivity type into said exposed portions of said substrate and introducing said impurities into said substrate.

4,046,607

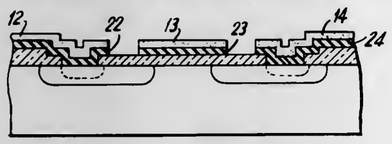
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Yasukazu Inoue, and Shoji Fujimoto, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed June 9, 1976, Ser. No. 694,359
Claims priority, application Japan, June 13, 1975, 50-71770
Int. Cl.² H01L *21/225*
U.S. Cl. 148—187 **13 Claims**

1. A method of manufacturing a semi-conductor device comprising the steps of:
forming a semiconductor region of one conductivity type in a semiconductor substrate;

forming a contact window in an insulating film covering the surface of said semiconductor substrate to expose at least a portion of the surface of said semiconductor region;
depositing a layer of silicon over the insulating layer;
introducing an impurity of said one conductivity type into said semiconductor region through said contact window;



depositing a conductive layer over the silicon layer;
defining a pattern in said conductive layer; and thereafter removing a portion of said silicon layer that is not covered by the conductive layer of said pattern.

4,046,608

METHOD OF PRODUCING SEMICONDUCTOR COMPONENTS AND PRODUCT THEREOF

Paul van Isegheem, Fislisbach; Thomas Vlasak, Birr, and Wolfgang Zimmermann, Klingnau, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Nov. 4, 1975, Ser. No. 628,842
Claims priority, application Switzerland, Nov. 4, 1974, 14718/74
Int. Cl.² H01L *21/225*
U.S. Cl. 148—188 **9 Claims**

1. In a method for producing semiconductor components with at least one junction and at least weakly N- or P-conducting zone containing from 10^{13} to 2.5×10^{14} doping atoms/cm³ and formed by diffusing the dopant atoms at elevated temperatures into appropriate zones of a semiconductor crystal from a nickel film containing said dopant deposited on the surface of said crystal, the improvement comprising:
cooling said in-diffused semiconductor crystal to room temperature at a rate of
$A/h^2 > (0.15 \pm 0.05)$, wherein
$A = 16.6 \int_{t'} \exp(-2.381\ eV/kT\ (t'))\ dt'$,
T = temperature in °K as a function of the time during cooling,
t = time in seconds during cooling,
h = thickness of the semiconductor crystal in cm, and
k = Boltzman constant = 8.614×10^{-5} eV°K⁻¹
sufficient such that the specific resistance of said weakly doped zone is not changed by the nickel atoms which diffuse into the semiconductor crystal along with said doping atoms, thereby forming a semiconductor component having a voltage capacity greater than 2.5 kV.

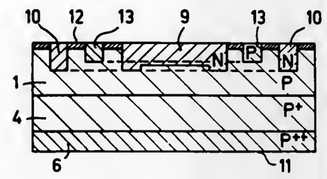
4,046,609

METHOD OF MANUFACTURING PHOTO-DIODES UTILIZING SEQUENTIAL DIFFUSION

Jean-Louis Digoy, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 490,409, July 22, 1974, Pat. No. 3,978,511, which is a continuation of Ser. No. 381,105, July 20, 1973, abandoned, which is a continuation of Ser. No. 183,800, Sept. 27, 1971, abandoned. This application Feb. 25, 1976, Ser. No. 661,054
Claims priority, application France, Oct. 5, 1970, 70.35834
Int. Cl.² H01L *21/223, 31/10*
U.S. Cl. 148—189 **5 Claims**

1. A method of producing a diode comprising the steps of:
a. providing a semiconductor body of a first conductivity type and having a high resistivity;
b. carrying out from at least one surface of said semi-conductor body at least two successive diffusions with a higher concentration of doping impurities of the said first conductivity type, a first region of said semiconductor diode being formed by the portion of said semiconductor body that is substantially free of said diffused doping impurities and the diffused portion of said semiconductor body forming a more highly doped second region of said semiconductor body, said doping impurity concentration in said second region having a graded distribution such that said



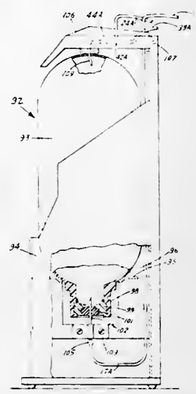
impurity concentration increases with increasing distance from the interface between said first and second region;
c. reducing the thickness of said first region; and then
d. providing in said first region a zone of opposite conductivity type so as to form a diode junction in said first region.

4,046,610

FLUID PRODUCT RESERVOIR AND METHOD

Duane F. Lilja, 2410 Central Ave. NE., Minneapolis, Minn. 55418

Division of Ser. No. 512,523, Oct. 7, 1974, Pat. No. 3,934,746, which is a continuation-in-part of Ser. No. 413,768, Nov. 8, 1973, Pat. No. 3,841,555, which is a continuation-in-part of Ser. No. 280,476, Aug. 14, 1972, Pat. No. 3,780,943. This application Dec. 8, 1975, Ser. No. 638,658
Int. Cl.² B32B *31/20*
U.S. Cl. 156—73.1 **11 Claims**



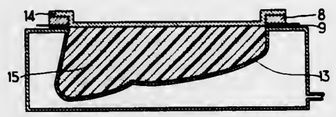
1. A method of closing a thermoplastic container of the type having an open neck with an outwardly facing ledge in the neck, said method comprising the steps of:
providing a thermoplastic plug having side wall means closely conforming to the interior wall of the neck;
locating the plug in the neck of the container with a portion of the plug in contact with the ledge of the neck of the container; and
applying ultrasonic energy substantially simultaneously to the neck of the container and the plug at a location remote from the ledge and plug portion to weld together the ledge of the neck and the portion of the plug in contact with the ledge of the neck.

4,046,611

MANUFACTURE OF CUSHIONS

Joseph F. Sanson, 66, Avenue du Colonel Morlaix-Demozay, 45190 Beaugency, France

Filed Jan. 13, 1975, Ser. No. 540,555
Claims priority, application France, Jan. 15, 1974, 74.01274; Apr. 10, 1974, 74.12661
Int. Cl.² B29D *27/04*; B29C *17/02*; B32B *5/20*
U.S. Cl. 156—79 **13 Claims**



1. A method of manufacturing a flexible cushion of foamed plastics material with an integrated cover of cloth that is resiliently stretchable, which comprises
placing a flat piece of cloth between complementary members of a preforming frame to dispose the cloth in substantially smooth unstretched condition with its margins projecting between said frame members;
exerting sufficient pressure on said frame members to restrain said cloth while permitting it to be slid between said members without causing stretching of the cloth to its elastic limit;
depressing said cloth centrally of said frame to draw the cloth margins inwardly between the frame members to cause peripheral contraction of said piece of cloth and to preform a pocket therein wherein the cloth is still in substantially unstretched condition, this pocket forming operation providing the major conformation of the cloth shaping to the mold surface but being discontinued prior to development of plaits in the cloth;
fixing the periphery of said piece of cloth in the plane of said preforming frame to retain said cloth as a preformed, essentially unstretched pocket having a peripheral flange and restrain said cloth against return to its original condition;
placing said preformed peripherally flanged pocket on a recessed vacuum mold having an inner surface configured to the desired shape of the finished cushion, sealing said peripheral flange of said pocket about the recessed mold and applying a vacuum to the mold to resiliently stretch the preformed pocket to conform it to the inner surface of the mold; and
placing a foamable reactive resin mixture capable of forming a resilient cellular thermoset resin in said stretched pocket and allowing it to expand in said mold and become bonded to the cloth therein so as to produce, when a condition of structural integrity of the foam has been reached, said flexible cushion with integrated cover.

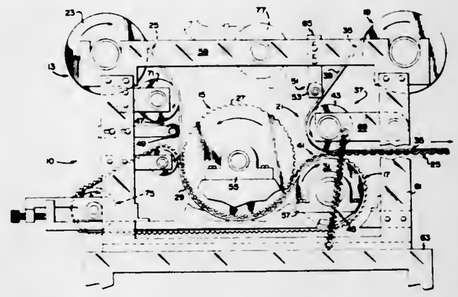
4,046,612

METHOD FOR PRODUCING A BILAYERED GREEN CERAMIC TAPE

Leadom A. Warner, Sayre, and Joseph J. Cleveland, Wysox, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 555,406, March 5, 1975, abandoned, which is a division of Ser. No. 392,761, Aug. 29, 1973, Pat. No. 3,904,473. This application Apr. 2, 1976, Ser. No. 672,990
Int. Cl.² B29D *23/10*
U.S. Cl. 156—205 **4 Claims**

1. A method for producing a bilayered green ceramic tape having a corrugated first layer and a substantially flat second layer bonded to a first side of said corrugated first layer, said method utilizing an apparatus including a forming means comprising a ribbed corrugating cylinder and a first portion of an endless ribbed belt, and bonding means comprising a flat surfaced cylinder and a second portion of said endless ribbed belt, said method comprising:
supplying said first layer of green ceramic material to said apparatus in substantially flat and pliable form;
applying an organic solvent to a second opposing side of said first layer, in order to form a tacky surface to enable said layer to stick to the first portion of the endless belt, and thus facilitate feeding of the layer after corrugation to the bonding means; corrugating said first layer having said organic solvent on said second opposing side, by passing said first layer between said ribbed corrugating cylinder and said first portion of said endless belt, engaging only said first side of said first layer with said ribbed cylinder,



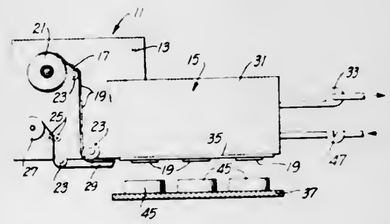
and applying pressure against said second side of said first layer with said first portion of said endless belt;
supplying said second layer of green ceramic material to said apparatus in substantially flat and pliable form; and
bonding a surface of said flat and pliable second layer to said first side of said corrugated first layer by passing said flat second layer and said corrugated first layer between said flat surface cylinder and a second portion of said endless belt, said endless belt applying pressure against said second side of said first layer in order to achieve a bond between said surface of said second layer and said first side of said corrugated first layer, thereby to form a bilayered green ceramic tape.

4,046,613

MATRIX LABEL APPLICATOR

Leo Kucheck, Irvine, and Michael Crankshaw, Sante Fe Springs, both of Calif., assignors to Label-Aire Inc., Fullerton, Calif.

Filed Mar. 8, 1976, Ser. No. 664,966
Int. Cl.² B32B *31/00*; B29C *17/00*
U.S. Cl. 156—249 **27 Claims**

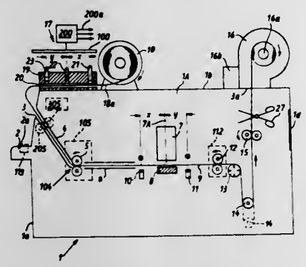


1. A method of labeling articles comprising:
moving a plurality of labels arranged in a row along a label path at a labeling station with the axes of the row and the label path being generally parallel;
transporting articles nonparallel to the label path through the labeling station with the articles forming a column of articles at the labeling station and with the axis of the

column being generally parallel to the axes of the row and the label path;
carrying out said steps of moving and transporting until the labels of the row are in registry with the column of the articles at the labeling station;
transferring the labels of said row to the articles of said column; and
said step of moving includes providing a movable conveyor and using the conveyor to move the row of labels along the label path, and said method includes providing a single row of labels on a backing strip, removing the labels from the backing strip, transferring the labels to the conveyor, and spacing the labels on the conveyor further apart than the labels on the backing strip.

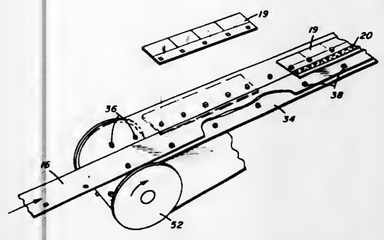
5. A label applicator comprising:
a conveyor belt having first and second belt surfaces and opening means extending between said belt surfaces;
means for moving said belt for movement;
means for moving the belt;
means for depositing a label on the first belt surface of the belt at a first station;
means for applying a differential fluid pressure to the label on the belt for retaining the label on the first belt surface whereby the label can be retained on the belt as the belt moves; and
means for blowing air under pressure through said opening means to transfer the label from the belt at a second station to at least one object.

4,046,614
SPLICING APPARATUS FOR PHOTOGRAPHIC FILMS OR THE LIKE
Wolfgang Zahn, Munich; Helmut Zangenfeind, Puchheim, and Günther Dömges, Oberhaching, all of Germany, assignors to AGFA-Gevaert, Aktiengesellschaft, Leverkusen, Germany
Filed Nov. 16, 1976, Ser. No. 742,518
Claims priority, application Germany, Nov. 28, 1975, 2553611
Int. Cl.² B31F *5/00*
U.S. Cl. 156—353 **14 Claims**



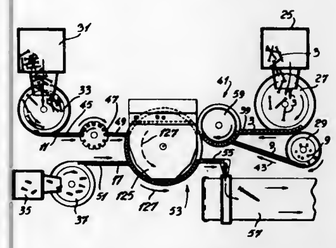
1. Apparatus for uniting photographic films with each other and/or with threading tape, comprising a housing defining a dark chamber; a splicer installed in said chamber; guide means for directing the leaders of films and tape into the range of said splicer; a source of tape located ahead of said guide means, as considered in the direction of movement of tape into the range of said splicer; and means for treating the tape intermediate said source and said guide means, said treating means comprising means for severing the tape and means for applying indicia which facilitate the positioning of tape relative to said splicer.

4,046,615
APPARATUS FOR LAMINATING FILM STRIPS TO A TRANSPORT WEB
John R. Jansen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 24, 1975, Ser. No. 625,740
Int. Cl.² B65H *17/40*; G03B *1/30*
U.S. Cl. 156—544 **7 Claims**



1. Apparatus for laminating film strips of a plurality of film sizes to a relatively long transport web, said apparatus comprising:
means for supplying the transport web to said apparatus;
interchangeable means for positioning film strips of a particular film size relative to the transport web;
means for selectively receiving one of a possible number of said interchangeable positioning means, thus enabling film strips of the particular film size to be positioned relative to the web by one of said interchangeable positioning means and film strips of another film size to be positioned relative to the web by another of said interchangeable positioning means;
each said interchangeable positioning means comprising a transport belt, means coupled to said transport belt for engaging the film strips and the transport web to establish the relative position therebetween, and means for advancing said transport belt so that the film strips and transport web are advanced in such established relative position for lamination; and,
means for laminating the film strips to the transport web in such established relative position.

4,046,616
AUTOMATIC ASSEMBLY APPARATUS OF SYRINGES
Edward Klein, Montreal, Canada, assignor to V-Mark Automation Ltd., Canada
Filed Sept. 13, 1976, Ser. No. 722,595
Int. Cl.² B32B *31/00*; B65C *11/04*
U.S. Cl. 156—559 **3 Claims**



1. An apparatus for automatically assembling syringes, each said syringe comprising; a plunger having a stem, a top flanged end, and a bottom tip receiving end; a tip for mounting on said tip receiving end; a cylindrical barrel having a top flanged end and a bottom needle arrangement receiving end, said barrel receiving said plunger and tip in the interior thereof; and a needle arrangement for mounting on said needle arrangement receiving end;
said apparatus comprising;
a sub-assembly station for mounting said tip on said plunger including a first rotary drum having a plurality of equally spaced vertical slots disposed around the periphery thereof, each said slot being open at the top end thereof and closed at the bottom end thereof, means for rotating said drum in a first direction, means for providing plungers to said drum to be inserted at the top ends of respective slots one at a time, said plungers being inserted in said slots with the top ends of said plungers being adjacent the top ends of the respective slots and the plunger stems extending downward in the slot, a gap being provided in said slot between the tip receiving end and the bottom of each respective slot, means disposed downstream in said first direction of said means for providing plungers, for providing tips in the gaps at the bottom ends of the slots one at a time, a camming surface disposed downstream, in said first direction of said means for providing tips, and located at the top end of said drum to engage the flanged top ends of the plungers as the drum rotates in said first direction, said cammed surface being sloped downwardly in the first direction, whereby the plungers are forced downwardly as they pass the camming surface, to force the tip receiving ends into the tips to mount the tips on the plunger and provide a plunger and tip arrangement;
a processing station for cleansing and lubricating said barrels comprising elongated first means connected to a source of cleansor, said elongated first means being movable by vertically upwardly and vertically downwardly first moving means, elongated second means connected to a source of lubricant, said elongated second means being movable by vertically upwardly and vertically downwardly second moving means, and stop and start moving means to moving said barrels to said processing station such that one barrel is disposed under said elongated first means and another barrel is disposed under said elongated second means during each stop condition, whereby, during each stop condition the elongated first means is inserted in said one barrel and withdrawn from said one barrel cleansing said one barrel during the insertion and withdrawal of said elongated first means, said elongated first means being inserted in said one barrel after the start of a stop condition and being withdrawn from said one barrel before the start of the following start condition and whereby, during each stop condition the elongated second means is inserted in said other barrel and withdrawn from said other barrel lubricating said other barrel during the insertion and withdrawal of said elongated second means, said elongated second means, said elongated second means being inserted in said other barrel after the start of a stop condition and being withdrawn from said other barrel before the start of the following start condition;
a main assembly station for assembling the plunger and tip arrangements, the processed barrels and the needle arrangement comprising; a second rotary drum having means for rotating said drum in an assembly direction; said second rotary drum having an upper carrying surface for receiving plunger and tip arrangements from said subassembly station at a first point on said second rotary drum, said upper carrying surface being movable with said second rotary drum and comprising a plurality of equally spaced vertical plunger and tip arrangement carrying slots disposed around the periphery of said second rotary drum; an upper camming surface disposed over the top of said upper carrying surface and sloping downward in said assembly direction, said upper camming surface being fixed relative to the motion of said second rotary drum, said upper camming surface engaging the top flanged ends as said upper surface moves past the upper camming surface in the assembly direction whereby to force the plunger and tip arrangements downwardly; a center carrying surface for receiving processed barrels from said processing station at a second point on said second rotary drum downstream of said first point, said center surface comprising a plurality of equally spaced vertical barrel carrying slots disposed around the periphery of the second rotary drum, said center carrying surface being movable with said second rotary drum; a lower carrying surface for receiving said needle arrangements at a third point on said second rotary drum downstream of said second point, said lower carrying surface comprising a plurality of vertical needle arrangement carrying slots disposed around the periphery of said second rotary drum, said lower surface being movable with said second rotary drum;
the plurality of said vertical plunger and tip arrangement slots being equal to and aligned with respective ones of the plurality of vertical barrel carrying slots and the plurality of needle arrangement carrying slots;
glue dispensor means located adjacent said second rotary drum at a fourth point thereof downstream of said third point, for applying glue to each needle arrangement receiving end of each barrel as each barrel reaches said fourth point;
a rod carrying means disposed around the periphery of said second rotary drum and beneath said carrying surface and movable with said second rotary drum, said rod carrying means comprising a plurality of vertical rods movable up and down in said rod carrying means, the plurality of rods being equal to and aligned with respective ones of the plurality of needle arrangement carrying slots;
a lower camming surface disposed below said rod carrying means and sloping upward in said assembly direction, the lower carrying surface being fixed relative to the motion of said second rotary drum, the lower camming surface engaging the bottom ends of said rods to force said rods upwardly;
the top end of said rods engaging the bottom ends of respective ones of said needle arrangement, whereby the needle arrangements are forced upwardly as the rods are forced upwardly;
constant pressure applying means in said lower camming surface disposed downstream of said glue dispensor means and adapted to apply constant pressure, through each said rods, to a respective needle arrangement, as it is being mounted on a respective barrel;
whereby, as said second rotary drum moves in the assembly direction each plunger and tip is inserted into a respective processed barrel, glue is applied to each barrel at the needle arrangement receiving end thereof, each needle arrangement is mounted on a respective barrel at the glued needle receiving end thereof, and constant pressure is applied to each needle receiving end to fix it to its respective barrel, to provide completely assembled syringes.

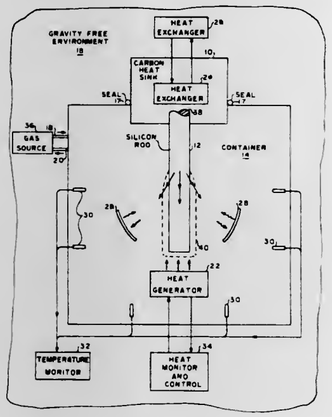
4,046,617
METHOD OF CRYSTALLIZATION
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Hans U. Walter, and Robert S. Snyder, both of Huntsville, Ala.
Filed Sept. 5, 1975, Ser. No. 610,801
Int. Cl.² B01J *17/06, 17/10*
U.S. Cl. 156—601 **2 Claims**

1. A method of crystallization of a rod of material comprising:
fixably supporting one end of the rod within a heat sink and otherwise extending the rod into a sealed enclosure, said enclosure being positioned in a substantially gravity-free environment, and said heat sink having surfaces outside of said enclosure;
the interior of said enclosure containing a selected atmosphere;
directing heat onto an end region of said rod opposite the end region at which it is supported, whereby it is melted;

monitoring the temperature of selected regions of said rod and controlling the application of heat to said rod;

selectively reducing the application of heat, whereby heat to said rod flows to said heat sink, and solidification of the melted rod occurs progressively, moving radially outwardly and longitudinally in a direction away from the supported end of said rod; and

selectively transferring heat between said heat sink and a separate body, said separate body being external to said enclosure.



4,046,618

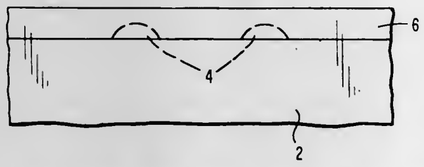
METHOD FOR PREPARING LARGE SINGLE CRYSTAL THIN FILMS

Praveen Chaudhari, Briarcliff Manor; Jerome John Cuomo, Bronx, and John Wanchope Matthews, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 319,125, Dec. 29, 1972, abandoned. This application Feb. 26, 1975, Ser. No. 553,194

Int. Cl.² B01J *17/08*

U.S. Cl. 156—603 **2 Claims**



1. A method of growing a single crystal thin film on a substantially inert substrate comprising the steps of:

depositing an amorphous film onto said inert substrate at a temperature below the crystallization temperature of said amorphous film to form a peripheral part of said amorphous film in a point;

locally heating said peripheral part of said amorphous film to its crystallization temperature to form a single crystal; and

passing continuously from said single crystal across said amorphous film a hot zone at a temperature below the melt temperature of said amorphous film but sufficiently high to propagate a crystalline phase through said amorphous film, whereby a single crystal thin film is produced.

4,046,619

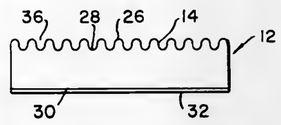
METHOD OF TREATING THE SURFACE OF A GLASS MEMBER

Stephen H. Rice, Forestville; Rodney S. Spencer, College Park, and Charles M. Fleetwood, Jr., Odenton, all of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 3, 1976, Ser. No. 682,435

Int. Cl.² C03C *15/00, 25/06*

U.S. Cl. 156—645 **9 Claims**



1. A method of treating a glass member intended to abut a transparent element for disrupting the light interference fringes formed therebetween, comprising the steps of:

grinding the surface of the glass member intended to abut the transparent element with a grinding powder of substantially 22.5 microns to form a multiplicity of alternating peaks and valleys, said peaks and valleys permitting non-detectable light interference fringes to form within said valleys when said transparent element contacts said peaks;

bathing said surface with an aqueous solution having a temperature range of between substantially 70° and 75° F. and containing between substantially 41.3% and 45.7% by volume of sulfuric acid and between substantially 54.3% and 58.7% by volume of hydrofluoric acid for a time period of between substantially 105 and 135 seconds for polishing said peaks and valleys until said glass member is about 90% light transmissive; and

washing said glass member with a liquid having a temperature range of between substantially 45° and 55° F. for preventing further reaction between said aqueous solution and said surface.

4,046,620

PROCESS FOR IMPROVING THE SOLDERABILITY OF ELECTRIC CIRCUIT BOARDS

Ernst Andrascek, and Hans Hadersbeck, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 8, 1976, Ser. No. 703,373

Claims priority, application Germany, July 11, 1975, 2531163

Int. Cl.² C23F *1/00*; B44C *1/22*

U.S. Cl. 156—666 **8 Claims**

1. A process for improving the solderability of a circuit board with conductor paths composed of copper, or copper alloy comprising the steps of

A. first contacting conductor paths on a circuit board at least at areas to be soldered with a first solution for a time of from about 1 to 50 minutes, said first solution comprising on a 100 weight percent total weight basis.

from about 2 to 20 weight percent of at least one dissolved non-ionic surfactant,

from about 1 to 20 weight percent of at least one dissolved organic acid capable of producing a pH of not larger than 2 in water solution at a concentration of less than 50 grams per lite, and

the balance up to 100 weight percent of any given such solution being water,

B. first flushing the so first contacted areas with water for a period of time of at least about 12 seconds,

C. secondly contacting the so first flushed areas with a second solution for a time of from about 2 to 10 minutes, said second solution comprising on a 100 weight percent total weight bases;

from about 0.5 weight percent up to solution saturation of dissolved potassium persulfate

sufficient added sulfuric acid to produce therein a pH of from about 1 to 4,

from and including 0 up to about 0.5 weight percent dissolved phosphoric acid, and

the balance up to 100 weight percent of any given such solution being water,

D. secondly flushing the so secondly contacted areas with water for a period of time of at least about 10 seconds,

E. thirdly contacting the so secondly flushed areas with a said first solution for a time of from about 1 to 5 minutes,

F. thirdly flushing the so thirdly contacted areas with water for a period of time of at least about 10 seconds, and

G. drying the so thirdly flushed areas in air.

4,046,621

PROCESS FOR TREATING A SLURRY OF CELLULOSIC MATERIAL

Ernest Arthur Sexton, St. Catharines, Canada, assignor to The Ontario Paper Company Limited, Thorold and Canadian International Paper Company, Montreal, both of, Canada

Division of Ser. No. 533,692, Dec. 17, 1974. This application Oct. 28, 1975, Ser. No. 625,819

Int. Cl.² D21C *9/06, 9/18*

U.S. Cl. 162—40 **7 Claims**

1. A process for treating a slurry of cellulosic material which comprises:

a. diluting the slurry to reduce its consistency to a flowable level;

b. depositing the diluted slurry on a surface permeable to the liquid and solid phases thereof but which is substantially more permeable to the liquid phase;

c. subjecting the deposited slurry to a pressure differential, whereby more of the liquid phase thereof than the solid phase passes through the permeable surface to increase the consistency of the slurry to a value between the consistency of the diluted slurry deposited on the surface and the consistency of the slurry prior to its dilution, thereby forming a mat of cellulosic material on said surface;

d. recycling substantially all of the liquid and solids which pass through the surface for use as the slurry diluent in step (a);

e. counter-currently applying a treating liquid in a plurality of treatment stages, including application of a fresh treating liquid in the last stage of said treatment stages, to the mat of cellulosic material, while the mat remains on the permeable surface and subject to the pressure differential, whereby the treating liquid displaces at least a portion of liquid present in the mat from the mat and through the permeable surface in each treatment stage;

f. measuring the electrical conductivity of the liquid displaced from the mat in the last stage of said treatment stages and then

g. adjusting the amount of fresh treating liquid applied in the last stage of said treatment stages in response to the deviation, from a predetermined norm, of the measured value of electrical conductivity of only the liquid displaced in the last stage of said treatment stages.

4,046,622

MULTI-PLY FIBROUS SHEETS HAVING A WET-LAID PLY AND A DRY-LAID PLY

Brian William Attwood, Bristol, and Dennis Raymond Hicklin, Bath, both of England, assignors to Karl Kroyer St. Anne's Limited, Bristol, England

Continuation of Ser. No. 485,266, July 2, 1974, abandoned. This application June 15, 1976, Ser. No. 696,184

Claims priority, application United Kingdom, Aug. 23, 1973, 40074/73

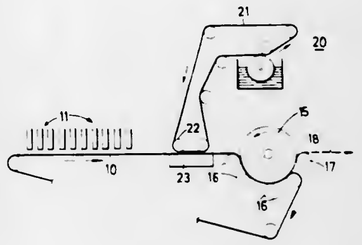
Int. Cl.² D21H *1/02, 1/06*

U.S. Cl. 162—132 **7 Claims**

1. A process for forming a multi-ply sheet of cellulosic fibrous material comprising the steps of:

dry-laying a mat of cellulosic fibrous material by depositing cellulosic fibers in a dry state via an airstream onto a main forming band to a thickness sufficient to form a distinct ply within a multi-ply sheet after the fibers of the mat have been caused to adhere together by the concurrent application of heat, moisture and pressure,

forming a web of cellulosic fibrous material by a wet-forming technique on an auxiliary forming band,



joining the web and the mat together under sufficient pressure to join them into a multi-ply sheet while concurrently consolidating the fibers of the dry-laid mat into a strong discernable ply by concurrently subjecting the mat to all three of moisture, heat greater than 150° F and pressure of not less than 50 p.s.i. by passing the joined multi-ply sheet through at least one press nip formed between at least one press roll and a heated cylinder wherein the dry-laid mat receives at least a major portion of the moisture it requires for such strength by transfer of moisture from the wet-laid web to the dry-laid mat.

4,046,623

APPARATUS FOR SHIFTING COMPONENT PARTS OF PAPER MACHINES

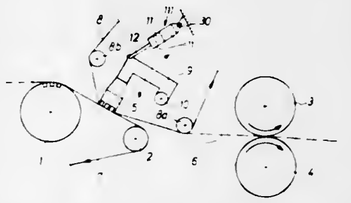
Heinrich Schmid, Schwabisch Gmund, Germany, assignor to J. M. Voith GmbH, Heidenheim (Brenz), Germany

Filed May 25, 1976, Ser. No. 689,793

Claims priority, application Germany, June 5, 1975, 25249381

Int. Cl.² D21F *1/24, 7/00*

U.S. Cl. 162—306 **10 Claims**



1. In a paper machine, a combination comprising a movable component, particularly a suction head or a pick-up roll, which is movable between an operative position, a retracted position and an intermediate position; a support connected to and movable with said component; a frame, and apparatus for moving said component between said positions, including a fluid-operated motor having a cylinder member, a piston rod member, a first piston reciprocable in said cylinder member and

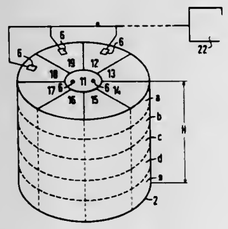
rigid with said piston rod member, a second piston slidably installed in said cylinder member at one side of said first piston, means for connecting one of said members to said frame, and means for connecting the other of said members to said support, said cylinder member having means for admitting pressurized fluid against that side of said second piston which faces away from said first piston to thereby move said second piston from a first to a second position whereby, when said first piston abuts against said second piston in said first position of said second piston, the movement of said second piston from said first to said second position entails a movement of said support and said component between said operative and intermediate positions through the medium of said first piston, said cylinder member further having means for admitting pressurized fluid against either side of said first piston to thereby move said first piston relative to said second piston whereby, when said second piston assumes said second position, the movement of said first piston relative to said second piston entails a movement of said support and said component between said intermediate and retracted positions.

4,046,624

METHOD OF OPERATING A NUCLEAR REACTOR

Werner Aleite, and Heinz-Wilhelm Bock, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 28, 1974, Ser. No. 501,352
Claims priority, application Germany, Sept. 17, 1973, 2346725
Int. Cl.² G21C 7/08
U.S. Cl. 176—22 **6 Claims**



1. A method of operating a pressurized water reactor having a reactor core with a core height of at least 3.5 meters and having control rods adjustable for controlling power, the rods being adjustable individually and sequentially in groups so as to maintain a uniform power distribution over the cross section of the core comprising:

a. subdividing the reactor core both vertically and horizontally into a plurality of at least 50 segments;

b. disposing a measuring probe for measuring the power density in each of said segments;

c. coupling the outputs of said measuring probes to a computing apparatus;

d. computing in said computing apparatus, from the values measured by said probes, an operating program for the control rods which takes into consideration burn up and zenon poisoning;

e. using control rods which are adjustable over the height of the core and uniformly have only a small reactivity; and

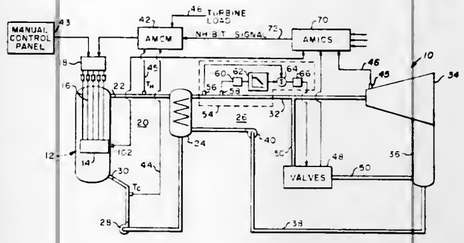
f. coupling the output from said computing apparatus to control said control rods so as to move said rods in groups of between 1 and 10 whereby said control rods will be moved independently of power output changes over the height of the core in an irregular sequence in such a manner that local power peaks are avoided.

4,046,625

AUTOMATIC MOTION INHIBIT SYSTEM FOR A NUCLEAR POWER GENERATING SYSTEM

Charles Ronald Musick, Vernon, and Jose Marcelo Torres, Simsbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 18, 1975, Ser. No. 605,706
Int. Cl.² G21C 7/00
U.S. Cl. 176—24 **6 Claims**



1. A nuclear power generating system comprising:

coolant vapor generating apparatus including a nuclear reactor having a nuclear core and a plurality of control elements movable within said core for controlling the power output thereof;

a turbine for receiving coolant vapor produced by said vapor generating apparatus;

coolant circuitry for said vapor generating apparatus and said turbine including means for delivering vapor to said turbine;

coolant vapor relief means in said coolant circuitry operable to cause at least some of the coolant vapor to be diverted from said turbine, said coolant vapor relief means including a plurality of coolant vapor relief valves, at least some of said valves being operable automatically to divert coolant vapor;

means for generating a turbine load signal proportional to the quantity of steam received by said turbine;

means responsive to said reactor for generating a reactor power output signal commensurate with the reactor power output;

automatic motion control means responsive to turbine load and the power output of said nuclear core for automatically controlling the motion of said control elements within said nuclear core to adjust the power output of said nuclear core to be equal to turbine load;

adjustable means for generating a predetermined reactor power level setpoint signal above which it is undesirable to inhibit automatic control element motion produced by said automatic motion control means;

means responsive to said coolant vapor relief means for producing a total valve capacity signal proportional to the power level corresponding to the total capacity of said coolant vapor relief valves which are operable automatically to divert coolant vapor;

means responsive to said predetermined reactor power level setpoint signal, said turbine load signal and said total capacity signal for producing a signal commensurate with the lower of said predetermined reactor power level setpoint signal and the sum of said turbine load signal and said total valve capacity signal, said resultant signal being the real reactor power level setpoint signal;

means responsive to said real reactor power level setpoint signal for limiting said signal to values greater than or equal to a predetermined minimum value below which the nuclear power system's control systems become unstable, said limited signal being the final reactor power level setpoint signal;

means responsive to said final reactor power level setpoint signal and said reactor power output signal for producing a motion inhibit signal only when the final reactor power level setpoint is greater than the reactor power output; and

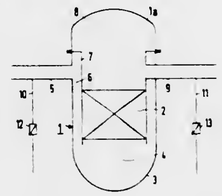
means responsive to said motion inhibit signal for inhibiting said automatic motion control means from responding to changes in turbine load.

4,046,626

PRESSURIZED-WATER REACTOR EMERGENCY CORE COOLING SYSTEM

Franz Winkler, and Harald Helf, both of Erlangen, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Nov. 14, 1974, Ser. No. 523,888
Claims priority, application Germany, Nov. 20, 1973, 2357893
Int. Cl.² G21C 9/00
U.S. Cl. 176—38 **2 Claims**



1. An emergency core cooling system for a pressurized-water reactor pressure vessel containing a core and forming a lower plenum having an inlet for receiving pressurized-water coolant for upward flow through said core, and an upper plenum receiving said coolant from said core and having an outlet connection for said coolant, said system having a first means for holding a first supply of emergency water under a first pressure and for connecting this first supply through a check valve to said lower plenum, and a second means for holding a second supply of emergency water under pressure and for connecting this second supply through a second check valve to said upper plenum, said pressure of both said means being lower than the pressure of the pressurized-water coolant when said upward flow is adequate to cool said core, said check valves opening in the event said pressure of said coolant drops below said pressure of said means, so that said supplies flow into said plenum, said second means providing a flow of said second supply into said upper plenum, at a greater rate than the flow rate provided by said first means of said first supply into said lower plenur .

4,046,627

NUCLEAR REACTORS

John Ernest Middleton, Knutsford, England, assignor to Nuclear Power Company (Whetstone) Limited, London, England

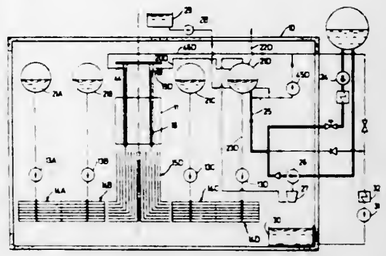
Filed Apr. 23, 1975, Ser. No. 570,667
Claims priority, application United Kingdom, Apr. 29, 1974, 18619/74
Int. Cl.² G21C 9/00
U.S. Cl. 176—38 **12 Claims**

1. A nuclear-reactor cooling-water supply header assembly comprising

a plurality of sub-header pipes extending generally parallel with one another, each having a first end and a second end and, spaced along its length, a plurality of water outlets for connection each to a respective reactor pressure-tube feed pipe,

first and second end pipes connecting the sub-header pipes together at their first and second ends respectively, and

a plurality of header pipes extending transversely across the sub-header pipes and spaced from one another longitudinally thereof, each header pipe having a water inlet, for connection to a water pump, and a plurality of branch



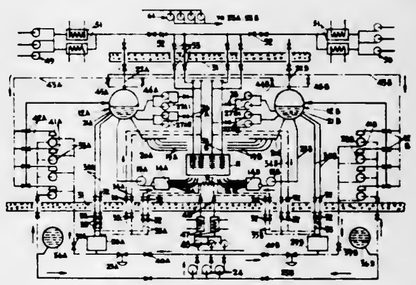
pipes spaced along its length and connecting it each to a respective one of the sub-header pipes.

4,046,628

NUCLEAR REACTORS

John Ernest Middleton, Knutsford, England, assignor to Nuclear Power Company (Whetstone) Limited, London, England

Filed Oct. 24, 1975, Ser. No. 625,507
Claims priority, application United Kingdom, Oct. 25, 1974, 46267/74
Int. Cl.² G21C 15/00
U.S. Cl. 176—38 **7 Claims**



1. In a water-cooled nuclear reactor comprising: two coolant circuits each comprising a bottom header, a plurality of vertically-arranged pressure tubes each having nuclear fuel disposed therein and being connected at its lower end to the bottom header to receive therefrom a main flow of coolant water for cooling the fuel, a steam drum connected to the upper ends of the pressure tubes to receive heated coolant water therefrom, main coolant-circulator means arranged for pumping water from the steam drum to the bottom header, and respective further pump means arranged to pump an auxiliary coolant water flow from the steam drum of each coolant circuit directly into the pressure tubes of that circuit in the form of spray cooling in such pressure tubes; means interconnecting the bottom headers of the two coolant circuits; a steam outlet for each steam drum; a water inlet means for each steam drum; main feedwater pumps arranged to supply make-up water to the said water inlet means; and water inlet valves connected between the main feedwater pumps and the said water inlet means, that improvement comprising: means controlling the water inlet valves in dependence on the pressure in the coolant circuits and closing said valves in response to a fall in such pressure; and further connections arranged to supply feedwater directly, in the event of such pressure fall, from the main feedwater pumps to the bottom header of each coolant circuit and into the pressure tubes of each coolant circuit as the said spray cooling therein.

4,046,629

NUCLEAR REACTORS

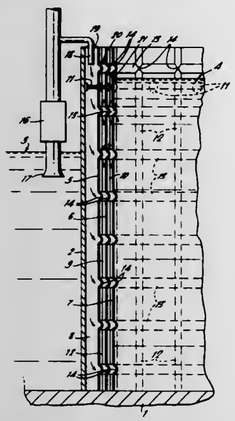
John Graham Durston, Northwich, and John Richard Hind, Warrington, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed June 23, 1976, Ser. No. 699,222

Claims priority, application United Kingdom, July 7, 1975, 28533/75

Int. Cl.² G21C 9/00

U.S. Cl. 176—38 2 Claims



1. A liquid metal cooled nuclear reactor comprising,
a primary vessel containing a pool of liquid metal, a nuclear reactor core submerged in the pool of liquid metal,
a core tank immersed in the pool of liquid metal and enclosing the reactor core,
a continuous membrane spaced from the inner wall surface of the core tank thereby defining a first compartment bounded by the inner wall surface of the core tank and the membrane,
a plurality of continuous membranes defining a series of second compartments, the series extending radially inwardly from the first compartment, the membranes having a network of intersecting corrugations, each one of a first group of parallel corrugations being continuous and each one of a second group of parallel corrugations orthogonal to the first group being formed intermittently, the ends of the intermittent sections of the corrugations being profiled to follow the corrugations of the first group, the corrugations of the first group being perforated by slits at the intersections of the corrugations, and
a pump having an inlet port submerged in the pool of liquid metal outside of the core tank and an outlet port disposed for discharging liquid metal into the first compartment whereby liquid metal is able to be flowed from the outlet port sequentially through the chambers by way of the perforations.

4,046,630

PROCESS PLANT

Geoffrey Coast, Northwich, and Ronald Francis Briody, Wigan, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

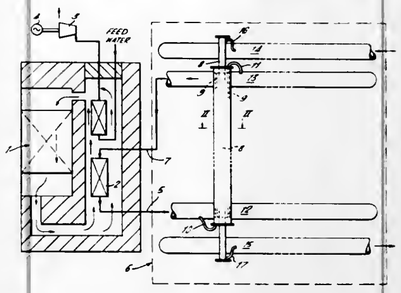
Filed Apr. 26, 1976, Ser. No. 680,227

Claims priority, application United Kingdom, May 15, 1975, 20744/75

Int. Cl.² G21D 9/00

U.S. Cl. 176—39 6 Claims

1. A process plant for performing high temperature endothermic reactions with the aid of a distributed catalyst and having a high temperature gas cooled nuclear reactor as a heat source, the plant comprising at least one bank of parallel, unidirectional-flow, process tubes, each tube defining therewithin a reaction zone, conduits for hot gas coaxially surrounding the process tubes to supply heat to the reaction zones, each said conduit being associated with one only of said process tubes, a first pair of header pipes, one header pipe of said first pair connected to supply reactants to one end of each of the



process tubes, the other header pipe of said first pair connected to receive reaction products from the other end of each of the process tubes and a second pair of header pipes connected to supply heating gas to one end of each of the conduits and to receive said gas from the other end of each of the conduits

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4,046,631

PLUGS

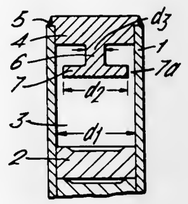
Leslie Clapham, Lytham, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Sept. 10, 1973, Ser. No. 396,106

Claims priority, application United Kingdom, Sept. 15, 1972, 42838/72

Int. Cl.² G21C 3/10

U.S. Cl. 176—79 2 Claims



1. A metal nuclear fuel can having a metal closure plug for closing an open end of the can, the plug having a closure portion dimensioned to engage the open end, a team of reduced cross-sectional area extending axially from the dimensioned portion into the can interior, the stem terminating in a flange of enlarged cross-sectional are, the flange being formed of a material which is selectively susceptible of attack by hydrogen, the surface of the flange remote from the closure portion having a surface roughness greater than that of the interior surface of the can wall.

4,046,632

NUCLEAR REACTOR PRESSURE VESSEL, MULTIPLE MEASURING LINE, BUSHING ASSEMBLY

Manfred Puchelt, Buckenhof, and Hartmut Seidelberger, Erlangen, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Apr. 9, 1975, Ser. No. 566,317

Claims priority, application Germany, Apr. 10, 1974, 2417601

Int. Cl.² G21C 17/00

U.S. Cl. 176—87 5 Claims

1. A nuclear reactor pressure vessel having a passage

through which a bundle of individual measuring lines extends, a tubular mounting having an inner end provided with releasable means for releasably connecting it to said vessel with said bundle projecting into the mounting and the mounting having an outer end from which a multiplicity of tubes start and extend to terminal ends with said lines extending individually from the bundle through individual ones of the tubes and beyond their terminal ends, each line being passed through a



sleeve slidably inserted in the tube through which the line extends and the sleeve having an inner portion with a terminal end within the tube and which portion has a soldered joint with the line and the sleeve having an outer portion projecting beyond the tube's terminal end, each tube having a length between the soldered and welded joints long enough to permit welding of the welded joint without melting of the soldered joint.

4,046,633

DIRECT RENIN ASSAY SYSTEM AND METHOD

Hans J. Keutel, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed July 1, 1974, Ser. No. 484,472

Int. Cl.² G01N 31/14

U.S. Cl. 195—103.5 R 12 Claims

1. A substrate having a specificity for the enzymatic action of renin enzyme comprising:
an octopeptide having the general formulation: PRO-PHE-HIS-LEU-LEU-VAL-TYR-SER;
a marker attached at one end of the substrate;
an insoluble carrier attached at the other end of the substrate so as to immobilize the substrate and attached marker.

4,046,634

ASSAY OF ISOENZYMES BY ION EXCHANGE CHROMATOGRAPHY

Donald W. Mercer, 451 Royce Ave., Pittsburgh, Pa. 15216

Continuation-in-part of Ser. No. 473,438, May 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 426,002, Dec. 19, 1973, abandoned. This application Apr. 16, 1976, Ser. No. 677,553

Int. Cl.² G01N 31/04. 31/08, 31/14

U.S. Cl. 195—103.5 R 11 Claims

1. A method of determining the presence of isoenzymes of different net electrical charges derived from creatine phosphokinase in a sample of blood serum or tissue extracts, comprising the steps of
a. equilibrating an ion exchange agent of the amine type based on a polysaccharide matrix with an aqueous buffered alkali metal chloride having about 0.1 molar alkali metal chloride at about pH 8.0 to 9.5 so that the net electrical charge characteristics of the ion exchange agent are similar to those of the blood serum sample in undialyzed, unaltered ionic form or the tissue extract sample in undialyzed, unaltered ionic form;
b. passing said sample of blood serum in undialyzed, unaltered ionic form or tissue extract sample in undialyzed, unaltered ionic form through said equilibrated ion exchange agent and collecting the effluent, then
c. passing through said ion exchange agent successive separate volumes of an aqueous buffered alkali metal chloride solution of a first molar ion concentration of about 0.1 and a pH of about 8.0 to 9.5, collecting the effluent separate from the effluent of step (b), then passing through the same column of the ion exchange agent an aqueous buffered alkali metal chloride solution of a second molar ion concentration of about 0.2 and a pH of about 8.0 to 9.5, and collecting the effluent separately from the effluents of step (b) and the first effluent of step (c);
d. assaying each of said separate effluents to determine whether the isoenzymes of creatine phosphokinase are present therein.

4,046,635

METHOD FOR DETECTING ENZYMES CAPABLE OF DIGESTING FIBRINOGEN OR FIBRIN

Leonard Arthur Moroz, Westmount, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Aug. 27, 1975, Ser. No. 608,237

Int. Cl.² G01N 31/14

U.S. Cl. 195—103.7 10 Claims

1. A method for detecting and measuring enzymes capable of digesting fibrin and for detecting and measuring activators and inhibitors of enzymes capable of digesting fibrin which comprises:
a. coating at room temperature a water-insoluble polymer test apparatus with a buffered solution of a radioactive tracer labelled enzyme-free human fibrinogen to produce a moist coating;
b. reacting said moist coating with a thrombin solution thereby converting the labelled fibrinogen to labelled fibrin;
c. contacting said coating of radioactively labelled fibrin with a sample of the unknown enzyme or a mixture of a known enzyme capable of digesting fibrin and the unknown enzyme activator or a mixture of a known enzyme capable of digesting fibrin and the unknown enzyme inhibitor;
d. incubating said sample in contact with said coating;
e. washing the test apparatus with a buffered solution and recovering the solution containing the radioactively digested products released by said sample;
f. counting radiation emitted by said digested and released fibrin and comparing said counts with the number of counts from the coated test apparatus prepared in Step (a).

4,046,636

DIAZEPAM ENZYME CONJUGATES

Edwin F. Ullman, Atherton, and Kenneth E. Rubenstein, Menlo Park, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 481,022, June 20, 1974, abandoned, which is a division of Ser. No. 304,157, Nov. 6, 1972, Pat. No. 3,852,157, which is a continuation-in-part of Ser. No. 143,609, May 14, 1971, abandoned. This application May 24, 1976, Ser. No. 689,234

Int. Cl.² C07G 7/02

U.S. Cl. 195—63 16 Claims

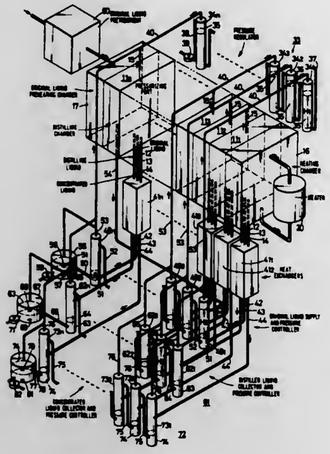
1. An enzyme-bound-benzdiazocycloheptane, wherein said benzdiazocycloheptane is bound to an enzyme at other than its active site and wherein said enzyme retains at least 30% of its original acitivity and has reduced activity when said benzdiazocycloheptane is bound to antibody for said benzdiazocycloheptane.

4,046,637

DISTILLATORY APPARATUS

Shosuke Sasaki, Amagasaki, Japan, assignor to Shosuke Sasaki, Tokyo and Sasaki Takaaki, both of, Japan

Filed Mar. 18, 1976, Ser. No. 668,117
Claims priority, application Japan, Mar. 20, 1975, 50-33691
Int. Cl.² B01D 3/02
U.S. Cl. 202—174 9 Claims



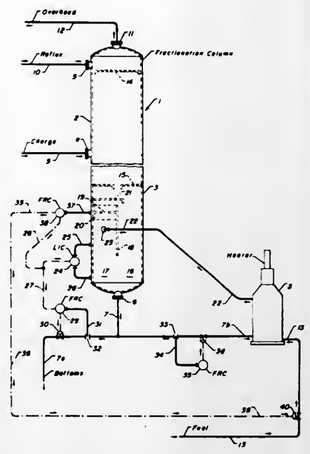
1. A distillatory apparatus, which comprises:
a plurality of distilling chambers disposed in adjacent relation to one another;
original liquid supplying means coupled to each of said chambers for individually supplying an original liquid to each of said distilling chambers;
distilled liquid draining means coupled to each of said chambers for individually draining out distilled liquids produced in each of said distilling chambers;
concentrated liquid draining means coupled to each of said chambers for individually draining out concentrated liquids remaining in each of said distilling chambers;
pressure retaining means coupled to said chambers for maintaining the atmospheric pressures in said distilling chambers respectively at constant values which gradually decrease one after another; and
a plurality of heat exchanging devices coupled to said plurality of distilling chambers respectively for effecting heat exchange between the original liquid which is supplied to each of said distilling chambers and the distilled and concentrated liquids which are drained out therefrom, each of said heat exchanging devices comprising at least three plate-shaped passageways formed in layers by disposing in opposing relation a plurality of parallel partition walls extending in the direction of liquid flow, the original liquid flowing in one of said three passageways for supply to the distilling chamber which is associated with said heat exchange device, and the distilled liquid resulting from condensation of vapor generated in said distilling chamber and the concentrated liquid drained from said distilling chamber respectively flowing in the other two of said passageways adjacent to said one passageway in a flow direction opposite to the direction of flow of the original liquid through said one passageway.

4,046,638

METHOD FOR CONTROLLING HEAT INPUT TO THE REBOILER SECTION OF A DISTILLATION COLUMN

R. Gene Fickel, Roselle, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 586,447, June 12, 1975, which is a continuation-in-part of Ser. No. 459,973, April 11, 1974, abandoned. This application Jan. 29, 1976, Ser. No. 653,570
The portion of the term of this patent subsequent to May 6, 1992, has been disclaimed.
Int. Cl.² B01D 3/42
U.S. Cl. 203—1 3 Claims



1. A method for controlling heat input to the reboiler section of a distillation column comprising said reboiler section and a fractionation section, which method comprises the steps of:
a. withdrawing a single liquid bottoms stream from a partially-partitioned reboiler section;
b. regulating the quantity of a portion of said bottoms stream removed from said distillation column as a bottoms product, in response to the level of liquid within said reboiler section;
c. introducing the remaining portion of said bottoms stream into an external reboiler heater;
d. passing the heated, mixed-phase bottoms stream into a substantially liquid-free area of said partially-partitioned reboiler section and therein disengaging liquid from said heated mixed-phase;
e. measuring, within said liquid-free area, the quantity of vapor which passes from the partially-partitioned reboiler section into the fractionation section of said distillation column; and,
f. regulating the fuel input to said external reboiler heater in response to a signal representative of the measured quantity of vapor passing into said fractionation section.

4,046,639

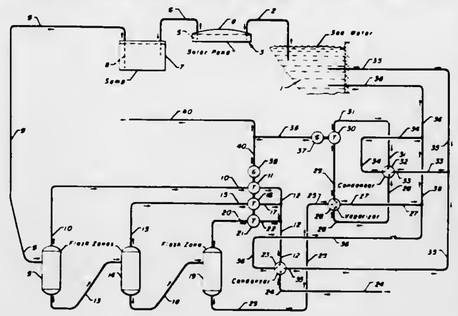
POWER GENERATION AND POTABLE WATER RECOVERY FROM SALINOUS WATER

Don B. Carson, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 22, 1976, Ser. No. 744,065
Int. Cl.² B01D 3/06
U.S. Cl. 203—11 10 Claims

1. A process for the simultaneous generation of power and the recovery of potable water from a source of salinous water which comprises the sequential steps of:
a. introducing a first salinous water portion, obtained from a first depth proximate to the surface of said source, into a solar radiation heat sink;

b. exposing said first salinous water portion, within said solar radiation heat sink, to radiant solar energy for a time sufficient to raise the temperature thereof to a level of at least about 135° F.;
c. introducing the thus-heated salinous water into a plurality of vacuum flash separation zones, each succeeding one of which is maintained at a lower subatmospheric pressure than the preceding zone, (i) to provide substantially non-salinous vaporous phases equal in number to the number of flash separation zones, and (ii) wherein the salinous liquid phase is introduced in series through the plurality of zones;
d. passing each of said non-salinous vapor phases through a separate turbine and (i) condensing the exit vapors via



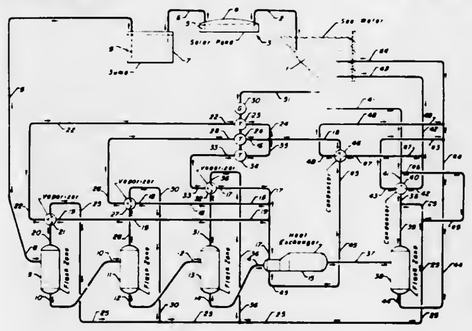
indirect heat-exchange with a second salinous water portion, obtained from a second depth substantially below the surface of said source, to recover liquid potable water, and, (ii) generating power from the resulting motion of said turbines;
e. vaporizing a hydrocarbon, via indirect heat-exchange with the salinous liquid phase emanating from the last flash zone in said plurality, and (i) passing the resulting vaporized hydrocarbon through a turbine, (ii) condensing the exit hydrocarbon vapors, via indirect heat-exchange with said second salinous water portion and, (iii) re-vaporizing the resulting condensed hydrocarbon; and,
f. generating additional power from the turbine through which said hydrocarbon vapors are passed.

4,046,640

POWER GENERATION AND POTABLE WATER RECOVERY FROM SALINOUS WATER

Don B. Carson, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 22, 1976, Ser. No. 744,064
Int. Cl.² B01D 3/06
U.S. Cl. 203—11 10 Claims



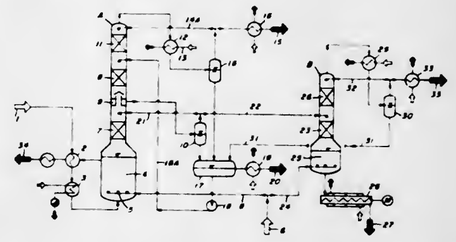
1. A process for the simultaneous generation of power and the recovery of potable water from a source of salinous water which comprises the sequential steps of:
a. introducing a first salinous water portion, obtained from a first depth proximate to the surface of said source, into a solar radiation heat sink;
b. exposing said first salinous water portion, within said solar radiation heat sink, to radiant solar energy for a time sufficient to raise the temperature thereof to a level of at least about 135° F.;
c. introducing the thus-heated salinous water into a plurality of vacuum flash separation zones, each succeeding one of which is maintained at a lower subatmospheric pressure than the preceding zone, (i) to produce substantially non-salinous vaporous phases equal in number to the number of flash separation zones and, (ii) wherein the salinous liquid phase is introduced in series through the plurality of zones;
d. vaporizing a hydrocarbon via indirect contact with each of said non-salinous vaporous phases, in separate vaporizers, and (i) passing each of the resulting vaporized hydrocarbon streams through a separate turbine, (ii) condensing the exiting hydrocarbon vapors via indirect heat-exchange with a second salinous water portion, obtained from a second depth substantially below the surface of said source, (iii) generating power from the resulting motion of said turbines and, (iv) re-vaporizing the resulting condensed hydrocarbon;
e. condensing said non-salinous vaporous phases, following vaporization of said hydrocarbons, to recover liquid potable water;
f. introducing the salinous liquid phase emanating from the last flash separation zone in said plurality into a separate vacuum flash zone, maintained at an absolute pressure less than that of the last flash zone in said plurality; and,
g. condensing the resulting non-salinous vaporous phase, via indirect heat-exchange with said second salinous water portion, and recovering additional liquid potable water.

4,046,641

PROCESS AND APPARATUS FOR THE SEPARATION OF CRUDE BENZOL AND NAPHTHALENE FROM WASHING OIL

Hansjürgen Ullrich, Bochum-Wattenscheid, Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Mar. 12, 1975, Ser. No. 557,829
Claims priority, application Germany, Mar. 19, 1974, 2413029
Int. Cl.² B01D 3/16
U.S. Cl. 203—39 3 Claims



1. In a process to regenerate washing oil which has been spent during the recovery of naphthalene and benzene from coke oven gas and wherein said spent washing oil is then stripped of volatile constituents with steam to thereby enable resolving the volatile constituents into a number of fractions, said process comprising:
treating a vapor mixture consisting essentially of steam and volatile hydrocarbons, formed as the products of passing steam through said washing oil, by feeding said mixture into the lowermost one of a succession of at least two

superimposed and serially-connected exchange in columns in vapor flow communications,
refluxing the first of said serially-connected exchange columns with a mixture of toluene, xylene and naphthalene,
feeding the second of said serially-connected exchange columns with water as the reflux,
recovering an overhead product from the uppermost exchange column of said succession of at least two exchange columns,
condensing said overhead product,
separating said condensed overhead product in a first phase separator into an essentially water-free benzene fraction and a water fraction,
collecting the resulting liquid mixture from the lower portion of the second of said serially-connected exchange columns, and
separating said resulting liquid mixture in a second phase separator into an essentially water-free toluene-xylene-naphthalene phase and a water fraction.

4,046,642
METHOD OF MAKING ELECTRIC STORAGE BATTERIES

William Howard Edwards, Bolton, England, assignor to Chloride Group Limited, London, England

Filed Sept. 10, 1976, Ser. No. 722,123
Claims priority, application United Kingdom, Sept. 11, 1975, 37405/75
Int. Cl.² H01M *10/44*
U.S. Cl. 204—2.1 9 Claims

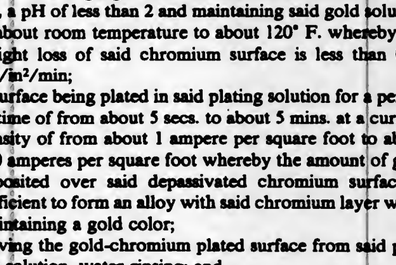
1. A method of making a Plante lead acid cell which comprises electrolyte formation of the positive plate in a sulphuric acid solution characterised in that the positives in electrolytically unformed or only partially formed condition are assembled with negative plates and separators into the battery container, the container filled with sulphuric acid electrolyte and an amount of a corroding agent selected from the group consisting of nitric acid and nitrates having a powerful corrosive action on lead under anodic conditions and reducible under the final cathodic condition at the corresponding negative plate to ionic species which do not interfere with the cell reactions, is incorporated into the cell, such as to convert the lead surface to an extended surface area and provide a sufficient mass of lead dioxide at the extended surface, and subjecting the positive plates to anodic conditions so as to convert the lead surface to an extended surface area and provide a sufficient mass of lead dioxide at the said extended surface, the treatment being for a time sufficient under the cathodic conditions at the negative plates, to convert all of the said corroding agent to the non-interfering ionic species.

4,046,643
PRODUCTION OF MULTI-METAL PARTICLES FOR POWDER METALLURGY ALLOYS

Ralph E. Rippere, 4145 Banff Lane, Phoenix, Ark. 85023

Filed Sept. 9, 1975, Ser. No. 611,810
Int. Cl.² C25D *5/18, 7/00*
U.S. Cl. 204—10 24 Claims

1. A method of producing a diffuse composition of multi-metal particles comprising the steps of:
a. providing a cathode comprising a powder of at least a first metal, said powder having a relatively low apparent density of less than approximately 22% of the maximum theoretical density of said first metal;
b. electro-depositing a second metal onto said cathode from an electrolytic composition containing ions of said second metal by imposing direct electrical current on the electrolytic composition;
c. periodically interrupting the flow of direct electrical current, the period of direct current flow being of greater ampere second duration than the period of interruption, wherein
1. deplating of both the first and second metals is effected during each period of interruption,
2. comingling in solution of ions of both the first and second metals is effected by said deplating, and



3. codepositing of both the first and second metals together in a comingled state is effected by each period of direct current flow following a period of interruption;
d. continuing the electro-deposition of said second metal until a desired substantially homogeneous multi-metal composition is obtained.

4,046,644
PROCESS FOR FORMING A GOLD-CHROMIUM ALLOY FROM AN ELECTRODEPOSITED GOLD-CHROMIUM SURFACE

John Joseph Liska, Fords, N.J., assignor to American Standard Inc., New York, N.Y.

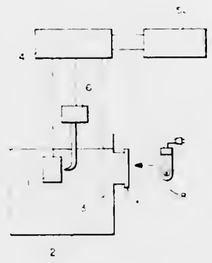
Filed May 24, 1976, Ser. No. 689,433
Int. Cl.² C25D *5/10, 5/24, 5/50*
U.S. Cl. 204—37 R 13 Claims

1. A process for the heat diffusion of an electro-deposited gold layer on a chromium surface to form abrasion resistance gold-chromium alloy consisting essentially of
simultaneously depassivating and cathodically gold plating the chromium surface in an aqueous acid gold plating solution having a gold content of about 0.2 to 2 tr. ozs. per gal, a pH of less than 2 and maintaining said gold solution at about room temperature to about 120° F. whereby the weight loss of said chromium surface is less than 0.01 mg/in²/min;
said surface being plated in said plating solution for a period of time of from about 5 secs. to about 5 mins. at a current density of from about 1 ampere per square foot to about 200 amperes per square foot whereby the amount of gold deposited over said depassivated chromium surface is sufficient to form an alloy with said chromium layer while maintaining a gold color;
removing the gold-chromium plated surface from said plating solution, water rinsing; and
thereafter heat diffusing the gold plated chromium surface to form a gold-chromium alloy by subjecting said gold-chromium surface to elevated temperatures of from about 650° F to about 900° F. for a period of time of from about 2 minutes to about 6 hours whereby a gold-chromium alloy surface is produced which has a hardness and is more abrasion resistant than the same gold coating which has not been heat diffused.

4,046,645
METHOD OF MANUFACTURING SOLID ELECTROLYTIC CAPACITOR

Akihiko Yoshida, Sakai, and Atsushi Nishino, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed June 4, 1976, Ser. No. 692,945
Claims priority, application Japan, June 6, 1975, 50-68886
Int. Cl.² C25D *9/06;* H01G *9/24*
U.S. Cl. 204—37 R 9 Claims



1. A method of manufacturing a solid electrolytic capacitor, which comprises the steps of:
anodizing the surface of a base material of valve action metal to form a semiconductive dielectric film;
electrodepositing a semiconductive metal oxide on said dielectric film by electrolytically oxidizing an electrolyte comprising a metallic salt solution at a temperature above 70° C, with said dielectric film being used as an anode and being irradiated with radiation, the energy of which is high enough to allow valence electrons of the dielectric film to enter the conduction band,
subjecting said metal oxide film to heat treatment at above 110° C; and
forming a cathode layer on said metal oxide film.

4,046,646
METHOD OF GALVANIZING STEEL PARTS

Heinrich Warnke, Marienfeld, and Friedel Kaup, Gutersloh, both of Germany, assignors to Miele & Cie, Gutersloh, Germany

Continuation-in-part of Ser. No. 502,415, Sept. 3, 1974, abandoned. This application Dec. 1, 1975, Ser. No. 636,456
Claims priority, application Germany, Sept. 4, 1973, 2344434
Int. Cl.² C25D *5/36*
U.S. Cl. 204—38 B 19 Claims

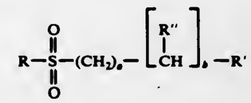
1. A method for coating a steel part comprising introducing the steel part into an activation solution which contains a metal salt which is nobler in potential than iron to non-electrolytically deposit a layer of the nobler metal on the surface of the steel part and subsequently immersing the thus-coated steel part in a galvanizing bath containing a zinc salt whereupon a similar layer of zinc is electrogalvanized onto the steel part.

4,046,647
ADDITIVE FOR IMPROVED ELECTROPLATING PROCESS

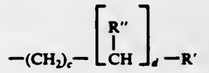
Edward P. Harbulak, Allen Park, Mich., assignor to M&T Chemicals Inc., Greenwich, Conn.

Filed June 17, 1976, Ser. No. 697,033
Int. Cl.² C25D *3/12, 3/20, 3/56*
U.S. Cl. 204—43 T 26 Claims

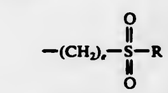
1. A process for the preparation of an electrodeposit which contains; at least one metal selected from the group consisting of nickel and cobalt or; binary or ternary alloys of the metals selected from nickel, iron, and cobalt; which comprises passing current from an anode to a cathode through an aqueous acidic electroplating solution containing at least one member selected from the group consisting of nickel compounds and cobalt compounds and iron compounds providing nickel, cobalt and iron ions for electrodepositing nickel, cobalt, nickel-cobalt alloys, nickel-iron alloys, cobalt-iron alloys or nickel-iron-cobalt alloys; the improvement comprising the presence of 5×10^{-6} moles per liter to 0.5 moles per liter of a β-substituted, γ-substituted, or β,γ-disubstituted sulfone exhibiting the following generalized structural formula:



wherein R represents alkyl, alkenyl, alkynyl, aryl, alkaryl, or aralkyl, or the group



R′ represents hydrogen, R, or the group



R″ represents —OH, —SO_3H or salt thereof, or —COOH or salts or esters thereof;
a, b, c, d, e, are independently integers 1 or 2; except when R″ is —COOH "*a*" may be zero;
for a time period sufficient to form a metal electroplate upon said cathode.

4,046,648
POLYAMINE ADDITIVES IN ALKALINE ZINC ELECTROPLATING

John Derek Rushmere, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 29, 1975, Ser. No. 617,539
Int. Cl.² C25D *3/22, 3/24*
U.S. Cl. 204—55 R 25 Claims

1. An aqueous addition agent for the electrodeposition of zinc from an alkaline bath, said addition agent comprising a water-soluble polyamine brightener prepared by
condensing an alkanolamine with an epihalohydrin in proportions of at least about 2 moles of epihalohydrin per mole of alkanolamine to produce a condensation product which is essentially completely water-soluble and free from epihalohydrin, and
reacting said condensation product with at least 0.3 mole of ammonia or an amine other than an alkanolamine per mole of alkanolamine until the total ionic halogen is at least about 1 mole per mole of alkanolamine.

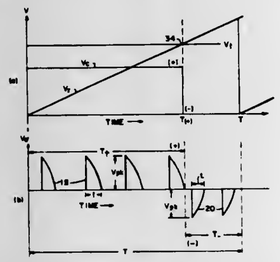
14. An aqueous alkaline bath for the electrodeposition of zinc comprising a source of zinc ions and from about 0.1 g/l to the solubility limit of a polyamine brightener of claim 1.

4,046,649

FORWARD-REVERSE PULSE CYCLING ANODIZING AND ELECTROPLATING PROCESS

Richard A. Elco, Pittsburgh; James A. Boner, Murrysville, both of Pa., and Willard E. Troese, Walnut Creek, Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 497,174, Aug. 13, 1974, Pat. No. 3,975,254.
This application Mar. 30, 1976, Ser. No. 671,855
Int. Cl.² C25D *11/04*
U.S. Cl. 204—58 2 Claims



1. A process of anodizing an aluminum-copper alloy metal comprising the steps of:

applying a first series of discrete partial sinusoidal positive pulses to the aluminum-copper alloy metal part in the anodizing bath for a first predetermined time; and

applying a second series of discrete partial sinusoidal negative pulses sequentially after said first series of positive pulses are completed for a time less than said first predetermined length of time.

4,046,650

CARBON BLOCK FOR CATHODES OF ALUMINUM

Kazuhiko Hiraswa, Nagoya, and Yasuo Okamoto, Okayama, both of Japan, assignors to Sumitomo Aluminum Smelting Co., Ltd. and Kyowa Carbon Company, Limited, both of Osaka, Japan

Continuation of Ser. No. 123,469, April 29, 1975, abandoned.
This application Apr. 29, 1975, Ser. No. 572,767
Claims priority, application Japan, Mar. 16, 1970, 45-22397
Int. Cl.² C25C *1/02, 7/02*
U.S. Cl. 204—67 2 Claims

1. In an electrolytic process for producing aluminum which comprises dissolving alumina in a molten salt bath containing cryolite at an elevated temperature in an electrolytic cell and electrolyzing said alumina by passing a direct current through the molten salt bath through a carbon anode to a carbon cathode constructed by lining baked carbon blocks on the bottom of the electrolytic cell to deposit aluminum on the bottom of the electrolytic cell, the improvement which comprises prolonging the life of the electrolytic cell by constructing said cathode of at least one carbon block having a stability constant of 0.7–1.0, said block consisting of at least 50% by weight of petroleum coke and less than 50% by weight of at least one other carbonaceous material selected from the group consisting of calcined anthracite, cokes other than petroleum coke, and other graphitized carbonaceous materials, based on the weight of a dry aggregate of the coke and said other materials, which has been kneaded with pitch, formed and baked at a temperature higher than 2000° C but lower than about 2400° C to yield said carbon block.

4,046,651

ELECTROLYTIC HYDRODIMERIZATION PROCESS IMPROVEMENT

Joseph C. Barnett, Jr.; John J. Hicks, and Leonard L. Hovey, all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed July 28, 1975, Ser. No. 599,908
Int. Cl.² C25B *3/10*
U.S. Cl. 204—73 R 10 Claims

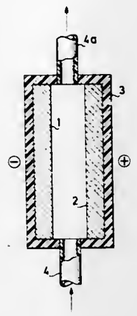
1. In a process for hydrodimerizing in an undivided cell an olefinic compound having a formula $R_2C{=}CR{-}X$ wherein —X is —CN, —CONR or —COOR′, R is hydrogen or R′, R′ is C_1–C_4 alkyl and at least one R directly attached to either of the two carbon atoms joined by the double bond in said formula is hydrogen by electrolyzing an aqueous solution having dissolved therein said olefinic compound, conductive salt selected from the group consisting of alkali metal phosphates, borates, carbonates and sulfates, at least 10^{-3} gram mole per liter of a directive salt selected from the group consisting of quaternary ammonium and phosphonium ions and between about 0.1 and about 50 millimoles per liter of a nitrilocarboxylic acid compound having the formula $Y_2N(Z)_nR''COOM$ wherein Y is hydrogen, —R″COOM, $(CH_2)_{m+1}OH$ or C_1–C_{20} alkyl; —R″— is $(CH_2)_m$ or (CHR′); R″ is hydroxy, 'COOM, $(CH_2)_mCOOM$ or C_1–C_8 alkyl, hydroxyalkyl or hydroxyphenyl; Z is a divalent C_2–C_6 hydrocarbon radical; M is hydrogen, alkali metal or ammonium, *m* is 1 or 2; *n* is an integer from 0 to 4 and at least one Y is —R″COOM or $(CH_2)_{m+1}OH$ in contact with a cathodic surface having a cathode potential sufficient for hydrodimerization of said olefinic compound, the improvement which comprises including in said solution between 0.1 and about 50 millimoles per liter of a tri(C_2–C_4 alkanol)amine.

4,046,652

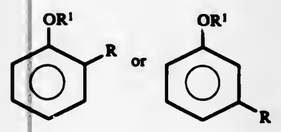
PROCESS FOR PREPARING P-BENZOQUINONE DIKETALS

Rudolf Pistorius, Bennichausen, and Hans Millauer, Eschborn, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 19, 1975, Ser. No. 642,397
Claims priority, application Germany, Dec. 21, 1974, 2460754
Int. Cl.² C25B *3/02*
U.S. Cl. 204—78 12 Claims



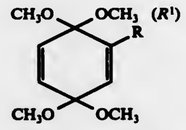
1. A process for electrochemically preparing p-benzoquinone ketals which comprises anodically oxidizing benzene per se or an alkoxybenzene of the formula



wherein R is hydrogen, an alkyl group having from 1 to 4 carbon atoms or halogen and R^1 is an alkyl group having from 1 to 4 carbon atoms, in an electrolyte which is a methanolic solution containing no more than about 5% by weight of water and about 0.2 to 15% by weight, calculated on the electrolyte, of a conductivity improving salt selected from ammonium and alkali metal fluorides, perchlorates, nitrates, tetrafluoroborates, hexafluorosilicates, hexafluorophosphates, benzene sulfonates, p-toluene sulfonates and quaternary ammonium and phosphonium salts of the formula

$$A_xB_{4-x}Z^+Y^-$$

wherein A represents identical or different alkyl radicals,
B represents C_6H_5,
x represents an integer of from 1 to 4,
Z represents N or P and
Y represents F or SO_4CH_3
as well as mixtures of such salts at a pH of more than 7, at an anode of a material selected from graphite, metals of the platinum group, alloys thereof and PbO_2, at a temperature of from about −20° to +60° C, to obtain a p-benzoquinone tetramethyl ketal of the formula



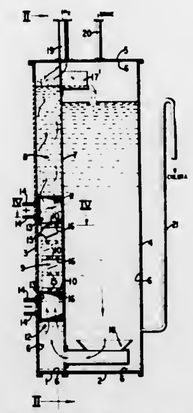
wherein R and R^1 have the meaning given above.

4,046,653

NOVEL ELECTROLYSIS METHOD AND APPARATUS

Oronzio de Nora; Vittorio de Nora, and Placido M. Spaziante, all of Milan, Italy, assignors to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Filed May 27, 1975, Ser. No. 580,952
Claims priority, application Italy, Feb. 20, 1975, 20464/75
Int. Cl.² C25B *1/24*
U.S. Cl. 204—95 7 Claims



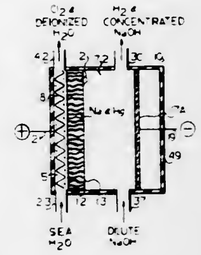
1. A process for the preparation of an alkali metal halate by electrolysis of an aqueous alkali metal halide solution comprising passing an alkali metal halide solution utilizing a sustained gas-lift effect of evolved hydrogen gas, upwardly through a vertically enlongated housing, a plurality of vertically stacked bipolar electrolysis units occupying substantially the entire cross-sectional area of the housing with vertical anodes and cathodes interleaved to provide a vertical honeycomb effect and to avoid recirculation of the electrolyte inside the compartment while passing an electrolysis current therethrough at a temperature of 90° to 100° C and at a electrolysis current to volume ratio of 15 to 30 A/liter to convert at least a portion of the alkali metal halide to alkali metal hypohalite and to alkali metal halate, providing for very low hydraulic pressure drop along the entire vertical path of the electrolyte, passing the resulting electrolyte, while venting the hydrogen formed, to a reaction zone whose volume is sufficient to provide a residence time to substantially complete the conversion of the alkali metal hypohalite to alkali metal halate and recovering the said halate from the electrolyte.

4,046,654

PROCESS FOR DESALINATION WITH CHLOR-ALKALI PRODUCTION IN A MERCURY DIAPHRAGM CELL

Marc Cole, 1057 C Argyll Circle, Lakewood, N.J. 08701

Filed Apr. 6, 1976, Ser. No. 674,288
Int. Cl.² C25B *1/26, 1/20, 13/08, 1/02*
U.S. Cl. 204—99 17 Claims



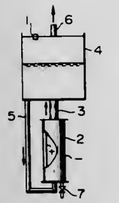
1. A novel process for the production of deionized water, alkali metal hydroxide, halogen, and hydrogen from an anolyte comprising an aqueous saline solution the solutes of which comprise alkali metal halides, said halides being selected from the group consisting of chloride and bromide, said anolyte being continuously influent to the anodic compartment of an electrolytic cell, said process being characterized by two alternating phases, a first of said phases comprising the electrosorption of anions in said anolyte on the surface of a porous anode immersed in said anolyte, said anode being impressed with a voltage lower than the discharge D.C. voltage for said anions, said voltage activating transmission of cations in said anolyte from said anodic compartment thru a cation-permeable diaphragm structure separating said anodic compartment from a cathodic compartment of said cell, said cations being then transmitted by said impressed voltage thru a catholyte comprised of an aqueous alkali metal hydroxide solution continuously circulated thru said cathodic compartment, said anolyte and said catholyte being separately maintained, said cations being then electrosorbed on the surface of a porous cathode immersed in said catholyte, said cathode being impressed by a lower than discharge D.C. voltage for said cations, the so formed at least partly deionized water being effluent from said anodic compartment during said first phase of said process, and a second of said alternating phases comprising the raising of the D.C. voltage of both said anode and said cathode to or above the voltage necessary for electrical discharge of the said electrosorbed anions and cations respectively, the so formed halogen being effluent with said anolyte and the so formed alkali metal hydroxide and hydrogen being effluent with said catholyte during said second phase, and finally the voltage of both said anode and said cathode being lowered as specified above for said first phase as part of an alternation to said first phase of said novel process.

4,046,655

PROCESS FOR ELECTROLYTICALLY PURIFYING A PHOTOGRAPHIC DEVELOPER WASTE SOLUTION

Reiichi Itai, and Katsuyuki Murakami, both of Machashi, Japan, assignors to The Japan Carlit Company, Ltd., Tokyo, Japan

Filed Feb. 18, 1975, Ser. No. 550,228
Claims priority, application Japan, Feb. 21, 1974, 49-19996
Int. Cl.[2] C02C 5/04, 5/12
U.S. Cl. 204—149 9 Claims



1. A process for electrolytically purifying a photographic developer waste solution containing components having high COD values comprising adding to said waste solution three precursors to provide a concentration of from about 3 to about 60 grams of chloride ion, from about 3 to about 25 grams of bromide ion, and from about 0.08 to about 9 grams of iodide or iodate ion per liter of said waste solution, and subjecting the resulting waste solution to non-diaphragm electrolytic oxidation at a pH of 2 to 12, a temperature of 10° to 100° C., an anode current density of 2 to 40 amperes per square decimeter and a current concentration of 3 to 50 amperes per liter until said COD values are reduced.

4,046,656

PHOTOCHLORINATION PROCESS FOR METHYL AROMATIC COMPOUNDS

Ralph A. Davis, and R. Garth Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 6, 1976, Ser. No. 747,859
Int. Cl.[2] B01J 1/10
U.S. Cl. 204—158 HA 15 Claims

1. A process for the photochlorination of a methyl aromatic reactant to form an α-chloro-substituted aromatic product, in which process each benzylic hydrogen of the reactant is replaced by a chlorine atom, comprising contacting said reactant with chlorine in the presence of ultraviolet radiation and an accelerating amount of bromine.

4,046,657

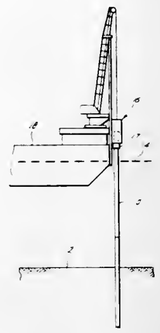
APPARATUS AND METHOD OF ASSISTING PILE DRIVING BY ELECTRO-OSMOSIS

Phillip Andrew Abbott, 1430 Fountainview Drive, No. 310, Houston, Tex. 77057

Filed May 5, 1976, Ser. No. 683,564
Int. Cl.[2] B01D 13/02; E02D 7/26
U.S. Cl. 204—180 R 10 Claims

1. A method of assisting the driving of a hollow pile into soil containing water comprising,

when the pile is in contact with the soil, directing a direct current downwardly through the soil on the inside of the pile, out the bottom of the pile, and up the outside of the pile whereby water on the inside of the pile will move out



and up the outside of the pile making the pile easier to drive through the soil.

4,046,658

PROCESS FOR ELECTROCOATING AMINIMIDE CONTAINING COMPOSITIONS

William B. Brown, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1975, Ser. No. 604,950
Int. Cl.[2] C25D 13/06
U.S. Cl. 204—181 4 Claims

1. A method of electrophoretically depositing a continuous resin coating on an electrode comprising the steps of:

A. forming a stable dispersion comprising water and electrically charged resin particles having an average diameter of from 1 to 10 microns, and wherein the pH of said aqueous dispersing medium is maintained at least about 2 units from the neutral value of 7 by the presence of compatible organic acids or bases, said resin comprising:

a. a major portion of a film forming addition polymer or mixtures thereof, and chemically bonded at random thereto;

b. a minor portion of an aminimide pendent functionality, and

B. applying a relatively constant voltage through electrodes in direct contact with said dispersion, and thereby depositiong continuous coating of said resin onto the electrode which has the charge opposite that of the charge on the particles.

4,046,659

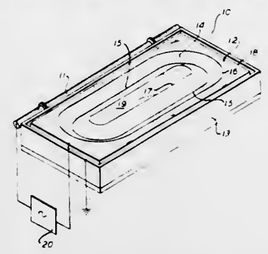
METHOD FOR COATING A SUBSTRATE

Robert L. Cormia, Oakland; Terry A. Trumbly, Orinda, and Sigurd Andresen, Redwood City, all of Calif., assignors to Airco, Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 469,004, May 10, 1974, abandoned. This application Jan. 10, 1975, Ser. No. 540,044
Int. Cl.[2] C23C 15/00
U.S. Cl. 204—192 C 8 Claims

1. In a method for coating a substrate in a process in which an insulating layer is formed on one portion of a conductive target, and a second portion of the target is kept free of the insulating layer by ionic bombardment, the improvement comprising:

applying an alternating electric potential to the target of a frequency greater than 400 Hz and sufficiently high to



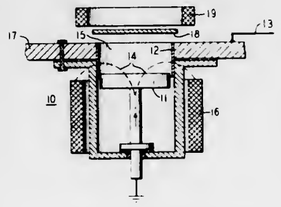
substantially eliminate the formation of arcs but less than 60,000 Hz.

4,046,660

SPUTTER COATING WITH CHARGED PARTICLE FLUX CONTROL

David Bruce Fraser, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1975, Ser. No. 645,087
Int. Cl.[2] C23C 15/00
U.S. Cl. 204—192 C 6 Claims



1. Method for the sputter deposition of a layer on a substrate comprising placing the substrate in the particle beam of a magnetic field aided sputtering source, which said substrate is situated in the residual magnetic field of the sputtering source CHARACTERIZED IN THAT the residual magnetic field is reduced by means of a second magnetic field of the same order of intensity or greater than said residual magnetic field, and, corresponding in geometry to said residual magnetic field, whereby the flux of charged particles incident on the substrate is reduced said second magnetic field being produced by an auxiliary magnet means situated below the plane of said substrate, opposite said source.

4,046,661

CERAMIC OXYGEN PROBE

Robert Kenneth Stringer, Heidelberg, and Kenneth Alan Johnston, Elsternwick, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Apr. 14, 1972, Ser. No. 243,930
Claims priority, application Australia, Apr. 14, 1971, 4587/71
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 S 3 Claims

1. A probe for use in measuring the oxygen concentration of fluids comprising: a ceramic tube constructed of alumina, mullite, or an aluminous porcelain containing at least 56% by weight alumina and in which at least 7% of the alumina content is free alumina and not more than 40% by weight silica; a pellet of solid electrolyte located in said ceramic tube in proximity to the end of said ceramic tube, and sealed to the tube by a fusion weld, the outer diameter of said pellet being substantially the same as the inner diameter of said tube; a eutectic



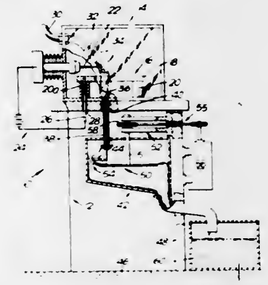
mixture at the electrolyte/tube interface; and an electrode within said tube contacting the inner face of said pellet.

4,046,662

ELECTRO-CHEMICAL MACHINE TOOLS

Charles Stanley Gardner, Allestree, and Denis Edward Molloy, Mickleover, both of England, assignors to Rolls-Royce (1971) Limited, London, England

Filed Oct. 31, 1975, Ser. No. 627,787
Claims priority, application United Kingdom, Nov. 6, 1974, 47905/74
Int. Cl.[2] C25F 3/02, 7/00
U.S. Cl. 204—275 2 Claims



1. An electrolyte draining apparatus comprising:

an electrolyte collecting vessel;

an electrochemical machine tool worktable;

an electrolyte drainage conduit connectable between said electrochemical machine tool worktable and said electrolyte collecting vessel;

a rotary member positioned within said collecting vessel, said rotary member receiving a flow of electrolyte from said conduit; and

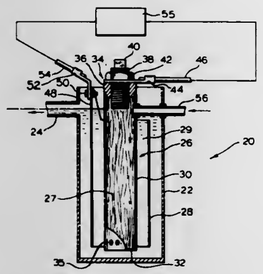
means for rotating said rotary member at a speed sufficient to throw off said electrolyte therefrom in the form of droplets so dispersed as to prevent conduction of electricity therebetween, said dispersed electrolytic droplets being rejoined in said collector vessel.

4,046,663

CARBON FIBER ELECTRODE

Bernard Fleet, London, and Sankar Das Gupta, New Malden, both of England, assignors to 308489 Ontario Limited, Toronto, Canada

Filed July 28, 1975, Ser. No. 599,457
Claims priority, application United Kingdom, Aug. 7, 1974, 34770/74; Nov. 15, 1974, 49533/74
Int. Cl.² C02B 1/82; C25B 9/00, 9/02
U.S. Cl. 204—280 3 Claims



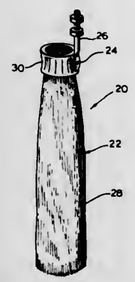
1. A flow-through electrode for use in an electrochemical reactor, the electrode comprising:
means providing for electrical connection to the electrode;
a housing having a preferred length;
a plurality of individual carbon fibers arranged continguously in the housing and each of the carbon fibers having a length at least equal to said preferred length and having an end coupled to the electrical connection means for electrical continuity between said means and the carbon fibers; and
said carbon fibers being sufficiently numerous to effectively fill the housing, the housing having an inlet and an outlet to direct a forced flow of electrolyte between the carbon fibers in the housing for better electrochemical efficiency.

4,046,664

METALLIC FILAMENT ELECTRODE

Bernard Fleet, London, and Sankar Das Gupta, New Malden, both of England, assignors to 308489 Ontario Limited, Toronto, Canada

Filed July 28, 1975, Ser. No. 599,458
Claims priority, application United Kingdom, Aug. 7, 1974, 34770/74; Nov. 5, 1974, 49533/74
Int. Cl.² C02B 1/82; C25B 9/00, 9/02
U.S. Cl. 204—280 2 Claims



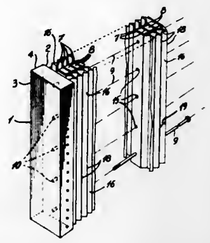
1. An electrode for use in an electrochemical reactor the electrode comprising: a plurality of electrically conductive metallic filaments each of the filaments having a very small maximum thickness compared with the length of the filament and having a relatively good electrical conductivity, the filaments exhibiting little resistance to transverse deflection and being arranged in side by side relationship so that as electrolyte flows generally longitudinally over the filaments flow eddys will cause continuous transverse movements of the filaments relative to one another to enhance electrolytic action at the electrode and means retaining a portion of the filaments in electrical contact with one another over a discrete portion of the length of the filaments and providing electrical connection means for coupling the electrode to an external electrical circuit.

4,046,665

ELECTRODE ASSEMBLY FOR DIAPHRAGM CELLS

Gothe Oscar Westerlund, Vancouver, Canada, assignor to Chemetics International Ltd., Montreal, Canada

Filed Dec. 15, 1976, Ser. No. 750,887
Claims priority, application Canada, Jan. 7, 1976, 243239
Int. Cl.² C25B 13/02; C25C 7/04; C25B 9/00
U.S. Cl. 204—282 4 Claims



1. An electrode assembly comprising in combination:
A. an elongated titanium bar of rectangular transversal cross-section having a pair of major planar opposed surfaces and a pair of minor planar opposed surfaces;
B. a finned electrode consisting essentially of a plurality of elongated spacer bars of uniform width and thickness mounted in stacked parallel relationship on one of said major planar surfaces and a plurality of elements maintained in spaced parallel relationship throughout their length by said spacers, each element having a bottom flat wall of a width not less than that of the spacers and a pair of spaced outwardly sloping sidewalls each including an outwardly extending ledge; said spacers and elements being made of a metal selected from iron, copper, cobalt, nickel and alloys of these metals; and
C. enveloping the finned electrode, a prefabricated diaphragm having uniformly spaced corrugations of a wave length equal to the distance between two adjacent ledges, said diaphragm being so positioned on the electrode that each ledge has its longitudinal edge in contact therewith at the bottom of a corrugation.

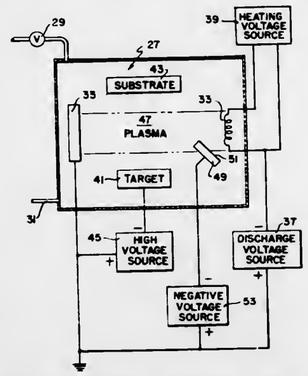
4,046,666

DEVICE FOR PROVIDING HIGH-INTENSITY ION OR ELECTRON BEAM

Edwin D. McClanahan, and Ronald W. Moss, both of Richland, Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 7, 1976, Ser. No. 684,418
Int. Cl.² C23C 15/00; H01J 19/04
U.S. Cl. 204—298 10 Claims

1. In a device for producing an ion beam including a gas-tight chamber with means for providing ionizable, inert gas at near vacuum pressures within said chamber, said chamber containing a cathode comprising a heat-resistant material and having an outer electron emissive surface adapted for thermionic emission; an anode spaced apart from said cathode; said anode and cathode interconnected with a source of sufficient voltage to establish an ionized gas plasma between said electron emissive surface of said cathode and said anode; the improvement wherein an auxiliary electrode is disposed with at least one surface exposed to and facing electron emissive surface of said cathode and positioned so as to be exposed to said ionized gas plasma, said at least one surface of the auxiliary electrode containing a low-work-function material which when dispersed within the electron emissive surface of said cathode material provides a thermionic work function lower than the work function of said cathode material, said cathode and auxiliary electrode being more closely positioned than the positioning of said cathode to said anode and wherein there are



provided electrical means for maintaining said auxiliary electrode at a more negative potential that that of said cathode such that ionized gas from said plasma impinges on said one surface of said auxiliary electrode to sputter-deposit said low-work-function material onto said electron emissive surface of said cathode.

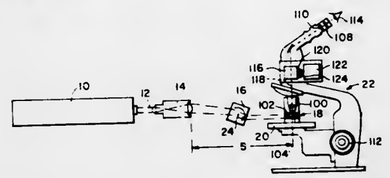
8. The improved device of claim 1 wherein said vacuum chamber also contains a target electrode connected to a second voltage source at a more negative potential than that of said cathode or said auxiliary electrode to extract gas ions from said plasma and thereby sputter portions of target material, said vacuum chamber further containing a substrate disposed to receive said sputtered target material.

4,046,667

MICROELECTROPHORESIS APPARATUS

Philip J. Goetz, Pleasantville, N.Y., assignor to Pen Kem, Inc., Croton-On-Hudson, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,299
Int. Cl.² G01N 27/26, 27/28
U.S. Cl. 204—299 R 30 Claims



1. Apparatus for measuring the electrophoretic mobility of particles migrating in a suspending medium under the influence of an applied electric field comprising:
an electrophoresis chamber,
a microscope having an objective lens system and an ocular lens system, said microscope being positioned to view said chamber along an optical path extending from said chamber through said objective lens system toward said ocular lens system,
optical means associated with said microscope to intercept said optical path between said chamber and said ocular lens system,
means for scanning said optical means relative to said optical path, and means coupled to said scanning means for controlling the scanning of said optical means wherein the improvement comprises disposing said optical means relative to said microscope such that said optical means intercepts said optical path between said objective lens system and said ocular lens system.

4,046,668

DOUBLE SOLVENT EXTRACTION OF ORGANIC CONSTITUENTS FROM TAR SANDS

Malvina Farcasiu, Princeton, and Darrell Duayne Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,597
Int. Cl.² C10G 1/04
U.S. Cl. 208—11 LE 7 Claims

1. A process for recovering hydrocarbons from tar sand which comprises:
A. mixing tar sand with a solvent mixture of light naphtha comprising C_5 to C_9 carbon atoms per molecule and methanol to produce a light naphtha fraction with solublized non-polar components, a methanol fraction with solublized polar components and a solid sand fraction with accumulated asphaltenes on the sand surface;
B. separating by decanting said light naphtha fraction from said methanol fraction,
C. separating said methanol fraction from said solid, sand fraction, and
D. separating and recovering polar and non-polar components from said separated solvent mixture components.

4,046,669

SOLVENT EXTRACTION OF OIL FROM TAR SANDS UTILIZING A TRICHLOROETHYLENE SOLVENT

Neal Franklin Blaine, deceased, late of Lomita, Calif., and Geneva Blaine, executrix, 26007 S. Lucille Ave., Lomita, Calif. 90717

Continuation of Ser. No. 537,654, Dec. 31, 1974, abandoned.
This application Jan. 19, 1976, Ser. No. 650,165
Int. Cl.² C10G 1/04
U.S. Cl. 208—11 LE 2 Claims

1. In an oil solvent extraction process wherein a tar sand is contacted with a solvent at mild conditions of temperatures from 70° F. to about 800° F. and pressures from 0 to about 200 psig, the improvement wherein said solvent is trichloroethylene and wherein said solvent is contacted with said tar sand in a contact vessel; wherein the solvent and tar is removed from the upper portion of such vessel; wherein the sand is removed from the lower portion of such vessel and wherein the solvent is removed from the extracted tar for further use in the solvent extraction process.

4,046,670

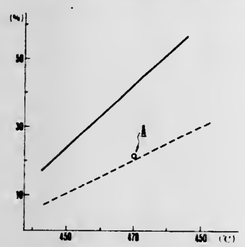
METHOD FOR THE TREATMENT OF HEAVY PETROLEUM OIL

Koji Seguchi, Hino; Minoru Sugita; Kazuyoshi Inada, both of Tokyo; Kiyoshi Tagaya, Funabashi, and Yuji Nakamura, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 680,439, April 26, 1976, abandoned. This application Aug. 11, 1976, Ser. No. 713,356
Claims priority, application Japan, Apr. 30, 1975, 50-51266
Int. Cl.² C10G 9/16
U.S. Cl. 208—48 AA 3 Claims

1. In a process for the thermal cracking of a heavy petroleum oil having an API specific gravity of not more than 25, within a tubular type heating furnace at a temperature of not less than 400° C, the improvement comprising:

mixing the heavy petroleum oil feed to the furnace with 0.5 to 5% by weight of an inorganic substance having a surface area of not less than $30m^2/g$ and an average particle diameter of not more than 30 microns, said inorganic



material containing, as principal components, a high melting oxide and an iron oxide, said inorganic material being obtained by alkali treatment of a member selected from the group consisting of Laterite, Garnierite, Magnesite, Fly ash and Kyoto yellow ochre and mixtures thereof.

4,046,671

REDUCTION OF PLATINUM GROUP METAL CATALYSTS

Bernard Whiting Burbidge, Leatherhead; Terence John Cook, Bexleyheath, and Roger Crowson, Richmond, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Nov. 15, 1974, Ser. No. 524,314
Claims priority, application United Kingdom, Dec. 5, 1973, 56313/73
Int. Cl.² C10G *35/08;* B01J *37/16*
U.S. Cl. 208—138 11 Claims

1. A method for reducing catalysts of a platinum group metal on a support which method comprises contacting the catalyst with hydrogen for a reduction time period in the range of 1 to 24 hours at elevated temperature in the range of 350° to 480° C characterized in that the catalyst is brought to a reduction temperature in the range 350° to 480° C in a non-reducing wet atmosphere before the introduction of hydrogen and the reduction is carried out under superatmospheric pressure without dropping the temperature of the catalyst below 350° C in the presence of moisture to produce amorphous platinum group metal of particle size less than 20A.

4,046,672

HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC COMPOSITE

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application May 20, 1976, Ser. No. 688,453
The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.
Int. Cl.² C10G *35/08*
U.S. Cl. 208—139 27 Claims

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, and tin are uniformly dispersed throughout the porous carrier material; wherein the average crystallite size of the tin and catalytically available cobalt is less than 100 Angstroms in maximum dimension; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state of in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

24. An acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, and tin are uniformly dispersed throughout the porous carrier material; wherein the average crystallite size of the tin and catalytically available cobalt is less than 100 Angstoms in maximum dimension; wherein substantially all of the platinum group metal is present in the corresponding elemental metallic state; wherein substantially all of the tin is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,046,673

SIMPLIFIED REGENERATION PROCEDURE

John D. Paynter; Beverly B. Fuqua, both of Baton Rouge, La., and Richard R. Cecil, Mendham, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 388,745, Aug. 16, 1973, abandoned. This application Sept. 15, 1975, Ser. No. 613,242
Int. Cl.² C10G *35/08;* B01J *11/18*
U.S. Cl. 208—140 19 Claims

5. In a process for the catalytic conversion of a naphtha feed stock wherein said naphtha feed stock and hydrogen are contacted with a catalyst comprising from about 0.01 to about 3.0 wt. % of an iridium component contained on a refractory inorganic oxide support at reforming conditions, the catalyst having been at least partially deactivated during contact with said naphtha feed stock by the deposition of carbonaceous residues thereon, a method for regenerating said catalyst comprising:

1. contacting said carbonaceous residue-containing catalyst, after being contacted with said naphtha feed stock but prior to contact with oxygen at a temperature greater than about 775° F., with a chlorine-containing reagent in an amount sufficient to increase and maintain the catalyst chlorine content to from 0.8 to 1.5 wt. %, based on anhydrous, carbonaceous residue-free catalyst, to inhibit the agglomerated iridium on said catalyst during the subsequent burn operation;
2. contacting said chlorinated carbonaceous residue-containing catalyst with a substantially halogen-free and sulfur-free gaseous mixture containing oxygen at a maximum temperature varying from about 775° to 900° F. for a time sufficient to burn a substantial portion of said carbonaceous residues from said catalyst while maintaining at least 0.7 wt. % chlorine on said catalyst during contact with said gas mixture; and
3. contacting said carbonaceous residue-depleted catalyst from step (2) with said naphtha feed stock at reforming conditions without having previously contacted said catalyst with an oxygen-containing gas at a temperature in excess of about 900° F.

4,046,674

PROCESS FOR REMOVING ARSENIC FROM HYDROCARBONS

Dean Arthur Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed June 25, 1976, Ser. No. 700,017
Int. Cl.² C10G *23/02*
U.S. Cl. 208—251 H 27 Claims

1. A process comprising:

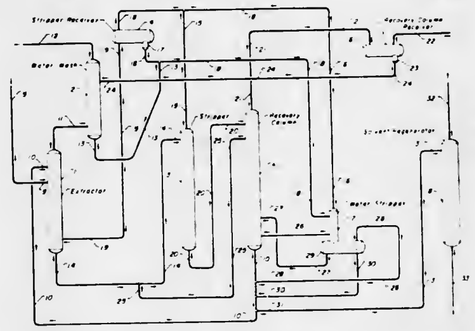
a. contacting a hydrocarbon feedstock containing at least 2 ppmw arsenic at elevated temperatures with a catalytic absorbent comprising between about 30 and 70 wt.% of one or more nickel components (as NiO) and 2 and 20 wt.% of one or more molybdenum components (as MoO_3) composited with a refractory oxide, said nickel and molybdenum components comprising a nickel sulfide and a molybdenum sulfide, until a weight of arsenic at least equal to the weight of nickel in the catalytic absorbent has been absorbed thereon; and
b. withdrawing from said contacting a product oil stream containing arsenic in a lower concentration than said feedstock.

4,046,675

AROMATIC HYDROCARBON SEPARATION VIA SOLVENT EXTRACTION

George F. Asselin, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 22, 1976, Ser. No. 679,275
Int. Cl.² C10G *21/28*
U.S. Cl. 208—321 10 Claims



1. A method for separating polar hydrocarbons from a mixture thereof with non-polar hydrocarbons and an aqueous solvent characteristically selective for absorbing polar hydrocarbons, which method comprises the steps of:

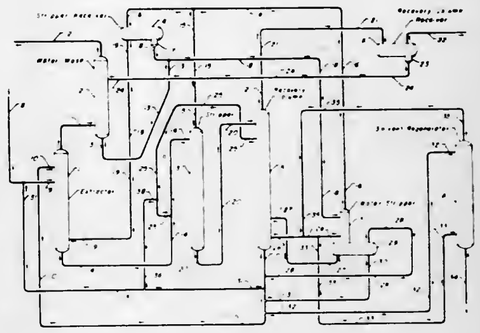
a. introducing said mixture into a first fractionation column, removing a water-containing, non-polar hydrocarbon-rich stream from an upper portion of said first column and removing a solvent-rich, polar hydrocarbon-containing stream from a lower portion of said first column;
b. introducing at least a portion of said solvent-rich, polar hydrocarbon-containing stream into a second fractionating column, removing a polar hydrocarbon-rich stream, substantially free from solvent and non-polar hydrocarbons, from an upper portion of said second column, removing a first solvent-rich stream, substantially free from hydrocarbons, from a lower portion of said second column and removing a hydrocarbon-containing, second solvent-rich stream from an intermediate portion of said second column;
c. separating water from said non-polar hydrocarbon-rich stream removed from the upper portion of said first column in step (a) and vaporizing the same to form steam;
d. introducing stream from step (c) as a vaporous stripping medium into said second fractionation column through a locus below that from which said second solvent-rich stream is removed; and,
e. introducing at least a portion of said second solvent-rich stream into said first fractionation column.

4,046,676

AROMATIC HYDROCARBON SEPARATION VIA SOLVENT EXTRACTION

George F. Asselin, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 22, 1976, Ser. No. 679,273
Int. Cl.² C10G *21/28*
U.S. Cl. 208—321 8 Claims



1. A process for the recovery of polar hydrocarbons from a mixture thereof with non-polar hydrocarbons, which process comprises the steps of:

a. introducing said polar/non-polar hydrocarbon mixture into an extraction zone and therein countercurrently contacting said mixture with a solvent characteristically selective for absorbing polar hydrocarbons, removing a non-polar hydrocarbon raffinate stream from said zone and removing a polar hydrocarbon, solvent-rich extract phase from said zone;
b. introducing said extract phase into a stripper column, removing a non-polar hydrocarbon concentrate from said stripper column, through an upper locus thereof, and removing a solvent-rich, polar hydrocarbon concentrate through a lower locus thereof;
c. introducing said polar hydrocarbon concentrate into a recovery column, through an upper first locus thereof, introducing a first vaporous stripping medium into a lower second locus thereof, recovering a substantially solvent-free, polar hydrocarbon concentrate through an upper third locus thereof, removing a substantially hydrocarbon-free, first solvent-rich stream from a lower fourth locus thereof and removing a second solvent-rich stream, containing hydrocarbons, through a fifth locus intermediate said first and second loci;
d. introducing a portion of said first solvent-rich stream into the upper section of a solvent regenerating zone and introducing a second vaporous stripping medium into the lower section of said regenerating zone and recovering a regenerated solvent stream containing substantially all of the second vaporous stripping medium;
e. introducing said regenerated solvent stream into said recovery column as at least a portion of said first vaporous stripping medium;
f. introducing a portion of said second solvent-rich stream into said stripper column through an intermediate locus thereof; and,
g. introducing another portion of said second solvent-rich stream, with said polar/non-polar hydrocarbon mixture, into said extraction zone.

4,046,677

METHOD FOR SEPARATING LARGE-SIZED FILM-LIKE PLASTICS

Kozo Saitoh, Tokyo; Hiroshi Tanaka, Chofu; Tatsuya Nagahama, Tokyo, and Sumio Izumi, Kokubunji, all of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Nihonbashi, Japan

Filed May 14, 1974, Ser. No. 469,925
Claims priority, application Japan, July 21, 1973, 48-81880
Int. Cl.² B03D 1/02
U.S. Cl. 209—166 9 Claims

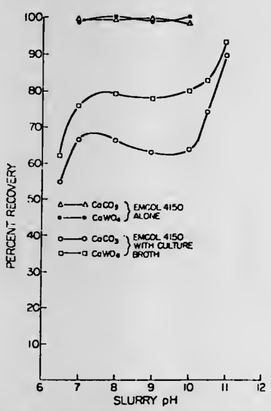
1. A method for separating plastic film-like particles of differing wettability, said particles having a size of from about 10 to about 100 mm, which comprises introducing gas bubbles into a dispersion of said particles in an aqueous liquid medium; causing greater members of gas bubbles to adhere to the surfaces of the less wettable particles thereby substantially selectively floating said less wettable particles to the surface of the liquid medium; said plastics being selected from the group consisting of polypropylene, polystyrene, soft polyvinyl chloride, hard polyvinyl chloride, a polyamide, a polyacrylate, a phenolic and a melamine.

4,046,678

FLOTATION OF SCHEELITE FROM CALCITE WITH A MICROBIAL BASED COLLECTOR

James Edward Zajic, 25 Redford Road, London, Ontario, Canada, and Naim Kosaric, E.T.H. Technisch Chemisches Laboratorium, Universitatstrasse 6, 8006 Zurich, Switzerland

Filed Sept. 9, 1975, Ser. No. 611,719
Int. Cl.² B03D 1/02
U.S. Cl. 209—166 9 Claims



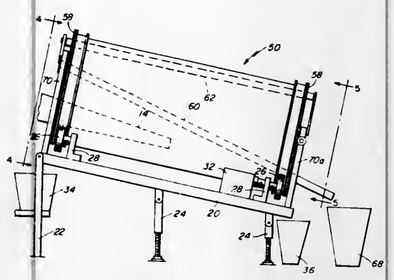
1. A process of treating an aqueous slurry of a mixture of calcite mineral ore and scheelite mineral ore by froth flotation process so as to obtain a second mixture of calcite and scheelite in which the relative proportion of scheelite is increased, which comprises adding to said aqueous slurry a surface active frother and a microbial based collector and agitating the slurry to cause frothing thereof, the microbial base collector being a product of the aerobic fermentation of a hydrocarbon substrate and a mixture of cultures including at least one culture of the genus Pseudomonas or the genus Alcaligenes in an aqueous fermentation medium, and recovering from the froth said second mixture of calcite and scheelite containing relatively increased proportion of scheelite.

4,046,679

MAGNETIC DRUM MATERIALS SEPARATOR

Ernst F. R. A. Schloemann, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 28, 1975, Ser. No. 636,176
Int. Cl.² B03C 1/12
U.S. Cl. 209—212 18 Claims



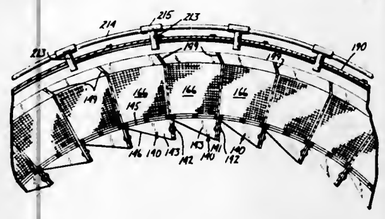
1. A magnetic rotary drum materials separating system for separating electrically conductive items from a supply of commingled materials comprising a drum disposed at a selected angle to the horizontal, said drum having on its inner surface means for separating electrically conductive items from nonconductive items in said supply, said means comprising steady-state magnetic means for establishing an alternating series of oppositely directed magnetic fields throughout a major portion of the interior of the drum at an angle to the axis thereof, said steady-state magnetic means including an array of alternating north and south magnetic pole pieces lining the inner side of the drum, said array comprising a plurality of magnets arranged in strips disposed in substantially parallel relation with each other in spirals arranged around the interior of the drum at a selected angle to said axis and in a predetermined direction; means for depositing a supply of commingled materials to be separated on said steady-state magnetic means within the drum at an axial midpoint thereof, and means for rotating the drum and said magnetic means about the longitudinal axis of the drum in a direction opposite to the direction of said spirals for causing the alternating oppositely directed magnetic fields to pass sequentially through said commingled materials and causing eddy currents to be induced in electrically conductive items in the comingled materials to produce force components which move said conductive items progressively axially upwardly toward the upper end of the drum.

4,046,680

PERMANENT MAGNET HIGH INTENSITY SEPARATOR

Alan J. Fritz, Grand Rapids, Minn., assignor to Itasca Magnetics, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 558,337, Oct. 17, 1975, Pat. No. 3,947,349. This application Jan. 29, 1976, Ser. No. 653,366
Int. Cl.² B03C 1/14
U.S. Cl. 209—214 8 Claims



1. The method of separating magnetic particles from nonmagnetic particles as components of a slurried mixture thereof which comprises steps of:

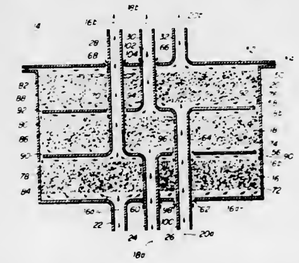
feeding the slurry to the outer surface of a hollow filter drum rotatable on a horizontal axis, for passage therethrough as a plurality of separate inwardly moving streams;
magnetically delaying the passage of magnetic particles through said filter to emerge from said filter at a different time from the nonmagnetic particles;
separately receiving the magnetic and nonmagnetic particles discharged inwardly of said drum;
and preventing said discharged material from flowing around the inside of said drum as the drum rotates.

4,046,681

MULTIPLE MATRIX ASSEMBLY AND MATRIX UNIT FOR MAGNETIC SEPARATOR WITH SIMPLIFIED SEALING

Peter G. Marston, Gloucester, and John J. Nolan, Cambridge, both of Mass., assignors to Sala Magnetics, Inc., Cambridge, Mass.

Filed July 10, 1975, Ser. No. 594,708
Int. Cl.² B03C 1/02
U.S. Cl. 209—224 7 Claims



1. A multiple matrix assembly for a magnetic separator comprising:
a container;
a plurality of magnetic matrices arranged in a longitudinal stacked array in said container; each matrix having a feed and a collection area on opposite longitudinal ends transverse to the longitudinal axis of said container and the flow through it, and having a peripheral portion surrounding it and extending longitudinally between said feed and collection areas, said matrices being disposed with their feed areas all facing in a first direction and their collection areas all facing in a second direction;
inlet and outlet means in said container for feeding to and collecting from said matrices; and
open receptacle means, disposed between each pair of adjacent matrices, each of said receptacle means including a transverse member proximate and coextensive with only one of said feed and collection areas, and a peripheral member extending longitudinally in one of said first and second directions from said transverse member along and sealingly engaged with said peripheral portion of said matrix.

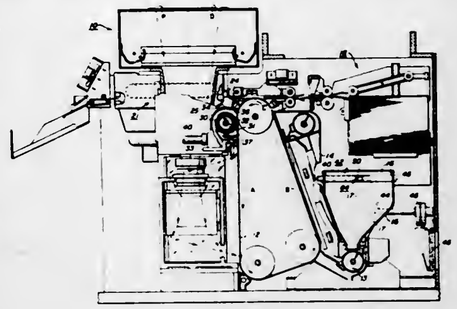
4,046,682

TONER RECLAIMING SYSTEM

Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 17, 1973, Ser. No. 324,248
Int. Cl.² B07B 1/10
U.S. Cl. 209—250 4 Claims

1. In a copier having a photosensitive surface for supporting toner images, the combination comprising conduit means, cleaning means located in said conduit means for removing toner from said surface, a housing in communication with said conduit means, suction means in communication with said conduit means and said housing for conveying toner particles away from said cleaning means, a movable endless filter means disposed in said housing for trapping and passing toner particles above and below, respectively, a predetermined size, a development system including a reservoir for toner particles, an opening in said housing means communicating with said



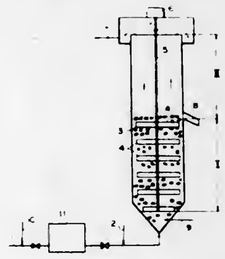
reservoir, means for discharging the trapped toner particles on said filter means through said opening into said reservoir, and means for moving said endless filter means through said housing.

4,046,683

PROCESS FOR SEPARATING SUSPENDED METAL OXIDE AND METAL HYDROXIDE SOLIDS FROM A MOTHER LIQUOR

Shogo Tsunoda; Katsuyuki Kataoka, both of Yokohama, and Toshinori Baba, Kawasaki, all of Japan, assignors to Ebara Infilco Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 481,948, June 21, 1974, abandoned. This application May 13, 1976, Ser. No. 686,195
Claims priority, application Japan, Apr. 10, 1974, 49-40779; Apr. 10, 1974, 49-40780
Int. Cl.² B01D 21/01; C02B 1/20; C02C 5/02
U.S. Cl. 210—20 13 Claims



1. A water-clarification process for separating suspended metal oxide and metal hydroxide solids from a mother liquor which may also contain metal ions and phosphate ions, the concentration of suspended solids being less than 10 g/l of said mother liquor, comprising the steps of adding to said mother liquor a high molecular weight organic flocculating agent, hereinafter referred to as "OFA", said OFA being selected from the group of polymers consisting of polyacrylamide, partially hydrolyzed polyacrylamide, and sodium polyacrylate, said polymer having a molecular weight between 500,000 and 6,000,000 in an amount sufficient for coagulating said solids, holding said OFA-treated mother liquor for a period sufficient for completion of coagulation, adding to said mother liquor containing coagulated solids after completion of coagulation an inorganic metal salt flocculating agent, hereinafter referred to as "IFA", passing essentially the entire quantity of said OFA- and IFA-treated mother liquor through an appara-

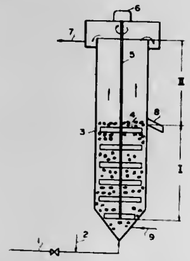
tus in an upward direction, said apparatus having in the lower section thereof a blanket layer of granulated solids formed from said coagulated solids, the concentration of granulated solids being from a lower limit of 3 times the concentration of suspended solids in the said mother liquor to an upper limit of 150 g/l, agitating said mother liquor impart a rotational flow thereto by means of an impeller on a vertical rotating shaft at a rate sufficient to bring coagulated solids into mutual contact and into contact with formed granules to form granules and larger granules, said agitation rate being below that at which said blanket layer is disrupted, the tip speed of said impeller lying between 0.05 and 0.7 m/sec., drawing off said granulated solids from said blanket layer at a rate such as to maintain the concentration of granular solids in said blanket layer within said limits, and drawing off clarified water above said blanket layer, said IFA being added in an amount effective in combination with said agitation for granulating said coagulated solids.

4,046,684

PROCESS FOR THE TREATMENT OF A COLLOIDAL SUSPENSION

Shogo Tsunoda, and Katsuyuki Katsuka, both of Yokohama, Japan, assignors to Ebara Infilco Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 481,947, June 21, 1974, abandoned. This application May 13, 1976, Ser. No. 686,197
Int. Cl.² C02B *1/20*
U.S. Cl. 210—20 **13 Claims**



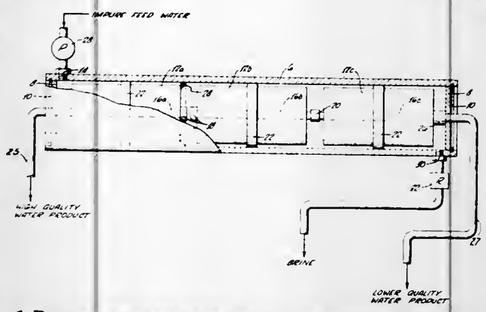
1. A water-clarification process for separating colloidally-suspended solids from a mother liquor containing less than 10 g/l of said colloidally-suspended solids, comprising the steps of adding to said mother liquor an inorganic metal salt flocculating agent, hereinafter referred to as "IFA" in an amount sufficient for coagulating said solids, holding said IFA-treated mother liquor for a period sufficient for completion of coagulation, adding to said mother liquor containing coagulated solids immediately after completion of coagulation a high molecular weight organic flocculating agent, hereinafter referred to as "OFA", said OFA being selected from the group of polymers consisting of polyacrylamide, partially hydrolyzed polyacrylamide, and sodium polyacrylate, said polymer having a molecular weight between 500,000 and 6,000,000, introducing essentially the entire quantity of said IFA- and OFA- treated mother liquor into an apparatus for upward flow therethrough, said apparatus having in the lower section thereof a blanket layer of granulated solids formed from said coagulated solids, the solids concentration in said blanket layer lying between a lower limit of 3 times that of the colloidally-suspended solids in said mother suspension and an upper limit of 150 g/l, agitating said mother liquor to impart a rotational flow of said mother liquor at a rate sufficient to bring said coagulated solids in mutual contact and form said granulated solids, said agitation rate being below that at which said blanket is disrupted, and said agitation being effected by impellers rotating about a vertical shaft with a tip speed between 0.05 and 0.7 m/sec, drawing off said granulated solids from said blanket layer at a rate such as to maintain the concentration of granular solids in said blanket layer within said limits, and drawing off clarified water above said blanket layer, said OFA being added in an amount effective in combination with said agitation for granulating said coagulated solids.

4,046,685

SIMULTANEOUS PRODUCTION OF MULTIPLE GRADES OF PURIFIED WATER BY REVERSE OSMOSIS

Donald Theodore Bray, Escondido, Calif., assignor to Desalination Systems, Inc., Escondido, Calif.

Continuation-in-part of Ser. No. 382,909, July 26, 1973. This application Mar. 17, 1976, Ser. No. 667,842
Int. Cl.² B01D *13/00, 31/00*
U.S. Cl. 210—23 H **9 Claims**



1. Reverse osmosis apparatus comprising a unitary elongated pressure resistant container housing a plurality of semipermeable membrane cartridges, said pressure resistant container having an impure feed water inlet near one of its ends, a brine outlet near the other of its ends, and a product water outlet communicating with a permeate collector for said semipermeable membrane cartridges; in which the improvement comprises:

a. said pressure resistant container housing at least two of said semipermeable membrane cartridges, arranged in end-to-end relationship, and through which said impure feed water flows sequentially, in a single stage, the unpermeated feed water from each cartridge constituting the feed water for the next cartridge in the sequence;

b. a first product water outlet from said pressure resistant container, to provide an amount of high quality, low total dissolved solids content product water, connected only to the permeate collector of at least one of said semipermeable membrane cartridges located nearest the impure feed water inlet of said pressure resistant container; and

c. a second product water outlet from said pressure resistant container, to simultaneously provide an amount of lower quality, higher total dissolved solids content product water, connected only to the permeate collector of the remainder of said semipermeable membrane cartridges in said pressure resistant container.

4,046,686

REVERSE OSMOSIS TREATMENT OF BATTERY WASTE

Melvin Goldstein, Mountain Brook, Ala., assignor to Crane Co., New York, N.Y.

Continuation of Ser. No. 573,185, April 30, 1975, abandoned. This application Jan. 7, 1977, Ser. No. 757,528
Int. Cl.² B01D *13/00*
U.S. Cl. 210—23 H **14 Claims**

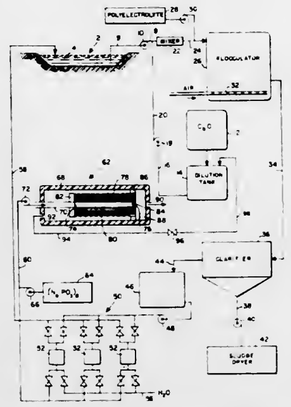
1. A process for the treatment of acid waste comprising the steps of:

a. introducing a lime solution into the acid waste, thereby neutralizing the acid and precipitating calcium sulphate;

b. mechanically removing precipitated matter from the neutralized waste;

c. introducing a sequestering agent into the liquid which remains after removal of the precipitated matter, to sequester dissolved calcium;

d. introducing into a permeator, the liquid which results after the introduction of the sequestering agent and there effecting, by reverse osmosis, a separation of the last mentioned liquid into a first component consisting of essentially pure water, and a second component comprising water and separated calcium: and



e. introducing the second component into the lime solution prior to the aforementioned introduction of the lime solution into the acid waste, to thereby convert the sequestering agent to a less effective form removable in said mechanical removal or reverse osmosis steps.

4,046,687

PROCESS FOR THE ADSORPTIVE REMOVAL OF ARSENIC, ANTIMONY AND/OR BISMUTH FROM AN AQUEOUS SOLUTION

Reinhold Schulze, Seevetal, Germany, assignor to Norddeutsche Affinerie, Hamburg, Germany

Filed Mar. 31, 1976, Ser. No. 672,334
Claims priority, application Germany, Apr. 11, 1975, 2515861
Int. Cl.² B01D *15/06*
U.S. Cl. 210—32 **5 Claims**

1. A process for the adsorptive removal of an element from the group which consists of arsenic, antimony and bismuth from an aqueous solution containing same, comprising: treating the solution with an adsorbent consisting of a salt of phosphoric acid or of a phosphate ester, said salt or ester being located in the pores of a porous substrate consisting of particles having a maximum particle size of 3 to 10 mm and a porosity of at least 40%, said salt being a salt of a cation selected from the group which consists of trivalent cerium and lanthanum and tetravalent titanium, zirconium and tin, and recovering said element from said adsorbent.

4,046,688

REMOVAL OF ANTIMONY FROM INDUSTRIAL STREAMS

Virginia L. Cunningham, Hatboro; James S. Clovis, Morrisville, and Marvin J. Hurwitz, Elkins Park, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 21, 1975, Ser. No. 624,359
Int. Cl.² C02B *1/56*
U.S. Cl. 210—37 R **11 Claims**

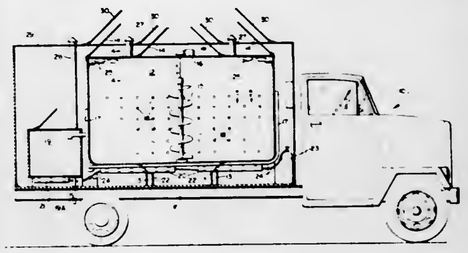
1. A process for removing antimony from an industrial stream containing a minor amount of solubilized antimony which comprises passing said industrial stream into contact with at least one ion exchange resin selected from strong acid cation exchange resin in the hydrogen form to remove antimony present as, or convertible to, the cationic form and strong base anion exchange resin in the hydroxyl form to remove antimony present as, or convertible to, the anionic form.

4,046,689

METHOD AND APPARATUS FOR TRANSPORTING SLUDGE WHILE RENDERING IT FOR CONVERSION INTO FERTILIZER

Marion H. Argyll, 15 E. Irving St., Chevy Chase, Md. 20015

Filed July 9, 1976, Ser. No. 703,948
Int. Cl.² C22B *11/10*
U.S. Cl. 210—59 **5 Claims**



1. An apparatus for transporting secondary sludge and effluent while rendering it usable for conversion into fertilizer, comprising the following elements:

a. a truck body having a transport bed,

b. a drum mounted on and spaced above said transport bed,

c. channels secured about the outside of the drum and communicating with the interior of the drum through openings through the wall of the drum,

d. burners carried by the drum support being spaced along and beneath said drum,

e. an archimedean screw plunger mounted in said drum for rotary and vertical movement relative thereto,

f. an effluent tank secured to said transport bed and spaced above same,

g. burners carried beneath said effluent tank and being connected to a heat source,

h. means connecting said effluent tank to said channels to receive effluent therefrom,

i. a plurality of pivotally mounted doors along the top of said drum,

j. fan means pivotally mounted to the outside of the drum for direction into the drum when the doors are open,

k. discharge doors in the bottom of said drum for discharging dried sludge, and

l. discharge means for said effluent tank; said elements cooperatively functioning the produce a dry granular material from said sludge and effluent, which forms the base for a fertilizer product and a liquid which forms the base for a urea fertilizer product.

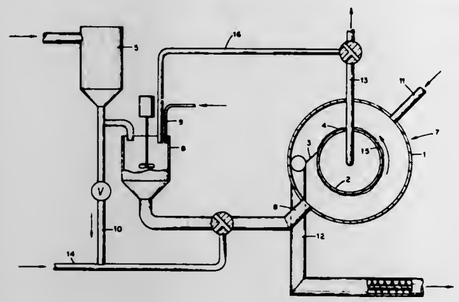
4. The method of transporting secondary sludge and effluent from a sewage system to a fertilizer plant comprising filling a drum with a mixture of sludge and effluent, heating the mixture to boiling during transport so as to separate the effluent into a separate effluent container and to dry and concentrate the sludge, aerating the sludge within the drum, and upon arriving at destination removing concentrated effluent in liquid state from the liquid effluent container and raking and dried sludge from the drum; said dried sludge providing a base for a fertilizer product and said concentrated effluent providing a base for a urea fertilizer product.

4,046,690

FILTERING COAL-DERIVED OIL THROUGH A FILTER MEDIA PRECOATED WITH PARTICLES PARTIALLY SOLUBILIZED BY SAID OIL

Billy R. Rodgers, Concord, and Michael S. Edwards, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 1, 1976, Ser. No. 672,807
Int. Cl.² B01D 37/02
U.S. Cl. 210—75 7 Claims



1. A method for separating solids such as char, ash, and refractory organic compounds from a viscous slurry comprising tars, asphaltenes, and up to 25 wt.% of said solids including ash particles smaller than 1 micron, said method comprising the steps of:

a. forming a layer of partially solubilized 85–350 mesh particles of anthracite coal, bituminous coal, lignite, devolatilized anthracite coal, devolatilized bituminous coal, or devolatilized lignite on a filter media;

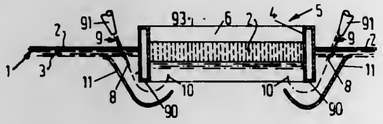
b. filtering said viscous slurry through said layer and said media at a differential pressure of about 0.1–10 atmosphere across said media and said layer so as to recover a liquid containing less than 0.15 wt.% ash.

4,046,691

METHOD FOR COLLECTING LIGHT-WEIGHT SUBSTANCE FLOATING ON A LIQUID SURFACE

Eric Irons, East Haddon, England, assignor to Ballast-Nedam Groep, N.V., Amstelveen, Netherlands

Continuation of Ser. No. 545,552, Jan. 30, 1975, abandoned. This application Apr. 26, 1976, Ser. No. 680,449
Claims priority, application United Kingdom, Feb. 25, 1974, 9211/74; Netherlands, Aug. 23, 1974, 7411232
Int. Cl.² E02B 15/04
U.S. Cl. 210—83 3 Claims



1. The method of collecting oil floating on the surface of a body of water, comprising the steps of:

a. providing an enclosure with an open bottom and side walls extending from a depth below the interface between the oil and water to above the surface of the body of water;

b. locating a nozzle above the surface of said body of water outside of and spaced from said side walls and downwardly directed for directing water from said nozzle to a location beneath the open bottom of said enclosure;

c. directing a stream of water from said nozzle through the oil on the surface of said body of water whereby said oil is displaced to a location beneath the open bottom of said enclosure and thereafter rises to the surface of the water within said enclosure; and

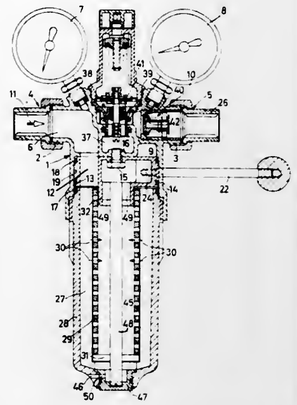
d. removing the oil from the surface of the water within said enclosure.

4,046,692

DOMESTIC WATER CONTROL UNIT

Bernhard W. Braukmann, and Rudolph Vollmer, both of Mosbach, Germany, assignors to Braukmann Armaturen AG, Rotherist, Switzerland

Filed Sept. 17, 1975, Ser. No. 614,245
Int. Cl.² B01D 35/14
U.S. Cl. 210—108 3 Claims



1. A domestic water control unit comprising a housing, a filter located in said housing to provide a channel, an inlet and an outlet in line in said housing above and normal to said channel, a pressure reducer between said inlet and said outlet above said filter, a check valve in said outlet, the normal flow from said inlet being along said channel through said filter and then through said check valve to said outlet, a rotary valve between said filter and said check valve movable from a first position in which it receives said normal flow to a second position to reverse the flow from said inlet through said filter and then into said channel and a plug valve to said housing, connected to said rotary valve and responsive thereto, the arrangement being such that on normal flow the plug valve is closed but on reverse flow through operation of said rotary valve, the latter opens said plug valve to drain said unit, said rotary valve and said plug valve being co-axial and connected by means of a rod which passes axially through said filter.

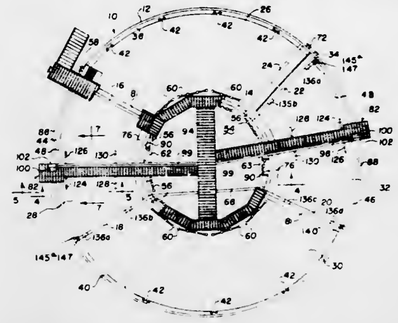
4,046,693

SCUM SKIMMER APPARATUS

Nolan S. Glover, Mineral Wells, Tex., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Aug. 27, 1975, Ser. No. 608,286
Int. Cl.² B01D 21/12; C02B 1/36; C02C 1/16, 1/30
U.S. Cl. 210—195 S 20 Claims

1. In a clarifier tank for removing microorganisms and waste from liquid influent: a tank having first and second ends joined by side walls; a bridge; means moveably mounting the bridge over the tank; drive means to move said bridge from a position adjacent the first end of the tank to a second position adjacent the second end of the tank; means to alternately reverse the direction of movement of the bridge between the first and second ends of the tank; a skimmer blade; a ballast chamber having an open lower end submersible below the level of liquid in the tank; means for rigidly securing the ballast chamber to the skimmer blade; means for slideably attaching the ballast chamber to the bridge for movement in a vertical direction such that the ballast chamber and skimmer blade move in a horizontal direction with the bridge but are free to move in a vertical direction relative to the bridge to move the skimmer blade out of contact with the liquid; air supply means communicating with the interior of the ballast chamber above the liquid level therein; a valve to control the flow of air into and



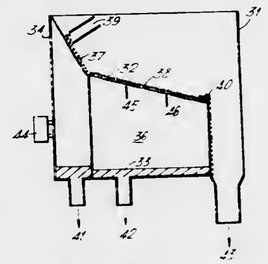
out of the ballast chamber such that air may be injected under pressure into the ballast chamber to raise the ballast chamber upwardly in the liquid, and air may be vented from the ballast chamber through the valve to lower the ballast chamber into the liquid; actuating means adjacent the first end to control the valve means to move the valve to a position to admit air under pressure into the chamber; and actuating means adjacent the second end of the tank to move the valve to a position to exhaust air from the chamber.

4,046,694

APPARATUS FOR SEPARATING PARTICULATE SOLIDS FROM LIQUIDS

John Frederick Ellis, Preston, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 4, 1974, Ser. No. 458,043
Claims priority, application United Kingdom, Feb. 1, 1974, 4868/74
Int. Cl.² B01D 35/20
U.S. Cl. 210—297 3 Claims



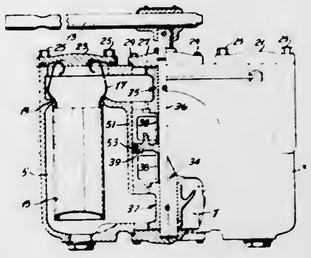
1. Apparatus for the separation of particulate solids from a liquid, the apparatus comprising a container, a first generally planar declivous draining screen located within the container to separate upper and lower regions of the container, means including a subsidiary generally planar declivous draining screen disposed above, inclined in the same sense as, but steeper than, the first screen for feeding a mixture of particulate solids and liquid onto the upper end of the first screen, baffles on the underside of the first screen transverse to the direction of movement of the solids to discourage adherence of liquid beneath the first screen, a weir in the form of a generally vertical barrier upstanding abruptly from and disposed at the lower end of the first screen for allowing the controlled passage of solids thereover, means for withdrawing liquid from the lower region of the container substantially below the lowest part of either screen to ensure that the screens are above the level of any liquid in the container, and means for vibrating the container to move solids along the first screen and over the weir.

4,046,695

DUPLEX BASKET STRAINER ARRANGEMENT

John W. Tucker, 10 - 38th Avenue, Ile Perrot, Quebec, Canada

Filed June 7, 1976, Ser. No. 693,726
Int. Cl.² B01D 35/12
U.S. Cl. 210—340 5 Claims



1. A duplex basket strainer arrangement comprising:

an outer casing having a first basket strainer receptacle at one end thereof, a second basket strainer receptacle at the other end thereof, a center plug receptacle having an inner wall surface and being disposed between said first and second receptacles, inlet means disposed in one side wall of said casing for permitting entry of a fluid into said casing, and outlet means in the other side wall of said casing for permitting exit of said fluid from said casing;

a center plug disposed in said center plug receptacle, said center plug comprising an elongated shaft member, extending through, and being coaxial with, said center plug receptacle, an inflow stage comprising an inflow valve circular in cross-section, an outflow stage comprising an outflow valve circular in cross-section, said shaft being mounted for rotation therewith, a circular separator plate mounted on said shaft for relative rotation and disposed in said center plug receptacle between said inflow and outflow valves, and spacer means on said shaft between said circular separator plate and each of said inflow and outflow valves positioning said circular separator plate axially of said shaft, and resilient means disposed around the periphery of said separator plate;

the outer diameter of said resilient means being greater than the diameter of the inner wall surface of said center plug receptacle adjacent said resilient means, said resilient means resiliently engaging the inner wall surface and providing both a fluid tight seal between said inflow stage and said outflow stage and restraining means fixing said circular separator plate against rotation;

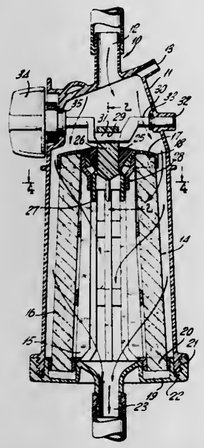
each of said valve comprising a cylindrical shell surrounding a hollow interior and having one end thereof adjacent said separator plate, said one end being open to permit communication with said hollow interior therethrough, and a side opening in each shell to permit communication with said hollow interior therethrough.

4,046,696

EXTRACORPOREAL CIRCUIT BLOOD FILTER

Herman Charles Mouwen, Ventura, Calif., assignor to Johnson & Johnson, New Brunswick, N.J. and Purolator, Inc., Del.

Continuation-in-part of Ser. No. 462,455, April 19, 1974, abandoned. This application Sept. 23, 1975, Ser. No. 615,854
Int. Cl.² B01D *35/02*
U.S. Cl. 210—431 **1 Claim**



1. An extracorporeal blood filter comprising an assembly for supporting a cartridge filter media in a housing fixedly securable to said assembly, said housing having an inlet in the top portion thereof for receiving unfiltered blood, said assembly for supporting the filter cartridge comprising a bottom member attached to the bottom of said housing, said bottom member having a blood outlet located substantially in the center of said bottom member, a hollow, permeable, cylindrical core extending upwardly within the housing from said bottom member to a top cap, filter media contained within the housing and extending from the top cap to the bottom member and about the periphery of the core, said top cap having an opening substantially in the center of said top cap, a valve member seated in said opening, a rotatable shaft mounted in the housing, a portion of said shaft being offset from the major axis of the shaft, said offset portion being connected to the valve member, and means for rotating the shaft whereby the valve member is lifter upwardly and away from the opening in the top cap and blood is allowed to flow directly through the hollow core to the blood outlet.

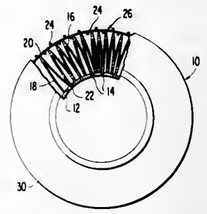
4,046,697

PLEATED PAPER FILTER

Southwick W. Briggs, 6420 Western Ave., Chevy Chase, Md. 20015, and William A. Brazerol, 2115 31st Place, SE., Washington, D.C. 20020

Continuation of Ser. No. 711,159, Feb. 27, 1968, abandoned, which is a continuation-in-part of Ser. No. 371,899, June 2, 1964, abandoned. This application Oct. 13, 1969, Ser. No. 866,169
Int. Cl.² B01D *27/06*
U.S. Cl. 210—457 **8 Claims**

1. In a filter, an elongated permeable filter element providing a lengthwise extending annular array of normally stable pleats, each being resiliently flexible in a direction generally circumferential of the filter element, and flexibly collapsible foraminous means successively extending from pleat to pleat and being secured to each pleat and interconnecting the pleats in a selectively collapsible ganged relationship to enable circumferential collapse of any particular ganged pleat towards an adjacent ganged pleat and to provide concurrent circumferential flexing movement of a plurality of successively adjacent ganged pleats when said particular ganged pleat undergoes circumferential collapse, with each of said plurality of successively adjacent ganged pleats thereafter resiliently restoring to



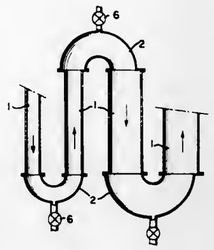
act collectively through said flexible means in returning the collapsed pleat.

4,046,698

COALESCENCE APPARATUS

Jacob Pielkenrood, Krommenie, Netherlands, assignor to Pielkenrood-Vinitex B.V., Assendelft, Netherlands

Continuation of Ser. No. 521,573, Nov. 7, 1974, Pat. No. 3,972,819. This application Apr. 14, 1976, Ser. No. 676,708
The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.
Int. Cl.² B01D *21/00*
U.S. Cl. 210—513 **4 Claims**



1. In combination with gravitational separation apparatus for the gravitational separation of particles suspended in a fluid:
fluid conduit means for causing the coalescence of particles suspended in a fluid in said conduit, including
an inlet end in communication with a source of fluid,
an outlet end in fluid communication with said separation apparatus for separation of particles in the latter by gravity, and
means for increasing the collision frequency of particles in a fluid within said conduit including
at least two vertically arranged sections in said conduit, said sections being of unequal cross-sectional area with, of any two sections, the one having the greater cross-sectional area being closer to said outlet end, and
a "U" bend interconnecting said sections.

4,046,699

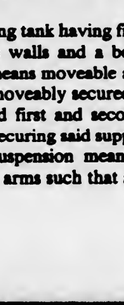
ACCESS DEVICE FOR CENTRIFUGAL SEPARATION ASSEMBLIES

Anthony R. Zine, Jr., Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,536
Int. Cl.² B01D *21/26*
U.S. Cl. 210—516 **10 Claims**

1. An access device for use in combination with a multiple phase fluid having a light phase and a heavy phase for gaining access to the separated heavy phase of the multiple phase fluid comprising, upright tubular means for providing access to the separated heavy phase of a multiphase fluid, and base means for supporting said upright tubular means, said base means having a closed bottom end and an open upper end, said open upper end having a cavity formed therein extending downwardly within said base means, means for mounting said upright tubular means on an upper portion of said base means, said tubular means including a tubular portion extending upwardly from said base means and having a top end and a bottom end, said bottom end being positioned in open communication with said cavity formed in said base means for access to a separated heavy phase, said top end being provided with a porous membrane, and said access device having an apparent specific gravity greater than the specific gravity of the heavy phase of said multiple phase fluid.

5. In combination with a vessel for collecting and partitioning multiphase fluids into an upper light phase and a lower heavy phase, an access device having an apparent specific gravity greater than the specific gravity of the heavy phase to



be separated for permitting access to and extraction of such lower separated heavy phase of the multiphase fluid comprising, vessel means for collecting and partitioning a multiphase fluid into a light phase and a heavy phase and for receiving said access device, partitioning media in said vessel for partitioning separated light and heavy phases of the multiphase fluid, said access device including upright tubular means for providing access to the separated heavy phase of a multiphase fluid, and base means for supporting said upright tubular means and for directing the flow of said partitioning media for partitioning separated light and heavy phases of the multiphase fluid, said upright tubular means including a tubular section having an upper end adapted to extend above the upper surface of a separated light phase and an open lower end adapted to be an open communication with a separated heavy phase, said tubular section having an outer surface which is radially inwardly offset from the outer periphery of said base means, and means for mounting said upright tubular means on an upper portion of said base means.

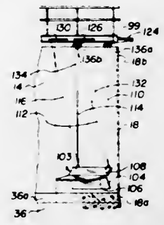
4,046,700

SLUDGE SCRAPER MECHANISM

Nolan S. Glover, Mineral Wells, Tex., assignor to Harsco Corporation, Camp Hill, Pa.

Filed July 8, 1975, Ser. No. 594,116
Int. Cl.² B01D *21/18*
U.S. Cl. 210—523 **19 Claims**

15. In a sludge settling tank having first and second end walls secured between side walls and a bottom, a sludge scraper comprising: scraper means moveable along the bottom of said tank; support means moveably secured over said tank adapted to move between said first and second end walls; a pair of support arms; means securing said support arms to said support means and flexible suspension means securing said scraper means to said support arms such that as an end of each of said support arms moves past one of the end walls the flexible suspension means is drawn over the end wall thereby lifting the



scraper means off of the bottom and then to lower the scraper means to the bottom as the support means reverses direction.

4,046,701

DURABLE FLAME RETARDANT FINISHES FOR TEXTILE MATERIALS

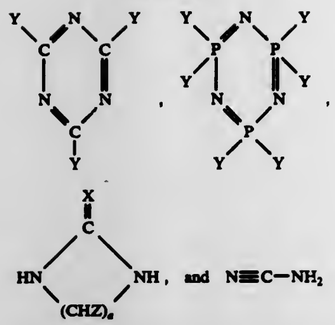
Ray E. Smith, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 23, 1976, Ser. No. 660,502
Int. Cl.² C09K *3/28*
U.S. Cl. 252—8.1 **76 Claims**

1. A flame retardant textile finish containing:
a. from about 16 percent to about 30 percent of a flame retardant compound of the formula

wherein each X is independently selected from chlorine or bromine, wherein each R is independently selected from the group consisting of hydrogen, hydroxyalkyl, halogenated hydroxyalkyl, and $(YO)_nH$ groups, wherein said hydroxyalkyl groups contain from 2 to 6 carbon atoms per group, wherein said halogenated hydroxyalkyl groups contain from 1 to 4 halogen atoms per group, said halogen atoms being selected from chlorine or bromine, wherein Y is an alkyl or monohalogenated alkyl group, said monohalogenated alkyl group having a halogen atom selected from chlorine or bromine, wherein n is an integer from 1 to 20, and mixtures thereof;
b. from about 3.2 percent to about 4.8 percent of a substantially water immiscible organic solvent characterized by having a flash point of at least 80° F. and a boiling point within the range of from about 300° to about 350° F.;
c. from about 3.2 percent to about 4.8 percent of an emulsifying agent possessing a hydrophile lipophile balance value of from about 10 to about 14;
d. from about 25 percent to about 45 percent of a water soluble quaternary phosphonium salt selected from the group consisting of tetrakis (hydroxymethyl) phosphonium and tetrakis (methylhydroxymethyl) phosphonium salts;
e. from about 9 percent to about 16 percent of a water soluble organic nitrogen containing compounds selected from the group consisting of

-continued



wherein each G is independently selected from the group consisting of hydrogen, hydroxymethyl, alkyl containing 1 to 6 carbon atoms, amino, and cyano; X is selected from the group consisting of oxygen, sulfur, =NH, and =NC ≡N; *m* is an integer from 0 to 1; *n* is an integer from 1 to 2 with the provision that *m* + *n* equals 2; a is an integer from 2 to 3; each Y independently is —NHG wherein G is defined above; and Z is selected from the group consisting of hydrogen and hydroxyl; and

f. from about 20 percent to about 32 percent of water.

4,046,702

LUBRICATING OIL COMPOSITION

Thomas V. Listou, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 5, 1976, Ser. No. 655,659

The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.

Int. Cl.² C10M *1/38*

U.S. Cl. 252—33.4 **6 Claims**

1. A lubricating composition comprising an oil of lubricating viscosity and from 10 to 10,000 parts per million of the sulfated alcohol or phenol, having a molecular weight in the range of 500–5,000, said sulfated alcohol or phenol being prepared by the steps comprising:
   1. reacting (i) an aliphatic alcohol having from 1-20 carbon atoms, from 0 to 10 amino groups and from 1 to 10 hydroxy groups or phenol or a C_1 to C_{20} alkyl phenol with (ii) ethylene oxide or propylene oxide or mixtures thereof, to form a polyoxyalkylenated alcohol or phenol,
   2. reacting said polyoxyalkylenated alcohol orphenol with sodium, potassium, sodium hydride, sodium methoxide, potassium methoxide or potassium t-butoxide to form the sodium or potassium salt of said polyoxyalkylenated alcohol or phenol, and
   3. sulfating said sodium or potassium salt of polyoxyalkylenated alcohol or phenol by reaction with chlorosulfonic acid to form said sulfated alcohol.

4,046,703

TRACTION FLUIDS

Irl N. Duling, West Chester, and David S. Gates, Swarthmore, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Division of Ser. No. 598,619, July 23, 1975, abandoned, which is a division of Ser. No. 163,543, July 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 679,833, Nov. 1, 1967, Pat. No. 3,595,796. This application Nov. 26, 1975, Ser. No. 635,561

Int. Cl.² C10M *1/16, 3/10*

U.S. Cl. 252—59 **4 Claims**

1. Method of increasing the coefficient of traction between two surfaces in tractive relationship which comprises introducing to said surfaces a perhydrogenated dimer of styrene or a methylstyrene.

4,046,704

HIGH POLYMER ELECTRET

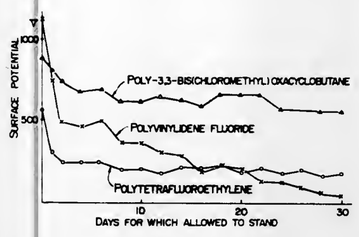
Isao Sumita, Toyonaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 13, 1973, Ser. No. 415,304

Claims priority, application Japan, Nov. 16, 1972, 47-115376

Int. Cl.² H01B *3/00*

U.S. Cl. 252—63.2 **2 Claims**



1. A high polymer electret composed, as main component, of at least one member selected from the group consisting of poly-3,3-bis-(chloromethyl)oxacyclobutane, poly-3,3-bis(-fluoromethyl)oxacyclobutane and poly-3,3-bis-(bromomethyl)-oxacyclobutane, which has been treated by applying thereto a d-c electric field of high intensity at a temperature above room temperature which is gradually reduced to room temperature.

2. A high polymer electret according to claim 1, wherein it contains additionally one member selected from polyethylene, polypropylene, polyvinylidene fluoride and polyethyleneterephthalate.

4,046,705

STABLE BLEACHING DETERGENT COMPOSITION

Kouichi Yagi, Tokyo; Makoto Yamanaka, Koganei, and Takashi Fujino, Yokohama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed May 21, 1976, Ser. No. 688,531

Claims priority, application Japan, June 4, 1975, 50-67268

Int. Cl.² C11D *7/18, 7/56*

U.S. Cl. 252—99 **7 Claims**

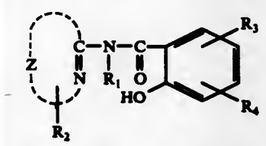
1. A stable bleaching detergent composition, consisting essentially of:

A. from about one to about 30 percent by weight of a surfactant selected from the group consisting of water-soluble anionic surfactant, water-soluble nonionic surfactant, water-soluble amphoteric surfactant and mixtures thereof;

B. from about one to about 50 percent by weight of an inorganic peroxygen compound capable of releasing oxygen in aqueous solution;

C. the balance is a substance selected from the group consisting of water-soluble neutral inorganic builder salts, water-soluble alkaline inorganic builder salts, water-soluble organic builders and mixtures thereof; and

D. from 0.001 to 5 parts by weight, per 100 parts by weight of the sum of the weights of A plus B plus C, of a compound or mixture of compounds having the formula



wherein R_1 is hydrogen or alkyl having one to 3 carbon atoms;



is a monovalent radical of an unsaturated 5 member or 6 member heterocyclic ring containing only nitrogen and carbon atoms in the ring, or said heterocylic ring fused to a benzene ring or another heterocyclic ring to give a polycyclic radical having the characteristic

grouping; R_2 is hydrogen, unsubstituted alkyl having one to 10 carbon atoms, alkyl having one to 10 carbon atoms substituted with hydroxy, chloro, amino, alkoxy (C_1 to C_{10}), phenoxy, phenyl, hydroxyphenyl or benzoylamino, unsubstituted phenyl, phenyl substituted with one or two alkyls (C_1 to C_2), chloro, hydroxy, alkoxy (C_1 to C_{10}), acyloxy (C_1 to C_4) or amino, aroyl having 6 to 8 carbon atoms, pyridyl or oxopyrrolidinyl; R_3 is hydrogen, unsubstituted alkyl having one to 22 carbon atoms, alkyl having one to 22 carbon atom substituted with hydroxy, chloro, alkoxy (C_1 to C_4), phenoxy, phenyl or amino, phenyl, phenyl substituted with one or 2 alkyls having one or 2 carbon atoms or alkoxy (C_1 to C_{10}), aroyl having 6 to 8 carbon atoms, alkoxy having one to 10 carbon atoms, phenoxy, halogen, alkylamino (C_1 to C_{10}), aminosulfonamido, alkanoyloxy (C_2 to C_6), aroyloxy (C_6 to C_8), carbamoyl, alkoxy (C_1 to C_{10}) carbonyl and aryl (C_6 to C_8) oxycarbonyl, or R_3 and R_4 together form a benzo group; and R_4 is hydrogen or $—R_5Y$, in which R_5 is alkylene having one to 6 carbons, alkylidene having one to 6 carbons or phenylene, and Y is a radical obtained by removing R_4 from a compound of said formula.

4,046,706

CONTACT LENS CLEANING COMPOSITION

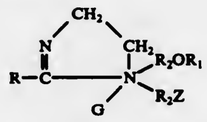
Joseph Zenon Krezanoski, Los Altos, Calif., assignor to Flow Pharmaceuticals, Inc., Palo Alto, Calif.

Filed Apr. 6, 1976, Ser. No. 674,159

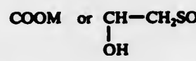
Int. Cl.² C11D *1/94, 1/88*

U.S. Cl. 252—106 **19 Claims**

1. An aqueous composition for cleaning contact lenses which comprises:
   a. about 0.01% to about 40% of a poly (oxyethylene)-poly(oxypropylene) block copolymer having a molecular weight between about 1900 and 15,500, a water solubility in excess of about 10 grams per 100 ml, a cloud point in 1% aqueous solution above about 30° C and a Foam Height in excess of 30 mm;
   b. about 2% to about 25% ethyl or isopropyl alcohol; and
   c. about 2% to about 25% of an amphoteric surfactant having the formula



in which R is a C_6 to C_{24} hydrocarbon radical, selected from straight or branch chain, saturated or unsaturated, aliphatic hydrocarbon or an alkyl-aryl group in which the alkyl group contains at least six carbon atoms; R_1 is H, alkali metal, or CH_2COOM; R_2 is a C_1 to C_4 alkylene group; Z is



M is alkali metal, H or a nitrogen containing organic base; and G is OH, or a radical comprising the acid group of a C_6 to C_{24} anionic surface active sulfate or sulfonate.

4,046,707

TREATMENT OF AQUEOUS SYSTEMS

Malcolm John Smith; Peter Miles, both of Stockport; Norman Richardson, Middleton, and Michael Anthony Finan, Macclesfield, all of England, assignors to Ciba Geigy (UK) Limited, London, England

Filed May 29, 1975, Ser. No. 582,402

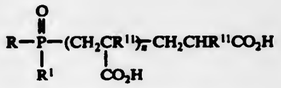
Claims priority, application United Kingdom, June 11, 1974, 25853/74

Int. Cl.² C02B *5/06*

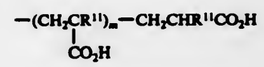
U.S. Cl. 252—180 **5 Claims**

1. A method of inhibiting the precipitation of the scale forming salts of calcium, magnesium, barium and strontium from aqueous systems comprising adding to the aqueous system a minor but effective scale-inhibiting amount of a product comprising a telomeric compound of the formula:

I



or salts thereof, wherein R^{11} is hydrogen of a methyl or ethyl residue, R is a residue of formula:



wherein R^{11} has its previous significance, and the sum of n + m is an integer of at most 100, and R^1 is OH.

4,046,708

MIXTURE OF NEMATIC LIQUID CRYSTALS EXHIBITING A POSITIVE DIELECTRIC ANISOTROPY AND A WIDE TEMPERATURE RANGE

Jean-Claude Dubois, Paris, France, assignor to Thomson-CSF, Paris, France

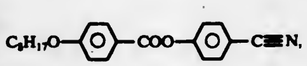
Filed Nov. 25, 1974, Ser. No. 526,930

Claims priority, application France, Nov. 28, 1973, 73.42293

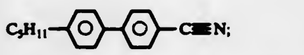
Int. Cl.² C09K *3/34*; G02F *1/13*

U.S. Cl. 252—299 **2 Claims**

1. A mixture of nematic liquid crystals consisting essentially of about two moles of:



about one mole of:



the mixture having a nematic range of about 0° C. to 70° C.

4,046,709
METHOD OF MANUFACTURING CARBONACEOUS GRANULAR MOLECULAR SIEVE

Nakaji Yuki, Kawaguchi, Japan, assignor to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 24, 1975, Ser. No. 561,164
Int. Cl.² B01J 37/00, 21/18; C01B 31/00
U.S. Cl. 252—421 5 Claims

1. A method of manufacturing carbonaceous granular molecular sieves having a pore diameter in the range of about 3–10 A comprising the steps of subjecting a vinylidene chloride copolymer to a thermal carbonization treatment for removal of hydrogen chloride gas, cooling and pulverizing the resultant product to a grain size smaller than 100 mesh, admixing per 100 parts of said pulverized product 15 to 35 parts of a carbonaceous sintering agent and 8 to 15 parts of an organic pelletizing binder generating gas upon heating, pelletizing the resultant mixture and carbonizing the resultant pellets without activation at a temperature ranging from 400° C to 900° C for a period ranging from 2 to 6 hours, all parts being by weight.

4,046,710
POLYMERIZATION OF CYCLIC OLEFINS

Günther Lehnert; Dieter Maartens; Gottfried Pampus, all of Leverkusen, Germany, and Josef Witte, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation of Ser. No. 481,188, June 20, 1974, abandoned. This application Jan. 27, 1976, Ser. No. 652,884
Claims priority, application Germany, June 27, 1973, 2332563
Int. Cl.² C08F 4/78
U.S. Cl. 252—429 B 5 Claims

1. A process for the preparation of a catalyst composition which consists essentially of reacting at least one halide or oxyhalide of molybdenum with at least one 2-haloalcohol at −30° to 20° C. until evolution of hydrogen halide ceases either in the absence of solvent or in the presence of at least one chlorinated polar solvent which is inert towards the molybdenum compound and in which the molybdenum compound is soluble at least to the extent of being able to obtain a 0.01 molar solution, and then adding at least one organoaluminum compound selected from the group consisting of aluminum alkyl and aluminum haloalkyl, the mole ratio of molybdenum compound to the haloalcohol being 1:1 to 1:10 and the mole ratio of the molybdenum compound to the organoaluminum compound being 1:0.5 to 1:30.

4,046,711
METHOD OF CATALYST MANUFACTURE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

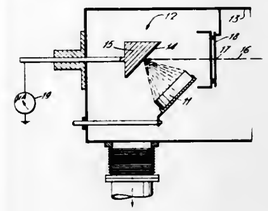
Filed June 24, 1976, Ser. No. 699,748
Int. Cl.² B01J 27/08, 27/10, 23/14
U.S. Cl. 252—441 9 Claims

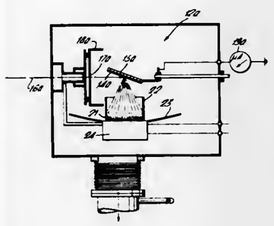
1. A method of catalyst manufacture which comprises impregnating a porous high surface area carrier material with a non-aqueous solution of soluble platinum group metal compound and a halo-substituted germane containing less than four halo substituents in amount to provide a final catalyst containing from about 0.05 to about 1.0 wt.% platinum group metal and from about 0.05 to about 1.0 wt.% germanium, said platinum group metal compound being selected from the group consisting of chloroplatinic acid, platinum chloride, ammonium chloroplatinate, dinitrodiaminoplatinum, palladium chloride, chloropalladic acid, rhodium chloride, ruthenium chloride, ruthenium oxide, osmium chloride and iridium chloride, and drying and calcining the thus impregnated carrier material.

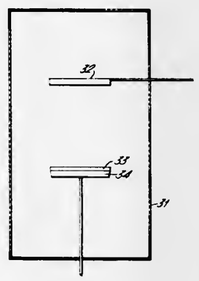
4,046,712
CATALYSTS SPUTTERED ON SUBSTANTIALLY NONPOROUS LOW SURFACE AREA PARTICULATE SUPPORTS

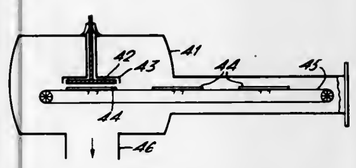
James Anthony Cairns, Wantage; Richard Stuart Nelson, Goring on Thames, and Rhydwyn William Barnfield, Cumnor Hill, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Continuation-in-part of Ser. No. 418,966, Nov. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 375,744, July 2, 1973, abandoned. This application June 16, 1975, Ser. No. 587,281
Claims priority, application United Kingdom, Nov. 30, 1972, 55466/72
Int. Cl.² B01J 23/56, 21/04, 21/14, 35/10
U.S. Cl. 252—447 4 Claims









1. A catalyst comprising a hard, substantially non-porous particulate substrate selected from the group consisting of ceramic material and carbon and having a mean particle diameter within the size range 0.1 micron to 0.5 centimeters and a surface area not greater than approximately 20 square meters per gram, and a sputtered deposit of catalytic material comprising one or more of the metals from the group platinum, rhodium, palladium, ruthenium, osmium and iridium upon the substrate, said deposit of said catalytic material having been deposited by bombardment of said catalytic material with energetic ions, the bombardment dislodging atoms of said catalytic material which are then deposited as an atomic dispersion upon the substrate.

2. A catalyst as claimed in claim 1, wherein the sputtered deposit of catalytic material comprises a quantity of catalytic material equivalent to between 0.5 and 5 monatomic layers upon the substrate surface.

4. A catalyst as claimed in claim 1, wherein the ceramic material comprises alumina.

4,046,713
METHOD OF MANUFACTURING AN EXTRUDED CATALYST COMPOSITION

Roy T. Mitsche, Island Lake; Hillard L. Kuntz, Mount Prospect, and John C. Hayes, Palatine, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 400,290, Sept. 24, 1973, abandoned. This application Oct. 24, 1975, Ser. No. 625,417
Int. Cl.² B01J 29/06
U.S. Cl. 252—455 Z 13 Claims

1. A method of preparing an extruded catalyst composition which comprises:

a. admixing an acidic alumina hydrosol with a dry mixture consisting essentially of a finely divided alumina and a finely divided cyrstalline aluminosilicate, said crystalline aluminosilicate comprising from about 0.5 to about 20 wt. % of said dry mixture, and said hydrosol component comprising from about 2 to about 10 wt. % of the resulting mixture;

b. extruding said resulting mixture while the last-mentioned component thereof is still in the hydrosol form; and

c. drying and calcining the extrudate.

4,046,714
METHOD OF MANUFACTURING A HYDROREFINING CATALYST

Mark J. O'Hara, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 588,561, June 19, 1975, abandoned. This application Sept. 1, 1976, Ser. No. 719,885
Int. Cl.² B01J 29/06, 23/13, 23/64
U.S. Cl. 252—455 R 12 Claims

1. In the manufacture of a hydrorefining catalyst comprising a Group VIB and a Group VIII metal component impregnated on a refractory inorganic oxide carrier material wherein said carrier material is impregnated with an aqueous solution of a Group VIB metal compound and a Group VIII metal compound and thereafter dried and calcined, the improvement which comprises impregnating said carrier material with an aqueous solution comprising an anionic complex of a Group VIB and a Group VIII metal sufficient to provide a final catalyst product containing from about 5 to about 20 wt. % Group VIB metal, and with a simple salt of a Group VIII metal sufficient in combination with said anionic complex to provide a final catalyst product containing from about 0.1 to about 10 wt. % Group VIII metal.

3. The improvement of claim 1 further characterized in that said carrier material comprises alumina composited with silica in a weight ratio of from about 3:1 to about 9.5:1.

4,046,715
NONACIDIC MULTIMETALLIC DEHYDROGENATION CATALYST

Frederick C. Wilhelm, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 501,113, Aug. 27, 1974, Pat. No. 3,966,895, which is a continuation-in-part of Ser. No. 348,379, April 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 81,512, Oct. 16, 1970, which is a continuation-in-part of Ser. No. 15,960, March 2, 1970, abandoned. This application Feb. 5, 1976, Ser. No. 655,660
Int. Cl.² B01J 21/04, 23/58, 23/62, 23/78
U.S. Cl. 252—466 B 17 Claims

1. A nonacidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 5 wt. % nickel, about 0.01 to about 5 wt. % Group IVA metal, and about 0.1 to about 5 wt. % of an alkali or alkaline earth metal, wherein the platinum group metal, Group IVA metal, nickel, and alkali or alkaline earth metal are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the Group IVA metal is present in an oxidation state above that of the elemental metal and wherein substantially all of the alkali or alkaline earth metal is present in an oxidation state above that of the elemental metal.

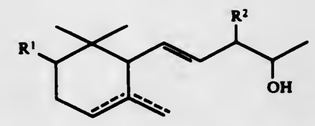
4,046,716
NOVEL ODORANT COMPOSITIONS

Peter Naegeli, Wettingen, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 569,121, April 17, 1975, Pat. No. 4,010,213. This application Aug. 23, 1976, Ser. No. 716,724
Int. Cl.² C11B 9/00
U.S. Cl. 252—522 6 Claims

1. An odorant composition which contains as an odor-imparting ingredient an effective amount of an alcohol of the general formula

(I)



wherein R^1 represents a hydrogen atom or a methyl group and R^2 represents a C_{1-6} alkyl group and wherein one of the two additional bonds indicated by dots may be present and at least one other olfactorily desirable agent.

4,046,717
DETERGENT BARS

Gordon Francis Johnston, Ellesmere Port; Alexander Martin, Warrington, and Alan Digby Tomlinson, Neston, all of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 438,043, Jan. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 324,622, Jan. 18, 1973, abandoned. This application Apr. 21, 1976, Ser. No. 678,784
Claims priority, application United Kingdom, Jan. 28, 1972, 4180/72
Int. Cl.² C11D 3/33, 3/20, 17/00
U.S. Cl. 252—546 9 Claims

1. A detergent bar consisting essentially of

a. an additive effective to increase the water content of human skin which additive is selected from the groups

i. from about 5% to about 55% by weight of a water soluble salt of glutamic acid,

ii. from about 5% to about 55% by weight of a mixture of

a water soluble salt of glutamic acid and a water soluble lactate salt, and

iii. from at least 12% by weight to about 55% by weight of a water soluble lactate salt; and

b. from about 45% to about 95% by weight of detergent active material.

4,046,718

POLYMERIZATION METHOD EMPLOYING TUBULAR REACTOR

Robert O. Maas, Midland, and Donald L. Tomkinson, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 17, 1976, Ser. No. 696,954
Int. Cl.² C08F 2/02
U.S. Cl. 260—2 R 6 Claims

1. In a method for the polymerization of an organic monomeric material to a synthetic resinous thermoplastic polymer, the polymer being soluble in the monomeric material, the steps of the method comprising passing the monomeric material into an inlet of an elongate unstirred tubular reactor maintaining the monomeric material within the tubular reactor at a temperature sufficient to induce polymerization of at least a portion of the monomer to form polymer, discharging and recovering polymerized thermoplastic material from the tubular reactor, the improvement which comprises intermittently feeding monomer material to the reactor in quantities not greater than 0.5 reactor volume converting at least 50 percent of the monomer introduced to polymer prior to discharge from the reactor subsequently introducing additional monomer.

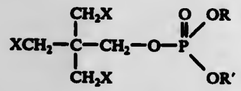
4,046,719

FLAME-RETARDANT RESINOUS COMPOSITIONS CONTAINING TRIHALONEOPENTYL HALOALKYL PHOSPHATES

Robert J. Stanaback, Gladstone, N.J., and Michael J. Reale, Southeast, N.Y., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Apr. 17, 1975, Ser. No. 569,130
Int. Cl.² C08K 5/52
U.S. Cl. 260—2.5 FP 17 Claims

1. A phosphate having the structural formula



wherein each X represents bromine or chlorine; R represents haloalkyl having 2 to 4 carbon atoms and 1 to 5 halogen atoms selected from the group consisting of chlorine, bromine, and mixtures thereof, phenyl, or $—CH_2—C(CH_2X)_3$; and R' represents haloalkyl having 2 to 4 carbon atoms and 1 to 5 halogen atoms selected from the group consisting of chlorine, bromine, and mixtures thereof.

4,046,720

CROSSLINKED, POROUS, POLYACRYLATE BEADS

Alan Rembaum; Shiao-Ping S. Yen, and William J. Dreyer, all of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 434,124, Jan. 17, 1974, Pat. No. 3,957,741.
This application May 30, 1975, Ser. No. 582,134
Int. Cl.² C08J 9/00
U.S. Cl. 260—2.5 B 4 Claims

1. A composition consisting essentially of uniformly shaped, hydrophilic, swellable, porous, round beads, at least 80% having a diameter less than 2 microns and being the cross-linked polymer of acrylamide and 0.1 to 30 weight percent of a liquid diene or triene cross-linking agent.

4,046,721

LOW FRIABILITY POLYISOCYANURATE FOAMS

Thomas H. Austin, and George P. Speranza, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed July 30, 1976, Ser. No. 709,984
Int. Cl.² C08G 18/48, 18/14
U.S. Cl. 260—2.5 AW 12 Claims

1. A urethane-modified polyisocyanurate rigid foam comprising a reaction product obtained by bringing together in the presence of a blowing agent, an aromatic polyisocyanurate, an isocyanurate group formation catalyst and a polyol comprising the addition product of a alkylene oxide to a mixture of a novolak resin and excess phenol or phenolic derivative wherein said phenol or phenolic derivative is present in an amount of 5-25 weight percent based on the weight of said resin.

4,046,722

IMMUNOLOGICAL MATERIALS

George Ferdinand Rowland, Gerrards Cross, England, assignor to G. D. Searle & Co. Limited, Bucks, England

Filed Jan. 14, 1976, Ser. No. 648,841
Claims priority, application United Kingdom, Feb. 4, 1975, 4696/75
Int. Cl.² C08L 89/00
U.S. Cl. 260—6 13 Claims

1. A cytotoxic agent comprising an immunoglobulin specific for antigens on the surface of cells to be killed having 1–10 polymer carrier molecules convalently bound thereto, said polymer carrier having about 5–500 molecules of a cytotoxic drug covalently bound thereto and said polymer carrier having a molecular weight of 5000–500,000 and free carboxyl, amino or cycloimidocarbonate groups for covalently bonding, said cytotoxic drug also having amino or carboxyl groups available for covalent bonding.

4,046,723

AZIDE BONDING OF A PROTEIN TO A LATEX

Linneaus C. Dorman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 22, 1976, Ser. No. 679,639
Int. Cl.² C08L 89/00
U.S. Cl. 260—8 6 Claims

1. A method for coupling a latex having surface carboxylic amide groups to a protein having free amino groups which comprises hydrazinolysing the carboxylic amide group on the latex to a carboxylic hydrazide group by treatment with hydrazine, diazotizing the carboxylic hydrazide group on the latex with a nitrite in the presence of an acid to form a carboxylic azide group, and coupling the carboxylic azide group of the latex with a free amino group on the protein.

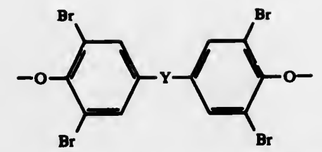
4,046,724

FIREPROOF POLYESTER COMPOSITION

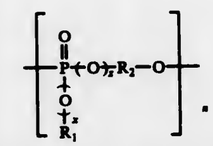
Yasuo Kato, Shiga; Katsuhiko Kato, Otsu; Masahiro Sugino, Otsu; Jun Ikegami, Otsu, and Junichi Harukawa, Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Dec. 16, 1974, Ser. No. 533,067
Claims priority, application Japan, Dec. 17, 1973, 48-141650
Int. Cl.² C08L 1/02, 67/00
U.S. Cl. 260—9 6 Claims

1. A fireproof polyester composition comprising a blend of (1) a copolymerized polyester comprising a polyalkylene terephthalate containing in the main chain thereof binding units of the formula:



wherein Y denotes an oxygen atom, an alkylidene radical having 1 to 6 carbon atoms or a cycloalkylidene radical having 3 to 6 carbon atoms, the bromine content in said copolymerized polyester being from 2 to 12% by weight, with (2) a high molecular weight organic phosphorus compound of the formula:



wherein R_1 denotes a monovalent hydrocarbon radical of 1 to 18 carbon atoms which is unsubstituted or substituted with one or more substituents, R_2 denotes a divalent hydrocarbon radical of 2 to 20 carbon atoms which is unsubstituted or substituted with one or more substituents, x and z each denote 0 or 1 and n is an integer of 5 to 100, the amount of organic phosphorus compound in said blend being such as to correspond to 0.1 to 0.8% by weight of phosphorus atoms.

5. A fireproof fibrous product obtained by mixing the fireproof polyester fibers as set forth in claim 4 with nonfusible fibers.

4,046,725

POLYURETHANES FOR ARTICLES FOR MEDICAL USAGE

Christian Pusineri, Serezin du Rhone, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Sept. 16, 1976, Ser. No. 723,975
Claims priority, application France, Sept. 22, 1975, 75.29467
Int. Cl.² C08L 5/10
U.S. Cl. 260—9 23 Claims

1. A polyurethane which can be used in particular for the production of articles intended to be in contact with blood, characterized in containing a macromolecular chain comprising nitrogen atoms in the form of quaternary ammonium groups, to which molecules of heparin are bonded, these nitrogen atoms originating from polymers consisting of q recurring units of the formula:

$$—A—NH—CO—O—B—O—CO—NH— \quad (I)$$

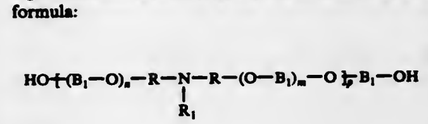
and t recurring units of the formula:

$$—A—NH—CO—Z—NH— \quad (II),$$

these units of the formula (I) and (II) being bonded to on another, and the various symbols of these units having the following meanings:

A is a divalent organic radical consisting of a straight-chain or branched-chain alkylene radical containing from 3 to 10 carbon atoms, or a cycloalkylene radical having 5 or 6 carbon atoms in the ring or a phenylene radical which is optionally substituted by 1, 2 or 3 lower alkyl radicals (with at most 4 carbon atoms), or two alkylene or phenylene radicals linked to one another by a divalent hydrocarbon radical containing from 1 to 4 carbon atoms or by a hetero-atom chosen from amongst oxygen, sulphur and nitrogen,

B represents a divalent organic radical obtained by removing the terminal hydroxyl groups from a macrodiol of the formula:



(III)

in which:

B_1 represents a linear or branched aliphatic radical having from 2 to 12 carbon atoms,

R represents an alkylene radical of from 1 to 4 carbon atoms,

R_1 represents an alkyl radical of from 1 to 20 carbon atoms which may contain functional groups, such as, for example, aldehyde, carboxylic acid or sulphonic acid groups,

n, m and p are identical or different integers (or fractions in the case where (III) represents a mean formula) such that the molecular weight of B is between 300 and 10,000, and

q and t are such that the polyurethane, before quaternization of the nitrogen atoms, has a specific viscosity, measured at 20° C on a solution of 2 g/l in dimethyl formamide, of greater than 0.05 and preferably between 0.1 and 0.9, ratio q/t being between 0.5 and 10,

Z is a single bond or a divalent radical chosen from amongst the radicals of the formulae: —NH—NH—CO—, —NH—CH_2—CO—NH—NH—CO—, —NR_2—D—NR_3—CO—, and —O—M—O—CO—, in which

R_2 and R_3, which may be identical or different, are hydrogen atoms or lower alkyl radicals,

D is a hydrocarbon chain containing from 2 to 12 carbon atoms, or a hydrocarbon ring with 5 or 6 carbon atoms or a nitrogen-containing heterocyclic ring with 5 or 6 chain members, containing 1 or 2 nitrogen atoms, all the hydrocarbon chains and rings being saturated or unsaturated, unsubstituted or substituted by one or two lower alkyl radicals or by a nitrogen-containing heterocyclic ring with 5 or 6 chain members, which is attached by a nitrogen atom, it being possible for two of the chains or rings to be linked to one another by an alkylimino group, and

M is an aliphatic hydrocarbon radical containing from 2 to 12 carbon atoms, which is linear or branched, saturated or ethylenically unsaturated, unsubstituted or substituted by one or two lower alkyl radicals or by a dialkylamino radical, which is uninterrupted or interrupted by an alkylimino radical.

4,046,726

FLOOR FINISH COMPOSITION AND COMPONENTS THEREOF

Roger D. Meiser, Melrose Park; James M. Haines, Bolingbrook, and Henry Alsberg, Northbrook, all of Ill., assignors to The Richardson Company, Des Plaines, Ill.

Filed Dec. 22, 1975, Ser. No. 642,752
Int. Cl.² C08L 93/00
U.S. Cl. 260—27 R 12 Claims

1. A water insoluble emulsion polymer useful for preparing a wax, alkali soluble resin and surfactant containing aqueous emulsion floor finish composition comprising the emulsion polymerization reaction product of from about 5 to about 40% by weight of alpha methylstyrene, from about 5 to about 40% by weight of styrene, and from about 20 to about 90% by weight of other copolymerizable monoethylenically unsaturated monomers, based on the combined weight of monomers charged.

4,046,727

THERMOSETTABLE ACRYLIC RESIN COMPOSITION FOR POWDER COATING

Iko Itoh; Yasuhiko Inoue; Shojiro Ito, and Kazumitsu Kawamura, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed July 23, 1974, Ser. No. 490,998
Claims priority, application Japan, July 25, 1973, 48-84350
Int. Cl.² C08L 33/02, 33/14, 63/08, 63/10
U.S. Cl. 260—28.5 R 18 Claims

1. A powdered thermosettable acrylic resin composition for powder coating comprising a mixture consisting essentially of

A. 100 parts by weight of an acrylic resin having a glass transition temperature of 10° to 75° C and a weight average molecular weight of from 8,000 to 100,000, made by copolymerizing at least one nonfunctional monomer selected from the group consisting of methyl acrylate, ethyl acrylate, n-propyl acrylate, isopropyl acrylate, n-butyl acrylate, isobutyl acrylate, tert-butyl acrylate, hexyl acrylate, cyclohexyl acrylate, 2-ethylhexyl acrylate, octyl acrylate, 2-ethyloctyl acrylate, dodecyl acrylate, benzyl acrylate, phenyl acrylate, methyl methacrylate, ethyl methacrylate, n-propyl methacrylate, isopropyl methacrylate, n-butyl methacrylate, isobutyl methacrylate, tert-butyl methacrylate, hexyl methacrylate, cyclohexyl methacrylate, 2-ethylhexyl methacrylate, octyl methacrylate, 2-ethyloctyl methacrylate, dodecyl methacrylate, benzyl methacrylate, and phenyl methacrylate in an amount of about 20 to 97% by weight based on said acrylic resin with (a) at least one monomer containing an epoxy group selected from the group consisting of glycidyl acrylate, glycidyl methacrylate, β-methylglycidyl acrylate, β-methylglycidyl methacrylte, n-glycidylacrylamide, allyl glycidyl ether, and glycidyl vinylsulfonate in an amount of 2 to 28% by weight based on said acrylic resin and (b) at least one monomer containing a carboxyl group or an acid anhydride group selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, itaconic acid, fumaric acid, maleic acid, citraconic acid, monoalkyl itaconates, monoalkyl fumarates, monoalkyl maleates, monoalkyl citraconates, itaconic anhydride, maleic anhydride, and citraconic anhydride in an amount of 0.1 to 8% by weight based on said acrylic resin, wherein the gram equivalent ratio of said carboxyl groups to said epoxy groups in said acrylic resin is in the range from 1/2 to 1/20 (provided that the gram equivalent of an acid anhydride group is assumed to be equivalent to 2 gram equivalents of the carboxyl group) and

B. 0.5 to 25 parts by weight of a curing agent selected from the group consisting of polycarboxylic acids, anhydrides or polycarboxylic acids, and polycarboxylic hydrazides.

4,046,728

POLYVINYL CHLORIDE TERPOLYMER POWDER COATING COMPOSITION

Charles M. Harmuth, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 30, 1975, Ser. No. 645,388
Int. Cl.² C08L 23/08
U.S. Cl. 260—28.5 A 11 Claims

1. A powder coating composition of powder particles having a particle size range of about 1–100 microns; wherein the powder particles consist essentially of a blend of:

A. 75–90% by weight of a polyvinyl chloride terpolymer consisting essentially of
1. 72–87% by weight, based on the weight of the terpolymer, of vinyl chloride,
2. 10–25% by weight, based on the weight of the terpolymer of vinyl acetate and
3. 0.1–3% by weight, based on the weight of the terpolymer, of maleic acid;
wherein the terpolymer has a weight average molecular weight of about 20,000–125,000; and

B. 10–25% by weight of a polymer consisting essentially of
1. 50–80% by weight, based on the weight of the polymer, of ethylene,
2. 15–35% by weight, based on the weight of the polymer of vinyl acetate, and
3. 5–15% by weight, based on the weight of the polymer, of carbon monoxide;
wherein the polymer has a weight average molecular weight of about 100,000–400,000;
wherein the powder particles contain in addition to the binder about 1–5% by weight of a heat stabilizer, 1–10%, by weight of a low molecular weight epoxy hydroxy polyether resin and 0.1–1% by weight of a low molecular weight polyethylene wax.

4,046,729

WATER-REDUCED URETHANE COATING COMPOSITIONS

Roger L. Scriven, and Wen-Hsuan Chang, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 2, 1975, Ser. No. 583,085
Int. Cl.² C08G 22/04; C08K 3/18; C08L 63/00
U.S. Cl. 260—29.2 TN 35 Claims

1. A stable aqueous dispersion which is emulsifiable in the absence of added emulsifier of a non-gelled polyurethane formed by reacting in the presence of water:

A. a partially reacted NCO-containing polymer containing salt groups and highly active hydrogens selected from the group consisting of hydroxyl, thiol, primary and secondary amine, said partially reacted NCO-containing polymer having a reactive hydrogen equivalent weight of 150 to 10,000,

B. an active hydrogen-containing compound having at least one hydrogen more reactive with NCO groups than water to form a polyurethane having an intrinsic viscosity of less than 4.0 deciliters per gram.

4,046,730

VINYL CHLORIDE POLYMER LATEXES WITH TWO MONODISPERSE MODES

Jean-Pierre Tortai, Villers Saint-Sepulcre, France, assignor to Produits Chimiques Ugine Kuhlmann, Saint-Denis, France

Filed Sept. 4, 1975, Ser. No. 610,285
Claims priority, application France, Sept. 24, 1974, 74.32094
Int. Cl.² C08L 27/06
U.S. Cl. 260—29.6 RB 6 Claims

1. A method of preparing a stable latex having two monodisperse populations of vinyl chloride polymer or copolymer particles, one population corresponding to between about 5 and 50% of the total weight of particles and having a mean particle diameter between about 0.1 and 0.5 micron, and the other population containing the remainder of the latex particles and having a mean particle diameter greater than 0.5 and less than 2 microns;

which method comprises polymerizing in aqueous emulsion, vinyl-polymerizable monomers containing at least 60% by weight vinyl chloride, and the remainder at least one monomer copolymerizable therewith in the presence of both (a) a vinyl chloride polymer or copolymer seed latex, having its particles protected by a "first" emulsifier selected from the group consisting of nonionic and anionic surfactants in an amount less than about 100% coverage of particle surfaces and (b) a "second" emulsifier selected from the same group as specified for the "first" emulsifier whose chemical composition is different from that used as the "first" emulsifier.

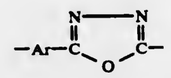
4,046,731

PROCESS FOR PREPARING DOPES FROM WHICH SHAPED ARTICLES OF OXADIAZOLE/N-ALKYLHYDRAZIDE COPOLYMERS ARE OBTAINED

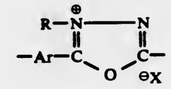
George A. Mortimer; Chris A. Pelezo, both of Pensacola, and John C. Richardson, Cantonment, all of Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed May 13, 1976, Ser. No. 686,207
Int. Cl.² G08K 3/30; C08K 3/52, 5/42
U.S. Cl. 260—30.6 R 8 Claims

1. A process for preparing a dope comprising an acid and a copolymer consisting essentially of recurring units (I) of the formula

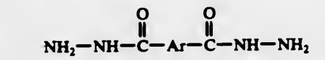


and recurring units (II) of the formula

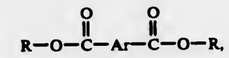


wherein the mole ratio of units I and II is between 20:80 and 95:5, consisting of

a. combining and mixing (i) a slurry of monomers consisting essentially of one or more dihydrazides in particulate form of the formula



in one or more diesters in the liquid state of the formula



wherein the mole ratio of dihydrazide to diester is between about 1:1 and about 2:1, and (ii) and acid selected from the group consisting of oleum, chlorosulfonic acid, polyphosphoric acid, and mixtures thereof, whereby a monomer solution is formed, and then

b. maintaining said monomer solution for a period of time at a temperature sufficient to polymerize said monomers, thereby obtaining a dope comprising said fiber-forming copolymer in said acid,

wherein Ar represents a divalent aromatic radical, R represents a C_1 to C_4 alkyl, and $-X$ represents an anion present in said acid.

4,046,732

DISPERSANT FOR THE APPLICATION OF DENTAL CERAMIC

Samuel J. Infante, 1 Rosedale Terrace, Livingston, N.J. 07039

Filed Jan. 9, 1975, Ser. No. 539,916
Int. Cl.² C08J 5/02, 5/10, 5/32, 33/12
U.S. Cl. 260—31.2 R 1 Claim

1. A dispersant for the application of ceramic opaque to a substrate consisting by volume essentially of

a. 1.0 parts polymethylmethacrylate,
b. 0.5 to 4.5 parts monomethylmethacrylate,
c. 1.0 to 4.5 parts ethylacetate,
d. 1.0 to 4.5 parts trichloroethane, and
e. 10.0 to 25.0 parts nitroethane.

4,046,733

SULFONIC ACID COMPOSITION FOR FORMING THERMOPARTICULATING COATING

James D. B. Smith, Turtle Creek, and David C. Phillips, Penn Hills, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1975, Ser. No. 645,164
Int. Cl.² C08K 5/01; C08L 63/00; G01K 13/02; G01N 31/00
U.S. Cl. 260—33.6 EP 16 Claims

1. A composition comprising

1. a thermoparticulating compound selected from the group consisting of sulfonic acids, amine salts of sulfonic acids, and mixtures thereof; and

2. a solution of a resinous carrier curable at room temperature, stable at 60° C, and unreactive with said thermoparticulating compound.

4,046,734

PROCESS FOR THE MANUFACTURE OF AMINOPLAST AND PHENOPLAST MOULDING COMPOSITIONS USING A THIN LAYER EVAPORATOR OR A ROLLER DRIER

Willi Zimmerli, Olten, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,106
Claims priority, application Switzerland, Nov. 5, 1973, 15560/73
Int. Cl.² C08J 3/14
U.S. Cl. 260—38 6 Claims

1. An improved process for the manufacture of aminoplast or phenoplast compositions by drying an aqueous solution, which optionally contains pigments or mineral fillers, of a phenol-formaldehyde resin, a urea-formaldehyde resin, a melamine-formaldehyde resin or a phenol-modified melamine-formaldehyde resin, grinding the resin composition, optionally mixing it with a filler, pigment, lubricant and, if desired, other additives, and warm-densifying the mixture wherein the improvement comprises

passing the aqueous resin solution into a thin layer evaporator or roller drier,
distilling off the water at an elevated temperature, and
withdrawing the dried material in a fused or solid form.

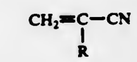
4,046,735

STABILIZERS OF NITRILE POLYMERS USING TRIAZINE DERIVATIVES

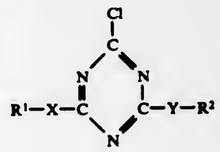
Alva F. Harris, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Sept. 2, 1976, Ser. No. 719,806
Int. Cl.² C08K 5/34
U.S. Cl. 260—45.8 NT 10 Claims

1. A nitrile polymer composition stable toward thermal discoloration which comprises a polymer of at least 40% by weight of a nitrile monomer having the formula:



wherein R is hydrogen, lower alkyl having from 1 to 4 carbon atoms or halogen and an effective amount of a stabilizing agent having the formula:



wherein R^1 and R^2 each independently represent an alkyl group having 1 to 8 carbon atoms or an aryl group having 6 to 20 carbons; and X and Y each represent O, S, NH or NR^3 wherein each R^3 independently represents H, an alkyl group of 1 to 8 carbon atoms or an aryl group of 6 to 20 carbon atoms with the proviso that R^1 and R^2 may be H when X and/or Y is NH, NR^3 or S.

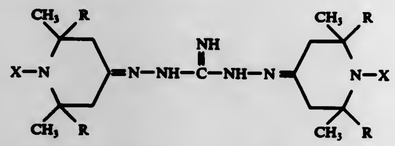
4,046,736

1,3-BIS[(2,2,6,6-TETRAALKYL-4-PIPERIDYLIDENE)AMINO]GUANIDINES AS LIGHT STABILIZERS FOR POLYOLEFINS

William Baptist Hardy, Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 16, 1976, Ser. No. 715,019
Int. Cl.² C07D 401/12
U.S. Cl. 260—45.8 N **13 Claims**

1. A compound of the formula:



wherein X is —H, —OH, —O., alkyl of 1 to 8 carbon atoms, or carboxylic acyl of 2 to 10 carbon atoms, and R is alkyl of 1 to 8 carbon atoms.

9. A polyolefin stabilized against degradation by ultraviolet light by an effective amount of a compound of claim 1.

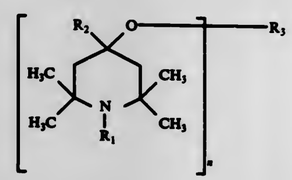
4,046,737

PIPERIDINE DERIVATIVES

Brian Holt, Royton, and Donald Richard Randell, Stockport, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

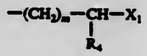
Division of Ser. No. 310,031, Nov. 28, 1972, abandoned. This application May 14, 1975, Ser. No. 577,501
Claims priority, application United Kingdom, June 17, 1972, 28458/72; Nov. 30, 1971, 55487/71; July 28, 1972, 35473/72
Int. Cl.² C08K 5/00
U.S. Cl. 260—45.8 N **16 Claims**

1. A composition comprising an organic material and 0.01% to 5% by weight of a stabilizer having the formula



I

and their salts
wherein *n* is 1, 2, 3 or 4;
R_1 is a monovalent residue and is an alkyl residue from 1 to 20 carbon atoms, an alkenyl or alkynyl residue having from 3 to 20 carbon atoms, an aralkyl residue having from 7 to 12 crbon atoms, or a residue having the formula:



or

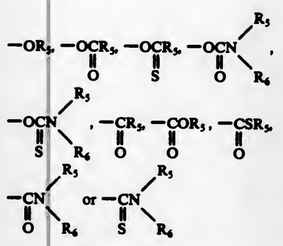
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wherein *m* is 1, 2 or 3,
R_4 is a hydrogen, methyl or phenyl residue, X_2 is halogen, cyano,



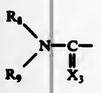
—COR_5, —$CO.OR_5$, —$CO.SR_5$—,
or —$CONR_5R_6$ and
X_1 is hydroxyl, halogen, cyano,



where R_5 is an alkyl residue having from 1 to 20 carbon atoms, an alkenyl residue having from 2 to 20 carbon atoms, a cycloalkyl residue having from 5 to 12 carbon atoms, an aryl residue having from 6 to 11 carbon atoms or an aralkyl residue having 7 to 14 carbon atoms or when R_5 is joined to a nitrogen atom, also hydrogen and
R_6 is hydrogen or an alkyl residue having from 1 to 4 carbon atoms, or R_5 and R_6 together with the nitrogen atom to which they are bound form a 5- or 6-membered ring which contains no other hetroatoms or contains one or more other heteroatoms, or R_1 is an acyl group

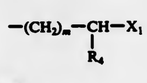


where R_7 is hydrogen, an unsubstituted aliphatic or substituted aliphatic residue having from 1 to 20 carbon atoms, an alkenyl or alkynyl residue having from 2 to 20 carbon atoms, a cycloaliphatic residue having from 5 to 12 carbon atoms, an araliphatic residue having from 7 to 14 carbon atoms, an aromatic residue having from 6 to 20 carbon atoms or an heterocyclic residue, or
R_1 is a carbamoyl or thiocarbamoyl residue having the formula:



wherein X_3 is —O— or —S—,
R_8 is hydrogen or an alkyl residue having from 1 to 4 carbon atoms, and
R_9 is hydrogen, an alkyl residue having from 1 to 20 carbon atoms, an alkenyl residue having from 3 to 20 carbon atoms, a cycloalkyl residue having from 5 to 12 carbon atoms or an unsubstituted aryl or substituted aryl residue having from 6 to 12 carbon atoms;
R_2 is an alkyl residue having from 1 to 4 carbon atoms, an alkenyl or alkynyl residue having 3 to 20 carbon atoms, a

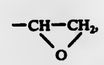
cycloalkyl residue having from 5 to 12 carbon atoms, an aryl residue having from 6 to 11 carbon atoms or an aralkyl residue having from 7 to 9 carbon atoms or hydrogen; and
when *n* is 1, R_3 is a monovalent residue and is an alkyl residue having from 1 to 20 carbon atoms, a cycloalkyl residue having from 5 to 12 carbon atoms, an alkenyl or alkynyl residue hving from 3 to 20 carbon atoms, an aralkyl residue having from 7 to 12 carbon atoms, or a residue having the formula:



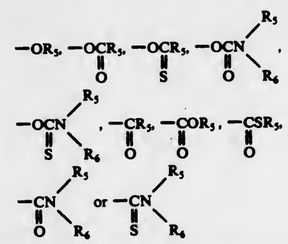
or



wherein *m* is 1, 2 or 3,
R_4 is a hydrogen, methyl or phenyl residue,
X_2 is halogen, cyano,



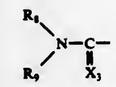
—COR_5, —$CO.OR_5$, —$CO.SR_5$, or $CONR_5R_6$
and
X_1 is hydroxyl, halogen, cyano,



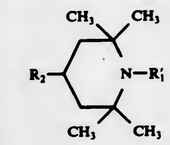
wherein R_5 is an alkyl residue having from 1 to 20 carbon atoms, an alkenyl residue having from 2 to 20 carbon atoms, a cycloalkyl residue having from 5 to 12 carbon atoms, an aryl residue having from 6 to 11 carbon atoms or an aralkyl residue having 7 to 14 carbon atoms, or when
R_5 is joined to a nitrogen atom, also hydrogen and
R_6 is hydrogen or an alkyl residue having from 1 to 4 carbon atoms, or
R_5 and R_6 together with the nitrogen atom to which they are bound form a 5- or 6-membered ring which contains no other heteroatoms or contains one or more other heteroatoms, or
R_3 is an acyl group,



wherein R_7 is hydrogen, an unsubstituted aliphatic or substituted aliphatic residue having from 1 to 20 carbon atoms, an alkenyl or alkynyl residue hving from 2 to 20 carbon atoms, a cycloaliphatic residue having from 5 to 12 carbon atoms, an araliphatic residue having from 7 to 14 carbon atoms, an aromatic residue having from 6 to 20 carbon atoms or an heterocyclic residue, or
R_3 is a carbamoyl or thiocarbamoyl residue having the formula:



wherein X_3 is —O— or —S—,
R_8 is hydrogen or an alkyl residue having from 1 to 4 carbon atoms, and
R_9 is hydrogen, an alkyl residue having from 1 to 20 carbon atoms, an alkenyl residue having from 3 to 20 carbon atoms, a cycloalkyl residue having from 5 to 12 carbon atoms or an aralkyl residue having from 6 to 14 carbon atoms or from 7 to 14 carbon atoms, or when
R_3 represents a monovalent group obtained by removing a hydroxyl group from a sulphinic acid, a sulphonic acid, a phosphorus containing acid or a boric acid, or
R_3 is an aryl residue or a residue having the formula:



wherein R_1' is hydrogen or R_1' has the significance as R_1:
when *n* is 2, R_3 is a divalent residue and is an aklkylene residue having from 1 to 20 carbon atoms, an alkenylene residue having from 2 to 20 carbon atoms, an alkynylene residue having from 2 to 20 carbon atoms, a cycloalkyliden residue having from 5 to 12 carbon atoms, an arylene residue having 6 to 14 carbon atoms, an aralylene residue having from 8 to 14 carbon atoms or an aliphatic, aromatic or heterocyclic diacyl residue, the group —Co— or —CO.CO—, an aliphatic or aromatic dicabamoyl or dithiocarbamoyl, sulphinyl or sulponyl residue or a divalent residue obtained by removing two hydroxyl groups from a disulphonic acid, a phosphorus containing acid or a boric acid;
when *n* is 3, R_3 is a trivalent residue and is an alkanetriyl, an arenetriyl or an arenetriyl-trialkylene residue, an aliphatic or aromatic triacyl residue or a triacyl residue derived from o-phosphoric, o-phosphorous or o-boric and
when *n* is 4, R_3 is a tetravalent residue and is an alkanetetrayl residue or a tetraacyl residue derived from an aliphatic or aromatic tetracarboxylic acid or from o-silicic acid as well as, when *n* is 2, 3 or 4, partial ethers, esters and carbamoyloxy and thiocarbamoyloxy compounds related to the fully reacted compounds of formula I; provided that when a compound of formula I is an ester, the alkyl group of R_1 has only 5 to 20 carbon atoms.

4,046,738

PROCESS FOR THE MANUFACTURE OF GRANULAR OXYMETHYLENE POLYMERS

Gunter Sextro; Karlheinz Burg, both of Nauod, Taunus; Hans Joachim Leugering, Frankfurt am Main; Helmut Schlaf, Flechbach, Taunus, and Alwin Heller, Erzhausen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 5, 1975, Ser. No. 629,628
Claims priority, application Germany, Nov. 7, 1974, 2452737; Feb. 4, 1975, 2504482; Mar. 7, 1975, 2509924
Int. Cl.² C08G 2/28
U.S. Cl. 260—67 FP **14 Claims**

1. A process for making a granular oxymethylene copolymer (POM) containing, in addition to oxymethylene units, from 0.1 to 20% by weight of oxyalkylene units having from 2 to 8 adjacent carbon atoms in the main chain thereof, which process comprises preparing a solution or fine dispersion of POM in a methanol/water mixture at a temperature of 5° to 65° C.

above the sintering temperature (T_s) of the POM, preparing a cooling agent which is a suspension of 1 to 25% by weight POM in 99 to 75% by weight of a methanol/water mixture at a temperature below T_p cooling said POM solution or fine dispersion in a first stage by mixing it with said cooling agent in such proportions as to produce a blend having a temperature of 0° to 10° C. above T_p thereafter cooling said blend in a second stage to a temperature of 1° to 10° C. below T_p separating the granular POM from the blend and drying it.

4,046,739

PROCESS FOR REDUCING THE PROCESSING TIME IN THE PRODUCTION OF POLYESTERS

Joseph Lacoste, Canonsburg, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sept. 25, 1975, Ser. No. 616,770
Int. Cl.² C08G 63/52, 63/16
U.S. Cl. 260—75 M **9 Claims**

1. In a two-stage process for the production of polyesters wherein an aromatic polycarboxylic acid selected from the group consisting of isophthalic acid and terephthalic acid is reacted in the first stage with a polyol to produce half-ester mixture which is reacted with a saturated or unsaturated aliphatic polycarboxylic in the second stage to produce the polyester, to reduce the processing time in the first stage; thereby reducing the processing time for the production of the polyester, comprising:

a. contacting first portion of the polyol with the aromatic polycarboxylic acid in the first stage in an amount at least sufficient to form an agitatable mixture with the aromatic polycarboxylic acid but in an amount slightly less than the theoretical amount of polyol needed to react with the isophthalic acid or terephthalic acid and saturated or unsaturated aliphatic polycarboxylic acid,

b. heating the agitatable mixture to a temperature of at least 190° C to 230° C, and

c. adding the remaining portion of the polyol to the heated agitatable mixture in the first stage in such a manner that the temperature of the heated agitatable mixture is maintained at a temperature of at least 190° C in order to produce a half-ester mixture.

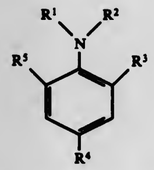
4,046,740

NOVEL POLYESTER COMPOSITIONS

Peter Robert Thornburrow, South Glamorgan, Wales, assignor to BP Chemicals Limited, London, England

Filed Apr. 20, 1976, Ser. No. 678,701
Claims priority, application United Kingdom, May 1, 1975, 18198/75
Int. Cl.² C08G 63/12; C08L 67/06
U.S. Cl. 260—75 N **5 Claims**

1. An unsaturated polyester resin composition which comprises an unsaturated polyester, a soluble cobalt salt, an amine accelerator having the formula



where R^1, R^2 are selected from the radicals alkyl, hydroxyalkyl and carboxy alkyl groups and R^3, R^4 and R^5 are selected from the radicals alkyl, aralkyl, cycloalkyl, alkoxy and halogen groups, and a peroxy initiator that is accelerated by said amine.

4,046,741

POST-TREATMENT OF POLYUREA MICROCAPSULES

Herbert B. Scher, Moraga, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 17, 1976, Ser. No. 658,212
Int. Cl.² C08G 18/82; B01J 13/02; B05D 7/24
U.S. Cl. 260—77.5 A **9 Claims**

1. Method of reducing residual isocyanate level in polyurea microcapsules comprising post-treatment of said polyurea microcapsules with an excess of ammonia or an amine.

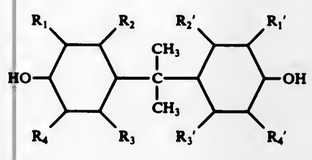
4,046,742

COMPOSITIONS CONTAINING HYDROXYL GROUPS AND THEIR USE FOR THE PRODUCTION OF FLAMEPROOF PLASTICS

Erich Eimers; Rolf Dhein, both of Krefeld-Bockum, and Rolf Wiedermann, Bergisch-Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

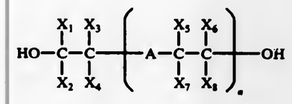
Filed Oct. 8, 1975, Ser. No. 620,725
Claims priority, application Germany, Oct. 24, 1974, 2450540
Int. Cl.² C08G 18/42, 18/14; C09K 3/28
U.S. Cl. 260—77.5 AN **6 Claims**

1. A composition containing hydroxyl groups which has an acid number of less than 1 and a hydroxyl number in the range from 150 to 300 obtained by mixing 25 to 75% by weight of a halogenated 2,2-diphenylol propane corresponding to the general formula



in which

R_1, R_2, R_3, R_4, R_1', R_2', R_3', Rhd 4' represents H, C_1–C_4-alkyl, or halogen, at least 1 R = halogen, with 75 to 25% by weight of a polyester containing hydroxyl groups, obtained from saturated, unsaturated or halogenated aliphatic and/or cycloaliphatic and/or aromatic polycarboxylic acids, and a molar excess of dialcohols corresponding to the following formula



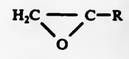
in which

X_1 to X_8 = H, or C_1–C_4-alkyl,

n = 1 - 10,

A = O or S

and by subsequently alkoxylating in the presence of alkaline reacting substances the aforementioned mixture with the alkylene oxide corresponding to the formula



in which R = H, CH_3, CH_2OH, CH_2Cl, CH_2Br, C_2H_5.

4,046,743

CATALYSIS OF AMINE CURABLE POLYMERS BY HIGH DIELECTRIC CONSTANT COMPOUNDS

Steven Edward Schoufeld, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 496,504, Aug. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 476,369, June 5, 1974, abandoned. This application July 21, 1975, Ser. No. 597,808
Int. Cl.² C08G 18/18
U.S. Cl. 260—77.5 AB **11 Claims**

1. A mixture of a catalyst curable polymer, comprising,

100 parts by weight of an amine curable urethane polymer or prepolymer containing free isocyanate groups,

from 0.8 to 1.2 equivalents of an amine containing curing agent based upon the free active groups of said amine curable polymer or prepolymer, said curing agent selected from a group consisting of a complex of 4,4'-methylene dianiline and a salt, said salt selected from the group consisting of sodium chloride, sodium bromide, sodium iodide, sodium nitrate, lithium chloride, lithium bromide, lithium iodide, lithium nitrate and sodium cyanide, and a complex of racemic 2,3-di(4-aminophenyl) butane and a salt, said salt selected from the group consisting of sodium chloride, sodium bromide, sodium iodide, potassium chloride, potassium bromide, potassium iodide, rubidium chloride, rubidium bromide, rubidium iodide, cesium chloride, cesium bromide and cesium iodide, the ratio of said dianiline or said butane to said salt in said complex being about 3 moles per 1 mole, and

from 0.1 to about 35 parts of a curing agent catalyst having a high dielectric constant selected from the class consisting of oleic acid, benzaldehyde, adiponitrile, acetic anhydride, polydimethylsiloxane and diethyl sulfate.

4,046,744

THERMOSETTING COATINGS BASED ON KETOXIME-BLOCKED ISOCYANATES AND OXAZOLIDINES

Raymond F. Jenkins, Masonville, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed July 28, 1976, Ser. No. 709,570
Int. Cl.² C08G 18/06
U.S. Cl. 260—77.5 AQ **18 Claims**

1. A low temperature curing, one-component thermosetting coating composition comprising an oxime-blocked polyisocyanate and an oxazolidine, said oxazolidine being hydrolyzable by moisture at a temperature of between about 125° F. and 325° F. the hydrolysis product of which can react with a polyisocyanate, to produce a polymeric product.

4,046,745

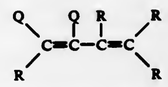
PREPARATION OF FUNCTIONAL POLYMERS

Charles M. Selman, and Carl A. Uraneck, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

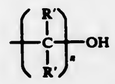
Division of Ser. No. 625,743, Oct. 24, 1975, Pat. No. 3,993,853. This application May 27, 1976, Ser. No. 690,805
Int. Cl.² C08F 4/48, 8/00; C08E 8/08
U.S. Cl. 260—77.5 CR **23 Claims**

1. A process for preparing a cured polymer which comprises the steps of:

a. copolymerizing at least one conjugated diene, or at least one conjugated diene with at least one monovinyl-substituted aromatic hydrocarbon, with a minor effective amount for a lithium salt of a monohydroxyalkyl-substituted conjugated alkadiene as comonomer, under solution polymerization conditions of temperature and pressure and employing an effective amount of a lithium-based initiator, thereby preparing a copolymer, wherein said lithium salt of a monohydroxyalkyl-substituted conjugated alkadiene represents the reaction product of a monohydroxyalkyl-substituted conjugated alkadiene with lithium or with a hydrocarbyllithium compound, and wherein said monohydroxyalkyl-substituted conjugated alkadiene is represented by the formula



wherein Q is R or a mononydroxyalkyl group represented by



wherein each R is hydrogen or is an alkyl, cycloalkyl, aryl, or combination radical; each R' is hydrogen, methyl, or ethyl; n is an integer of 1 to 3; such that said monohydroxyalkyl-substituted conjugated alkadiene contains 1 hydroxyalkyl group per molecule;

b. treating said copolymer from said step (a) with an effective amount of an alkylene oxide; and

c. curing the alkylene oxide-treated copolymer with a polyisocyanate curing system.

4,046,746

METHOD FOR EXTRACTING GRANULAR POLYAMIDES AND FOR PREPARING POLYAMIDE POWDERS

Srinivasan Sridhar, and Horst Heddeo, Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed June 30, 1975, Ser. No. 592,036
Claims priority, application Germany, July 19, 1974, 2434755; July 19, 1974, 2434756
Int. Cl.² C08G 69/46
U.S. Cl. 260—78 S **7 Claims**

1. A method for preparing powdered polycarbonamide having at least 10 aliphatically bound carbon atoms per carbonamide group or mixed polycarbonamide containing at least 70 percent by weight of said polycarbonamide as constituents consisting of essentially:

a. extracting said polycarbonamide in granular form with dimethyl formamide at a temperature of about 70° to 100° C, to remove the monomerous and low molecular ingredients;

b. separating the extracted polycarbonamide in granular form from the dimethyl formamide residue;

c. dissolving the separated and extracted polycarbonamide in dimethyl formamide at a temperature between about 140° and 150° C to form a solution; and

d. precipitating said powdered polycarbonamide by cooling said solution.

4,046,747

ADDITIVE FOR IMPROVING THE ADHESION TO TEXTILES OF HOT MELT ADHESIVES BASED ON COPOLYAMIDES

Anton Capelle, Delden, Netherlands, and Heinz Scholten, Lippramsdorf, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Sept. 29, 1975, Ser. No. 617,440
Claims priority, application Germany, Oct. 10, 1974, 2448344
Int. Cl.² C08L 77/02
U.S. Cl. 260—78 S **4 Claims**

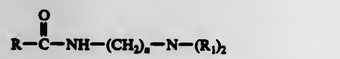
1. A polyamide adhesive composition consisting essentially of:

A. about 96 to 99.9 by weight of a solid copolyamide of an aliphatic dicarboxylic acid, cyclic dicarboxylic acid each

having 4–12 carbon atoms or mixtures thereof or said dicarboxylic acids and an equivalent amount of aliphatic diamine, cyclic diamine each having 4 – 15 carbon atoms or mixtures thereof or aminocarboxylic acid having 4–16 carbon atoms or mixtures thereof; and

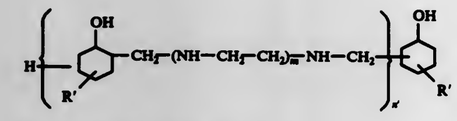
B. an additive of

a. about 0.05 – 2 percent by weight based on the total weight of copolyamide of at least one acid amide of the general formula



wherein R represents a saturated or unsaturated aliphatic hydrocarbon group having 12 – 20 carbon atoms, R_1 represents an alkyl group of 1 – 3 carbon atoms, and n represents an integer of between 3 and 6; and

(b) about 0.05 – 2 percent by weight of a mixture of differently condensed aminoalkyl phenols of the general formula



wherein n' has the value of 0.5 – 2,

m has the value of 2 – 6, and

R' represents an aliphatic hydrocarbon group having 8–10 carbon atoms which is in the ortho- or para-position with respect to the OH-group.

4,046,748

POLYMERS OF TERPENE-MALEIC ANHYDRIDE ADDUCTS WITH ALIPHATIC DIAMINES

Robert William Schlaenz, and Carry Beach Davis, both of Panama City, Fla., assignors to Arizona Chemical Company, Wayne, N.J.

Filed Apr. 19, 1976, Ser. No. 678,082

Int. Cl.² C08G 67/04; C08F 236/00; C08L 11/00

U.S. Cl. 260—78 UA 2 Claims

1. A resinous terpene maleimide prepared by reacting in equimolar amounts of aliphatic diamine and a mixture prepared by reacting at temperatures between 140° C. and 200° C. substantially equimolar amounts of (a) a non-conjugated terpene or mixed non-conjugated terpenes and (b) maleic acid anhydride in the presence of from 0.002% to 0.03% iodine, based on the weight of the terpene, and recovering a mixture of less than 85% mono-adduct and more than 15% di-adduct of terpene-maleic adducts.

4,046,749

PHENYLENE SULFIDE OLIGOMER PRODUCTION

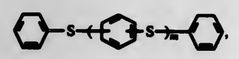
Richard T. Hawkins, Orem, Utah, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 15, 1975, Ser. No. 613,669

Int. Cl.² C08F 28/00; C08G 75/06

U.S. Cl. 260—79 17 Claims

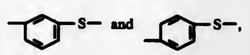
1. A process for the production of phenylene sulfide oligomers which comprises heating at least one aromatic sulfide having the formula



where *m* is an integer of 1, 2, or 3 and where the structure of each



is selected from



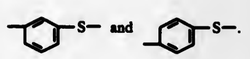
in an atmosphere of an oxygen-containing gas and at an elevated temperature and for a period of time sufficient to form a phenylene sulfide oligomer represented by the formula



where *n* is an integer of 2 to about 12 and where the structure of each



is selected from



4,046,750

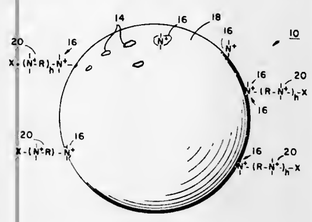
IONENE MODIFIED SMALL POLYMERIC BEADS

Alan Rembaum, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

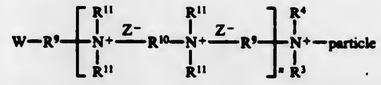
Filed Sept. 30, 1974, Ser. No. 510,786

Int. Cl.² C08F 8/30

U.S. Cl. 526—310 8 Claims



1. A composition of matter comprising: small, synthetic, organic, polymeric spherical particles having a diameter from 100 A. to 100 microns which are the cross-linked, addition polymerization product of a mono-unsaturated, acrylic monomer substituted with ionene reactive chloro, bromo, iodo or tertiary amine sites with 0.1 to 30% by weight of a diene or triene capable of addition polymerization with the unsaturated group of the acrylic monomer and having covalently bonded to at least one of said sites linear, polyquaternary ionene segments having an average charge of at least one intrapolymeric quaternary nitrogen for an average of every twelve chain atoms such that the halogen content of the segments is from 1 meg to 30 meg per gram of particle to form a particle of the structure:



where R^{11} is methyl, R^9 and R^{10} are divalent aliphatic, aromatic or heterocyclic groups containing at least 3 carbon atoms, or R^9 combined with R^{11} form a cyclic group, W is chloro, bromo, or iodo and *n* is an integer.

4,046,751

SUBSTITUTED PHENYL KETONES

Cedric Herbert Hassall, Welwyn; William Henry Johnson, Hitchin; Antonin Krohn, London; Carey Ernest Smithen, Welwyn, and William Anthony Thomas, Huntingdon, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 605,580, Aug. 18, 1975, Pat. No. 4,007,219.

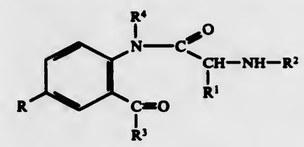
This application Nov. 11, 1976, Ser. No. 741,084

Claims priority, application United Kingdom, Aug. 20, 1974, 36567/74; May 21, 1975, 21821/75; Aug. 11, 1975, 36567/75

Int. Cl.² C07D 213/51; A61K 31/44

U.S. Cl. 260—112.5 R 1 Claim

1. A compound of the general formula



wherein R is selected from the group consisting of a halogen atom, nitro and a trifluoromethyl group; R^1 is a hydrogen atom or a lower alkyl group; R^2 is an acyl group derived from a naturally occurring amino acid; R^3 is a 2-pyridyl group; and R^4 is selected from the group consisting of a hydrogen atom, a methyl, cyclopropylmethyl, di(C_{1-4}alkyl) aminoethyl, methoxymethyl and a hydroxyethyl group or the acid addition salts thereof.

4,046,752

PROCESS FOR PREPARING AN AZO COMPOUND FROM A 2-AMINOTHIAZOLE DIAZO COMPONENT

Kurt Hohmann, Neu-Isenburg; Reinhard Mohr, Offenbach, Main, and Manfred Hahnke, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 8, 1975, Ser. No. 594,111

Claims priority, application Germany, July 11, 1974, 2433229

Int. Cl.² C09B 29/36

U.S. Cl. 260—158 3 Claims

1. In a process for the preparation of a pure thiazolazo compound wherein a 2-aminothiazole is used as a diazo component which comprises diazotizing a synthetized 2-aminothiazole and coupling it with a coupling component to yield the azo compound, the improvement consisting of using the 2-aminothiazole in the diazotization process directly after its synthesis without intermediate isolation from its preparation reaction mixture.

4,046,753

SUBSTITUTED 2-PHENYLHYDRAZINO AND 2-PHENYLAZO THIAZOLINES

Michael H. Fisher, Somerville, and Ma Tin Wa, Clark, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 405,714, Oct. 11, 1973, abandoned.

This application Oct. 2, 1975, Ser. No. 619,000

Int. Cl.² C07C 107/04; C07D 277/04, 277/08, 277/38

U.S. Cl. 260—158 7 Claims

1. The compound which is 2-phenylazo-2-thiazoline.

4,046,754

WATER-SOLUBLE NAPHYHYL-AZO-PYRAZOLONE FIBER REACTIVE DYESTUFFS

Fritz Meininger, and Hartmut Springer, both of Frankfurt am Main, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

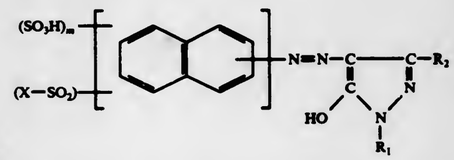
Continuation-in-part of Ser. No. 449,517, March 8, 1974, abandoned, which is a continuation of Ser. No. 261,925, June 12, 1972, abandoned, which is a division of Ser. No. 66,552, Aug. 24, 1970, abandoned. This application Oct. 17, 1975, Ser. No. 623,339

Claims priority, application Germany, Mar. 11, 1971, 1943904

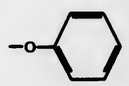
Int. Cl.² C09B 29/38, 43/18

U.S. Cl. 260—162 7 Claims

1. A water-soluble monoazo dyestuff having in the form of the free acid the formula



wherein X is $-CH=CH_2$ or $-CH_2-CH_2-Z$ in which is $-OH$, $-Cl$, $-Br$, $-OSO_3H$, $-SSO_3H$, $-OPO_3H_2$,



or $-N$(lower alkyl)$_2$, R_1 is phenyl or naphthyl substituted by at least one member of the group sulfo and halo, R_2 is lower alkyl, carboxyl or carboxylic acid lower alkylester and *m* is 1 or 2.

4,046,755

DISAZO PIGMENTS CONTAINING NAPHTHALENE COUPLING COMPONENTS

Rudolf Mory, Dornach, and Rolf Muller, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

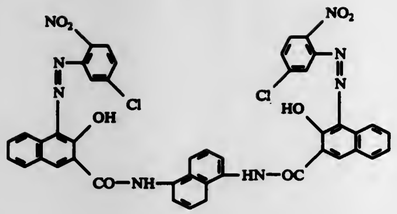
Continuation-in-part of Ser. No. 314,282, Dec. 12, 1972, abandoned. This application Aug. 14, 1975, Ser. No. 604,828

Claims priority, application Switzerland, Dec. 31, 1971, 18188/71

Int. Cl.² C09B 43/12, 33/14

U.S. Cl. 260—174 1 Claim

1. A compound of the formula



substituent of substituted lower alkylcarbonylamino is chloro, bromo, acetoxy, methoxy, ethoxy or phenoxy,

R_{13} is hydrogen, lower alkyl or lower alkoxy,

R_{14} is hydrogen, lower alkyl or substituted lower alkyl wherein the substituent is cyano, hydroxy, methoxy, ethoxy, cyanoethoxy, formyloxy, acetoxy, propionyloxy, methoxycarbonyl, ethoxycarbonyl, methoxycarbonyloxy, ethoxycarbonyloxy, acetoxyethoxy or phenyl, and

R_{15} is hydrogen, lower alkyl or substituted lower alkyl wherein the substituent is hydroxy, methoxy, ethoxy, cyanoethoxy, phenoxy, phenyl, methylamino, ethylamino, formyloxy, acetoxy, propionyloxy, benzoyloxy, methoxycarbonyl, ethoxycarbonyl, phenoxycarbonyl, methoxycarbonyloxy, ethoxycarbonyloxy, phenoxycarbonyloxy, methoxyethoxycarbonyl, 1,1-dimethylhydrazinium A^-, trimethylammonium A^-, or triethylammonium A^-, wherein A^- is an anion.

4,046,756

2,5-DIHALO-4-DIALKYLSULFAMOYL 4'-(N-CYANOALKYL-N-ALKYL-AMINO)-1,1'-AZOBENZENE DISPERSE DYES

Piero Maderni, and Curt Mueller, both of Binningen, Bl, Switzerland, assignors to Sandoz Ltd., Basle, Switzerland

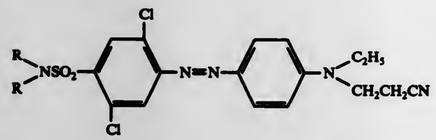
Continuation of Ser. No. 17,916, March 9, 1970, abandoned, which is a continuation-in-part of Ser. No. 673,921, Oct. 9, 1967, abandoned. This application May 30, 1975, Ser. No. 582,081

Claims priority, application Switzerland, Oct. 10, 1966, 16198/66; Oct. 29, 1966, 17094/66

Int. Cl.² C09B *29/08*

U.S. Cl. 260—205 **4 Claims**

1. A of the formula



wherein each R is independently methyl or ethyl.

4,046,757

2-OPTIONALLY SUBSTITUTED ALKYL-AND PHENYLSULFONYLPHENYL-AZO-PHENYL DYES AND A PROCESS FOR THEIR SYNTHESIS

Jacques Meyboeck; Curt Mueller, both of Binningen, and Fred Mueller, Muttenstein, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

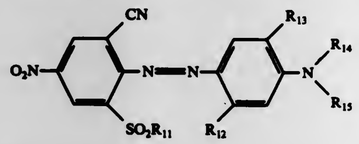
Filed Sept. 23, 1969, Ser. No. 860,403

Claims priority, application Switzerland, Oct. 18, 1968, 15612/68

Int. Cl.² C09B *43/02*

U.S. Cl. 260—207 **26 Claims**

1. A compound of the formula



wherein

R_{11} is phenyl or substituted phenyl, wherein each substituent of substituted phenyl is independently fluoro, chloro, bromo, iodo, hydroxy, methyl, amino, methylamino, nitro or acetamido,

R_{12} is hydrogen, lower alkyl, formamido, lower alkylcarbonylamino, substituted lower alkylcarbonylamino, methoxycarbonylamino, ethoxycarbonylamino, benzamido, methylsulfonylamino or ethylsulfonylamino, wherein the substituent of substituted lower alkylcarbonylamino is chloro, bromo, acetoxy, methoxy, ethoxy or phenoxy,

R_{13} is hydrogen, lower alkyl or lower alkoxy,

R_{14} is hydrogen, lower alkyl or substituted lower alkyl wherein the substituent is cyano, hydroxy, methoxy, ethoxy, cyanoethoxy, formyloxy, acetoxy, propionyloxy, methoxycarbonyl, ethoxycarbonyl, methoxycarbonyloxy, ethoxycarbonyloxy, acetoxyethoxy or phenyl, and

R_{15} is hydrogen, lower alkyl or substituted lower alkyl wherein the substituent is hydroxy, methoxy, ethoxy, cyanoethoxy, phenoxy, phenyl, methylamino, ethylamino, formyloxy, acetoxy, propionyloxy, benzoyloxy, methoxycarbonyl, ethoxycarbonyl, phenoxycarbonyl, methoxycarbonyloxy, ethoxycarbonyloxy, phenoxycarbonyloxy, methoxyethoxycarbonyl, 1,1-dimethylhydrazinium A^-, trimethylammonium A^-, or triethylammonium A^-, wherein A^- is an anion.

4,046,758

3-HALO-2,6-DINITRO-4-TRIFLUOROMETHYLANILINES

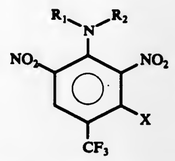
William G. Woods, Fullerton, and Don L. Hunter, Anaheim, both of Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Division of Ser. No. 448,322, March 5, 1974, Pat. No. 3,966,816, which is a continuation-in-part of Ser. No. 878,262, Nov. 19, 1969, abandoned. This application Jan. 28, 1976, Ser. No. 653,182

Int. Cl.² C07D *295/06;* A01N *9/22*

U.S. Cl. 260—239 E **5 Claims**

1. A compound of the formula



in which R_1 and R_2 are combined to form an alkylene group having 2 to 6 carbon atoms in the chain and X is halogen.

5. A compound according to claim 1, which is N,N-pentamethylene-3-chloro-2,6-dinitro-4-trifluoromethylaniline.

4,046,759

PENICILLIN ESTERS

Toshiyasu Ishimaru, D-14, 2-7, Momoyamadai, Suite, Japan

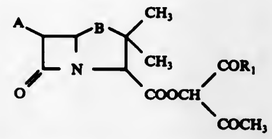
Filed Aug. 25, 1975, Ser. No. 607,362

Claims priority, application Japan, Aug. 29, 1974, 49-99580; Oct. 18, 1974, 49-120488; Apr. 14, 1975, 50-45448; June 6, 1975, 50-68879

Int. Cl.² C07D *499/58, 499/44*

U.S. Cl. 260—239.1 **9 Claims**

1. A penicillin ester having the formula:



wherein A is a conventional penicillin acylamino group;

B is =S or =S—O; and

R_1 is methyl, methoxy or ethoxy.

4,046,760

PROCESS FOR PREPARING 1-α-HYDROXY CHOLESTEROL DERIVATIVES

Howard Jones, Holmdel, and Robert A. Frankshun, Plainfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

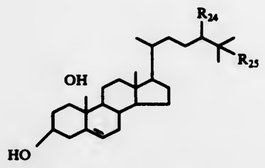
Filed July 1, 1976, Ser. No. 701,917

Int. Cl.² C07J *21/00*

U.S. Cl. 260—239.55 R **6 Claims**

1. A process for the preparation of a 1α-hydroxycholes-5-enol of the formula:

VI



wherein R_{24} is a member selected from the group consisting of hydrogen and methyl and R_{25} is a member selected from the group consisting of hydrogen and hydroxy and wherein the dashed line at C-22-23 represents the optional presence of a double bond, which comprises: p1 a. treating R_{24}, R_{25}-Δ^4-cholestene-3-one of formula I with 2,3-dichloro-5,6-dicyano-1,4-benzoquinone in the presence of a hydrocarbon solvent having a boiling point of about 70° to about 120° C. to produce R_{24}, R_{25}-$\Delta^{1,4}$-cholestediene-3-one of formula II;

b. rearranging the product of Step (a) with a proton abstracting base to produce R_{24}, R_{25}-$\Delta^{1,5}$-cholestediene-3-one of formula III;

c. treating the product of Step (b) with a reducing agent capable of reducing a keto group to a hydroxy group to produce R_{24}, R_{25}-$\Delta^{1,5}$-cholestediene-3β-ol of formula IV;

d. treating the product of Step (c) with an oxidizing agent capable of epoxidizing the 3-hydroxy-Δ^5-system to produce R_{24},R_{25},1α, 2α-epoxy-Δ^5-cholestene-3β-ol of formula V; and

e. treating the product of Step (d) with a reducing agent capable of reducing the epoxide group to a hydroxy group to produce R_{24},R_{25},1α-hydroxycholest-5-enol of formula VI.

6. The compound of claim 4 which is 1α,2α-epoxy-Δ^5-cholestene-3β-acetate.

4,046,761

PROCESS FOR PREPARING CEPHALOSPORIN DERIVATIVES

Jan Verweij, Leiden, and Hong Sheng Tan, Bleiswijk, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Division of Ser. No. 547,948, Feb. 7, 1975, Pat. No. 4,007,202. This application Mar. 4, 1976, Ser. No. 664,056

Claims priority, application United Kingdom, Feb. 8, 1974, 05811/74

Int. Cl.² C07D *501/02;* A61K *31/545*

U.S. Cl. 544—17 **3 Claims**

1. The process of claim 3 wherein acetic acid is added to the reaction mixture.

4,046,762

ESTERS AND AMIDES OF 3-ARYL-1,4 BENZODIOXAN-2-CARBOXYLIC ACIDS

Elso Manghisi, Mouza, and Aldo Salimbeni, Milan, both of Italy, assignors to Instituto Luso Farmaco D'Italia S.r.l., Milan, Italy

Filed Oct. 17, 1973, Ser. No. 407,109

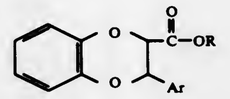
Claims priority, application Italy, Oct. 20, 1972, 30778/72

Int. Cl.² C07D *295/00*

U.S. Cl. 544—148 **5 Claims**

1. A compound of the formula

(I)



or a pharmaceutically acceptable salt thereof, in which Ar represents a monocarbocyclic substituted or unsubstituted aryl group, and R is an ω-aminoalkyl, an ω-aminoalkoxyalkyl radical or an ω-aminoalkyl wherein the amino group is



wherein R_1 and R_2 are identical or different, and are hydrogen, lower alkyl, or R_1 and R_2 are joined together to form an N,N-alkyleneimino, an N,N-oxoalkyleneimino, or an N,N-azaalkyleneimino group in which the alkylene has three to eight carbon atoms.

4,046,763

2,3-DIPHENYL-5-ETHYLPYRAZINE

Norman Schwartz, Philadelphia, and Richard J. Mohrbacher, Fort Washington, both of Pa., assignors to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Division of Ser. No. 774,486, Nov. 8, 1968, Pat. No. 3,761,477. This application Nov. 17, 1972, Ser. No. 307,684

Int. Cl.² C07D *241/12*

U.S. Cl. 260—250 B **1 Claim**

1. 2,3-diphenyl-5-ethylpyrazine.

4,046,764

METHOD AND APPARATUS FOR MEASURING THE THERMAL NEUTRON ABSORPTION RATE IN EARTH FORMATIONS

Gerald L. Marquis, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 2, 1975, Ser. No. 564,233

Int. Cl.² G01V *5/00*

U.S. Cl. 250—262 **5 Claims**

1. Apparatus for investigating the character of earth substances and the like, comprising:

means for irradiating said substances with a burst of neutrons;

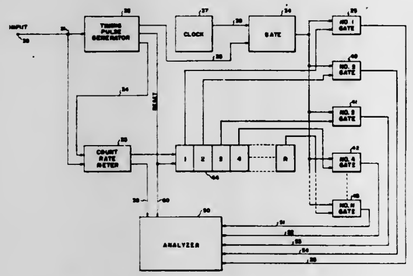
means for detecting radiation occasioned in said irradiated substances by said burst of neutrons during a preselected time interval following said burst of neutrons and for generating electrical pulses indicative of said detected radiation;

circuit means for determining the time relationship of each of said electrical pulses with respect to said time interval;

circuit means for determining the arithmetic mean of said electrical pulses as determined with respect to said time interval; and

circuit means for computing the macroscopic thermal neu-

tron capture cross section from the said arithmetic mean based upon the following relationship:



$$\Sigma = \frac{K_0}{Vt} - K_1 t$$

where

Σ = macroscopic thermal neutron capture cross section
K_0 = a first constant
K_1 = a second constant
V = speed of thermal neutrons
t = arithmetic mean of said electrical pulses.

4,046,765

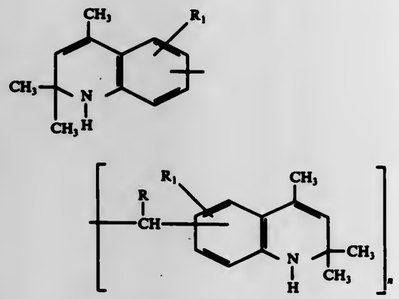
DIHYDROQUINOLINE DERIVATIVES OF ANTIOXIDANT ACTIVITY AND A PROCESS FOR THE PREPARATION THEREOF

Vilmos Ber; Jeno Mercz; Janos Szvoboda; Zsuzsanna B. Pollak, and Jakab Matyas, all of Budapest, Hungary, assignors to Material Kez., Budapest, Hungary

Division of Ser. No. 285,168, Aug. 31, 1972, abandoned. This application Jan. 2, 1975, Ser. No. 538,293
Claims priority, application Hungary, Sept. 7, 1971, BA 2642
Int. Cl.² C07D *401/06, 401/14*
U.S. Cl. 260—288 CE **11 Claims**

1. A process for the preparation of a nontoxic dihydroquinoline-aldehyde condensation product, having the formula */I/*

/I/



wherein

R represents hydrogen or a lower alkyl group of 1 to 4 carbon atoms,

R_1 represents hydrogen or a methyl group which may be attached in any of the free positions to the ring system, with the exception of position 6,

n is 1, 2 or 3,

or the addition salts of these compounds with nontoxic acids, comprising the steps of reacting the heterocycle 2,2,4-trimethyl-1,2-dihydroquinoline or a derivative thereof having a further methyl group but being unsubstituted in the 6-position, or an acid addition salt of these compounds with 0.5 to 1.0 molar equivalents of an aldehyde of the formula

R — CHO

wherein R has the same meaning as defined above in the presence of a solvent and of a catalyst, said catalyst being an acid or a metal halide of acidic character, at temperatures between room temperature and the boiling point of the reaction mixture, and removing any unreacted starting compound and catalyst where toxic from the reaction mixture, at least one pair of adjacent heterocycles being joined through said aldehyde at 6, 6 positions of same.

4,046,766

QUINOLIZINIUM RESINS AND MONOMERS AND METHODS FOR MAKING THEM

Charles Richard Costin, Willow Grove, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 18, 1975, Ser. No. 550,493
Int. Cl.² C07D *211/00*; C08F *8/28*
U.S. Cl. 260—290 HL **3 Claims**

1. A vinyl quinolizinium monomer in which the vinyl group, $-CH=CH_2$, is bonded directly to a quinolizinium ring carbon atom.

4,046,767

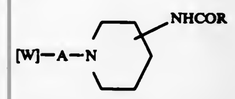
PIPERIDINO COMPOUNDS

John Frederick Cavalla, Isleworth, and John Leheup Archibald, Windsor, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Division of Ser. No. 564,508, April 2, 1975, which is a continuation-in-part of Ser. No. 323,684, Jan. 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 175,345, Aug. 26, 1971, abandoned. This application June 16, 1976, Ser. No. 697,081
Claims priority, application United Kingdom, Sept. 3, 1970, 42090/70; July 22, 1971, 34376/71
Int. Cl.² C07D *211/36*
U.S. Cl. 260—293.77 **13 Claims**

1. A compound of formula Ia

Ia



wherein [W]represents cyclohexyl, monohalophenyl, dihalophenyl, lower alkoxyphenyl, dilower alkoxyphenyl, trilower alkoxyphenyl, di(loweralkyl)phenyl, methylenedioxyphenyl, lower alkanoylaminophenyl, nitrophenyl, or aminophenyl. A is lower alkylene of 1 to 6 carbon atoms, and R represents phenyl or a pharmaceutically acceptable acid addition salt thereof.

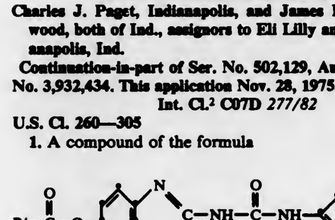
4,046,768

1-THIAZOLYL-5-PYRIDYLCARBONYLOXYIMIDAZOLIDINONES

John Kreuzer, Oak Park, and Chin Ching Wu, Libertyville, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed June 17, 1976, Ser. No. 696,957
Int. Cl.² C07D *417/14*
U.S. Cl. 260—294.8 D **8 Claims**

1. A compound of the formula



wherein X is selected from the group consisting of halogen and lower alkylsulfonyl; R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and propargyl; Z is selected from the group consisting of lower alkyl and halogen; and n is an integer from 0 to 2.

4,046,769

4,10-DIHYDRO-4,10-DIOXO-1H-1-BENZOPYRANO[3,2-B]PYRIDINE-2-CARBOXYLIC ACIDS AND ESTERS

David T. Connor, Parsippany; Patricia A. Young, Madison, and Max von Strandtmann, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 29, 1976, Ser. No. 736,788
Int. Cl.² C07D *491/04*
U.S. Cl. 260—295 T **14 Claims**

1. A compound of the formula:

I.

wherein R_1 is hydrogen, lower alkyl, halogen, hydroxy or lower alkoxy; R_2 is hydrogen, aralkyl or lower alkyl; R_3 is hydrogen or lower alkyl.

4,046,770

N-(6-ACYLOXYBENZOTHIAZOL-2-YL)-N'-PHENYL (OR SUBSTITUTED PHENYL)UREAS

Charles J. Paget, Indianapolis, and James H. Wikel, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 502,129, Aug. 30, 1974, Pat. No. 3,932,434. This application Nov. 28, 1975, Ser. No. 635,832
Int. Cl.² C07D *277/82*
U.S. Cl. 260—305 **9 Claims**

1. A compound of the formula

wherein R is hydrogen, halo, (C_1–C_3) alkyl or ($C_1$14 C_3) alkoxy and R' is ($C_1$14 C_3) alkyl.

6. A compound of the formula

wherein R is hydrogen, halo, (C_1–C_3) alkyl or (C_1–C_3) alkoxy and R' is phenyl.

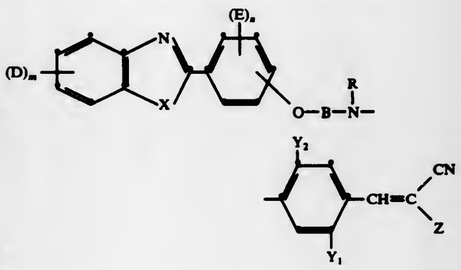
4,046,771

STYRYL DYESTUFFS

Hermann Beecken, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 26, 1975, Ser. No. 617,142
Claims priority, application Germany, Oct. 3, 1974, 2447229
Int. Cl.² C07D *263/56*
U.S. Cl. 260—307 D **4 Claims**

1. Water-insoluble styryl dyestuffs of the formula



wherein

D and E, independently of one another, are C_1-C_4-alkyl, C_1-C_4-alkoxy, trifluoromethyl, chlorine or bromine, and D additionally is phenyl, benzyl, cyclopentyl or cyclohexyl; provided that when more than one substituent on the same nucleus is tetra-butyl or trifluoromethyl they are on nonadjacent carbon atoms;

m and n, independently of one another, are numbers 0 to 4;

B is C_2H_4, $-CH(CH_3)CH_2-$, $-CH(CH_2OCH_3)CH_2-$, or $-CH(C_6H_3)CH_2-$;

R is hydrogen, C_1-C_4-alkyl, or C_1-C_4-alkyl substituted by ethoxy, methoxy, cyano, or phenyl;

Y_1 is hydrogen, C_1-C_4-alkyl, trifluoromethyl, C_1-C_4-alkoxy, or chlorine;

Y_2 is hydrogen, C_1-C_4-alkyl, C_1-C_4-alkoxy, or chlorine;

x is —O—; and

Z is cyano or COOR, where R_1 is C_1-C_4-alkyl or C_1-C_4-alkyl substituted by methoxy, ethoxy, chlorine, cyano, or phenyl.

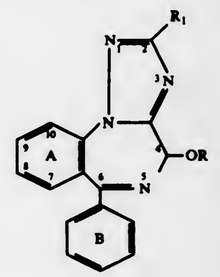
4,046,772

BENZODIAZEPINE DERIVATIVE AND PROCESS FOR PRODUCING THE SAME

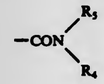
Yutaka Kuwada, Ashiya; Hiroyuki Tawada, Takatsuki, and Kanji Meguro, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 9, 1975, Ser. No. 566,434
Claims priority, application Japan, Apr. 12, 1974, 49-41229
Int. Cl.² C07D *487/14*
U.S. Cl. 260—308 R **17 Claims**

1. A compound of the general formula (I):



wherein R_1 represents a hydrogen atom, cyclopropylmethyl, cyclopentyl, cyclohexyl, an alkyl group of from 1 to 6 carbon atoms, carboxyl, $-COOR_3$ wherein R_3 is alky of from 1 to 4 carbon atoms, or



wherein each of R_4 and R_5 are hydrogen, alkyl of from 1 to 6 carbon atoms, alkyl substituted with alkoxy groups having from 1 to 4 carbon atoms said alkyl group having 1 to 6 carbon atoms, and wherein R_4 and R_5 join to form with the nitrogen a 5 to 7 membered heteroxyclic ring selected from the group consisting of pyrrolidine, piperidine, homopiperidine, morpholine, N-alkylpiperazine having 1 to 3 carbon atoms in the alkyl group, and N-(2-methoxyethyl) piperazine and wherein R is a hydrogen atom, a lower alkyl having 1 to 4 carbon atoms, an acyl group $-COR_6$ wherein R_6 is phenyl, tolyl, benzyl, phenethyl or a lower alkyl group having 1 to 4 carbon atoms, and each of the rings A and B is unsubstituted or substituted by a halogen atom, nitro, lower alkyl having 1 to 4 carbon atoms, triflucromethyl or a lower alkoxy group having 1 to 4 carbon atoms, and the pharmaceutically acceptable acid addition salts thereof.

4,046,773

CARBAMOYL-IMIDAZOLE DERIVATIVE HAVING PESTICIDAL ACTIVITY

Viktor Andriska; Katalin Gorog nee Privitzer; Gyorgyi Bruckner; Zsuzsanna Nemessanyi nee Szekely; Miklos Havasi, all of Budapest; Bela Raskay, Veszprem; Erzsebet Grega nee Toth, Miskolc; Terez Szigeti nee Harangky, Miskolc; Jozsef Dudas, Miskolc; Gyula Szilagyi, Miskolc; Sandor Marosvolgyi, Miskolc; Pal Gribovszky, Miskolc; Zoltan Pinter, Miskolc, and Gyozo Bors, Miskolc, all of Hungary, assignors to Nehezvegyipari Kutato Intezet, Veszprem and Eszakmagyarorszagi Vegyimuvek, Sjobabony, both of, Hungary

Filed June 18, 1973, Ser. No. 370,620

Int. Cl.² C07D *233/66*

U.S. Cl. 548—339 **3 Claims**

1. 1-Phenylcarbamoyl-2-methyl-5-nitroimidazole.
2. 1-(4-chlorophenyl)-carbamoyl-2-methyl-5-nitroimidazole.
3. 1-(3,4-dichlorophenyl)-carbamoyl-2-methyl-5-nitroimidazole.

4,046,774

PROCESS FOR N-PHOSPHORYLATION OF HETEROCYCLIC AMINES

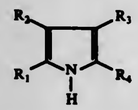
Roger P. Napier, Califon, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,393

Int. Cl.² C07D *209/86*

U.S. Cl. 260—315 **5 Claims**

1. A process for the N-phosphorylation of heterocyclic acidic amines having the following general formula:



where R_1 through R_4 are selected from the group consisting of H, C_1–C_{25} alkyl, phenyl, carbalkoxyl, carboxy, nitro, alkythio, alkoxy, halo, and haloalkyl; and where R_1 and R_2 may be connected so as to form an aromatic ring; and where R_1 and R_2 and R_3 and R_4 may be connected to form respective aromatic rings comprising treating said amine with a complex formed by a mixture of bromotrichloromethane and a trialkyl phosphite having from 1–3 carbon atoms per alkyl group.

4,046,775

4,5-DIHALOPYRROLE-2-CARBOXAMIDES

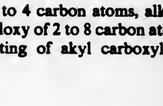
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 349,973, April 11, 1973, Pat. No. 3,963,480. This application June 3, 1975, Ser. No. 583,280

Int. Cl.² C07D *207/44*

U.S. Cl. 260—326.2 **22 Claims**

1. A compound having the formula:



wherein X is chlorine, bromine or iodine, both values of X being identical; R is hydrogen or lower-alkyl; and Q is a member of the group consisting of benzylamino, hydrazino, phenylamino or phenylamino substituted in the phenyl ring by from one to two lower-alkoxy, halogen, lower-alkyl, trifluoromethyl, nitro or sulfamoyl groups.

4,046,776

HETEROCYCLIC SUBSTITUTED LACTONE COMPOUNDS

Robert Garner, Bury, England, and Jean-Claude Petitpierre, Kaiseraugst, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

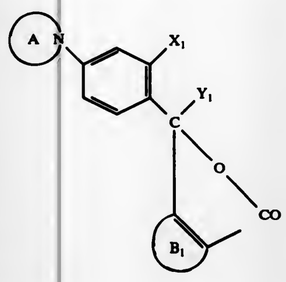
Filed Apr. 2, 1975, Ser. No. 564,383

Claims priority, application United Kingdom, Apr. 9, 1974, 15645/74

Int. Cl.² C07D *209/04, 261/20, 405/04*

U.S. Cl. 260—326.14 R **11 Claims**

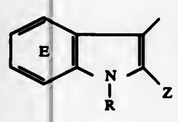
1. A lactone compound of the formula



wherein

X_1 is alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 8 carbon atoms, or acyloxy of 2 to 8 carbon atoms selected from the group consisting of akyl carboxylic acid acyloxy and benzoyloxy;

Y_1 represents



wherein

R is hydrogen, alkyl of 1 to 12 carbon atoms, alkenyl of up to 12 carbon atoms, alkanoyl of 2 to 4 carbon atoms, phenyl, benzyl or phenyl or benzyl which are substituted by halo, nitro, methyl or methoxy;

Z is hydrogen, alkyl of 1 to 12 carbon atoms or phenyl;

and the benzene ring E is unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halo or nitro;

the ring B, represents naphthalene, benzene or benzene substituted by chloro, bromo or nitro; and

the ring A represents pyrrolidinyl, piperidino, pipecolino, perhydroazepinyl, hexamethyleneiminyl, heptamethylene-iminyl, octamethyleneiminyl, 1,2,3,4-tetrahydroquinolinyl indolinyl, phthalimidinyl, hexahydrocarbozolyl.

4,046,777

FLUORINE SUBSTITUTED MALEIMIDES

Albrecht Müller, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 3, 1975, Ser. No. 610,515

Claims priority, application Switzerland, Sept. 19, 1974, 12722/74

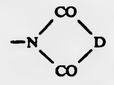
Int. Cl.² C07D *207/12*

U.S. Cl. 260—326.26 **4 Claims**

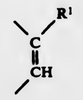
1. A fluorine-containing imide of the formula



in which a denotes 1 or 2 and R denotes the radical



wherein D represents a divalent radical



R^1 is hydrogen or methyl, and in which *b* denotes a number from 3 to 5 if $a = 1$, or *b* denotes 3 or 4 if $a = 2$, and if $a = 2$ the two radicals are preferably in the p- or in the m-position to one another.

4,046,778

PROCESSES FOR THE PREPARATION OF 4-HYDROXY-2H-1-BENZOTHIOPYRAN-3-CARBOXAMIDE 1,1-DIOXIDES

Harold Zinnes, Rockaway, and Neil A. Linda, Chatham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 604,369, Aug. 13, 1975, Pat. No. 4,007,203, which is a continuation-in-part of Ser. No. 163,076, July 15, 1971, abandoned. This application Oct. 18, 1976, Ser. No. 733,487

Int. Cl.² C07D *409/04*

U.S. Cl. 260—326.34 **1 Claim**

1. 4-(1-pyrrolidinyl)-2H-1-benzothiopyran-3-carboxyl chloride 1,1-dioxide.

4,046,779

DIBENZOFURAN-2,3,6,7-TETRACARBOXYLIC ACID DIANHYDRIDE

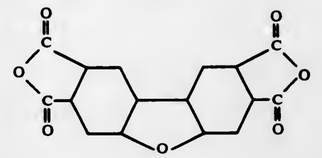
Imre Puskas, Glen Ellyn, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 30, 1975, Ser. No. 582,357

Int. Cl.² C07D *493/14*

U.S. Cl. 260—346.22 **1 Claim**

1. The dibenzofuran-2,3,6,7,-tetracarboxylic dianhydride, structurally represented as follows:



4,046,780

PREPARATION OF PHTHALIC ANHYDRIDE

Yoshiyuki Nakanishi, Misoo; Shigeru Nakamura, Takatsuki, and Tetsuji Ono, Amagasaki, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Oct. 29, 1975, Ser. No. 626,913

Int. Cl.² C07D *307/89*

U.S. Cl. 260—346.4 **9 Claims**

1. A method for preparing phthalic anhydride by catalytic vapor phase oxidation of ortho-xylene or naphthalene, which comprises passing a gas mixture comprising molecular oxygen, an inert gas and a member selected from the group consisting of ortho-xylene and naphthalene through a catalyst A comprising a first catalytically active substance on a first porous inert carrier, said first catalytically active substance consisting essentially of 1 to 20 parts by weight of V_2O_5, 99 to 80 parts by weight of anatase-type TiO_2, and, based on the total weight of V_2O_5 and TiO_2, 0.01 to 1.0% by weight of Nb_2O_5, 0.5 to 1.1% by weight of P_2O_5, 0 to 0.25% by weight of K_2O and 0 to 0.5% by weight of Cs_2O, the total weight of the K_2O and Cs_2O being at least 0.05% by weight, 0.05 to 0.3% by weight of Na_2O and 0 to 0.5% by weight of Rb_2O, said first porous inert carrier predominantly containing SiC, and

passing the thus treated gas mixture through a catalyst B comprising a second catalytically active substance on a second porous inert carrier, said second catalytically active substance consisting essentially of 1 to 20 parts by weight of V_2O_5, 99 to 80 parts by weight of anatase-type TiO_2, and, based on the total weight of the V_2O_5 and TiO_2, 0.01 to 1.0% by weight of Nb_2O_5, 1.2 to 2.5% by weight of P_2O_5, 0 to 0.25% by weight of K_2O and 0 to 0.5% by weight of Cs_2O, the total weight of the K_2O and Cs_2O being at least 0.05% by weight, 0.05 to 0.3% by weight of Na_2O and 0 to 0.5% by weight of Rb_2O, said second porous inert carrier predominantly containing SiC.

4,046,781

BIS-[5-(4-CHLOROPHENYL)FURFURYL]DIALKYLAMMONIUM BROMIDES

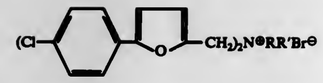
Chia-Nien Yu, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed May 17, 1976, Ser. No. 687,404

Int. Cl.² C07D *307/52*

U.S. Cl. 260—347.7 **4 Claims**

1. A compound of the formula:



wherein R and R_1 are methyl or n-butyl.

4,046,782

PROCESS FOR THE INDUSTRIAL PRODUCTION OF ETHYLENE OXIDE AND AROMATIC ACID

John Koller, 6 Spencer Court, Wyckoff, N.J. 07481

Filed May 8, 1975, Ser. No. 575,643
Int. Cl.[2] C07D *301/06*
U.S. Cl. 260—348.32 30 Claims

1. Process for the manufacture of ethylene oxide and an aromatic acid comprising, reacting oxygen with ethylene and a mono or poly methyl benzene in liquid phase selected from the group consisting of toluene, xylene and pseudocumene, at a temperature within the range from 150° C to 300° C and a pressure within the range from 100 p.s.i.a. to 4000 p.s.i.a. and with the ethylene in the reaction mixture within the range from 0.1 wt. % to 9 wt. %, to form an oxidate comprising the alcohol and the aldehyde of said methyl benzene and to form ethylene oxide, removing the said ethylene oxide, removing the unreacted mono or polymethyl benzene, and further oxidizing the said oxidate to the corresponding aromatic acid.

4,046,783

METHOD OF OLEFIN EPOXIDATION

Stanley B. Cavitt, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 382,919, July 26, 1973, abandoned, which is a division of Ser. No. 102,227, Dec. 28, 1970, Pat. No. 3,956,180. This application July 23, 1975, Ser. No. 598,498
Int. Cl.[2] C07D *301/06*
U.S. Cl. 260—348.33 5 Claims

1. A method for epoxidizing olefins to the corresponding oxirane in liquid phase, which comprises the step of:

intimately contacting an olefinically unsaturated compound with an epoxidizing amount of a molecular oxygen epoxidizing agent in the presence of a solubilizing amount of a suitable nonpolar solvent and a catalytically effective amount of an oxidized alkyl molybdate complex at epoxidizing temperatures of from about 210° C to about 270° C and at pressures sufficient to maintain the reaction mixture consisting essentially of the olefin, solvents, products and by-products substantially in liquid phase, wherein said oxidized alkyl molybdate complex is prepared by

initially forming a lower oligomeric alkyl molybdate,, by heating a compound selected from a group consisting of ammonium molybdate, ammonium paramolybdate, 85% molybdic acid and mixtures thereof with an excess of a primary or secondary aliphatic monohydric alcohol having from about 6 to about 30 carbon atoms to a temperature sufficient to substantially dissolve said molybdate; and

oxidizing said lower oligomeric alkyl molybdate with an oxidizing amount of molecular oxygen.

4,046,784

BORIDE CATALYST FOR EPOXIDIZING OLEFINIC COMPOUNDS

Robert Malone Gipson, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Division of Ser. No. 565,004, April 4, 1975. This application June 25, 1976, Ser. No. 699,838
Int. Cl.[2] C07D *301/20*
U.S. Cl. 260—348.29 2 Claims

1. A method for the liquid phase epoxidation of olefin having from about 2 to about 60 carbon atoms with an organic hydroperoxide comprising the step of:

intimately contacting said olefin with said organic hydroperoxide at lower temperatures of about 25° C to about 200° C and pressures sufficient to maintain the product and reactants substantially in liquid phase in the presence of a catalytically effective amount of a binary boride compound consisting of boron and lanthanum.

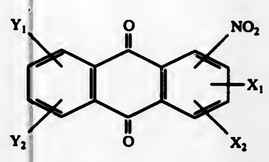
4,046,785

PROCESS FOR PREPARING AMINOANTHRAQUINONES

Yutaka Hirai; Katsuharu Miyata; Tagui Osawa; Masayasu Samecima; Ken Mukai; Koichi Yoshiura, and Hidetoshi Mori, all of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Dec. 18, 1975, Ser. No. 641,832
Claims priority, application Japan, Dec. 20, 1974, 49-145615
Int. Cl.[2] C09B *1/16, 1/36, 1/50*
U.S. Cl. 260—380 9 Claims

1. A process for preparing aminoanthraquinones, which comprises catalytically hydrogenating a nitroanthraquinone of the general formula



(I)

wherein X_1 represents a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, a carboxyl group or a phenoxy group whose benzene nucleus optionally contains a substituent, X_2 represents a hydrogen atom, a hydroxyl group or an amino group, and Y_1 and Y_2, independently from each other, represent a hydrogen atom, a halogen atom, a nitro group, an amino group, a hydroxyl group, a lower alkyl group, a lower alkoxy group or a phenoxy group whose benzene nucleus optionally contains a substituent, with the proviso that when the nitro group is bonded to the 1-position, X_1, X_2, Y_1 and Y_2 do not at the same time represent a hydrogen atom,

in the suspended state in an aqueous medium in the presence of a hydrogenating catalyst.

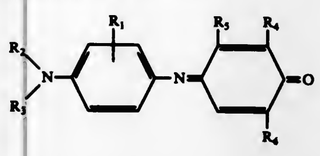
4,046,786

INDOANILINES

Gregoire Kalopissis, Paris; Andrée Bugaut, Boulogne-sur-Seine, and Françoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 482,523, June 24, 1974, Pat. No. 3,929,404. This application Oct. 3, 1975, Ser. No. 619,477
Claims priority, application Luxembourg, June 22, 1973, 67860
Int. Cl.[2] C07C *119/12, 127/17, 143/75*
U.S. Cl. 260—396 N 9 Claims

1. An indoaniline having the formula



wherein:

R_1 represents hydrogen, halogen, alkyl or alkoxy;

R_2 represents alkyl and hydroxyalkyl;

R_3 represents hydroxyalkyl, carbamylalkyl, sulfoalkyl, dialkylaminoalkyl, acetylaminoalkyl and mesylaminoalkyl;

R_4, R_5 and R_6 each independently represent hydrogen, halogen, alkyl, alkoxy, acetylamino, ureido or carbalkoxyamino,

with the proviso that at least one of R_4, R_5 and R_6 is other than hydrogen or halogen and that at least two of said R_4, R_5 and R_6 are other than hydrogen when R_4 or R_6 is methyl and R_5 can further represent amino, alkylamino, hydroxyalkylamino and carbamylalkylamino,

wherein the alkyl and alkoxy groups contain from 1 to 6 carbon atoms.

4,046,787

NOVEL 15-SUBSTITUTED PROSTANOIC ACIDS AND ESTERS

Robert Eugene Schaub, Upper Saddle River, and Martin Joseph Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 468,795, May 9, 1974, Pat. No. 3,932,472, which is a division of Ser. No. 274,558, July 24, 1972, Pat. No. 3,835,179. This application Oct. 24, 1975, Ser. No. 625,406
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—399 16 Claims

1. A compound of the formula:

wherein m is an integer from 5 to 8, inclusive; R_1 is an alkyl group having from 3 to 6 carbon atoms, inclusive; R_2 is selected from the group consisting of hydrogen and an alkyl group having up to 4 carbon atoms; X is selected from the group consisting of mercapto and lower alkanoylthio; and Y is a divalent radical selected from the group consisting of those of the formulae:

and the pharmaceutically acceptable cationic salts thereof when R_2 is hydrogen.

4,046,788

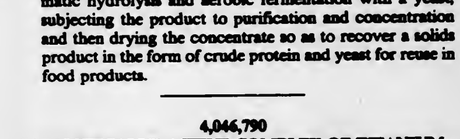
NICKEL STABILIZERS FOR SYNTHETIC POLYMERS

Michael Rasberger, Allschwil; Jean Rody, Basel; Paul Moser, Riehen, and Helmut Miller, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 491,978, July 26, 1974, Pat. No. 3,948,852. This application Mar. 3, 1976, Ser. No. 663,332
Claims priority, application Switzerland, Aug. 7, 1973, 11407/73; Jan. 28, 1974, 1103/74
Int. Cl.[2] C11C *1/00*
U.S. Cl. 260—404 11 Claims

1. Compounds of the formula I

-continued



(I)

wherein either R^1 is hydroxyl and R^2 is hydrogen or R^1 is hydrogen and R^2 is hydroxyl, R^3 and R^4 are hydrogen or alkyl with 1–5 C atoms, either p is 1 and q is 1 or p is 2 and q is zero, X is optionally hydroxyl-substituted alkyl, cycloalkyl, aryl, alkaryl or aralkyl, m is a value from 1–2 and, if $q = 1$, can also be zero, n represents a value from 0 to 2 and L denotes a ligand $R^5—N(R^6)—R^7$, in which R^5 represents alkyl, alkoxyalkyl, alkylthioalkyl, aryl, aralkyl or cycloalkyl and R^6 represents H, alkyl, aralkyl or cycloalkyl and R^7 is H, alkyl or aralkyl.

4,046,789

PROCESS FOR THE SEPARATION OF WASTE PRODUCTS OF THE FOOD INDUSTRY

Hans Muller, Erlenbach, and Louis Grob, Zurich, both of Switzerland, assignors to Chemap AG, Mannedorf, Switzerland

Filed Dec. 2, 1975, Ser. No. 636,946
Claims priority, application Switzerland, Dec. 3, 1974, 16286/74; Jan. 31, 1975, 1286/75; Aug. 22, 1975, 11011/75
Int. Cl.[2] C11B *13/00*; A23J *1/18*; C13D *1/14*
U.S. Cl. 260—412.8 6 Claims

1. A process for separately recovering or converting for reuse the fats, sugar, protein and starch from wastes occurring in the making of bakery products and containing these components,

the said process comprising

1. subjecting the comminuted waste product to a first extraction filtration with a liquid fat solvent, removing the filtered-out fat solution, recovering the fat and recycling the solvent;
2. then subjecting the degreased product to a second extraction-filtration step in the same extraction-filtration zone with an aqueous or alcoholic sugar solvent, followed by removing the filtered-out sugar solution from said suspension and recovering the sugar therefrom; and
3. thereafter withdrawing the filter residue from said extraction-filtration zone and subjecting it to an acidic or enzymatic hydrolysis and aerobic fermentation with a yeast, subjecting the product to purification and concentration and then drying the concentrate so as to recover a solids product in the form of crude protein and yeast for reuse in food products.

4,046,790

CATALYTICALLY ACTIVE COMPLEX OF TITANIUM, CYCLOPENTADIENYL LIGANDS, AND AMMONIA

John N. Armor, Morris Plains, and Guido P. Pez, Boonton, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Aug. 5, 1976, Ser. No. 712,107
Int. Cl.[2] C07F *7/28*
U.S. Cl. 260—429.5 4 Claims

1. Composition having the structural formula, when in crystalline form,

where cp indicates a cyclopentadienyl ligand; said compound, being characterized by,

1. giving a powder x-ray diffraction pattern in which the twelve strongest lines show the following Bragg spacings in Angstrom units, paired with their relative intensities (I/I_1):
(9.5, 45); (7.0, 89); (5.74, 100); (5.50, 72); (5.20, 28); (4.79, 42); (4.27, 8); (4.02, 15); (3.91, 4); (3.71, 6); (3.38, 4); (2.69, 8).
2. giving in suspension in mineral oil, an infrared spectrum showing bands characteristic of compounds containing the $(cp)_2Ti$ moiety and unique characteristic bands at wave numbers of 1585, 1230, 910 and 430 cm^{-1}; and
3. giving a solid state reflectance spectrum in the visible-near infrared region showing a broad band centered at wavelength of 495 ± 10 nm and additional bands at 1300, 1540, 1650 and 1860nm; and in benzene solution giving a visible-near infrared absorption spectrum showing a band at 495 nm and no intense bands between 800nm and 2,000nm.

4,046,791

METHOD FOR PRODUCING MONOALKYL-TIN-TRIHALIDES

Sumio Matsuda, Ibaraki, and Hajime Kudara, Shiga, both of Japan, assignors to Chugoku Marine Paints, Ltd., Hiroshima, Japan

Filed Sept. 15, 1975, Ser. No. 613,155
Claims priority, application Japan, Mar. 20, 1975, 50-33706; Apr. 9, 1975, 50-43533
Int. Cl.² C07F 7/22
U.S. Cl. 260—429.7 **8 Claims**

1. A method for producing monoalkyl-tin-trihalides comprising reacting a stannous halide of the formula SnX_2 wherein X is selected from the group consisting of chlorine and bromine, with an alkyl halide of the formula RX wherein R is an alkyl group having 1 to 8 carbon atoms and X is selected from the group consisting of chlorine and bromine, in an organic solvent consisting of a mixture of tetrahydrofuran and an aromatic hydrocarbon having 6 to 9 carbon atoms, in the presence of a catalyst consisting of iodine and magnesium, and isolating said resulting monoalkyl-tin-trihalide from the reaction mixture.

4,046,792

PROCESS FOR PREPARING METHYLTIN CHLORIDES

Wolfgang Deinhammer; Manfred Wick, and Antonio Macri, all of Munich, Germany, assignors to Consortium fur Elektrochemische Industrie GmbH, Munich, Germany

Filed Mar. 1, 1976, Ser. No. 662,482
Claims priority, application Germany, Mar. 4, 1975, 2514459
Int. Cl.² C07F 7/22
U.S. Cl. 260—429.7 **5 Claims**

1. A process for the preparation of methyltin chlorides, which comprises reacting tetramethylsilane with tin tetrachloride at a temperature of from about 20° to 250° C.

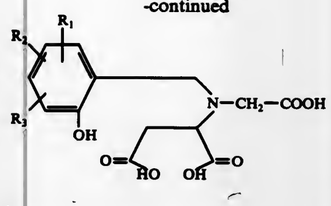
4,046,793

CHELATES FOR THE REGULATION OF METAL-DEFICIENCY PHENOMENA IN PLANTS

Peter Baccini, Kriens, and Werner Fory, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 292,708, Sept. 27, 1972, Pat. No. 3,855,286. This application Oct. 3, 1974, Ser. No. 511,971
Int. Cl.² C07F 15/02
U.S. Cl. 260—439 R **6 Claims**

1. A metal chelate selected from the group consisting of iron, magnesium, calcium, manganese, cobalt, nickel, copper, zinc and cadmium metals of an asparagic acid derivative of formula I



(I)

-continued

wherein
R_1 represents hydrogen, hydroxy, halogen, sulpho, carboxyl C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 halogenoalkyl, di-(C_1–C_6 alkyl) amino, C_2–C_4 alkanoyl or phenyl,
R_2 represents hydrogen, hydroxy, halogen, C_1–C_6 alkyl or C_1–C_6 alkoxy, and
R_3 represents hydrogen or C_1–C_6 alkyl.

4,046,794

UREA SILICON PRODUCT AND USES THEREOF

Enrico J. Pepe, and James G. Marsden, both of Amawalk, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 244,280, April 14, 1972, Pat. No. 3,754,971, which is a division of Ser. No. 759,524, Sept. 12, 1968, Pat. No. 3,671,562, which is a continuation-in-part of Ser. No. 729,895, May 17, 1968, abandoned. This application June 18, 1973, Ser. No. 370,849
Int. Cl.² C07F 7/10, 7/18
U.S. Cl. 260—448.2 N **3 Claims**

1. The hydrolyzate of:



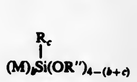
4,046,795

PROCESS FOR PREPARING THIOFUNCTIONAL POLYSILOXANE POLYMERS

Eugene Ray Martin, Onsted, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Filed Nov. 10, 1975, Ser. No. 630,475
Int. Cl.² C07F 7/08, 7/18
U.S. Cl. 260—448.2 E **22 Claims**

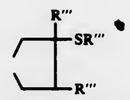
1. A method for preparing thiofunctional polysiloxane polymers which comprises reacting in the presence of a catalyst having a pK value below 1.0 a cyclic trisiloxane with a silicon compound selected from the class consisting of silanes of the formula



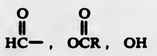
and siloxanes of the formula



in which the cyclic trisiloxane or silicon compound contains at least one thiol group, R is selected from the group consisting of a monovalent hydrocarbon radical and a halogenated monovalent hydrocarbon radical, each having from 1 to 18 carbon atoms, M is selected from the class consisting of R'(SR''')$_y$ and



R' is selected from the group consisting of substituted and unsubstituted divalent, trivalent and tetravalent hydrocarbon radicals free of aliphatic unsaturation having from 1 to 18 carbon atoms, hydrocarbon ether, hydrocarbon thioether, hydrocarbon ester and hydrocarbon thioester radicals in which R' is attached to a silicon atom via a silicon-carbon bond, R'' is selected from the group consisting of hydrogen and a monovalent hydrocarbon radical having from 1 to 18 carbon atoms, R''' is selected from the group consisting of R'' and a radical represented by the formula R''''X, wherein X is a radical selected from the group consisting of



and a cyanoalkyl radical, in which R'''' is a divalent hydrocarbon radical free of a aliphatic unsaturation having from 1 to 18 carbon atoms, Y is a radical selected from the class consisting of $R_3SiO_{1/2}$, RC═O and



where R and R'' are the same as above, *b* is a number of from 0 to 3, *c* is a number of from 0 to 3 and the sum of b+c is a number up to 3, *d* is a number of from 0 to 2, *e* is a number of from 1 to 3, *m* and *n* are each equal to a number of from 0 to 999 and the sum of *m*+*n* is at least 1 and *y* is a number of from 1 to 3.

4,046,796

PROCESS FOR THE PRODUCTION OF POLYFUNCTIONAL CYANIC ACID ESTERS

Gunther Rottloff, Cologne; Rudolf Sundermann, Leverkusen; Ernst Grigat, Odenthal-Gloebusch, and Rolf Putter, Duesseldorf, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Feb. 17, 1976, Ser. No. 658,815
Claims priority, application Germany, Feb. 22, 1975, 2507705; July 2, 1975, 2529487
Int. Cl.² C07C 122/00
U.S. Cl. 260—453 P **2 Claims**

1. A process for producing a polyfunctional aromatic cyanic acid ester which compirses reacting at least one aromatic hydroxy salt selected from the group consisting of alkaline earth and alkali metal salts of aromatic polyhydroxy compounds in the presence of aqueous isopropanol as solvent and from 0.001 to 10% by weight, based on the weight of said aromatic hydroxy salt, of a catalytic tertiary amine with excess cyanogen halide, said aromatic hydroxy salt having been produced by reacting a polyhydroxy compound with an excess of up to 0.1 mol of aromatic hydroxy groups of at least one metal compound of the group consisting of alkaline earth and alkali metal compounds and said cyanogen halide excess comprised up to 1 mol per mol of aromatic hydroxy groups plus the excess mols of said metal compound used for producing said aromatic hydroxy salt plus 1.1% by weight of cyanogen halide for each percent by weight of the catalytic tertiary amine used.

4,046,797

1-METHOXY-1-METHYL-3-{P-[(1,1-DIMETHYL-2-PROPYNYLOXY)-METHOXY]PHENYL}UREA

Barrington Cross, Rocky Hill, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 584,543, June 6, 1975, which is a division of Ser. No. 283,603, Aug. 24, 1972, abandoned. This application Apr. 7, 1976, Ser. No. 674,474
Int. Cl.² C07C 127/15, 127/19; A01N 9/20; C07C 83/08
U.S. Cl. 260—453 R **1 Claim**

1. 1-Methoxy-1-methyl-3-{p-[(1,1-dimethyl-2-propynyloxy)-methoxy]phenyl} urea.

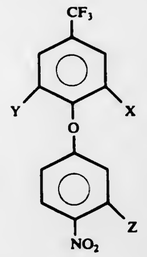
4,046,798

HERBICIDAL 4-TRIFLUOROMETHYL-4'NITRODIPHENYL ETHERS

Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 331,719, Feb. 12, 1973, Pat. No. 3,928,416, which is a continuation-in-part of Ser. No. 234,651, March 14, 1972, Pat. No. 3,798,276. This application Sept. 29, 1975, Ser. No. 617,562
Int. Cl.² C07C 121/75
U.S. Cl. 260—465 D **11 Claims**

1. A compound of the formula



wherein
X is a cyano group,
Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and
Z is a hydroxy group, an alkoxy group having up to 6 carbon atoms, an alkyl group having up to 4 carbon atoms, a halogen atom, an amino group, an alkylthio group having up to 4 carbon atoms, a cyano group, a carboxyalkyl group having up to 4 carbon atoms, a carbalkoxyalkyl group having up to 6 carbon atoms, an alkanoyloxy group having up to 4 carbon atoms, or a carbamoyloxy group having up to 6 carbon atoms.

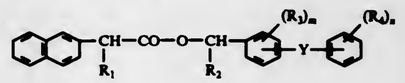
4,046,799

α-CYANO BENZYL-2-NAPHTHALENEACETATES

Venkataraman Kameswaran, Pennbrook, Pa., and Roger William Addor, Pennington, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 2, 1976, Ser. No. 673,244
Int. Cl.² A01N 9/20; C07C 121/66
U.S. Cl. 260—465 D **6 Claims**

1. A compound having the structure:



wherein R_1 represents alkyl C_1–C_4; R_2 is CN; R_3 and R_4 each

represent halogen or methyl; *m* and *n* each represent an integer 0, 1 or 2; and Y represents O, S or CH_2.

4,046,800

CIS-β-[TRIMETHYLAMMONIUM]-ACRYLONITRILE TOSYLATE

Edward J. Hessler, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 546,074, Jan. 31, 1975, Pat. No. 3,978,042. This application June 4, 1976, Ser. No. 692,947
Int. Cl.² C07C *121/78*
U.S. Cl. 260—465 E 1 Claim

1. Cis-β-[trimethylammonium]-acrylonitrile tosylate.

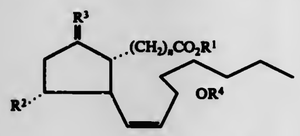
4,046,801

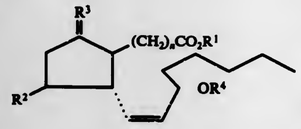
13-CIS PROSTAGLANDIN DERIVATIVES

Arthur F. Kluge, Palo Alto; Karl G. Untch, Los Altos, and John H. Fried, Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 272,880, July 18, 1972, Pat. No. 3,867,377. This application Dec. 9, 1974, Ser. No. 530,778
Int. Cl.² C07C *177/00*
U.S. Cl. 560—121 7 Claims

1. A 13-cis prostaglandin compound selected from the group of isomers having the formulas:





wherein *n* is a whole integer of from two through eight; R^1 is hydrogen, alkyl having from one through ten carbon atoms, chloroethyl, dichloroethyl, or trichloroethyl; R^2 is hydrogen; R^3 is oxo; and $\sim OR^4$ is hydroxy or acid labile ether having from three through ten carbon atoms wherein the wavy bond line indicates either the α or β configuration or isomer mixtures of the α and β configurations;
and mixtures of such isomers and pharmaceutically acceptable salts of such isomers and isomer mixtures wherein R^1 is hydrogen.

4,046,802

PROCESS FOR MAKING A HIGH MOLECULAR WEIGHT ALKYLPHENOXY SUBSTITUTED ALIPHATIC CARBOXYLIC ESTER

John Scotchford Elliott, Boscombe, Bryan Terence Davis, and Richard Martin Howlett, both of Wokingham, all of England, assignors to Edwin Cooper and Company Limited, Bracknell, England

Continuation-in-part of Ser. No. 446,461, Feb. 27, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,210
Claims priority, application United Kingdom, Feb. 27, 1973, 09542/73
Int. Cl.² C09F *5/08, 7/10*; C07C *69/76*
U.S. Cl. 560—61 G 15 Claims

1. A process for making a high molecular weight alkylphenoxy-substituted aliphatic carboxylic ester from an alkylphenol containing 50-200 carbon atoms in the alkyl group, said process being conducted without separating C_{50-200} alkylphenol from the resultant product, said process comprising reacting at least one alkyl-substituted phenol in which the alkyl substituent contains from 50 to 200 carbon atoms with at least one halogen-substituted aliphatic carboxylic ester to obtain said alkylphenoxy-substituted aliphatic carboxylic ester in high yield.

4,046,803

METHOD OF PREPARING β-AMINO DERIVATIVES OF α,β-UNSATURATED ESTERS

John S. Heckles, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Oct. 27, 1976, Ser. No. 736,107
Int. Cl.² C07C *119/12*
U.S. Cl. 560—172 7 Claims

1. A method for preparing β-amino derivatives of α,β-unsaturated esters of the formula $CH_3C(NH_2)=CHC(O)OR'$ wherein R' is C_1 to C_{10} linear or branched alkyl or substituted C_1 to C_{10} linear or branched alkyl, the substituents being those that would not interfere with the reaction, which comprises:
a. forming a reaction mixture of an alkyl acetoacetate ester of the formula $CH_3C(O)CH_2C(O)OR'$ wherein R' is the same as defined above,
1. with ammonia and
2. a salt of a metal selected from the group consisting of lithium, zinc, cadmium, cerium, lead or mixtures thereof in an organic solvent; said salt being soluble in said organic solvent in an amount sufficient to catalyze the reaction between said ester and said ammonia; and
b. recovering said β-amino derivative of α,β-unsaturated ester.

4,046,804

PROCESS FOR PREPARING A NOVEL BENZYLAMINE HYDRATE

Edward M. Cohen, Norristown, and Earl R. Oberholtzer, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 596,942, July 18, 1975. This application Oct. 1, 1976, Ser. No. 728,675
Int. Cl.² C07C *143/10*
U.S. Cl. 260—501.21 3 Claims

1. A process for preparing α,α-dimethyl-4-(α,α,β,β-tetrafluorophenethyl)benzylamine isethionate monohydrate which comprises
a. preparing an aqueous solution containing less than 10% by weight of α,α-dimethyl-4-(α,α,β,β-tetrafluorophenethyl)-benzylamine isethionate,
b. freezing said solution,
c. thawing said frozen solution at a temperature of about 5° C. and
d. separating therefrom α,α-dimethyl-4-(α,α,β,β-tetrafluorophenethyl)benzylamine isethionate monohydrate which precipitates.

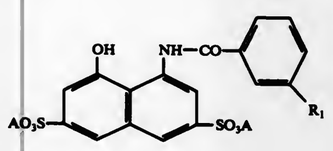
4,046,805

SUBSTITUTED-HYDROXY-NAPHTHALENEDISULFONIC ACID COMPOUNDS

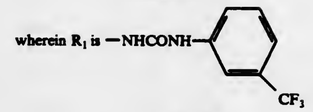
Seymour Bernstein, New City, N.Y.; Robert Herman Leonard, Paramus, N.J., and Milton David Heller, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

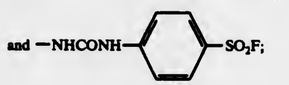
Filed May 10, 1976, Ser. No. 684,598
Int. Cl.² C07C *143/30*; A61K *31/185*
U.S. Cl. 260—506 4 Claims

1. A compound selected from those of the formula:



-continued

wherein R_1 is —NHCONH— 

and —NHCONH—  ;

and A is hydrogen, alkali metal or alkaline earth metal, with the proviso that each A is identical in the same compound.

4,046,806

METHOD OF PREPARING A DISALT OF 3,3-SULFONYLBIS (6-HYDROXYBENZENE SULFONIC ACID)

John H. Kozlowski, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Sept. 12, 1975, Ser. No. 612,598
Int. Cl.² C07C *143/42*
U.S. Cl. 260—512 C 3 Claims

1. A method of preparing an ammonium or alkali metal disalt of 3,3'-sulfonylbis (6-hydroxybenzene sulfonic acid) comprising
a. reacting 4,4'-dihydroxyldiphenyl sulfone with a sulfonating agent selected from the group consisting of chlorosulfonic acid and sulfur trioxide in the presence of sulfolane as a solvent to form 3,3'-sulfonylbis(6-hydroxybenzene sulfonic acid),
b. adding an alcohol selected from the group consisting of methanol and ethanol and a base soluble in the alcohol to the reaction mixture, the base being selected from the group consisting of hydroxides and salts of weak acids wherein the cation of the base is ammonium or an alkali metal, the base being present in an amount sufficient to form the disalt of 3,3'-sulfonylbis(6-hydroxybenzene sulfonic acid), and the alcohol being present in an amount sufficient to selectively precipitate the disalt, and
c. recovering the disalt from the reaction mixture.

4,046,807

PROCESS FOR PREPARING ACETIC ANHYDRIDE

Herbert Kackertz, Bad Soden, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 24, 1975, Ser. No. 625,692
Claims priority, application Germany, Oct. 26, 1974, 2450965
Int. Cl.² C07C *51/10, 51/56*
U.S. Cl. 260—549 11 Claims

1. A process for the preparation of acetic anhydride which comprises reacting a mixture consisting essentially of acetic acid methyl ester and carbon monoxide at a pressure of 1 to 500 bar and at temperature of from 50 to 250° C and carrying out said reaction in the presence of a catalyst containing a noble metal of the 8th subgroup of the Periodic Table.

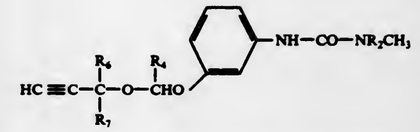
4,046,808

(ALKENYLOXY)-, (ALKYNYLOXY) AND (CYANOALKOXY) ALKOXYPHENYL UREAS AND THEIR USE AS HERBICIDES

Barrington Cross, Rocky Hill, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 283,603, Aug. 24, 1972, abandoned. This application June 6, 1975, Ser. No. 584,543
Int. Cl.² C07C *127/15, 127/19*
U.S. Cl. 260—553 A 3 Claims

1. A compound represented by the formula:



wherein R_2, R_4, R_6 and R_7 are hydrogen or methyl.

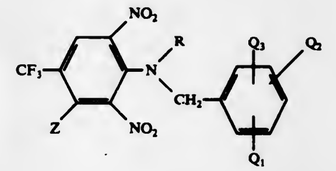
4,046,809

N-BENZYL-2,6-DINITRO-3-AMINO-4-TRIFLUOROMETHYLANILINES AS PLANT GROWTH REGULANTS

Merrill Wilcox, 2911 NW. 30th Terrace, Gainesville, Fla. 32601

Filed Dec. 16, 1974, Ser. No. 533,045
Int. Cl.² C07C *87/28*
U.S. Cl. 260—570.9 10 Claims

1. A compound of the formula



in which
R is lower alkyl,
Z is amino, lower alkylamino or di lower alkylamino,
each of Q_1 and Q_2 is hydrogen, halogen, lower alkyl or methoxy, and
Q_3 is hydrogen, lower alkyl or methoxy.

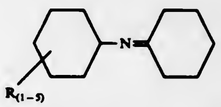
4,046,810

PROCESS FOR THE PREPARATION OF DIPHENYLAMINE AND DERIVATIVES THEREOF

Pietro Antonio Moggi, and Ugo Romano, both of Milan, Italy, assignors to SNAM Progetti S.p.A., San Donato Milanese, Italy

Continuation of Ser. No. 369,494, June 13, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,296
Claims priority, application Italy, June 24, 1972, 26169/72
Int. Cl.² C07C *87/54, 91/16, 91/18*
U.S. Cl. 260—571 9 Claims

1. Process for the production of a member of the group consisting of diphenylamine and the alkyl, phenyl, amino, alkoxy, hydroxy and halogen derivatives thereof consisting in reacting an imine having the formula



wherein R is a substituent selected from alkyl, H, phenyl, amine, alkoxy, hydroxy and halogen with oxygen at a temperature in the range from 300° C to 450° C by feeding to a reactor charged with a contact mass selected from silica, alumina, silica-alumina, silica-aluminate and oxides, oxide mixtures, and compounds of metals selected from the group consisting of V, Bi and Mo and maintained at said temperature a stream of said imine in the vapor phase, together with oxygen at a molar ratio in the range from 0.1:1 to 20:1 and at a rate providing a contact time in said reactor in the range from 0.1 to 20 seconds.

4,046,811

ANTIVIRAL 1,2,3,4-TETRAHYDRO-1,4-ALKANONAPHTHALENAMINE DERIVATIVES

Kekhasroo R. Bharucha, Toronto; Djordje Ajdukovic, Montreal; Vytautas Pavilanis, Westmount, and Angus Campbell Mackay, Toronto, all of Canada, assignors to Canada Packers Limited, Toronto, Canada

Division of Ser. No. 289,122, Sept. 14, 1972, Pat. No. 3,932,512. This application May 19, 1975, Ser. No. 578,871

Int. Cl.² C07C *87/64*

U.S. Cl. 260—578 **2 Claims**

1. A compound selected from the group consisting of 1,2,3,4-tetrahydro-1,4-methanonaphthalen-endo-2-amine and its pharmaceutically acceptable acid addition salts.

4,046,812

PROCESS FOR PREPARING 1,1-DIMETHYL HYDRAZINE

Heimo J. Langer, Columbus; Kenneth R. Robinson, and Peter E. Throckmorton, both of Worthington, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 510,370, Sept. 30, 1974, abandoned. This application Sept. 29, 1975, Ser. No. 617,502

Int. Cl.² C07C *109/02*

U.S. Cl. 260—583 B **3 Claims**

1. A process for the preparation of 1,1-dimethyl hydrazine which comprises initially reacting in an aqueous medium at a temperature of from 0° to 10° C about equi-molar amounts of 1,1-dimethylurea and an alkali or alkaline earth metal hypochlorite, said hypochlorite salt associated with x mole of a corresponding metal hydroxide where x is less than one mole per mole of the hypochlorite salt but in a sufficient amount to inhibit substantially completely the decomposition thereof, and wherein the concentration of each reactant is at least about 1.0 molal, thereupon introducing an additional amount of said metal hydroxide to provide (2-x) moles thereof per mole of the starting 1,1-dimethylurea and reacting the basified mixture at a temperature not in excess of 30° C to effect the rearrangement thereof whereupon 1,1-dimethyl hydrazine is recovered by distillation

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4,046,813

PROCESS FOR PRODUCING KETOISOPHORONE

Wolf Brunner, Fallinsdorf, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 28, 1975, Ser. No. 563,040

Claims priority, application Switzerland, Apr. 11, 1974, 5187/74

Int. Cl.² C07C *45/00*

U.S. Cl. 260—586 P **8 Claims**

1. A process for oxidizing β-isophorone to ketoisophorone comprising oxidizing, in the presence of an organic aromatic nitrogen base, β-isophorone with oxygen or an oxygen containing gas utilizing as a catalyst a salt of a metal selected from the group consisting of lead, vanadium, chromium, manganese, iron or cobalt.

4,046,814

PREPARATION OF DIKETONES

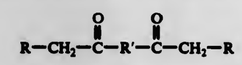
Frank W. Harris, Xenia, and Bruce A. Reinhardt, Dayton, both of Ohio, assignors to Wright State University, Dayton, Ohio

Filed Dec. 18, 1975, Ser. No. 641,959

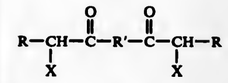
Int. Cl.² C07C *49/76, 45/00*; C07D *307/12*; C07C *121/60*; C07D *307/46, 213/50*

U.S. Cl. 260—590 E **8 Claims**

1. The method of preparing a diketone having the formula



wherein R′ is phenyl and R is a radical selected from the group consisting of phenyl, substituted phenyl, pyridyl, and furyl radicals, comprising: (a) reacting a dicarboxylic acid derivative that contains no alpha hydrogens selected from the group consisting of dimethyl terephthalate; terephthaloyl dichloride, dimethyl isophthalate and isophthaloyl dichloride with an active-hydrogen compound selected from the group consisting of ethyl phenylacetate, phenylacetamide, phenylacetonitrile, ethyl 2-pyridylacetate, 4-aminophenylacetonitrile, methyl 4-biphenylacetate, 4-methylphenylacetonitrile, 3-chlorophenylacetonitrile, 5-fluoro-2-nitrophenylacetonitrile, 2-furanacetonitrile and 2-benzimidazolylacetonitrile, said reaction taking place at −100° C to 200° C for 10 minutes to 10 hours and in the presence of a strong base selected from the group consisting of sodium hydride, sodium amide, and sodium triphenylmethyl to form an intermediate having the formula



wherein R and R′ are as defined and X is a nitrile or a carboxylic acid functional group, and (b) hydrolyzing and decarboxylating said intermediate to form said diketone.

4,046,815

PROCESS FOR THE PREPARATION OF TRIARYLBORANE

Nicholas Nazarenko, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 630,993, Nov. 12, 1975, abandoned. This application May 17, 1976, Ser. No. 687,174

Int. Cl.² C07F *5/02*

U.S. Cl. 260—606.5 B **12 Claims**

1. A process for the preparation of an alkali metal hydroxide salt of a triarylborane which comprises reacting under substantially anhydrous conditions alkali metal, an aryl halide and an orthoborate ester at a ratio of halide to ester in the range of about 3.5:1 to about 3:1 in an inert organic liquid solvent having 5–8 carbon atoms and thereafter contacting the reaction products with water to thereby form an alkali metal hydroxide salt of said borane in aqueous medium.

4,046,816

PROCESS FOR PREPARING RESORCINOL MONOETHERS

Werner Heinrich Muller, Aldersbach, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 12, 1975, Ser. No. 586,352

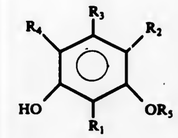
Claims priority, application Germany, June 14, 1974, 2428879

Int. Cl.² C07C *41/00*

U.S. Cl. 260—613 R **1 Claim**

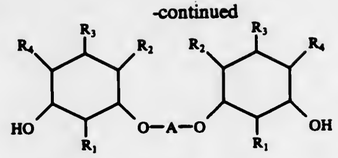
1. A process for the preparation of resorcinol monoalkyl ethers of the general formula I and II:

I



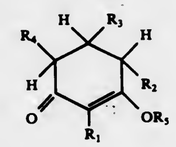
II

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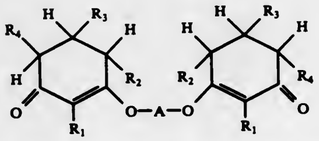


wherein the radicals R_1 to R_4 may be the same or different and each represents a hydrogen, straight chain, branched or cyclic aliphatic radical or an aryl group or araliphatic radical and the radicals R_5 and A stand for straight chain, branched or cyclic aliphatic radical or araliphatic radical which comprise dehydrogenating in a liquid phase using as a liquid a triethylene glycol dialkyl ether or a diethylene glycol dialkyl ether having alkyl groups of up to 6 carbon atoms, at a temperature from 160° to 350° C in the presence of a catalyst containing noble metals of subgroup VIII of the Periodical Table 3-alkoxycyclohexene-(2)-ones of the general formulae I′ and II′

I′



II′



wherein R_1 to R_5 and A have the aforesaid meaning.

4,046,817

METHOD OF SYNTHESIS OF PYROGALLOL

Mohammed T. Shipchandler, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Maryland

Continuation-in-part of Ser. No. 490,156, July 19, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,422

Int. Cl.² C07C *39/10, 69/38, 69/66*

U.S. Cl. 260—621 R **5 Claims**

1. A process for the production of pyrogallol comprising the steps of

a. reacting dialkyl glutarate with dialkyl dialkoxymalonate, said alkyl and alkoxy groups having from 1–6 carbon atoms in about a 1 to 1–2 mole ratio at a temperature of about 25°–150° in the presence of sodium hydride or a sodium alkoxide thereby producing dialkyl-4,6-dihydroxy-5,5-dimethoxy-3,6-cyclohexadiene-1,3-dicarboxylate, and separating same,

b. heating said dialkyl 4,6-dihydroxy-5,5-dimethoxy-3,6-cyclohexadiene-1,3-dicarboxylate in the presence of a strong acid selected from the group consisting of sulfuric, hydrochloric, hydrobromic, trichloroacetic and p-toluene sulfonic acid at a temperature of from about 30° to about 150° C to produce 4,5,6-trihydroxyisophthalic acid, and separating same,

c. heating said trihydroxyisophthalic acid at a temperature of about 190°–210° C to produce pyrogallol.

4,046,818

PURIFICATION OF 3,5-DIALKYLPHENOLS

Gerd Leston, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed June 26, 1975, Ser. No. 590,458

Int. Cl.² C07C *37/22, 39/06*

U.S. Cl. 260—627 G **9 Claims**

1. A method of purifying 3,5-dialkylphenols from a mixture containing monoalkylphenols and other dialkylphenols wherein the 3,5-dialkylphenol has alkyl groups which are primary or secondary and have a sum total number of carbon atoms greater than 2, comprising:

a. subjecting said mixture to sulfonation with a sulfonating agent selected from the group consisting of sulfuric acid, fuming sulfuric acid, or sulfur trioxide in an amount of at least one mole of sulfonating agent per mole of compound other than 3,5-dialkylphenol present in said mixture and at a temperature in the range of room temperature to 150° C at atmospheric pressure whereby all the compounds in said mixture other than said 3,5-dialkylphenol are converted to sulfonic acids, and

b. separating said sulfonic acids from the unsulfonated 3,5-dialkylphenol to produce a purified 3,5-dialkylphenol.

4,046,819

ALKYLATION OF ALKYL, CYCLOALKYL AND ARALKYL HALIDES

Louis Schmerling, Riverside, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 489,868, July 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 247,082, April 24, 1972, abandoned. This application May 3, 1976, Ser. No. 682,550

Int. Cl.² C07C *19/00, 23/10, 25/14*

U.S. Cl. 260—648 R **12 Claims**

1. An alkylation process which comprises reacting an olefin containing from 2 to about 9 carbon atoms with a halide reactant selected from the group consisting of a monohaloalkane containing from 3 to about 16 carbon atoms, monohalocycloalkane containing 5 or 6 carbon atoms in the ring and an aralkyl monohalide containing from 2 to about 4 carbon atoms in the alkyl group, said halide reactant containing at least one saturated aliphatic carbon atom which possesses at least one hydrogen atom, said reaction being effected in the presence of a catalytic system consisting essentially of hydrogen chloride and a free radical-generating organic peroxide compound, at reaction conditions which include a temperature in the range of from about 50° to about 300° C. and at least as high as the decomposition temperature of said organic peroxide compound and a pressure of from about atmospheric to about 100 atmospheres, and recovering the resultant monoalkylated halide as the principal product.

4,046,820

STABILIZATION OF 1,1,1-TRICHLOROETHANE

Willis Ray Goodner, Chandler; James Nelson Smith, Tempe, and John Horvath, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed June 7, 1976, Ser. No. 693,588

Int. Cl.² C07C *17/40*

U.S. Cl. 260—652.5 R **4 Claims**

1. A stabilized composition consisting essentially of 1,1,1-trichloroethane and an effective amount of a free radical scavenger selected from the group consisting of trichloroethylene and fluorene which will trap trichloromethyl radicals, making them unavailable for formation of acidic species in said trichloroethane.

4,046,821

OXYCHLORINATION OF HYDROCARBONS IN THE PRESENCE OF NON-HALIDE COPPER CONTAINING CATALYSTS

Louis J. Croce, Seabrook, Tex.; Laimonis Bajars, Princeton, and Maigonis Gobliks, Highland Park, both of N.J., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation of Ser. No. 889,671, Dec. 31, 1969, abandoned. This application May 12, 1975, Ser. No. 576,589

Int. Cl.² C07C *17/15*

U.S. Cl. 260—654 A **24 Claims**

1. In the process of oxychlorination of hydrocarbons comprising contacting in a vapor phase a hydrocarbon, hydrogen chloride or chlorine and oxygen at a temperature range of 200° – 700° C. in the presence of a catalyst wherein the improvement comprises employing a catalyst calcined at 600° – 1100° C consisting of a non-halide copper component consisting of copper and an element selected from the group consisting of O, S. N. P, As, Sn, Pb, Fe, Cr, Mo, W, V, Ti and mixtures thereof and a rare earth compound component, wherein the rare earth is selected from the group consisting of La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu and mixtures thereof and the atomic ratio of rare earth to copper is in the range of 4 to 0.1:1.

4,046,822

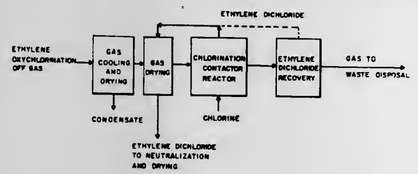
METHOD FOR RECOVERING ETHYLENE VALUES

Frank Titus Severino, Teaneck, N.J., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 191,975, Oct. 26, 1971, abandoned. This application Nov. 20, 1973, Ser. No. 417,648

Int. Cl.² C07C *17/00*

U.S. Cl. 260—659 A **6 Claims**



1. In a process for preparing ethylene dichloride by oxychlorinating ethylene in which ethylene, hydrogen chloride and an oxygen containing gas are reacted in the presence of an oxychlorination catalyst and where unreacted ethylene values are present in the oxychlorination off-gas; the improvement which comprises recovering the unreacted ethylene values in the oxychlorination process off-gas by the steps of:

a. cooling the off-gas to condense at least part of the water in the off-gas to form a condensed phase and a gaseous phase;
b. separating the condensed phase from the gaseous phase thereby providing a partially dried gaseous phase;
c. contacting the partially dried gaseous phase with ethylene dichloride to further reduce the water content of the partially dried gaseous phase and separating the gaseous phase from the ethylene dichloride;
d. reacting the ethylene in the gaseous phase from step c) with chlorine in the presence of a non-reactive liquid to form ethylene dichloride; and
e. recovering the ethylene dichloride; the water content of said off-gas

being reduced by said cooling, separating and contacting steps to a level such that the water content of the non-reactive liquid is maintained below about 50 parts per million by weight.

4,046,823

PROCESS FOR PRODUCING 1,2-DICHLOROETHANE

Ronnie D. Gordon, and Charles M. Starks, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Mar. 15, 1971, Ser. No. 124,441

Int. Cl.² C07C *17/10*

U.S. Cl. 260—662 R **7 Claims**

1. A process for producing 1,2-dichloroethane which comprises reacting chlorine and ethane in the vapor phase at temperatures in the range of 200° to 500° C in the presence of an alumina supported cupric catalyst promoted with a member selected from the group consisting of KCl and inorganic iron salts, said cupric constituent being selected from the group consisting of $CuCl_2$ and CuO, the mol ratio of chlorine to ethane being in the range of 1:10 to 10:1.

4,046,824

PROCESS FOR SELECTIVE HYDROGENATION OF ETHYLBENZENE

Derek L. Ransley, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 31, 1975, Ser. No. 645,586

Int. Cl.² C07C *5/10, 5/14*

U.S. Cl. 260—667 **14 Claims**

1. A process for selectively hydrogenating ethylbenzene in a C_8 aromatic mixture comprising ethylbenzene and at least one xylene isomer, which comprises heating said mixture with hydrogen in the presence of a catalyst consisting essentially of rhodium until from about 5% to about 60% of said mixture is hydrogenated.

4,046,825

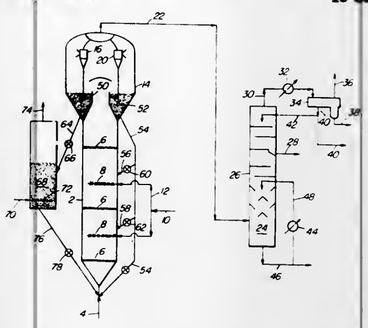
CONVERSION OF OXYGENATED COMPOUNDS TO GASOLINE

Hartley Owen, Belle Mead, and Paul B. Venuto, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 470,084, May 15, 1974, abandoned. This application July 9, 1976, Ser. No. 703,716

Int. Cl.² C07C *1/24*

U.S. Cl. 260—668 R **18 Claims**



1. In the method for chemically reacting aliphatic hetero compounds comprising alcohols, halides, mercaptans, sulfides, amines, ethers and carbonyl compounds under exothermic conditions to form aromatics in the gasoline boiling range by contacting said hetero compounds with catalyst particles comprising a crystalline zeolite selected from a class of crystalline zeolites represented by ZSM-5 crystalline zeolite providing a pore conversion greater than 5 Angstroms, a silica to alumina ratio greater than 12 and a constraint index in the range of 1 to 12, the improvement which comprises:

forming a mixture of said catalyst particles with one of said hetero compound reactants in a ratio greater than 20 to 1 at a mix temperature within the range of 400° to 900° F;

passing the catalyst reaction mixture as a suspension upwardly at a plurality of spaced apart intervals along the height of a elongated reaction zone containing transverse gas bubble-dispersing means at a reactant residence time within the range of 2 to 10 seconds so as to restrict an incremental exothermic temperature increase not to exceed about 100° during rearrangement of said chemical reactants to higher boiling product compounds and minimize the formation of durene;

separating the suspension into a catalyst phase and a product phase upon discharge from the reaction zone;

recovering said separating from the product phase a gasoline and a higher boiling liquid phase;

recovering the catalyst phase as a dense fluid bed of catalyst and recycling a major portion thereof to said reaction zone;

passing a minor portion of said recovered dense fluid bed of catalyst to catalyst regeneration when an amount of reactant deposits accumulates on the catalyst requiring removal thereof by burning with oxygen containing gases;

cooling catalyst particles following regeneration thereof when its temperature exceeds about 900° F and passing the cooled catalyst to the inlet of said elongated reaction zone.

4,046,827

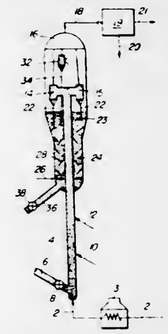
HIGH SELECTIVITY TRANSALKYLATION

Hartley Owen, Belle Mead; Paul B. Venuto, Cherry Hill, and Edward T. Habib, Jr., Mantua, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 26, 1975, Ser. No. 616,966

Int. Cl.² C07C *3/62*

U.S. Cl. 260—672 T **20 Claims**



1. In a process for effecting transalkylation of an alkylaromatic hydrocarbon compound having from 7 to 10 carbon atoms which comprises contacting said alkylaromatic hydrocarbon compound with a transalkylating agent in the presence of a porous acid-active zeolite catalyst and in the absence of added hydrogen, the improvement wherein said catalyst has a fluid activity index of at least 18 and said contacting is conducted in a fluidized catalyst system reactor under conditions effective for accomplishing said transalkylation including a reactor inlet temperature of between about 300° F and about 1200° F, a reactor pressure of between about 0 psig and about 200 psig, a catalyst/alkylaromatic hydrocarbon compound weight ratio of between about 1 and about 60, a catalyst residence time of between about 0.01 second and about 20 seconds, an alkylaromatic hydrocarbon compound residence time of between about 0.01 second and about 20 seconds and a ratio of catalyst residence time/alkylaromatic hydrocarbon compound residence time of from about 1 to about 2.

4,046,826

PROCESS FOR ALKYLATING AROMATIC HYDROCARBONS WITH SYNTHETIC HECTORITE-TYPE CLAY CATALYST

George E. Stridde, Houston, Tex., assignor to N L Industries, Inc., New York, N.Y.

Division of Ser. No. 530,092, Dec. 6, 1974, Pat. No. 3,979,331, which is a continuation-in-part of Ser. No. 503,985, Sept. 6, 1974, Pat. No. 3,965,043. This application June 21, 1976, Ser. No. 698,104

Int. Cl.² C07C *3/52, 15/09*

U.S. Cl. 260—671 C **17 Claims**

1. In a process for alkylating in the liquid phase an alkylatable aromatic hydrocarbon with an olefin-acting compound selected from the group consisting of mono-olefins, alkyl bromides, alkyl chlorides, and mixtures thereof, the improvement which comprises contacting said hydrocarbon and said compound under anhydrous alkylating conditions with a catalyst comprising a synthetic hectorite-type clay in which the central octahedral layer contains one or more divalent metals having an ionic radius not greater than 0.75 A, provided that the octahedral layer contains less than 95 mole percent Mg, containing a metallic cation having a Pauling electronegativity greater than 1.0 in cation exchange positions on the surface of said clay.

2. The process of claim 1 wherein said catalyst has the structural formula:

$$[(M_{6-x}{}^{2+}\ Li_x{}^{+})^{VI}(Si_8)^{IV}O_{20}(OH)_{4-y}F_y]\ (x/z)R^z$$

where

$0.33 \leq x \leq 1$

$0 \leq y \leq 4$

M is one or more divalent cations having an ionic radius not greater than 0.75 A selected from the group consisting of Mg, Ni, Co, Zn, Mn, and Cu, and

R is at least one metallic cation having a Pauling electronegativity greater than 1.0 of valence z

4,046,828

DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application May 24, 1976, Ser. No. 689,316

The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.

Int. Cl.² C07C *5/24*

U.S. Cl. 260—673.5 **27 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt and tin are uniformly dispersed throughout the porous carrier material; wherein the average crystallite size of the tin and catalytically available cobalt is less than 100 Angstroms in maximum dimension; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalyti-

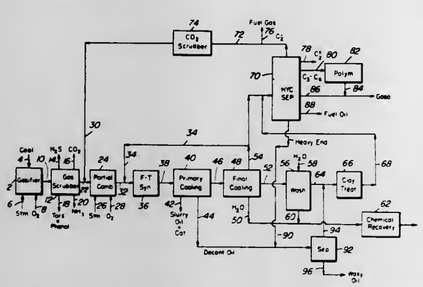
cally available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrocyclization conditions or in a mixture of these states.

4,046,829

METHOD FOR IMPROVING THE FISCHER-TROPSCH SYNTHESIS PRODUCT DISTRIBUTION

Henry R. Ireland, Woodbury, and Thomas R. Stein, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,753
Int. Cl.² C07C *1/04*
U.S. Cl. 260—676 R **1 Claim**



1. A method of forming hydrocarbons from carbon monoxide and hydrogen which comprises:

passing carbon monoxide and hydrogen in contact with a Fischer-Tropsch synthesis carbon monoxide reduction catalyst under temperature and pressure conditions promoting the formation of hydrocarbons and oxygenates,

separating the Fischer-Tropsch synthesis product into a hydrocarbon fraction boiling below about 400° F and a hydrocarbon fraction boiling above about 400° F,

passing said hydrocarbon fraction boiling below about 400° F in contact with a crystalline zeolite that has a pore diameter greater than about 5 angstroms; a silica to alumina ratio of at least 12; a constraint index within the range of 1–12; under temperature and pressure conditions promoting the formation of gasoline boiling range products of higher octane rating, passing said hydrocarbon fraction boiling above 400° F sequentially in contact with a hydrogenation catalyst maintained under relatively mild hydrogenation conditions and then in contact with a crystalline zeolite that has a pore diameter greater than about 5 angstroms; a silica to alumina ratio of at least 12; a constraint index within the range of 1–12; maintained under conditions to convert said hydrocarbon fraction to a lower boiling fuel oil product of reduced pour point, and

recovering gasoline boiling range products from each of said crystalline zeolite conversion operations of a higher octane rating than the octane rating of gasoline product of Fischer-Tropsch synthesis.

4,046,830

METHOD FOR UPGRADING FISCHER-TROPSCH SYNTHESIS PRODUCTS

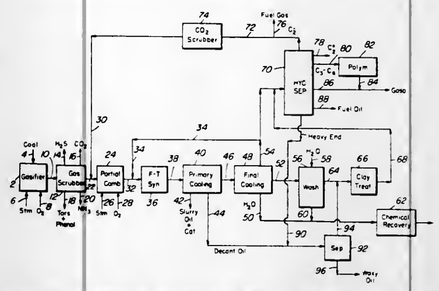
James C. Kuo, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,586
Int. Cl.² C07C *1/04*
U.S. Cl. 260—676 R **5 Claims**

1. A method for upgrading products of Fischer-Tropsch synthesis comprising normally gaseous and liquid hydrocarbons in combination with organic oxygenates which comprises:

cascading the total effluent of a Fischer-Tropsch synthesis operation comprising nitrogen, hydrogen, carbon monoxide, carbon dioxide, methane, water, oxygenates and C_2+ hydrocarbons through a catalyst fines removal zone to a zone containing a crystalline ZSM-5 zeolite conversion catalyst and maintained at an elevated pressure and temperature above 500° F,

recovering a product effluent of said crystalline zeolite conversion operation comprising less organic oxygenates than the Fischer-Tropsch effluent charged therein and a gasoline product of substantially improved octane rating,



recovering gaseous products of said crystalline zeolite conversion operation comprising C_5 and lower boiling components,

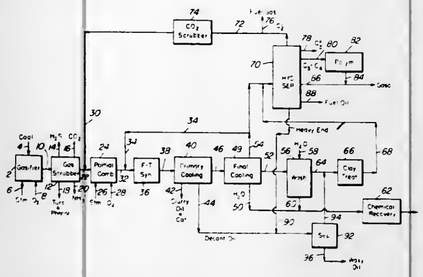
catalytically upgrading said C_5 and lower boiling components to form gasoline boiling components and combining the gasoline boiling components thus formed with the gasoline product of improved octane recovered from said zeolite conversion operation.

4,046,831

METHOD FOR UPGRADING PRODUCTS OF FISCHER-TROPSCH SYNTHESIS

James C. Kuo, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,585
Int. Cl.² C07C *1/04*
U.S. Cl. 260—676 R **6 Claims**



1. A method for upgrading the product effluent of a Fischer-Tropsch synthesis gas operation comprising gaseous hydrocarbons, liquid hydrocarbons and oxygenates which comprises,

cooling the product effluent of Fischer-Tropsch synthesis sufficient to separate a decant oil phase comprising the higher boiling hydrocarbon components of the Fischer-Tropsch effluent from a lower boiling phase comprising gaseous and liquid hydrocarbons and a water phase,

heating the lower boiling phase to a temperature of at least about 500° F and passing the thus heated material in contact with a selective crystalline zeolite conversion catalyst selected from the class of crystalline zeolites represented by ZSM-5 maintained at a temperature within the range of 500° to 850° F,

separating a product effluent of said crystalline zeolite conversion operation under conditions to recover a gaseous phase comprising C_5 and lower boiling material, a water phase and a hydrocarbon phase boiling above said gaseous phase and

separating the hydrocarbon phase obtained from said zeolite conversion operation under conditions to recover LPG gaseous materials, a gasoline product and a light fuel oil product.

4,046,832

CATALYTIC PROCESS FOR THE PREPARATION OF BUTENES FROM PROPYLENE

Edward N. Nowak, Uniontown, and Kenneth J. Frech, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 496,670, Aug. 12, 1974, abandoned. This application Oct. 20, 1975, Ser. No. 623,879
Int. Cl.² C07C *3/62*; B01J *23/22, 23/30*
U.S. Cl. 260—683 D **5 Claims**

1. A method of preparing butenes from propylene which comprises contacting propylene with a catalyst comprising from 3 to 10 percent by weight of V_2O_5 and from 0.1 to 3.0 percent by weight of WO_3 impregnated on a support which has a surface area of 10 to 400 square meters per gram and which is selected from the group consisting of alumina, silica, thoria, zirconia, oxides of titanium, oxides of magnesium and mixtures thereof, which catalyst has been activated by contact with from 0.1 to 10 moles of a trialkylaluminum selected from the group consisting of aluminum trimethyl, aluminum triethyl, aluminum tripropyl and aluminum triisobutyl per mole of V_2O_5, in which the temperature ranges from about 20 to about 450° C. and the propylene is fed at a GHSV of from about 10 to about 1000.

4,046,833

DEHYDROGENATION OF PARAFFINS

Harley F. Hardman, Lyndhurst, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 22, 1975, Ser. No. 643,463
Int. Cl.² C07C *5/18*
U.S. Cl. 260—683.3 **15 Claims**

1. The process for the dehydrogenation of paraffinic hydrocarbons containing from 3 to 6 carbon atoms to the corresponding monoolefins comprising contacting said paraffin with molecular oxygen over a catalyst at a temperature of from about 400° to 700° C, a pressure of from about one atmosphere up to about 3 atmospheres, and wherein the molar ratio of paraffin to oxygen is in the range of from about 1:0.04 to 1:10; said catalyst having the composition:

$$A_aV_bAl_cO_x$$

wherein

A can be one or more of the metals selected from Groups IIA, IIB, VIB, and VIII of the Periodic Table, and

wherein

a is a number from 0 to 3,

b is a number from 0.25 to 5,

c is a number from 0.5 to 25, and

x is a number determined by the valence requirements of the metals of A, vanadium and aluminum,

and wherein said catalyst is heat-treated in the presence of oxygen.

10. The catalyst having the composition:

$$A_aV_bAl_cO_x$$

wherein

A is one or more of the metals selected from the group consisting of magnesium, zinc, chromium, uranium, iron, nickel and cobalt, and

wherein

a is a number from 0.1 to 1.5,

b is a number from 0.5 to 1.5,

c is a number from 1 to 16, and

x is a number determined by the valence requirements of the metals A, vanadium and aluminum;

and wherein said catalyst is heat-treated in the presence of oxygen.

4,046,834

TREATMENT OF VULCANIZED RUBBER

Timothy Charles Philip Lee, and William Millns, both of Shrewsbury, England, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 8, 1974, Ser. No. 431,623
Int. Cl.² C68L *7/00*
U.S. Cl. 260—752 **15 Claims**

1. A finely-divided, vulcanized, recycled rubber comprised predominently of particles having a particle size less than 20 microns, said particles being further characterized by the property of separating out from an admixture with water.

4,046,835

POLYMERS WITH IMIDE GROUPS, AND COMPRISING A POLYESTER FREE FROM ALIPHATIC UNSATURATION

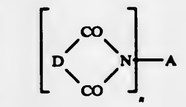
Max Gruffaz, La Mulatiere, and Jean-Louis Locatelli, Vienne, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Mar. 3, 1976, Ser. No. 663,346
Claims priority, application France, Mar. 10, 1975, 75.07381
Int. Cl.² C08L *77/00*
U.S. Cl. 260—857 PA **4 Claims**

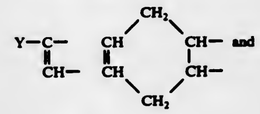
1. A polymer resulting from the reaction of:

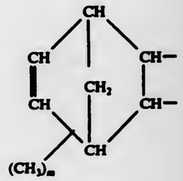
a. a polyimide of the formula

(I)



in which the symbol D represents a divalent radical selected from the class consisting of the radicals





where Y represents H, CH_3 or Cl and *m* is 0 or 1, the symbol A represents an organic radical of valency *n* which may contain up to 30 carbon atoms, and *n* represents a number at least equal to 2;

b. a polyamine of the formula

$$(NH_2)_nB \qquad \text{(II)}$$

in which the symbol B represents an organic radical of

valency *p* which may contain up to 30 carbon atoms, and *p* represents a number at least equal to 2; and

c. a linear polyester, free from aliphatic unsaturation, and of molecular weight at least equal to 1,500, the amounts of these reactants being such that there are 1.2 to 5 imide groups per NH_2 group, and the polyester represents at least 5% and up to 50% of the weight of the polyimide/-polyamine/polyester combination.

4,046,836

POLYCARBONATE MOLDING MATERIALS

Siegfried Adelmann, Krefeld; Dieter Margotte, Krefeld-Fischeln; Josef Marten, Korschenbroich, and Hugo Vernaleken, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 14, 1976, Ser. No. 648,992

Claims priority, application Germany, Jan. 28, 1975, 2503336

Int. Cl.² C08L *69/00, 81/04*

U.S. Cl. 260—860 **10 Claims**

1. Thermoplastic polycarbonate molding materials based on high molecular weight, aromatic, thermoplastic polycarbonates having molecular weights, M_w of about 10,000 to 200,000, characterized in that they contain about 0.5 – 50% by weight of a polyphenylene sulphide, based on the total weight of polycarbonate + polyphenylene sulphide.

4,046,837

POLYESTER-POLYOLEFIN BLEND FILM OR COATING COMPOSITION

Max L. Carroll, Jr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 293,298, Sept. 25, 1972, abandoned. This application Nov. 5, 1976, Ser. No. 739,370

Int. Cl.² C08L *67/00, 23/06*

U.S. Cl. 260—873 **3 Claims**

1. The composition comprising a blend of poly(tetramethylene terephthalate) having an inherent viscosity in ml./g. of from about 0.6 to about 1.4, with from about 5 to about 35 percent by weight of polyethylene having a density of about 0.918 gm./cc. and a melt index of from about 0.1 to about 10.0, said blend having a flow rate of from about 10 to about 30 gm./10 min. as determined as ASTM D1238 at 250° C. and 2.16 kg.

4,046,838

ADHESIVE COMPOSITIONS OF A BLOCK COPOLYMER AND TACKIFYING RESIN

George W. Feeney, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 490,834, July 22, 1975, abandoned, which is a continuation of Ser. No. 287,946, Sept. 11, 1972, abandoned. This application Oct. 10, 1975, Ser. No. 622,271

Int. Cl.² C08L *51/00, 53/00*

U.S. Cl. 260—876 B **3 Claims**

1. A pressure sensitive adhesive which comprises a mixture of (a) an unvulcanized elastomeric block copolymer comprised of both non-elastomeric and elastomeric polymer blocks having the general configuration A — B — A wherein each A is an independently selected non-elastomeric styrene polymer block having an average molecular weight of 5000 to 30,000 and a glass transition temperature above about 25° C, the total block A content being from about 10 to about 50 percent by weight of the copolymer, and B is an elastomeric conjugated diene polymer block of 1,3-butadiene having an average molecular weight from about 50,000 to about 500,000 and a glass transition temperature below about 10° C, said copolymer having a tensile strenght at 25° C, in excess of about 200 pounds per square inch, prepared by first polymerizing sytrene with a lithium-based initiator to a polymer of molecular weight in the range of about 5,000 to about 30,000, followed by adding 1,3-butadiene and additional amounts of styrene to the polymerization mixture, and (b) about 20 to about 80 weight percent of a compatible, thermoplastic tackifying resin containing carbon-to-carbon unsaturation therein, based on the total tackifying resin and block copolymer, and characterized by having a softening point in the range of about 70° C to about 110° C consisting essentially of from about 30 to about 55 weight percent units derived from piperylene, from about 20 to about 45 weight percent units derived from 2-methyl-2-butene, from about 20 to about 35 weight percent units derived from dicyclopentadiene and from about 20 to about 35 weight percent units derived from α-methyl styrene prepared by the method which comprises polymerizing said monomers in the presence of aluminum chloride and a solvent selected from aliphatic hydrocarbons and steam stripping the resin product.

4,046,839

COMPOSITIONS HAVING HIGH IMPACT AT LOW RUBBER LEVELS

Stelvio Papetti, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.

Division of Ser. No. 370,108, June 14, 1973, abandoned. This application Aug. 29, 1975, Ser. No. 608,934

Int. Cl.² C08L *9/08*

U.S. Cl. 260—880 R **13 Claims**

1. A process for graft polymerizing a mixture containing styrene and acrylonitrile onto polybutadiene in the form of a latex by effecting the polymerization in the presence of a catalyst and an effective amount of suspending agent wherein the improvement consists essentially of using a polybutadiene latex which has a particle size of about 1500–2500 A, a gel content of about 26–37 % by weight and a swell index of about 85–105.

4,046,840

THERMOPLASTIC POLYMER BLENDS OF AN EPDM POLYMER HAVING A HIGH ETHYLENE LENGTH INDEX WITH POLYETHYLENE

Charles Jerry Carman, Stow; Martin Batiuk, Grafton, and Richard Michael Herman, Elyria, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 23, 1976, Ser. No. 660,319

Int. Cl.² C08L *23/16*

U.S. Cl. 260—897 A **7 Claims**

1. A thermoplastic polymer blend comprising (1) an EPDM polymer consisting essentially of interpolymerized units of about 67 percent to about 75 percent by weight of ethylene, about 15 percent to about 30 percent by weight of propylene, and from about 0.5 percent to about 10 percent by weight of an alkenyl norbornene monomer; said polymer having an ethylene length index of from about 2.8/1 to about 5/1, a melt endotherm value of about 1 to about 10 calories per gram, and a percent unstretched crystallinity of 0 percent to about 8 percent, and (2) from about 5 parts to about 200 parts by weight per 100 parts by weight of the EPDM polymer, of a polyethylene polymer, said blend containing no crosslinking or curing agents.

4,046,841

PHOSPHONATES CONTAINING PROTECTED KETONE GROUP

Robert Foster; Roger Edwin Preston, and Graham Ernest Robinson, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 30, 1976, Ser. No. 718,625

Claims priority, application United Kingdom, Sept. 16, 1975, 38032/75

Int. Cl.² C07F *9/40*

U.S. Cl. 260—923 **4 Claims**

1. A protected ketone derivative of the formula $(R^1O)_2.PO.CH_2.CR^3.CH_2OR^2$, wherein R^1 is C_{1-6}-alkyl, R^2 is 3-chlorophenyl or 3-trifluoromethylphenyl and R^3 is semicarbazono, thiosemicarbazono, oximino, C_{1-6}- alkyloxyimino, hydrazono, C_{1-6}-alkylhydrazono, phenylhydrazono, or phenylhydrazono substituted in the phenyl part with one or more substituents selected from halogen, C_{1-3}-alkyl or alkoxy, or nitro.

4,046,842

CASTING OF POLYMERIC FILM

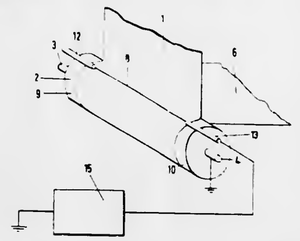
David John Groves, Hitchin, and Albert Mason, Stevenage, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 440,571, Feb. 7, 1974, abandoned, and a continuation-in-part of Ser. No. 336,047, Feb. 26, 1973, abandoned. This application July 28, 1975, Ser. No. 599,935

Claims priority, application United Kingdom, Feb. 7, 1973, 6031/73; Aug. 5, 1974, 34337/74

Int. Cl.² B29D *7/22*; H05B *7/00*

U.S. Cl. 264—22 **11 Claims**



1. A process for quenching a molten polymeric film, which comprises forming a molten polymeric film and quenching said film on a cooled casting surface which is electrically earthed, the molten film being passed across an electrode located in spaced relation from the film surface and in the proximity of the region of first contact of the molten film and the casting surface, applying an alternating voltage to the electrode, said voltage being an asymmetrical wave form, having positive and negative portions with the positive peak having a greater magnitude than the negative peak, and exceeding 4.0 kilovolts peak to peak, the peak to peak voltage being at least equal to the A.C. corona discharge inception voltage and having a frequency less than that at which positive and negative electrostatic charges alternately emitted by the electrode are unable to cross the space between the electrode and the molten film before the polarity of the voltage on the electrode changes, so as to produce an rms pinning current to the electrode, including leakage current, in the range 0.2 to 20 milliamperes whereby the electrostatic charges emitted by the electrode are deposited by the applied electric field upon the molten film to cause it to adhere to the casting surface.

4,046,843

PROCESS FOR PREPARING MEMBRANES FOR SEPARATION OF SUBSTANCES

Takezo Sano, Takatsuki; Takatoshi Shimomura, Toyonaka, and Masao Sasaki, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 20, 1975, Ser. No. 606,005

Claims priority, application Japan, Sept. 5, 1974, 49-102806

Int. Cl.² B29H *7/20*

U.S. Cl. 264—22 **24 Claims**

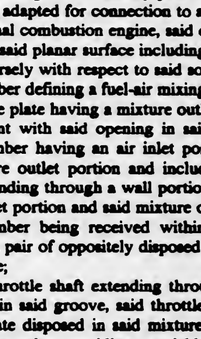
1. A process for preparing a membrane for separation of substances which comprises:

a. dissolving a water-insoluble high polymer, and a water-soluble high polymer and/or a water-soluble surfactant in a proportion of 0.1 to 3 parts by weight of water-soluble high polymer and/or surfactant with 1 part by weight of the water-insoluble high polymer, in an organic solvent;

b. casting said solution to form a shaped article;

c. evaporating said organic solvent;

d. exposing the thus formed shaped article to a plasma to crosslink the surface; and



e. subsequently removing uncrosslinked water-soluble high polymer and/or surfactant by washing with water.

4,046,844

CARBURETOR CONSTRUCTION

Paul Ellis Rickert, Oregon, Ohio, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed June 30, 1976, Ser. No. 701,386

Int. Cl.² F02M *17/04*

U.S. Cl. 261—34 A **11 Claims**

1. A carburetor construction comprising:

a base plate having a substantially planar surface including an opening adapted for connection to an air inlet passage of an internal combustion engine, said opening defining a socket and said planar surface including a groove extending transversely with respect to said socket;

a throat member defining a fuel-air mixing passage mounted on said base plate having a mixture outlet portion thereof in alignment with said opening in said base plate, said throat member having an air inlet portion spaced from said mixture outlet portion and including fuel aperture means extending through a wall portion thereof between said air inlet portion and said mixture outlet portion, said throat member being received within said socket and including a pair of oppositely disposed slots aligned with said groove;

a rotatable throttle shaft extending through said slots and journalled in said groove, said throttle shaft including a throttle plate disposed in said mixture outlet portion of said throat member providing a variable restriction in said mixing passage; and

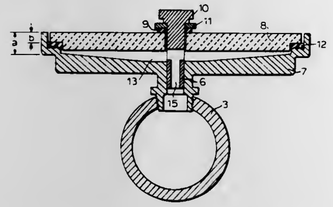
a fuel module mounted on said base plate receiving said throat member including fuel channel means arranged and disposed for communication with a source of fuel and with said aperture means in said throat member, said base plate, throat member and fuel module being secured in interlocking engagement.

4,046,845

AIR DIFFUSER ELEMENT

Richard K. Veeder, Pittsford, N.Y., assignor to Ferro Corporation, Cleveland, Ohio

Filed June 23, 1976, Ser. No. 698,933
Int. Cl.² B01D *47/02*
U.S. Cl. 261—122 6 Claims



1. An improved unitary diffuser element adapted for assembly into an air diffuser head for diffusing air into liquids, said diffuser head having a substantially enclosed air chamber therewithin, the improved diffuser element having exterior and interior faces generally opposed and spaced apart, said exterior face being substantially planar, both faces having generally coincident outlines conforming to, and circumscribed by, an integral, peripheral annular zone, said zone having a greater, substantially non-permeable, density than the balance of a said diffuser element, though compositionally identical to the balance of said element, the interior face of said element forming part of the air chamber aforesaid when assembled in said diffuser head.

4,046,846

METHOD OF PRODUCING HARD FOAMED MATERIALS

Tokuzo Fujimori, No. 167, Fukuichi, Yonago, Totori, Japan

Filed Aug. 14, 1974, Ser. No. 497,297
Claims priority, application Japan, Sept. 1, 1973, 48-98370
Int. Cl.² B29D *27/00*
U.S. Cl. 264—45.3 5 Claims

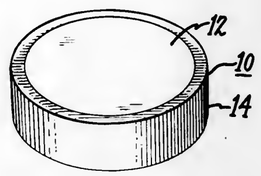
1. In the method of producing hard foamed objects of expanded vinyl chloride resin which comprises forming a mixture comprised of said vinyl chloride resin and a blowing agent; introducing the mixture into a mold; pressurizing the mold while heating the mold to cause the blowing agent to partially expand the resulting resin mixture to fill said mold; cooling said mold; removing the resulting object from said mold and then heating the object to further expand its size without changing its shape, the improvement which comprises: forming a dry mixture of said resin with about 0.4 to about 40 times by weight of the resin of a powdery inorganic filler, adding to the dry mixture at least about 30 parts by weight of said mixture of a solvent selected from toluene and xylene, kneading the solvent, resin and inorganic filler containing mixture in a closed kneader at about 40° to about 100° C until the outer surfaces of the particles of said inorganic filler are covered with said resin and are adhered to each other by said resin, adding a blowing agent comprised of liquid butane, and an additional amount of about 30 to about 40 parts by weight of said solvent, thoroughly mixing the resulting mixture so that all the ingredients including the liquid butane are thoroughly dispersed and then introducing said mixture into said mold.

4,046,847

PROCESS FOR IMPROVING THE STABILITY OF SINTERED ZINC OXIDE VARISTORS

James S. Kresge, Pittsfield, Mass., assignor to General Electric Company

Filed Dec. 22, 1975, Ser. No. 643,541
Int. Cl.² H01B *1/08*; C01G *9/02*
U.S. Cl. 264—61 5 Claims



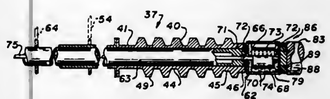
1. A process for making a varistor body of the zinc oxide type, comprising the steps of:
   a. sintering the body at an elevated temperature of at least about 1100° C; then
   b. cooling the body to a temperature below about 400° C; then
   c. reheating the body to a temperature above 400° C but below 700° C; then
   d. recooling the body slowly to a temperature below about 400° C, and then
   e. repeating at least once the sequence of the reheating step (c) and then recooling step (d).

4,046,848

EXTRUSION MACHINE FOR MAKING ARTICLES OF CEMENT-LIKE MATERIAL

George Putti, North Vancouver, Canada, assignor to Dyform Concrete (Prestressed) Ltd., Vancouver, Canada

Continuation of Ser. No. 310,791, Nov. 30, 1972, abandoned, which is a division of Ser. No. 69,300, Sept. 30, 1970, Pat. No. 3,877,860, which is a division of Ser. No. 882,039, Dec. 4, 1969, abandoned. This application Nov. 11, 1974, Ser. No. 522,920
Int. Cl.² B28B *1/08*
U.S. Cl. 264—70 7 Claims



1. A method of making a cured slab of concrete comprising the steps of:
   introducing wet concrete into an elongate, substantially horizontal mold comprising an inlet end, an outlet end, an elongated spiral conveyor extending in and spaced from the mold between the inlet end and the outlet end thereof for moving concrete under pressure longitudinally of said mold, and a former element in the mold positioned adjacent the outlet end thereof beyond and immediately downstream of the spiral conveyor and substantially aligned with the spiral conveyor, said former element being approximately the same size or slightly less than the downstream end of the spiral conveyor, said former element being mounted so as to be rotated independently of the spiral conveyor, the cross sectional area of said mold being less at said outlet end than at said inlet end and progressively decreasing in cross-section substantially from the inlet end to the end of the spiral conveyor whereby said concrete is packed under pressure around said former;
   forcing the concrete along the spiral conveyor by rotating it to force the concrete onto the former at a progressively increasing pressure as a result of the progressively increasing radial restraint of the mold at the former because of the progressively decreasing cross-sectional area of the mold substantially from the inlet end to the former,
   said forcing step including extruding the concrete out through the outlet and against the previously formed concrete to move the mold in a direction away from said formed concrete, and
   rotating the former during said forcing step independently of the speed or direction of rotation of the spiral conveyor so as to select a speed for optimizing the properties of the interior surface of the core.

5. A method of making a cured slab of concrete comprising the steps of:
   introducing wet concrete into an elongate, substantially horizontal mold comprising an inlet end, an outlet end, an elongated spiral conveyor extending in and spaced from the mold between the inlet end and the outlet end thereof for moving concrete under pressure longitudinally of said mold, and a former element in the mold positioned adjacent the outlet end thereof beyond and immediately downstream of the spiral conveyor and substantially aligned with the spiral conveyor, said former element being approximately the same size or slightly less than the downstream end of the spiral conveyor, said former element being mounted so as to be separate from and rotatable independently of the spiral conveyor, the cross-sectional area of said mold being less at said outlet end than at said inlet end whereby said concrete is packed under pressure around said former;
   forcing the concrete along the spiral conveyor by rotating it to force the concrete onto the former at a progressively increasing pressure as a result of the progressively increasing radial restraint of the mold at the former because of the smaller cross-sectional area of the mold at the former as compared with the cross-sectional area at the spiral conveyor,
   said forcing step including extruding the concrete out through the outlet and against the previously formed concrete to move the mold in a direction away from said formed concrete, and
   including the further step of vibrating the concrete in the mold at a high frequency with a vibrator located within said separated former element such that its high frequency vibrations are imparted to the concrete at said location whereat the concrete is packed under pressure around the former, and wherein the concrete upstream from the former is substantially free of said high frequency vibrations.

4,046,849

METHOD OF COMPOUNDING THERMO-PLASTIC POLYMERIC MATERIALS AND FILLERS AND EXTRUDING ONTO ELECTRICAL CONDUCTORS

Ray Clarence Lever, Fairfield, and Edward Vincent Wilkus, Trumbull, both of Conn., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 273,156, July 19, 1972, Pat. No. 3,997,494. This application July 29, 1974, Ser. No. 492,965
Int. Cl.² B29F *3/10*
U.S. Cl. 264—174 15 Claims

1. The method of manufacturing an electrically insulated conductor having an insulation of a compound comprising thermoplastic polymeric material and filler, comprising the steps of:
   a. mixing particles of thermoplastic polymeric material with particulate filler proportioned in amounts ranging from at least 5 to about 200 parts by weight of the filler per 100 parts by weight of the polymeric material while melting surface portions of the particles of polymeric material, whereby the filler is blended with the melting surface portions of said polymeric particles and the resultant blend of the melted polymeric material and filler is removed from the remaining portion of the polymeric particles by the mixing action;
   b. continuing both the mixing of the particles of thermoplastic polymeric material with the filler and the melting of surface portions of said particles with the resulting blending of the melting surface portions and filler and the removal of the resultant blend of melted polymeric material and filler from said particles of polymeric material to effect a progressing melting and diminution of the said



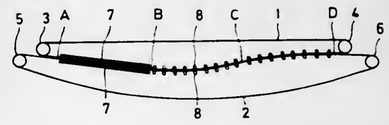
particles of polymeric material until greater than 50 % of the particulate polymeric material has become expended by melting and a majority of greater than 50% of the filler has become substantially assimilated into the polymeric material whereby said polymeric material and filler are substantially compounded to a free flowing particulate from comprising discrete particles of the compounded blend of polymeric material and filler with said blend comprising fundamental units predominantly structure essentially of a stratified layer of the filler adhesively embraced by a film-like mass of polymeric material; and,
   c. extruding the resultant compound about a core of metallic electrical conductor.

4,046,850

CONTINUOUS CASTING OF A POLYMERIZABLE COMPOSITION BETWEEN MOVING ENDLESS BELTS

Yasuyuki Kato; Masahiko Moritani, and Seiichi Suzuki, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 24, 1974, Ser. No. 517,617
Claims priority, application Japan, Oct. 25, 1973, 48-120517
Int. Cl.² B29D *7/02*
U.S. Cl. 264—216 11 Claims



1. A process for continuously casting a liquid polymerizable composition which comprises:
   1. feeding the liquid polymerizable composition into a spacing defined between a pair of moving metal endless belts

having thicknesses in the range of from 0.1 to 3 mm. which are arranged such that the lower run of the upper belt is disposed above the upper run of the lower belt and the runs are caused to move concurrently with each other in the same direction at substantially the same speed;

2. feeding a pair of continuous gaskets into the spacing together with the liquid polymerizable composition, in such a manner that the gaskets travel between and in contact with the opposing surfaces at the opposite edges of the belts to form a pair of seals and define a cavity between the surfaces and the seals, and wherein the belts are provided with a mechanism for adjusting the cavity in response to variation in volume of the composition which may take place during polymerization;

3. passing the liquid polymerizable composition through a region of the path defined by the belts where said composition is partially polymerized at a temperature of from 50° to 150° C. to such an extent that the common logarithm of the viscosity of the composition in terms of poise at the temperature of polymerization is within the range of from 2 to 5;

4. passing the partially polymerized composition through a region in which the lower and upper runs of the respective upper and lower belts are curved in opposite directions at least twice downwardly and then upwardly or vice versa through a common inflection point at the radius of the curves represented by the following equation:

$$R = K \times L$$

where R is the radius of curvature in meters; L is the horizontal distance between the point at which the initial curvature starts and the point where a mechanism capable of following the variation of volume of the polymerized composition ends; and K is a constant; the value of the constant K varying depending upon the horizontal distance L and the number of curves and being within a range of from 0.5 to 5, and the runs are brought closer together as the composition passes through the spacing between the belts, whereby contact of the composition with the respective lower and upper runs of the upper and lower belts is maintained during the polymerization and subsequent volume variation of said composition and while the polymerization is completed; and

5. removing the resulting rigid plate of the polymerized composition from the belts at the side opposite to the feed side of the moving belts.

4,046,851

TWO STAGE SULFURIC ACID LEACHING OF SEA NODULES

Kolur Nagaraja Subramanian, Mississauga, and Gerald Vernon Glasun, Oakville, both of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed June 21, 1976, Ser. No. 697,957
Claims priority, application Canada, July 30, 1975, 232547
Int. Cl.² C01G 3/10, 51/10, 53/10
U.S. Cl. 423—41 **11 Claims**

1. A two-stage process for treating manganiferous sea nodules containing acid soluble gangue minerals, a major amount of manganese and iron, and a minor amount of at least one of the nonferrous metals nickel, cobalt, and copper, for the selective extraction of said nonferrous metal values comprising:

a. effecting a first stage leach of raw sea nodules slurried in a sulfuric acid medium at an elevated temperature up to about 100° C, said slurry having a pulp density of about 10% to 40% solids and having a sulfuric acid content of about 20% to 50% based on the weight of the nodules, the acid being present in sufficient amount to dissolve a preponderant part of the acid soluble gangue minerals and to obtain a resultant slurry having a final pH of no less than about 1.5, and

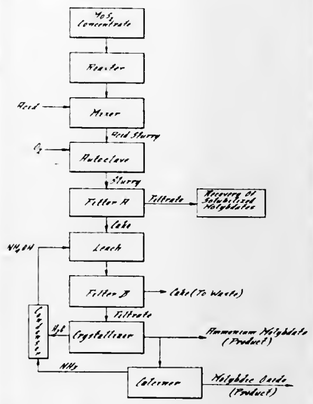
b. effecting a second stage leach of the resultant nodules of the first stage leach in the resultant leach solution of the first stage leach at a temperature in the range of above about 100° C up to about 260° C at an initial pH no lower than about 1.5 to extract nickel, cobalt and copper from said nodules; whereby said nickel, cobalt and copper values are extracted from said nodules with reduced tendency for scale formation.

4,046,852

PURIFICATION PROCESS FOR TECHNICAL GRADE MOLYBDENUM OXIDE

Michael A. Vertes, Weston, Conn.; Richard A. Ronzio, Golden, Colo., and Tommy C. Kearns, Argyle, Iowa, assignors to Amax Inc., Greenwich, Conn.

Filed May 19, 1976, Ser. No. 687,675
Int. Cl.² C01G 39/00
U.S. Cl. 423—58 **10 Claims**



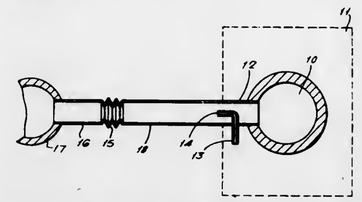
1. A process for producing a high purity alkali molybdate product from an impure molybdenite concentrate which comprises the steps of providing an impure particulated molybdenite feed material consisting predominantly of MoS_2, oxidizing said feed material to convert substantially all of the MoS_2 to molybdenum oxide, mixing the oxidized said feed material with an aqueous acid solution to form a slurry containing from about 5% up to about 40% solids, said acid solution containing a mineral acid selected from the group consisting of sulfuric acid, nitric acid, hydrochloric acid and mixtures thereof wherein said acid is present in an amount in stoichiometric excess of that required to react with the contaminating metals and metal compounds present in said feed material, autoclaving said slurry at a temperature of from about 150° C to about 350° in the presence of a free oxygen partial pressure of at least about 100 psi for a period of time sufficient to convert the predominant portion of molybdenum compounds present in said feed material to molybdenum trioxide and a conversion of the predominant portion of contaminating metal sub-molybdate compounds present to aqueous acid solution soluble compounds, subjecting the autoclaved said slurry to a separation treatment to recover the solids from said acid solution, treating the separated said acid solution to remove and recover the major portion of dissolved molybdate anions therein, leaching the recovered said solids with an aqueous alkali hydroxide solution to effect a conversion of the molybdic oxide constituents therein to soluble alkali metal molybdate compounds, separating said aqueous alkali hydroxide solution containing the solubilized alkali metal molybdate compounds from the remaining insoluble residue, and recovering the alkali metal molybdate compounds from said aqueous alkali hydroxide solution as a high purity alkali metal molybdate product.

4,046,853

PRODUCTION OF TITANIUM TETRACHLORIDE

Michael Robinson, Grimsby, England, assignor to Laporte Industries Limited, London, England

Filed June 15, 1976, Ser. No. 696,280
Claims priority, application United Kingdom, July 4, 1975, 28175/75
Int. Cl.² C01G 23/02, 23/04
U.S. Cl. 423—77 **15 Claims**



1. A process for the production of titanium tetrachloride from an iron-containing titaniferous ore, which comprises;

chlorinating said ore in a fluidized bed of a mixture of the ground ore and a carbonaceous material to obtain an effluent gas which comprises a mixture of titanium tetrachloride and iron chlorides in the vapor state, more than 50 percent of said iron chlorides being ferrous chloride;

oxidizing from 65 to 95 percent of the ferrous chloride in said effluent gas by mixing with the effluent gas a proportion of oxygen sufficient to oxidize any carbon blow-over from the fluidized bed and from 65 to 95 percent of the ferrous chloride in said effluent gas while maintaining the temperature of the effluent gas-oxygen mixture above the dew point of the ferrous chloride but below about 1075° C., whereby the oxidized effluent gas contains ferric oxide and ferric chloride as the predominant iron chloride component;

moving the mixture of gases resulting from oxidizing, in a stream having a velocity sufficient to entrain particles of the ferric oxide formed, to a particle separation zone;

separating ferric oxide and any residual ferrous chloride and ferric chloride from the moved mixture of gases to obtain a residual gas containing titanium tetrachloride vapor; and

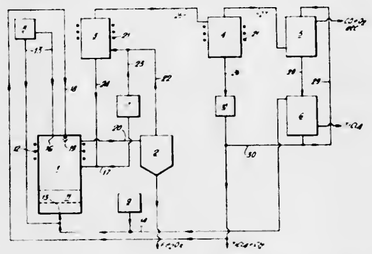
condensing said titanium tetrachloride vapor from said residual gas.

4,046,854

RECOVERY OF TITANIUM TETRACHLORIDE

John Dunderdale, Grimsby, England, assignor to Laporte Industries Limited, London, England

Filed June 15, 1976, Ser. No. 696,361
Claims priority, application United Kingdom, July 4, 1975, 28176/75
Int. Cl.² C01G 23/02, 49/06
U.S. Cl. 423—77 **16 Claims**



16. A process for the recovery of titanium tetrachloride by separating it from iron chloride contained in an effluent; the effluent comprising a gaseous mixture of titanium tetrachloride and iron chloride which is predominantly in the form of ferric chloride, and resulting from a process comprising the steps of continously feeding into a fluidised bed reactor solids comprising 60% to 80% by weight of ilmenite ore and from 20% to 40% by weight of coke; maintaining the solids in the fluidised state by means of a fluidising gas comprising from 75% to 100% by volume of chlorine, from 0% to 15% by volume of an inert gas and from 0% to 10% by volume of oxygen, maintaining the temperature of the fluidised solids in the range from 850° C to 1000° C and controlling the rate of feed of solids to maintain the level of the surface of the fluidised solids at a point in the lower half of the reactor, the separation of the titanium tetrachloride being effected by passing the effluent from the surface of the fluidised bed upwardly through the upper half of the reactor, while cooling it to a temperature in the range from 500° C to 800° C by incorporating liquid titanium tetrachloride therein, mixing the cooled effluent at or near the top of the reactor, with oxygen in a quantity 5% to 100% in excess of the quantity required in theory to oxidise the ferric chloride content of the effluent to produce particles of ferric oxide, the velocity of the resulting mixture of the remaining gases of the effluent, oxygen and chlorine being sufficient to entrain the said particles, removing the said mixture and entrained particles from the reactor, adjusting the temperature of the removed mixture firstly to above 250° C but low enough to solidify any calcium or magnesium chlorides which may be present therein and removing ferric oxide particles and any resulting solid calcium or magnesium chlorides; further cooling the mixture to a temperature in the range from 250° C to 130° C to solidify any residual ferric chloride, removing any resulting particles of ferric chloride from the mixture; further cooling the mixture to below 130° C to condense titanium tetrachloride therefrom, recovering the condensed titanium tetrachloride; recovering residual chlorine from the remaining vapours by selective absorption in titanium tetrachloride followed by desorption, and recycling the receovered chlorine into the fluiding gas, incorporating residual ferric chloride in the solids in the fluidised bed reactor and utilising a proportion of the liquid titanium tetrachloride recovered to cool the effluent from the fluidised bed.

4,046,855

METHOD FOR REMOVING HARMFUL ORGANIC COMPOUNDS FROM ALUMINATE LIQUORS OF THE BAYER PROCESS

Bernhard Schepers, Speyer (Rhine); Gerhard Bayer, Rheingonheim; Ernst Urmann, Ludwigshafen (Rhine), and Klaus Schanz, Limburgerhof, all of Germany, assignors to Gebruder Giulini GmbH, Ludwigshafen (Rhine), Germany

Filed Apr. 14, 1976, Ser. No. 676,883
Claims priority, application Germany, Apr. 25, 1975, 2518431
Int. Cl.² C01F 7/00, 7/46
U.S. Cl. 423—130 **10 Claims**

1. A method for removing harmful discoloring organic compounds from an aluminate liquor obtained in the production of alumina according to the Bayer process where bauxite is decomposed in a digester, comprising:

a. adding a magnesium compound to the aluminate liquor, the magnesium compound being a compound which reacts with the aluminate liquor to form a hydroxide mixture containing magnesium hydroxide and aluminum hydroxide which precipitates from the aluminate liquor;

b. maintaining the precipitated mixture in the aluminate liquor, while stirring, until at least a part of the harmful discoloring organic compounds have been eliminated from the aluminate liquor; and

c. then separating the hydroxide mixture containing said harmful discoloring organic compounds from the aluminate liquor.

4,046,856

METHOD FOR REMOVING SULFUR OXIDE FROM STACK GAS

Hayami Itoo; Noriaki Takahashi, both of Kobe, and Hiromasa Kondo, Akasi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Mar. 15, 1974, Ser. No. 451,394
Int. Cl.² C01F *1/00, 5/40, 11/46;* C01B *17/00*
U.S. Cl. 423—166 4 Claims

1. A method for removing sulfur oxides from stack gas as gypsum comprising the steps of:
adding $Mg(OH)_2$ to an absorbent comprising predominantly at least one calcium compound;
absorbing the sulfur oxides in the absorbent whereby the sulfur oxides are converted to the sulfite form in a slurry;
oxidizing the resulting sulfite to form a slurry composed essentially of gypsum and supernatant liquid containing as the main component $MgSO_4$;
maintaining the pH of the slurry produced in the oxidizing step under 5 to produce a good quality gypsum;
separating the gypsum from the supernatant liquid to recover the gypsum as a product; and
double decomposing the supernatant liquid in the presence of $Ca(OH)_2$ to produce $CaSO_4$ and regenerate the $Mg(OH)_2$ which is added to the absorbent to recirculate almost all the magnesium in the system, the molar ratio of Ca.Mg supplied to the absorbent being 0.5 to 99.0.

4,046,857

CONTINUOUS PROCESS FOR THE PRODUCTION OF PHOSPHONITRILIC CHLORIDES

Thomas M. Fekete, Yardley, Pa., and John F. Start, Mercerville, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 484,857, July 1, 1974, abandoned. This application May 19, 1975, Ser. No. 578,631
Int. Cl.² C01B *25/10*
U.S. Cl. 423—300 11 Claims

1. A continuous process for the production of polymeric phosphonitrilic chlorides which comprises:
a. continuously feeding phosphorus pentachloride in an inert solvent into the first of two reaction zones;
b. concomitantly feeding ammonia continuously into at least the first of the two reaction zones;
c. maintaining the phosphorus pentachloride and ammonia reactants in the first reaction zone at a temperature of 100° to 120° C;
d. continuously transferring the reaction mixture from the first reaction zone to the second reaction zone maintained at a temperature of 125° to 180° C;
e. feeding the ammonia to the first reaction zone at a ratio of at least 0.33 moles per mole of phosphorus pentachloride with the total ammonia introduced in the process being between 1.01 and 1.20 moles of ammonia per mole of phosphorus pentachloride; and
f. continuously withdrawing phosphonitrilic chloride polymer from the second reaction zone.

4,046,858

SYNTHESIS FOR CRYSTALLINE HYDROXYAPATITE

John J. Barna, 133 Blaisdell Road, Orangeburg, N.Y. 10962; Edward T. Farris, 2541 Sweetbriar Road, Dallas, Tex. 75228, and Richard J. Lagow, 21 Magnolia Ave., Manchester, Mass. 00144

Filed July 24, 1974, Ser. No. 491,581
Int. Cl.² C01B *15/16, 25/26*
U.S. Cl. 423—305 4 Claims

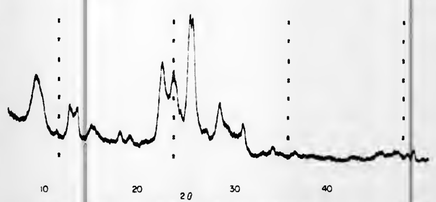
1. A process for preparing crystalline hydroxyapatite comprising contacting a source of calcium ions with about a stoichiometric amount of anhydrous trisodium phosphate in a combination solvent comprising from about 10 to about 75 weight percent of a polar, aprotic organic solvent and from about 25 to about 90 weight percent of water and thereafter recovering said crystalline hydroxyapatite.

4,046,859

CRYSTALLINE ZEOLITE AND METHOD OF PREPARING SAME

Charles J. Plank, Woodbury; Edward J. Rosinski, Pedricktown, both of N.J., and Mae K. Rubin, Bala Cynwyd, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 528,060, Nov. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 393,767, Sept. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 358,192, May 7, 1973, abandoned. This application Mar. 20, 1975, Ser. No. 560,412
Int. Cl.² C01B *33/28;* C07C *87/30;* C07F *5/06*
U.S. Cl. 423—328 20 Claims



1. A synthetic crystalline aluminosilicate zeolite having a composition in the anhydrous state, expressed in terms of mole ratios of oxides as follows:

$$(0.3\text{–}2.5)R_2O : (0\text{–}0.8)M_2O : Al_2O_3 : > 8\ SiO_2$$

wherein R is an organic nitrogen-containing cation derived from a 2-(hydroxyalkyl)trialkylammonium compound and M is an alkali metal cation and having an X-ray powder diffraction pattern substantially the same as that shown in Table 1A of the specification, the sorption capacity of said zeolite after calcination at 600° C being characterized by the ratio of normal hexane sorption to 2-methylpentane sorption at 90° C of less than 10.

4,046,860

AMMONIUM FLUORIDE PROCESS FOR DEFLUORINATING PHOSPHORIC ACIDS AND PRODUCTION OF AMMONIUM FLUOSILICATE

Gustave E. Kidde, 294 California Terrace, Pasadena, Calif. 91105

Division of Ser. No. 359,765, May 14, 1973, Pat. No. 3,907,973, which is a continuation-in-part of Ser. No. 231,826, March 6, 1972, abandoned. This application June 4, 1975, Ser. No. 583,584
Int. Cl.² C01B *25/18, 33/20;* C01C *1/00*
U.S. Cl. 423—341 8 Claims

1. A process for removing fluorine from phosphoric acid solutions comprising;
combining unconcentrated, fluorine-containing phosphoric acid with colloidal silica to form a slurry having a colloidal silica concentration of at least about one percent by weight;
heating said slurry;
subjecting said slurry to reduced pressures thereby concentrating said slurry and volatilizing said fluorine into a vapor stream in the form of silicon tetrafluoride and thus removing a substantial portion of said fluorine from said phosphoric acid; and
scrubbing said vapor stream with an aqueous scrubbing solution containing ammonium fluoride and additionally contains ammonium fluosilicate, to thereby convert said silicon tetrafluoride to ammonium fluosilicate.

4,046,861

PROCESS FOR THE PRODUCTION OF FERROCYANIDE BLUE

Helmut Reinhardt, Rodenkirchen; Everhard Gratzfeld, Wesseling, and Eva Claussen, Rodenkirchen, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Oct. 7, 1975, Ser. No. 620,273
Claims priority, application Germany, Nov. 8, 1974, 2453014
Int. Cl.² C01C *3/12*
U.S. Cl. 423—367 14 Claims



1. In a process for the production of ferrocyanide blue by reaction of an aqueous ferrocyanide solution with an iron II salt and thereafter aging the precipitate at elevated temperature and oxidizing the aged precipitate to form ferrocyanide blue, the improvement comprising simultaneously introducing an aqueous solution of ferrocyanide consisting of a mixture of sodium and potassium ferrocyanides and an aqueous solution of the ferrous II salt into a water receiver containing water in an amount of 20 to 40 weight % based on the weight of the entire suspension formed to thereby provide optimum mixing and to form a suspension of the precipitate of ferrocyanide white in the resulting aqueous reaction medium, and aging the precipitate in the reaction medium in the presence of the salts formed in the reaction.

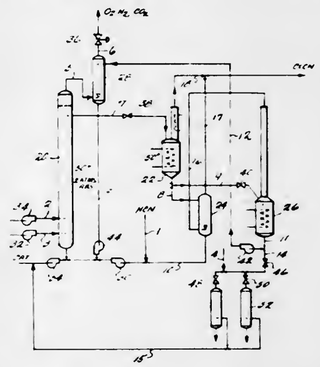
4,046,862

PROCESS FOR THE PRODUCTION OF CYANOGEN CHLORIDE USING HYDROGEN PEROXIDE WITH PRESSURE

Werner Heimberger, and Gerd Schreyer, both of Hanau, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed May 7, 1976, Ser. No. 684,352
Claims priority, application Germany, May 15, 1975, 2521581; May 15, 1975, 2521582; May 12, 1975, 2521012; May 12, 1975, 2521013
Int. Cl.² C01B *21/18*
U.S. Cl. 423—383 25 Claims

1. In a process for the production of cyanogen chloride or cyanogen bromide by reaction of (1) hydrogen cyanide with (2) hydrogen chloride or hydrogen bromide, and (3) hydrogen peroxide, in aqueous medium, in the presence of cupric ions and ferric ions as catalysts, the improvement comprising carrying out the reaction at a pressure of 1.5 to 16 bar and recovering the cyanogen chloride or cyanogen bromide free from oxygen and nitrogen.



4,046,863

PROCESS FOR THE PRODUCTION OF SHAPED ARTICLES OF HIGH DENSITY GRAPHITE

Kazuo Kobayashi, Kurume; Ichitaro Ogawa, Yame; Hidemasa Honda, Tosu, and Yasuhiro Matsushita, Higashiosaka, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Aug. 4, 1975, Ser. No. 601,609
Claims priority, application Japan, Aug. 29, 1974, 49-99622
Int. Cl.² C01B *31/04*
U.S. Cl. 423—448 4 Claims

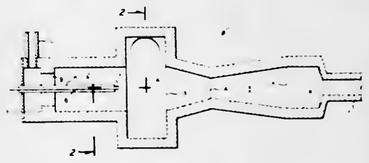
1. A process for producing shaped articles of graphite having a density of at least about 2.0 comprising the steps of forming a generally uniform mixture of finely divided amorphous carbon or synthetic graphite and boric acid or boron oxide in an amount equal to about 3–30% by weight of the mixture, shaping said mixture into a given shape, and baking the mixture in the absence of a pitch binder to a temperature of at least about 2000° C while under a pressure of at least about 100 kg/cm².

4,046,864

PROCESS TO PRODUCE CARBON BLACK

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 25, 1974, Ser. No. 526,981
Int. Cl.² C09C *1/50*
U.S. Cl. 423—450 7 Claims



1. A carbon black process wherein
a. a hydrocarbon feedstock liquid under normal conditions is axially introduced into a tubular reactor comprising
an axial zone;
an enlarged precombustion zone having a larger internal diameter than the axial zone in open communication

and axial alignment operatively connected with said axial zone;

a reaction zone formed as a Venturi nozzle-shaped chamber in open communication and axial alignment and operatively connected with said precombustion zone;

the diameter of said axial zone being about 1.5 to about 3 times the diameter of the throat of said Venturi nozzle-shaped chamber,

b. free oxygen-containing gas and gaseous fuel forming hot combustion gases are introduced into said axial zone;

c. free oxygen-containing gases and fuel forming hot combustion gases are introduced into said precombustion zone;

d. about 10 to about 70 volume percent of the total of the gases forming the hot combustion gases are introduced into said axial zone in step (b);

e. a carbon black-containing gas is withdrawn from said reaction section; and

f. carbon black is recovered from said gas.

4,046,865

PROCESS FOR PRODUCING SODIUM CHLORIDE BRINES SUITABLE FOR ELECTROLYSIS

Rolf Schafer, Krefeld-Uerdingen, Germany, assignor to Bayer Aktiengesellschaft, Germany

Continuation of Ser. No. 451,993, March 18, 1974, abandoned. This application Nov. 22, 1976, Ser. No. 744,088

Claims priority, application Germany, Mar. 22, 1973, 2314255

Int. Cl.² C01D *3/06*

U.S. Cl. 423—499 **5 Claims**

1. In the process for producing sodium chloride brine having a calcium sulfate concentration suitable for use in the electrolysis of sodium chloride wherein rock salt containing calcium sulfate as an impurity is contacted with an aqueous sodium chloride solution the improvement which comprises contacting said rock salt with an aqueous sodium chloride solution initially containing from about 200 to about 300 g/l of sodium chloride and having a calcium ion concentration of 0.01 to 0.5 g/l and a sulfate ion concentration of 2 to 15 g/l for a contact time of at least thirty minutes and until sodium chloride brine having a calcium sulfate concentration suitable for use in said electrolysis is formed, the multiplication product of said calcium ion concentration and said sulfate ion concentration having a maximum value of 2, discontinuing said contact and removing undissolved calcium sulfate.

4,046,866

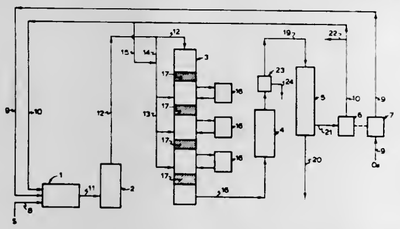
PRODUCTION OF LIQUID SULFUR TRIOXIDE

Harvey Zeh Hurlburt, Houston, Tex., and Clark A. Sumner, Santa Ana, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 24, 1975, Ser. No. 571,136

Int. Cl.² C01B *17/50, 17/76*

U.S. Cl. 423—533 **9 Claims**



1. In an oxygen-based process for the production of liquid sulfur trioxide at elevated pressure by combustion of sulfur with elemental oxygen, followed by catalytic conversion of the resulting sulfur dioxide to sulfur trioxide in at least two stages, recovering a portion of the sulfur trioxide by condensation of the gaseous product of the catalytic conversion and recycling of sulfur trioxide-containing gases to the combustion step, the improvement whereby sulfur trioxide is prepared without concomitant production of sulfuric acid or oleum comprising: conducting the combustion in a single stage, in the presence of from about 2 to about 6 moles of recycled gas per mole of sulfur at an outlet temperature of between about 1250° F. and 1800° F., condensing between about 20% and about 70% of the sulfur trioxide in the gaseous product of the catalytic conversion and recycling substantially all the uncondensed gases exiting from the sulfur trioxide condenser to the combustion step.

4,046,867

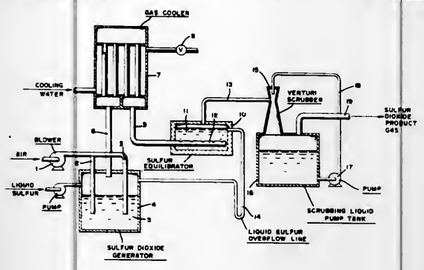
METHOD FOR MAKING SULFUR DIOXIDE-CONTAINING GAS STREAM

Philip F. Seeling, North Syracuse, and Samuel L. Bean, Jamesville, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Feb. 25, 1975, Ser. No. 552,822

Int. Cl.² C01B *17/54, 17/48;* B01D *47/02*

U.S. Cl. 423—543 **4 Claims**



1. In the method for generating a sulfur dioxide-containing gas stream of low elemental sulfur content involving the steps of contacting a stream of oxygen-containing gas with elemental sulfur maintained at temperature of at least about 500° F. to generate a gas stream comprising sulfur dioxide and gaseous elemental sulfur, followed by contacting said gas stream with elemental sulfur maintained at temperature of from about 240° F. to 310° F. to obtain a gas stream low in oxygen and elemental sulfur, the improvement which comprises:

contacting said gas stream low in oxygen and elemental sulfur in a venturi scrubber with water or an aqueous medium containing about 0.1 to about 10% by weight of ammonium ion under conditions of turbulent flow and recovering a sulfur dioxide-containing gas stream substantially free of oxygen and sulfur trioxide and containing less than about 0.0002 lb. of elemental sulfur per cubic foot of gas, measured at standard conditions.

4,046,868

PRODUCTION OF HYDROGEN PEROXIDE

Lawrence G. Vaughan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 26, 1973, Ser. No. 401,070

Int. Cl.² C01B *15/02*

U.S. Cl. 423—588 **10 Claims**

1. In a process for the production of hydrogen peroxide by the reduction and oxidation of an anthraquinone, the improvement which comprises carrying out the reduction and oxidation while the anthraquinone is dissolved in an (N,N-dialkyl)-carboxylic acid amide having a solubility in water of less than 1 percent at 25° C.

4,046,869

STEAM REFORMING PROCESS

Tansukhlal G. Dorawala, Wappingers Falls, and Russell R. Reinhard, Hopewell Junction, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 11, 1976, Ser. No. 657,139

Int. Cl.² C01B *1/18, 2/16*

U.S. Cl. 423—652 **17 Claims**

1. The method of steam reforming a charge hydrocarbon which comprises

passing mixture of steam and charge hydrocarbon into contact with a steam reforming catalyst containing oxide of nickel and oxide of chromium at steam reforming reaction conditions including temperature of 800°–1100° F and pressure of 0–100 psig for 30–180 seconds during which time the activity of the steam reforming catalyst, as measured by the mole percent conversion of charge hydrocarbon to product hydrogen, decreases during the reaction period;

interrupting said reaction period when the activity of said catalyst has decreased, said interrupting being effected by decreasing the flow of said charge hydrocarbon;

contacting said catalyst of decreased activity with steam during a regeneration period at regenerating conditions, including temperature of 800°–1100° F and pressure of 0–100 psig for 90–540 seconds, as the activity of said catalyst increases, thereby forming regenerated catalyst; and

recovering product hydrogen.

4,046,870

ASSAY FOR FREE THYROID HORMONES

William Hertl, Corning, and Gerald Odstrchel, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed June 30, 1976, Ser. No. 701,192

Int. Cl.² G01N *33/00, 33/16*

U.S. Cl. 424—1 **7 Claims**

1. A method for determining the concentration of free thyroid hormone in a fluid sample, the method comprising the steps of

1. performing separate immunoassays for thyroid hormone, one immunoassay being in the presence of a blocking agent and the other immunoassay being in the absence of a blocking agent to thereby establish a binding differential; and

2. then correlating that differential with a standard curve which relates known free thyroid hormone concentrations with binding differentials.

4,046,871

COMPOSITIONS AND SEROLOGICAL METHODS INCLUDING BOVINE SERUM ALBUMIN POLYMERS

Rudolph P. Reckel, Somerville, N.J., assignor to Ortho Diagnostics Inc., Raritan, N.J.

Filed Apr. 8, 1975, Ser. No. 566,641

Int. Cl.² C07G *7/00;* G01N *31/00, 33/16*

U.S. Cl. 424—11 **10 Claims**

1. A bovine serum albumin composition suitable for use in specific antibody detection and for antibody sensitized erythrocyte detection comprising at least one polymer of bovine serum albumin in an aqueous solution, said polymer or polymers being homopolymers in which from 2 to about 15 monomeric albumin units are joined to each other through a convalent peptide bond, said composition having a total albumin content of from about 10 percent to about 35 percent by weight of the composition; and

wherein the albumin component of said aqueous composition is prepared by a method comprising (i) intimately contacting bovine serum albumin with a peptide bond forming reagent selected from the group consisting of 3-H-isoxazolium salts and carbodiimide reagents to form albumin polymers, (ii) adding basic nitrogen compound to the polymerization mixture containing said polymers to quench the reaction and to substantially destroy excess peptide bond forming reagent, (iii) acidifying the mixture to a pH of about 4.5 to 7, and (iv) thereafter recovering the albumin monomers and polymers.

9. A method for detecting anti-D antibody sensitized erythrocytes comprising

1. intimately admixing with the anti-D antibody containing red cell suspension, a serological albumin composition comprising the composition of claim 3 and

2. centrifuging the resulting mixture and observing for agglutination.

4,046,872

DENTAL CREAM

Robert Lee Mitchell, Somerset, and William John Chang, Spotswood, both of N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 464,896, April 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 369,705, June 13, 1973, abandoned. This application Oct. 2, 1975, Ser. No. 618,856

Int. Cl.² A61K *7/18*

U.S. Cl. 424—52 **22 Claims**

1. A process of preparing a dental cream composition containing a monofluorophosphate salt which dental cream retains soluble monofluorophosphate as fluoride which dental cream comprises a dental cream vehicle, a water soluble monofluorophosphate salt, abrasives and alkali metal tripolyphosphate comprising dissolving in said dental cream vehicle containing said monofluorophosphate salt and said abrasives an alkali metal tripolyphosphate whereby there is dispersed or dissolved in said vehicle said alkali metal tripolyphosphate salt as a component which increases retention of soluble monofluorophosphate as fluoride, said monofluorophosphate salt being selected from the group consisting of alkali metal, calcium, magnesium and aluminum monofluorophosphate and present in an amount which provides between about 0.01 and1% by weight of fluoride in said composition, said abrasives being in amount between about 35 and 60% by weight, said abrasive consisting essentially of calcium carbonate and alumina, said alumina being present in an amount of at least about 0.05% by weight up to an amount equal to or less than but not greater than said calcium carbonate, and said alkali metal tripolyphosphate being in amount between about 0.1 and 1.5% by weight.

4,046,873

ALICYCLIC AMIDO-QUATERNARY AMMONIUM ANTI-BACTERIAL AGENTS

Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 400,097, Sept. 24, 1973, Pat. No. 3,928,411, which is a continuation of Ser. No. 39,536, May 21, 1970, abandoned. This application Feb. 25, 1974, Ser. No. 445,713

Int. Cl.² A61K *7/22, 31/14;* C07C *87/40*

U.S. Cl. 424—54 **8 Claims**

1. A chemical compound having the structural formula:



wherein R is an alicyclic group seclected from the group consisting of an adamantyl group, a bicyclooctane group and a norborane group, R^2 and R^3 are independently a methyl or ethyl group, R^4 is an alkyl chain consisting of 10–18 carbon atoms, *n* is the integer 2 or 3 and X is an anion selected from the group consisting of halides, sulfates, nitrates and arylsulfonates.

7. A composition comprising an effective antimicrobial

amount of the compound of claim 1 admixed with a pharmaceutical carrier.

8. A composition comprising an effective antimicrobial amount of the compound of claim 1 admixed with an oral preparation.

4,046,874

SOAPLESS SHAVE COMPOSITION

John Lester Gabby; Dennis Dale Corbin, and Jack Bruner Lowe, all of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 442,015, Feb. 13, 1974, Pat. No. 3,936,391, which is a division of Ser. No. 153,837, June 16, 1971, Pat. No. 3,809,764, which is a continuation-in-part of Ser. No. 74,211, Sept. 21, 1970, abandoned. This application Nov. 17, 1975, Ser. No. 632,427

Int. Cl.² A61K 7/15

U.S. Cl. 424—73 2 Claims

1. A shaving cream adapted for dry shaving with a conventional razor blade which comprises an aqueous foam containing in the aqueous pahse from 0.5 to 7.5% by weight of a polyglycerol ester molecularly constituted of from 3 to 10 glycerol units and from 1 to 2 fatty acyl ester groups each containing from 16 to 20 carbon atoms and a texturizing amount of from 2 to 10% by weight of a water insoluble pulverulent bodying agent, wherein said composition contains substantially no soap, fat, or oil.

4,046,875

ATTENUATED TGE VIRUS

Slobodan M. Djurickovic, Middletown, Md., assignor to Richardson-Merrell Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 595,621, July 14, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,902

Int. Cl.² A61K 39/12; C12K 9/00

U.S. Cl. 424—89 12 Claims

1. An attentuated live transmissible gastroenteritis (TGE) virus vaccine for swine comprising an attentuated live transmissable gastroenteritis virus and a pharmaceutically acceptable carrier, wherein the TGE virus has been attenuated by passaging virulent TGE virus on pig colon organ culture for at least five serial passages; said vaccine being suitable for oral administration to sows and said vaccine being further characterized by leaving the villi of the small intestines of piglets, to which the vaccine has been administered, undamaged and adsorption of protein by said villi is not prevented.

4,046,876

N²-ALKOXYNAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, Kobe; Ryoji Kikumoto; Kazuo Ohkubo, both of Tokyo; Tohru Tezuka, Yokohama; Shinji Tonomura, Tokyo; Yoshikuni Tamao, Yokohama, and Akiko Hijikata, Kobe, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

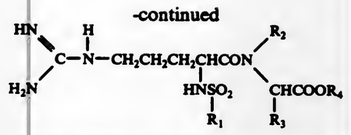
Continuation-in-part of Ser. No. 671,436, March 29, 1976, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Feb. 10, 1976, Ser. No. 656,870

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.² C07C 103/52; A61K 37/00

U.S. Cl. 424—177 8 Claims

1. N²-alkoxynaphthalenesulfonyl-L-argininamides having the formula (I):



(I)

and the pharmaceutically acceptable salts thereof, wherein R_1 is naphthyl substituted with at least one C_1–C_5 alkoxy; R_2 is selected from the group consisting of C_2–C_{10} alkyl, C_2–C_{10} alkoxyalkyl, C_2–C_{10} alkylthioalkyl, C_7–C_{15} aralkyl, C_3–C_{10} cycloalkyl and C_4–C_{10} cycloalkylalkyl; R_3 is C_1–C_5 alkyl; and R_4 is selected from the group consisting of hydrogen, C_1–C_{10} alkyl, C_7–C_{12} aralkyl and C_6–C_{10} aryl.

4,046,877

METHOD OF INCREASING IMMUNOLOGIC COMPETENCE

Abraham White, Palo Alto, and Pamela M. Burton, Cupertino, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 597,116, July 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 561,409, March 24, 1975, abandoned. This application Feb. 17, 1976, Ser. No. 658,200

Int. Cl.² A61K 37/00

U.S. Cl. 424—177 3 Claims

1. A pharmaceutical composition useful for increasing immunologic competence comprising a therapeutically effective amount of human serum prealbumin in admixture with a pharmaceutically acceptable non-toxic carrier.

4,046,878

DAUNOMYCIN ANALOGUES, THEIR PREPARATION AND USE

Bianca Patelli; Luigi Bernardi, both of Milan; Federico Arcamone, Nerviano (Milan), and Aurelio Di Marco, Milan, all of Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

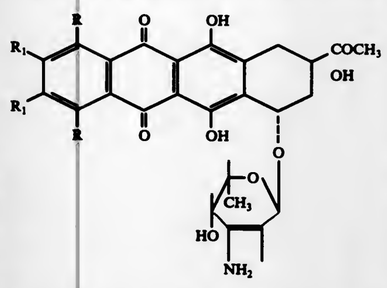
Filed May 22, 1975, Ser. No. 579,901

Claims priority, application United Kingdom, June 12, 1974, 26083/74

Int. Cl.² A61K 31/71; C07H 11/00

U.S. Cl. 424—180 20 Claims

1. A racemic daunomycin analogue of the formula



(I)

comprising the α-anomer, the β-anomer or a mixture of α- and β-anomers wherein when each R_1 is hydrogen, each R is hydrogen, chlorine, bromine methyl or methoxy; and when each R_1 is chlorine, bromine or methyl, each R is hydrogen.

18. A method of inhibiting the growth of a tumor selected from the group consisting of Moloney Sarcoma Virus, Sarcoma 180 Ascites and L_{1210} leukemia which comprises administering to a host afflicted with said tumor an amount of a compound according to claim 1 sufficient to inhibit the growth of said tumor, together with an inert pharmaceutically acceptable carrier.

4,046,879

ANTIVIRAL COMPOSITIONS

Peter Swetly, Vienna, Austria, assignor to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Filed Mar. 1, 1976, Ser. No. 662,374

Claims priority, application Germany, Mar. 5, 1975, 2509531

Int. Cl.² A61K 31/70

U.S. Cl. 424—180 4 Claims

1. A topical antiviral pharmaceutical composition consisting essentially of an inert carrier and uniformly distributed therein 0.05 to 20 mgm of at least one nucleoside triphosphate or deoxynucleoside triphosphate and 0.5 to 100 mgm of at least one complex-former for bivalent cations per gram of total weight of said composition.

4,046,880

METHOD OF TREATING HYPERTENSION

John L. Gainer, Charlottesville, Va., assignor to The University of Virginia, Charlottesville, Va.

Filed Apr. 20, 1976, Ser. No. 678,551

Int. Cl.² A61K 31/70, 31/20

U.S. Cl. 424—180 6 Claims

1. A method for the treatment of hypertension in mammals which comprises administering to said mammal suffering from hypertension an antihypertensively effective dose of a water soluble carotenoid.

4,046,881

FUNGICIDALLY ACTIVE ANTIBIOTIC FROM STREPTOMYCES TENDAE ETTLINGER ET AL. TU 901

Ursula Daha, Filderstadt-Bernhausen; Hanspaul Hagenmaier, Tuebingen; Helmut Hohne, Bad Soden; Wilfried Konig, Pinneberg; Hans Scheinpflug, Leverkusen, and Hans Zahner, Tuebingen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 24, 1976, Ser. No. 669,780

Claims priority, application Germany, Aug. 20, 1975, 2537028

Int. Cl.² A61K 31/71; C07H 19/06

U.S. Cl. 424—181 3 Claims

1. The antibiotic Nikkomycin, which

a. is colorless, readily soluble in water and pyridine but insoluble in other customary organic solvents, shows a positive reaction with ninhydrin, sodium metaperiodate/-benzidine and potassium permanganate, and gives a yellow coloration with iron-(III) chloride;

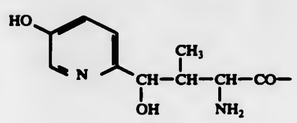
b. has the UV spectra and IR spectrum shown in FIGS. 1 and 2;

c. on chemical degradation gives uracil, an amino-hexuronic acid and an amino acid containing a pyridine ring;

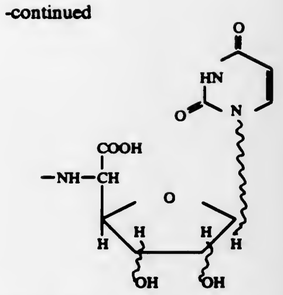
d. proves, in paper electrophoresis, to be an amphoteric substance and has an isoelectric point at about pH 6;

e. comprises carbon, hydrogen, oxygen and nitrogen, and

f. has the formula



-continued



3. A process for combating fungi, comprising applying to such fungi or a fungus habitat a fungicidally effective amount of Nikkomycin according to claim 1.

4,046,882

ISOLATION OF UTERO-EVACUANT SUBSTANCES FROM PLANT EXTRACTS

Ramesh Maganlal Kanojia, Somerville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Nov. 18, 1976, Ser. No. 742,950

Int. Cl.² A61K 35/78

U.S. Cl. 424—195 16 Claims

1. The method of purifying extracts containing uteroevacuant materials obtained from the zoapatle plant which comprises the steps of:

reacting semi-purified material obtained from the extract with an acylating agent, chromatographing the reaction mixture on an adsorbent material, eluting the adsorbent material and collecting the fractions containing acylated utero-evacuant materials.

4,046,883

FUNGICIDAL COMPOSITIONS BASED ON POLYIMIDES OF PHOSPHORUS AND METHOD OF TREATING PLANTS THEREWITH

Guy Lacroix, Lyon, and Jean-Claude Debourge, Courbevoie, both of France, assignors to Philagro S.A., France

Filed Oct. 7, 1975, Ser. No. 620,377

Claims priority, application France, Oct. 8, 1974, 74.34530

Int. Cl.² A01N 9/36

U.S. Cl. 424—209 2 Claims

1. A method of treating plants to control fungal diseases thereof comprising applying to said plants a fungicidally effect amount of at least one compound of the formula

$(RN)_4P_4$

in which R is an alkyl radical containing 1 to 4 carbon atoms.

4,046,884

N-(α-AMINOALKYLIDENE)PHOSPHOR- AND PHOSPHONAMIDATES, AND METHOD FOR CONTROLLING INSECTS

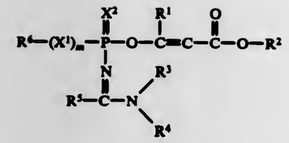
Leonard J. Stach, Riverside, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 1, 1976, Ser. No. 662,667

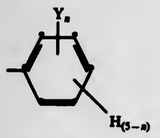
Int. Cl.² A01N 9/36; C07F 9/24

U.S. Cl. 424—210 10 Claims

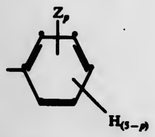
1. A compound of the formula



wherein X^1 and X^2 are independently selected from the group consisting of oxygen and sulfur; *m* is the integer 0 or 1; R^1 is selected from the group consisting of hydrogen and lower alkyl; R^2 is lower alkyl; R^3 and R^4 are independently selected from the group consisting of hydrogen and lower alkyl; R^5 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, lower alkylthio, amino and



wherein Y is selected from the group consisting of lower alkyl, halogen, lower alkoxy, lower alkylthio, nitro and cyano; and *n* is an integer from 0 to 3; and R^6 is selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxyalkyl and



wherein Z is selected from the group consisting of lower-alkyl, halogen, lower alkoxy, lower alkylthio, nitro and cyano; and *p* is an integer from 0 to 3.

2. A method of controlling insects which comprises contacting said insects with an insecticidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to insects, a compound of claim 1.

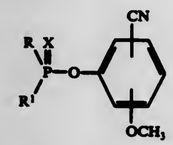
4,046,885

METHOXY-SUBSTITUTED CYANOPHENYL ESTER DERIVATIVES OF PHOSPHORUS ACIDS AS INSECTICIDAL AGENTS

Edward N. Walsh, New City, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 632,523, April 21, 1967, Pat. No. 3,983,188, which is a continuation-in-part of Ser. No. 328,463, Dec. 6, 1963, abandoned. This application May 20, 1976, Ser. No. 688,506
Int. Cl.² A01N *9/36*
U.S. Cl. 424—210 7 Claims

1. A method for killing insects which comprises contacting the insects with an insecticidal amount of at least one compound represented by the formula:



where R and R^1 are members independently selected from the group consisting of lower alkyl, chloro-substituted lower alkyl, lower alkoxy, phenyl, and phenoxy; and X is a member selected from the group consisting of oxygen and sulfur.

4,046,886

DERMATOLOGICAL COMPOSITIONS

Donald Edward Smith, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 541,902, Jan. 17, 1975, Pat. No. 3,952,099, which is a division of Ser. No. 340,787, July 22, 1975, Pat. No. 3,896,238, which is a continuation-in-part of Ser. No. 241,404, April 5, 1972, abandoned. This application Jan. 12, 1976, Ser. No. 647,943
Int. Cl.² A61K *47/00, 7/48, 31/65*
U.S. Cl. 424—227 5 Claims

1. A composition adapted to topical application to animal tissue comprising: (1) a safe and effective amount of a pharmacologically active agent; (2) at least about 0.1% by weight of a sugar ester wherein said sugar ester is a member selected from the group consisting of sucrose monooctanoate, sucrose monodecanoate, sucrose monolaurate, sucrose monomyristate, sucrose monopalmitate, sucrose monostearate, sucrose monooleate, and sucrose dioleate; and (3) at least about 0.1% by weight of a phosphine oxide wherein said phosphine oxide is a member selected from the group consisting of octyl dimethyl phosphine oxide, nonyl dimethyl phosphine oxide, decyl dimethyl phosphine oxide, undecyl dimethyl phosphine oxide, dodecyl dimethyl phosphine oxide, 2-hydroxydecyl dimethyl phosphine oxide, 2-hydroxyundecyl dimethyl phosphine oxide and 2-hydroxydodecyl dimethyl phosphine oxide.

4,046,887

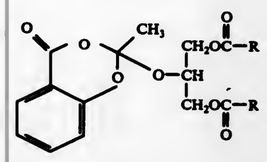
GLYCERIDES WITH ANTI-INFLAMMATORY PROPERTIES

Gerard Yvon Paris, Duvernay, and Denis Gaston Cimon, Montreal, both of Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 28, 1976, Ser. No. 736,633
Int. Cl.² C07D *319/08*
U.S. Cl. 424—232 12 Claims

1. A compound of the formula

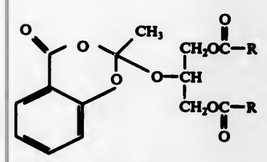
I



wherein each R is an alkyl group of 1–15 carbon atoms.

11. An anti-inflammatory composition containing an effective amount to combat inflammation in warm-blooded animals afflicted therewith, of the compound of formula

I



wherein R is an alkyl group of 1–15 carbon atoms together with and acceptable pharmaceutical carrier in dosage unit form.

4,046,888

METHODS FOR CATALYTIC REDUCTION OF NITROGEN OXIDES

Tsugio Maeshima; Eiichiroh Nishikawa, and Mitsuko Nakamura, all of Ohi, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1976, Ser. No. 665,946
Claims priority, application Japan, June 12, 1975, 50-71229
Int. Cl.² B01D *53/34*
U.S. Cl. 423—239 11 Claims

1. A process for reducing the concentration of nitrogen oxides in a gaseous mixture which comprises

A. introducing ammonia in an amount between about 1.2 and 3.0 times the stoichiometric amount necessary for reducing the nitrogen oxides into a reaction zone containing a catalyst said catalyst comprising an active metal component and natural or synthetic zeolite having an SiO_2/Al_2O_3 molar ratio of at least about 2 and an alkali metal content within the range from 0.2 to 0.6 equivalents per gram atom of alumina, the introduction of ammonia at this rate continuing for at least about 20 minutes and then

B. contacting the nitrogen oxides containing gas with the catalyst in the presence of ammonia in an amount between about 0.7 and 1.0 times the stoichiometric amount necessary for reducing the nitrogen oxides.

C. repeating step (A) periodically.

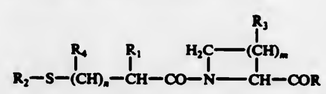
4,046,889

AZETIDINE-2-CARBOXYLIC ACID DERIVATIVES

Miguel Angel Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 13, 1976, Ser. No. 657,792
Int. Cl.² C07D *205/08*; A61K *31/395*
U.S. Cl. 424—244 23 Claims

1. A compound of the formula



wherein

R is hydroxy, amino or lower alkoxy;

R_1 and R_4 each is hydrogen, lower alkyl or phenyl-lower alkyl;

R_2 is hydrogen or R_5—CO;

R_3 is hydrogen, hydroxy or lower alkyl;

R_5 is lower alkyl, phenyl or phenyl-lower alkyl;

m is 1;

n is 0, 1 or 2.

and basic salts thereof.

15. A method for reducing blood pressure by inhibiting the conversion of angiotensin I to angiotensin II which comprises administering a composition comprising a compound of claim 1 in an amount sufficient to reduce blood pressure by inhibiting the conversion of angiotension I to angiotension II and a pharmaceutically acceptable vehicle therefor.

4,046,890

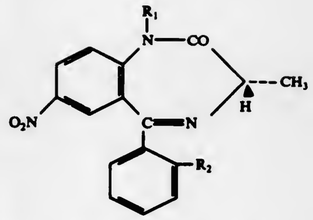
BENZODIAZEPINE DERIVATIVES

Andre Szeate, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 23, 1975, Ser. No. 589,495
Claims priority, application Switzerland, June 28, 1974, 8926/74
Int. Cl.² C07D *243/24*
U.S. Cl. 424—244 6 Claims

1. An optically active 1,4-benzodiazepin-2-one of the general formula

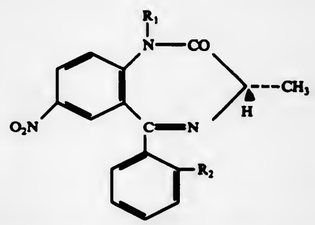
I



wherein R_1 represents a hydrogen atom or a lower alkyl group and R_2 represents a halogen atom, which have the absolute configuration S at the carbon atom in the 3-position.

5. An anthelmintic composition which comprises an anthelmintically active amount of a compound of the formula

I



wherein R_1 represents a hydrogen atom or a lower alkyl group and R_2 represents a halogen atom, which has the absolute configuration S at the carbon atom in the 3-position and a nontoxic, inert, therapeutically compatible carrier.

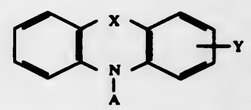
4,046,891

SMOOTH MUSCLE RELAXANT PROCESS EMPLOYING 10-IMIDOYLPHENOXAZINES

Yao Hua Wu, and Walter G. Lobeck, Jr., both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 561,462, March 24, 1975, Pat. No. 3,962,252, which is a division of Ser. No. 336,671, Feb. 28, 1973, Pat. No. 3,888,852. This application Mar. 26, 1976, Ser. No. 670,600
Int. Cl.² A61K *31/535*
U.S. Cl. 424—248.4 13 Claims

1. The process for producing a smooth muscle relaxant effect in a mammal which comprises administering thereto a non-toxic dose of from about 0.01 to 10 mg./kg. of body weight of said mammal of a compound selected from the group consisting of 10-imidoylphenoxazines having the formula

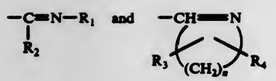


and a non-toxic pharmaceutically acceptable acid addition salt thereof wherein

X represents oxygen

Y represents hydrogen, trifluoromethyl, halogen, dihalogen, lower alkyl of 1 to 4 carbon atoms inclusive, lower alkoxy of 1to 4 carbon atoms inclusive; and

A is selected from the group consisting of



wherein

R_1 is lower alkyl of 1 to 4 carbon atoms inclusive or cycloalkyl of 3 to 6 carbon atoms inclusive;

R_2 is hydrogen or lower alkyl of 1 to 4 carbon atoms inclusive;

R_3 and R_4 are independent members selected from the group consisting of hydrogen or lower alkyl of 1 to 4 carbon atoms inclusive;

n is an integer of 3 to 5.

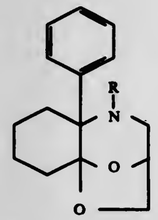
4,046,892

7-AZA-11,12-DIOXA-6-PHENYL-TRICYCLO[7,2,1,$0^{1,6}$]DODECANE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Edward John Warawa, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 24, 1976, Ser. No. 670,192
Int. Cl.² C07D *498/08*; A61K *31/535*
U.S. Cl. 424—248.57 11 Claims

1. The compound of the formula



wherein R is hydrogen or loweralkyl or a physiologically acceptable acid addition salt thereof.

4. An injectable anesthetic composition containing between 0.1 and 10% by weight of the compound of claim 1 in a liquid, physiologically acceptable diluent.

7. The process of preparing 7-aza-11,12-dioxa-6-phenyl-7-alkyl-tricyclo[7,2,1,$0^{1,6}$]dodecane comprising heating a 2-alkylamino-2-phenylcyclohexanone with a 2–10% molecular excess of epibromohydrin in the presence of an inert acceptor for HBr and an inert reaction medium, for 5 to 30 hours to a temperature between 80° C and 150° C.

4,046,893

TRIOXOPTERIDINE DERIVATIVES SUITABLE AS MEDICAMENT

Masuichi Takino, Nerashi; Teikichi Kurosaki, and Munehiko Odaka, both of Osaka, all of Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 396,810, Sept. 13, 1973, Pat. No. 3,946,012. This application Jan. 20, 1976, Ser. No. 650,749
Claims priority, application Japan, Sept. 13, 1972, 47-91907
Int. Cl.² A61K *31/505*
U.S. Cl. 424—251 3 Claims

1. An analgesic and antiphlogistic pharmaceutical composition comprising an effective analgesic and antiphlogistic amount of the compound 6-dihydroxyethyl-2,4,7-trioxo-8-D-ribityipteridine and a pharmaceutically acceptable, inert diluent, carrier or adjuvant.

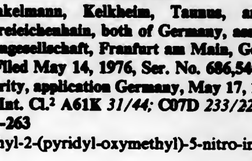
4,046,894

CERTAIN BARBITURIC ACID DERIVATIVES USED AS ANTICONVULSANT AGENTS

Carlos M. Samour, Wellesley, Mass., and Julius A. Vida, Greenwich, Conn., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 888,943, Dec. 29, 1969, which is a continuation-in-part of Ser. No. 749,972, Aug. 5, 1968, abandoned. This application Mar. 18, 1971, Ser. No. 125,813
Int. Cl.² A61K *31/515*
U.S. Cl. 424—254 5 Claims

1. A method of treating convulsions in warm-blooded animals which comprises administering to said animals an amount sufficient to produce an anticonvulsant effect of a compound having the structure



wherein R and R_1 are phenyl and ethyl respectively, or R and R_1 are individually ethyl, allyl or 2-pentyl and wherein R_2 and R_3 are individually methyl, ethyl, butyl, lauryl or benzyl.

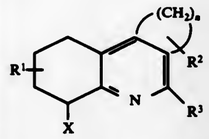
4,046,895

PHENANTHRIDINE DERIVATIVES AND RELATED COMPOUNDS

Adrian Charles Ward Carran, South Cave, and Robin Gerald Shepherd, Burnham, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Filed Jan. 23, 1976, Ser. No. 651,748
Claims priority, application United Kingdom, Feb. 5, 1975, 4967/75
Int. Cl.² C07D *215/48*; A61K *31/47*
U.S. Cl. 424—258 5 Claims

1. A compound of formula I



(I)

wherein R^1 and R^2 are the same or different and represent hydrogen or alkyl of 1–6 carbon atoms, R^3 represents hydrogen, alkyl of 1–6 carbon atoms, or phenyl, X is $CSNHR^4$ wherein R^4 is hydrogen or alkyl of 1–6 carbon atoms and *n* is 3, 4 or 5 or a pharmaceutically acceptable acid addition salt of a compound where X is $CSNHR^4$.

4. An antiulcer composition comprising an effective amount of a compound of formula I as claimed in claim 1, wherein X is $CSNHR^4$ and a pharmaceutically acceptable carrier.

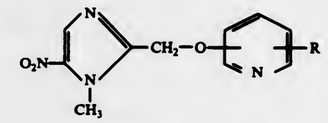
4,046,896

1-METHYL-2-(PYRIDYL-OXYMETHYL)-5-NITRO-IMIDAZOLES

Erhardt Winkelmann, Kelkheim, Taunus, and Wolfgang Raether, Dreieichenhain, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 14, 1976, Ser. No. 686,540
Claims priority, application Germany, May 17, 1975, 2522176
Int. Cl.² A61K *31/44*; C07D *233/22*
U.S. Cl. 424—263 3 Claims

1. A 1-methyl-2-(pyridyl-oxymethyl)-5-nitro-imidazle of the formula



wherein R is nitro or cyano and wherein oxygen is bound to pyridyl in the 2-, 3-, or 4-position.

3. A method for the treatment of disease caused by atrichomonad or amoeba in a human or animal suffering therefrom, which method comprises orally or locally administering to said human or animal a therapeutically effective amount of a compound as in claim 1.

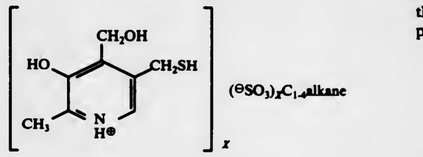
4,046,897

5-MERCAPTOPYRIDOXINE ALKANESULFONATES AND METHODS OF USE AND PHARMACEUTICAL COMPOSITIONS

Conrad P. Dorn, Plainfield; Howard Jones, Holmdel, and David P. Jacobus, Princeton, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

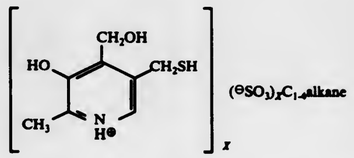
Continuation-in-part of Ser. No. 576,055, May 9, 1975, abandoned. This application Mar. 15, 1976, Ser. No. 666,536
Int. Cl.² A61K *31/44*; C07D *213/62*
U.S. Cl. 424—263 6 Claims

1. A compound of formula:



wherein X is 1 or 2, and C_{1-4} alkane is straight or branched chain.

3. A method of treating rheumatoid arthritis which comprises the administration to a patient in need of such treatment an effective amount of a compound of formula:



wherein X is 1 or 2, and C_{1-4} alkane is straight or branched chain.

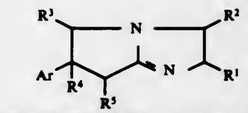
4,046,898

6-ARYL-PYRROLO[1,2-A]IMIDAZOLE DERIVATIVES WHICH POSSESS ANTI-HYPERTENSIVE ACTIVITY

Andrew Shaw, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 26, 1976, Ser. No. 652,060
Claims priority, application United Kingdom, Jan. 31, 1975, 4303/75
Int. Cl.² A61K *31/44*, *31/415*; C07D *487/04*
U.S. Cl. 424—263 9 Claims

1. A compound selected from the group consisting of compounds of the formula:



wherein R^1, R^2, R^3, R^4 and R^5, which may be the same or different, each is hydrogen or alkyl of up to 4 carbon atoms, and wherein Ar is phenyl, naphthyl, thienyl, pyridyl or furyl which is unsubstituted or which bears one, two or three substituents selected from halogen, amino, nitro, trifluoromethyl and alkyl, alkoxy, alkanoylamino and dialkylamino each of up to 6 carbon atoms and the pharmaceutically-acceptable acid-addition salts thereof.

9. A method for lowering blood pressure in a warm-blooded animal which comprises administering to said animal an effective amount of a compound claimed in claim 1.

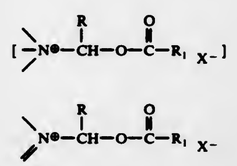
4,046,899

LABILE QUATERNARY AMMONIUM SALTS USEFUL IN BINDING BILE ACIDS IN WARM-BLOODED ANIMALS

Nicolae S. Bodor, Lawrence, Kans., assignor to INTERx Research Corporation, Lawrence, Kans.

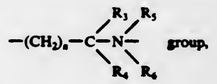
Filed June 1, 1976, Ser. No. 691,781
Int. Cl.² A61K *31/33*, *31/505*, *31/44*, *31/495*
U.S. Cl. 424—266 18 Claims

1. A method for substantially binding free and conjugated bile acids in a warm-blooded animal characterized as being ulcer-prone which comprises orally administering thereto, a therapeutically effective bile acid binding amount of a compound having the formula:



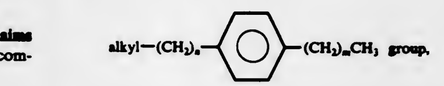
(I)

wherein ⩾ N represents a pyridyl or nicotinic acid group; wherein R represents a member selected from the group consisting of a hydrogen atom, a C_1–C_{20} open chain or cyclo alkyl group, a C_1–C_{20} alkoxyalkyl group, a C_1–C_{20} alkanoyloxyalkyl group, a C_1–C_{20} haloalkyl group, a C_1–C_{20} carboxyalkyl group, a phenyl group, a naphthyl group, and a substituted phenyl or naphthyl group, whose substituents are selected from the group consisting of a halogen atom, an O–C_1–C_6 alkyl group, an O–C_1–C_8 alkanoyl group, a nitro group, a carboxyl group, and a carboethoxy group; wherein R_1, which may be the same or different, represents any member defined by R above with the proviso that R cannot be a hydrogen atom, a



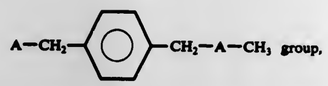
group,

wherein R_3, R_4, R_5 and R_6 are each selected from the group consisting of a hydrogen atom, a methyl group or an ethyl group, a C_1–C_{22} straight or branched



group.

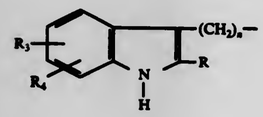
wherein *n* in each occurrence and *m* represent an integer of from 0 to 22, an

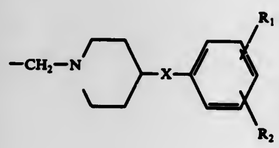


wherein A represents a C_1–C_{22} straight or branched alkyl group as above or a $-(CH_2CH_2O)_p$ group, wherein the *p* represents an integer of from 0 to 22, and the residue of any naturally occurring bile acid selected from the group consisting of cholic acid, deoxycholic acid, glycocholic acid and chenodeoxycholic acid; and wherein X represents a halogen atom, a methanesulfonate group, a fluorosulfonate group and a tosylate group.

4,046,900
BENZOYLPIPERIDYLALKYLINDOLES
Grover C. Helsley, Pottersville; Joseph T. Strupczewski, Flemington, and Beth Ann Gardner, Stanhope, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.
Continuation-in-part of Ser. No. 594,042, Aug. 8, 1975, abandoned. This application Mar. 4, 1976, Ser. No. 663,820
Int. Cl.² C07D *401/06*
U.S. Cl. 424—267 20 Claims

1. A compound of the formula



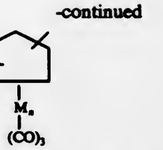


wherein X is

or CHOH; R is hydrogen or methyl; R_1 and R_2 are the same or different and stand for hydrogen, halogen, straight or branched chain alkyl of up to 5 carbon atoms, alkoxy of up to 5 carbon atoms, trifluoromethyl, hydroxy, phenoxy or phenyl; R_3 and R_4 are hydrogen or methoxy; *n* is the integer 1 or 2; or an acid addition salt thereof prepared from a pharmaceutically acceptable acid.

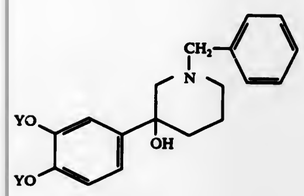
4,046,901
PHENYLPIPERIDINES
Lucien Neddlec, Le Raincy; Jacques Guillaume, Aulnay-sous-Bois, and Claude Dumont, Nogent-sur-Marne, all of France, assignors to Roussel-UCLAF, Paris, France
Filed May 13, 1976, Ser. No. 686,076
Claims priority, application France, May 16, 1975, 75.15381
Int. Cl.² C07D *211/22;* A61K *31/445*
U.S. Cl. 424—267 11 Claims

1. A compound selected from the group consisting of phenylpiperidines of the formula

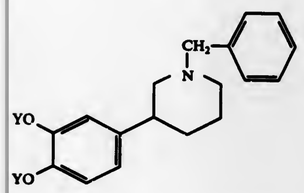


wherein X is selected from the group consisting of hydrogen and an acyl of alkanoic acid of 2 to 6 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

5. A compound selected from the group consisting of N-benzyl-3-(3′,4′-dimethoxyphenyl)-piperidine, a compound of the formula



and a compound of the formula

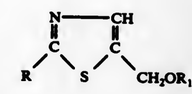


wherein Y is selected from the group consisting of $-CH_3$ and benzyl and the dotted line is a double bond in the 2,3 or 3,4 position of piperidine.

11. A method of reducing hypertension in warm-blooded animals comprising administering to warm-blooded animals an hypotensively effective amount of 3-(3′,4′-dihydroxyphenyl)-piperidine or its non-toxic, pharmaceutically acceptable acid addition salts.

4,046,902
HYPOLIPEMIANT COMPOSITION AND METHOD USING THIAZOLE-5-METHANOLS
Michel Hardy, Maisons-Alfort, and Daniel Humbert, Paris, both of France, assignors to Roussel Uclaf, Paris, France
Division of Ser. No. 495,556, Aug. 8, 1974, Pat. No. 3,957,809. This application Feb. 26, 1976, Ser. No. 661,608
Claims priority, application France, Aug. 29, 1973, 73.31182
Int. Cl.² A61K *31/425*
U.S. Cl. 424—270 5 Claims

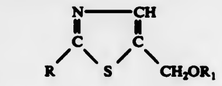
1. An hypolipemiant composition comprising an hypolipemiantly effective amount of at least one compound of the formula



wherein R is alkyl of 2 to 12 carbon atoms and R_1 is selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms and acyl of an organic carboxylic acid of 1 to 12 carbon

atoms selected from the group consisting of alkanoic acids, cycloalkylcarboxylic acids, cycloalkylalkanoic acids, benzoic acid, and phenyl alkanoic acids and a pharmaceutical carrier.

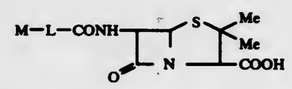
2. A method of inducing hypolipemic activity in warm-blooded animals comprising administering to warm-blooded animals an hypolipemically effective amount of at least one compound of the formula



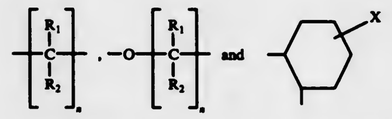
wherein R is alkyl of 2 to 12 carbon atoms and R_1 is selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms and acyl of an organic carboxylic acid of 1 to 12 carbon atoms selected from the group consisting of alkanoic acids, cycloalkylcarboxylic acids, cycloalkylalkanoic acids, benzoic acid, and phenyl alkanoic acids.

4,046,903
ORGANOMETALLIC DERIVATIVES OF PENICILLIN
Eva Irene Edwards, 42 Woodfield Avenue, Brierley Hill, West Middlands; Roger Epton, 2 Claydon Road, Wall Heath, West Middlands, and George Marr, 67 Swelling Green Lane, Codsal, Wolverhampton, all of England
Filed Oct. 20, 1975, Ser. No. 624,405
Claims priority, application United Kingdom, Oct. 30, 1974, 46932/74; Apr. 29, 1975, 17853/75
Int. Cl.² C07D *499/44;* A61K *31/43*
U.S. Cl. 424—271 17 Claims

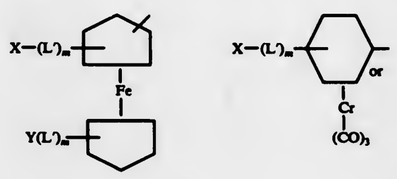
1. A semi-synthetic penicillin of the formula:



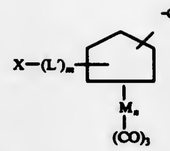
wherein: L is selected from the group consisting of



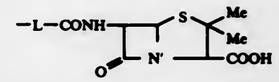
n being an integer from 0 to 2, and each R_1 and R_2 are the same or different members of the group consisting of hydrogen, alkyl, aryl, alkaryl, aralkyl, alkoxy, —CHO, —COOH, $-CH_2N(CH_3)_2$, $-NH_2$, $-C_6H_5$, $-CH_2SH$, $-CH_2I$, —CO—CH_2Z wherein Z is Cl, Br or I, $-MeR_3$ wherein Me is Si, Ge or Sn and R is alkyl containing 1 to 3 carbon atoms, or R_1 and R_2 taken together form a cycloalkyl group; and M is selected from the group consisting of pi-bonded aromatic organometallic complexes of a transition metal represented by the formulae:



-continued



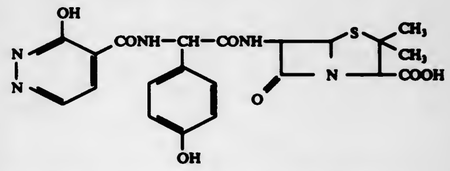
X and Y being the same of different members of the group consisting of hydrogen, alkyl, aryl, aralkyl, alkaryl, —CHO, —COOH, $-CH_2N(CH_3)_2$, $-NH_2$, $-C_6H_5$, $-CH_2SH$, —CH I or —CO—CH_2Z wherein Z is Cl, Br or I, $-MeR_3$ wherein Me is defined as above, or another penicillin nucleus:



L′ represents a methylene linkage or —O—, and *m* is 0 or 1, or a pharmaceutically acceptable salt thereof.

4,046,904
NOVEL PENICILLIN, AND ITS PREPARATION AND USE
Hirotada Yamada, Nishinomiya; Hisao Tobiki, Kobe; Norihiko Tamao, Takarazuka; Kozo Shimago, Toyonaka; Kosaku Okamura, Minoo; Takenari Nakagome, Nishinomiya; Toshiaki Komatsu, Takarazuka; Akio Izawa, Kawanishi; Hiroshi Noguchi, Nishinomiya; Kenji Irie, Takarazuka, and Yasuko Eda, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan
Filed Feb. 13, 1976, Ser. No. 658,035
Claims priority, application Japan, Feb. 14, 1975, 50-19040
Int. Cl.² A61K *31/43;* C07D *499/68*
U.S. Cl. 424—271 3 Claims

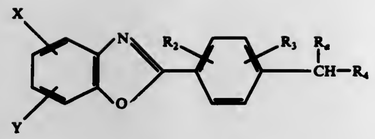
1. A compound of the formula:



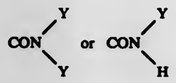
or a non-toxic, pharmaceutically acceptable salt thereof.

4,046,905
ANTI-INFLAMMATORY, ANALGESIC AND ANTIPYRETIC PHENYLACETIC ACIDS
Tsung-Ying Shen, Westfield, N.J.; Jorge P. Li, Brown Deer, Wis., and Conrad P. Dorn, Jr., Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
Division of Ser. No. 548,486, Feb. 10, 1975, Pat. No. 3,947,582, which is a division of Ser. No. 308,852, Aug. 16, 1973, Pat. No. 3,899,506, which is a continuation-in-part of Ser. No. 168,389, July 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 71,227, Sept. 10, 1970, abandoned. This application Aug. 14, 1975, Ser. No. 604,524
Int. Cl.² A61K *31/42*
U.S. Cl. 424—272 10 Claims

1. A method of treating pain, fever and inflammation which comprises the administration to humans and animals of an analgesic, antipyretic or anti-inflammatory effective amount of a compound having the formula:



or a pharmaceutically acceptable salt thereof, wherein
R_a is hydrogen or methyl;
R_2, R_3, X and Y are each hydrogen,
chloro,
bromo, or
fluoro; and
R_4 is COOH;
COOR, where R may be
C_{1-5} alkyl,
$CONH_2$;



where Y may be C_{1-3} alkyl.

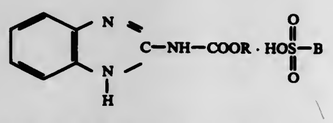
4,046,906

SALTS OF ALKYL 2-BENZIMIDAZOLE-CARBAMATE

Heinz Fresenius, Frankfurt am Main; Konrad Albrecht, Fischbach, Taunus, and Kurt Hartel, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 462,124, April 18, 1974, abandoned. This application Oct. 1, 1975, Ser. No. 618,571
Claims priority, application Germany, Apr. 21, 1973, 2320529
Int. Cl.[2] A61K *31/415;* **C07D** *235/32*
U.S. Cl. 424—273 R **13 Claims**

1. A water insoluble compound of the formula



in which R is alkyl having 1–4 carbon atoms and B is alkyl, alkenyl, alkoxy each having from 10 to 20 carbon atoms, alkylphenyl, alkylnaphthyl, or alkoxy phenyl or mixtures thereof each having from 10 to 20 carbon atoms.

13. Process for combating fungus diseases in plants which comprises treating the plants with an effective amount of a compound as claimed in claim 1.

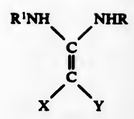
4,046,907

IMIDAZOLE ALKYLAMINOETHYLENE COMPOUNDS

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote; Charon Robin Ganellin, Welwyn Garden City, and Hunter Douglas Prain, Welwyn, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Continuation-in-part of Ser. No. 468,617, May 9, 1974, Pat. No. 3,953,460. This application Nov. 5, 1975, Ser. No. 629,174
Claims priority, application United Kingdom, May 17, 1973, 23568/73
Int. Cl.[2] A61K *31/415;* **C07D** *233/88*
U.S. Cl. 424—273 R **10 Claims**

1. A compound of the formula:



wherein X and Y, which may be the same or different, are hydrogen, nitro, cyano or SO_2Ar but are not both hydrogen; R^1 is Het-$(CH_2)_m$Z$(CH_2)_n$; R is hydrogen, lower alkyl or, being the same or different from R_1, Het-$(CH_2)_m$Z$(CH_2)_n$; Z is sulphur or methylene; *m* is 0, 1 or 2 and *n* is 2 or 3 provided that the sum of *m* and *n* is 3 or 4; Het is an imidazole ring which ring is attached at a ring carbon and which ring is optionally substituted by lower alkyl or halogen; and Ar is an aryl group such as phenyl optionally substituted by halogen or methyl or a pharmaceutically acceptable acid addition salt thereof.

10. A method of inhibiting H-2 histamine receptors which comprises administering to an animal in an effective amount to inhibit said receptors a compound of claim 1.

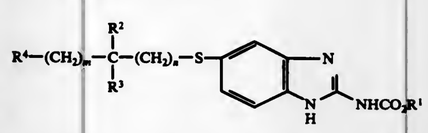
4,046,908

BENZIMIDAZOLE DERIVATIVES, COMPOSITIONS THEREOF AND METHOD OF USE AS ANTHELMINTICS

Rudiger D. Haugwitz, and Barbara V. Maurer, both of Titusville, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 16, 1976, Ser. No. 706,040
Int. Cl.[2] C07D *235/32, 401/12*
U.S. Cl. 424—273 R **10 Claims**

1. A compound of the structure



wherein R^1 is lower alkyl, phenyl-lower alkyl, halo-lower alkyl, mono lower alkylaminoalkyl, and alkyl pyridinium halide, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen or lower alkyl, and R^4 is cycloalkyl containing 3 to 12 carbons or cycloalkenyl containing 3 to 10 carbons, *m* is 0 to 3, *n* is 0 to 3 and $m + n$ is ≤ 5, and physiologically acceptable salts thereof where R^1 includes an amino function.

10. A method for treating helminthiasis which comprises administering to a mammalian host a therapeutically effective amount of the composition as defined in claim 9.

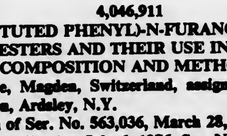
4,046,909

PYRROLIDYLIDENE, PIPERIDYLIDENE AND HEXAHYDROAZEPINYLIDENE UREAS AS CNS DEPRESSANTS

Chris Royce Rasmussen, Ambler; Joseph Francis Gardocki, Doylestown, and James Nelson Plampin, Roslyn, all of Pa., assignors to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Division of Ser. No. 499,706, Aug. 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 335,845, Feb. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 235,816, March 17, 1972, abandoned. This application July 16, 1975, Ser. No. 596,480
Int. Cl.[2] A61K *31/40*
U.S. Cl. 424—274 **8 Claims**

1. A process of alleviating muscular pain which comprises systemically administering to a subject with such pain a pharmaceutical composition in dosage unit form comprising per dosage unit from about 50 to about 400 mg of a member selected from the group consisting of a compound of the formula:



wherein *n* is the integer 1, 2 or 3, R is a member selected from the group consisting of hydrogen and loweralkyl, R_1 is a member selected from the group consisting of loweralkyl and benzyl, R_2 is a member selected from the group consisting of hydrogen and loweralkyl, and Ar is a member selected from the group consisting of di-halophenyl, di-loweralkylphenyl, di-loweralkoxyphenyl, di-trifluoromethylphenyl, loweralkyl-halophenyl, loweralkoxy-halophenyl, benzyloxy-halophenyl, trifluoromethylhalophenyl and nitro-halophenyl, provided that when said *n* is 2 or 3, then said R is hydrogen and said R_1 is loweralkyl, and the therapeutically active acid addition salts thereof in admixture with a pharmaceutical carrier.

4,046,910

DOSAGE SCHEDULE

Herbert G. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 436,996, Jan. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 323,158, Jan. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 278,275, Aug. 7, 1972, abandoned. This application Apr. 14, 1976, Ser. No. 677,514
Int. Cl.[2] A61K *31/35, 31/385*
U.S. Cl. 424—278 **8 Claims**

1. A method for administering DSCG in mammals for the prophylatic treatment of allergy of a reagin or non-reagin mediated nature which comprises
a. administrating to a mammal in need of said treatment a priming dose of DSCG which provides effective inhibition of allergy manifestation, and thereafter
b. administering to said mammal treated in step (a) an effective maintenance dose of DSCG, said maintenance dose quantity
1. providing greater inhibition of allergic manifestations in the maintenance dose situation than the same quantity provides in the priming dose situation and
2. being about 0.1 to about 20% of the quantity of the priming dose.

4,046,911

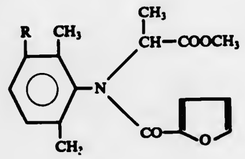
N-(SUBSTITUTED PHENYL)-N-FURANOYL-ALANINE METHYL ESTERS AND THEIR USE IN FUNGICIDAL COMPOSITION AND METHODS

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 563,036, March 28, 1975, abandoned. This application July 6, 1976, Ser. No. 703,037
Claims priority, application Switzerland, Apr. 2, 1974, 4572/74; Feb. 10, 1975, 1591/75
Int. Cl.[2] A01N *9/20;* **C07D** *307/68*
U.S. Cl. 424—285 **9 Claims**

1. An anilide of the formula I

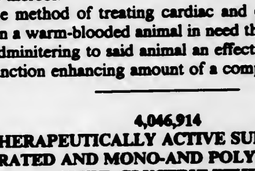
(I)



wherein R represents hydrogen or methyl.

5. A fungicidal composition which contains as active substance a fungicidally effective amount of a compound of the formula I

(I)



wherein R represents hydrogen or methyl, together with a suitable carrier therefor.

4,046,912

S-P-METHOXYPHENYL N-2,3-DIBROMOPROPYLTHIOLCARBAMATE AND ITS USE IN THE CONTROL OF PLANT NEMATODES

William E. Biesinger, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 13, 1975, Ser. No. 631,751
Int. Cl.[2] A01N *9/12;* **C07C** *155/02*
U.S. Cl. 424—300 **14 Claims**

1. S-p-methoxyphenyl N-2,3-dibromopropylthiolcarbamate.

2. A method of controlling the deleterious effects of plant pathogenic nematodes upon plants and plant parts which comprises:
applying an effective amount of S-p-methoxyphenyl N-2,3-dibromopropylthiolcarbamate to the area deleteriously effected by said nematodes to control said deleterious effects of the nematodes.

4,046,913

1-(M-ALKANOYLOXY-PHENYL)-1-HYDROXY-2-(N-LOWER ALKYL-AMINO)-ETHANES AND SALTS THEREOF

Anton Meatrup; Kurt Schromm; Ernst-Otto Reath, all of Ingelheim am Rhein, and Werner Traunecker, Munster-Sarmsheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 497,726, Aug. 15, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 660,401
Claims priority, application Germany, Aug. 18, 1973, 2341876
Int. Cl.[2] A61K *31/22;* **C07C** *67/08*
U.S. Cl. 424—311 **3 Claims**

1. 1-(m-Stearyloxy-phenyl)-1-hydroxy-2-(N-ethylamino)-ethane or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3. The method of treating cardiac and circulatory insufficiency in a warm-blooded animal in need thereof, which comprises administering to said animal an effective circulation and heart function enhancing amount of a compound of claim 1.

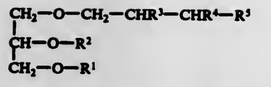
4,046,914

THERAPEUTICALLY ACTIVE SUBSTITUTED SATURATED AND MONO-AND POLYUNSATURATED ALKYL-GLYCERYLETHERS

Bo Erik Hallgren, Molndal, and Gunnel Anna Maria Stallberg, Goteborg, both of Sweden, assignors to Astra Nutrition AB, Molndal, Sweden

Continuation of Ser. No. 152,976, June 14, 1971, abandoned, which is a division of Ser. No. 689,789, Dec. 12, 1967, abandoned. This application Feb. 27, 1975, Ser. No. 553,683
Int. Cl.[2] A61K *31/23, 31/22*
U.S. Cl. 424—312 **30 Claims**

1. A pharmaceutical preparation containing as an active ingredient at least one glycerol ether of the formula



wherein R^1 and R^2 are the same or different and each is selected from the group consisting of hydrogen and aliphatic acyl groups of at most 24 carbon atoms, one of R^3 and R^4 being hydrogen and the other being selected from the group consisting of straight, branched, saturated and unsaturated alkoxy groups containing at most 7 carbon atoms, R^5 is selected from the group consisting of straight, branched, alkyl and alkenyl groups of 4 to 21 carbon atoms, in association with a pharmaceutically acceptable carrier, said active ingredient being present in an amount of at least 5% by weight, effective to exhibit antibacterial or cytostatic activity.

4,046,915

PROCESS FOR TREATING ELEVATED PLATELET ADHESIVENESS

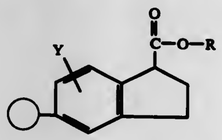
Noel C. Sekhar, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 530,255, Dec. 6, 1974, Pat. No. 3,996,103, which is a continuation of Ser. No. 371,033, June 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 276,698, July 31, 1972, abandoned. This application Aug. 26, 1976, Ser. No. 717,841

Int. Cl.² A61K *31/19*

U.S. Cl. 424—317 4 Claims

1. A process for treating elevated platelet adhesiveness comprising the administration of an effective amount for reducing platelet adhesiveness of a compound of the formula:



wherein ○ is phenyl; Y is hydrogen, halogen, $-CF_3$, —OH, lower alkyl of 1 to 8 carbon atoms, lower alkoxy of 1 to 8 carbon atoms, $-NH_2$, —SH, or —S-lower alkyl of 1 to 8 carbon atoms; and R is hydrogen, or a pharmacologically acceptable cation, to a human or animal having elevated platelet adhesiveness.

4,046,916

N-(CARBOXYMETHOXY-BENZYLIDINE)CARBOXY ANILINES AND PHARMACEUTICAL COMPOSITIONS THEREOF

Georges Nagrevergne, Bordeaux, France, assignor to Societe Anonyme Cortial S.A., Paris, France

Division of Ser. No. 327,236, Jan. 26, 1973, Pat. No. 3,947,587. This application Dec. 4, 1974, Ser. No. 529,464

Claims priority, application France, Jan. 27, 1972, 72.02644

Int. Cl.² C07C *101/66*

U.S. Cl. 424—319 12 Claims

1. The product 2-N-(4'-carboxymethoxy-benzylidene)-carboxy-aniline.

7. A pharmaceutical composition having analgesic and antipyretic activity which comprises as the active ingredient a therapeutically effective amount of the product of claim 1.

4,046,917

METHOD OF TREATING MIGRAINE

Günter Scholtysik, Reinach, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Apr. 19, 1976, Ser. No. 678,241

Claims priority, application Switzerland, Apr. 23, 1975, 5205/75

Int. Cl.² A61K *31/155*

U.S. Cl. 424—326 4 Claims

1. A method of treating or preventing migraine in animals which comprises administering a therapeutically effective amount of the compound 2,6-dichlorophenyl-acetylguanidine to an animal in need of such treatment.

4,046,918

TREATMENT OF CELLS

Gregorio Ramon Cebrian, Madrid, Spain, assignor to Fundacion de Estudios Farmaco-Biologicos, Madrid, Spain

Division of Ser. No. 366,360, June 4, 1973, Pat. No. 3,991,211, which is a division of Ser. No. 201,331, Nov. 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 155,239, June 21, 1971, abandoned. This application Jan. 24, 1975, Ser. No. 543,909

Claims priority, application Spain, June 19, 1970, 380951; United Kingdom, Dec. 30, 1970, 61899/70

Int. Cl.² A61K *31/12*

U.S. Cl. 424—331 4 Claims

1. A method for selective cell necrosis, which comprises administering through the circulatory system to the altered cells of a patient having such altered cells a pharmaceutically effective amount of a composition containing 1,2-diphenyl-α,β-diketone and a pharmaceutically suitable carrier therefor.

4,046,919

TREATMENT OF CELLS

Gregorio Ramon Cebrian, Madrid, Spain, assignor to Fundacion de Estudios Farmaco-Biologicos, Madrid, Spain

Division of Ser. No. 366,360, June 4, 1973, Pat. No. 3,991,211, which is a division of Ser. No. 201,331, Nov. 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 155,239, June 21, 1971, abandoned. This application Jan. 24, 1975, Ser. No. 543,910

Claims priority, application Spain, June 19, 1970, 380951; United Kingdom, Dec. 30, 1977, 61899/70

Int. Cl.² A61K *31/075*

U.S. Cl. 424—338 5 Claims

1. A method for selective cell necrosis, which comprises administering through the circulatory system to the altered cells of a patient having such altered cells a pharmaceutically effective amount of a composition containing benzoyl peroxide and a pharmaceutically suitable carrier therefor.

4,046,920

METHOD FOR FORMING DOUGH SHELLS

Roy V. Moline, Duluth, Minn., assignor to Jeno's, Inc., Duluth, Minn.

Division of Ser. No. 167,405, July 29, 1971, Pat. No. 3,880,069. This application Feb. 25, 1975, Ser. No. 552,842

Int. Cl.² A21D *8/02*

U.S. Cl. 426—19 8 Claims

1. A method for forming dough into dough sections comprising the steps of

sheeting said dough into a moving continuous dough web:

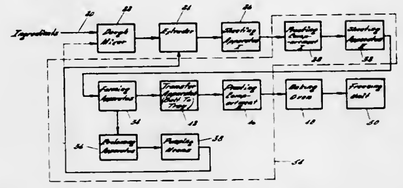
proofing said dough web for a predetermined proofing interval while concurrently transporting the same;

sheeting said dough web to a predetermined thickness and width;

cutting said dough web of predetermined thickness and width to form dough sections therefore with the remaining portion of said cut dough web being trimmings;

separating said dough sections from said trimmings;

blending said trimmings into said dough prior to the sheeting thereof; and



proofing said separated dough sections for a predetermined resting interval while concurrently transporting the same.

4,046,921

PROCESS FOR CULTIVATING MICROORGANISMS BY MEANS OF FLUIDIZED BED

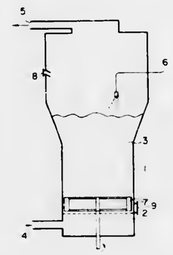
Takeshi Akao; Toshio Sakasai, both of Noda; Yoshikazu Matsuyama, Nagareyama, and Yukio Kasaga, Takasago, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Japan

Filed Feb. 4, 1976, Ser. No. 655,130

Claims priority, application Japan, Feb. 5, 1975, 50-14290

Int. Cl.² A23L *1/20*

U.S. Cl. 426—46 39 Claims



19. A process for producing a soy sauce koji by means of fluidized bed comprising cultivating a microorganism on a solid culture medium while mixing the solid culture medium in a fluidized bed with an upward gas stream and supplying an atomized liquid into the solid culture.

4,046,922

SHELF STABLE, SEMI-MOIST SIMULATED EGG

Morris P. Burkwall, Jr., Marengo, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 471,338, May 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 234,990, March 15, 1972, abandoned. This application May 17, 1976, Ser. No. 686,724

The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.

Int. Cl.² A23L *1/32*

U.S. Cl. 426—104 8 Claims

1. A shelf stable, semi-moist, simulated, cooked, egg product comprising:

a. from about 1 to about 35 percent by weight of egg solids;

b. from about 5 to about 35 percent by weight of a member selected from the group consisting of sugar, sugar equivalents, and mixtures thereof;

c. from 1 to 30 percent by weight edible water absorbing hydrocolloid:

d. from 10 to 30 percent by weight high protein binding agent;

e. a sufficient amount of at least one edible, food-grade, non-toxic acid or acid salt to adjust the pH to from 4.5 to 6.9;

f. sufficient antimycotic to prevent mold; and

g. sufficient water to give a final moisture content of from 20 to 40 percent by weight; and

h. wherein the total weight percentage of the product is 100 percent and (b), (e), and (f) provide bacteriological stability and shelf stability.

4,046,923

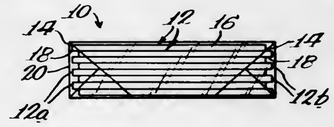
PACKAGE WITH STAGGERED PRODUCT SLICES AND PROCESS FOR PRODUCING THE SAME

John C. Meng, and Gerald J. Driessen, both of Green Bay, Wis., assignors to L. D. Schreiber Cheese Co., Inc., Green Bay, Wis.

Filed Oct. 19, 1970, Ser. No. 81,687

Int. Cl.² A23C *19/16*

U.S. Cl. 426—130 10 Claims



1. A package comprising: a plurality of quadrilateral product slices formed of a flexible, plastic material, such as cheese, each slice having substantially the same external dimensions, said slices being arranged in a stack with a major portion of adjacent slices in face abutting engagement with one another, the lateral edges of adjacent slices being parallel and offset relative to one another to provide a gripping portion that extends laterally outwardly relative to an adjacent slice, said gripping portions having a dimension that is sufficient to facilitate manual separation of the slices but insufficient to allow the gripping portions to sag out of the plane of the major portion of the slice, the lateral edges of the offset portions of alternating slices being aligned with one another to provide parallel surfaces at opposite sides of the stack that are perpendicular to the top and bottom thereof, and wrapping means enclosing said stack therewithin.

8. A process for producing a package having staggered product slices comprising: providing a plurality of product ribbons formed of a flexible, plastic material such as cheese, said ribbons having substantially the same lateral dimensions, offsetting adjacent ribbons laterally relative to one another while maintaining alternating ribbons in alignment with one another, guiding the ribbons into overlapping relationship to provide a stack of ribbons, wherein the lateral edges of adjacent ribbons are offset relative to one another, the dimension of said offset being sufficiently small to prevent the offset edges from sagging; said ribbon offsetting and guiding steps being performed by moving the ribbons of each group past guide members, and locating the guide members such that a guide member bears against at least one lateral edge of each ribbon; severing said stack of ribbons in longitudinally spaced locations to segregate the stack of ribbons into individual stacks of staggered product slices, and thereafter applying a wrapper to said stacks of product slices.

4,046,924

METHOD FOR PANCAKE COOKING

Pierre Tanguy, Dijon, France, assignor to Etud, Dijon, France

Division of Ser. No. 473,227, May 24, 1974, Pat. No. 3,978,781. This application Dec. 19, 1975, Ser. No. 642,301

Claims priority, application France, June 1, 1973, 73.20016

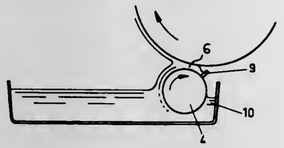
Int. Cl.² A21B *1/48*; A21D *8/06*

U.S. Cl. 426—502 1 Claim

1. A method for applying a cooking mix to the cylindrical cooking surface of the rotating cooking drum of an automatic machine for making pancakes, whereby a coating of the mix is

selectively applied to the cooking surface, comprising the steps of: providing a rotating drum;

entraining a film of mix by adhesion on the surface of a continuously rotating mix-entraining roller partly immersed to a substantially constant depth in a tank containing the mix, said roller rotating oppositely from the direction of rotation of said drum and being located generally below said drum in confronting relationship, the mutually opposite surfaces of said roller and said drum being spaced apart a distance greater than the thickness of the layer of mix entrained by adhesion on said roller;



tangentially contacting the surface of said roller with a retaining member immediately after the zone wherein the surfaces of said oppositely rotating roller and drum are closest to one another for partly retaining the entrained film of mix on said roller so as to thereby produce a bead of mix which extends across the distance between said roller and said cooking drum to touch and coat said cooking surface of said drum, to start the cooking of a pancake; and subsequently

disengaging said retaining member from said roller so as to thereby terminate the formation of said bead of mix, thereby terminating the application of mix to said cooking surface.

4,046,925

ACIDIFIED MILK PRODUCT AND METHOD OF PRODUCING THE SAME

Robert S. Igoe, San Diego, Calif., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 577,145, May 13, 1975, abandoned. This application May 3, 1976, Ser. No. 682,292

Int. Cl.² A23L *1/04*

U.S. Cl. 426—573 **16 Claims**

1. A gel-forming composition for use in a blend comprising fruit juice and milk or fruit juice and cream, the blend having a pH below about 4.5, said gel forming composition comprising from about 20% to about 50% xanthan gum, from about 10% to about 45% locust bean gum, and from about 30% to about 50% carboxymethyl cellulose, the percentages being based on the total weight of the gel-forming composition and chosen so that the total is 100%.

4,046,926

NON-DAIRY CREAMER COMPOSITIONS

David Stirling Gardiner, Cornhill-on-Tweed, England, assignor to General Foods Ltd., Banbury, England

Filed July 30, 1976, Ser. No. 710,065

Int. Cl.² A23D *5/00*

U.S. Cl. 426—613 **8 Claims**

1. A process for the preparation of a non-dairy creamer powder composition having enhanced feathering resistance which comprises forming an emulsion comprising from 20 to 40% by weight on a dry basis of fat, from 3 to 15% by weight of sodium caseinate, from 35 to 65% by weight of carbohydrate and including as a buffering agent a mixture of effective amounts of sodium carbonate and a phosphate or a citrate at a level from 1 to 4% by weight and drying said emulsion.

4,046,927

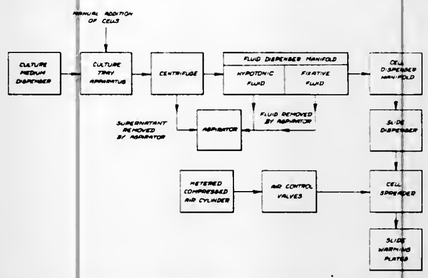
PROCESS FOR SEMI-AUTOMATED PRODUCTION OF MAMMALIAN CELL SLIDES

John Melnyk, 1316 Cerritos Drive, Laguna Beach, Calif. 92651

Filed Nov. 29, 1976, Ser. No. 745,675

Int. Cl.² C12B *3/00, 9/00*

U.S. Cl. 427—2 **5 Claims**



1. A process for semi-automated production of mammalian cell slides, comprising:

adding a suitable culture medium from a dispenser into a plurality of culture tray means;

adding mammalian cells to the culture medium;

incubating said cells in the culture medium for a suitable period of time and at a suitable temperature in said plurality of culture tray means;

centrifuging the mixture of culture medium and said cells while in said culture tray means to produce a supernatant;

removing the supernatant by aspirator means simultaneously from said plurality of culture tray means, leaving said cells in said culture tray means;

adding hypotonic fluid to said cells in said plurality of culture tray means simultaneously from a dispenser while at the same time initiating and maintaining shaking of said culture tray means;

removing said hypotonic fluid and adding a fixative fluid to said cells in said plurality of culture tray means simultaneously from a dispenser, while at the same time initiating and maintaining shaking of said culture tray means;

removing said fixative fluid and collecting the resulting cell suspension in a cell dispenser manifold;

discharging the cell suspension from said cell dispenser manifold simultaneously on a plurality of slides;

and spreading said cell suspension over the surfaces of said plurality of slides with an air blast.

4,046,928

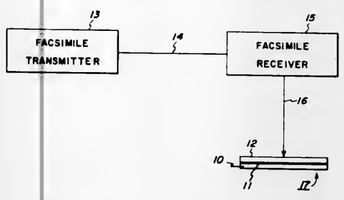
ELECTRORESISTIVE PAPER

Aiptekin Akman, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 8, 1973, Ser. No. 322,048

Int. Cl.² B05D *5/12*; B32B *29/00*

U.S. Cl. 427—12 **6 Claims**



1. An electrosensitive marking blank comprising:

a. a substrate;

b. a blushed opaque conductive layer coated on said substrate said conductive layer including conductive carbon in a film-forming binder of cellulose acetate butyrate; and

c. a contrasting masking layer overlaying said conductive coating said masking layer containing a pigment and film-forming binder said masking layer completely overlaying said conductive coating in order to provide contrast with the conductive layer upon electrical stylus removal of the opaque masking layer.

4,046,929

ATTENUATION SPOT FILTERS MANUFACTURING PROCESS

Rein Randmae, Fort Saloaga, N.Y., assignor to Vicon Industries, Inc., Farmingdale, N.Y.

Filed May 9, 1975, Ser. No. 576,027

Int. Cl.² G02B *5/22*; B05D *1/20, 1/36, 5/06*

U.S. Cl. 427—164 **2 Claims**

1. A method for manufacturing an attenuation spot filter, comprising the steps of:

a. rotating a substrate about a vertical axis above a flame,

b. varying the vertical distance between said flame and said substrate whereby a carbon film having a greater density toward its center and a gradient density outwardly of the center is caused to be deposited upon said substrate, and

c. coating said carbon film deposit with a protective coating by:

i. floating said carbon film deposit bearing substrate in a floatation fluid,

ii. covering said carbon film deposit with a resin, and

iii. drying said resin.

4,046,930

TREATMENT OF PAPER AND TEXTILE FABRICS WITH EMULSIFIED EPOXY-SILICONES

Gordon Carlton Johnson, Armonk, and Richard Bruce Metzler, Ossining, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 521,512, Nov. 6, 1974, abandoned. This application July 6, 1976, Ser. No. 702,471

Int. Cl.² B05D *3/02*; C08G *47/04*; D06M *15/66*

U.S. Cl. 427—387 **19 Claims**

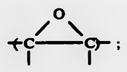
1. In the method of imparting water repellency to paper and textile fabric substrates which comprises contacting the substrates with a water-dispersible aqueous emulsion of an epoxy-silicone having the formula:

$$MD_xU_yM'_q$$

wherein D represents an R_2SiO unit in which R is a monovalent hydrocarbon radical free of acetylenic unsaturation; U represents a unit selected from the class consisting of

$$\begin{matrix} R' \\ | \\ R-Si-O \end{matrix} \text{ and } R'SiO_{3/2}$$

in which R is as defined above and R' a monovalent organic radical containing at least one vicinal epoxy group,



M and M' are in each occurrence an endblocking unit having the formula

$$\begin{matrix} R'_a \\ | \\ R''_{3-a}SiO_{1/2} \end{matrix}$$

in which R'' is a monovalent hydrocarbon radical free of olefinic unsaturation, R' is as defined above, a has a value from 0 to 1 inclusive, q has a value of 1 when U is an

$$\begin{matrix} R' \\ | \\ R-SiO \end{matrix}$$

unit and a value of $(y + 1)$ when U is an $R'SiO_{3/2}$ unit, x is an integer having a value of from 10 to about 10^3, y is an integer having a value of from 1 to about 10^2, the sum of x, y and q being such that the epoxy-silicone compound MD_xU_yM' has a molecular weight of from about 10^3 to about 10^6 and the ratio of epoxy-containing units to units containing no epoxy groups is within the range of from about 0.001 to 0.5, said epoxy-silicone being employed in an amount of from about 0.01 to about 4 weight % based on the weight of dry substrate, the improvement which consists of producing an aqueous emulsion for application to said substrates by emulsifying said epoxy-silicone in water using about 1 to 25 weight %, based on the weight of said epoxy-silicone, of an anionic sulfonate emulsifier capable of producing an aqueous emulsion of said epoxy-silicone having a maximum water absorption on paper at 49° C. for 3 minutes of about 0.6 g./100 cm² when measured by the Cobb Test in accordance with TAPPI-T-441.

4,046,931

METHOD AND APPARATUS FOR APPLYING COATING COMPOSITIONS TO STRIP MATERIAL

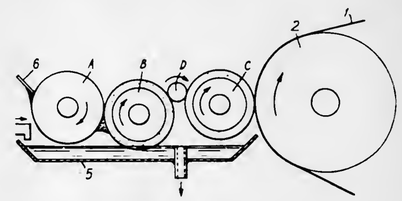
Robert Arthur Innes, Amherstview; Gregory Preston Michael Earight, and Garnet Lloyd Derrick, both of Kingston, all of Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Feb. 18, 1975, Ser. No. 550,750

Claims priority, application United Kingdom, Feb. 19, 1974, 7611/74

Int. Cl.² B05D *1/28*

U.S. Cl. 427—428 **13 Claims**



1. An apparatus for applying a coating material to a metal strip comprising a deformable-covered coating take-up roll, means for supplying a coating material to said roll, a hard metering roll in contact therewith to perform a primary metering function on said coating material on said take-up roll, means for removing coating material from the surface of the metering roll at a position remote from its line of contact with the take-up roll, a hard transfer roll in contact with said take-up roll at a point downstream from the line of contact with said metering roll and a deformable-covered applicator roll in contact with said hard transfer roll, said hard transfer roll being of small diameter and means for rotating all said rolls in the same sense at controllable velocities so that at lines of mutual contact the surfaces of the rolls travel in opposite directions with said hard transfer roll rotating at a peripheral speed greater than that of said take-up roll and said applicator roll rotating at a peripheral speed greater than that of said transfer roll; said supplying means comprising means for bringing said coating material into contact with the surface of said take-up roll at a locality spaced from the line of contact of said transfer roll with said take-up roll; and said metering roll being

disposed for contact with said take-up roll along a line between said last-mentioned locality and the line of contact of said transfer roll with said take-up roll in the direction of surface travel of said take-up roll.

6. A method of applying a film of a coating material to a moving metal strip comprising taking up a continuous film of coating material on a rotating first deformable-covered roll, contacting said first deformable-covered roll with a hard roll having its surface travelling in the opposite direction thereto at the line of contact with said first deformable-covered roll to form a metered film on the surface of said first deformable-covered roll, continuously removing coating material from the surface of said hard roll, contacting the surface of said first deformable-covered roll, carrying said metered film, with a small diameter hard transfer roll having its surface travelling in the opposite direction thereto at the line of contact with said first deformable-covered roll to transfer coating material to said hard transfer roll, contacting said hard transfer roll with a second deformable-covered roll having its surface travelling in the opposite direction thereto at the line of contact with said hard transfer roll to transfer coating material to said second deformable-covered roll, and then transferring said coating material from said second deformable-covered roll to moving strip metal by contacting said second deformable-covered roll with a strip travelling in opposite direction thereto at the line of contact with said second deformable-covered roll, said method including rotating said hard transfer roll at a peripheral speed greater than said first deformable-covered roll, and rotating said second deformable-covered roll at a peripheral speed greater than said transfer roll; the step of taking up coating material comprising bringing said coating material into contact with the surface of the first deformable-covered roll at a locality spaced from the line of contact of the first deformable-covered roll with said hard transfer roll, and said first-mentioned hard roll being disposed for contact with said first deformable-covered roll along a line between said last-mentioned locality and the line of contact of said hard transfer roll with said first deformable-covered roll in the direction of surface travel of said first deformable-covered roll.

4,046,932

MAGNETIC RECORDING DISCS

Hans-Joerg Hartmann, Breinsheim; Roland Falk, Achern; Peter Gawlik, Ludwigshafen, all of Germany; Werner Balz, Bedford, Mass.; Karl Uhl, Frankenthal, Germany; Dieter Schaefer, Germany, and Herbert Motz, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 460,469, April 12, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,182
Claims priority, application Germany, Apr. 17, 1973, 2319363
Int. Cl.² H01F *10/02*
U.S. Cl. 428—64 **6 Claims**

1. A magnetic recording disc which comprises a base and an adhesive magnetic coating composition thereon, said coating comprising a binder and finely divided magnetic pigment dispersed in said binder, said binder comprising a mixture of polycondensates consisting essentially of

A. 60 to 70% by weight of a solid curable polycondensate of 2,2-bis-(4-hydroxyphenyl)-propane and epichlorohydrin, with and epoxy equivalent weight from about 400 to 2,500 and having a melting point from about 50° to 150° C,

B. 10 to 30% by weight of a curable allyloxybenzene-formaldehyde condensate of the resol type with free methylol groups or methylol groups etherified with a lower alcohol, and having a molecular weight of less than 1,000, and

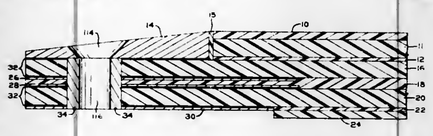
C. 10 to 30% by weight of a curable melamine-formuladehyde condensate with more than two methylol groups etherified with n-butanol or isobutanol and having a molecular weight of less than 2,500.

4,046,933

LAMINATED WINDOW STRUCTURE AND ITS METHOD OF FABRICATION

John E. Stefanik, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 16, 1975, Ser. No. 613,790
Int. Cl.² B32B *3/02*
U.S. Cl. 428—81 **7 Claims**



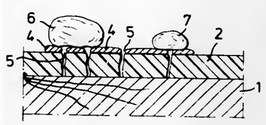
1. A transparent laminated window or canopy for aircraft and the like comprising a vision area comprising alternate plies of a rigid, transparent glazing material selected from the class consisting of glass, polycarbonates, acrylic esters and polyesters, and of a flexible interlayer material selected from the class consisting of polyurethanes, silicones and polyvinyl acetals and a marginal edge portion unitary with and surrounding said vision area and comprising a reinforcement member bonded to a ply of said interlayer material and a fabric tape impregnated with a silicone elastomeric adhesive and having substantially uniform thickness after said fabric is impregnated bonded between said reinforcing member and an adjacent surface of one of said plies of rigid, transparent glazing material, said ply of interlayer material being reduced in thickness in said marginal edge portion along one surface thereof to receive said reinforcing member.

4,046,934

FIBROUS BUILDING ELEMENTS

Hans Hjalmar Gustafson, Tradgardsgatan 22, S-172 38 Sundbyberg, Sweden

Filed Dec. 11, 1975, Ser. No. 639,907
Claims priority, application Sweden, Jan. 9, 1975, 7500188
Int. Cl.² B05D *5/00*; B32B *3/00*
U.S. Cl. 428—155 **3 Claims**



1. A fibrous building element which is coated on at least the outwardly facing side thereof with a layer of a water-base paint which forms a cracked surface in a manner to permit vapor to diffuse through said building element and a second layer of a wax emulsion applied to the outer surface of said water-base paint to prevent the penetration of water into the building element through the cracked surface thereof.

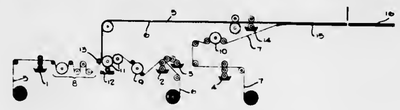
4,046,935

RIGID-WHEN-WET PAPERBOARD CONTAINERS AND THEIR MANUFACTURE

Robert M. Wilkinson, Florissant, Mo., and James R. Lyon, Godfrey, Ill., assignors to Altor Box Board Company, Altor, Ill.

Division of Ser. No. 277,646, Aug. 3, 1972, Pat. No. 3,886,019, which is a continuation-in-part of Ser. No. 39,086, May 20, 1970, abandoned. This application Apr. 14, 1975, Ser. No. 568,131
Int. Cl.² B32B *3/28*
U.S. Cl. 428—182 **7 Claims**

1. The process of making rigid-when-wet container-board comprising, surface-treating one face of a sheet of paperboard without substantially effecting the moisture absorbing attributes of its opposite face by printing thereon discretely metered increments of a mixture of phenolic resin in a liquid vehicle in minutely spaced relationship, surface-treating both faces of a second sheet of paperboard with a mixture of phenolic resin in a liquid vehicle, and surface-treating one face of a third sheet of paperboard without substantially effecting the moisture absorbing attributes of its opposite face by printing thereon discretely metered increments of said mixture of phe-



nolic resin in a liquid vehicle in minutely spaced relationship, immediately removing a substantial part of said liquid vehicle from the said first, second, and third sheets, and after the vehicle is in substantial part removed from all of said sheets, corrugating said second sheet, and the sheets are laminated with said one face of said first-mentioned sheet and third sheet in at least partial contact with opposite faces of said second sheet.

4,046,936

IMPRINTED COMPRESSIBLE FOAM ARTICLE AND METHOD OF MANUFACTURE

Joseph D. Schachter, 866 Elm Street, Winnipeg, Manitoba, Canada

Filed Jan. 7, 1977, Ser. No. 757,663
Claims priority, application Canada, Dec. 29, 1976, 268,782
Int. Cl.² B32B *3/00, 7/14*
U.S. Cl. 428—195 **11 Claims**

1. A multicellular compressible article comprising

(a) a volume of compressible foam cut ot predetermined dimensions,

(b) a design imprint on the surface of the foam desposited by direct heat transfer sublimation of sublistatic ink.

4,046,937

MELAMINE-ALDEHYDE RESIN AND POSTFORMABLE LAMINATE MADE THEREFROM

Harold O. McCaskey, Jr., Allendale, and Lenon G. Brooker, Hampton, both of S.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 10, 1974, Ser. No. 513,785
Int. Cl.² B32B *29/00, 29/04, 15/14, 21/04*
U.S. Cl. 428—211 **68 Claims**

1. A composition comprising

1. an aldehyde and melamine in a mole ratio of about 1.5 to about 6;

2. about 1 to about 50% (by weight based on melamine weight) of a water-soluble, aliphatic diglycidyl ether; and

3. sufficient water to form a solution of about 15 to about 65% solids.

13. An article comprising an absorbent sheet impregnated with an A-staged composition which comprises:

1. an aldehyde and melamine in a mole ratio of about 1.5 to about 6;

2. about 1 to about 50% by weight based on melamine weight of a water-soluble, aliphatic diglycidyl ether; and

3. sufficient water to form a solution of about 15 to about 65% solids.

31. A laminate comprising a postformable core stock to which is bonded at least one absorbent sheet impregnated with a C-staged composition comprising:

A. an aldehyde and melamine in a mole ratio of about 1.5 to about 6;

B. about 1 to about 50% by weight based on melamine weight of a water-soluble, aliphatic diglycidyl ether; and

c. sufficient water to form a solution of about 15 to about 65% solids.

52. A method of making a postformable laminate comprising:

A. preparing an A-staged composition which comprises

1. an aldehyde and melamine in a mole ratio of about 1.5 to about 6;

2. about 1 to about 50% by weight based on melamine weight of water-soluble, aliphatic diglycidyl ether; and

3. sufficient water to form a solution of about 15 to about 65% solids.

B. applying said composition to an absorbent sheet to a weight ratio of composition solids to absorbent sheet of about 1.2 to about 4.0;

C. reacting said composition to the B-stage;

D. forminga stack of at least one of said sheets with a postformable core stock; and

E. curing said stack to the C-stage.

4,046,938

INSULATING MATERIAL

Kevork A. Torossian, and Leo S. Kohn, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 277,482, Aug. 2, 1972, abandoned. This application July 23, 1976, Ser. No. 708,256
Int. Cl.² B32B *17/10, 27/36*; H01B *7/28*; B32B *27/38*
U.S. Cl. 428—285 **7 Claims**

1. Composite electrical insulation comprising at least one layer of electrical insulating tape, said tape consisting essentially of (a) at least one electrical insulating layer, (b) thermosetting resin impregnant for (a) and adhering to at least one outer surface of (a) a protective polymer film which is soluble in said resin at the curing temperature of said resin, said polymer film being selected from the group consisting of polycarbonate, polysulfone and polyphenylene oxide.

4,046,939

GAS RESISTANT FOAM MATERIALS

John A. H. Hart, South March, Canada, assignor to Her Majesty the Queen in Right of Canada, Canada

Continuation of Ser. No. 132,611, April 8, 1971, abandoned. This application Jan. 7, 1976, Ser. No. 647,097
Claims priority, application Canada, May 4, 1970, 81768
Int. Cl.² B32B *5/18*
U.S. Cl. 428—311 **9 Claims**

1. An air and water permeable open cell solid flexible polyurethane foam resistant to the passage therethrough of noxious chemicals in liquid or vapor form, said foam having dispersed therein particulate activated carbon of average particle size in the range 7 to 10 microns and in an amount of at least 10% by weight of said foam and not in excess of 12 milligrams per sq. cm. of foam, said activated carbon particles being bonded in said foam by an acrylic elastomeric binder which is substantially free from substances which would substantially deactivate the activated carbon particles, said binder being present in an amount from 15 to 100 parts by weight per 100 parts by weight of said carbon.

4,046,940

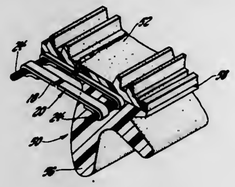
WEATHERSTRIP STRUCTURE

John Prikkel, III, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 15, 1975, Ser. No. 640,724
Int. Cl.² E06B *7/215*; B32B *15/06, 15/14*
U.S. Cl. 428—313 **3 Claims**

1. An elongated elastomeric body having a longitudinally extending U-shaped section and embedded in said U-shaped section, a reinforcing and retention aiding core comprising a plurality of separate U-shaped resilient metal strips disposed transversely to the longitudinal axis of the body in closely and

uniformly spaced relation therealong with the ends of said strips being bent around and thereby securely attached to



flexible continuous fibrous cords longitudinally disposed in each side wall of said U-shaped section.

4,046,941

SUPPORT SHEET WITH SENSITIZED COATING OF ORGANIC ACID SUBSTANCE AND ORGANIC HIGH MOLECULAR COMPOUND PARTICULATE MIXTURE

Tetsusuke Saito, Kobe; Jujiro Kohno, Takatsuki; Daiichiro Tanaka, Arao, and Shinichi Oda, Amagasaki, all of Japan, assignors to Sanko Chemical Company Ltd. and Kanzaki Paper Manufacturing Company, Ltd., both of, Japan

Division of Ser. No. 401,552, Sept. 27, 1973, Pat. No. 3,924,027. This application Aug. 21, 1975, Ser. No. 606,548

Claims priority, application Japan, Sept. 27, 1972, 47-97430

Int. Cl.² B32B *5/16*

U.S. Cl. 428—323 **21 Claims**

1. A sheet material for use in a pressure-sensitive copy system, comprising a support sheet and a coating thereon sensitized to produce color on contact with a chromogenic material, said coating containing a particulate mixture having uniformly dispersed therein in the form of fine powders comprising (a) 100 parts by weight of an acidic organic substance selected from the group consisting of aromatic carboxylic acids and polyvalent metal salts thereof, and (b) from 5 to 300 parts by weight of an organic high molecular compound selected from the group consisting of polystyrene, styrene copolymers, a-methylstyrene polymers, a-methylstyrene copolymers, polyvinyl chloride, vinylchloride copolymers, vinylidenechloride copolymers, polychloroprene, cyclopentadiene polymers, cyclopentadiene copolymers, acrylic ester polymers, acrylic ester copolymers, acrylic acid copolymers, methacrylic ester polymers, methacrylic ester copolymers, methacrylic acid copolymers, vinyl acetate polymers, vinyl acetate copolymers such as ethylene-vinylacetate copolymers, acrylonitrile copolymers, acrylamide copolymers, allylalcohol copolymers, benzylchloride polycondensation products, benzylchloride copolycondensation products, meta-xylene-formaldehyde condensates, diphenyl-formaldehyde condensates, and diphenyl-meta-xylene-formaldehyde copolycondensation products, said organic high molecular compound having a molecular weight of at least 400 and in a non-fluid or solid state at normal temperature, and being compatible with said acidic organic substance.

4,046,942

METHOD OF PRODUCING AN ENDLESS FOLLOWER, AND PRODUCT PER SE

Kurt van Wersch, Wegberg, Germany, assignor to A. Monforts, Monchengladbach, Germany

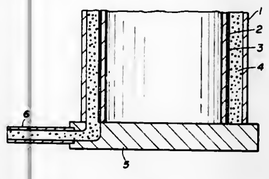
Filed Nov. 29, 1974, Ser. No. 528,331

Claims priority, application Germany, Nov. 28, 1973, 2359170

Int. Cl.² B29D *27/04;* B32B *7/00*

U.S. Cl. 428—255 **4 Claims**

1. Method of producing an entrainer for squeezing or dyeing textile fabric webs with the aid of a foulard which comprises inserting a spread-out endless textile web into an annular mold having an annular space bounded by an outer wall having a continuous surface and an inner wall having a continuous surface with said spread-out endless textile web disposed on said inner wall having a continuous surface, both the web and the annular mold having a periphery and a width corresponding to the periphery and width of the entrainer to be formed and thereafter filling the annular mold with a material that hardens to form a sponge to produce an entrainer having an endless textile web inlaid with an endless sponge web with the sides of said entrainer adjacent said walls having continuous surfaces, and with the surface of said sponge web being free of



seams and joints, permiting said material to harden in said mold; removing the skins at both end surfaces of the hardened annular sponge; passing a cleansing medium through the sponge from one end surface to the other end surface to wash out unreacted materials; and removing the outer surface skin from said cleansed product to form said entrainer.

4. Endless entrainer adapted for squeezing or dyeing textile fabric webs with the aid of a foulard which entrainer is prepared according to the method of claim 1.

4,046,943

MALONIC ACID DERIVATIVE COMPOSITION FOR FORMING THERMOPARTICULATING COATING

James D. B. Smith, Turtle Creek, and David C. Phillips, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

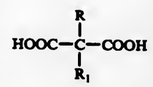
Division of Ser. No. 568,219, April 15, 1975, Pat. No. 3,995,489. This application July 16, 1976, Ser. No. 706,089

Int. Cl.² C08K *5/01;* G01K *13/02*

U.S. Cl. 428—339 **15 Claims**

1. A composition comprising

1. at least one compound having the general formula



which decomposes to produce detectable particles between about 60° to about 200° C, where R is selected from the group consisting of alkyl from C_1 to C_{10}, aryl, alkyl aryl from C_1 to C_{10}, cycloaliphatic, and heterocyclic, and R_1 is selected from the group consisting of R and hydrogen; and

2. a solution of at least one resinous carrier curable and stable at 60° C and unreactive with said compound.

13. A thermoparticulating coating comprising a solid layer of a composition according to claim 1 on a substrate.

15. A coating according to claim 13 which is about 1/16 to about ¼ inch thick.

4,046,944

FLUORINATED CONDENSATION POLYMERS AND THEIR USE AS SOIL RELEASE AGENTS

Karl Friedrich Mueller, New York, and Robert A. Falk, New City, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 6, 1976, Ser. No. 674,188

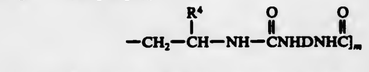
Int. Cl.² B32B *27/04;* C08G *18/50;* D06M *15/68*

U.S. Cl. 428—262 **20 Claims**

1. A fluorinated condensation polymer having a chemical structure containing the units



and



in the ratio of 15–70% by weight of the fluorinated units to 30–85% by weight of the non-fluorinated polyethyleneoxide units, wherein

R_f is a branched or linear perfluoroalkyl or perfluorooxyalkyl group of 5–18 carbons,

R^3 is an aliphatic triradical of 2–50 carbon atoms selected from the group consisting of branched or straight chain alkylene, alkylenethioalkylene, alkyleneoxyalkylene and alkyleneiminoalkylene,

R^4 is hydrogen or methyl,

D is the organic divalent radical of a diisocyanate,

k is 8–100,

m is an integer of 1 to 5,

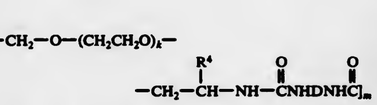
n is 1 or 2, and

p is an integer of 1 to 5.

20. A soil-releasing textile, consisting essentially of textile fibers coated with a fluroinated condensation polymer having a chemical structure containing the units



and



in the ratio of 15–70% by weight of the fluorinated units to 30–85% by weight of the non-fluorinated polyethyleneoxide units wherein

R_f is a branched or linear perfluoroalkyl or perfluorooxyalkyl group of 5–18 carbons,

R^3 is an aliphatic triradical of 2–50 carbon atoms selected from the group consisting of branched or straight chain akylene, alkylenethioalkylene, alkyleneoxyalkylane and alkyleneiminoalkylene,

R^4 is hydrogen or methyl,

D is the organic divalent radical of a diisocyanate,

k is 8–100,

m is an integer of 1 to 5,

n is 1 or 2, and

p is an integer of 1 to 5.

4,046,945

PROCESS FOR THE BONDING OF FILMS AND MOLDED COMPONENTS

Fritz Baxmann; Albert Frese; Hermann Röben, all of Marl, and Jürgen Wolpers, Wulfen, all of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Jan. 13, 1975, Ser. No. 540,534

Claims priority, application Germany, Jan. 18, 1974, 2402259

Int. Cl.² D04H *1/16;* B32B *17/10, 27/34;* C09J *3/14*

U.S. Cl. 428—282 **15 Claims**

1. In a process for bonding unheated pieces of elastic polymers and thermoplastic polymers in film or shaped form to each other or to a suitable substrate selected from the group consisting of wool, wood, masonry, concrete, glass, metals, polyesters and roofing felt, the improvement which comprises employing as the bonding agent an adhesive composition heated at a temperature of up to 250° C. and consisting essentially of:

a. 5–95% by weight of a solid or semi-solid atactic poly-α-olefin or poly-α-olefin mixture having a reduced specific viscosity of 0.05–5.0 dl./g.;

b. 95–5% by weight of liquid atactic polybutene or polybutene mixture having a viscosity of 150–1,000,000 cp./20° C. which contains no readily boiling components that boil below 150° C. at 15 mm. Hg pressure; and

c. up to 50% by weight of the adhesive composition of an inert, water insoluble inorganic filler.

8. An article of manufacture comprising a section of elastomer film bonded to another section of elastomer film or to a substrate selected from the group consisting of wool, wood, masonry, concrete, glass, metals, polyesters and roofing felt by spreading onto an unheated section or substrate an adhesive composition consisting essentially of:

a. 5–95% by weight of a solid or semi-solid atactic poly-α-olefin or poly-α-olefin mixture having a reduced specific viscosity of 0.05–5.0 dl./g.;

b. 95–5% by weight of liquid atactic polybutene or polybutene mixture having a viscosity of 150–1,000,000 cp./20° C. which contains no readily boiling components that boil below 150° C. at 15 mm. Hg pressure; and

c. up to 50% by weight of the adhesive composition of an inert, water insoluble inorganic filler.

4,046,946

LITHOGRAPHIC PRINTING PLATE

Michael J. Shaw, Kalamazoo, Mich., assignor to Allied Paper Incorporated, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 493,528, Aug. 1, 1974, Pat. No. 3,922,441. This application Nov. 24, 1975, Ser. No. 634,899

Int. Cl.² B41C *1/10;* B41N *1/08;* B32B *13/08*

U.S. Cl. 428—325 **12 Claims**

1. In a lithographic printing plate having a paper base and a lithographic printing surface thereon comprising a face coating of positively charged colloidal silica and insolubilized hydrophilic polymer, in the ratio by weight of about two parts silica:one part polymer to about six parts silica:one part polymer, the improvement for reduction or elimination of a barrier coat on said base which comprises including in the face coating from about 10% to about 60% by weight of a fine particle size pigment which is non-flocculating and about 5% to about 30% by weight of a resinous binder which is cationic, nonionic or mixed cationic and nonionic, the hydrophilic polymer comprising about 5% to about 25% of the face coating and the positively charged colloidal silica comprising about 10% to about 70% by weight of the face coating, said weight percents being based on the dried lithographic printing surface coating free of volatiles.

11. The method of claim 9 wherein said coating composition is applied at the rate of about 2–20 pounds per ream of paper base.

4,046,947

MATERIAL AND METHODS FOR BONDING TREADS TO TIRES

Edwin T. Brodie, Muscatine, Iowa, assignor to Bandag Incorporation, Muscatine, Iowa

Division of Ser. No. 439,639, Feb. 4, 1974, Pat. No. 3,951,720, which is a continuation of Ser. No. 149,834, June 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 612,026, Jan. 26, 1967, abandoned. This application Sept. 8, 1975, Ser. No. 611,253

Int. Cl.² B29H *9/00*

U.S. Cl. 428—352 **8 Claims**



1. A single ply strip of bonding medium for bonding a prevulcanized tread strip to the periphery of a tire, said strip containing a homogeneous mixture of unvulcanized rubber, vulcanizing agent and a vulcanizing accelerator system capable of vulcanizing said unvulcanized rubber at temperatures below about 210° F, said bonding medium being compounded and rendered stable against premature vulcanization at a room temperature of 104° F separate incorporation of the accelerator and vulcanizing agent into the rubber, said strip having applied to each of its opposite surfaces a removable protective film, said strip being wound in a loose roll whereby no appreciable pressure is exerted on the strip.

4,046,948

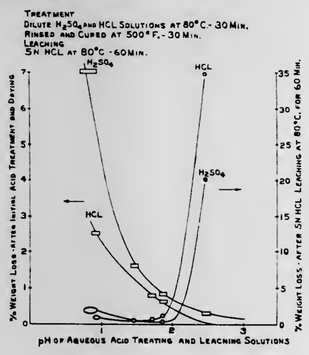
ACID RESISTANT GLASS FIBERS

Isaac A. Zlochower, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 566,471, April 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 455,471, March 27, 1974, abandoned. This application June 2, 1976, Ser. No. 692,160

Int. Cl.² B32B *9/00*; C03C *13/00*; D02G *3/00*

U.S. Cl. 428—392 **2 Claims**



1. A glass fiber having a dual composition, one composition comprising the core of the fiber, the second composition comprising the surface of the fiber and in which the surface composition has a high concentration of SiO_2 therein, the dual composition being formed by acid treating a glass fiber having a composition comprising by weight 52 to 58 SiO_2, 12 to 20 percent Al_2O_3, 12 to 25 percent CaO, 0 to 8 percent MgO, 0 to 13 percent B_2O_3, 0 to 3 percent $Na_2O + K_2O$ and 0 to 1 percent F_2, said acid treatment being conducted at a pH, temperature and time sufficient to produce a final glass composition having a surface containing 70 to 90 percent by weight SiO_2 and a final glass composition of the entire fiber of 52 to 64 percent by weight SiO_2.

4,046,949

NOVEL POLYMERS FROM REACTION OF TRICARBOXYLIC ANHYDRIDES AND HYDRAZINES OR HYDRAZIDES COATED ON SUBSTRATE

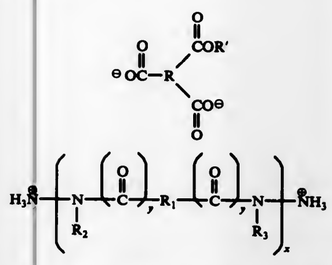
Karl F. Schimmel, Verona, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 628,611, Nov. 4, 1975, which is a division of Ser. No. 511,337, Oct. 2, 1974, Pat. No. 3,969,566, which is a division of Ser. No. 369,629, June 13, 1973, Pat. No. 3,882,086. This application Nov. 16, 1976, Ser. No. 742,305

Int. Cl.² B32B *9/04*

U.S. Cl. 428—411 **4 Claims**

1. An article of manufacture comprising a polysalt coated on a metal substrate wherein said polysalt is represented by the structural formula:



wherein R is trivalent organic radical having at least three carbon atoms, R' is an aliphatic cycloaliphatic monofunctional alkyl radical, R_1 is a divalent organic radical selected from the group consisting essentially of alkylene, arylene, and heterocyclic; R_2 and R_3 are monovalent alkyl, aryl, aralkyl, cycloalkyl or hydrogen radicals and x and y are either 1 or 0.

4,046,950

CHALCOGENATED TETRACENE ORGANIC METALS

Lawrence Clair Isett, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 18, 1976, Ser. No. 668,116

Int. Cl.² H01B *1/00*

U.S. Cl. 428—411 **20 Claims**

1. A composition of matter comprising an ion-radical of the formula

$$(D_2)^{x+}(A)^{x-}$$

wherein $(D_2)^{x+}$ is a chalcogenated tetracene complex cation selected from the group consisting of complex cations of tetrathiotetracene, tetraselenotetracene and tetratellurotetracene and A is an anion selected from the group consisting of

a. an inorganic anion selected from the group consisting of Br_3^-, I_3^-, F^-, Cl^-, Br^-, I^-, SCN^-, nitrate, sulfate, phosphate, fluoroborate, ferricyanide, molybdate, tungstate; and

b. an organic anion derived from an organic acid selected from the group consisting of: an aliphatic monocarboxylic acid, an aliphatic dicarboxylic acid, an aliphatic polycarboxylic acid, an unsaturated carboxylic acid, an aromatic carboxylic acid, a sulfonic acid, a heterocyclic acid con-

taining from 5 to 6 atoms in the heterocyclic nucleus and having at least one hetero atom selected from the group consisting of a nitrogen, oxygen, or sulfur atom; a monohydric phenol, and a polyhydric phenol; and



x represents the ratio of D to A and has a value between about 3 and about 1.5 and

n is an integer between 1 and 5, said salt having an electrical resistivity less than about 10^{-2} ohm-cm at 295° K said resistivity decreasing with decreasing temperature.

4,046,951

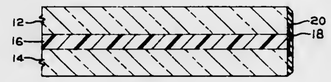
LAMINATED TRANSPARENT ASSEMBLY WITH EDGE SEALING MEANS

John E. Stefanik, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 1, 1976, Ser. No. 737,467

Int. Cl.² B32B *3/02, 31/04*; B60J *1/06*

U.S. Cl. 428—412 **14 Claims**



1. A laminated transparency comprising two transparent layers of rigid material selected from the class consisting of glass, polycarbonates, acrylic plastics and other rigid transparent plastics commonly used as a substitute for glass bonded together by an interlayer of given thickness composed of a material selected from the class consisting of polyvinyl acetals and polyurethanes, a composite edge sealing system comprising a thin barrier layer of a fluorinated polymer selected from the class consisting of fluoroethylene polymers and copolymers of fluoroethylene and fluoropropylene having a width greater than the thickness of said interlayer and bonded to the edge of said interlayer completely around the perimeter thereof and completely covering said edge of said interlayer and a sealant layer having greater adhesion to the edge of said transparency than said barrier layer and composed of a composition selected from the class consisting of polysulfides, silicones and fluorosilicones at least coextensive in width with said barrier layer bonding said barrier layer to said transparency in such a manner as to improve the strength of the bond between said barrier layer and the edge of said interlayer.

4,046,952

MANUFACTURE OF OVERLAYED PRODUCT WITH PHENOL-FORMALDEHYDE BARRIER FOR POLYISOCYANATE BINDER

Philip D. Shoemaker, Baker, and Hobart O. McQueary, Sweet Home, both of Oreg., assignors to Ellingson Timber Co., Baker, Oreg.

Continuation-in-part of Ser. No. 404,026, Oct. 5, 1973, Pat. No. 3,919,017, and Ser. No. 441,278, Feb. 11, 1974, Pat. No. 3,930,110. This application Oct. 8, 1975, Ser. No. 620,850

Int. Cl.² B32B *33/00*

U.S. Cl. 428—423 **11 Claims**

1. A method of making an overlayed product with comminuted cellulosic material as the core thereof, comprising

producing a furnish of the comminuted cellulosic material by mixing therewith an organic polyisocyanate which operates upon the application of heat and pressure to bond the material,

preparing as assembly comprising a mat formed of such furnish and against a side of said mat a sheet overlay, with phenol-formaldehyde resin distributed in said overlay and presented by said overlay toward said mat, and

consolidating the furnish in said mat and said overlay to form an integral product by the application of heat and pressure, the phenol-formaldehyde resin during such consolidation forming a resinous barrier inhibiting penetration of the polyisocyanate through the overlay.

4,046,953

GLASSY MATERIALS FROM PLUMBITES AND CELLULOSICS

Truman L. Ward; Ruth R. Benerito, both of New Orleans, and Jacques J. Hebert, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

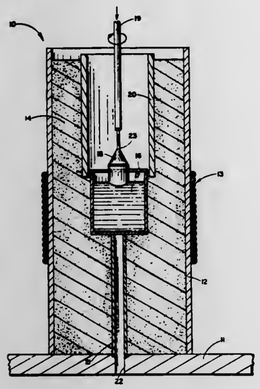
Division of Ser. No. 499,689, Aug. 22, 1974, Pat. No. 3,926,709. This application Sept. 8, 1975, Ser. No. 611,372

Int. Cl.² C03C *27/00*

U.S. Cl. 428—426 **1 Claim**

1. A substantially rigid, polymeric, and transparent or translucent material formed on and bonded to the surface of soda lime glass, porcelain, borosilicate glass, and 96% silica fused quartz glass, said material being the reaction product of a sodium plumbite-cotton intermediate with the said glass, said intermediate material having a lead content of about from 5 to 15%, and said reation product having resistance to etching by strong alkalies and mineral acids.

4,046,954
MONOCRYSTALLINE SILICATES
Michael F. Ehman, Mission Viejo, and Stanley B. Austerman, Villa Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Division of Ser. No. 426,412, Dec. 19, 1973, Pat. No. 3,895,921. This application Apr. 9, 1975, Ser. No. 566,547
Int. Cl.² B32B 9/04
U.S. Cl. 428—446 **6 Claims**



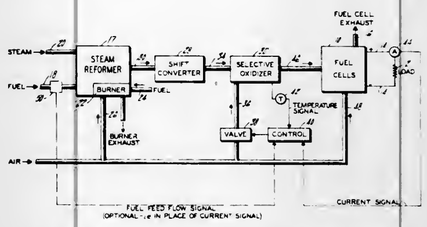
1. A composite comprising a substrate formed of a monocrystalline silicate material selected from akermanite and mullite and a film of monocrystalline semiconductor material epitaxially disposed on said substrate.

4,046,955
PROTEINACEOUS ADHESIVE COMPOSITION
Carolyn N. Bye, Cinnaminson, N.J., assignor to National Casein of New Jersey, Riverton, N.J.
Filed Nov. 14, 1975, Ser. No. 631,821
Int. Cl.² B32B 27/06; C08L 89/00
U.S. Cl. 428—479 **10 Claims**

1. A two-part adhesive composition consisting essentially of one part comprising a dry mix of acid precipitated casein including solubilizing agents, and a second part comprising water and furfuryl alcohol to which the dry mix is added to form an aqueous homogeneous adhesive ready for application to substrates to be joined, the furfuryl alcohol being present in an amount of about 1.0% to about 35.0% by weight and the casein being present in an amount to supply a protein content of about 8.0% to about 22.9% by weight based upon the weight of the overall aqueous adhesive composition.

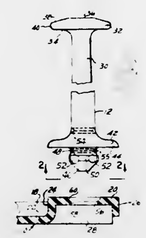
3. A structure comprising two wood product substrates bonded together by the adhesive composition of claim 1 in a cured condition.

4,046,956
PROCESS FOR CONTROLLING THE OUTPUT OF A SELECTIVE OXIDIZER
Salvatore Fanciullo, Plainville, Conn., assignor to United Technologies Corporation, Hartford, Conn.
Filed May 27, 1976, Ser. No. 690,824
Int. Cl.² H01M 8/06
U.S. Cl. 429—20 **1 Claim**



1. In an improved method of controlling the composition of the output from a selective oxidizer in a fuel cell system, the fuel cell system including a steam reformer, a shift converter, a selective oxidizer and a fuel cell, the method including the steps of supplying a hydrocarbon fuel and steam to the steam reformer, steam reforming the hydrocarbon fuel, conveying the steam reformed fuel to the shift converter, shift converting the steam reformed fuel, conveying the shift converted fuel to the selective oxidizer, supplying air to the selective oxidizer, conveying the output of the selective oxidizer to the fuel cell, and supplying air to the fuel cell, the improvement comprising:
sensing the operating temperature of the selective oxidizer;
sensing the current output of the fuel cell;
maintaining the operating temperature of the selective oxidizer within a narrow band selected to simultaneously minimize hydrogen consumption and maximize the conversion of carbon monoxide to carbon dioxide in the selective oxidizer by controlling the flow rate of the air to the selective oxidizer as a function of the operating temperature of the selective oxidizer and by biasing the flow rate of air to the selective oxidizer as a function of the current output of the fuel cell.

4,046,957
PIN STRUCTURE FOR MODULAR WIRING DUCT AND WIRE HOLDER SYSTEM
Philip W. Taylor, Burnet, Tex., and Rollin G. Scheidler, Howell, Mich., assignors to Taylor Industries, Inc., Howell, Mich.
Filed July 24, 1975, Ser. No. 598,572
Int. Cl.² H02G 3/02; F16B 19/00
U.S. Cl. 174—72 A **6 Claims**

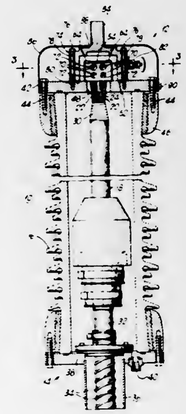


1. In a holder for supporting, containing and distributing a plurality of electrical conductors which comprises a base plate member made of plastic material and having a lower and an upper surface, a plurality of aligned apertures disposed substantially parallel to an edge of said plate member and pins on the upper surface of said plate member each disposed in one of said apertures, each of said pins being made of plastic material and having an elongated body portion provided at an end thereof with an enlarged head portion and at the other end thereof with a foot portion for mounting on said plate member, said foot portion comprising a radially extending flange portion in engagement with the upper surface of said base plate member and a tapered projecting portion inserted in said aperture, the improvement comprising said tapered projecting portion of said pin foot portion having laterally projecting flange sections of a major dimension slightly larger than the diameter of said aperture separated by substantially flat portions of a minor diameter substantially equal to the diameter of said aperture, a peripheral groove disposed proximate said projecting flange sections between said projecting flange sections and said radially extending flange portion, said groove being so dimensioned as to snugly fit in said aperture, said projecting flange sections being caused to laterally contract in part resiliently and in part permanently and the edge of said aperture being caused to correspondingly enlarge in part resiliently and in part permanently during insertion of said tapered projecting portion into said aperture and to subsequently resiliently respectively expand and contract partly for directly and positively holding the foot portion of said pin with said groove engaged in said aperture.

4,046,958
CABLE TERMINATION CONNECTOR ASSEMBLY AND METHOD
George E. Lusk, Woodstock, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.
Filed Jan. 7, 1976, Ser. No. 647,147
Int. Cl.² H02G 15/02; H01R 7/12
U.S. Cl. 174—73 R **27 Claims**

1. A connector assembly for a high voltage cable termination comprising
means for receiving and securely retaining a plurality of wire strands of a current carrying center conductor of a high voltage power cable terminated by said cable termination, said receiving and retaining means comprising a unitary metallic member having a plurality of elongated apertures formed therein for selectively, respectively receiving a desired portion of said plurality of wire strands and
means for physically supporting said receiving and retaining means in said cable termination, said supporting means comprising an annular, metallic plate and fastening means for securing said metallic plate in said cable termination.

14. A cable termination for terminating an elongated end portion of an insulated high voltage power cable of the type having a current carrying center conductor formed by a plurality of wire strands comprising
an elongated dielectric housing having an elongated bore for receiving said end portion of said power cable interiorly of said housing, the longitudinal axis of said bore being disposed substantially parallel to the longitudinal axis of said end portion,
rigid means disposed at one longitudinal end of said dielectric housing for physically supporting said dielectric housing thereabove and
an electrical conductive connector assembly disposed at the other longitudinal end of said dielectric housing for making an electrical connection between said center conductor of said end portion of said power cable and an external electrical connector, said electrical conductive connector assembly comprising means for receiving, electrically connecting and securely retaining said plurality of wire strands of said center conductor, said receiving, electrically connecting and retaining means including a unitary conductive member having a plurality of elongated apertures formed therein, each aperture adapted to receive a desired portion of said plurality of wire strands, said desired portion comprising more than one wire strand.

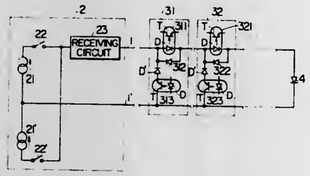


24. A method of terminating an elongated end portion of an insulated high voltage power cable of the type having a current carrying center conductor formed by a plurality of wire strands comprising the steps of
disposing said end portion of said power cable interiorly of an elongated dielectric housing having an elongated bore such that the longitudinal axis of said disposed end portion lies substantially parallel to the longitudinal axis of said bore,
dividing said plurality of said wire strands into a predetermined number of discrete portions, each of said discrete portions having more than one wire strand, and
disposing each one of said discrete portions in one aperture of a unitary conductive member having a plurality of elongated apertures formed therein for respectively receiving one of said discrete portions of said plurality of wire strands.

4,046,959
DATA COMMUNICATION SYSTEM USING PHOTOCOUPLERS

Kazutaka Watanabe; Mineo Shimizu, and Akihiro Sagawara, all of Musashino, Japan, assignors to Kabushikikaisha Yokogawa Denki Seisakusho, Tokyo, Japan

Filed June 7, 1976, Ser. No. 693,689
Claims priority, application Japan, June 13, 1975, 50-71504
Int. Cl.² H04L 15/00
U.S. Cl. 178—68 5 Claims

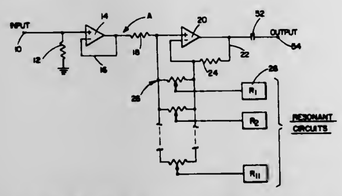


1. A data communication system comprising
a. a pair of transmission lines;
b. a plurality of subsidiary stations, each comprising
a first photocoupler having a light emitting element of rectifying property, connected serially to the pair of transmission lines,
a diode connected in parallel and reverse in polarity to the first photocoupler, and
a second photocoupler having photosensing element connected in parallel between the pair of transmission lines;
c. a diode disposed at a point where the two transmission lines are terminated, the diode being in the same polarity as the light emitting element of the first photocoupler; and
d. a master station comprising
a first constant DC current source producing a current forward with respect to the light emitting element of the first photocoupler,
a second constant DC current source producing a current reverse with respect to the light emitting element of the first photocoupler and forward with respect to the photosensing element of the second photocoupler,
a transmission means for supplying a current from the first constant DC current source to the pair of transmission lines,
and a receiving means for supplying a current from the second constant DC current source to the pair of transmission lines and for detecting the current supplied.

4,046,960
AUDIO FIDELITY FREQUENCY EQUALIZER SYSTEM

John R. Veale, 2925 Greenfield Ave., Los Angeles, Calif. 90025

Filed Dec. 31, 1975, Ser. No. 645,805
Int. Cl.² H03H 7/16
U.S. Cl. 179—1 D 17 Claims

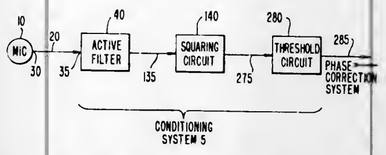


1. An audio fidelity frequency equalizer system comprising input means, an operational amplifier operatively connected to said input means, a resistive feedback path connected across an output of and an input to said operational amplifier, a plurality of discrete octave band potentiometer elements connected between said feedback circuit and said first named input to said operational amplifier and where said frequency controlling potentiometer elements are connected in parallel ralationship with respect to each other and with respect to the output of and the first named input to said operational amplifier, an individual resonant octave band control circuit connected with respect to each said octave band control potentiometer element, and each said resonant control circuit including an inductive-capacitive circuit therein comprised of an electronically active simulated inductor and a capacitor connected thereto, each said octave band control circuit operating in conjunction with the associated potentiometer element to adjust the frequency of a particular octave band as a function of the inductance generated by the electronically active simulated inductor.

4,046,961
CONDITIONING SYSTEM FOR TRANSDUCER SIGNALS

Michael Kenneth Brown, Tecumseh, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 4, 1976, Ser. No. 664,012
Int. Cl.² H03G 1/00; G01D 15/18
U.S. Cl. 179—1 P 31 Claims

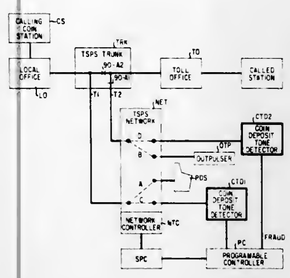


2. An interface unit for improving signal to noise ratios comprising transducer means for sensing changes from a given ambient level, means operative to receive signals from said transducer means for excluding relatively all frequencies extrinsic to a given band, and means connected to said extrinsic frequency exclusion means for amplifiably squaring signals therefrom and for transforming the squared signals into digital-like representations thereof whenever a given threshold level is exceeded.

4,046,962
CALLED PARTY FRAUD DETECTION IN AN AUTOMATED COIN SYSTEM

Barry William Rogers, Geneva, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 3, 1976, Ser. No. 720,158
Int. Cl.² H04M 1/66
U.S. Cl. 179—6.3 R 14 Claims



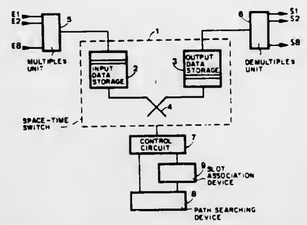
1. In a telephone system wherein a calling coin station and a called station are interconnected via a communication path, fraud detection and coin deposit detection apparatus, which comprises:

means for splitting the communication path into a first portion connected to the calling station and into a second portion connected to the called station,
a first coin tone detector connectable to said first portion for monitoring signals received from the calling station and indicating the presence of coin deposit signals, and
a second coin tone detector connectable to said second portion for monitoring signals received from the called station and for generating an alarm if coin deposit signals are detected therefrom.

4,046,963
TIMES SLOT SWITCHING

Hans Helmut Adelaar, The Hague, Netherlands, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,221
Claims priority, application France, Feb. 13, 1975, 75.04438
Int. Cl.² H04J 3/04
U.S. Cl. 179—15 A 5 Claims



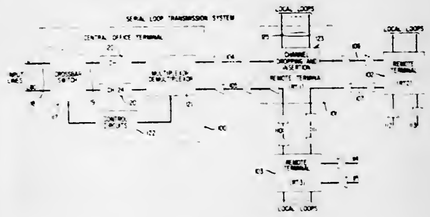
1. A time slot association device for the establishment of a high quality connection between two subscribers utilizing several time slots within the same frame in a time switching network, said device being designed to associate with each input time slot x of each data storage reserved for said high quality connection an output time slot y from among the available output time slots such that the samples written in the data storages during these input time slots x are read during the output time slots y according to the order in which they were entered, said device including first means for detecting said input time slots x and output time slots y reserved for said high quality connection according to their chronological order within a frame, second means coupled to said first means to increase by one step a binary reference code m when said first means detects an output time slot y and to decrease by one step said binary code when an input time slot x is detected, third means coupled to said second means to identify one of the output time slots y corresponding to the maximum result obtained during the different increasings, and fourth means coupled to said first and third means to associate one of said time slots y corresponding to the maximum result respectively with the immediately preceding input time slot x of the high quality connection.

4,046,964
TESTING OF DIGITAL SYSTEMS

Thomas Henry Dougherty, Succasunna, and Dale Eugene Stone, Cedar Knolls, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 24, 1976, Ser. No. 699,659
Int. Cl.² H04J 3/14
U.S. Cl. 179—15 BF 10 Claims

1. An automatic channel testing system for bilateral multiplex pulse transmission systems having a plurality of data channels and at least one supervisory channel, said testing system comprising
a common test signal source including a supervisory signal source;
a common test signal detector including a supervisory signal detector;
means for sequentially connecting said test signal source and said test signal detector to each of said channels;

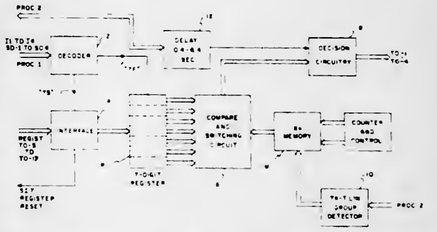


means included in each said channel for converting said test signals to digital pulses for transmission on said transmission system; and
means included in each said channel for converting received digital pulses from said transmission system into test signals.

4,046,965
TOLL RESTRICTOR FOR A TIME DIVISION TELECOMMUNICATION SYSTEM

Andrew Koutomerkos, Jackson, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 26, 1976, Ser. No. 652,552
Int. Cl.² H04M 1/66
U.S. Cl. 179—18 DA 9 Claims



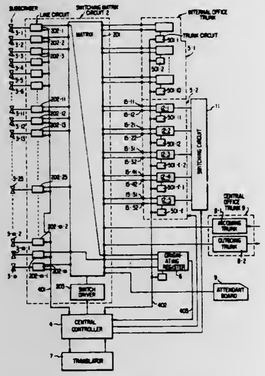
1. A toll restrictor for use with a TDM switching system, adapted to receive digits representing calling information for generating restrictor initiating signals, and comprising: a decoder, said decoder responding to said restrictor initiating signals for generating and transmitting a first coded signal to enable intitiation of a restricting function and to maintain the restricting function during the receipt of digits from a calling station, first memory means, interface circuits coupled responsive to said first coded signal to transmit digits received from a calling station to said first memory means, second memory means containing data identifying restrictions applicable to all potential calling stations, comparison means coupled to said first memory means and to said second memory means, said comparison means providing additional signals to said system indicating whether a call from said calling station may be allowed or denied and said decoder responsive to said additional signals to clear said restricting function.

4,046,966

CONFERENCE TRUNK CIRCUIT FOR AN EXCHANGE

Kiyoshi Urui, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation-in-part of Ser. No. 568,248, April 15, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 759,726
Claims priority, application Japan, Apr. 15, 1974, 49-40943
Int. Cl.² H04M *3/56*
U.S. Cl. 179—18 BC **3 Claims**



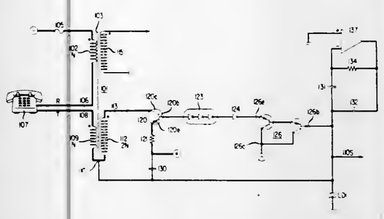
1. A trunk circuit for an exchange comprising:
a plurality of subscribers' telephones,
a plurality of internal office trunks for electrically connecting two subscribers' telephones with each other, each of the internal office trunks having first, second and third terminals,
a switching matrix circuit for electrically connecting the subscribers' telephones to the internal office trunks, the switching matrix circuit having a first plurality of terminals and a second plurality of terminals,
a switching circuit for electrically mutually connecting a desired number of the third terminals of the plurality of internal office trunks, the switching circuit having a plurality of terminals,
a central controller for controlling internal connections of the switching matrix circuit, in the plurality of internal office trunks and in the switching circuit,
means connecting the subscribers' telephones to the first plurality of terminals of the switching matrix circuit,
means connecting the second plurality of terminals of the switching matrix circuit to the first and second terminals of the plurality of internal office trunks,
means connecting the third terminals of the plurality of internal office trunks to the plurality of terminals of the switching circuit,
means connecting the central controller to the switching matrix circuit, and
means connecting the central controller to the switching circuit,
each internal office trunk comprising:
a first transistor,
a second transistor,
a third transistor,
a first diode,
a second diode,
a first resistor,
a second resistor,
a third resistor,
means connecting the first terminal of the internal office trunk to the collector of the first transistor,
means connecting the second terminal of the internal office trunk to the collector of the second transistor,
means connecting the first resistor between ground and the emitter of the first transistor,
means connecting the second resistor between ground and the emitter of the second transistor,
means connecting the collector of the first transistor to the anode of the first diode,
means connecting the collector of the second transistor to the anode of the second diode,
means connecting the cathode of the first diode and the cathode of the second diode to the third terminal of the internal office trunk,
means connecting the third resistor between the third terminal of the internal office trunk and the collector of the third transistor,
means connecting the emitter of the third transistor to ground,
means connecting the base of the first transistor to the central controller,
means connecting the base of the second transistor to the central controller, and
means connecting the base of the third transistor to the central controller.

4,046,967

LINE CIRCUIT USING MINIATURE LINE TRANSFORMER

John Francis O'Neill, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 5, 1976, Ser. No. 711,809
Int. Cl.² H04Q *1/28*
U.S. Cl. 179—18 FA **8 Claims**



1. A line circuit for the tip and ring conductors of a telephone line comprising:
a transformer having tip, ring and balancing windings, said balancing winding being poled in opposite sense to that of said tip, ring and balancing windings, said current source means having a high AC impedance; and
a capacitor in circuit with said current source means and said balancing winding, said capacitor exhibiting a low AC impedance to current in said tip and ring windings.

4,046,968

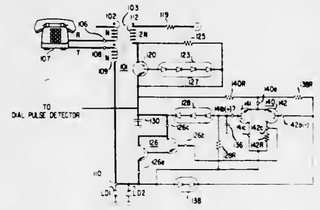
INTEGRABLE LINE CIRCUIT FOR USE WITH MINIATURE LINE TRANSFORMER

Milton Luther Embree; David Clayton Goldthorp, both of Reading, Pa., and John Francis O'Neill, Boulder, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 5, 1976, Ser. No. 711,810
Int. Cl.² H04Q *1/28*
U.S. Cl. 179—18 FA **8 Claims**

1. A telephone line circuit comprising:
a transformer having tip, ring and balancing windings, said balancing winding being poled in opposite sense to said tip and ring windings;
first and second solid-state means electrically connected between said tip and ring windings and said balancing winding;

capacitor means in series with said first solid-state means and said balancing winding; and



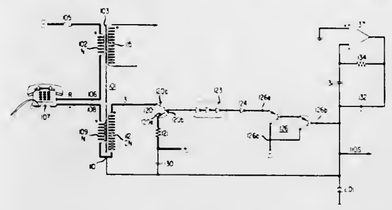
servo amplifier means for driving said second solid-state means substantially to suppress any variation in the AC potential of the junction of said second solid-state means with said tip and ring windings.

4,046,969

DIAL PULSE REPEATING LINE CIRCUIT USING MINIATURE LINE TRANSFORMER

James Edwin Dalley, Denver, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 5, 1976, Ser. No. 711,811
Int. Cl.² H04Q *1/28*
U.S. Cl. 179—18 FA **8 Claims**



1. In a telephone line circuit having a transformer including a balancing winding serially connectable to the tip and ring windings and poled so as to counterbalance the DC magnetization thereof together with a capacitor joined to said windings for bypassing audio frequency current around said balancing winding, an arrangement for dynamically multiplying the apparent capacitance exhibited by said winding at audio frequencies except during dial pulsing, said arrangement comprising a capacitive voltage divider and an operational amplifier, the midpoint of said divider being connected to the point of junction of said bypass capacitor with said balancing winding and the ends of said divider being connected between an input and the output of said amplifier.

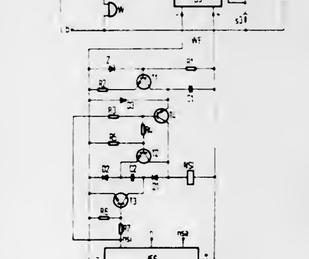
4,046,970

RINGING DETECTOR FOR TELEPHONE CIRCUITS

Cordell V. Castleman, Bloomington, Minn., assignor to Magnetic Controls Company, Minneapolis, Minn.

Filed Apr. 12, 1976, Ser. No. 675,949
Int. Cl.² H04M *1/26*
U.S. Cl. 179—84 L **3 Claims**

1. A ringing detector circuit for use in telephone systems comprising:
receiving means adapted to connect to the phone lines and operable to convert the alternating current ringing signal from the lines to a series of direct current pulses;
first charge storing means connected to receive the pulses from the receiving means and further connected to discharge through a predetermind resistance at a comparatively slow rate, so as to require a sufficiently high frequency of pulses in order to maintain a first selected voltage;
second charge storing means connected to a source of voltage so as to be charged thereby;
first switching means connected to said first and second storing means and operable to discharge the second charge storing means when in a first condition and to not discharge said second storing means when in a second



condition, said first switching means operable to switch from said first condition to said second condition in response to the reception of said first selected voltage stored by said first storing means; and
second switching means connected to said second storing means and to an indicating means, the second switching means operable to activate the indicating means in response to the reception of a second selected voltage stored in said second storing means.

4,046,971

SWITCHING ARRANGEMENT FOR TELEPHONE SUBSETS USING IMPULSE-TYPE PUSHBUTTON CALLING

Helmut Loschand, Dachau, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 24, 1976, Ser. No. 689,043
Claims priority, application Germany, May 23, 1975, 2522957
Int. Cl.² H04M *1/44*
U.S. Cl. 179—90 K **3 Claims**

1. In a switching arrangement for a telecommunications set having a keyboard-actuated, replaceably connected selection unit, said selection unit having a pulse generator for producing pulse trains of differing characteristics in dependence on which of the keys is actuated, two relays in said selection unit, one of which controlled by said pulse generator serves for pulsing and

the other, a bistable relay, is connected to disable the speech circuit of the subset during the duration of the pulse train from the pulse generator and the selection unit further including transmitting and feeding circuit means connected to the connection line to the subset upon actuation of one of the keys in the keyboard, the improvement comprising:

said one of said relays being a monostable pulsing relay in said selection unit operable responsive to actuation of said pulse generator.

first common key-actuated contact means including said other relay operable responsive to actuation of a key for disconnecting said speech circuit from the subset connection line,

coupling means for connecting said selection unit to the subset connection line including at least a contact operated by said pulsing relay, said coupling means being short circuited by non-operation of said first common contact means,

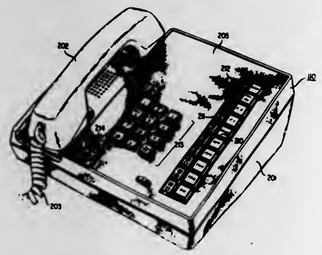
said transmitting and feeding circuit being connected to said coupling means for receiving current from the connection line and feeding said selection unit when said coupling means is connected to the connection line, said transmitting and feeding circuit including a current supply means comprising first capacitance means, charged from current received through said coupling means for functioning as a voltage doubler and supplying actuating pulses to said pulsing relay and second capacitance to said selection unit and a holding current to said pulsing relay.

4,046,972

KEY TELEPHONE STATION SET CIRCUIT

Donald Dean Hutzinga, Indianapolis; Edward William Underhill, Knightstown, and James Arthur Whitcomb, Indianapolis, all of Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 27, 1976, Ser. No. 735,991
Int. Cl.[2] H04Q *5/18*
U.S. Cl. 179—99 16 Claims



1. Key telephone station set circuitry including:

means for selecting one of a plurality of apparent telephone lines having an appearance at the station set;

means, responsive to said selecting means, for producing digital data indicating which one of said apparent telephone lines is selected;

means, responsive to digital data transmitted to said station set, for producing an indication of which one of said apparent telephone lines is selected and which ones of said apparent telephone lines are in an operational mode at other station sets having in common said plurality of apparent lines;

means for generating an alerting signal; and

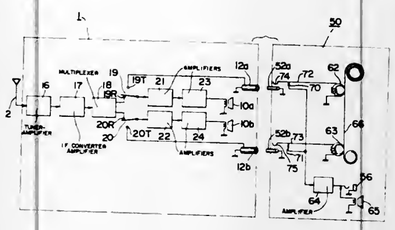
means, further responsive to said digital data transmitted to said station set, for controlling a volume and a frequency of oscillation of said alerting signal indicating an incoming call to said station set.

4,046,973

COMBINED PORTABLE TAPE RECORDER AND STEREOPHONIC RECEIVER SYSTEM

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed July 15, 1975, Ser. No. 596,172
Claims priority, application Japan, July 18, 1974, 49-81663; July 22, 1974, 49-83906; Nov. 9, 1974, 49-129184; Nov. 9, 1974, 49-129185; Nov. 14, 1974, 49-131284
Int. Cl.[2] G11B *31/00*; H04B *1/20*
U.S. Cl. 179—100.11 3 Claims



1. Portable stereophonic apparatus, comprising:

a portable tape recorder including a left channel and a right channel playback head; and a first amplifier in series with a speaker;

an FM stereophonic radio including an FM stereophonic tuner and a stereo multiplexer electrically connected to said tuner for generating left and right channel signals, said stereophonic radio also including a left channel amplifier in series with a left channel speaker and a right channel amplifier in series with a right channel speaker;

means for mechanically coupling and decoupling said portable tape recorder to said radio such that said tape recorder and radio may be decoupled to form two independent units or coupled to form a single integrated unit;

first and second electrical connector means associated with said stereophonic radio;

third and fourth electrical connector means associated with said portable tape recorder, said first and third electrical connector means adapted to be electrically connected and said second and fourth electrical connector means adapted to be electrically connected when said tape recorder and radio are coupled to form a single integrated unit;

first switch means for connecting the outputs of both said left channel and said right channel playback heads to said first amplifier when said tape recorder and radio are decoupled whereby said tape recorder operates as a monaural recorder, said first switch means also for connecting said left channel and said right channel playback heads to said third and fourth electrical connector means, respectively, when said tape recorder and radio are coupled to form a single integrated unit;

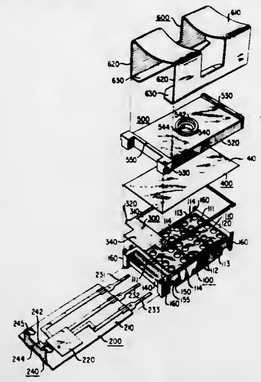
second switch means for connecting said left and right channel signals to said left and right channel amplifiers, respectively, when said second switch means is in a first position and for connecting said first and second electrical connector means to said left channel and right channel amplifiers, respectively, when said second switch means is in a second position such that said tape recorder operates as a stereophonic tape recorder when said tape recorder and radio are coupled to form a single integrated unit and said second switch means is in said second position.

4,046,974

ELECTROACOUSTIC TRANSDUCER WITH SPRINGS FORMING ELECTRICAL INTERCONNECTIONS AS A RESULT OF ASSEMBLY

John Charles Baumhauer, Jr.; Alex Michael Brzezinski; Joe Edward Warren, and Stephen Reed Whitesell, all of Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 1, 1976, Ser. No. 728,604
Int. Cl.[2] H04R *19/00*
U.S. Cl. 179—111 R 12 Claims



1. An electroacoustic transducer comprising:

a backplate having a conductive upper surface electrically interconnected with a contact surface thereof;

a circuit-bearing member positioned beneath the backplate, the circuit-bearing member having a contact spring mounted thereon, the contact spring engaging the contact surface of the backplate to electrically connect the conductive surface to the circuit on the circuit-bearing member and support the circuit-bearing member in place;

a diaphragm juxtaposed with the conductive upper surface of the backplate, the diaphragm having a conductive surface on the side opposite to that facing the backplate;

a conductive intermediate member positioned in engagement with the conductive surface of the diaphragm; and

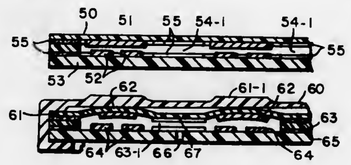
a conductive spring member biasing the intermediate member toward the backplate, the spring member providing a conductive path between the conductive intermediate member and the circuit on the circuit-bearing member, and further support for the circuit-bearing member.

4,046,975

KEYBOARD SWITCH ASSEMBLY HAVING INTERNAL GAS PASSAGES PREFORMED IN SPACER MEMBER

Richard E. Seeger, Jr., Topsfield, Mass., assignor to Chomerics, Inc., Woburn, Mass.

Filed Sept. 22, 1975, Ser. No. 615,230
Int. Cl.[2] H01H *13/04*
U.S. Cl. 200—5 A 9 Claims



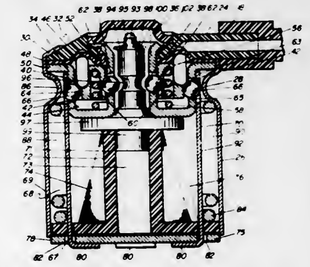
1. A keyboard sandwich comprising a bottom layer of insulator plastic, electrically conductive contacts supported on one side of said bottom layer, an insulator spacer layer positioned against said bottom layer side supporting said contacts, said spacer having a plurality of sets of openings therethrough from the top to the bottom surface thereof, each opening in register with at least one different contact and at least extending about substantially said entire contact in register therewith, a top layer of resilient and flexible plastic positioned against said spacer layer, said top layer supporting a plurality of contactors, at least one contactor in register with each of said openings, and a plurality of passages in said spacer layer which are substantially narrower in width than said openings and extending therethrough from the top to the bottom surface thereof, and different ones of said passages extending between each different set of said openings, said spacer top and bottom surfaces sealed to said top and bottom layers about said openings and said passages, whereby upon depression of a contactor into one of said openings of a set, gas trapped in said opening will move into others of said opening of said set, said top layer includes a plurality of protrusions in register with a different one of said openings, each protrusion supporting at least one different contactor on the underside thereof and in which a vent hole extends through at least said top or bottom layers and opens into one of the narrow passages.

4,046,976

PRESSURE ACTUATED SENSOR SWITCH WITH BOBBIN, TRIP CORD AND BREAKWIRE

Jerome J. Price, Bloomington; Carl G. Karsten, Crystal, and William D. Paggen, Minneapolis, all of Minn., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 16, 1976, Ser. No. 649,626
Int. Cl.[2] H01H *3/02*
U.S. Cl. 200—61.93 3 Claims



1. A gas pressure actuated sensor which comprises:

a tubularly shaped housing having a forward end and a rear end, said forward end having a peripherally disposed inwardly protruding annular groove therein;

bobbin means biasedly disposed in said housing for deploying a personnel actuated trip line;

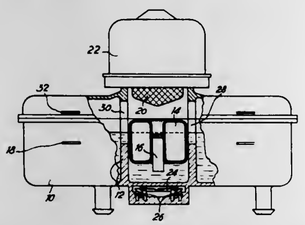
breakwire-disturbance sensitive means for detecting movement of said trip line by personnel after deployment of said bobbin means;

a release-lock gas preasure sensitive means operatively positioned in said housing intermediate the forward end of said housing and said inwardly protruding annular groove, for releasing said bobbin means upon an increase of gas preasure, for locking said breakwire means during a first interval of time and releasing said breakwire means after said first interval of time so that said breakwire is responsive to movement of said trip line, which includes;

a cup shaped member having an integral tubular section which has a plurality of peripherally disposed inner detent holes, a flange exterior wall having a plurality of peripherally disposed outer detent holes, and an annular sliding groove disposed intermediate the interior wall

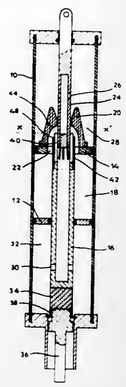
surface of said flanged exterior wall and the exterior wall surface of said tubular section;
a cover plate disposed in said housing having a gas inlet port integral therewith;
a ring camming member slidably and biasedly positioned in said cup member annular sliding groove, said ring member having an inner annular camming surface, an outer annular camming surface thereon and a spring groove on one end;
a circularly shaped diaphragm disposed intermediate said cover plate and said cup shaped member, said diaphragm operatively moving said ring camming member in response to gas being introduced into said inlet port;
a helical release ring spring biasedly positioned intermediate said ring camming member and said cup shaped member;
a plurality of inner detent balls disposed in said inner detent holes of said cup shaped member tubular section adjacent said inner annular camming surface of said ring camming member;
a plurality of outer detent balls disposed in the outer detent holes of said cup shaped member tubular section intermediate said outer camming surface of said ring member and said housing.

4,046,977
FLUID RESERVOIR
Leonardo Cadeddu, Crema, Italy, assignor to Benditalia S.p.A., Italy
Filed July 31, 1975, Ser. No. 600,710
Claims priority, application Italy, Aug. 22, 1974, 26501/74
Int. Cl.² H01H *35/40*
U.S. Cl. 200—84 C 2 Claims



1. A fluid reservoir made of non-magnetic material comprising two chambers communicating with a common well, a single reservoir refill aperture located between the two chambers and above said well and communicating with said well, a float disposed in said well and bearing a permanent magnet and a switch outside said reservoir under the bottom of the well, said switch being actuated by the magnet when the float is at a predetermined level in the well, said well communicating with the two chambers through vertical narrow slots, the location of the lower ends of said slots being such that a predetermined quantity of fluid is retained in one chamber in case of fluid depletion of the other chamber, the upper ends of said slots being above the maximum fluid level admissible in the reservoir to permit fluid refilling of the chambers from said well via the single reservoir refill aperture up to said maximum fluid level.

4,046,978
CONTACT STRUCTURE FOR PUFFER-TYPE GAS-BLAST CIRCUIT INTERRUPTER
Aimé Badon, Montbonnot-St. Martin, France, assignor to Merlin Gerin, Grenoble, France
Filed Feb. 13, 1976, Ser. No. 658,033
Claims priority, application France, Feb. 26, 1975, 75.06075
Int. Cl.² H01H *33/70*
U.S. Cl. 200—148 A 1 Claim

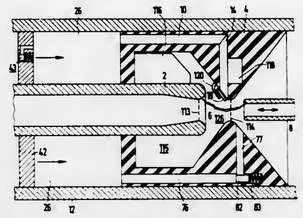


1. A contact structure for a circuit interrupter comprising a pair of elongated aligned contact members axially separable to draw an arc between the confronting end portions of said contact members, and a puffer mechanism to produce a blast of compressed gas directed towards said arc, one of said contact members being tubular and having the end portion thereof provided with a plurality of generally axially extending circumferentiallyspaced-apart resilient contact fingers adapted to telescopically receive the confronting end portion of the other contact member in gripping contact relation therewith, said contact fingers being surrounded by a cylindrical sleeve ending short of the tips of said fingers thereby permitting to direct a cross-blast of gas through the interstices between said tips to exhaust through the venting interior of said tubular contact member, said sleeve screening off the residual length portion of said fingers preventing the radial flow of fresh gas between the corresponding part of said fingers during the separation movement of said contact members.

4,046,979
ARC QUENCHING ARRANGEMENT FOR A GAS-FLOW TYPE CIRCUIT BREAKER
Walter Hertz; Jan Stroh, and Jürgen Mentel, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Nov. 18, 1975, Ser. No. 632,991
Claims priority, application Germany, Nov. 25, 1974, 2455674
Int. Cl.² H01H *33/70*
U.S. Cl. 200—148 A 11 Claims

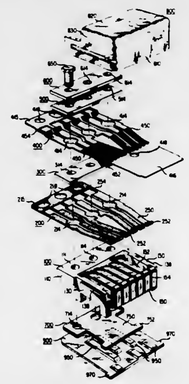
1. In a gas-flow circuit breaker apparatus including a housing, a body of electrical insulation material disposed within said housing and forming an arc quenching gap therewithin, at least one gas flow canal disposed within said body of insulation material for directing a quenching gas from a space within said housing to the vicinity of said quenching gap, fixed and movable electrical contacts disposed within said housing adjacent said quenching gap, and a check valve disposed in said flow canal for permitting the flow of said gas only from said gap, the

improvement comprising said flow canal extending to and opening adjacent said quenching gap, and said check valve



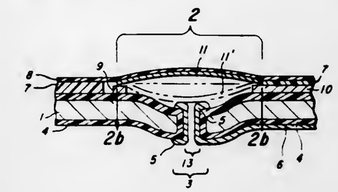
being disposed at the end of said flow canal at said quenching gap.

4,046,980
CAM ACTUATED SWITCH
Frederick Allen Rosebrock, Greenfield, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Apr. 20, 1976, Ser. No. 678,690
Int. Cl.² H01H *3/00*
U.S. Cl. 200—153 LA 14 Claims



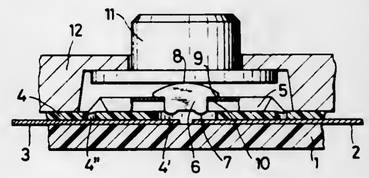
1. A switch comprising:
a pair of cantilever contact springs, the fixed ends of the contact springs being electrically insulated from one another and the free end portions of the contact springs extending into juxtaposition with one another and having contact surfaces for engaging one another;
a unitary support member including:
1. integral base means to which the fixed ends of the contact springs are secured,
2. integral guide means defining a channel, and
3. integrally hinged cam follower means extending between the free end portion of a first of the contact springs and the channel, the support member being electrically insulated from the contact springs; and
an actuator positioned within the displaceable along the channel, the actuator including cam portions for engaging the cam follower means and deflecting them so as to displace the first contact spring to effect operation of the switch.

4,046,981
KEYBOARD SWITCH WITH PRINTED WIRING BOARD STRUCTURE AND ITS METHOD OF MANUFACTURE
Dudley Bruce Johnson, Irving, and Stephen Leroy Hanni, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 24, 1975, Ser. No. 644,206
Int. Cl.² H01H *13/70, 9/00*
U.S. Cl. 200—159 B 19 Claims



1. A momentary contact switch comprising:
a. a metallic sheet substrate having at least one major surface of insulating material and having at least one indentation on said major surface;
b. at least one first contact disposed on said major surface in the region of said at least one indentation;
c. a second contact affixed to said substrate, being disposed in spaced relation to said at least one first contact, and having a top surface of said second contact located above a top surface of said at least one first contact; and
d. an actuating element having at least one surface of conductive material, mounted on said second contact and being disposed over at least part of said indentation, the conductive surface of said actuating element being electrically connected to said second contact and in spaced relation to said first contact;
e. said first and second contacts being electrically connectable by the conductive surface of said actuating element to provide an electrically conductive path between said first and said second contacts in response to depression of said actuating element into said indentation.

4,046,982
SWITCH MEANS FOR SHORT-STROKE PUSH-BUTTON KEYS
Rudolf Schadow, and Dieter Michalski, both of Berlin, Germany, assignors to Rudolf Schadow, GmbH, Germany
Filed June 30, 1975, Ser. No. 591,746
Int. Cl.² H01H *3/12*
U.S. Cl. 200—159 R 5 Claims



1. A snap-action, two-position, push-button switch device for bridging adjacent ends of conductors which are disposed on a common surface side of a printed circuit board of insulating material, thereby to complete a switch circuit when said switch device is in one of its two positions, said switch device comprising, in combination:
a spring element engaging a portion of said board and formed from a generally flat metallic spring material

which is bent at a central portion thereof to provide a resiliently deformable arch-like portion which is normally spaced-apart from said adjacent ends of said conductors corresponding to a first of said two positions, but which is deformable toward said adjacent ends corresponding to the second of said two positions, and which snaps back to its initial arch-like configuration upon the removal of an external deforming force;

a conductive bridging element carried by said spring element and which conductively engages said adjacent ends of said conductors when said switch device is in one of its two positions; and,

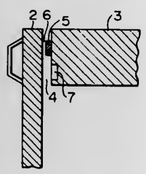
a push-button member mounted adjacent said board on said common surface side thereof and engaging one of said spring and conductive bridging elements, said push-button member being translatable by said external force toward said board to deform said spring element.

4,046,983

MICROWAVE HEATING OVEN HAVING SEAL MEANS FOR PREVENTING THE LEAKAGE OF MICROWAVE ENERGY

Ken Ishino, Nagareyama; Yasuo Hashimoto, and Hiroaki Abe, both of Ichikawa, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed June 14, 1976, Ser. No. 695,436
Claims priority, application Japan, Sept. 3, 1975, 50-106824
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 D 7 Claims



1. In a microwave heating oven comprising a body formed by walls and having an opening in one of said walls; a door provided for closing said opening; said body and said door in a closed position defining a path through which microwave energy may leak from the inside to the outside of said oven; and leakage prevention means comprising a layer of microwave absorber located directly along one surface defining said path, the layer of microwave absorber incompletely blocking the opening of said path and having a surface exposed to said path, whereby said surface of said microwave absorber and opposed surface of said path form a gap therebetween, said microwave absorber consisting of a mixture of the powder of magnetic material and an organic high molecular weight compound, the improvement wherein the length of the microwave absorber along the direction of propagation of microwave in the path of microwave leakage is an integral multiple of about ½λ, wherein λ is a wavelength of the microwave in the microwave absorber.

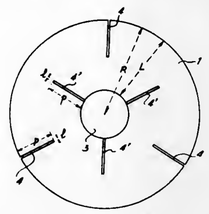
4,046,984

CUTTING-OFF MACHINE WORKING BY ELECTRIC SPARKING

Guy Aimé Vial, Pont de Claix, France, assignor to Vial S.A.R.L., Eybens, France

Filed Dec. 29, 1975, Ser. No. 645,304
Claims priority, application France, Jan. 17, 1975, 75.01376
Int. Cl.² B23P 1/08
U.S. Cl. 219—69 E 15 Claims

1. In a device for cutting material by means of electric sparks, said device comprising a disc of electrically conductive material through which a dielectric liquid circulates, means supporting said disc for rotary motion, and means for providing an electrical current between the periphery of said disc and said material, the improvement according to which said disc is formed with a group of circumferentially spaced radial slots



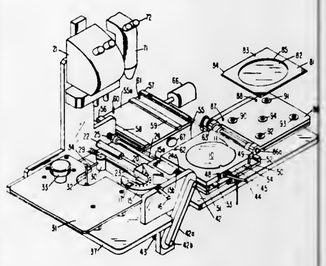
therein which inhibit deformation of said disc by said current, said slots having a length equal to at least L/2, where L= the radial distance between the periphery of said disc and said supporting means.

4,046,985

SEMICONDUCTOR WAFER ALIGNMENT APPARATUS

Gerald Alan Gates, Jericho, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,989
Int. Cl.² B23K 26/00
U.S. Cl. 219—121 L 10 Claims



3. An apparatus for dicing a semiconductor wafer, opaque to visible light, having first and second major surfaces and first and second reference marks on said first surface thereof comprising,

optical means for viewing said marks with visible light reflecting from said first surface,

means for aligning said marks with a reference position,

dicing means contacting said second surface,

means for establishing said dicing means in a known relationship with respect to said optical means and said reference position, and

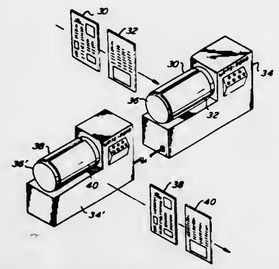
means for traversing said dicing means across said second surface of said wafer to dice said wafer into individual units.

4,046,986

APPARATUS FOR MAKING PRINTING PLATES AND OTHER MATERIALS HAVING A SURFACE IN RELIEF

Ronald C. Barker, Weston, Mass., assignor to Applied Display Services, Inc., New York, N.Y.

Continuation of Ser. No. 404,532, Oct. 9, 1973, abandoned, which is a division of Ser. No. 86,656, Nov. 4, 1970, Pat. No. 3,832,948, which is a continuation-in-part of Ser. No. 883,525, Dec. 9, 1969, abandoned. This application Oct. 8, 1975, Ser. No. 620,897
Int. Cl.² B23K 9/00
U.S. Cl. 219—121 LM 9 Claims



1. Apparatus for forming a surface in relief in a composite plate of the type having a layer of material which is absorptive of a first wavelength of radiation but reflective of a second wavelength of radiation and a substrate which is absorptive of the second wavelength of radiation, comprising:

first means for optically reading page composition information,

second means operatively associated with said first means for selectively generating a first coherent radiation at said first wavelength, said first wavelength radiation having sufficient energy to remove selected portions of said layer of material and to expose corresponding portions of said substrate.

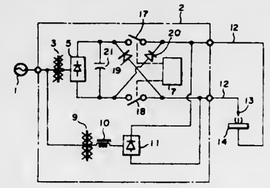
third means operatively associated with said first means for selectively generating a second coherent radiation at said second wavelength, said second coherent radiation having sufficient energy to remove at least partially each of said exposed portions of said substrate.

4,046,987

DC ARC WELDING APPARATUS USING HIGH-FREQUENCY PULSE CURRENT

Shinichiro Hashimoto; Toru Goto, and Yukio Kajino, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1976, Ser. No. 662,876
Claims priority, application Japan, Mar. 10, 1975, 50-28788
Int. Cl.² B23K 9/10
U.S. Cl. 219—135 8 Claims



1. A DC arc welding apparatus using a high-frequency pulse current comprising:

a rectifier bridge for commutating AC voltage and for applying DC voltage having a substantially smooth waveform to a circuit comprising an electrode and a workpiece for welding,

a first switch connected between one side of an arc load formed between the electrode and the workpiece and a positive output side of the rectifier bridge,

a second switch connected between the other side of the arc load and a negative output side of the rectifier bridge,

a capacitor one end of which is connected to a contact of the rectifier bridge and the first switch and the other end of which is connected to a contact of the rectifier bridge and the second switch,

first and second rectifiers connected so as to charge energy accumulated in the inductance of the circuit comprising the electrode and the workpiece during the OFF state of the first and second switches to the capacitor, and

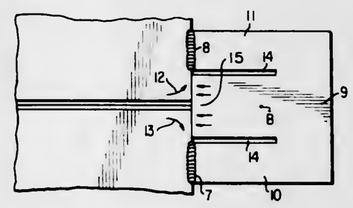
control means for detecting two predetermined instantaneous values of the welding current passed through the arc load and for providing ON and OFF commands to one of the switches to reciprocate the welding current for plural times in a range between the two instantaneous values during the ON state of the other switch.

4,046,988

METHOD OF PREVENTING BASE METAL END CRACK IN ARC WELDING AND END TAB USED THEREFOR

Naoki Okuda, Fujisawa, and Kazuo Tanaka, Yokosuka, both of Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed Mar. 5, 1976, Ser. No. 664,272
Int. Cl.² B23K 9/32
U.S. Cl. 219—137 R 5 Claims



1. A method of preventing base metal end cracks in arc welding using an end tab having two slits defined within one lateral side portion thereof so as to in turn define three uniplanar, cantilevered protuberant portions within said one side thereof, comprising the steps of:

positioning the two end protuberant portions of said end tab against the base metal in end abutment therewith on both sides of the groove line where the welding arc and the weld metal are not directly contacted;

simultaneously positioning the center protuberant portion of said end tab against said base metal in end abutment therewith on an extension of said groove line thereof;

fixedly securing said two end protuberant portions of said end tab to the welding end of said base metal while leaving said center protuberant portion of said end tab in free end abutment with said base metal; and

carrying out a welding operation on said base metal with said end tab secured thereto as characterized herein,

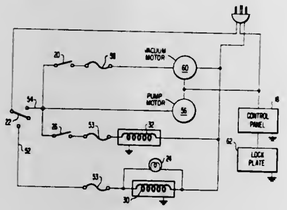
the three protuberant portions being so dimensioned such that said deformation and expansion of said base metal is properly controlled as a result of the relative disposition of said base metal and said end tab, and the controlled expansion of said center end tab portion as permitted by said slits defined between said center and end portions of said end tab.

4,046,989

HOT WATER EXTRACTION UNIT HAVING ELECTRICAL IMMERSION HEATER

Carl Parise; Ralph Eugene Blackman, both of Reno, and James M. Wimsatt, Carson City, all of Nev., assignors to Parise & Sons, Inc., Reno, Nev.

Filed June 21, 1976, Ser. No. 698,252
Int. Cl.² F27D *11/02*
U.S. Cl. 219—437 **2 Claims**



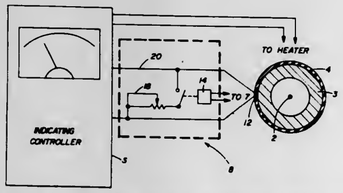
1. In a hot-water extraction unit comprising:
a solution tank,
an electrical vacuum motor,
an electrical pump motor,
an electrical immersion heater, said heater being mounted within said tank, said immersion heater comprising a first high wattage heating element and a second low wattage heating element,
circuit means for selectively connecting said heater elements and said motors across a source of electrical power, said circuit means comprising means defining a first circuit path for said first heater element and a second circuit path in parallel with said first path for said second heating element,
switching means for alternately connecting said first and second current paths across said source, and
means for connecting both electrical motors within said second circuit path;
whereby, said vacuum motor and said pump motor may be energized during energization of said second, low wattage heating element, but cannot be energized during energization of said first high wattage heating element.

4,046,990

TEMPERATURE SENSING AND CONTROL OF A FUSING ROLL

William E. White, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,993
Int. Cl.² H05B *1/02*
U.S. Cl. 219—471 **5 Claims**



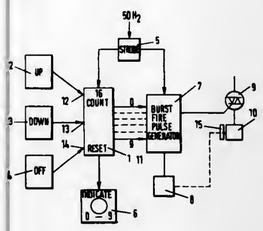
5. In an electrographic device including a fusing roller of the type including (1) a heat conductive inner core having a heat insulative outer release coating which includes an outer fusing surface, and (2) controllable heat source means for heating the inner core of the roller and thereby heating the outer fusing surface, improved apparatus for maintaining said fusing surface at a desired fusing temperature, said apparatus comprising:
a. means for directly sensing the temperature of said inner core; and
b. temperature control means, responsive to said sensing means and associated with said heat source means to maintain said inner core at a predetermined core temperature above the desired temperature of said fusing surface to provide proper heat flow through said heat insulative outer release coating to compensate for heat loss occurring at the outer fusing surface, whereby said fusing surface is maintained at the desired temperature.

4,046,991

POWER CONTROL APPARATUS

Philip Charles Sefton, London, and Kenneth Ernest Chad, Bushey Heath, both of England, assignors to Thorn Domestic Appliances (Electrical) Limited, London, England

Filed Sept. 27, 1974, Ser. No. 509,787
Int. Cl.² H05B *1/02*
U.S. Cl. 219—497 **15 Claims**



1. In an electric cooker, a power control apparatus including; a memory for storing a variable numerical value, the memory having an output, a first control input for causing the values stored in the memory to be increased progressively while such first control input is actuated, and a second control input for causing the value stored in the memory to be decreased progressively while such second control input is actuated; first and second manually operable means for actuating said first and second control inputs respectively; an electric cooker heating element; and means connected to the output of the memory for varying the current supplied to the heating element in dependence on the value stored in the memory, so that each value corresponds to a particular rate of current supply to the load.

4,046,992

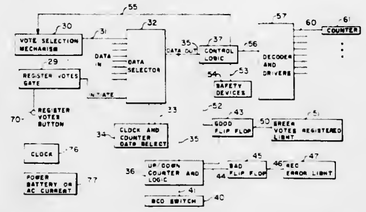
COMPACT ELECTRONIC VOTING

Mary Susan Huhn, 38 Ridgewood Ave., Groton, Mass. 01450; Paul Horowitz, 19 Fair Oaks Drive, Lexington, Mass. 02173, and Winfield Hill, 165 Hunnewell Ave., Newton, Mass. 02158

Filed Mar. 4, 1976, Ser. No. 663,839
Int. Cl.² G07C *13/00*
U.S. Cl. 235—54 F **8 Claims**

1. Voting apparatus comprising,
corresponding pluralities of bistable elements and vote selecting switches each associated with a candidate and having a vote position for registering a vote selection and an erase position for cancelling a previous vote selection coupled to an associated bistable element for storing the condition of selection,
a corresponding plurality of candidate counter means associated with a respective vote selection switch for accumulating the votes cast in an election for a particular candidate associated therewith,
vote registration switching means for actuation by a voter to cause the votes then selected by the voter for transfer to said candidate counter means,

means for storing a number corresponding to the maximum number of votes a voter may cast in a particular election,
means for sequentially scanning said bistable elements to provide a sequence of signals representative of the number of votes then cast by a voter and for effectively comparing the latter number with the number stored in said means for storing to provide a good signal in response to actuation of



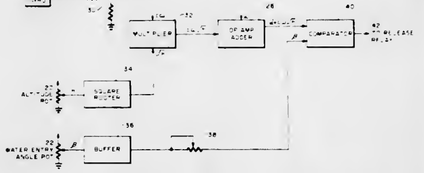
said vote registration switching means when that number is not exceeded by the maximum number there stored,
means responsive to the occurrence of said good signal for preventing said vote selection switches from altering the state of said bistable elements,
and means responsive to said good signal for transferring votes then stored in said bistable elements to corresponding ones of said output counter means.

4,046,993

TARGET FOR TORPEDO LAUNCH SYSTEM

Charles A. Wilson, Oxnard, and Patrick J. Moran, Ventura, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 28, 1976, Ser. No. 700,655
Int. Cl.² G06G *7/80*
U.S. Cl. 235—61.5 D **8 Claims**



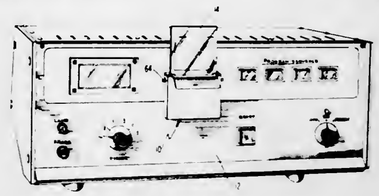
1. A system for launching an object from an aircraft over a relatively flat surface area such that said object impacts said surface area at a predetermined angle comprising:
a. means for producing a signal representative of pitch angle of said aircraft;
b. means for producing a signal proportional to angular velocity of said pitch angle of said aircraft;
c. means for producing a signal representative of the square root of a preselected launch height of said aircraft over said surface area;
d. means for multiplying said signal proportional to angular velocity of said pitch angle of said aircraft by said signal representative of the square root of said preselected launch height of said aircraft over said surface area to produce a time angle rotation signal;
e. means for adding said time angle rotation signal to said signal representative of pitch angle of said aircraft to produce a signal which is continuously representative of predicted object impact attitude with said surface area;
f. means for producing a signal representative of said predetermined angle; and
g. means for comparing said signal representative of predicted object impact attitude with said signal representative of said predetermined angle to produce an object release signal whenever said signal representative of predicted object impact attitude exceeds said signal representative of said predetermined angle.

4,046,994

CONTROL CARD RECEIVING AND SENSING ASSEMBLY

Raymond James Prohaska, Glen Cove, N.Y., assignor to Unit Process Assemblies, Inc., Syosset, N.Y.

Filed Nov. 12, 1975, Ser. No. 631,376
Int. Cl.² G06K *7/06*; H01H *43/08*
U.S. Cl. 235—61.11 A **10 Claims**



1. A card reader assembly for control cards having a metallic contact electrode pattern thereon and the like comprising
a fixed rectangularly shaped base plate,
a generally U-shaped displaceable cover member having a rectangular base portion and a pair of side wall portions perpendicularly extending in parallel relation from one face thereof and spaced to closely contain the base plate therebetween,
means pivotally interconnecting the dependent end of said base plate with side wall portions of said cover member for pivotal displacement of said cover member relative to said base plate,
means for biasing said base plate and cover member into abutting interfacial relation,
sensing electrode elements mounted on the facing surfaces of said base plate and cover member and displaceable in conjunction therewith and selectively shaped card entry slot defining means disposed on the upper end of said cover member and said rectangularly shaped base plate contoured to permit card entry intermediate said card sensing electrode elements only when the latter are spaced apart a distance that permits card insertion therebetween without pressure contact on the electrode pattern surfaces thereof.

4,046,995

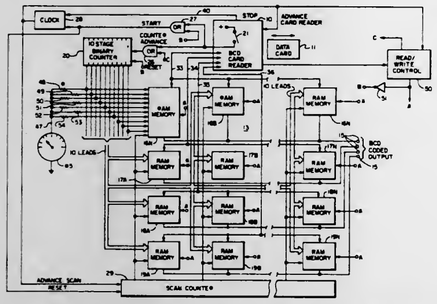
MEMORY FULLNESS INDICATOR

Ernest J. Salley, Phoenix, Ariz., assignor to Engineered Systems, Inc., Phoenix, Ariz.

Filed Nov. 17, 1975, Ser. No. 632,263
Int. Cl.² G06K *15/18*; G11C *11/00*
U.S. Cl. 235—61.6 R **12 Claims**

8. A system for indicating the degree of fullness of an electronic memory including in combination:
an electronic memory with a predetermined number of address locations for storing unique digital data at each such address location;
a plurality of address leads coupled with corresponding address inputs to said electronic memory;
addressing means coupled with said address leads for supplying binary encoded address signals to said memory to sequentially select individual addresses therein;
digital-to-analog converter means coupled with said address

leads for supplying a signal to an output lead therefrom; and



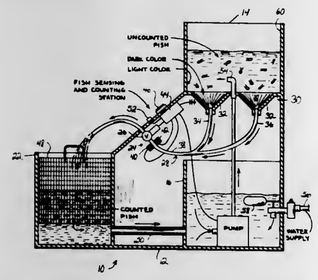
an analog meter coupled with said output lead for providing an analog indicia of the address location selected by said addressing means.

4,046,996

ELECTRONIC MINNOW COUNTER

Larry Thomas Williams, 603 Maple Ave., and William Jerry Williams, 921 Kentucky Parkway, both of Owensboro, Ky. 42301

Filed Nov. 17, 1976, Ser. No. 742,915
Int. Cl.² B65G 51/36; G06M 3/02
U.S. Cl. 235—92 PK **4 Claims**



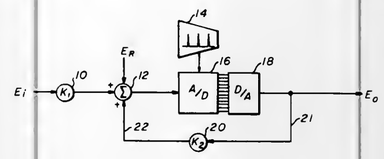
1. A device for counting live minnows comprising:
a tank for holding water containing a plurality of live minnows which are to be counted;
a conduit connected to the tank to serve as a drain therefor;
a valve interposed in said conduit and shiftable between an open condition which permits water and live minnows to drain through the conduit from the tank, and a closed condition which impounds the water and live minnows in the tank and conduit upstream of the valve;
a minnow sensing and counting means addressing the conduit, for sensing and counting minnows passing through the conduit in the draining water, as they pass said minnow sensing and counting means;
a control device interconnecting the valve and the minnow sensing and counting means, for closing the valve when a preselected number of minnows has been sensed and counted by the minnow sensing and counting means; and
an improvement, wherein the conduit is connected to the tank by funnel means which presents a dark surface towards the minnows in the tank, and the remainder of the tank presenting a light surface towards the minnows, for using the natural habitat effect of minnows to draw them head first toward the funnel means.

4,046,997

DIGITAL-STORAGE FILTER

Paul Herbert Chase, East Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 4, 1976, Ser. No. 683,442
Int. Cl.² G06J 1/00
U.S. Cl. 235—150.5 **5 Claims**



1. A storage device for receiving a device input and processing it to produce a device output comprising:
a. a digital-to-analog converter, having an output port and a plurality of input terminals;
b. means, having an input port, for maintaining a digital representation of a signal occurring at its input port at the most recent of a series of periodically occurring discrete times as an input to the terminals of the digital-to-analog converter, the signal at the output of the digital-to-analog converter thereby being equal to

$$K_3 e + E_4,$$

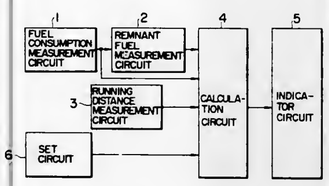
where K_3 is a first constant, e is the input, at the most recent of the discrete times, to the means for maintaining a digital representation, and E_4 is a second constant; and
c. means having an output port and first and second input ports, the output port being connected to the input port of the means for maintaining a digital representation, the first port receiving the device input, and the second input port being connected to the output port of the digital-to-analog converter, for producing a signal at its output port equal to the sum of a first quantity proportional to signals occurring at its first input port, a second quantity proportional to signals occurring at its second input port, and a third constant.

4,046,998

POSSIBLE VEHICLE RUNNING DISTANCE INDICATION

Akira Kuno, Nagoya; Yoshio Shinoda, Okazaki, and Hiroshi Arai, Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Feb. 3, 1976, Ser. No. 654,963
Claims priority, application Japan, Feb. 11, 1975, 50-17178
Int. Cl.² G01M 13/26
U.S. Cl. 235—150.21 **7 Claims**



1. A method of indicating a remaining possible vehicle running distance available on the remnant fuel of a vehicle comprising the steps of:

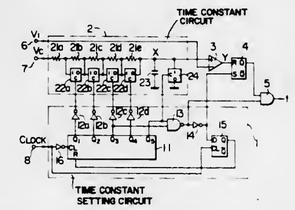
measuring the amount of fuel consumed;
measuring the remnant fuel amount in a fuel tank;
measuring the running distance the vehicle has run;
storing the measured remnant fuel amount when either one of the measured consumed fuel amount and the measured running distance has reached a predetermined value;
generating a train of pulses after said storing step, one cycle period of the train of pulses being determined by the other one of the measured consumed fuel amount and the measured running distance;
calculating a time interval in which the number of pulses in the train of pulses reaches the stored remnant fuel amount, said time interval being proportional to a remaining possible running distance available on the stored remnant fuel amount; and
indicating the calculated remaining possible running distance by an indicator.

4,046,999

LOGARITHMIC FUNCTION GENERATING SYSTEM

Ritsu Katsuoka, Okazaki; Hisasi Kawai, Toyohashi, and Seiji Morino, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 29, 1976, Ser. No. 681,744
Claims priority, application Japan, June 16, 1975, 50-72892
Int. Cl.² G06J 1/00; G06G 7/24
U.S. Cl. 235—150.53 **6 Claims**



1. A logarithmic function generating system comprising:
a time constant setting circuit for counting clock signals having a predetermined frequency to generate a setting signal varying at every passing of a unit time; and
a time constant circuit connected to said time constant setting circuit and including a capacitor, said capacitor being charged with a time constant which is constant during said unit time and is proportionally increased at said every successive unit time, whereby the voltage across said capacitor gives a broken line approximation to a logarithmic function with time as a variable.

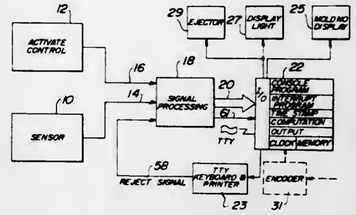
4,047,000

CONTROL SYSTEM FOR COMPUTER CONTROLLED IDENTIFICATION OF BOTTLES

Nelson H. Bryant, Ithaca; Ross L. Hobler, Elmira, both of N.Y.; Wilbur J. Allen, Millerton, Pa., and Joseph W. Poliseo, Elmira, N.Y., assignors to Powers Manufacturing, Inc., Elmira, N.Y.

Filed Dec. 2, 1975, Ser. No. 636,875
Int. Cl.² G01D 21/04
U.S. Cl. 235—151.1 **10 Claims**

1. A computer controlled system for identifying the mold source of a bottle provided with one or more sectors spanning a circumferential zone with prism-like timing marks thereon including a laser source for passing a laser beam through the sectors and a sensor for generating a series of digital pulses in response thereto, comprising:
means for generating a series of digital clock pulses independently of said sensor pulses;
means for time stamping said sensor pulses with said clock pulses and for storing the time stamp information;
means for digitally computing the pulses widths and interpulse spacings of said sensor pulses in terms of said time stamp information.
means for digitally comparing the spans of said sectors in terms of said time stamp information to said interpulse spacings of said sensor pulses; and
means for digitally weighting the sensor pulses in response to said digitally comparing means to provide a digital signal representing the distribution of said timing marks on said bottle, said distribution of timing marks uniquely identifying the mold source of said bottle.

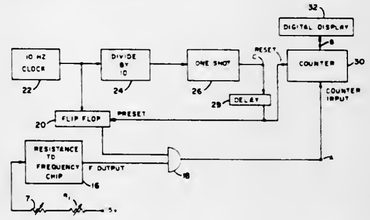


4,047,001

ENCODING ALTIMETER

Norman M. Witriol, 2501 Lancelot Drive SE., Huntsville, Ala. 35803, and Carlton L. Frederick, 518 Dryden Road, Ithaca, N.Y. 14850

Division of Ser. No. 533,576, Dec. 17, 1974, Pat. No. 3,961,272.
This application Mar. 8, 1976, Ser. No. 664,592
Int. Cl.² G01V 1/28; G01L 7/20
U.S. Cl. 235—151.3 **2 Claims**



1. A system comprising: a signal whose amplitude is to be measured; first means having an input and an output, said signal being connected to the input of said first means, said first means having an output which has a frequency proportional to the amplitude of said signal; counting means for counting the number of cycles in a predetermined amount of time of the output of said first means, said counting means having an input, a reset input, and an output; gating means having two inputs and an output, the output of said first means being connected to one of the inputs of said gating means, and the output of said gating means being connected to the input of said counting means; timing means having first and second outputs, said first output being connected to the other input of said gating means for providing a voltage output over said predetermined amount of time in a cyclic manner over a second larger predetermined amount of time; said gating means passing the output of said first means to the input of said counting means when said timing means is producing a voltage output, and said gating means having no output when said timing means is not producing a voltage output; said timing means having a second output connected to the reset input of said counting means for

producing a voltage output at said second output just prior to the starting of the first predetermined amount of time to reset the count of said counting means; said timing means repeating its output functions in a predetermined number of clock cycles, said first output having a voltage thereon for a first clock cycle, and said second output having a voltage thereon for a second clock cycle just prior to said first clock cycle; and wherein said timing means comprises a clock means producing clock cycles at its output; a divide by ten means having an input connected to the output of said clock means; a one shot circuit means having an input connected to an output of said divide by ten means and having an output which represents the second output of the timing means; a flip-flop circuit having two inputs and an output; said clock means having an output connected to one of the inputs of said flip-flop; said one shot circuit means having its output connected to the other input of said flip-flop means; the output of said flip-flop means being the first output of said timing means; said flip-flop having a voltage output when said one shot means has a voltage output; said flip-flop having no output when said one shot does not have an output; and a digital display means being connected to said counting means so as to display the count of the counting means.

4,047,002

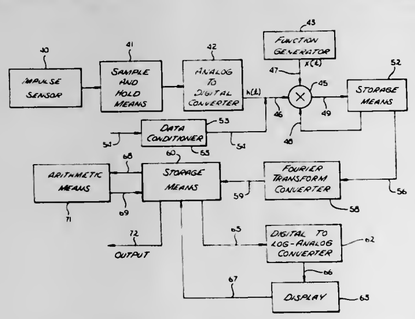
LAPLACE TRANSFORM SYSTEM

Edwin A. Sloane, Los Altos; Bruce T. McKeever, Mountain View, and Eugene Wong, Berkeley, all of Calif., assignors to Time/Data Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 552,655, Feb. 24, 1975, abandoned, which is a continuation of Ser. No. 389,510, Aug. 20, 1973, abandoned. This application June 28, 1976, Ser. No. 700,446

Int. Cl.² G01R *23/16, 27/02;* G06F *15/34*

U.S. Cl. 235—151.3 **33 Claims**



1. A system for determining the natural resonant frequencies associated with a specimen comprising:

sensor means for sensing the response of the specimen to a predetermined excitation;

converting means for converting the sensed response of said specimen to a frequency domain representation of said response coupled to said sensor means;

differentiation means for differentiating said frequency domain representation, coupled to said converting means; and

peak detection means for detecting the peaks of a signal coupled to said differentiation means;

whereby the interaction of the poles are minimized through said differentiation such that said resonant frequencies may be determined.

4,047,003

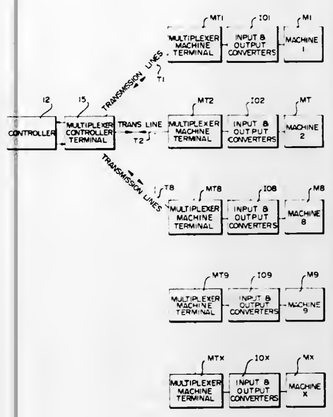
COMMUNICATION CONTROL SYSTEM

James J. LaRocca, La Grange, and Richard A. Mazur, Downers Grove, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 570,430, April 22, 1975, abandoned, and a continuation-in-part of Ser. No. 570,407, April 22, 1975, abandoned. This application Apr. 9, 1976, Ser. No. 675,608

Int. Cl.² G06F *15/46;* G08C *15/00*

U.S. Cl. 235—151.11 **27 Claims**



1. A multiplexing machine control communications system for controlling a plurality of machines from a programmable controller, comprising

a multiplexer controller terminal for receiving condition-defining information signals representing the operational functions of a plurality of independently operable multifunctioning machines and transmitting in response thereto predetermined condition-responsive command signals to control selected functions of each of said machines,

a programmable controller coupled to said multiplexer controller terminal to provide a source of said predetermined condition-responsive command signals for controlling said machine functions in response to said condition-defining information signals,

a multiplexer machine terminal coupled to each one of said plurality of independently operable multifunctioning machines to transmit condition-defining information signals responsive to the operational functions of a machine coupled thereto and to receive in response thereto selected ones of said predetermined condition-responsive command signals,

an input and output converter coupled between said multiplexer machine terminal and a machine coupled thereto for coupling said information and command signals therebetween,

respective transmission lines for connecting said multiplexer controller terminal in parallel with each of said multiplexer machine terminals, nd

said multiplexer controller terminal enabling communication between said multiplexer controller terminal and each of said multiplexer machine terminals.

4,047,004

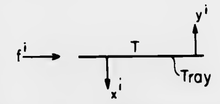
SIMULATION OF COMPLEX SEQUENCES OF MULTI-STAGE SEPARATORS

Alfred M. Peiser, Rocky Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 179,984, Sept. 13, 1971, which is a continuation of Ser. No. 92,534, Nov. 24, 1970, abandoned, which is a continuation of Ser. No. 562,808, July 5, 1966, abandoned. This application May 24, 1976, Ser. No. 689,262

Int. Cl.² G05B *17/00;* G06F *15/20*

U.S. Cl. 235—151.12 **5 Claims**



1. In separation processes wherein a multicomponent feed stream in which the relative volatility of the individual components thereof are relatively insensitive to changes in temperature is supplied to a multi-stage fractionating tower, the method comprising:

performing heat, material and equilibrium balances for the stages of said tower to determine a singla principal variable S at each stage representing the product of the flow ratio times the equilibrium constant of a base component at the temperature of that stage and with initially assumed values representative of constant relative volatilities of said components based upon assumed temperatures, and

repeating the heat, material and equilibrium balances with new values for said constant relative volatilities based upon the newly found temperatures for the respective stages to determine a new value of the principal variable S at each stage until the last newly found temperatures substantially correspond with the assumed temperatures.

4,047,005

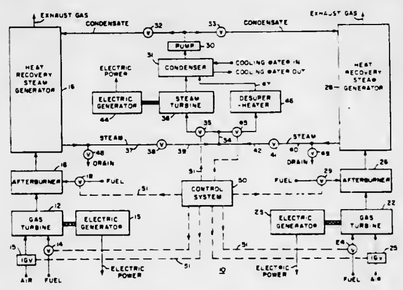
COMBINED CYCLE ELECTRIC POWER PLANT WITH A STEAM TURBINE HAVING A THROTTLE PRESSURE LIMITING CONTROL

Richard S. Heiser, Pittsburgh, and Ola J. Aanstad, Greensburg, both of, PA, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 13, 1974, Ser. No. 497,345

Int. Cl.² F01K *23/00;* F02C *1/04;* G05B *15/00*

U.S. Cl. 235—151.21 **18 Claims**



1. A combined cycle electric power plant comprising:

a. gas turbine means;

b. means for generating steam at a lower distinct rate and a higher distinct rate in response to heat energy from the gas turbine means;

c. a steam turbine driven by steam supplied to it from the steam generating means;

d. means for generating electric power under the driving power of said turbines;

e. means for controlling the operation of said turbines including a steam turbine control system;

f. said steam turbine control system including

f1. means to generate a first representation of actual steam pressure to the turbine,

f2. means to generate a second representation of steam flow,

f3. means to generate a third representation of a predetermined minimum steam pressure,

f4. means governed by the first representation and the third representation to restrict the flow of steam to the turbine only at times when the third representation exceeds the first representation while the steam generating means is generating steam at the higher of the two distinct rates, and

f5. means responsive to the steam generating means changing to the lower distinct rate to restrict the flow of steam to the turbine at times when the second representation exceeds the first representation.

4,047,006

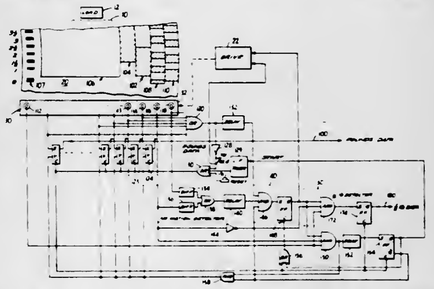
ELECTRONIC POSTAGE SCALE

Edwin Eliner, Oxford, Conn., assignor to Better Packages, Inc., Shelton, Conn.

Filed Jan. 27, 1976, Ser. No. 652,843

Int. Cl.² G06F *15/02;* G01G *23/42*

U.S. Cl. 235—151.33 **25 Claims**



1. A postage scale for providing an indication of the requisite postage for a parcel in accordance with the weight, class of shipment and destination zone of said parcel, comprising:

weight data generating means for generating a digital representation of the weight of said parcel upon which postage is determined;

memory means having a plurality of individual storage sections corresponding to said classes of shipment; each of said storage sections including a two-dimensional array of storage locations, a first dimension being defined by destination addresses and a second dimension being defined by weight increments and at which storage locations postage data representations corresponding to destination zones and parcel weight are stored;

first manually operable switch means for generating, when operated, a signal representing a selected class of shipment;

second manually operable switch means for generating, when operated, a signal representing a selected destination zone;

encoding means coupled to said first and second switch means and responsive to said generated signals for producing a coded signal representing a destination address;

means coupled to said first switch means for selecting one of said storage sections in accordance with the generated signal representing said selected class of shipment;

means coupled to said weight data generating means for supplying said digital representation of parcel weight to all of said storage sections; and

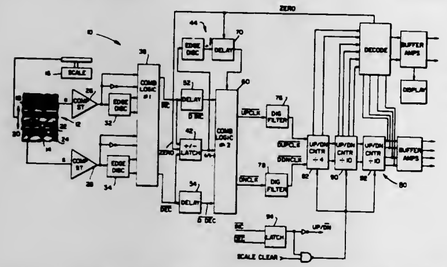
read-out means coupled to all of said storage sections for reading out the one postage data representation stored in the storage section selected by said first switch means at the location defined by the coded signal produced by said encoding means and the digital representation of said parcel weight.

4,047,007

CLOCKED DIGITAL COUNTING SYSTEM

Daniel F. Dingos, Huntington, and Flavio M. Manduley, Seymour, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Aug. 19, 1976, Ser. No. 715,882
Int. Cl.² G01G *3/00*; H03K *21/00*
U.S. Cl. 235—151.33 **9 Claims**



1. A system for processing cyclic waveforms generated as a function of the change of a bidirectionally variable parameter whose change is to be measured with respect to a reference, the system comprising digital wave shaping means, the digital wave shaping means receiving the cyclic waveforms and in response thereto providing a pair of shaped digital waveforms, clock means, the clock means providing a pulsed timing signal the frequency of which is greater than the maximum frequency of the cyclic waveforms, sensing means, the sensing means receiving the shaped waveforms and the timing signal and in response thereto determining the direction of a variation of the parameter and providing one series of pulses indicative of a variation in one direction and another series of pulses indicative of a variation in an opposite direction, counting means disposed in the system and coupled to the sensing means to receive either one of said series of pulses and the timing signal and in response thereto being adapted to add the pulses of the one series or to subtract the pulses of the other series to provide signals indicative of a measure of the varation in the parameter and processing means electrically connected within the system for receiving said signals and in response thereto providing an indication of the change of the bidirectionally variable parameter with respect to the reference, whereby reliable noise insensitive processing is provided.

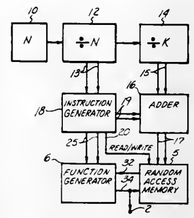
4,047,008

PSEUDO-RANDOM NUMBER SEQUENCE GENERATOR

Frank A. Perkins, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Feb. 23, 1976, Ser. No. 660,115
Int. Cl.² G06F *7/00*
U.S. Cl. 235—152 **7 Claims**

1. A pseudo-random number sequence generator comprising: a random access memory having a plurality of addressable storage locations, each for storing a number; a logic function generator means for operating upon at least a first and second number to provide a result; addressing means for accessing a first number from a first storage location of said random access memory and for accessing a second number from a second storage location having a predetermined location with respect to said first storage location; means providing said first and second numbers to said logic function generator means such that a result is provided, and means for providing the result as an output random number and for writing the result in said second storage location, whereby said second number is replaced by said result and whereby a cycle is complete; and control means for controlling said addressing means and said



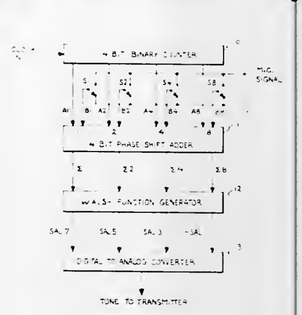
logic function generator means and said memory means for performing successive said cycles such that during each cycle the storage location having a result of a previous cycle comprises the first storage location.

4,047,009

DIGITAL TONE GENERATOR FOR USE WITH RADIO TRANSMITTERS AND THE LIKE

Richard F. Challen, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Apr. 19, 1976, Ser. No. 677,973
Int. Cl.² G06F *15/34*; H04B *1/16*
U.S. Cl. 235—152 **6 Claims**



1. For use in a radio communication system in which a tone of selected frequency is transmitted for activating at least one selected receiver and in which the phase of said tone is shifted to indicate the end of a transmission, an improved digital tone generator comprising:

a. a counter having an input for a clock signal and a plurality of digital signal outputs;

b. a function generator having a plurality of digital inputs and an output for generating a tone in response to digital signals applied to said digital inputs;

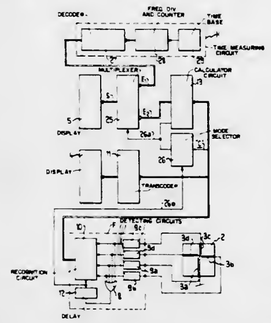
c. and a digital adder connected between said counter outputs and said generator inputs for applying said counter digital signals to said function generator, said digital adder having means for adding selected digital signals to said function generator inputs in response to the end of a transmission, thereby changing the phase of said function generator output to indicate to said one selected receiver that the transmission is ended.

4,047,010

MULTI-FUNCTIONAL ELECTRONIC WATCH

Jean Félix Perotto, Neuchatel, and Eric Vittoz, Cernier, both of Switzerland, assignors to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Aug. 26, 1975, Ser. No. 607,924
Claims priority, application Switzerland, Sept. 4, 1974, 12036/74
Int. Cl.² G06F *7/38*; G04B *47/00*; G06K *9/10*
U.S. Cl. 235—156 **13 Claims**



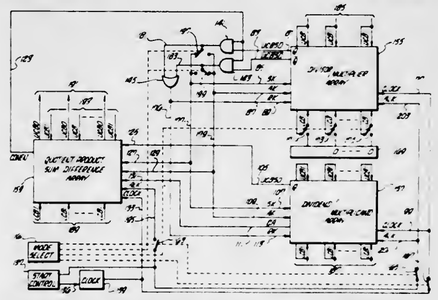
1. A multi-functional electronic watch, comprising an electro-optical digital display means; circuit means coupled to said display means for measuring time; a data processing circuit coupled to said display means; a writing surface including a plurality of pick-up electrodes embedded in the glass of said watch, said pick-up electrodes delivering a series of signals corresponding to the given order in which each of them is excited when an alpha-numerical symbol is traced analogically on the surface of said glass, said series of signals forming a combinatory code; and interface means connecting said pick-up electrodes to said data processing circuit for recognizing said combinatory code and supplying data signals to said processing circuit, said data signals corresponding unequivocally to said symbol.

4,047,011

MODULAR APPARATUS FOR BINARY QUOTIENT, BINARY PRODUCT, BINARY SUM AND BINARY DIFFERENCE GENERATION

Walter Scott Bennett, Loveland, Colo., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 489,884, July 19, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 639,517
Int. Cl.² G06F *7/52*
U.S. Cl. 235—164 **21 Claims**



1. A high-speed divider for binary numbers, comprising:

a divisor array comprising a plurality of like structured modules;

a dividend array comprising a plurality of like structured modules, like the modules in said divisor array;

a quotient array comprising a plurality of like structured modules, like the modules in said divisor array and said dividend array; and

control means, responsive to the divisor array, for generating signals indicative of manipulative control steps for said divisor array, said dividend array, and said quotient array.

4,047,012

GENERAL PURPOSE CALCULATOR HAVING FACTORIAL CAPABILITY

Peter D. Dickinson, Monte Sereno; Thomas E. Osborne, San Francisco; France Rode; Allen J. Baum, both of Los Altos; David S. Cochran, Palo Alto, and Chung C. Tung, Santa Clara, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 364,570, May 29, 1973, abandoned. This application Apr. 8, 1975, Ser. No. 566,631
Int. Cl.² G06F *15/20*
U.S. Cl. 235—156 **2 Claims**



1. An electronic calculator for calculating the factorial of a positive number entered into the calculator, said calculator comprising:

input means including a plurality of manually operable numeric and non-numeric keys for entering information into the calculator;

a first storage register for initially storing the entered number and for subsequently storing decremented values thereof; and

a second storage register coupled to the first storage register having a first field including one's and ten's digit positions for storing a preselected constant number in the ten's digit position thereof, and a second field for storing a number;

a third storage register coupled to the first and second storage registers having a first field including one's and ten's digit positions for storing successively modified values of the entered number, and a second field for storing a number;

processing means responsive to the actuation of a non-numeric key of the output means and coupled to the first, second and third storge registers for repetitively decrementing the entered number unless that number is zero, and, following each such decrementing, transferring each decremented value of the entered number to the first field of the third register, for performing a first series of successive additions to the contents of the first and second fields on the second and third storage registers, respectively, the sums of the first series of successive additions being stored in the first and second fields, respectively, of the third register, until the ten's digit position of the first field of the third register equals a first value, thereupon left-shifting the numbers stored in the first and second fields of the third register so that the one's digits of those numbers occupy the ten's digit positions of those fields, for per-

forming a second series of successive additions of the contents of the first and second fields of the second storage register to the left-shifted contents of the first and second fields of the third register, respectively, the sum of the second series of successive additions being stored in the first and second fields, respectively, of the third register, until the ten's position of the first field of the third register equals the first value, for repetitively storing the resultant number in the second field of the third storage register in the second field of the second register, and then zeroing the second field of the third register; and

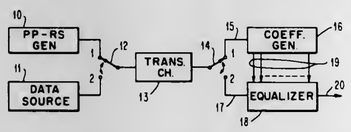
output means coupled to the processing means for providing an output indication of the total of the first and second series of successive additions of the contents of the second field of the second storage register and the second field of the third storage register, said total representing the factorial of the entered number.

4,047,013

METHOD AND APPARATUS FOR FAST DETERMINATION OF INITIAL TRANSVERSAL EQUALIZER COEFFICIENT VALUES

Andrzej Milewski, St-Jeannet, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 1, 1976, Ser. No. 701,730
Claims priority, application France, July 10, 1975, 75.22152
Int. Cl.² G06F *15/34*; H04B *3/14*
U.S. Cl. 235—156 **8 Claims**



1. In a synchronous data transmission system comprising a transmitter for transmitting data through a transmission channel causing distortions to a receiver including a transversal equalizer to compensate for the effects of said distortion, a method for determining the initial values of the equalizer coefficients comprising the steps of:

selecting among the periodic binary pseudorandom sequences of length L, a sequence (u_l) of L binary elements u_l having the following property:

$A_0=L$ and $A_j=-1$ for $j=1, \ldots (L-1)$

where

$$A_j = \sum_{i=o}^{L-1} u_i u_{i+j}$$

adding to each element u_l of the sequence (u_l) a constant m defined by the following relation:

$$m = \frac{-1 \pm \sqrt{1+L}}{L}$$

whereby building a sequence (v_l) of L elements $v_l v_l = u_l + m$;

transmitting said sequence (v_l) through the transmission channel;

receiving the sequence (x_l) of elements x_l, each of the received elements x_l corresponding to a transmitted element v_l, and

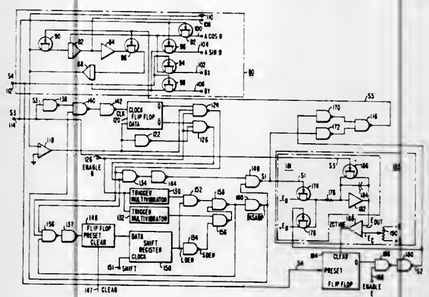
determining the initial values of the equalizer coefficients from the received sequence (x_l) and the transmitted sequence (v_l).

4,047,014

COORDINATE CONVERTER

Steven Morrison, Baltimore, and George A. Williams, Ellicott City, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 2, 1976, Ser. No. 672,893
Int. Cl.² G06G *7/22, 7/80*
U.S. Cl. 235—189 **11 Claims**



1. Electronic apparatus for transforming the coordinates of at least one vector through an input angle that is a measure of rotation of a first orthogonal coordinate system relative to a second orthogonal coordinate system about a common coordinate axis comprising:

first means for generating a first signal representative of said vector;

second means for generating a second signal representative of said input angle;

third means for generating an oscillation angle control signal having a transition point wherein an incremental change in said second signal at a first predetermined value causes a discontinuity in the duration of said oscillation angle control signal;

coordinate converter means responsive to said oscillation angle control signal for transforming said first signal in accordance with said second signal; and

fourth means for modifying the duration of said oscillation angle control signal to effectively eliminate said discontinuity within a selected range of said second signals.

4,047,015

PHOTOFLASH ARRAY CONSTRUCTION

Richard Blount, South Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 508,334, Sept. 23, 1974, abandoned. This application Nov. 28, 1975, Ser. No. 635,848
Int. Cl.² G03B *15/02*
U.S. Cl. 240—1.3 **8 Claims**



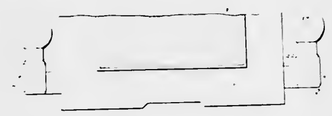
1. A multiple flash lamp array comprising a housing having a front and a back, a plurality of flash lamps in a planar configuration and disposed within said housing adjacent the front thereof, reflector means positioned within said housing and having portions located behind said lamps to direct light from said lamps toward the front of said housing when said lamps are flashed, a circuit board positioned within said housing behind said lamps and said reflector means and having circuitry thereon for causing flashing of said lamps in response to the transmission of flash actuation signals to said circuitry, openings through the back of said reflector means, leads on said lamps and extending rearwardly through said openings into electrical contact with said circuitry, said front of said housing being transparent at least in front of said lamps to permit passage of light from the lamps when the latter are flashed, and an indicia sheet located within said housing between said circuit board and said back of said housing, said indicia sheet containing flash indicator means thereon facing the back of said housing, said back of said housing being transparent at least in part to permit viewing of said flash indicator means, and means for actuating said flash indicator means in response to the flashing of said flash lamps, said flash indicator means being visible from behind said array for indicating the flashing of lamps which project light from the front of said array.

4,047,016

BATHROOM CABINET LIGHTING FIXTURE

James J. Palka, Arlington Heights, Ill., assignor to General Bathroom Products Corporation, Elk Grove Village, Ill.

Filed May 14, 1976, Ser. No. 686,675
Int. Cl.² F21V *33/00*
U.S. Cl. 240—4 **2 Claims**



1. Side lighting arm fixtures for cabinets used in bathrooms and mounted on a wall, said cabinets comprising a one piece, molded plastic cabinet body with ornamental hollow framing therearound having depending rearwardly extending flanges on the margin of said framing forming top, side and bottom walls, said side walls having cutouts adjacent the bottom wall, in combination with a pair of light arm brackets, each comprising a one piece, plastic molded, elongated horizontal portion and a right angled portion, an elongated rectangular portion formed on the terminal end of said latter portion extending vertically, said rectangular portion having a cylindrical bore therein, a cable conduit molded in said bracket with one end terminating in said bore, an electrical lamp socket secured at one end in said bore, an electric box secured to said bottom wall of the said framing, said other end of said conduits secured to said box, and means for fastening said horizontal portions to said framing adjacent the lower end of said cabinet.

4,047,017

ADJUSTABLE FLASHLIGHT SWINGABLE BRACKET FOR A WRITING INSTRUMENT

Bernard D. Herring, 712 Longridge Road, Oakland, Calif. 94610

Filed Mar. 22, 1976, Ser. No. 668,784
Int. Cl.² B43K *29/10*
U.S. Cl. 240—6.46 **1 Claim**

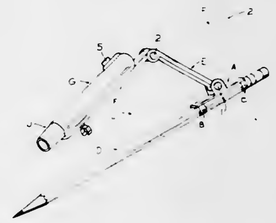
1. In combination:

a. a base having a spring clip for frictionally gripping the elongated body of a writing instrument and permitting adjustment along the length of the body;

b. an arm having one end pivotally secured to said base and being swingable from a position substantially paralleling the elongated body of the writing instrument into a desired angular position with respect to the axis of the body;

c. a flashlight supporting platform having one end pivotally connected to the free end of said arm, the axis of said platform lying in a radial plane that extends from the axis of the elongated writing instrument, the elongated axis of said arm lying in the same plane regardless of its angular position; and

d. said platform supporting a flashlight whose light rays are always beamed along said radial plane regardless of the angle made between said platform axis and said supporting arm axis, the angle of the light rays being adjusted by the swinging of said platform and said arm for directing the light rays toward the writing end of said instrument for



illuminating a surface over which the writing instrument is moved, said pivotal connections between the base, arm and platform holding said arm and platform in adjusted position so that both will space the flashlight away from the body of the writing instrument for permitting the latter to be manually grasped without interfering with the flashlight;

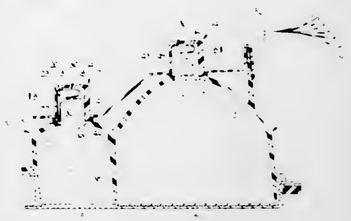
e. said platform being provided with a spring clip for removably engaging the body of the writing instrument when said arm and platform are swung into substantial linear alignment with each other, said last mentioned spring clip when engaging with the body of the writing instrument holding said platform and arm close to and substantially parallel with the adjacent side of the elongated body of the writing instrument.

4,047,018

LAMP ASSEMBLY

Mervyn George Harris, Solihull, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

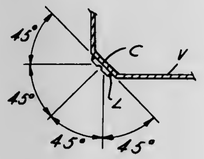
Filed Dec. 3, 1975, Ser. No. 637,179
Claims priority, application United Kingdom, Dec. 14, 1974, 54150/74
Int. Cl.² B60Q *1/00, 3/00, 11/00*
U.S. Cl. 240—7.1 R **11 Claims**

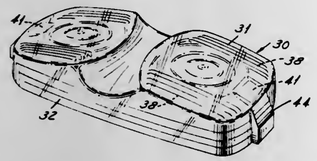


1. A lamp assembly comprising a body, means defining an aperture in said body, an electrically insulating bulbholder enclosing said aperture and detachably receiving a bulb, at least one electrical contact fixed in said bulbholder for engagement with said bulb, an electrical terminal connected to each

said electrical contact and carried by said bulbholder, and an electrical connector for connecting each said electrical terminal to a power supply, each said electrical connector being trapped between its respective electrical terminal and said body so as to be electrically connected with said respective electrical terminal.

4,047,019
COMBINED CLEARANCE AND MARKER LAMP
Robert I. Nagel, Skokie, Ill., assignor to Dominion Auto Accessories Limited, Toronto, Canada
Filed July 19, 1976, Ser. No. 706,746
Int. Cl.² B60Q 1/32
U.S. Cl. 240—8.2 **15 Claims**

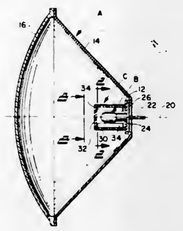




1. A combined clearance and marker lamp comprising
a generally rectangular housing having a base portion and a peripheral wall including side wall portions and end wall portions,
means for supporting a pair of light bulbs in longitudinally spaced relation in said housing with at least the filaments of said bulbs beneath the plane of the upper end of the peripheral wall of the housing,
a lens of transparent material on said housing and having a top wall, side walls and end walls telescoped over the side and end wall portions of the housing,
said top wall of said lens having longitudinally spaced sets of arcuate ribs on the inside surface of the top wall,
each said end wall of said lens having a prism on the outer surface thereof to direct the light longitudinally thereof.

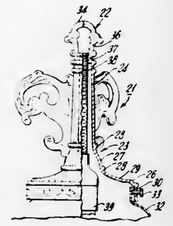
4,047,020
DISGUISED EMERGENCY LIGHT
Don W. Noren, Redwood City, Calif., assignor to Noren Products, Inc., Redwood City, Calif.
Filed Oct. 28, 1975, Ser. No. 626,494
Int. Cl.² F21V 9/08
U.S. Cl. 240—46.59 **25 Claims**

24. A light which appears of a predetermined color when turned on and appears other than said predetermined color when turned off comprising; a light source mounted in a housing having a light transmitting lens through which light is outwardly transmitted from said housing when said light source is turned on and through which the interior of said housing is visible from outside thereof when said light source is turned off, light transmitting color means of a predetermined color positioned within said housing in spaced relationship to said lens and closely adjacent said light source for imparting light transmitted outwardly therethrough from said light source with said predetermined color, and disguise means positioned within said housing closely adjacent said color means for transmitting light of said predetermined color outwardly therethrough and for blocking a substantial portion of



external light rays entering said housing through said lens from being imparted with said predetermined color by said color means.

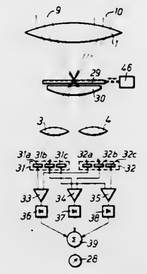
4,047,021
CASTING CONSTRUCTION
Arnold Francis Winant, Beechhurst, N.Y., assignor to Gim Metal Products, Carle Place, N.Y.
Filed Feb. 17, 1976, Ser. No. 658,444
Int. Cl.² F21S 1/06
U.S. Cl. 240—78 E **5 Claims**



1. A suspension type electric light fixture comprising a vertically axially extending hollow open bottomed body member including an upper vertical elongated tubular stem section terminating at its top in an integrally formed coaxial vertical hub section having a threaded vertical axial bore extending for the full length thereof, a light bulb socket, means supporting said light bulb socket from said hub and including an externally threaded pipe engaging said threaded bore and depending therefrom coaxially with said stem section and supporting said light socket at its lower end, and a suspension loop member located atop and projecting upwardly from and integrally formed with said hub section.

4,047,022
AUTO FOCUS WITH SPATIAL FILTERING AND PAIRWISE INTERROGATION OF PHOTOELECTRIC DIODES
Werner H. Holle, Wetzlar, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany
Filed Jan. 13, 1976, Ser. No. 648,785
Int. Cl.² G01J 1/20
U.S. Cl. 250—201 **7 Claims**

1. In an apparatus for photoelectrically determining the position of at least one focal plane of an image inside an optical instrument comprising optical components for imaging at least one object on at least one spatial frequency filter of an optical image correlator and further comprising a measurement display of the light fluxes filtered through the spatial frequency filter, the improvement comprising: means for receiving the light fluxes concentrated through said optical components having at least one photoelectric detector system consisting of at least one row of a plurality of photoelectric detecting diodes



and electrical means for pairwise interrogation of said photoelectric detecting diodes and for the annalysis of the photoelectric signals generated during interrogation.

4,047,023
COLOR MARK DETECTOR WITH PULSED SOURCE AND SYNCHRONOUS DEMODULATION
Paul Franklyn Key, San Martin, and Anthony Ross Lazzara, Portola Valley, both of Calif., assignors to Scientific Technology Inc., Mountain View, Calif.
Filed Aug. 9, 1976, Ser. No. 712,607
Int. Cl.² H01J 39/12
U.S. Cl. 250—214 B **13 Claims**

1. A mark detector for a mark on a surface having a contrasting background, comprising a framework, said framework having an aperture through one wall thereof, a light source mounted in said framework disposed to direct a light beam through said aperture, a light sensor mounted in said framework disposed to receive light reflected from the surface when the surface is positioned before said aperture, said light source providing a sensor output signal responsive to received light, means for driving said light source at a pulse frequency, thereby producing light source pulses, a gate for sampling said sensor output synchronously with said light source pulses during a gating period and providing a gated output, whereby noise occurring between said light source pulses is barred from said gated output, an integrator coupled to receive said gated output and providing an integral output, a comparator coupled to receive said integral output and said gated output at separate input terminals, whereby a predetermined comparator output state is produced during said gating period when a predetermined difference in levels between said integral and gated outputs occurs, and means for conditioning said comparator output coupled to said predetermined comparator output state and providing a mark output when a surface color passes before said aperture which contrasts with the background.

4,047,024
PHOTOELECTRIC DISC READER WITH ALTERNATE READING LOCATIONS
Benjamin B. Henderson, Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Mar. 18, 1976, Ser. No. 668,029
Int. Cl.² G01D 5/34
U.S. Cl. 250—231 SE **2 Claims**



1.A pulse initiator for producing pre-selected pulse rates in a three wire remote metering telemetry system in response to equal rotations of a watthour meter rotating movement, said pulse initiator comprising:
first and second parallel mounting boards assembled to a watthour meter;
plural pattern discs, each having different numbers of equally circumferentially spaced slot indicia disposed in identical circular tracks, each of said plural pattern discs being interchangeably mountable between said first and second mounting boards in driven relationship with the meter rotating movement;
first and second optoelectronic sensors each including a radiation source optically aligned with a radiation pickup, said sources and pickups of said first and second sensors having plural alternate mounting locations on identical circular axes of said first and second mounting boards, respectively, so as to have plural alternate circumferential spacings therebetween, said circular axes being oriented for alignment with each other and said circular tracks of said pattern discs, each of said alternate circumferential spacings being associated with a different one of said pattern discs so as to have a related arcuate spacing equal to a multiple of the indicia slot spacing plus one-half of the slot spacing, whereby rotation of the slotted indicia between the sensors and pickups produces interrupted radiations that alternately activate the pickups of said first and second sensors and produce alternate equally spaced impulses in accordance with a preselected pulse rate;
first and second printed circuit conductors disposed on said first and second mounting boards, respectively, and extending to alternate mounting locations for at least one of each of the radiation sources and radiation pickups so as to provide fixed common electrical connections between the alternate source and pickup mounting locations; and
circuit means including an output pulse generator coanected to a three wire telemetry system and receiving said impulses so as to produce output pulses at said preselected pulse rate.

4,047,025

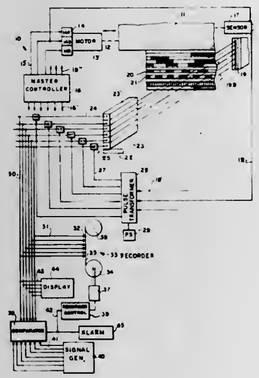
POSITION INDICATING SYSTEM AND METHODS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 220,347, Jan. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 864,510, Oct. 7, 1969, Pat. No. 3,636,635, Ser. No. 518,616, Jan. 4, 1966, Pat. No. 3,476,481, Ser. No. 294,076, July 10, 1963, Pat. No. 3,481,042, Ser. No. 250,942, Jan. 11, 1963, Pat. No. 3,266,833, and Ser. No. 477,467, Dec. 24, 1954, abandoned. This application May 17, 1974, Ser. No. 470,823

Int. Cl.[2] H01J *3/14*

U.S. Cl. 250—237 G **11 Claims**



1. An apparatus for measuring an indicating machine component position comprising:

a base,

a machine component movably supported by said base,

means for guiding and controllably driving said machine component on said base in a predetermined path to effect relative controlled movement of said component and said base with respect to each other,

a digital code scale fixedly supported by said machine component and movable therewith so as to permit said code scale to move with respect to said base when said component is driven on said base,

scanning means supported adjacent said machine component and operatively located to scan said digital code scale as the machine component and scale and said base relatively move with respect to each other,

said scanning means being operable to generate digital information as code signals as said scanning means said digital code scale, which code signals are indicative of the degree of relative movement of said component with respect to said base, and

transducing means operatively connected to receive said code signals generated by said scanning means and operable to effect a transducing operation with respect to the signals generated by said scanning means, and means connected to said transducing means for receiving and utilizing the information generated by said transducing means.

4,047,026

DEFLECTION OF ATOMIC BEAMS WITH ISOTOPE SEPARATION BY OPTICAL RESONANCE RADIATION USING STIMULATED EMISSION AND THE A.C. STARK EFFECT

John Ernst Bjorkholm, Holmdel, and Paul Foo-Hung Liao, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 2, 1976, Ser. No. 646,064

Int. Cl.[2] H01S *1/00*

U.S. Cl. 250—251 **3 Claims**



1. A method for separation of isotopes comprising the steps of supplying a mixture of the desired isotope and at least one isotope not desired to an interaction region, supplying a first coherent optical beam that is pulsed and selected for resonance radiation interaction, whereby a force is to be exerted on the selected isotope, the frequency of said first source being offset from the resonance by a selected amount, supplying to said mixture a second coherent optical beam that is pulsed with sufficient intensity to Stark-shift the resonance transition through coincidence with the photon energy of the first source, said second optical beam having a chirp rate of optical intensity that is appropriate for adiabatic rapid passage, and providing two sequential oppositely-directed passes of the first beam through the mixture coincident with appropriate Stark shifts produced by the second beam, yielding absorption by the selected isotope on the first pass and stimulated re-emission by the selected isotope on the second pass.

4,047,027

NEUTRON WELL LOGGING TECHNIQUE FOR GAS DETECTION

Richard M. Bateman, Chicago, Ill., and Christian M. Clavier, Ridgefield, Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 585,738, June 10, 1975, abandoned. This application Mar. 29, 1976, Ser. No. 671,905

Int. Cl.[2] G01V *5/00*

U.S. Cl. 250—264 **19 Claims**

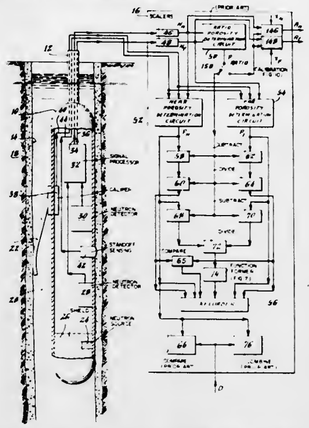
1. A method for determining characteristics of an earth formation, comprising the steps of:

producing a first measurement of the neutron population in said formation at a first spacing from a neutron source;

converting said first measurement into a first signal which is related to the porosity of the formation and corrected for environmental effects;

producing a second measurement of the neutron population in said formation at a second spacing from said neutron source;

converting said second measurement into a second signal which is related to the porosity of the formation and corrected for environmental effects; and



determining from said converted signals characteristics of the formation.

4,047,028

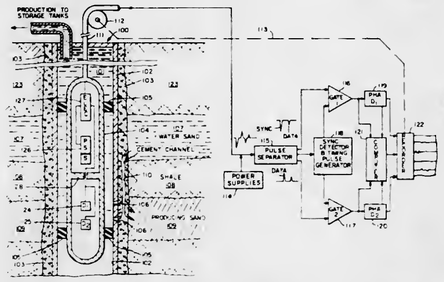
RESOLUTION OF THROUGH TUBING FLUID FLOW AND BEHIND CASING FLUID FLOW IN MULTIPLE COMPLETION WELLS

Dan M. Arnold, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,173

Int. Cl.[2] G01V *5/00*

U.S. Cl. 250—266 **9 Claims**



1. A method for detecting the direction, linear flow rate and volume flow rate of undesired behind casing water migration in an upper producing zone of a multiple completion well operating on gas lift, wherein the upper completion zone has a production tubing string of known diameter passing therethrough from a lower completion zone which contains water cut fluid flowing at a substantially known volume flow rate in an upward direction, substantially without interrupting production from either of the completion zones, comprising the steps of:

a. locating a well tool sized and adapted for passage through production tubing and having a source of fast neutrons at least some of which having sufficient energy to cause the nuclear reaction $O^{16}(n,p)N^{16}$ and at least two gamma ray detectors longitudinally spaced from said source and each other, in an upper producing zone of the well at a location adjacent either above or below producing perforations to be investigated;

b. irradiating the borehole environs with fast neutrons from said source;

c. detecting at said detector locations in at least two separate energy regions of the gamma ray energy spectrum, gamma rays substantially caused by the decay of the unstable isotope N^{16} comprising the molecular structure of any undesired behind casing water migration and any water cut flowing in the production tubing from the lower producing zone, and generating at least four separate count signals representative thereof;

d. combining said at least four separate count signals according to a first predetermined relationship to derive an indication of the linear flow rate of any undesired water flow behind the casing in the upper producing zone; and

e. combining the known volume flow rate and linear flow rate of the water cut in the production tubing from the lower producing zone and said at least four count signals according to a second predetermined relationhsip to derive an indication of the volume flow rate of the undesired water flow behind the casing in the upper producing zone.

4,047,029

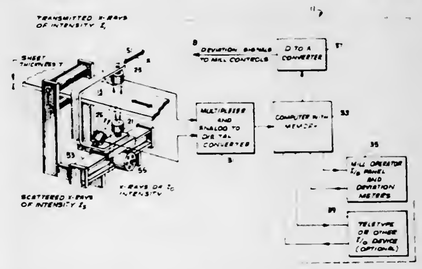
SELF-COMPENSATING X-RAY OR γ-RAY THICKNESS GAUGE

John J. Allport, 12298 Candy Court, Saratoga, Calif. 95070

Filed July 2, 1976, Ser. No. 702,285

Int. Cl.[2] G01N *23/20, 23/00*

U.S. Cl. 250—273 **16 Claims**



1. A system for continuously measuring the mass per unit area of sheet material, whose composition is slightly variable from nominal comprising,

radiation generating means for generating a radiation beam directed into said sheet, said radiation having sheet in a straight line from said generating means and a second portion of said beam is scattered from said sheet,

first detector means positioned on the opposite side of said sheet from said radiation generating means in a position to intercept said first portion of said beam for measuring the intensity of said first portion of said beam, and having a first output signal representative of beam intensity transmitted through said sheet material,

second detector means disposed in a position to intercept part of said second beam portion for measuring the intensity of said part and having a second output signal representative of beam intensity scattered from said sheet material,

computing means connected to said first and second detector means for continuously computing the transmission ratio, R_1, by dividing said first output signal by the signal output of said first detector means in the absence of sheet material and computing the scattering ratio, R_2, by dividing said second output signal by the signal output of said second detector means in the presence of very thick standard sheet material, said transmission and scattering ratios, R_1 and R_2 being represented by electrical signals, said computing means including reference means for receiving inputs of nominal material composition and for having stored calibration data therein with respect to said material composition and further having as inputs said signals representative of said transmission ratio, R_1, and said

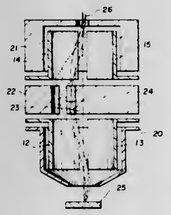
scattering ratio, R_2, said computing means using said ratios R_1 and R_2 with said calibration data and having as an output a corrected absorption coefficient signal μ_o, said reference means having circuit means interacting with said computing means for receiving said absorption coefficient signal μ_o and said transmission ratio signal R_1 for generating a material mass per unit area signal, ρT, and an output means for delivering said mass per unit area signal.

4,047,030

ARRANGEMENT FOR THE MASS-SPECTROMETRIC DETECTION OF IONS

Ernst Lobach, Triesenberg, Liechtenstein, assignor to Balzers Patent-und Beteiligungs-Aktiengesellschaft, Liechtenstein

Filed Sept. 24, 1975, Ser. No. 616,267
Claims priority, application Switzerland, Sept. 30, 1974, 13139/74
Int. Cl.² H01J *39/34*
U.S. Cl. 250—281 **7 Claims**



1. In an arrangement for the mass-spectrometric detection of ions, in the presence of a disturbing background, of the type including a source of ions, a mass-spectrometric separating system, a detector for the presence of ions, and a focusing device for the ions interposed between the source and the detector, an improved focusing device comprising an asymmetric electrostatic focusing lens system having a lens axis, an ion entrance aperture, and an ion exit aperture, and having at least a portion thereof asymetric to at least one of said apertures; said asymetric electrostatic focusing lens system suppressing the passage of disturbing particles while providing substantially unrestricted passage of ions between said entrance and exit apertures.

4,047,031

APPARATUS FOR OBTAINING RADIOGRAPHS

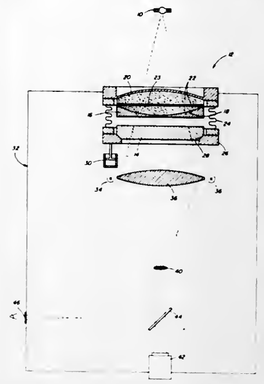
Lee Fitzpatrick Frank, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 22, 1976, Ser. No. 679,550
Int. Cl.² G01T *5/04*
U.S. Cl. 250—335 **10 Claims**

1. Radiographic apparatus for operation with a source of X-rays, said apparatus comprising:

means defining an air-tight chamber having a first, optically transparent end wall and a second, X-ray transparent end wall positioned between said X-ray source and said first end wall;

a mixture in said chamber, said mixture comprising (1) an X-ray absorber gas having an atomic number of at least 36, said absorber gas acting as an ion and electron emitter when exposed to X-rays, and (2) a supersaturated vapor adapted to condense on said ions and electrons whereby the path of the X-rays will be made visible; and



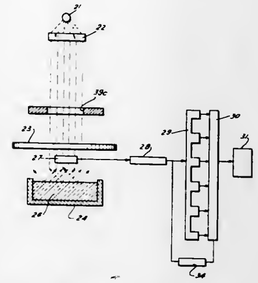
means for maintaining said absorber gas at a superatmospheric pressure so as to be substantially X-ray opaque.

4,047,032

STANDARD FOR SPECTRAL REFLECTANCE

John F. X. Judge, and Jerome Salpeter, both of Yorktown Heights, N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed June 9, 1975, Ser. No. 585,008
Int. Cl.² G01N *21/22, 21/48*
U.S. Cl. 250—338 **2 Claims**



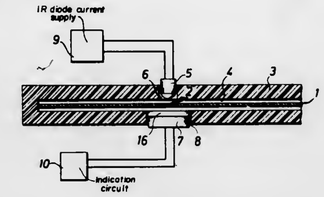
2. In an analyzer for quantitation of at least one constituent of interest of a sample by near infrared reflectance measurements, having means for irradiating a sample and a calibrating standard with light in the near infrared spectral region, detector means for receiving diffuse reflected light from said sample and said standard, such standard having known reflectance characterisitics in said spectral region, and means displaying the analytical results, the improvement wherein: said standard comprises a fired ceramic element having a surface for irradiation by said irradiating means to diffusely reflect said light, said element further having thickness to be self-supporting and having diffusivity and relatively low transmissive characteristics such that the characteristics of said reflected light are substantially determined by the material comprising said element and are essentially optically flat in the wavelength range of 1.4–2.4 micrometers, and wherein said standard comprises alumina.

4,047,033

CHECKING AN IDENTITY, AUTHORITY OR CHECK DOCUMENT OR THE LIKE

Thor Anders Helge Malmberg, Stockholm; Knut Göran Högberg, Hasselby, and Stig Roland Sjöquist, Vallentuna, all of Sweden, assignors to AB ID-Kort, Stockholm, Sweden

Filed Oct. 21, 1975, Ser. No. 624,473
Claims priority, application Sweden, Oct. 25, 1974, 7413480
Int. Cl.² G01J *1/00*
U.S. Cl. 250—341 **28 Claims**



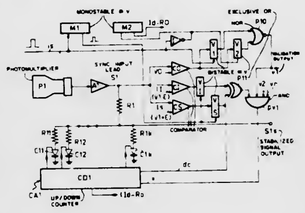
1. A checkable document, characterized in that it is provided with a marking comprising a material based upon rare earth metals, with the property that when excited by longer wave radiation it emits shorter wave radiation.

4,047,034

AUTOMATIC SYSTEM FOR CONTINUOUSLY CALIBRATING A GAMMA CAMERA

Michel Joseph Auphan, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 15, 1975, Ser. No. 613,622
Claims priority, application France, Sept. 27, 1974, 74.32687
Int. Cl.² G01J *1/42*
U.S. Cl. 250—354 **11 Claims**



1. An automatic system for the continuous re-calibration of a gamma ray camera comprising a scintillation crystal, a light conductor disposed proximate said crystal, a plurality of signal channels each including a photomultiplier disposed proximate said conductor, said automatic system comprising,

a device means for forming a reference light signal for the photomultipliers, said device means being disposed among said photomulitipliers, a generator means coupled to said device means for controlling the pulsed periodical calibration operation,

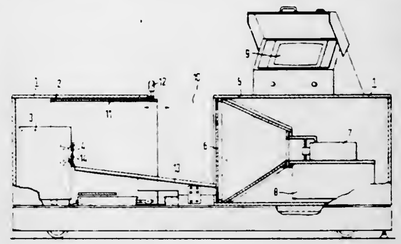
a plurality of cooperating circuits means coupled to said generator means for stabilizing the gain factor in each of said channels respectively at a value between a lower limit and an upper limit of a range about an initial gain factor, each of said stabilizing means comprising a resistance bridge including a plurality of resistors coupled to said photomultipliers, and means for changing the ratio of said resistors; and means for determining said initial gain factor with respect to only said reference light signal.

4,047,035

BAGGAGE INSPECTION DEVICE

Manfred Deanhoven, Wiesbaden; Claus Kunze, Taunusstein, and Reinhard Kuehn, Wiesbaden, all of Germany, assignors to Heimann GmbH, Germany

Filed Jan. 6, 1976, Ser. No. 649,663
Claims priority, application Germany, July 18, 1975, 2532218
Int. Cl.² G01M *23/22*
U.S. Cl. 250—355 **6 Claims**



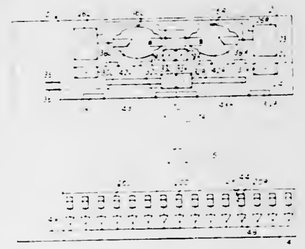
1. In a device for inspection of objects, particularly luggage and the like, by means of X-rays originating from an X-ray generator and penetrating the object being inspected to produce an image on a fluorescent screen, which image may be directly observable or, in combination with a television circuit, indirectly observable, the combination of an X-ray detector, a photo-conductive cell having an applied layer of X-ray sensitive luminescent material, said photo-conductive cell being disposed in the beam path of the X-ray generator directly at the beam outlet opening thereof, and means operatively connected to said X-ray detector and the high voltage circuit of the X-ray generator for switching off the high voltage generator in the event the intensity and/or duration of the emitted radiation at the detector exceeds a predetermined value.

4,047,036

STRIP PROFILE MEASUREMENT

Kenneth Browning Smith, Tuffley, and Derek William Adams, Cheltenham, both of England, assignors to Heath (Gloucester) Ltd., Gloucester, England

Filed Apr. 27, 1976, Ser. No. 680,558
Claims priority, application United Kingdom, May 10, 1975, 19743/75
Int. Cl.² G01N *23/16*
U.S. Cl. 250—359 **13 Claims**



1. A radiation gauge for measuring the profile of a strip travelling therethrough, comprising:

a single stationary radiation source disposed on one side of the strip for producing a beam of radiation in the form of a fan-shaped curtain intersecting said strip in a zone extending across at least part of the width of the strip substantially at right angles to its direction of travel;

a plurality of stationary radiation detectors disposed in a line on the other side of said strip, said detectors being spaced across at least part of the width of the strip corresponding to said irradiated zone and arranged to detect the fan-shaped beam of radiation from said single source which has passed through the strip in said zone; and

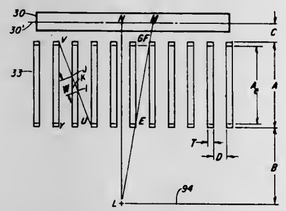
output signal means responsive to the detectors to produce respective output signals each representative of the thickness of the strip in a respective part of said zone.

4,047,037

GAMMA RAY CAMERA FOR NUCLEAR MEDICINE

Philip A. Schlosser, and John W. Steidley, both of Columbus, Ohio, assignors to The Ohio State University, Columbus, Ohio

Filed Feb. 9, 1976, Ser. No. 656,304
Int. Cl.² G01T *1/22*
U.S. Cl. 250—370 **21 Claims**



1. In a gamma camera type device for deriving image defining information of the source distribution of gamma rays providing a photon energy level, E, of interest, said device including an orthogonal strip array semi-conductor for deriving spatial and energy level information corresponding with said distribution, said detector array of strips having a frequency *vs* and strip spacing, l, said device further including collimator means operatively associated with said detector and having an inwardly disposed plane defining side spaced from the mid-plane of said detector a distance, C, having an outwardly disposed plane defining side spaced from said inward side to define thickness, A, and spaced from said source a distance, B; the improvement wherein said collimator means comprises:

an array of adjacently disposed channels, having internal surfaces and disposed intermediate of said inward and outward sides, said array being configured to define a septal thickness, T, intermediate said channels, an effective collimator thickness, $A_E = A - [2/\mu(E)]$, and $\mu(E)$ is the attenuation coefficient of the surface defining material of said channels, for said energy level, *E*, said channels having a channel cross sectional area of effective diameter, D; and said collimator means having a collimator resolution, R_c, equal to or greater than about 1.7 (l) and being configured in substantial satisfaction of the expression:

$$R_c = (D/A_E)(A + B + C).$$

4,047,038

U.V. DETECTOR

Arlon D. Kompelien, Richfield, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 23, 1976, Ser. No. 708,142
Int. Cl.² G01J *1/42*
U.S. Cl. 250—372 **2 Claims**

1. In combination:

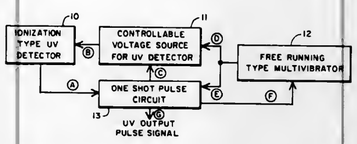
U.V. detector means of the ionization type;

controllable voltage source means having a pair of supply terminals connected for energizing said detector means, said supply terminals normally providing to said detector means a first polarity of potential;

second means in said controllable voltage source means for causing a reversal of polarity of the potential supplied at said pair of terminals;

free running oscillator means providing a first signal to said second means to cause temporary reversals of polarity at a predetermined rate;

a pulse output circuit from said U.V. detector means;



one-shot pulse circuit means connected to be triggered by said pulse output circuit, said one-shot means providing a second signal pulse to said second means each time it is triggered by a signal from said detector means to cause said reversal of polarity; and

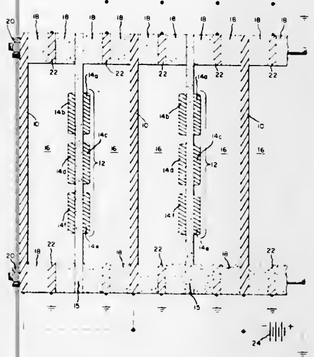
oscillator means turn-off means connected to stop said oscillator means when U.V. is being detected by said detector means.

4,047,039

TWO-DIMENSIONAL X-RAY DETECTOR ARRAY

John M. Houston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 3, 1976, Ser. No. 692,287
Int. Cl.² G01T *1/18*
U.S. Cl. 250—385 **18 Claims**



1. In an x-ray detector array of the type comprising a gaseous medium characterized as being substantially opaque to electromagnetic radiation at x-ray frequencies; a plurality of substantially planar cathodes disposed in said gaseous medium; a plurality of substantially planar anode assemblies disposed in said gaseous medium, each of said anode assemblies lying approximately equi-distant between two of said cathodes, and means for applying electric potential between said cathodes and said anode assemblies; the improvement wherein:

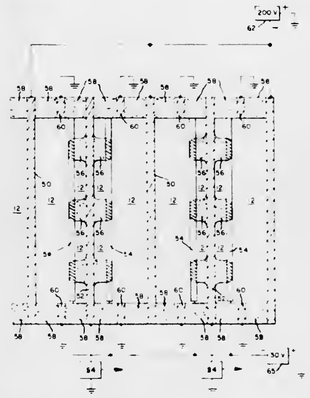
each of said anode assemblies comprises a plurality of parallel conductive strips disposed on one or more surfaces of a planar dielectric sheet, the long dimension of each of said strips being oriented substantially parallel to an incident x-ray beam.

4,047,040

GRIDDED IONIZATION CHAMBER

John M. Houston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 6, 1976, Ser. No. 683,908
Int. Cl.² G01T *1/18*
U.S. Cl. 250—385 **10 Claims**



1. An ionization chamber x-ray detector comprising:

a substantially flat anode sheet;

a substantially flat cathode sheet disposed parallel said anode sheet;

a perforated insulating layer disposed on the surface of said anode sheet;

an open grid comprising a thin, perforated metal sheet disposed on said insulating layer, the perforations of said insulating layer and metallic sheet being aligned;

a gaseous detecting medium disposed between said cathode, said anode, and said grid;

means for maintaining an electrical potential between said anode and said cathode;

means for maintaining said grid at an electrical potential intermediate that of said anode and said cathode; and

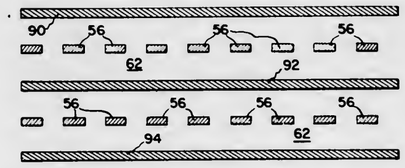
means for measuring current flow from said anode to said cathode.

4,047,041

X-RAY DETECTOR ARRAY

John M. Houston, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 19, 1976, Ser. No. 678,074
Int. Cl.² G01T *1/18*
U.S. Cl. 250—385 **9 Claims**



1. An ion chamber detector array for determining the distribution of x-ray intensities in one or more flat, coplanar, x-ray beams comprising:

a first flat anode sheet disposed in a plane lying parallel to the plane of said x-ray beams;

a second, flat anode sheet disposed parallel to said first anode sheet,

a third, flat anode sheet disposed parallel to and adjacent a side of said first anode sheet opposite said second anode sheet;

a first plurality of rod-like cathode elements disposed in said x-ray beam and equi-distant between said first anode sheet and said second anode sheet, a long dimension of said cathode elements being oriented in a direction substantially parallel to the angle of incidence of one or more of said x-ray beams;

a second plurality of rod-like cathode elements disposed in said x-ray beam and equi-distant between said first anode sheet and said third anode sheet, a long dimension of said cathode elements being oriented in a direction substantially parallel to the angle of incidence of one or more of said x-ray beams;

a gaseous detecting medium disposed between said first anode sheet, and second anode sheet, said third anode sheet, and said cathodes;

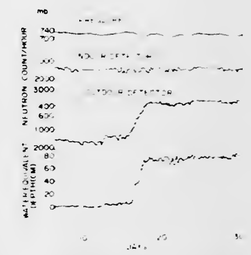
means for applying an electric potential between said cathodes and said anodes, whereby an electric field is impressed between said cathodes and said anodes, and for connecting each of said cathodes to a signal processing circuit.

4,047,042

METHOD OF DETERMINING THE WATER EQUIVALENT DEPTH OF SNOWFALL USING NEUTRONS OF COSMIC RAYS

Masami Wada, Higashikurume; Masahiro Kodama, Kita, and Shinkichi Kawasaki, Yokohama, all of Japan, assignors to Rikagaku Kenkyusho, Japan

Filed June 12, 1975, Ser. No. 586,510
Claims priority, application Japan, June 15, 1974, 49-68397
Int. Cl.² G01T *3/00*
U.S. Cl. 250—390 **1 Claim**



1. A method of determining the water-equivalent depth of an accumulation of snow, which comprises the steps of counting the neutrons of cosmic rays incident upon a given accumulation of snow, counting the neutrons of said cosmic rays after passing through said accumulation of snow, and determining the water-equivalent depth of said accumulation of snow from said countings of neutrons and upon the basis of the formula:

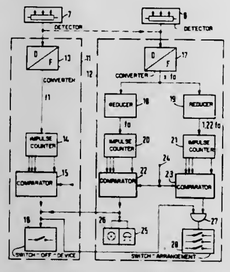
$$W = \frac{[\ln N_o - \ln N_s}{b},$$

wherein N_o is the count of neutrons of the cosmic rays incident upon said snow, N_s is the count of neutrons of the cosmic rays after passing through said snow, *b* is an absorption factor within the range 0.01/gcm^{-2} to 0.02/gcm^{-2}, and W is the water-equivalent depth, in cm., of said accumulation of snow.

4,047,043
IRRADIATION INSTALLATION FOR IONIZING RADIATION

Rudolf Meyer, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 26, 1976, Ser. No. 652,577
Claims priority, application Germany, June 12, 1975, 2526294
Int. Cl.[2] G01T 1/00
U.S. Cl. 250—401 5 Claims



1. In an irradiation installation for ionizing radiation, including at least one radiation detector exposed to the radiation; a first radiation monitor for presetting of the radiation dosage to be currently applied and for the limiting thereof to a currently preset reference value; a presettable integrating unit connected to said radiation detector; and automatic switch-off means for said installation activated by said integrating unit responsive to reaching of said preset radiation dosage, the improvement comprising: a second control radiation monitor for surveilling the plus and minus tolerance of said first radiation monitor, said second radiation monitor including a dose rate frequency converter for converting the signals of said radiation detector into a frequency proportional to the dose rate, two differing frequency reducers being connected to the output of said dose rate frequency converter, said reducers having reduction ratios deviating from each other within a tolerable error band width, impulse counters being connected one each to respectively one of said two frequency reducers, and digital comparators having a commonly presettable count capacity being connected to the outputs of each of said two frequency reducers, the output of the digital comparator associated with the more extensively reducing reducer being connected with said automatic switch-off means, the output of the digital comparator associated with the less extensively reducing reducer being connected to a main protector for blocking of the entire irradiation installation, and the input of said dose rate frequency converter being connected with said radiation detector.

4,047,044
ANODE HEAT MONITORING MEANS

Kenneth E. Weaver, Stamford, Conn., assignor to The Machlett Laboratories, Inc., Stamford, Conn.

Filed June 1, 1976, Ser. No. 691,945
Int. Cl.[2] H05G 1/28
U.S. Cl. 250—402 5 Claims

1. A radiographic system for displaying a visible image of an irradiated subject and comprising:
- an x-ray source disposed to direct an x-ray beam through the subject and produce a corresponding x-ray image thereof;
- imaging means interceptingly disposed in the path of the x-ray beam for receiving the x-ray image and producing a corresponding visible image;
- sensing means disposed to receive informational data concerning the x-ray source and produce equivalent electrical signals; and
- display means comprising a television monitor with a display screen and a television camera unit disposed to receive the visible image, said monitor being electrically coupled the camera unit and the sensing means for showing the visible

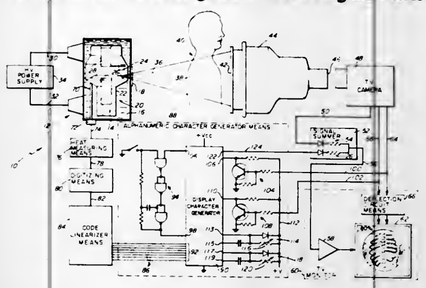
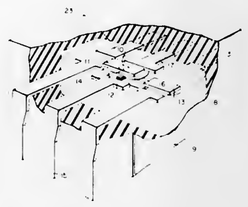


image and the informational data in the same field of view on the display screen.

4,047,045
OPTICAL COUPLER

Grady W. Paxton, Jr., P.O. Box 227, Allen, Tex. 75002; Bobby W. Howeth, 103 S. Lindale; Edward W. Mehal, 1110 Hamilton, both of Richardson, Tex. 75080; William F. Cashion, 5638 Anita St., Dallas, Tex. 75206, and Charles M. Cashion, 103 Wake, Richardson, Tex. 75080

Continuation-in-part of Ser. No. 554,968, March 3, 1975, abandoned. This application July 1, 1976, Ser. No. 701,895
Int. Cl.[2] G02B 27/00
U.S. Cl. 250—551 15 Claims

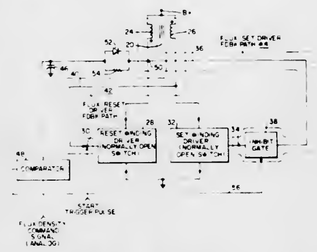


1. Apparatus comprising:
- a. a photo-emissive body mounted on a first beam,
- b. a photo-responsive body mounted on a second beam electrically isolated from said first beam and spaced therefrom, said photo-emissive and photo-responsive bodies mounted in opposed relationship with a space therebetween, said first and second beams extending in opposite directions from said bodies and juxtaposed in spaced relationship only in the areas supporting said bodies, and
- c. a rigid unitary body of substantially electrically non-conductive transfer molded material substantially transparent to the operative wavelengths of said photo-emissive and photo-responsive bodies formed in the space between said bodies and extending outwardly from said bodies and surrounding sufficient portions of said beams to provide structural rigidity to said apparatus and maintain the separation between said bodies, thereby avoiding the formation of any interface extending substantially parallel with the optical path between said photo-emissive body and said photo-responsive body.

4,047,046
CIRCUIT FOR SETTING MAGNETIC REMANENCE IN A MAGNETIZABLE CORE

Walter E. Millberger, Severna Park, and Gerald I. Klein, Baltimore, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 6, 1976, Ser. No. 646,790
Int. Cl.[2] H01F 13/00
U.S. Cl. 307—101 10 Claims

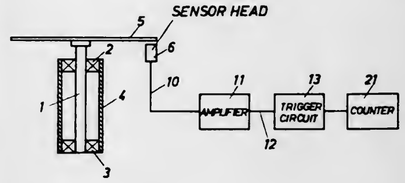


1. In circuit apparatus for selectively variably setting the magnetic remanence in a magnetizable core in accordance with a set control signal, the combination:
- a. a core made of a magnetizable material having an approximately rectangular hysteresis characteristic,
- b. a voltage source providing a potential between a pair of output terminals,
- c. a pair of windings wound about and inductively coupled to said core, said pair of windings comprising a reset winding and a set winding, each of said pair of windings having an operating potential end and an induced regenerative signal end, the operating potential ends of both the reset and set windings being commonly connected to one of the output terminals of the voltage supply, the construction and arrangement being such that a current through the reset winding will induce into the set winding a voltage signal which at the feedback end of the set winding bears a regenerative feedback relationship to said current through the reset winding, and such that a current through the set winding will induce into the reset winding a voltage signal which at the feedback end of the reset winding bears a regenerative feedback relationship to said current through the set winding,
- d. a normally open reset winding switch device for operatively connecting the other terminal of the voltage source with the feedback end of the reset winding, said reset winding switch device having a control input connected to the feedback end of the set winding, said reset winding switch device being operative to change to its closed circuit condition in response to the application to its control input of a voltage of the polarity of a regenerative feedback signal which appears at the feedback end of the set winding.
- e. a normally open set winding switch device for operatively connecting the other terminal of the voltage source with the feedback end of the set winding, said set winding switch having a control input and being operative to change to its closed circuit condition in response to the application to its control input of a voltage of the polarity of a regenerative feedback signal which appears at the feedback end of the set winding, said control input of the set winding switch device being connected to the regenerative feedback end of the reset winding whereby the collapsing flux associated with the reset winding following saturation of the core causes a voltage to be generated at the feedback end of the reset winding to actuate the set switch in its closed circuit condition, and
- f. signal inhibit means responsive to the set control signal and to the flow of current in set winding, said signal inhibit means being operative to terminate the application of the regenerative feedback signal from the feedback end of the reset winding to the control input of the set winding set device when the magnetization imparted to the core by flow of current through the set winding reaches a magnitude corresponding to the remanent magnetization called for by the set control signal.

4,047,047
PULSE GENERATOR

Mogens Bredal Boysen, Copenhagen, Denmark, assignor to 4K - International A/S, Copenhagen, Denmark

Filed June 14, 1974, Ser. No. 479,497
Int. Cl.[2] H03K 3/00
U.S. Cl. 307—106 8 Claims



1. A pulse generator for measuring the rotational angle of a rotatably supported shaft member comprising:
- a. a driven member including a magnetizable endless track forming an integral, direct surface portion of said driven member;
- b. recorded signal means carried on said endless track; said recorded signal means being formed of a plurality of recorded sinusoidal signals distributed along said endless track; said sinusoidal signals being constituted by different states of magnetization of the different locations on said endless track;
- c. means connecting said driven member to said shaft member for moving said driven member by said shaft member to an extent proportional to the rotational angle of said shaft member;
- d. means for continuously scanning successive locations of said endless track for generating a signal as a function of the flux of the magnetic field generated by the different states of magnetization of successive points on said endless track;
- e. signal processing means for continuously and successively sensing the generated signal for forming a voltage signal having a course corresponding to said generated signal and for emitting a signal pulse each time said voltage signal exceeds a threshold value; and
- f. counter means for counting said signal pulses.

4,047,048
MASTER CYLINDER WITH COMBINED RESERVOIR COVER, SEAL AND FLUID LEVEL SENSOR ASSEMBLY

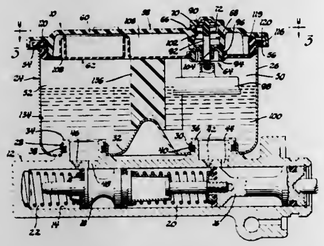
Michael Demido, Troy, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1976, Ser. No. 675,742
Int. Cl.[2] H01H 35/18
U.S. Cl. 307—118 3 Claims

1. For use with a fluid reservoir adapted to contain a fluid sealed from atmosphere and defining a fluid level adapted to be sensed without breaking the seal, the reservoir being defined by a housing having a continuous upper edge surface:
- a combined reservoir cover and seal and fluid level sensor assembly comprising:
- a molded cover having a channel on one side thereof defined by a bottom surface adapted to align with the reservoir housing upper edge surface and spaced inner and outer side walls adapted to receive the housing upper edge

surface therebetween, a generally cylindrical sensor mounting hub adapted to be positioned over the reservoir when the edge surface is received in said channel above a portion of the reservoir where the fluid level is to be sensed, and electrical conduits leading from said hub within said cover to a connector integrally formed as a part of said cover and adapted to receive a wiring harness connecting the sensor to a signal circuit;

said sensor having switch means mounted in said hub in electrical communication with said electrical conduits and float means extending below the cover and supported by said hub, said float means being adapted to extend into the reservoir for floating with respect to the fluid level therein to close said switch means to energize the signal circuit when the fluid level decreases to a predetermined point;



and a seal comprising a convoluted diaphragm spaced from said cover to form a cavity therebetween, said seal having an end wall positioned in said channel with one side thereof in sealing engagement with said channel inner side wall and adapted with the opposite side thereof to sealingly engage the reservoir housing adjacent the upper edge surface thereof to seal contained fluid from atmosphere, said float means extending through an aperture in said diaphragm, a guide in said aperture having means for venting between the reservoir and the portion of said hub containing said switch means, and vent means venting said cavity to displace air therethrough in response to changes in said fluid level;

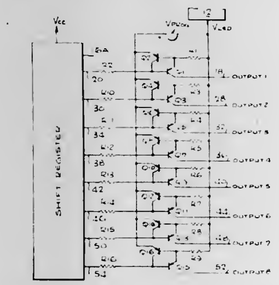
and means for removably retaining said cover and said seal on the reservoir.

4,047,049

DRIVE CIRCUIT WITH CONSTANT CURRENT OUTPUT

Fred William Erickson, Woodland Hills, and Roy Hiroshi Nakahara, Sun Valley, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 28, 1975, Ser. No. 626,250
Int. Cl.² H02J *9/02*
U.S. Cl. 307—157 **10 Claims**



1. A constant current drive circuit comprising:

a. first electrical energy source means supplying a first electrical energy level output,

b. second electrical energy source means responsive to said first electrical energy level output and supplying a selectively variable second energy level output,

c. a resistor connected in electrical series with said first electrical energy source means and responsive to said first electrical energy level output,

d. bistable control means including triode means responsive to said first electrical energy level output through said resistor and to said second electrical energy level output, said bistable triode means providing a third electrical energy level output having a constant current determinable by said selectively variable second energy level output, and

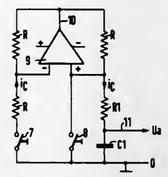
e. signal generating means selectively enabling and disabling said triode means so that the constant current drive circuit is selectively enabled and disabled.

4,047,050

CALIBRATING IMPULSE GENERATOR FOR AN IMPULSE-SHAPING ELEMENT

Estan Laurent, Lidingo, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 21, 1975, Ser. No. 624,559
Claims priority, application Germany, Nov. 7, 1974, 2452933
Int. Cl.² H05K *3/00*
U.S. Cl. 307—108 **3 Claims**



1. A calibrating impulse generator including a signal-shaping element having an input for receiving an input signal $f(t)$ and being operative for reshaping the input signal pursuant to a function represented by the quotient of the derivative with respect to time of the input signal, and the input signal, the quotient thus being expressed:

$$\left(\frac{df(t)}{dt} / f(t)\right),$$

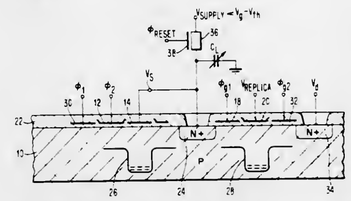
the improvement comprising said calibrating impulse generator having a calibrating impulse generating circuit with an output connected to the input of said signal-shaping element, said calibrating impulse generating circuit having a construction for supplying a calibrating impulse to said output which proceeds from an initial value pursuant to an *e*-function over a period of time to a final value and after reaching the final value returns again to its initial value, said calibrating impulse returning from said final value to its initial value pursuant to an *e*-function which is a mirror-image to the *e*-function pursuant to which said signal proceeds from its initial value to its final value.

4,047,051

METHOD AND APPARATUS FOR REPLICATING A CHARGE PACKET

Lawrence Griffith Heller, Brewster, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 24, 1975, Ser. No. 625,425
The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.
Int. Cl.² G11C *19/28*; H01L *29/78*
U.S. Cl. 307—221 D **3 Claims**



1. A circuit for entering quantities of electrical charge carriers into a first charge storage well of a solid-state charge-transfer-device of the type having a semiconductor substrate and a plurality of charge transfer means for moving quantities of electrical charge carriers in a controlled manner across said substrate, said circuit comprising:

a source diffusion means located on said semiconductor substrate and producing an inherent depletion capacitance C_ϕ

an input lead connected to said source diffusion means,

an active device connected between a supply voltage and said input lead, said active device being controlled by a source of reset signal to couple said supply voltage to said source diffusion to raise the potential of said source diffusion to equal a predetermined first precharge potential,

a second charge storage well containing a quantity of original charge Q for providing a voltage ΔV which is applied and coupled to said input lead to vary the potential of said source diffusion for producing and inserting into said first charge storage well of said charge-transfer-device a quantity of charge carriers Q directly proportional to said voltage ΔV and independent of said depletion capacitance C_ϕ

and an electrical charge drain means located on said semiconductor substrate to remove charge carriers produced by said diffusion when said source diffusion is equal to said predetermined first precharge potential.

4,047,052

CIRCUIT ARRANGEMENT FOR REGULATING THE AMPLITUDE OF A SAWTOOTH GENERATOR

Michael Koubek, Munich, and Dietmar Mallon, Zorneding, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 16, 1976, Ser. No. 667,516
Claims priority, application Germany, Mar. 17, 1975, 2511642
Int. Cl.² H03K *4/08*
U.S. Cl. 307—228 **1 Claim**

1. An arrangement for regulating the amplitude of a sawtooth wave, comprising:

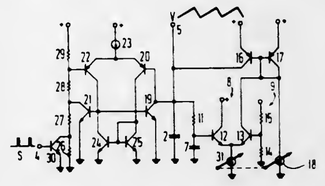
a first capacitor connected to a current source;

a switch connected to said first capacitor and operated to periodically charge and discharge said first capacitor to form the sawtooth wave, said switch including an input for receiving and being controlled by synchronizing pulses; and

a regulating circuit including a second capacitor connected to circuit with said first capacitor and having the mean value of the sawtooth wave, a comparator for comparing the mean value with a reference value, and means connected to said comparator and to said first capacitor for controlling the charging of said first capacitor in dependence upon the comparison to maintain the mean value equal to the reference value,

said comparator comprising a differential amplifier and a constant current source connected to said differential amplifier, and comprising a current reflector connected to said differential amplifier and to said first capacitor,

said differential amplifier comprising a pair of emitter-coupled transistors, and constant current source connected between said coupled emitters and a reference potential, a first of said transistors including a base connected to said



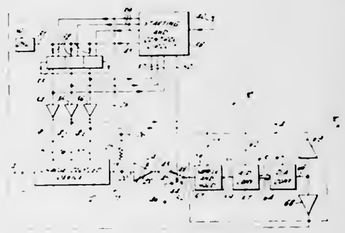
second capacitor and a collector connected to a supply potential, a voltage divider providing the reference value, the second transistor including a collector, and a base connected to the voltage divider to receive the reference potential, and third and fourth base-coupled transistors each having a collector, and an emitter connected to the supply potential, said coupled bases connected to said collectors of said second and third transistors, and said collector of said fourth transistor connected to said first capacitor.

4,047,053

ANALOGUE STORAGE CIRCUIT INCLUDING CHARGE TRANSFER DEVICE WITH COMPENSATION LOOP

Anthony John Ley, New Canaan, Conn., and Eric Metcalf, Ropley, England, assignors to The Solartron Electronic Group Limited, Farnborough, England

Filed Aug. 6, 1975, Ser. No. 602,161
Claims priority, application United Kingdom, Aug. 10, 1974, 35328/74; Sept. 7, 1974, 39186/74
Int. Cl.² H01L *27/10*
U.S. Cl. 307—238 **23 Claims**



1. An analogue storage circuit comprising:

a charge transfer device having an input whereby an analogue signal may be introduced into the device, an output, and means whereby the analogue signal may be shifted from the input to the output, the analogue signal being subject to a change in magnitude during said shifting;

a quantising circuit for receiving the analogue signal from the output of the charge transfer device and for quantising the received analogue signal at a respective one of a plurality of substantially discrete levels, the particular level at which said signal is quantised being one of two of the discrete levels between which the magnitude of the received analogue signal lies, the particular level being the

one nearest to the magnitude of the received analogue signal, the separation of each pair of adjacent discrete levels being not less than twice the magnitude of said change in analogue signals whose magnitude lies between that pair of levels, the quantising circuit being arranged to apply the quantised analogue signal to the input of the charge transfer device, whereby in operation the analogue signal is circulated round the loop defined by the charge transfer device and the quantising circuit, the quantising circuit being further arranged to quantise the analogue signal, upon each subsequent receipt thereof, at the same one of said discrete levels; and

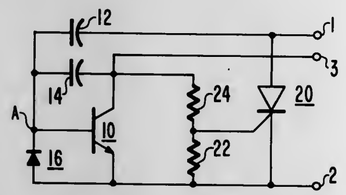
input means for introducing an analogue input signal to be stored into the loop defined by the charge transfer device and the quantising circuit.

4,047,054

THYRISTOR SWITCHING CIRCUIT

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,537
Int. Cl.² H03K 17/72
U.S. Cl. 307—252 J **2 Claims**



1. A switching circuit comprising, in combination:

first and second terminals for receiving a signal thereacross to be switched and a third terminal for receiving a trigger signal;

a thyristor having a main conduction path coupled between said first and second terminals and having also a gate electrode;

means coupling said gate electrode to said third terminal;

a node;

current amplifier means having an input electrode coupled to said node and an output electrode coupled to said third terminal;

a first capacitor coupled between said node and said first terminal; and

a second capacitor coupled between said node and said third terminal.

4,047,055

LINE CONTROL UNIT FOR TELEPRINTERS

Antonio Romano, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Nov. 18, 1975, Ser. No. 632,909
Claims priority, application Italy, Dec. 24, 1974, 70739/74
Int. Cl.² H03K 5/01
U.S. Cl. 307—262 **2 Claims**

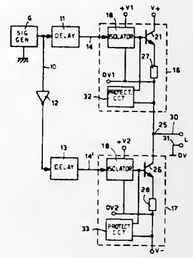
1. Line control unit for teleprinters for a double-current line, comprising:

a circuit for generating switching signals,

a first pair of line transistors connected to a source of positive and negative voltages, respectively, and furthermore interconnected at a point common to the said line to supply selectively on said line a positive and negative current, respectively,

a pair of isolating circuits disposed between said line transistors and said generating circuit for galvanically isolating said line from said generating circuit,

a pair of delay circuits arranged between said generating circuit and said isolating circuits, for delaying the edges of



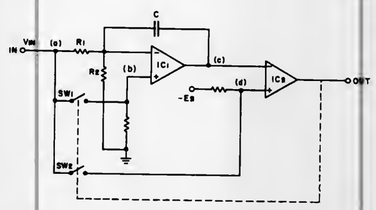
the switching signals at which said line transistors respectively turn from the blocked state to the conductive state.

4,047,056

VOLTAGE-FREQUENCY CONVERTER

Kazuyoshi Nakagawa, Yokohama, Japan, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 2, 1976, Ser. No. 737,989
Int. Cl.² H03K 1/16
U.S. Cl. 307—271 **3 Claims**



1. A voltage-to-frequency converter comprising

an integrator having an inverting input terminal and a non-inverting input terminal,

an input signal terminal,

circuit means connecting said input signal terminal to said inverting input terminal,

first switch means connecting said input signal terminal to said non-inverting input terminal,

a signal comparator having an inverting input terminal and a non-inverting input terminal,

circuit means connecting an output of said integrator to said inverting input of said comparator,

reference signal means connected to said non-inverting input of said comparator,

second switch means connecting said input signal terminal to said non-inverting input of said comparator and

means connecting an output of said comparator to said first and second switch means to concurrently operate said first and second switch means.

4,047,057

MONOSTABLE SWITCHING CIRCUIT

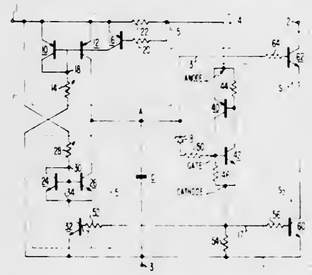
Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,538
Int. Cl.² H03K 3/02, 5/04
U.S. Cl. 307—273 **16 Claims**

1. A circuit, for producing a momentary output signal manifestation in response to a change in an input signal from a first level to a second level; said circuit comprising:

current source means having first and second input terminals for receiving said input signal thereacross, an output terminal responsive to said input signal when it is at said second level for producing an output current, and first and second control terminals for controlling the sense of said output current in accordance with the magnitude of a control current conducted between said control terminals, said control current having first and second magnitudes;

normally open switch means connected between said first and second control terminals for conducting said control current therebetween when closed and for blocking the flow of said control current when open, said switch means



including a trigger terminal responsive to a trigger signal supplied thereto for closing said switch and means for maintaining said switch closed once triggered; and

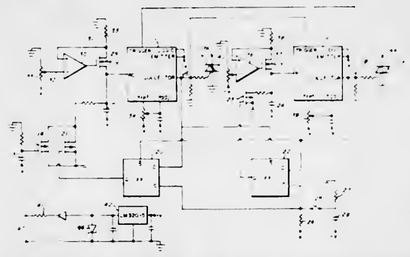
means for applying a trigger signal to said trigger terminal of said normally open switch means, said means including a circuit reference potential point, a capacitor connected between said reference potential point and said output terminal of said current source and a threshold conduction device connected between said output terminal and said trigger terminal.

4,047,058

ALTERNATING CONTROLLER COMPRISING PAIR OF MUTUALLY EXCLUSIVELY-OPERATED TIMERS

Aaron F. Green, One Holbrook Court, Rockport, Mass. 01966

Filed May 21, 1976, Ser. No. 688,906
Int. Cl.² H03K 5/13, 17/00
U.S. Cl. 307—293 **18 Claims**



1. An electronic controller for controlling the power applied to at least one load comprising;

first and second timers each having a trigger input, a timing input and an output,

means coupling the output of the first timer and trigger input of the second timer, and the output of the second timer and trigger input of the first timer to provide dependent operation between timers,

a pair of electronic switches coupling, respectively, from the output of the first and second timers to the load,

first and second charging circuits coupled to the timing input of the first and second timers, respectively, for providing a predetermined time interval of operation of each timer, and

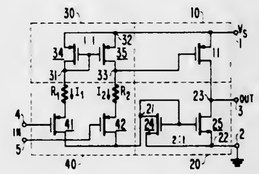
timer selection means including manual switch means coupled to the timing input of at least one of said timers for changing the state thereof.

4,047,059

COMPARATOR CIRCUIT

Bruce David Rosenthal, Highland Park, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 24, 1976, Ser. No. 689,267
Int. Cl.² H03K 5/20
U.S. Cl. 307—355 **10 Claims**



1. A comparator, for producing an output signal dependent upon both the ratio of the magnitudes and the sum of the magnitudes of first and second input signals to be compared, comprising, in combination:

two supply terminals for receiving an operating voltage thereacross and a circuit output terminal for providing said output signal thereat;

input means for conducting first and second currents between said supply terminals and for independently controlling the magnitudes thereof in accordance with the magnitudes of said first and second input signals, respectively;

controlled conduction means coupled between one of said supply terminals and said circuit output terminal for conducting a current therebetween proportional to a control signal;

means for summing said first and second currents to obtain said control signal, whereby said current conducted by said controlled conduction means varies in proportion to the sum of the magnitudes of said first and second input signals;

switch means connected between said output terminal and the other of said supply terminals; and

means coupled to said switch means and responsive to said first and second currents for closing said switch means when the ratio between said first and second currents is a first value and for opening said switch means when said ratio is a different value.

4,047,060

ACOUSTIC TRANSDUCER WITH ELASTOMERIC COUPLING

Hugo Willy Schafft, Des Plaines, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 178,102, Sept. 7, 1971, abandoned, and Ser. No. 405,208, Oct. 10, 1973, abandoned, and Ser. No. 532,114, Dec. 12, 1973, abandoned. This application Feb. 5, 1976, Ser. No. 655,367
Int. Cl.² H01L 41/04
U.S. Cl. 310—322 **3 Claims**

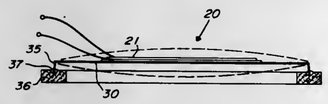
1. A piezoelectric acoustic transducer comprising:

a. a generally circular, disc shaped piezoelectric element having opposed major surfaces with electrodes affixed thereto;

b. a generally circular diaphragm formed of piezoelectrically inactive material having a different thermal coefficient of expansion from said piezoelectric element, said

diaphragm having opposed major surfaces one of which defines an area at least coextensive with one of the major surfaces of said piezoelectric element;

c. an elastomeric interlayer having one surface affixed to said one major surface of said piezoelectric element and an opposed surface affixed to said one coextensive major surface of said diaphragm, said elastomeric interlayer being formed of material having a shear modulus which varies directly with the frequency of stress applied thereto



and said material being further characterized by mechanically coupling said piezoelectric element to said diaphragm at acoustic frequencies within the operating range of the transducer and decoupling said piezoelectric element from said diaphragm at lower frequencies;

d. a mounting member; and

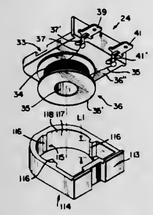
e. flexible hinge means fixedly attaching said diaphragm to said mounting member for axial flexing movements at an acoustic rate.

4,047,061

COIL PROTECTOR FOR PERMANENT MAGNET SYNCHRONOUS MOTOR

Bill G. Kilmer, Indianapolis, and David F. Baugh, Jr., Greenwood, both of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Continuation of Ser. No. 342,204, March 6, 1973, abandoned. This application July 3, 1974, Ser. No. 485,396
Int. Cl.² H02K *19/00*
U.S. Cl. 310—164 **1 Claim**



1. An electric motor construction comprising:

a. a field structure;

b. an energizing winding comprising a wire wound bobbin comprising a spindle, a coil of wire surrounding the spindle, said spindle carrying in substantially spaced relation a resilient flange and a terminal-retaining flange, ends of said wire being connected to two terminals in said terminal retaining flange;

c. a permanent magnet rotor; and

d. a coil protector comprising:

1. a substantailly-flat housing having a hole passing through it substantially the same size and shape as said resilient flange of said coil bobbin and of sufficient depth to envelop the outer periphery of said coil, and

2. a plurality of ribs projecting from an inside wall of said hole in toward the center, each having a length in a direction substantially parallel to the axis of said spindle about equal to the inside length of said spindle from said resilient flange to said terminal-retaining flange, whereby said coil protector is pressed down against said resilient flange, to force said projections over said resilient flange and snap them into place between said resilient flange and said terminal-retaining flange thereby entraping said coil protector to said wire-wound bobbin.

4,047,062

ROTATING ELECTRICAL MACHINE

Ludwig Ludin, Kesselackerweg, CH-5611 Anglikon-Wohlen, Switzerland, and Nikolaus Laing, Hofener Weg 35-37, D-7141 Aldingen near Stuttgart, Germany

Continuation of Ser. No. 419,216, Nov. 26, 1973, abandoned. This application Aug. 7, 1975, Ser. No. 602,671
Claims priority, application Austria, Nov. 28, 1972, 10108/72
Int. Cl.² H02K *1/12*
U.S. Cl. 310—216 **16 Claims**

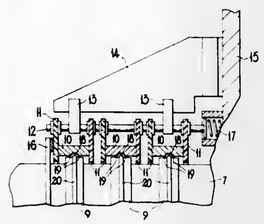
1. An electric motor including a rotatable armature, a stator having a plurality of circumferentially spaced pole teeth which extend substantially parallel to the axis of rotation of the armature, a magnetic circuit closure body having two axial ends magnetically connecting said teeth and extending axially along said axis, and a plurality of coils for generating a magnetic force in said teeth, the improvement comprising in that each said coil is positioned in a circumferential space between circumferentially adjacent teeth, in that said coils are circumferentially spaced from each other at a predetermined angle dependent upon the number of phases of excitation, in that each said coil has portions surrounding the two axial ends of said magnetic circuit closure body in radially extending planes and portions surrounding the circumferential surface of said magnetic closure body in axially extending planes and in that said pole teeth comprise strips arranged in radially extending planes.

4,047,063

LIQUID METAL SLIP-RING ARRANGEMENT FOR A DYNAMO ELECTRIC MACHINE

Albert Benjamin John Reece, Stafford, and Anthony John Walkden, Watford, both of England, assignors to The General Electric Company Limited, London, England

Continuation of Ser. No. 532,916, Dec. 16, 1974. This application Apr. 9, 1976, Ser. No. 675,481
Int. Cl.² H01R *39/08*
U.S. Cl. 310—232 **7 Claims**



1. A dynamo electric machine including:

A. a rotor shaft;

B. a member supporting the rotor shaft;

C. a winding carried on the rotor shaft; and

D. a liquid metal slip-ring arrangement for the supply of current to or from said winding, said slip-ring arrangement comprising:

I. a first electrically conductive annular member which is coaxial with said rotor and rotates therewith and which is electrically connected with said winding;

II. a second electrically conductive annular member;

III. support means connected between said second annular member and said member supporting the rotor shaft so as to support said second annular member coaxially with said first annular member and to provide an annular gap between said first and said second annular members, and to hold said second annular member non-rotating while permitting axial movement thereof;

IV. coupling means connected at one end to said second annular member and at its other end to the rotor shaft to cause said second annular member to move axially with said first annular member during axial movement of the rotor shaft; and

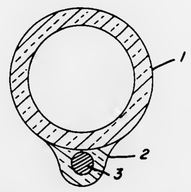
V. a supply of liquid metal in said annular gap between said first and said second annular members whereby electrical connection between said members is established.

4,047,064

FLASH TUBE HAVING ENCLOSED TRIGGER WIRE

Robert J. Cosco, Amesbury; Joseph V. Lima, Salem, and Frank Soucy, Danvers, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed June 16, 1976, Ser. No. 696,667
Int. Cl.² H01J *65/00*
U.S. Cl. 313—201 **2 Claims**



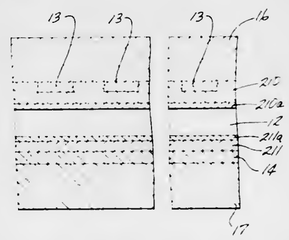
1. In a flash tube having an hermetically sealed glass envelope containing an inert gas and a pair of electrodes between which an arc discharge path is defined during lamp operation, the improvement which comprises a tungsten trigger wire embedded within a glass tube which is fused to the outer surface of the envelope, the coefficient of expansion of the glass tube being intermediate that of the tungsten trigger wire and that of the glass envelope.

4,047,065

GAS DIELECTRIC OVERCOAT FOR PANEL

Roger E. Ernsthausen, Lucky, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 406,022, Oct. 12, 1973, Pat. No. 3,943,394, which is a continuation-in-part of Ser. No. 204,700, Dec. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 70,745, Sept. 8, 1970, Pat. No. 3,634,719. This application Dec. 9, 1975, Ser. No. 639,150
The portion of the term of this patent subsequent to Mar. 9, 1993, has been disclaimed.
Int. Cl.² H01J *65/00, 61/02*
U.S. Cl. 313—201 **6 Claims**



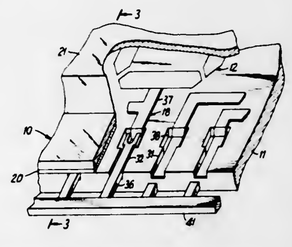
1. In a gas discharge display/memory device characterized by an ionizable gas medium in a gas chamber formed by a pair of opposed dielectric material charge storage members having surfaces in contact with the gas medium and at least one electrode insulated from the gas medium by a dielectric member, the improvement wherein each dielectric gas contacting surface is at least partially coated with a layer of at least one inorganic lead compound selected from the group consisting of lead selenide, lead sulfide, and lead telluride, said lead compound layer having a thickness of at least about 100 angstrom units.

4,047,066

FLAT DISPLAY PANEL COMPRISING AN ENVELOPE INCLUDING A SUBSTRATE HAVING TERMINAL-RECEIVING GROOVES

Masaki Kobayakawa, and Fumitake Akahane, both of Kagoshima, Japan, assignors to Nippon Electric Kagoshima, Limited, Kagoshima, Japan

Filed Feb. 25, 1976, Ser. No. 661,447
Claims priority, application Japan, Feb. 27, 1975, 50-24789
Int. Cl.² H01J *61/06*
U.S. Cl. 313—217 **8 Claims**



1. In a flat display panel including a hermetically sealed envelope and being for use together with an external circuit disposed externally of said envelope for energizing said display panel,

said display panel comprising a planar substrate formed of an insulating material as a part of said envelope and having an internal surface, a plurality of electrodes inside said envelope, and connection means for connecting said electrodes to said external circuit,

said connection means comprising a plurality of conductive end pieces fixedly attached to said substrate and connected to predetermined ones of said electrodes, a plurality of elongated terminals conductively attached to said end pieces and extended outwardly of said envelope for connection to said external circuit, and fixing means fixing said terminals to said substrate at predetermined portions of the respective terminals,

the improvement wherein:

each of said terminals comprises an internal conductor and a conductive lead; and

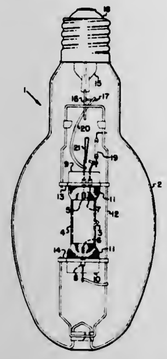
said substrate is provided with a plurality of grooves substantially snugly receiving the respective conductive leads and having openings, respectively, on said internal surface, said internal conductors extending on said internal surface from said conductive end pieces into said grooves through the respective openings, said conductive leads including said predetermined portions.

4,047,067

SODIUM HALIDE DISCHARGE LAMP WITH AN ALUMINA SILICATE BARRIER ZONE IN FUSED SILICA ENVELOPE

Edward M. Clausen, Eastlake, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed June 5, 1974, Ser. No. 476,726
Int. Cl.² H01J 61/35
U.S. Cl. 313—221 1 Claim



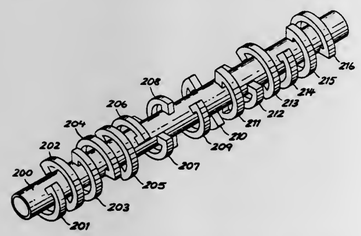
1. A metal halide lamp comprising a fused silica envelope containing a fill including sodium halide, said envelope having on the outside an alumina silicate glass zone at the surface serving as a barrier to sodium diffusion, said zone comprising aluminum oxide heat-diffused into the fused silica, said zone being from 5 to 25 microns thick and the peak concentration of aluminum oxide in it ranging from 5 to 25 weight percent.

4,047,068

SYNCHRONOUS PLASMA PACKET ACCELERATOR

Thomas I. Ress, Brea, and George V. Nolde, Santa Monica, both of Calif., assignors to Kreidl Chemico Physical K.G., Schaan, Liechtenstein

Division of Ser. No. 418,857, Nov. 26, 1973. This application Feb. 17, 1976, Ser. No. 658,729
Int. Cl.² H05H 7/04, 11/00
U.S. Cl. 313—359 26 Claims



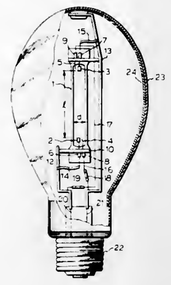
1. An accelerator for charged particles, comprising:
a vessel adapted to enclose a stream of charged particles along a preselected open-ended track; and
drive means juxtaposed with said vessel for generating therein a magnetic field traveling in a pre-selected direction relative to each point of said track with the magnetic flux vector of said field transverse to said track at all points, thereby setting said particles in motion along said track with a velocity having a predetermined relation to the velocity of said traveling field.

4,047,069

HIGH-PRESSURE MERCURY-VAPOR LAMP HAVING A PLURAL PHOSPHOR COATING

Hideo Akutsu, Hyogo; Katsuaki Iwama, Osaka; Naoki Saito, Osaka; Masanori Takagawa, Osaka; Yoshichika Kobayashi, Osaka, and Tamisuke Atsumi, Kobe, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed June 20, 1975, Ser. No. 588,951
Claims priority, application Japan, June 21, 1974, 49-71542; June 21, 1974, 49-71543; June 21, 1974, 49-71544; June 21, 1974, 49-71546
Int. Cl.² H01J 1/62
U.S. Cl. 313—487 2 Claims



1. A high-pressure mercury-vapor lamp comprising a discharge tube including electrodes sealed at both ends thereof, mercury and rare gas in said discharge tube, and an outer bulb around said discharge tube having a phosphor coating on the inside surface thereof, the phosphor coating being constituted by (a) a phosphor having emission peaks within the range of wavelengths between 440 and 540 nm and being at least one phosphor taken from the group consisting of strontium chloroapatite activated with di-valent europium, barium magnesium aluminate activated with di-valent europium strontium chlorosilicate activated with di-valent europium, barium magnesium aluminate activated with di-valent europium, and barium strontium silicate activated with di-valent europium, and (b) yttrium vanaphosphate activated with tri-valent europium and having emission peaks within the range of wavelengths between 600 and 720 nm, and the following conditions are satisfied:

$$0.50 \leqq P_{577\text{-}579}/P_{546} \leqq 1.0$$

$$0.3 \leqq P_{640\text{-}540}/P_{577\text{-}579} \leqq 1.2$$

$$0.1 \leqq P_{640\text{-}540}/P_{600\text{-}720} \leqq 1.0$$

where $P_{577\text{-}579}$ and P_{546} are the relative energy outputs of the mercury spectrum at wavelengths of 577–579 nm and a wavelength of 546 nm, and $P_{640\text{-}540}$ and $P_{600\text{-}720}$ are the relative total energy outputs for other than the mercury line spectrum in the ranges of wavelengths of 440 to 540 nm and 600 to 720 nm produced by the stimulation of the phosphor coating by the ultraviolet radiations of the discharge tube.

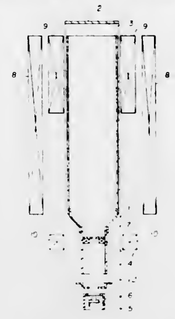
4,047,070

PYROELECTRIC VIDICON HAVING TARGET HEATING MEANS ON ACCELERATING ANODE

Thomas Conklin, North Scituate, R.I., assignor to North American Philips Corporation, New York, N.Y.

Filed Oct. 15, 1976, Ser. No. 732,734
Int. Cl.² H01J 29/45, 29/08
U.S. Cl. 313—388 2 Claims

1. In a pyroelectric vidicon having a thermally responsive target, an electron gun for generating an electron beam, and means to scan the target with said electron beam, the improvement wherein said electron gun comprises an electron emissive cathode, an accelerating anode including a diaphragm, and



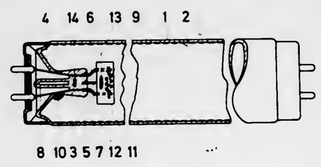
heating means on the side of said diaphragm facing said cathode for maintaining the target at a desired temperature.

4,047,071

LAMP HAVING AMALGAM CONTAINED IN A POROUS SILICATE MASS

Lothar Busch, Munich, and Günter Franck, Ebenhausen, both of Germany, assignors to Patent-Treuhand-Gesellschaft für Elektrische Glühlampen mbH, Munich, Germany

Filed Mar. 8, 1976, Ser. No. 665,054
Claims priority, application Germany, Mar. 10, 1975, 2510379
Int. Cl.² H01J 61/28, 61/42
U.S. Cl. 313—490 9 Claims



1. A low pressure mercury vapor discharge lamp of the fluorescent type comprising a light-transmitting envelope sealingly enclosing spaced discharge means and an amalgam contained in a porous silicate mass which is secured on an interior surface of said lamp which determines the equilibrium pressure during operation of the lamp,
said amalgam comprising mercury and an amalgam-forming metal,
said amalgam-containing porous silicate having been prepared by admixing the amalgam-forming metal in a water glass solution having a density between 1.35 and 1.39, with a weight ratio on a dry basis of amalgam-forming metal to water glass of from 15:1 to 0.5:1.

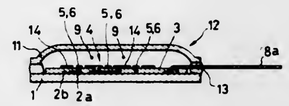
4,047,072

MULTI-DIGIT FLUORESCENT DISPLAY TUBE

Takao Kishino; Kiyoshi Morimoto, and Yukihiko Utamura, all of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Japan

Filed Mar. 29, 1975, Ser. No. 671,150
Claims priority, application Japan, Mar. 28, 1975, 50-36848; May 16, 1975, 50-57457
Int. Cl.² H01J 61/067, 61/66
U.S. Cl. 313—496 7 Claims

1. A multi-column fluorescent display tube comprising:
an insulating base plate,
a light transparent insulating cover plate joined to the base plate at a seal portion in air-tight fashion in order to maintain a vacuum condition therebetween,
a first wiring film disposed on the base plate,
a filament support supported by the base plate,
a second wiring film disposed on the base plate,
an insulating film disposed on the base plate to insulate the first and second wiring films and portions thereof,
a plurality of segment anodes forming a pattern display supported by the insulating film and connected to the first wiring film,
a plurality of fluorescent material layers disposed on the plurality of segment anodes,
a cathode disposed between the cover plate and the plurality of fluorescent material layers and connected to the filament support,



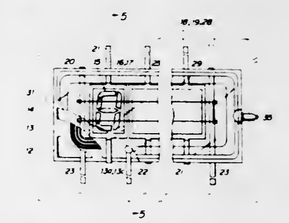
an electrification preventive layer connected to the second wiring film and supported by the insulating film and disposed adjacent to the plurality of segment anodes to prevent electrification due to the collision of electrons emitted from the cathode,
a plurality of first lead-in wires passing through the seal portion and connected to the first wiring film,
a second lead-in wire passing through the seal portion and connected to the cathode,
a third lead-wire passing through the seal portion and connected to the second wiring film,
means for applying to the electrification preventive layer a bias voltage having a value between the anode voltage and the average of the cathode voltage and the anode voltage,
means for applying a DC voltge across the cathode and selected ones of the plurality of segment anodes.

4,047,073

MULTI-DIGIT FLUORESCENT INDICATING APPARATUS

Takao Kishino, Mobara, Japan, assignor to Futaba Denshi Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 509,716, Sept. 26, 1974, Pat. No. 3,986,760. This application Apr. 19, 1976, Ser. No. 678,444
Claims priority, application Japan, Jan. 25, 1974, 49-10110
Int. Cl.² H01J 61/067, 61/66
U.S. Cl. 313—497 2 Claims



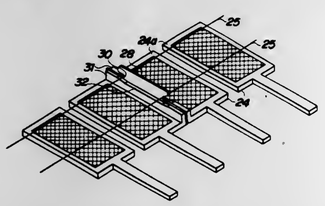
1. A multi-digit fluorescent indicating apparatus comprising:
a base plate;
a window plate hermetically sealed to said base plate forming an evacuated enclosure;
segmented electrode means forming each of multi-digit fluorescent indicating patterns disposed on said base plate within said enclosure;

a plurality of grid terminal lead-in wires with each grid terminal lead-in wire extending integrally substantially inside and substantially outside of the enclosure;
a spacer element disposed within the enclosure and integrally connected to each of said grid terminal lead-in wires;
a grid disposed within the enclosure and secured to each of said spacer elements;
a plurality of cathode terminal lead-in wires with each cathode terminal lead-in wire extending integrally substantially inside and substantially outside of the enclosure;
a cathode holding portion disposed within the enclosure and integrally connected to each of said cathode terminal lead-in wires;
a cathode disposed within the enclosure and connected to said cathode holding portion;
said grid terminal lead-in wires and said cathode terminal lead-in wires providing convenient external electrical connections.

4,047,074
MULTI-DIGIT FLUORESCENT DISPLAY TUBE WITH CATHODE FILAMENT SUPPORT

Taiho Kishino; Nobuo Yamaguchi, and Yukihiko Utamura, all of Mobara, Japan, assignors to Futaba Denshi Kogyo Kabushiki Kaisha, Japan

Filed Nov. 19, 1976, Ser. No. 743,357
Claims priority, application Japan, Nov. 22, 1975, 50-157959[U]
Int. Cl.² H01J 1/18, 1/72, 1/94, 63/06
U.S. Cl. 313—497 1 Claim

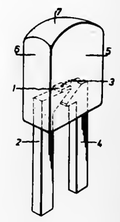


1. In a multi-column fluorescent display tube having at least a vacuum container, a base plate provided in said vacuum container, a plurality of display sections provided on said base plate side by side in the longitudinal direction of said base plate, each of said display sections having a fluorescent material layer thereon, and a filament cathode provided opposite to said plurality of display sections and tightly stretched in the longitudinal direction; the improvement which comprises at least a filament damper made of an insulating material low in thermal conductivity and having contact sections for slightly urging the middle portion of said filament cathode substantially vertically to said filament cathode maintaining substantially parallel relations with the surface of said display sections so that said filament cathode may be tightly stretched, filament damper supporters made of conductive material and bonded to the peripheral wall surfaces of said filament damper except at least said contact sections, and said supporters being connected to conductive sections such as grid electrodes thereby preventing electrification of the surface of said filament damper.

4,047,075
ENCAPSULATED LIGHT-EMITTING DIODE STRUCTURE AND ARRAY THEREOF

Werner Schoberl, Massenbachhausen, Germany, assignor to Licentia-Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Feb. 27, 1976, Ser. No. 662,086
Claims priority, application Germany, Mar. 1, 1975, 2509047
Int. Cl.² H05B 33/12, 33/16
U.S. Cl. 313—500 13 Claims

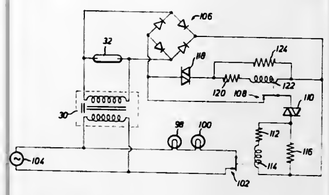


1. In a light-emitting diode structure including a housing formed of a plastic material and having a light-emitting surface, and a semiconductor light-emitting diode embedded in said housing opposite and spaced from said light-emitting surface, the improvement wherein: said plastic housing has a rectangular cross section formed by first and second pairs of opposed parallel flat outer side surfaces; and said light-emitting surface is an outwardly curved end surface of said housing which extends to each of said side surfaces and is curved so that its surface area presents an area of uniform brightness to an observer.

4,047,076
EMERGENCY LIGHTING SYSTEM FOR GASEOUS DISCHARGE LAMPS

Albert C. McNamara, Jr., Houston, Tex., assignor to Esquire, Inc., New York, N.Y.

Continuation of Ser. No. 429,991, Jan. 2, 1974, which is a continuation of Ser. No. 231,870, March 6, 1972, abandoned, which is a continuation of Ser. No. 13,519, Feb. 24, 1970, abandoned, which is a division of Ser. No. 728,970, May 14, 1968, Pat. No. 3,517,254. This application Nov. 3, 1975, Ser. No. 628,055
The portion of the term of this patent subsequent to June 23, 1987, has been disclaimed.
Int. Cl.² H05B 37/00
U.S. Cl. 315—88 13 Claims

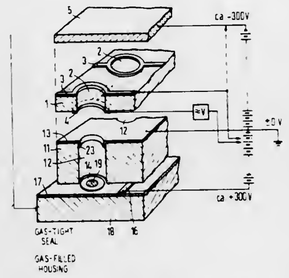


1. An emergency lighting system comprising:
a gaseous-discharge lamp,
means for applying electrical energy to said gaseous-discharge lamp to operate said gaseous-discharge lamp, incandescent light means, and
switching means, including at least one solid-state voltage-breakdown device, for connecting said incandescent light means to said energy-applying means when said gaseous discharge lamp is extinguished to light said incandescent light means, and for disconnecting said incandescent light means from said energy-applying means after re-striking of said gaseous-discharge lamp, in response to the voltage across the gaseous-discharge lamp approaching a stable voltage.

4,047,077
DISCHARGE DISPLAY DEVICE (PLASMA-PANEL)

Werner Veith, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 9, 1976, Ser. No. 647,991
Claims priority, application Germany, Feb. 26, 1975, 2508393
Int. Cl.² H05B 41/16
U.S. Cl. 315—169 TV 20 Claims
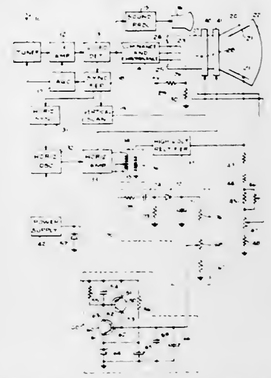


1. A discharge display device in the form of a plasma panel, comprising:
a gas-filled, gas-tight housing;
a primary discharge arrangement in said housing, said primary discharge arrangement including
a common first cathode,
a first insulating matrix spaced from said first cathode and comprising a first insulating plate having a plurality of holes therethrough arranged in an array of rows and columns and corresponding in number to a desired number of image points, a plurality of first anodes carried on one side of said first insulating plate facing said first cathode, each of said anodes associated with a respective row of holes and extending about the edge of the holes, and a plurality of control electrodes carried on the other side of said first insulating plate, each of said control electrodes associated with a respective column of holes and extending about the edge of the holes, the cathode, first anodes and control electrodes adapted to be connected to potentials to cause electrons to emerge from the holes in a controlled fashion from the gas discharge; and
a plurality of main d.c. discharge paths, each of said discharge paths being defined by a second cathode and a second anode and being divided by and including a second insulating matrix aligned with said first insulating matrix, each of said second cathodes and said second anodes adapted to be connected to a potential to cause each of said d.c. discharge paths to be ignited by electrons received from the holes of said first insulating matrix.

4,047,078
PULSE DIFFERENTIATING HIGH VOLTAGE SHUTDOWN CIRCUIT

David H. Meehan, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed June 1, 1976, Ser. No. 691,744
Int. Cl.² H01J 29/70
U.S. Cl. 315—411 5 Claims

1. In a television receiver having a cathode ray tube display device in which one or more electron beams are directed to a viewing screen, horizontal scansion means producing a scansion signal having a long duration trace portion and a short duration retrace portion causing said beams to scan said viewing screen from side-to-side, vertical scansion means causing a top-to-bottom progression of successive side-to-side scans and high voltage generating means producing an electron accelerating potential for said cathode ray tube from said short duration retrace portion of said horizontal scansion signal, the improvement comprising:

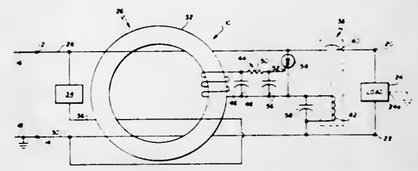


high voltage disabling means for rendering said high voltage generating means inoperative when said accelerating potential exceeds a pedetermined threahold including detection means simultaneously responsive to variations in the amplitude and duration of said retrace portion of said horizontal scansion means.

4,047,079
GROUND LEAKAGE CURRENT PROTECTION SYSTEM

Colin A. A. MacPhee, West Hill, Canada, assignor to Federal Pacific Electric Co., Newark, N.J.

Continuation of Ser. No. 771,451, Oct. 29, 1968, abandoned.
This application Dec. 16, 1974, Ser. No. 532,819
Int. Cl.² H02H 3/28
U.S. Cl. 361—45 20 Claims



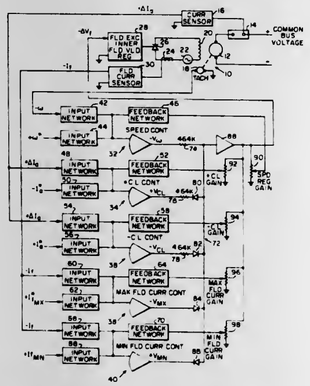
1. A ground leakage current protection system including first and second line terminals for connection to an AC power source and first and second load terminals for connection to a protected load, a differential current transformer including a core and having first and second windings on the core arranged to carry load current between said first line and load terminals and between said second line and load terminals, respectively, said and second windings being phased in relation to each other so that the load current carried by said windings tends to develop mutually cancelling flux in said core, said second line terminal being grounded at the side of said differential transformer remote from said load terminals, means for providing sustained AC biasing flux in said core out-of-phase with load current flux in the core produced by said first winding, switching means including a pair of normally open contacts interposed between said line and load terminals, a

holding coil effective when energized for holding said contacts closed, said differential current transformer having an output winding providing an output signal in response to said AC biasing flux, and phasesensitive means responsive to the biasing flux output signal of said output winding in the absence of ground leakage current for maintaining said holding coil energized, said first and second winding producing an unbalanced flux in said core when ground leakage current occurs, said unbalanced flux opposing the biasing flux and, when of sufficient magnitude, causing de-energization of said coil and opening of said contacts.

4,047,080
COMMON BUS PARALLEL SPEED REGULATOR SYSTEM

Robert S. Peterson, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 12, 1976, Ser. No. 685,463
Int. Cl.² H02P 5/16
U.S. Cl. 318—79 5 Claims



1. A speed regulation system for a d.c. motor operated as one of a plurality of such motors from a common voltage bus comprising:

field exciter means for controlling the voltage supplied to the field of said motor;

a speed regulation controller, having a linearized transfer function, connected to receive a motor speed signal ω and a motor speed reference signal ω^*, and to deliver a speed control signal $-V_{\omega}$;

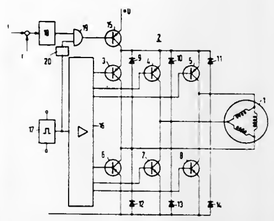
an armature current limit controller, having a linearized transfer function, connected to receive an armature current signal $+\Delta I_a$ and armature current reference signals $\pm I_a^*$ and to deliver an armature current control signal $\pm V_{CL}$;

switching means for determining priority among said controllers, said controllers being connected in parallel to said switching means, said switching means delivering an output signal $-\Delta V_f$ to said field exciter means which is a function of the output of one selected controller, based on the order of priority: (1) field current controller, (2) armature current limit controller, (3) speed controller.

4,047,081
COMMUTATING ARRANGEMENT FOR AN ELECTRIC MOTOR SUPPLIED FROM A DC VOLTAGE SOURCE

Manfred Liska, Nuraberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 24, 1976, Ser. No. 660,848
Claims priority, application Germany, Feb. 27, 1975, 2508546
Int. Cl.² H02K 29/00
U.S. Cl. 318—138 5 Claims



1. A circuit for use with an electric motor supplied from a DC voltage source comprising:

a commutating arrangement including transistors arranged in a bridge circuit;

a main transistor connected to said commutating arrangement and adapted to be connected to said source;

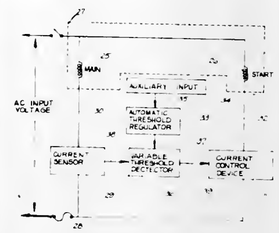
a first control means adapted to be responsive to the rotor position of said motor providing on-off commands for controlling said transistors of said commutating arrangement;

a second control means for providing on-off commands to said main transistor, said second control means feeding an off command of short duration to said main transistor when said control circuit delivers an on command to one of said transistors of said commutating arrangement.

4,047,082
VARIABLE THRESHOLD STARTING CIRCUIT FOR INDUCTION MOTOR

Paul R. Scheuer, West Lafayette; Karmen D. Cox, Lafayette, both of Ind., and Steven B. Sample, Lincoln, Nebr., assignors to Design & Manufacturing Corporation, West Lafayette, Ind.

Filed Sept. 4, 1975, Ser. No. 610,124
Int. Cl.² H02P 1/44
U.S. Cl. 318—221 E 11 Claims



1. In combination with an induction motor starting circuit of the type having a sensing means for producing a first signal proportional to the main winding current, a current control means for allowing current flow through a start winding only when energized, and means for energizing said current control means when said first signal exceeds a threshold level, the improvement comprising:

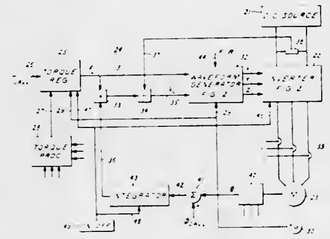
a. means for producing a second signal proportional to at least one condition affecting said main winding current; and

b. means for adjusting said threshold level in accordance with the value of said second signal.

4,047,083
ADJUSTABLE SPEED A-C MOTOR DRIVE WITH SMOOTH TRANSITION BETWEEN OPERATIONAL MODES AND WITH REDUCED HARMONIC DISTORTION

Allan Barr Plunkett, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Mar. 8, 1976, Ser. No. 664,951
Int. Cl.² H02M 1/08
U.S. Cl. 318—231 23 Claims



1. Improved static electric power apparatus having relatively positive and negative d-c input terminals adapted to be connected to a source of voltage, a plurality of a-c output terminals adapted to be connected to a variable frequency alternating current load, and means for connecting each of said output terminals to both of said input terminals in a manner to convert unipolarity voltage applied to said input terminals into alternating voltage at said output terminals, said connecting means comprising at least one pair of alternately conducting controllable electric valves interconnecting one of said output terminals and the respective input terminals of said apparatus, firing and commutating means for periodically switching the conducting states of said valves, and means responsive to frequency and amplitude command signals for controlling the operation of said firing and commutating means so as to vary, as functions of said command signals, the frequency and the amplitude of the fundamental component of said alternating voltage, wherein the control means includes:

a. first means responsive to said frequency command signal for generating a periodic reference signal having a frequency which depends on said frequency command signal;

b. second means keyed by said reference signal for causing said firing and commutating means to switch the conducting states of said valves at certain moments during each cycle of the fundamental component of said alternating voltage, the timing of a predetermined first switching moment in each half cycle of said fundamental component of voltage being established by said reference signal and any subsequent switching moments in the same half cycle occurring in accordance with a schedule comprising at least:

i. a moment following said first switching moment by a variable angle alpha (α) measured in electrical degrees of a full cycle of fundamental voltage,

ii. a moment following said first switching moment by another variable angle beta (β) measured in electrical degrees of a full cycle of fundamental voltage, β being larger than α but less than 90°,

iii. A moment occurring 180° -β after said first switching moment, and

iv. a moment occurring 180° -α after said first switching moment;

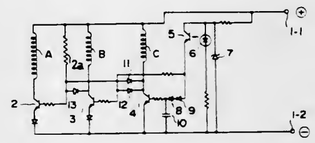
c. third means for varying α as a function of β so as to minimize selected harmonics of said alternating voltage; and

d. fourth means for varying β as a function of said amplitude command signal to thereby vary the amplitude of the fundamental voltage component.

4,047,084
SEMICONDUCTOR MOTOR CONTROLLED FOR ENERGIZATION BY A SINGLE POSITION SENSING ELEMENT

Itsuki Ban, 829, Higashiotzuni, Nerima, Tokyo, Japan

Filed Feb. 6, 1975, Ser. No. 547,507
Claims priority, application Japan, Feb. 21, 1974, 49-19959; Feb. 27, 1974, 49-22361; Mar. 15, 1974, 49-29229; Mar. 15, 1974, 49-29230; Mar. 15, 1974, 49-29231; July 8, 1974, 49-77439; Aug. 20, 1974, 49-94589
Int. Cl.² H02K 29/00
U.S. Cl. 318—254 13 Claims



1. A semiconductor motor comprising:

a. first, second and third phase armature coils mounted on a stator;

b. a field arranged to face to said armature coils including a plurality of magnetic poles in which the other in an equal pitch;

c. a disc member providing at a circumferential portion thereof with first, second and third three-step electromagnetic anisotropic portions;

d. an electromagnetic coil arranged to face said disc member of sensing said electromagnetic anisotropic portions upon a rotation of the motor to cause the inductance of the coil to be varied;

e. an oscillator source connected to said electromagnetic coil for feeding an alternating current to said electromagnetic coil;

f. a dicrimminating circuit connected to said coil for obtaining first, second and third electric signals from said first, second and third electromagnetic anisotropic portions via a variation of the inductance of the electromagnetic coil; and,

g. an energization control circuit connected to said discrimmination circuit for effecting an energization control via said first, second and third electric signals by conducting semiconductor switching elements seriesconnected to the respective first, second and third aramature coils whereby a rotation control for the motor is achieved by position sensing signals due to an induction.

4,047,085
METHOD AND APPARATUS FOR CONTROLLING A WEB HANDLING DEVICE

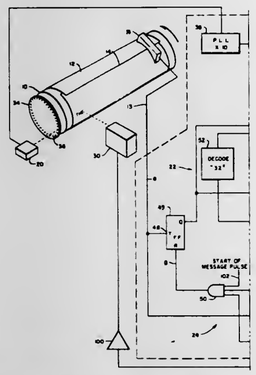
Gary B. Ollendick, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Mar. 1, 1976, Ser. No. 662,781
Int. Cl.² G05B 19/28
U.S. Cl. 318—601 19 Claims

1. A control circuit for sensing the condition of a web wrapped about a rotating drum displaying an outer surface wherein the web carries a positional indicator comprising:

means fixed with respect to the axis of rotation of the drum for sensing the presence of said web indicator for each passage across a predetermined location and for generating an indicator signal in response thereto,

means responsive to a selected one of said indicator signals for initiating the generation of a first series of positional signals, each signal corresponding to a subsequent predetermined rotational position of the indicator carried by the web; and



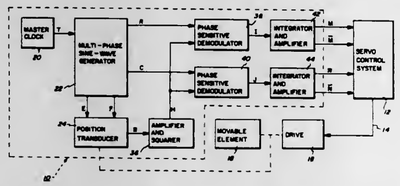
first means for comparing the concurrance of at least one of said indicator signals with at least one of said positional signals so as to ascertain whether said web indicator has rotated a predetermined amount since said selected indicator signal.

4,047,086

PHASE-SENSITIVE TRANSDUCER APPARATUS

Kenneth W. Cocksedge, Pleasanton, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 25, 1976, Ser. No. 670,465
Int. Cl.² G05B *1/01*
U.S. Cl. 318—608 **17 Claims**



1. In a phase-sensitive transducer apparatus comprising first and second relatively movable members, said first relatively movable member having a plurality of windings and said second relatively movable member having a winding; and means for applying a first input signal to one of the windings of said first relatively movable member and a second input signal to another of the windings of said first relatively movable member, an output signal being developed on the winding of said second relatively movable member, said first and second input signals being sinusoidal in nature of substantially identical frequency and peak amplitude and being phase-displaced by a predetermined amount, and said output signal being substantially constant in peak amplitude and variable in phase during relative movement of said first and second relatively movable members, the improvement comprised in that said means for applying comprises:

clock means for generating a clock signal at a clock frequency;

means coupled to said clock means and responsive to said clock signal for generating a plurality of mutually phase-displaced square-wave signals of substantially identical frequency and peak amplitude;

means coupled to said means for generating and responsive to a first group of said plurality of square-wave signals for deriving said first input signal and responsive to a second group of said plurality of square-wave signals different than said first group for deriving said second input signal; and

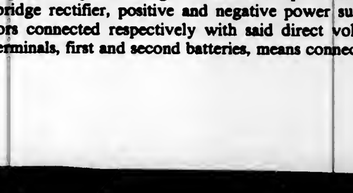
means for respectively coupling said first and second input signals to said one and said other windings of said first relatively movable member.

4,047,087

ELECTROMECHANICAL TRANSDUCER

Carl Torbern Telling, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Oct. 10, 1975, Ser. No. 621,571
Claims priority, application Sweden, Oct. 15, 1974, 7412929
Int. Cl.² G05B *1/06*
U.S. Cl. 318—661 **5 Claims**



1. An electromechanical transducer for converting mechanical analog angular information to electrical linear information, comprising

a primary winding and at least one first and one second secondary winding, said first and said second secondary windings being spatially arranged perpendicularly to each other and rotatable together in relation to the primary winding;

an amplifier, said primary winding being connected to the output of said amplifier;

said amplifier being fed back by two feedback circuits, a first of said circuits including a first impedance over which is fed a voltage proportional to the output voltage of said amplifier and the second of said circuits being a series connection of said first secondary winding and a second impedance;

means applying an input voltage to said amplifier;

the values of said first and second impedances and the turns ratios of said windings being chosen so that the relation between the voltage across said second secondary winding and the input voltage to said amplifier is a linear measure of the rotation of the secondary windings in relation to the primary winding.

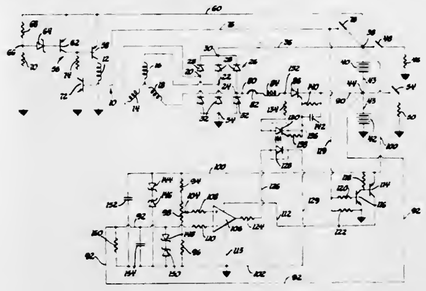
4,047,088

DUAL VOLTAGE CHARGING SYSTEM

Dennis W. Himmler, Clawson, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 9, 1976, Ser. No. 694,158
Int. Cl.² H02J *7/14*
U.S. Cl. 320—6 **3 Claims**

1. A motor vehicle electrical system comprising, an alternating current generator having a polyphase output winding and a field winding, a polyphase full-wave bridge rectifier having AC input terminals and direct voltage output terminals, means connecting said output winding with said AC input terminals of said bridge rectifier, positive and negative power supply conductors connected respectively with said direct voltage output terminals, first and second batteries, means connecting said batteries in series across said power supply conductors whereby said batteries can be charged at times in series by the direct voltage output of said bridge rectifier, the negative terminal of one battery connected to the positive terminal of the other battery, the connection between said batteries defining a battery junction having a voltage intermediate the voltage of said power supply conductors, voltage regulating means including voltage sensing means connected across said power supply conductors and a field current control means for controlling field current as a function of the voltage sensed by said sensing means to thereby maintain the voltage across said power supply conductors substantially constant, voltage divider means connected across said power supply conductors having a voltage divider junction that has a voltage intermediate the voltage of said power supply conductors, the ratio of voltage division provided by said voltage divider means being substantially equal to the ratio of the terminal voltage ratings of said batteries whereby said voltage divider junction and said



battery junction have substantially equal voltages during certain conditions of operation of said system, a circuit connected between one phase winding of said output winding and said battery junction for at times supplying charging current to said second battery, said circuit comprising in a series connection an inductive circuit element and the anode-cathode circuit of a first controlled rectifier, a second controlled rectifier having an anode connected to said one phase winding and a cathode connected to the gate of said first controlled rectifier, said second controlled rectifier operative to gate said first controlled rectifier conductive when said second controlled rectifier is gated conduc ve, and means coupled to said battery and voltage divider junctions and to said second controlled rectifier for gating said second controlled rectifier conductive when the voltage at said voltage divider terminal exceeds the voltage at said battery terminal by a predetermined amount, said first controlled rectifier being nonconductive when the voltage at said battery terminal is substantially equal to or greater than the voltage of said voltage divider junction.

4,047,089

STARTING CIRCUIT FOR INVERTER

Tadao Suzuki; Tadao Yoshida, and Shigeaki Wachi, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 10, 1976, Ser. No. 694,713
Claims priority, application Japan, June 14, 1975, 50-72393
Int. Cl.² H02M *3/335*
U.S. Cl. 363—49 **9 Claims**

1. A starting circuit for an inverter comprising:

a. A DC voltage source having first, second and voltage reference terminals;

b. an input transformer having a primary winding, a pair of secondary windings and a saturable magnetic core;

c. an output transformer having a primary winding, a secondary winding and a feedback winding;

d. first and second transistors each having base, emitter and collector electrodes, the collector-emitter circuits of which are connected, through the primary winding of said output transformer, between the first and voltage reference terminals of said DC voltage source, and between the second and voltage reference terminals thereof, respectively, and the base-emitter circuits of which are connected across the corresponding secondary windings of said input transformer, respectively;

e. circuit means for connecting the primary winding of said input transformer to the feedback winding of said output transformer;

f. first control means including at least a control winding



provided in connection with said saturable magnetic core of said input transformer, and capacitor means connected to said control winding for supplying an exciting current which flows through said control winding then the capacitor means is discharged so as to put one of said first and second transistors in its conductive state when said DC voltage source is operated; and

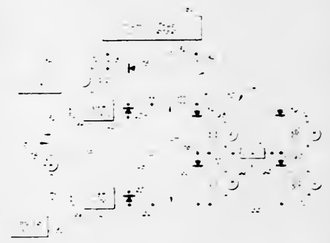
g. second control means for detecting the secondary voltage of said output transformer and stopping the operation of said first control means when the secondary voltage reaches a predetermined value.

4,047,090

DIGITAL CONTROLLED LOW FREQUENCY POWER AMPLIFIER

William L. Chapman, and Larry L. Newlin, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Feb. 25, 1976, Ser. No. 661,066
Int. Cl.² H02M *5/45*
U.S. Cl. 363—34 **6 Claims**



1. A power amplifier comprising:

means for generating a plurality of A-C voltages which are binarily related in amplitude;

means for rectifying selected ones of said binarily related A-C voltages to produce respective binarily related rectified and filtered voltages;

means for summing the respective ones of said plurality of binarily related rectified and filtered voltages to provide an output voltage;

a polarity switching bridge receiving said output voltage, said bridge consisting of first and second controlled recti-

fiers having common anode connection to said output voltage and having cathodes connected via first and second junctions to anodes of third and fourth controlled rectifiers which have common cathode connection to the output voltage common;

logic circuit means alternately providing first and second gate outputs for energizing alternately said first and fourth controlled rectifiers;

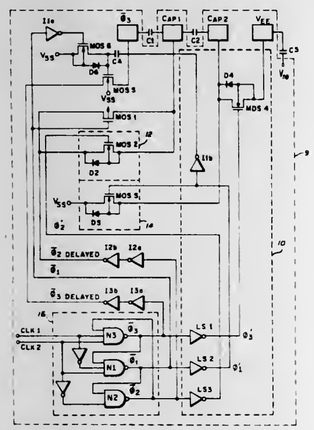
commutation circuit means energizable upon alternation of first and second gate outputs from said logic circuit means to generate reverse bypass voltage across said polarity switching bridge to turn off all controlled rectifiers; and

load means connected between said first and second junctions of said bridge configuration to be energized by said output voltage.

4,047,091
CAPACITIVE VOLTAGE MULTIPLIER

Jimmy L. Hutchines, San Jose, and John E. Meyer, Saratoga, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed July 21, 1976, Ser. No. 707,395
Int. Cl.² H02M 7/00
U.S. Cl. 363—59 3 Claims



1. A voltage multiplier comprising:

a plurality of capacitors connected in series across the output pads of an integrated circuit chip;

a clock circuit providing multiphase voltage output;

means connecting the pads of said chip to MOS transistor switches;

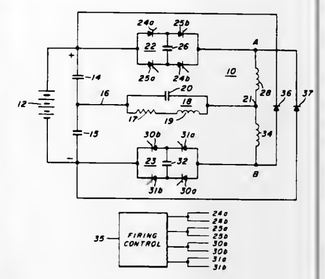
means interconnecting said MOS switches to said clocking circuit such that during successive phases of operation said switches are closed in such a manner that the series connected capacitors are separately charged to the input voltage successively during each phase of said clock circuit; and

means operable during the final phase of operation of said clock for connecting an output capacitor to said input voltage and said series connected capacitors such that the voltage developed across the output capacitors is the sum of all the voltages across the series connected capacitors plus the input voltage.

4,047,092
HIGH FREQUENCY INVERTER

Gabor J. Bendzsak, Montreal, Canada, assignor to Ajax Magnethermic Corporation, Warren, Ohio

Filed July 26, 1976, Ser. No. 708,995
Int. Cl.² H02M 7/515
U.S. Cl. 363—135 5 Claims



1. An inverter for supplying high frequency alternating current to a load having resistance and inductance connected in parallel with capacitance means to form a tank circuit having an impedance which is subject to variations during operation, said inverter comprising a DC voltage source provided with a center tap, first and second sets of thyristors and capacitors, each of said sets having at least one pair of parallel branches with at least two series-connected thyristors in each branch and capacitance means connected between the midpoints of the branches of each said pair, the first said set being connected to the positive side of said voltage source, the second said set being connected to the negative side of said voltage source, one side of said load being connected to said center tap, a first inductance means connected in series between said first set and the other side of said load, a second inductance means connected in series between said second set and said other side of said load, said inductance means forming tuned circuits with said load and said capacitance means, a first diode means having its anode connected to the negative side of said voltage source and its cathode connected to the terminal of said first inductance means which is not connected to the load, a second diode means having its cathode connected to the positive side of said voltage source and its anode connected to the terminal of said second inductance means which is not connected to the load, and means for firing said thyristors in a predetermined sequence alternating between the first and second of said sets to cause an alternating current to flow in the load, the thyristors of each set being fired in pairs, each pair consisting of thyristors in different parallel branches of the set, the thyristors of each pair being in series relation with the capacitance means, and the pairs of each set being fired alternately, whereby the polarity of the voltage across the capacitance means within each said set reverses with each half-cycle of current delivered by said set.

4,047,093
DIRECT THERMAL-ELECTRIC CONVERSION FOR GEOTHERMAL ENERGY RECOVERY

Larry Levoy, 799 36th Ave., San Francisco, Calif. 94121

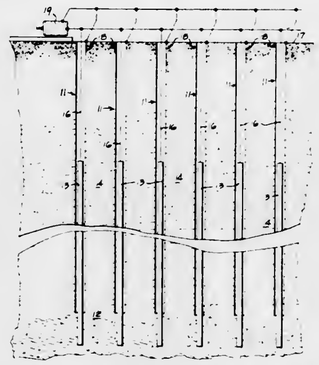
Filed Sept. 17, 1975, Ser. No. 614,319
Int. Cl.² H01J 45/00
U.S. Cl. 322—2 R 39 Claims

1. An in situ system for converting geothermal energy into electricity including a well drilled from ground surface into a high-temperature underground geological strata, comprising in combination,

a. a first high-temperature heat pipe structure longitudinally aligned parallel the axis of said well having a lower section thermally coupled to said high-temperature geological strata and an upper end section extending toward the ground surface,

b. a second low-temperature heat pipe structure longitudinally aligned parallel the axis of said well having a lower end section coaxially receiving the upper end section of said high-temperature heat pipe structure defining an annular volume between the upper end section of the high-temperature heat pipe structure and the lower surrounding end section of the low-temperature heat pipe structure,

c. means for cooling said second low-temperature heat pipe structure,



d. conversion means positioned within said annulus defined between the upper end section of said high-temperature heat pipe structure and the lower surrounding end section of said low-temperature heat pipe structure for thermally coupling said first high-temperature heat pipe structure to said second low-temperature heat pipe structure and for generating an electric current responsive to a temperature difference between said first and second heat pipe structures, and

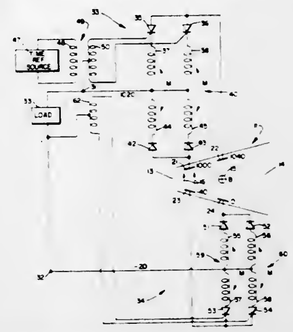
e. means connected to said conversion means for conducting said generated electrical current to the ground surface.

4,047,094
MHD GENERATOR WITH IMPROVED NETWORK COUPLING ELECTRODES TO A LOAD

Richard J. Rosa, Bozeman, Mont., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 22, 1976, Ser. No. 707,925
Int. Cl.² H02N 4/02
U.S. Cl. 322—7 8 Claims

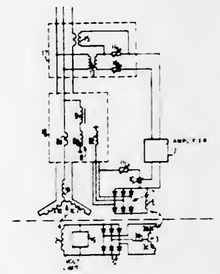
1. In combination with an MHD generator having a plurality of segmented electrodes extending longitudinally of a duct whereby progressively increasing high DC voltages are derived from a set of cathode electrodes of the generator and progressively increasing low DC voltages are derived from a set of anode electrodes of the generator, a first common terminal for the high voltage cathode electrodes, a second common terminal for the low voltage anode electrodes, said common terminals adapted to be normally maintained at predetermined voltages and to be connected across a load for the generator, a network for coupling one of said sets of electrodes to one of said terminals comprising: a controlled switch connected between a first electrode of the one set and said one common terminal, a rectifier connected between a second electrode of the one set and said one common terminal, said first and second electrodes having voltages on opposite sides of the voltage of said one common terminal, said rectifier being connected so that it is normally cut off by the voltage between the second electrode and said one common terminal, said switch being connected so that it is normally conductive between the first electrode and said one common terminal once it has been triggered into a conducting state in response to a control signal, and means for inductively coupling the switch and rectifier together so that the rectifier is biased into a conducting state in response to a change in the current flow through the switch.



4,047,095
BRUSHLESS THREE-PHASE CURRENT GENERATOR HAVING A DEVICE FOR SELF-EXCITATION AND AUTOMATIC CONTROL OF THE ENERGIZING CURRENT

Wierd Wijsterp, Hengelo, Netherlands, assignor to Heemaf B.V., Hengelo, Netherlands

Filed Aug. 15, 1975, Ser. No. 605,180
Claims priority, application Netherlands, Aug. 22, 1974, 7411221
Int. Cl.² H02P 9/30
U.S. Cl. 322—17 7 Claims

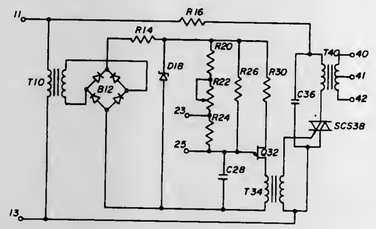


1. A brushless three-phase current generator having a rotating field winding and a fed-back, controllable device for self-excitation and automatic control of energizing current, said device comprising controllable means for deriving from the generator output part of the output voltage and the load current of the generator and for the vectorial combination and supply thereof to a multi-phase rectifier whose output is connected to a stationary d.c. energizing winding of an excitor, said excitor having a rotating multi-phase winding which enables the rotating field winding of the generator through a commonly rotating rectifier, characterized in that the synchronous reactance of each phase of the multi-phase winding of the excitor at the frequency corresponding to the nominal speed is greater than the equivalent resistance of the generator field winding.

4,047,096
APPARATUS FOR INSTANTLY COMPENSATING FOR LINE VOLTAGE IRREGULARITIES

George Robison Madewell, Hixson, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed June 15, 1976, Ser. No. 696,452
Int. Cl.² G05F 3/04
U.S. Cl. 323—19 3 Claims



1. In a current control circuit of the type that triggers means for permitting current from a supply voltage when the charge on a capacitor reaches a trigger level, the capacitor being charged by a charging current, at least part of which is caused by a charging-voltage source and a first series resistance in series with the charging-voltage source that are connected across the capacitor, the improvement comprising:

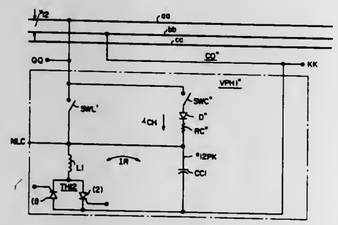
a. a second series resistance connected in series with the charging-voltage source, the first series resistance, and the capacitor; and

b. means, connected across the second series resistance, thereby forming a loop comprising itself and the second series resistance, and including a second voltage source whose value is essentially proportional to the instantaneous value of a rectified version of the supply voltage, for causing current to flow in the loop.

4,047,097
APPARATUS AND METHOD FOR TRANSIENT FREE ENERGIZATION AND DEENERGIZATION OF STATIC VAR GENERATORS

Laszlo Gyugyi; Eric J. Stacey, and Michael B. Brennen, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 15, 1976, Ser. No. 677,202
Int. Cl.² H02J 3/18
U.S. Cl. 323—119 13 Claims



1. Electrical apparatus, comprising:

a. a pair of electrical conductors in an electrical system, said pair of conductors having an alternating voltage of predetermined amplitude, frequency, wave shape and reference phase impressed thereacross, one of said conductors having a current flowing therethrough which is related to said alternating voltage;

b. voltage sensing means interconnected in circuit relationship with one of said conductors for determining said reference phase and said frequency during a predetermined period of time, said voltage sensing means having an output at which is provided an output signal related to said reference phase and said frequency;

c. capacitance means interconnected in circuit relationship at one terminal thereof with one of said conductors;

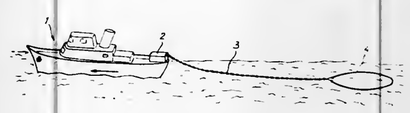
d. inductance means including gated controllable switch means interconnected in circuit relationship at one terminal thereof with said one of said conductors and interconnected in circuit relationship at another terminal thereof with another terminal of said capacitance means, the gate of said controllable switch means being connected to said output terminal of said voltage sensing means, said inductance means and said capacitance means cooperating during said predetermined period of time to provide an oscillating voltage of said wave shape at said point where said inductance means and said capacitance means are interconnected, said phase and said frequency of said oscillating voltage being made generally the same as said reference phase and said frequency of said alternating voltage by said controllable switch means, said amplitude of said oscillating voltage being generally equal to said amplitude of said alternating voltage; and

main switch means interconnected in circuit relationship between the other of said pair of conductors and said point where said oscillating voltage is present, said means being opened or closed as required during said predetermined period of time at generally zero voltage potential across the contacts thereof because of the correspondence of phase, wave shape, frequency and amplitude of said oscillating voltage and said alternating voltage, said inductance means and said capacitance means providing a circuit function for said electrical system when connected between said pair of conductors during a period of time other than said predetermined period of time.

4,047,098
PROCESS AND A DEVICE FOR PROSPECTING THE OCEAN BED BY MEASURING ELECTROMAGNETIC FIELDS

Jean Duroux, 12, rue Flatters, 75005 Paris, France

Filed July 24, 1975, Ser. No. 598,915
Claims priority, application France, July 30, 1974, 74.26465
Int. Cl.² G01V 3/08
U.S. Cl. 324—6 13 Claims



1. A process for prospecting the beds of rivers, lakes or the ocean by means of an electromagnetic emission and the measurement of at least one component of the field obtained at a specific distance above the area to be prospected, comprising the steps of

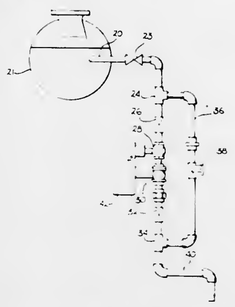
generating a controlled electromagnetic emission continuously and at a predetermined frequency less than 100 Hz from a location at the surface of the water, and

measuring the amplitude and phase of the selected component or components at the surface of the water at a location spaced a relatively great distance from the location of the electromagnetic emission, said component or components being either the transverse electric component Ey at the water surface or at least two components including the radial magnetic component Hx and either the vertical magnetic component Hz or the transverse electric component Ey, the steps of generating and measuring being carried out during a single dragging movement over the surface of the water while maintaining substantially the same distance between the generating and measuring locations.

4,047,099
METHOD AND APPARATUS FOR DETERMINING BOILER WATER CONDUCTIVITY

Lawrence A. Berger, Orange, and Robert Carroll Hunt, Santa Ana, both of Calif., assignors to Uniloc, Incorporated, Irvine, Calif.

Filed Sept. 15, 1975, Ser. No. 613,205
Int. Cl.² G01N 27/42
U.S. Cl. 324—30 R 10 Claims



1. In a boiler system having a boiler water conductivity probe, an improved apparatus for providing a signal responsive to the conductivity of the boiler water with minimal regard to short term fluctuations due to the presence of steam bubbles or the like comprising:

generating means coupled to a conductivity probe for providing an alternating first signal responsive to the apparent conductivity of the fluid surrounding the probe, said apparent conductivity being represented by short term fluctuations in said first signal;

detecting means coupled to said conductivity probe and responsive to said first signal for providing second signals corresponding to the peak values of said first signal and not to the short term fluctation in said first signal;

storage means coupled to said detecting means for temporarily retaining said second signals; and,

decay means for permitting said second signals retained by said storage means to decay at a decay rate selected to be greater than the corresponding rate of change of conductivity of the boiler water during blowdown and selected for minimal decay of said retained signals within the short term fluctuations between peak signals.

4,047,100
METER FOR MEASURING SYRUP RATIO IN SOFT DRINKS AND THE LIKE

Myron L. Robinson, Solana Beach, Calif., assignor to Simekus, Inc., Vista, Calif.

Filed Apr. 13, 1976, Ser. No. 676,566
Int. Cl.² G01N 27/42
U.S. Cl. 324—30 B 12 Claims

1. In an instrument for measuring the conductivity ratio of two liquids, the combination of:

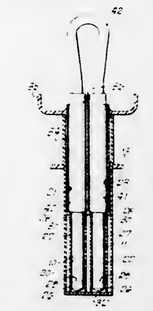
first and second elongate conductivity cells of substantially equal volume mounted in said instrument side-by-side with their axes substantially parallel,

each of said cells having an upper portion with an open end and a lower portion with a closed end and having spaced electrodes in the lower portion for providing an electrical path through a liquid in the cell,

with said upper portions of said cells formed of a single metal member and with said lower portions of each of said cells including upper and lower electrodes in the form of annular bands and an insulating tube between said bands, with said tube and bands having a flush inner surface;

means for introducing a liquid into each of said cells;

means for connecting said cells in a bridge circuit;



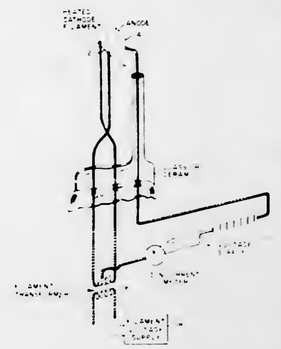
an ac power source connected as an input to said bridge circuit; and

indicator means for indicating the output of said bridge circuit.

4,047,101
FILAMENT FOR ALKALI METAL IONIZATION DETECTOR

James E. Bauerle, Pittsburgh; William H. Reed, Monroeville, and Edgar Berkey, Murrysville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 8, 1976, Ser. No. 647,464
Int. Cl.² G01N 27/00
U.S. Cl. 324—33 8 Claims



1. An alkali metal ionization detector comprising:

a thermal ionizer means consisting of a first electrode having an oxide protective coating for responding to impinging alkali metal atoms and compounds present in a carrier gas by producing positive alkali metal ions by thermal surface ionization of the alkali metal atoms and compounds,

first circuit means for maintaining the temperature of said thermal ionizer means at a temperature to ionize said alkali metal atoms and compounds,

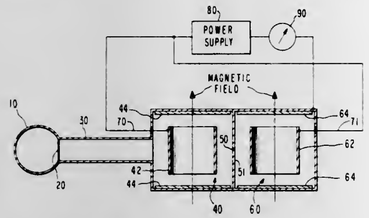
second electrode means, and

second circuit means for establishing a flow of said positive alkali metal ions from said thermal ionizer means to said second electrode, said flow of positive alkali metal ions being indicative of the concentration of said alkali metal present in said carrier gas.

4,047,102
DUAL CHAMBER, HIGH SENSITIVITY GAS SENSOR AND PUMP

Kimo M. Welch, Mountain View, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 519,369, Oct. 30, 1974, abandoned.
This application May 3, 1976, Ser. No. 682,554
Int. Cl.² G01N 27/00
U.S. Cl. 324—33 19 Claims

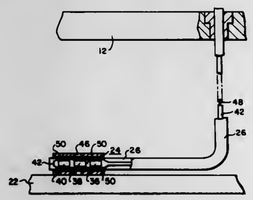


1. Gas sensing apparatus comprising:
a gas sensing unit; inlet means to said gas sensing unit comprising an inlet wall preferentially transmissive to gas under investigation;
a gas pumping unit having means for pumping gas, and passage means forming a conductance interconnecting said sensing and pumping units;
said sensing unit being constructed to have little or no pumping speed relative to the pumping speed of said pumping unit; and
the value of said conductance being small relative to the pumping speed of said pumping unit, whereby in operation the pressure in said sensing unit is higher than the pressure in said pumping unit to provide high sensitivity.

4,047,103
EDDY CURRENT POSITION INDICATING APPARATUS FOR MEASURING DISPLACEMENTS OF CORE COMPONENTS OF A LIQUID METAL NUCLEAR REACTOR

Clifford K. Day, and James L. Stringer, both of Richland, Wash., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1975, Ser. No. 547,074
Int. Cl.² G01R 33/12
U.S. Cl. 324—34 D 11 Claims

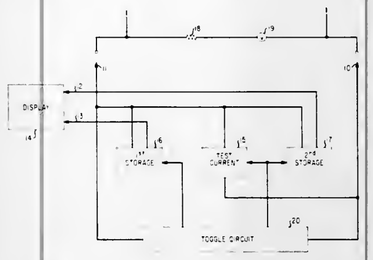


1. Apparatus for measuring displacements of a component of a liquid metal nuclear reactor immersed within the liquid metal coolant comprising:
an eddy current probe having a primary and secondary winding,
a dry thimble, adapted to be supported by a stationary portion of the reactor within the liquid metal coolant, housing the eddy current probe, which is stationarily supported therein during operation of the probe, and isolating the probe from the coolant, and
an electrically conductive annular ring with resistivity significantly different than the liquid metal coolant rigidly affixed to the component being monitored and slidably positioned around the periphery of the thimble concentric with the probe and symmetrically situated along the primary and secondary windings of the probe so that motion of the ring along the probe produces a proportional change in current in the secondary winding electrical output and wherein the annular ring includes a resistivity discontinuity formed from a cavity within the ring filled with a substance having a resistivity significantly different from the annular ring and the liquid metal coolant.

4,047,104
OHMMETER FOR CIRCUITS CARRYING UNKNOWN CURRENTS

Richard Grant Sparber, Wheaton, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 28, 1976, Ser. No. 709,429
Int. Cl.² G01R 27/02
U.S. Cl. 324—62 10 Claims



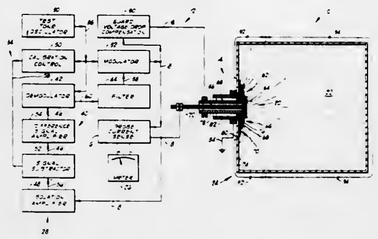
1. An ohmmeter circuit for measuring the resistance of a powered circuit comprising a pair of probes extending from said circuit for engagement with portions of said powered circuit; a first and second voltage storing means connectable to said probes; switching circuitry for controlling in alternating fashion the connection of said first and second voltage storing means to said probes; a current source associated with said first voltage storing means and being connected concurrently therewith to said probes by said switching circuitry; and a directly readable display connected to said first and second voltage storing means for indicating as a function of the difference of voltages stored thereon the resistance of said powered circuit between points therein touched by said probes.

4,047,105
METHOD AND APPARATUS FOR PROVIDING AN OUTPUT INDICATION PROPORTIONAL TO THE MOISTURE CONTENT OF PARTICULATE MATERIAL

Bruce Olen Anderson, Oklahoma City, Okla., assignor to The Dolese Company, Oklahoma City, Okla.

Filed Feb. 24, 1976, Ser. No. 660,917
Int. Cl.² G01R 27/02
U.S. Cl. 324—65 R 12 Claims

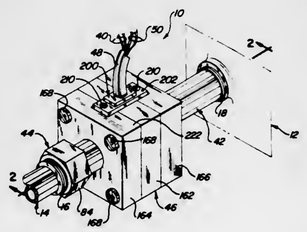
1. An apparatus for providing an output indication proportional to the moisture content of particulate material, the apparatus comprising:
a signal generator providing a probe drive signal having a predetermined frequency and a predetermined amplitude;
a probe connected to the signal generator and having a portion contacting the particulate material, the probe receiving the probe drive signal and applying the probe drive signal to the particulate material;
feedback control means connected to the probe and to the signal generator, the feedback control means sensing deviations of the amplitude of the probe drive signal applied to the particulate material via the probe from the predetermined amplitude and modulating the amplitude of the probe drive signal provided via the signal generator to maintain the amplitude of the probe drive signal at the predetermined amplitude; and
a probe current sensor interposed generally between the signal generator and the probe, the probe current sensor measuring the current flowing from the probe to the particulate material and providing a current indicator signal proportional to the measured current, the current indicator signal being proportional to the moisture content of the particulate material.



4,047,106
MOTOR SPEED SENSOR

Charles Elbert Robinson, Livermore, Colo. 80536

Filed June 1, 1976, Ser. No. 691,450
Int. Cl.² G01P 3/36
U.S. Cl. 324—175 10 Claims



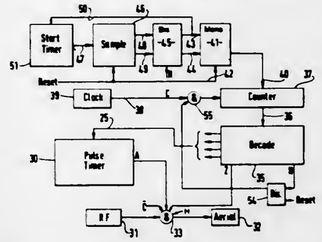
1. A motor speed sensor for placement between a take-off from said motor and a flexible drive for a tachometer, said take-off providing rotation proportional to the speed of said motor, said sensor comprising:
means connected to said take-off for extending the rotation of said take-off to said flexible drive,
a light source for providing a beam of light,
means operative with the rotation of said extending means for interrupting the beam of light at a rate that is proportional to said speed of said motor, and
means receptive of said interrupted beam for generating a series of pulses, the frequency of said pulses being proportional to said speed.

4,047,107
PULSE WIDTH RESPONSIVE SECURITY SYSTEM

Harvey Frank Dickinson, Bramhall, England, assignor to Ferranti Limited, Holliswood, England

Filed May 14, 1975, Ser. No. 577,164
Claims priority, application United Kingdom, May 18, 1974, 22281/74
Int. Cl.² H04B 1/00
U.S. Cl. 325—37 13 Claims

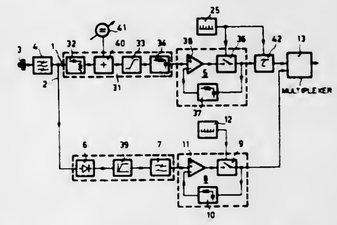
1. A security system transmitter comprising a high frequency wave generator for generating high frequency waves, first gating means operable to pass said high frequency waves, means for generating a group of pulses of predetermined frequency to operate the gating means by their sequential application including a charging circuit having a plurality of resistors, means for connecting each resistor in turn to determine the time constant of the charging circuit and the duration of each pulse generated whereby said group has a unique identity specified by the particular duration of the constituent pulses, and a tuned circuit aerial for transmitting pulses of high frequency waves passed by the gating means.



4,047,108
DIGITAL TRANSMISSION SYSTEM FOR TRANSMITTING SPEECH SIGNALS AT A LOW BIT RATE, AND TRANSMISSION FOR USE IN SUCH A SYSTEM

Arnold Jan Bijker, and Karel Riemens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 10, 1975, Ser. No. 594,591
Claims priority, application Netherlands, Aug. 12, 1974, 7410763
Int. Cl.² H04N 7/12; H04B 7/00
U.S. Cl. 325—38 B 10 Claims



1. Digital transmission system for transmitting band limited speech signals at a low bit rate, said system comprising a transmitter and a receiver, the transmitter comprising two transmitter channels having a common input means for receiving the speech signal to be transmitted, one of said channels including a first transmission device means operating at a given low bit rate for transmitting to the receiver a first digital signal representative of the frequency information content of the speech signal, the other channel including an envelope detector coupled to said input means, a low-pass filter coupled to said detector, and a second transmission device means coupled to said filter and operating at an appreciably lower bit rate than said first transmission device for transmitting to the receiver a second digital signal representative of the amplitude information content of the speech signal, said receiver comprising input means for receiving and separating said first and second digital signals, two receiving channels coupled to said separating means, one of said channels comprising a decoder means which in response to the applied second digital signal produces

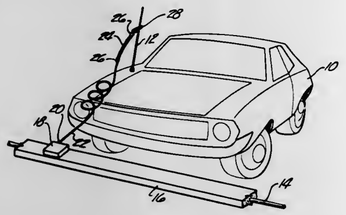
an output signal corresponding to the envelope of the speech signal, the other receiving channel comprising a pulse modulator to which the first digital signal and the said envelope signal as a modulating signal are applied, an integrator which is coupled to the output of the pulse modulator, and a band-pass filter coupled to said integrator, said first transmission device means comprising a uniform pulse delta modulator, said transmitter further including a differentiator coupled to said transmitter input means, an amplitude slicer coupled to said differentiator, and an integrator means coupled to said slicer for supplying the band-limited speech signal to said uniform pulse delta modulator for generating said first digital signal.

4,047,109

DRIVE-IN THEATER AUDIO SYSTEM

Kiichi Sekiguchi, 1-6-50-401 Akabanedai, Kitaku, Tokyo, Japan

Filed Sept. 9, 1975, Ser. No. 611,635
Claims priority, application Japan, Sept. 10, 1974, 49-103523
Int. Cl.² H04H *1/00*
U.S. Cl. 325—54 **4 Claims**



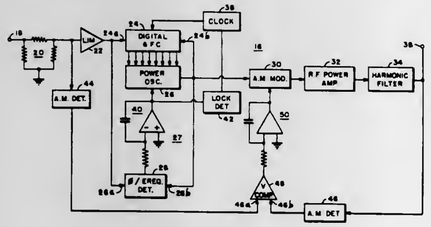
1. In a system for use in a drive-in theater for reproducing audio sound in plurality of vehicles having broadcast band radio receivers including a central broadcast band transmitter and a wired circuit connected to the output of the transmitter and extending in the vicinity of the vehicles, an improved form of lead-in for connecting the wired circuit to the radio receiver of a vehicle, comprising: a pair of elongated, flexible conductor sections supported in closely spaced parallel relationship to one another, and insulated from one another, one of the conductors being connected to the said wired circuit and the other conductor being connected to the antenna circuit of the vehicle radio to capacitively couple a transmitter signal to the vehicle radio without strong coupling of other broadcast band signals.

4,047,110

TRANSMITTER COUPLED ACTIVE FILTER

Eugene A. Jansing, West Chester, Ohio, assignor to Xetron Corporation, Cincinnati, Ohio

Filed July 1, 1976, Ser. No. 701,540
Int. Cl.² H04B *1/04*
U.S. Cl. 325—123 **21 Claims**



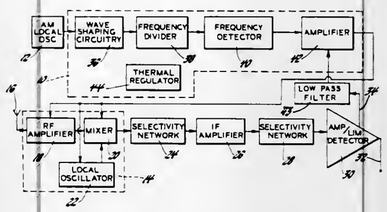
1. In a transmission system, the combination comprising: an R.F. transmitter having a high power original carrier output with signal modulations and broadband noise thereon;
means for dissipating said high power original carrier output to a relatively low level;
a tunable power oscillator for regenerating said carrier, said oscillator having a low noise output;
comparison circuit means for comparing said lower level original carrier with said regenerated carrier and for automatically tuning said power oscillator to the frequency of said original carrier in response to a difference between said carriers, said comparison circuit means including means responsive to said low level original carrier to derive a voltage proportional to said signal modulations for modulating said oscillator; and
means for amplifying the output of said power oscillator to a predetermined high power level.

4,047,111

TUNING SYSTEM FOR AM/FM RECEIVERS

Paul N. Barr, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 19, 1976, Ser. No. 706,848
Int. Cl.² H04B *1/16*
U.S. Cl. 325—315 **4 Claims**



1. In a combination AM and FM receiver including an AM local oscillator, electronically tunable FM tuner means, and automatic frequency control means providing a first DC signal having an amplitude proportional to drift of said FM tuner, the improvement comprising a circuit for detecting the frequency of said AM local oscillator and for supplying a tuning voltage to said FM tuner, said circuit comprising amplifier means for amplifying the AC input from said AM local oscillator for providing a trigger signal each half cycle of said AC input, frequency divider means responsive to said trigger signal for producing a square wave signal at one half the frequency of said local oscillator signal, frequency detector means responsive to the output of said frequency divider means for developing a second DC signal having an amplitude proportional to the frequency of said AM local oscillator, DC amplifier means responsive to said first and second DC signals for supplying to said tuner a voltage which is an amplified version of said first DC signal, adjusted to compensate for any drift of said tuner.

4,047,112
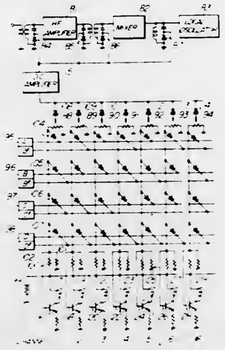
CHANNEL SELECTOR EMPLOYING VARIABLE CAPACITANCE ELEMENTS FOR TUNING

Yoichi Sakamoto, Toyonaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 194,998, Nov. 2, 1971, abandoned, which is a continuation of Ser. No. 853,165, Aug. 26, 1969, abandoned. This application Mar. 11, 1974, Ser. No. 449,757
Claims priority, application Japan, Aug. 30, 1968, 43-62206; Oct. 1, 1968, 43-72072; Oct. 1, 1968, 43-72073; Oct. 3, 1968, 43-72104; Dec. 4, 1968, 43-88865; Feb. 21, 1969, 44-13099
Int. Cl.² H04B *1/16*
U.S. Cl. 325—455 **8 Claims**

2. A television receiver channel selector for selecting one

from among a plurality of channel tuning frequencies, comprising:
a tuning circuit tunable to said plurality of channel tuning frequencies, including variable capacitance diodes as tuning elements;
a plurality of preset voltage supply circuits, including preset impedances, for supplying at outputs thereof tuning voltages corresponding to said plurality of channel tuning frequencies;
binary memory circuit means having a plurality of outputs for producing binary coded information signals indicating pure binary numbers and corresponding to said channel tuning frequencies;
binary decoder means having a first plurality of terminals coupled to the corresponding outputs of said binary memory circuit means and a second plurality of terminals coupled to the outputs of said voltage supply circuits;
means for selectively connecting the outputs of said voltage supply circuits to said variable capacitance diodes for tuning said tuning circuit to one of said channel tuning frequencies, including means for selectively connecting the output of one of said voltage supply circuits to said variable capacitance diodes to tune said tuning circuit to the corresponding channel tuning frequency and disconnecting the outputs of all others of said voltage supply circuits from said variable capacitance diodes, the selective connection of one said voltage supply circuit and disconnection of said all other voltage supply circuits being controlled by a signal appearing on a given one of said second plurality of decoder means terminals;
a plurality of switching elements having control terminals respectively connected to said second plurality of terminals of said binary decoder means, the corresponding one of said switching elements being urged conductive by said signal appearing at said given one of said second plurality of decoder terminals; and
a plurality of indicating means connected in series with the respective switching elements.



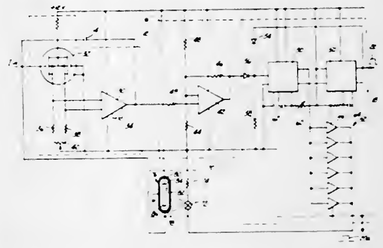
4,047,113

FEEDBACK CIRCUITRY FOR CHARGE DIGITIZER

Karl Staermer, Mentor, Ohio, assignor to Sheller-Globe Corporation, Cleveland, Ohio

Filed May 13, 1976, Ser. No. 686,044
Int. Cl.² G01R *19/26*; H01J *39/12*
U.S. Cl. 328—2 **3 Claims**

1. In a charge digitizer wherein the current to be measured is applied to an electronic integrator which includes capacitor means, high input impedence amplifier means, and wherein the output from the integrator is applied to a comparator, and wherein the comparator gates a multivibrator to produce pulses responsive to the output from the comparator, an improved feedback circuitry comprising,
a vacuum photo-diode coupled between the input of the integrator and a biasing voltage for the photo-diode, and a pulse light source connected to the output of the multivibrator and operative responsive to pulses therefrom, said light source being positioned to illuminate the cathode of the photo-diode to cause pulse current flow to discharge the capacitor means when the light source is illuminated, and guard ring means on said photo-diode to prevent unintended current flow between the anode and cathode, whereby an open feedback circuit is maintained during the absence of light pulses.

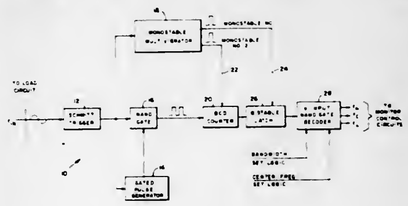


4,047,114

DIGITAL DETECTOR

Richard A. Lane, Huntsville, Ala., and Donald K. Froseck, Sparks, Nev., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 6, 1976, Ser. No. 712,427
Int. Cl.² H03K *9/06*
U.S. Cl. 328—140 **5 Claims**



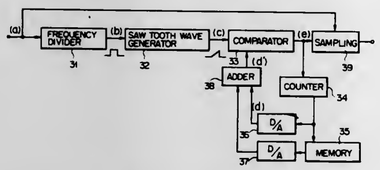
1. A digital detector for detecting the presence of selected frequencies in an input signal comprising: counting means having an input and an output; a NAND gate having first and second inputs and an output, said output being coupled to said counting means input; shaping means having an input for receiving said input frequency signals and an output for providing a shaped gating pulse, the output of said shaping means being coupled to the first input of said NAND gate; a pulse generator having an output coupled to said second NAND gate input and having a gating input coupled to said shaping means output; and a decoder circuit coupled to said counter output for responding to said counter output to provide output pulses as a function of said detector input frequencies.

4,047,115

SAMPLE PULSE GENERATING APPARATUS

Koichi Toda, Isehara; Tetsuya Miki, and Haruo Yamaguchi, both of Yokosuka, all of Japan, assignors to Anritsu Electric Co., Ltd. and Nippon Telegraph and Telephone Public Corporation, both of Tokyo, Japan

Filed Nov. 19, 1976, Ser. No. 743,347
Claims priority, application Japan, Nov. 21, 1975, 50-139993
Int. Cl.² H03K 5/18
U.S. Cl. 328—151 2 Claims



1. A sample pulse generating apparatus having means for generating an input signal with a high frequency to be sampled; means upon receipt of said input signal for generating a saw tooth wave signal which is in synchronism with said input signal and has lower frequency than that of said input signal; means for generating a staircase wave signal of which the voltage level is stepped up in synchronism with the occurence of said saw tooth wave signal; a voltage comparator for receiving said saw tooth wave signal and said staircase wave signal and comparing them and producing a sampling signal when those signals coincide in level with each other; and means for producing an observation signal which is analogous in wave shape to said input signal and has lower frequency than that of said input signal, by sampling said input signal by said sampling pulses, the improvement in which said staircase wave signal generating means includes a counter means for executing a count every time when it receives said sampling pulse from said comparator and a first digital to analogue converter for successively producing staircase signals every time it receives a digital counting output signal generated from said counter means, and said sample pulse generating apparatus further comprises: memory means for previously storing in the order of said saw tooth wave signal generation the signals each with the magnitude corresponding to the time error of said each sampling pulse occurrence due to the non-linearity of said saw tooth wave signal and for successively generating digital correction signals each corresponding to said magnitude of said each stored signal in response to said digital signal of said counter means; a second digital to analogue converter for successively producing staircase analogue correction signals every time it receives said digital correction signal from said memory means; and summing means for summing said staircase wave signal from said first digital to analogue converter and said staircase wave correcting signal from said second digital to analogue converter and for outputting the summed signal from said summing means to said comparator where it is compared with said saw tooth wave signal.

4,047,116

FM MULTIPLEX STEREO DEMODULATING CIRCUIT

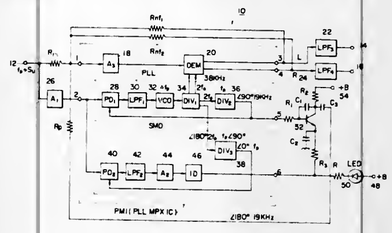
Minoru Ogita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 24, 1976, Ser. No. 717,389
Claims priority, application Japan, Aug. 28, 1975, 50-103429
Int. Cl.² H03D 3/00; H04H 5/00
U.S. Cl. 329—124 6 Claims

2. An FM multiplex stereo demodulating circuit for obtaining separated left and right channel signals from a composite signal containing a modulated stereophonic signal and a pilot signal of a certain frequency comprising:

a demodulator circuit having an input and first and second output signals comprising said separated left and right channel signals;

means for connecting said modulated and pilot signal to said input;



means for receiving said modulated and pilot signals and producing a cancellation signal which is identical to and 180° out of phase with said pilot signal; and

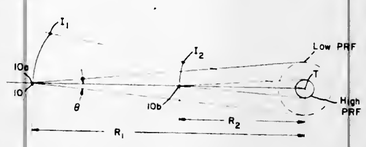
means for applying said cancellation signal to said input.

4,047,117

MULTI-LEVEL LASER ILLUMINATOR

Harold J. Tuchyner, Los Angeles, and Robert C. Benson, Canoga Park, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 434,145, Jan. 17, 1974, abandoned. This application Dec. 27, 1976, Ser. No. 754,285
Int. Cl.² H01S 3/00; F41G 7/00
U.S. Cl. 330—4.3 11 Claims



1. A laser target illuminator comprising

laser oscillator means for generating high power pulses and low power pulses,

a first control source coupled to said laser oscillator means for generating said high power pulses at a first pulse rate,

a second control source coupled to said laser oscillator means for generating said low power pulses at a second pulse rate higher than said first pulse rate, and

optical means responsive to said laser oscillator means to transmit a combined pulse train toward said target.

4,047,118

TRANSISTOR AMPLIFIER CIRCUIT

Yoshio Sakamoto, and Yasuo Kominami, both of Kokubunji, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 16, 1976, Ser. No. 649,745
Claims priority, application Japan, Jan. 16, 1975, 50-6271
Int. Cl.² H03F 3/04
U.S. Cl. 330—22 16 Claims

1. In a transistor amplifier circuit having

an input terminal to which signals to be amplified are applied;

an output terminal;

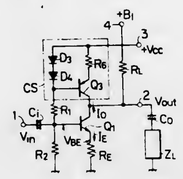
a common-emitter transistor having its base electrode connected to said input terminal and its collector electrode connected to said output terminal;

a power supply terminal to which a power supply voltage is applied; and

a constant-current circuit connected between said power supply terminal and the collector of said common-emitter transistor;

the improvement comprising:

means for setting a D.C. voltage level at the collector of said common-emitter transistor including a D.C. voltage terminal to which a prescribed D.C. voltage exclusive of said power supply voltage is applied, and



a load resistor connected between said D.C. voltage terminal and the collector of said common-emitter transistor, and

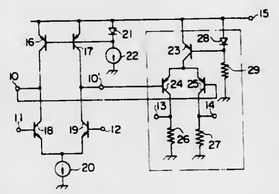
wherein the value of current supplied by said constant-current circuit to the collector of said common-emitter transistor is equal to that of the D.C. emitter current of said common-emitter transistor.

4,047,119

TRANSISTOR DIFFERENTIAL AMPLIFIER CIRCUIT

Yoshito Ohmura, Hachio; Takahiro Okabe, and Hiroshi Morozumi, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 24, 1976, Ser. No. 660,819
Claims priority, application Japan, Feb. 26, 1975, 50-22890
Int. Cl.² H03F 3/45
U.S. Cl. 330—30 D 23 Claims



15. A transistor differential amplifier circuit for producing pulse output signals from A.C. input signals comprising at least a first amplifier stage comprising:

a pair of amplifying transistors of a first conductivity type connected to each other by their emitters;

means for applying A.C. input signals between the bases of said amplifying transistors;

first constant current means commonly connected to both the emitters of said first amplifying transistors;

means for deriving output pulse signals from the collectors of said amplifying transistors;

a pair of load transistors of second conductivity type each connected by the collector thereof with the collector of a respective one of said amplifying transistors and having their bases and emitters commonly connected to each other;

diode means connected between the commonly connected bases and emitters of said load transistors for providing a voltage drop produced thereacross between the base and emitter of each of said load transistors; and

second constant current means connected to said diode means for providing said diode means with a constant current;

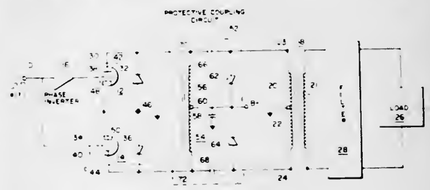
wherein said first and second current sources are adjustable such that the duty cycle of said output pulse signals is related to the ratio of the magnitude of said first and second current sources.

4,047,120

TRANSIENT SUPPRESSION CIRCUIT FOR PUSH-PULL SWITCHING AMPLIFIERS

Harold Wilbur Lord, Mill Valley, Calif., and Jimmy Dale Rogers, Dallas, Tex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 15, 1976, Ser. No. 705,489
Int. Cl.² H03F 21/00
U.S. Cl. 330—207 P 16 Claims



1. A push-pull amplifier comprising:

first and second switching amplifier elements operating to alternately conduct an input signal for 180° intervals,

means for phase shifting the input signals to said first switching amplifier element 180° relative to the input signal of said second switching amplifier element,

an output transformer having a primary coil with first and second end terminals located at respective ends of the coil and a grounded center tap, said first end terminal being coupled to the output of said first switching amplifier element, said second end terminal being coupled to the output of said second switching amplifier element, and a secondary coil connected to a load,

A D.C. power source; and

protective coupling means connecting said D.C. power source to said first and second end terminals of said primary coil and the outputs of the first and second switching amplifier elements, said protective coupling means limiting the voltage level of said primary coil switching amplifier elements to inhibit high transient voltages caused during conductive switching of said amplifier elements.

4,047,121

RF SIGNAL GENERATOR

Kenneth J. Campbell, Solana Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 16, 1975, Ser. No. 622,924
Int. Cl.² H04B 17/00
U.S. Cl. 331—76 5 Claims

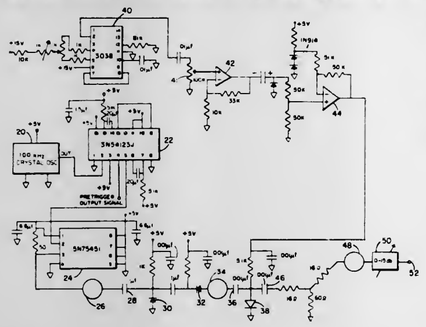
1. In a signal generator for generating modulated RF signals available for testing key parameters of receivers the combination comprising:

a. signal generating means for generating an output signal of a predetermined frequency;

b. pulse generating means coupled to said signal generating means for generating spike output pulses at said predetermined frequency;

c. balanced mixer modulator circuit means coupled to said pulse generator means;

d. a source of amplitude modulating signal means coupled to said modulator circuit means for modulating said narrow

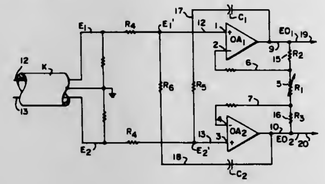


pulses to provide a plurality of RF signals at the output of said modulator circuit means.

4,047,122
FREQUENCY COMPENSATED DIFFERENTIAL AMPLIFIER

Dhulipala M. Rao, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 11, 1976, Ser. No. 656,993
Int. Cl.² H03F *1/36*
U.S. Cl. 330—84 **1 Claim**

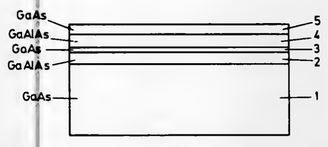


1. In a high impedance and high closed loop DC gain amplifier arrangement connected in circuit between two input terminals forming a differential input supplied with an analog signal and two output terminals, the combination of:
first and second operational amplifiers each having a non-inverting input, an inverting input and an output, the non-inverting inputs being connected to respective ones of said input terminals, the inverting inputs being connected to the opposite ends of an input resistor, the outputs being each connected to the associated inverting input through a corresponding output resistor and to a corresponding one of said output terminals to provide said closed loop DC gain;
with said input terminals being supplied with said analog signal together with an alternating current noise signal of a given frequency in the low frequency range;
a first capacitor connected between the output of one operational amplifier and the non-inverting input of the other operational amplifier, a second capacitor connected between the output of the other operational amplifier and the non-inverting input of the said one operational amplifier, said first and second capacitors having a value providing at and above said given frequency and AC gain substantially lower than said DC gain.

4,047,123
DOUBLE HETEROSTRUCTURE LASERS HAVING REDUCED MICROSTRESS

Paul Anthony Kirkby, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,320
Claims priority, application United Kingdom, Sept. 26, 1974, 41896/74
Int. Cl.² H01S *3/19*
U.S. Cl. 331—94.5 H **7 Claims**

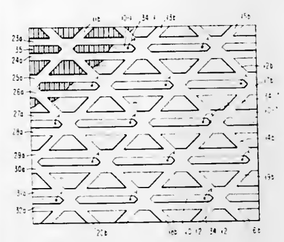


1. An improved double heterostructure laser of the type having an active region consisting of Group III–V material flanked by at least one layer of Group III–V material comprising:
an additional Group III material within the active region composition for providing reduced microstress strain in the laser structure; and
an additional Group III material within the Group III–V material of the flanking layers wherein the Group III material comprises gallium and the additional Group III material comprises indium.

4,047,124
PLANAR SOLID STATE LASER ARRAY

Liam David Comerford, Croton-on-Hudson, and Peter Stephen Zory, Jr., Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,851
Int. Cl.² H01S *3/19*
U.S. Cl. 331—94.5 H **2 Claims**

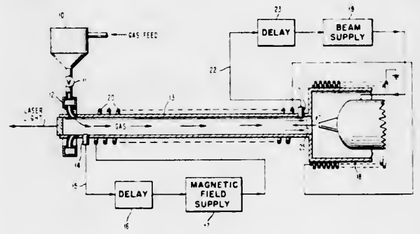


1. A solid state laser array comprising:
a monolithic body having a plurality of planar layers of semiconducting materials including an active layer bounded by a pair of buffer layers operative when forward biased to produce a population inversion;
electrode structures on opposing faces of said body operative when potentialized to apply a forward bias to said active layer;
a plurality of grooves opening into one of the faces of said body and penetrating into said body to a depth equal to or greater than the depth of the lower buffer layer the said grooves dividing said body into a plurality of islands each of which is bounded by walls of said grooves to provide a resonant circulatory cavity;
a diffraction grating formed in a layer of said body for coupling the circulating laser beam out of each of said laser islands in a direction normal to the plane of said layers;
the said plurality of grooves consisting of first, second, and third sets of grooves, the grooves in the respective sets being parallel to one another, and the first and second sets of grooves being mutually perpendicular and equiangularly disposed with respect to the grooves in said third set, the grooves in said first and second sets having vertical walls and the grooves in said third set having nonvertical walls whereby the resonating cavity is defined by the walls of said first and second sets of grooves.

4,047,125
ELECTRON BEAM PUMPED GAS LASER

Russell Warren Dreyfus, Cross River, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 3, 1976, Ser. No. 682,865
Int. Cl.² H01S *3/09*
U.S. Cl. 331—94.5 PE **18 Claims**

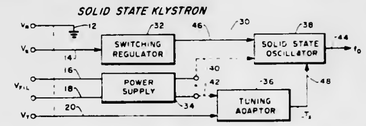


1. An electron beam pumped gas laser having an electron beam launching means in an evacuated cavity which is adapted to house a lasing gas which laser eliminates the requirement for apparatus to physically segregate the electron beam launching means from the lasing gas, which laser further comprises:
a reservoir of lasing gas, valve means connecting said cavity to said reservoir to allow said lasing gas to flow into said evacuated cavity, and
means to energize said electron beam launching means at a time when two distinct regions exist in said cavity, a first region immediately surrounding said electron beam launching means which is substantially evacuated and a second region containing a quantity of gas sufficient to support lasing action when pumped by an electron beam passing therethrough.

4,047,126
SOLID STATE KLYSTRON

Gary L. Anderson, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 19, 1976, Ser. No. 706,705
Int. Cl.² H03B *5/18, 7/14, 9/12*
U.S. Cl. 331—96 **34 Claims**

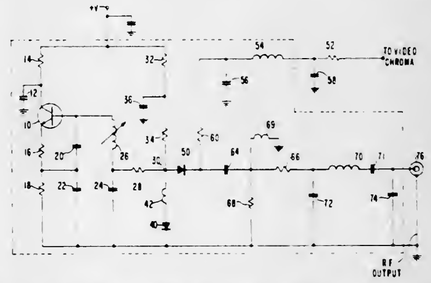


1. A solid state microwave generator for use in place of a low power tube-type klystron and operable from the klystron cathode and reflector voltage supplies comprising:
a. means for providing a cathode voltage;
b. means for providing a reflector voltage;
c. means responsive to said cathode voltage for reducing the voltage level of said cathode voltage to a first predetermined voltage;
d. tuning adapter means responsive to said reflector voltage for providing gain compensation to said reflector voltage; and
e. solid state oscillator means responsive to said first predetermined voltage and said gain compensated reflector voltage for generating an a-c output signal, said gain compensated reflector voltage determining the frequency of said a-c output signal.

4,047,127
RF OSCILLATOR AND MODULATOR HAVING REGULATED LOW HARMONIC OUTPUT

Wilson E. Alexander, Santa Clara, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Aug. 27, 1976, Ser. No. 718,279
Int. Cl.² H03C *1/14*
U.S. Cl. 332—31 T **7 Claims**



1. An RF oscillator and modulator wherein said oscillator has a regulated output power for a range of supply voltage and low harmonic voltage output comprising:
a. a bipolar transistor having emitter, base and collector terminals,
b. a voltage source,
c. means connecting said transistor to said voltage source;
d. means connecting said transistor to circuit ground;
e. tuned circuit means operably connected with said transistor to establish oscillation frequency;
f. means interconnecting said tuned circuit means and an oscillator output terminal;
g. diode biasing means having a fixed DC voltage drop connecting said output terminal and circuit ground whereby said fixed DC voltage is commuted to said transistor through said tuned circuit as a bias voltage and
h. modulation means connected to said oscillator output terminal for receiving a modulation signal and modulating said oscillator signal.

4,047,128
SYSTEM FILTER FOR DOUBLE FREQUENCY UTILIZATION

Gunter Morz, Ludwigsburg, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

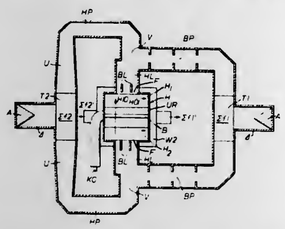
Filed Apr. 19, 1976, Ser. No. 678,387
Claims priority, application Germany, Apr. 19, 1975, 2517383
Int. Cl.² H01P *1/16, 5/20*
U.S. Cl. 333—11 **14 Claims**

1. A system filter for separating signals of two different frequency bands with each frequency band being doubly orthogonally polarized whereby the same frequency can be used in two channels, said system filter comprising in combination:
a broadband polarization filter of singly symmetrical construction including a doubly polarizable waveguide section, partition means positioned within said waveguide for axially dividing said waveguide section into two symmetrical partial waveguides, and means for coupling out the two frequency bands of the wave which is polarized paral-

lel to the plane of said partition means including two coupling windows each formed in a respective one of a pair of oppositely disposed walls of said doubly polarizable waveguide section and at least one waveguide hybrid tee having two symmetrical arms coupled to said coupling windows;

diplexer means coupled to said at least one waveguide hybrid tee for separation of the two frequency bands of the wave which is polarized parallel to the plane of said partition means; and,

means for dividing the other orthoganally polarized wave into its two frequency bands including frequency filters connected in series with said doubly polarizable waveguide section via a transition section connected to the output of said doubly polarizable waveguide section.



4,047,129

ELASTIC SURFACE WAVE FILTER

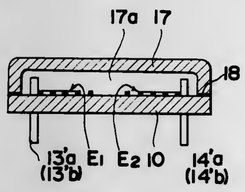
Hideki Ishiyama, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Mar. 12, 1976, Ser. No. 666,270

Claims priority, application Japan, Mar. 13, 1975, 50-34316[U]; Mar. 13, 1975, 50-34317[U]; Mar. 13, 1975, 50-34318[U]

Int. Cl.² H03H *9/04, 9/10, 9/26;* H01L *41/04*

U.S. Cl. 333—72 11 Claims



1. An elastic surface wave filter which comprises:

a substrate of peizoelectric property having opposed surfaces and interleaved-comb-type transducer electrodes formed on one of said opposed surfaces, one of said transducer electrodes being adapted to be coupled to a source of electric input signal and the other said transducer electrodes being adapted to be coupled to an external load circuitry, said transducer electrodes being formed on said one of said opposed surfaces of said piezoelectric substrate in spaced, but piezoelectrically coupled, relation to each other;

a top covering rigidly mounted on said one of said opposed surfaces of said piezoelectric substrate and defining an interior chamber between said top covering and said substrate;

each of said transducer electrodes including a pair of comb-type electrode arrays interleaved with each other; and

elongated terminal members one for each comb-type electrode array, each of said elongated terminal members having one end coupled to the associated comb-type electrode array and the other end extending outwardly from said substrate for external electrical connection.

4,047,130

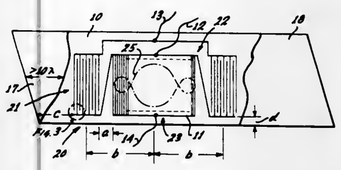
SURFACE ACOUSTIC WAVE FILTER

Teong C. Lim, Thousand Oaks, Calif.; Umit Tarakci, Balikesir, Turkey, and Carmine F. Vasile, Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 27, 1976, Ser. No. 718,249

Int. Cl.² H03H *9/04, 9/26, 9/32, 9/30*

U.S. Cl. 333—72 12 Claims



1. A surface acoustic wave filter for use in connection with an amplifier having a particular pulse response recovery time, comprising:

a flat, piezoelectric substrate having elongated extension in one direction and a parallelogram elevational contour, there being a plurality of interdigitized fingers establishing at least two transducers respectively for transmitting and receiving acoustic surface waves propagating in the one direction, the wavelength of the passband center frequency being determined by the spacing on said interdigitized fingers, particular surface areas being free from these fingers adjacent to short side edges of the parallelogram, said edges having an angle of less than 90° relative to one direction;

a damping material covering at least a portion of the said surface areas for a width in the said direction equivalent to about ten wavelengths of the transmitted surface waves; and

the edge-to-edge spacing between the transducers being greater than about four wavelengths, the center-to-center spacing between the two transducers being smaller than one half the distance a surface wave propagates during said recovery time.

4,047,131

VOLTAGE-CONTROLLED HF-SIGNAL ATTENUATOR

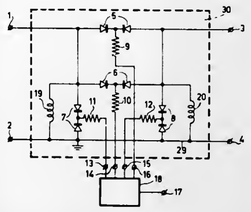
Adrianus Willem Ludikhuize, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,534

Claims priority, application Netherlands, May 28, 1975, 7506265

Int. Cl.² H03H *7/24*

U.S. Cl. 333—81 R 4 Claims



1. An integrated voltage controllable RF signal attenuator having a control range and a pair of signal input terminals and a pair of signal output terminals, said attenuator comprising a parallel arrangement of first and second signal transmission paths, both of said transmission paths being coupled between one of said signal input terminals and one of said output terminals; a signal shunting path coupled between the signal input terminals; said first transmission path comprising a first pair of PIN-diodes coupled in series opposition and having an RF impedance which depends on a first variable direct current; said signal shunting path comprising a second pair of PIN-diodes coupled in series opposition; and said second transmission path comprising a third pair of PIN-diodes coupled in series opposition and having an RF impedance which depends on a second variable direct current; the minimum signal impedance of the first transmission path being smaller than that of the second transmission path within the control range of the attenuator and the second variable direct current decreasing in magnitude after the first direct current decreases in magnitude for an increasing attenuation of the attenuator.

4,047,132

MULTILAYER PRINTED CIRCUIT BOARDS

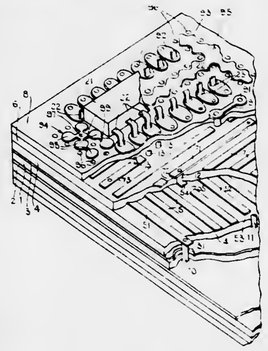
Ignacy Krajewski, Poynton, England, assignor to International Computers Limited, London, England

Filed June 21, 1976, Ser. No. 698,021

Claims priority, application United Kingdom, June 20, 1975, 26256/75

Int. Cl.² H01P *3/08*

U.S. Cl. 333—84 M 7 Claims



1. A multilayer printed circuit assembly including

a planar conductive layer;

a plurality of contact pads arranged in a first plane spaced from said conductive layer and parallel thereto, the contact pads being disposed for connection to circuit components and occupying only part of the area of said first plane;

a plurality of first conductors extending in a second plane;

a plurality of second conductors extending in a third plane, said second and third planes lying between said conductive layer and said first plane;

electrical connections between the contact pads and selected ones of said first and second conductors;

and a plurality of conductive areas occupying at least some of the remainder of the area of said first plane, being electrically connected to said conductive plane and being effective in conjunction with the conductive plane to cause the characteristic impedances of the first and second conductors to be approximately equal.

4,047,133

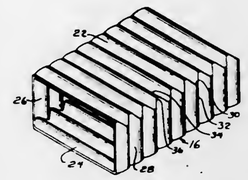
CONTINUOUS CORRUGATED WAVEGUIDE AND METHOD OF PRODUCING THE SAME

Michel Merle, Elmira, N.Y., assignor to Andrew Corporation, Orland Park, Ill.

Division of Ser. No. 397,955, Sept. 17, 1973, Pat. No. 3,938,244, which is a continuation-in-part of Ser. No. 315,101, Dec. 14, 1972, abandoned, which is a continuation of Ser. No. 235,161, March 16, 1972, abandoned, and Ser. No. 238,458, March 27, 1972, abandoned. This application Dec. 22, 1975, Ser. No. 643,369

Int. Cl.² H01P *3/14*

U.S. Cl. 333—95 A 29 Claims



1. A method of microwave transmission comprising transmitting microwaves through an elongated waveguide extending between two spaced points and comprising a continuous flat strip of electrically conductive metal formed into a continuous length of a coilable corrugated tube having intersecting walls with the currugations in each pair of intersecting walls being aligned with each other, the walls of one corrugation in each intersecting pair of corrugations being folded outwardly alongside the walls of the other corrugation in that pair beginning at the line of intersection of that pair of corrugations.

4,047,134

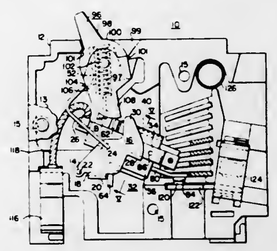
CIRCUIT BREAKER

Alfred E. Maier, Beaver Falls, and William I. Stephenson, Jr., Beaver, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 22, 1975, Ser. No. 579,756

Int. Cl.² H01H *73/48*

U.S. Cl. 335—23 12 Claims



1. A circuit breaker, comprising:

an insulating housing;

an operating handle having open, closed, and trip positions;

a latch lever;

means pivotally attaching said latch lever to said housing;

a stationary contact;

a moving contact assembly pivotally attached to said latch lever, said moving contact assembly comprising a moving contact cooperable with said stationary contact to open and close an electric circuit;

an operating spring having one end pivotally connected to

said moving contact assembly and having another end engaged by said operable handle;

a latch member attached to said moving contact assembly and releasably engaging said latch lever, release of said latch lever allowing said moving contact assembly to pivot with respect to said latch lever, said pivoting movement causing said moving contact to separate from said stationary contact and open an electric circuit; and

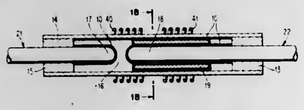
trip means operable upon overcurrent conditions through said moving and stationary contacts to effect automatic release of said latching lever by said latching member;

actuation of said operating handle between open and closed position being operable to pivot said latch lever and said moving contact assembly and cause said moving contact to cooperate with said stationary contact to open and close an electric circuit.

4,047,135
CYLINDRICAL, LINEAR, STOPLESS MERCURY SWITCH AND RELAY

Paul Edward Stuckert, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1975, Ser. No. 637,263
Int. Cl.² H01H 1/08
U.S. Cl. 335—58 **13 Claims**





1. A fluid-conductor-wetted, linear relay switch including a housing,

a stationary contact electrode within said housing,

a reciprocable contact element,

a conducting liquid,

means for supporting said conducting liquid to provide a bearing surface of said liquid for supporting said contact element for reciprocation within said housing,

said means for supporting and said liquid defining a predetermined space within which said element can reciprocate between open and closed switch positions relative to said electrode,

said element and said electrode being electrically connected by said liquid when said element and said electrode are in a closed switch condition,

said electrode and said element being mechanically spaced apart in all positions of said element, and

said element being held apart by a predetermined minimum spacing from said electrode in said closed condition by said liquid,

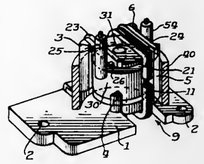
said element and said electrode having conforming electrical contact surfaces adapted for confrontation during sliding of said element into said closed condition, and in said closed condition

said conforming surfaces resting in side-by-side overlapping relationship with said liquid contained within the space between said conforming surfaces, said conforming surfaces extending parallel to the axis of reciprocation of said reciprocable contact element.

4,047,136
MOVING MAGNET TYPE INSTRUMENT

Seiichi Satto, Iruma, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.), Higashimurayama, Japan

Filed May 11, 1976, Ser. No. 685,238
Claims priority, application Japan, May 13, 1975, 50-56858; May 21, 1975, 50-67975; June 10, 1975, 50-78490
Int. Cl.² H01F 7/08
U.S. Cl. 335—222 **7 Claims**



1. Improvements in a moving magnet instrument in which a magnet member moves relative to a frame unit in response to variations in current flow through a coil fixed relative to the frame unit and relative to which the magnet member is rotatable arcuately in response to current flow variations through the coil, the improvement comprising:

the frame unit being of two piece construction capable of assembly into a unit, each piece having a bearing alignable with the other bearing upon assembly of the respective pieces;

the magnet member being formed with magnetic material and a plastic material interlocked to prevent separation of one material from the other, and

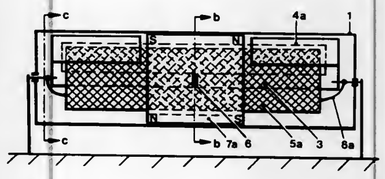
having an axle portion located in said bearings formed in said frame unit thereby defining an axis about which said magnet member is rotatable in the magnetic field of the fixed coil

whereby said magnet member is rotatable in response to current which flows through the coil.

4,047,137
BISTABLE POSITION INDICATING DEVICE

Birger Widén, Tierp, Sweden, assignor to Widéns Elautomatik AB, Tierp, Sweden

Filed Mar. 10, 1976, Ser. No. 665,408
Claims priority, application Sweden, Mar. 19, 1975, 7503123
Int. Cl.² H01F 7/08
U.S. Cl. 335—234 **4 Claims**



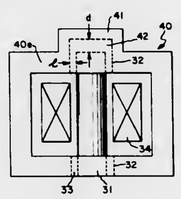
1. An electromagnetic indicating display device including at least one pair of bistable position indicators, each bistable position indicator comprising: a non-rotatable electromagnet having a pair of pole shoes; an elongate rotatable member concentrically positioned relative to said electromagnet, the outer surface of said elongate member being circumferentially divided into first and second axially extending sections of different colors; a permanent magnet carried by said rotatable member having poles alignable respectively with the pole shoes of said electromagnet upon excitation of said electromag-

net whereby said rotatable member is rotatable through an angle of not more than 180° selectively into one of two positions, the first of said positions displaying one of said first and second colored sections and information carried thereon and the second of said positions displaying the other of said colored sections and information carried thereon.

4,047,138
POWER INDUCTOR AND TRANSFORMER WITH LOW ACOUSTIC NOISE AIR GAP

Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 19, 1976, Ser. No. 688,010
Int. Cl.² H01F 27/24
U.S. Cl. 336—100 **2 Claims**



1. A low acoustic noise power inductive device for high operating frequency power inductor and transformer applications comprising

a ferrite magnetic core comprising an essentially rectangular outer member having opposing side sections and connecting end sections and further comprising a cylindrical center member that is continuous in the longitudinal direction,

said core end sections having a pair of aligned circular apertures extending completely therethrough into which opposite ends of said cylindrical center member extend to define between at least one end section and the respective end of said center member a radial magnetic air gap of constant predetermined length for controlling the permeability of said core, and a non-magnetic spacer mounted between said one end section and the respective end of said center member to maintain the radial air gap and support said center member, whereby the magnetic forces acting on said core members are radial and substantially sum to zero to result in low acoustic noise, and

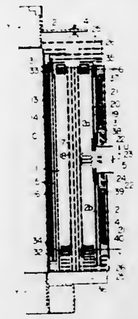
a winding assembly disposed about said cylindrical center member.

4,047,139
TRANSFORMERS OF LARGE CAPACITY FOR ULTRA-HIGH VOLTAGES

Teruo Fukuda, and Tetuo Otomo, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 16, 1976, Ser. No. 742,264
Claims priority, application Japan, Dec. 1, 1975, 50-142251
Int. Cl.² H01F 21/12
U.S. Cl. 336—150 **6 Claims**

1. A transformer of a large capacity for an ultra-high voltage comprising a core leg which is coaxially wound sequentially with at least a low voltage winding, a high voltage winding composed of an upper and a lower winding section, and an upper and a lower tap winding, said high voltage winding having a lead conductor led out from a center portion of said high voltage winding at which the opposite ends of said winding sections are connected to each other and having connection lead-out conductors taken out from top and bottom end portions of said high voltage winding, said lead conductor led out from the center portion of said high voltage winding extending to a terminal to be connected to a high voltage transmission line, said upper and lower tap windings being disposed vertically and being spaced from each other with a predetermined distance, said upper and lower sections of said high voltage winding being respectively connected to said upper and lower tap windings so that said upper and lower sections operate in a parallel relation to each other respectively through

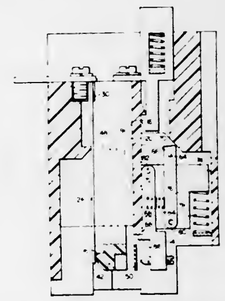


said upper and lower tap windings, wherein said upper and lower tap windings are disposed such that the magnetic center of each of said upper and lower tap windings is located at a height which corresponds to a value in a range of 55% to 65% of the height between said center portion and each end portion of said high voltage winding.

4,047,140
THERMAL OVERLOAD RELAY

Paul T. Anderson, and Stephen S. Dobrosielski, both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1975, Ser. No. 643,719
Int. Cl.² H01H 71/16
U.S. Cl. 337—75 **11 Claims**



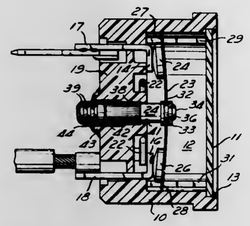
1. An electrical control device comprising a housing, a stationary contact, a movable contact, a slide within the housing for moving the movable contact between open and closed positions, a movable contact mounting arm on the slide, latch means on the slide for latching the slide in one of said positions, the slide being spring-biased in the other position, manual reset means for moving the slide to the latched position and comprising a reset rod, a plurality of pole units, each pole comprising a bimetal element responsive to current flow to effect heating thereof, and a crossbar associated with the bimetal elements to effect unlatching of the latch means.

4,047,141

CALIBRATION AND MOUNTING STRUCTURE FOR MOTOR CONTROLLERS OR THE LIKE

Ronald L. Holden, Mansfield, Ohio, assignor to Therm-O-Disc, Inc., Mansfield, Ohio

Filed Jan. 29, 1976, Ser. No. 653,538
Int. Cl.² H01H *61/00*
U.S. Cl. 337—89 **6 Claims**



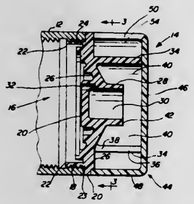
1. A control device comprising a molded plastic body formed with a bore, a bimetal snap element providing in its free state first and second positions of stability and operable in response to first and second predetermined temperatures thereof to snap between said positions, a mounting stud supporting said snap element on said body, said stud providing axially extending knurling intermediate its ends providing axially extending teeth, said teeth having a maximum radius greater than the radius of said bore initially formed in said body, said teeth being positioned within said bore and biting into the material of said body around said bore to provide high frictional engagement resisting axial movement of said stud with respect to said body, said body providing a counter-bore extending from the exterior of said body to said bore having a diameter at least substantially as large as the maximum diameter of said teeth, said stud providing radially and peripherally extending surfaces, and potting material extending into said counter-bore around said stud mechanically interlocking with said radially and peripherally extending surfaces cooperating with said frictional engagement to resist movement of said stud with respect to said body.

4,047,142

BREATHER ASSEMBLY FOR ELECTRICAL APPARATUS

Joseph Bernatt, Arlington Heights, and John E. Guleserian, Prairie View, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Nov. 11, 1976, Ser. No. 741,023
Int. Cl.² H01H *85/20*
U.S. Cl. 337—186 **10 Claims**



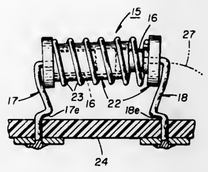
1. A breather assembly for permitting atmospheric venting to the interior of electrical apparatus comprising:
a first chamber means for communicating with the interior of the apparatus;
a second chamber means for communicating with said first chamber means;
a third chamber means for communicating with said second chamber means and with the atmosphere in such a manner that moisture cannot flow directly in a straight line from the atmosphere to said first chamber irrespective of the positional orientation of the apparatus whereby moisture is prevented from entering the apparatus but the atmosphere is freely vented thereto.

4,047,143

FUSED RESISTIVE ELECTRICAL PROTECTION DEVICE

David M. Burden, Columbus, and Frank N. Malaney, Pataskala, both of Ohio, assignors to Western Electric Company, Inc., New York, N.Y.

Filed July 9, 1976, Ser. No. 703,875
Int. Cl.² H01H *85/36*
U.S. Cl. 337—239 **16 Claims**



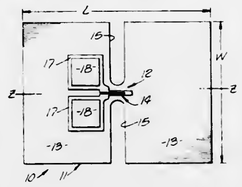
1. A protective device comprising:
fusible means capable of at least establishing a weakened condition along an electrical circuit-path-defining dimension thereof when subjected to a specified current-induced over-load condition:
biasing means;
insulative enclosure means for said fusible means including a substantially tubular member having one fixedly secured and apertured end wall, and being adapted to provide an abutment for one end of said biasing means, and further including a movable apertured end wall adapted to normally substantially enclose the end of said tubular member opposite said secured end wall thereof, and to confine said biasing means between said movable end wall and said abutment of said tubular member; and
conductive terminating means respectively secured to the ends of the circuit-path-defining dimension of said fusible means, and being adapted to pass through the apertures of, and to be brought into firm engagement with, the outer surfaces of the respectively adjacent secured and movable end walls such that said movable end wall is normally positioned against te adjacent end of said tubular member, in opposition to a predetermined degree of compressive force imparted thereagainst by said biasing means, but with said latter force being sufficient, in response to said fusible means being subjected to a given overload condition, to physically separate sad fusible means into two sections along the resultant weakened region thereof by displacing said movable end wall, together with that portion of the associated terminating means in engagement therewith, and that section of the sub-divided fusible means associated therewith, a predetermined increased distance relative to said tubular member.

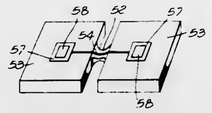
4,047,144

TRANSDUCER

Herbert Vernon Wong, San Francisco, Calif., assignor to Bectoa, Dickinson Electronics Company, San Juan Capistrano, Calif.

Continuation of Ser. No. 158,618, June 30, 1971, abandoned, which is a continuation of Ser. No. 802,595, Feb. 26, 1969, abandoned. This application Aug. 15, 1975, Ser. No. 605,120
Int. Cl.² G01L *1/22*
U.S. Cl. 338—2 **13 Claims**





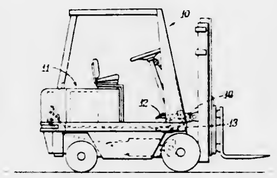
1. In an electromechanical transducer unit:
a substrate support body of semiconductive material having a first type of conductivity and having two pads separated by an intermediate reduced neck, and
a lineal resistor in the reduced neck of the substrate support body said resistor being composed of semiconductive material having a second type of conductivity, the electrical resistance of the lineal resistor varying with the relative displacement of the pads of the substrate support body, and
two relatively movable members secured to the respective pads for displacing one of the pads relative to the other.

4,047,145

PIVOTALLY ACTUATED SPEED CONTROL MEANS OF AN APPARATUS

Richard A. Schwehr, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed May 3, 1976, Ser. No. 682,814
Int. Cl.² H01C *13/00*
U.S. Cl. 338—67 **6 Claims**



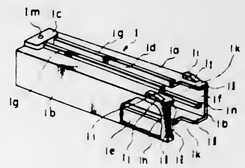
1. In apparatus having a power source, an accelerating element, and control means connected to the accelerating element for varying the speed of the apparatus in response to movement of the accelerating element, said control means having a start switch having an actuating means, a bypass switch having an actuating means, and a potentiometer having a pivotally movable control element, each of said switches and potentiometer being associated with the accelerating element and controllable in response to movement of the accelerating element, the improvement comprising:
an actuating element being pivotally movable between a first position at which the actuating element is spaced from the bypass switch, in contact with the actuating means of the start switch, and the actuating means of the start and bypass switches are open and a second position at which the actuating element is spaced from the start switch, in contact with the actuating means of the bypass switch, and the actuating means of the start and bypass switches are closed, said actuating means of the start switch being at the closed position and said actuating means of the bypass switch being at the open position in response to the actuating element being at intermediate positions;
means for connecting the actuating element to the accelerating element, said actuating element being pivotally movable in response to movement of the accelerating element; and
a tie bar having one end connected to the pivotally movable control element of the potentiometer and the other end connected to the actuating element at locations sufficient for controllably moving the control element and controlling the potentiometer in response to movement of the tie bar by the actuating element.

4,047,146

VARIABLE RESISTOR ASSEMBLY

Fumimasa Takeyama, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1976, Ser. No. 717,901
Claims priority, application Japan, Jan. 14, 1976, 51-3042[U]; Jan. 14, 1976, 51-3043[U]; Jan. 14, 1976, 51-3044[U]; Jan. 14, 1976, 51-3045[U]
Int. Cl.² H01C *10/38*
U.S. Cl. 338—176 **8 Claims**



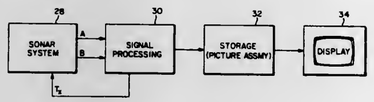
1. A variable resistor assembly comprising:
an elongated casing having one open end and a longitudinal slot formed through one wall thereof;
a plug member detachably fixed to the casing to close the open end thereof, the plug member having a shield plate extending therefrom coextensive with the interior of the casing;
a slider member formed with a slot through which the shield plate of the plug member slidingly extends, a handle extending from a first side of the slider member through the longitudinal slot of the casing and a slider contact extending from a second side of the slider member which is opposite to the first side thereof; and
a resistance member disposed between the second side of the slider member and the casing and being formed with a resistance element with which the slider contact slidingly engages.

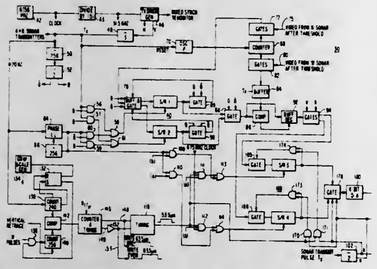
4,047,147

DUAL BEAM SONAR DISPLAY SYSTEM

Kenneth E. Wood, and James T. O'Farrell, both of Annapolis, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 2, 1976, Ser. No. 710,969
Int. Cl.[2] G01S 9/68, 7/62
U.S. Cl. 340—3 R 14 Claims





1. A dual sonar display system comprising:

A. sonar means for producing 1st and 2nd fan shaped beams and for scanning them in overlapping relationship in respective 1st and 2nd directions;

B. said sonar means being operable to provide a 1st set of beam signals from said first beam, indicative of targets in respective adjacent beam positions and a 2nd set of beam signals from said 2nd beam, indicative of targets in respective adjacent beam positions;

c. 1st storage means for storing target indications from said 1st set of beam signals;

D. means for comparing each beam signal from said 2nd set with all the beam signals from said 1st set, for target coincidence;

E. 2nd storage means for storing the results of said comparison;

F. display means;

G. 3rd storage means for storing signals for presentation on said display means; and

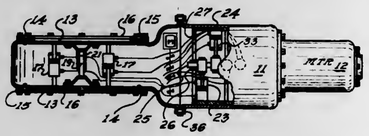
H. means for transferring the contents of said 2nd storage means to said 3rd storage means for assembly of a complete picture to be displayed.

4,047,148

PISTON TYPE UNDERWATER SOUND GENERATOR

Julius Hagemann, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 29, 1956, Ser. No. 568,682
Int. Cl.[2] H04B 13/00
U.S. Cl. 340—12 R 3 Claims



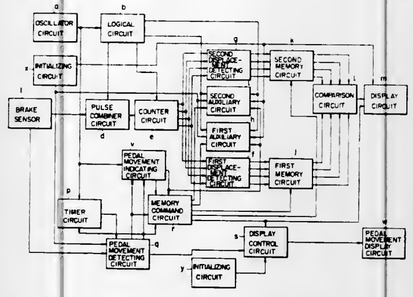
1. An apparatus for producing low frequency compressional waves under water which comprises two circular plates spaced in opposed parallel relation, a plurality of reciprocating fluid motors arranged in parallel between said plates, an independent fluid pump hydraulically connected to each of said motors for driving the same, a by-pass valve for each motor adjustable to vary the length of the stroke of such motor, a prime mover coupled to drive all of the pumps in synchronism, whereby the motors connected thereto reciprocate in unison to move said plates toward and away from each other at a frequency corresponding to the speed of the prime mover, and means for adjusting all of the by-pass valves in assembly, whereby the amplitude of oscillation of said plates in correspondingly varied.

4,047,149

BRAKE CHECKING SYSTEM

Sigeyuki Akita, Nukata, and Junji Kitagawa, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 8, 1976, Ser. No. 730,718
Claims priority, application Japan, Oct. 13, 1975, 50-123661
Int. Cl.[2] B60T 17/22
U.S. Cl. 340—52 B 9 Claims



1. A brake checking system for a vehicle comprising:

a. a brake sensor disposed to produce an output signal having a frequency corresponding to the displacement of a brake pedal of a vehicle;

b. a detection circuit including first and second displacement detecting circuits connected to said brake sensor and responsive to the output signal of said brake sensor for respectively detecting a maximum displacement of said brake pedal during first and second movements thereof, respectively;

c. a comparison circuit connected to said detection circuit for comparing the maximum displacements detected by said displacement detecting circuits to produce a signal corresponding to the difference between said maximum displacements; and

d. a display circuit connected to said comparison circuit and responsive to the signal from said comparison circuit for indicating the occurrence of a difference between said maximum displacements.

4,047,150

BICYCLE SAFETY FLASHER WITH OPTIONAL MOUNTING MEANS FOR OTHER USES

Dale T. Kelley, 2329 N. 39th Place, Phoenix, Ariz. 85008

Filed Apr. 12, 1976, Ser. No. 676,065
Int. Cl.[2] B60Q 1/30; B62J 5/00
U.S. Cl. 340—84 6 Claims

1. In a safety flasher having a lamp with terminals connected through a circuit to a battery, the improvements comprising:

a lens;

reflector means having said lamp and terminals mounted thereon for reflecting light from said lamp through said lens, said lens being removably mounted on said reflector means;

printed circuit board means for providing said circuit and having terminations for connection to said terminals;

battery case means for receiving said battery;



means for connecting said printed circuit board means to said battery; and

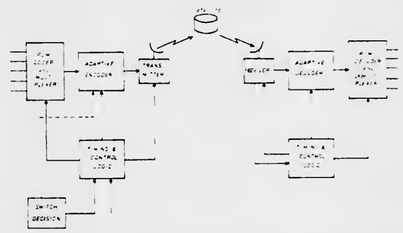
fastening means for fastening said reflector means to said battery case means, said fastening means serving an additional function of electrically connecting said terminals to said terminations to complete said circuit for said lamp.

4,047,151

ADAPTIVE ERROR CORRECTING TRANSMISSION SYSTEM

Nils R. C. Rydbeck, Vildanden J101, and Carl-Erik Wilhelm Sundberg, Vildanden C506, both of 22234 Lund, Sweden

Continuation-in-part of Ser. No. 536,182, Dec. 24, 1974, abandoned. This application Dec. 29, 1975, Ser. No. 644,804
Int. Cl.[2] G06F 11/12
U.S. Cl. 340—146.1 AX 10 Claims



1. An improved method for adapting transmission of analog information by digital modulation methods over a channel to variations in the transmission properties of the channel, the method including the steps of:

producing at least one control signal containing information indicative of the transmission properties of the channel;

using a first source code without introduced redundancy in the digital symbols thereof and with a first number of quantization levels in response to a said control signal for transmission of the information over the channel when the transmission properties are good; and

switching over to a second source code protected by an error-protecting code with introduced redundancy in the digital symbols thereof for transmission of the information over the said channel in response to said control signal when the transmission properties are poorer;

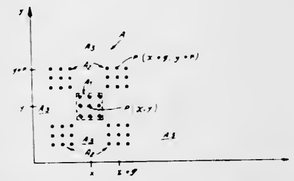
wherein said second source code has a number of quantization levels sufficiently smaller than that of the first source code such that the transmission speed is maintained after switching over from said first to said second source codes in spite of the introduced redundancy in the digital symbols transmitted over the said channel.

4,047,152

ELECTRONIC CHARACTER-READING SYSTEM

Ercole Giuliano, Genova; Orazio Paita, La Spezia, and Luigi Stringa, Arenzano-Genova, all of Italy, assignors to Elettronica San Giorgio - ELSAG - S.p.A., Genova-Sestri, Italy

Filed Nov. 3, 1976, Ser. No. 738,456
Claims priority, application Italy, Nov. 3, 1975, 69715/75
Int. Cl.[2] G06K 9/00
U.S. Cl. 340—146.3 AG 15 Claims



1. A method of electronically reading characters on a carrier moving unidirectionally past a set of photoelectric transducers positioned to scan the carrier surface along a line substantially perpendicular to the direction of carrier motion, said transducers generating individual signal voltages commensurate with the brightness of respective elemental areas of the carrier surface optically registering therewith at a given instant, comprising the steps of:

establishing a succession of operating cycles of a duration so chosen that the advance of said carrier during each cycle is on the order of magnitude of the width of an elemental area as measured along said line, each of said cycles being divided into a multiplicity of phases;

deriving from said signal voltages and from a reference voltage a set of electrical quantities representative of image contrasts existing at said elemental areas;

storing, during each phase, the electrical quantities derived from the signal voltages of a plurality of said transducers optically registering with a two-dimensional array of elemental areas on said carrier, said array including a first zone containing a central elemental area and a second zone composed of several peripheral elemental areas;

separately weighting different groups of stored electrical quantities, relating to elemental areas of said first zone and of said second zone, with a contrast-enhancing field function; and

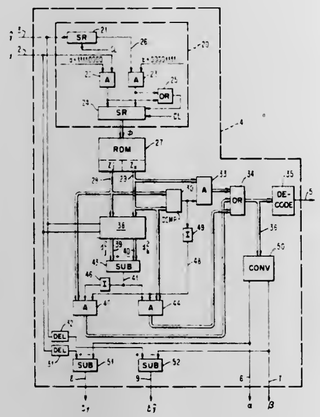
evaluating the most significant electrical quantity stored during any phase, relating to said central elemental area, together with a response parameter synthesized from the weighted electrical quantities to produce a binary output signal.

4,047,153

STATISTICAL DATA DETECTION METHOD AND APPARATUS

Philippe Emmanuel Thirion, Saint-Paul-de-Vence, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1976, Ser. No. 747,767
Claims priority, application France, Dec. 9, 1975, 75.38562
Int. Cl.² G06K 9/00
U.S. Cl. 340—146.3 AQ 7 Claims



1. A method for the decoding of data received in a synchronous data transmission system wherein a transmitted signal is varied in at least two characteristics to be representative of a transmitted data symbol, said method being characterized in that it includes the following steps:

a. sampling each of said characteristics of said signal at a signal receiving location;

b. forming a multipart character for each of said samples, each character having a more significant part and a less significant part;

c. forming an address with the more significant part of each of the two characters associated with a symbol;

d. addressing a storage table with said address, said storage table at each address storing an identification of at least two data symbols, said identifications being the same where the combined major parts of said characters unequivocally identify a transmitted data symbol and being different where said combined major parts may be formed for either of two almost equally probable transmitted data symbols, to read out the addressed word of said table;

e. comparing the two readout identifications;

f. selecting one identification as the identification of the transmitted symbol when said symbol is unequivocally identified;

g. comparing all of both of said characters for a received signal with said characteristics for both of said identified transmitted data symbols when said identifications are different to select the more probable one of said identifications; and

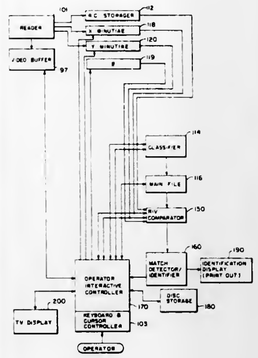
h. decoding the selected identification to determine said transmitted data symbol.

4,047,154

OPERATOR INTERACTIVE PATTERN PROCESSING SYSTEM

Visvaldis A. Vitols, Orange, and John P. Riganati, Yorba Linda, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 10, 1976, Ser. No. 722,306
Int. Cl.² G06K 9/00
U.S. Cl. 340—146.3 E 35 Claims



1. An interactive method for performing a succession of processing functions in relation to an unknown pattern to extract minutiae data therefrom uniquely identifying the pattern for subsequent comparison with minutiae data corresponding extracted from at least one known such pattern to determine a match therebetween, said processing functions being performed selectively in an automatic, continuous succession, and in an interrupted succession with operator interaction requested by the method, as a function of method determination of satisfactory performance of each said processing function, comprising the steps of:

storing said minutiae data of said at least one known such pattern,

comparing the extracted and the stored minutiae data to determine a degree of match therebetween,

establishing a required degree of match to determine satisfactory performance of said matching function and responsive to the degree of match determined by said comparing step to request operator interaction when said required degree of match is not satisfied, and to identify the given pattern as the known pattern for which the required degree of match is satisfied,

selectively displaying the given pattern in response to an operator interaction request and for selectively displaying the automatically extracted minutiae data in superposed relationship thereon, and

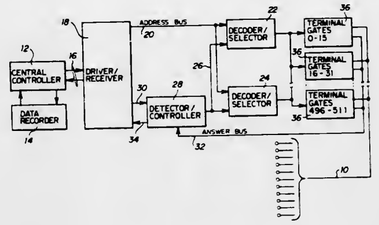
providing manually operable means for selectively correcting and supplementing the automatically extracted minutiae data to enable said comparing step to automatically compare the selectively corrected and supplemented minutiae data extracted from said given pattern with said stored minutiae data.

4,047,155

UNIVERSAL DATA RECORDING SYSTEM

Arthur O. Miller, 10141 Chesterton Drive, Dallas, Tex. 75238

Continuation of Ser. No. 531,549, Dec. 11, 1974, abandoned.
This application Nov. 16, 1976, Ser. No. 742,091
Int. Cl.² H04Q 5/00
U.S. Cl. 340—147 R 14 Claims



1. A condition monitoring system for scanning terminal voltage levels on a plurality of terminals each having an identifying address to detect changes in the voltage level at each of the terminals, comprising in combination:

a central controller for repetitively generating group identifying address codes in a prearranged order of the terminals to establish a group scanning order and including means for generating a control pulse,

a plurality of means for decoding the group identifying address codes, each of said means for decoding responsive to one group identifying address code and generating a gate control voltage,

a plurality of scanner gates at least equal in number to the plurality of terminals, said gates connected to the terminals and enabled by a gate control voltage and responsive into a conduction mode by a terminal voltage level above a reference voltage,

means responsive to the control pulse to apply a gate control voltage to selected scanner gates to enable said gates to respond to a terminal voltage above a reference voltage, and

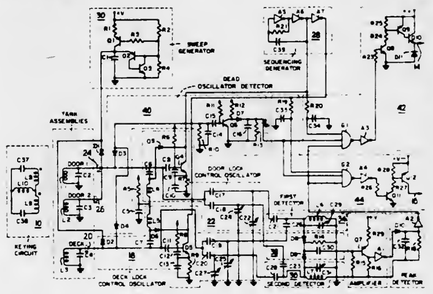
detector means responsive to the voltage level on the terminals connected to the scanner gates in the conduction mode to generate a terminal status signal for each such terminal.

4,047,156

REACTIVELY DECOUPLED DUAL CHANNEL KEYING CIRCUIT FOR WIDE-BAND FREQUENCY MODULATED KEYABLE CONTROL CIRCUIT

Carl E. Atkins, Montclair, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Apr. 12, 1976, Ser. No. 675,950
Int. Cl.² H04Q 9/10; H01F 5/00; G08B 21/00
U.S. Cl. 340—171 A 5 Claims



1. In a dual channel keyable control circuit of the type having swept rf energy coupled to at least one sensing coil, the invention of a keying circuit to trigger said keyable control circuit into producing a control output signal comprising:

a. a first resonant circuit containing at least a first inductor in parallel with a first capacitor said first resonant circuit being resonant at a first rf frequency;

b. a second resonant circuit containing at least a second inductor in parallel with a second capacitor said second resonant circuit being resonant at a second rf frequency different from said first rf frequency;

c. a common connection between said first and second resonant circuits;

d. a reactance in the common connection between said first and second resonant circuits;

e. when said swept rf energy is at the resonant frequency of said first resonant circuit, said reactance feeding into said first resonant circuit a signal of substantially correct amplitude and phase to cancel the rf energy coupled into said first resonant circuit by the proximity of said second resonant circuit; and

f. when said swept rf energy is at the rf frequency of said second resonant circuit, said reactance feeding into said second resonant circuit a signal of substantially correct amplitude and phase to cancel the rf energy coupled into said second resonant circuit by the proximity of said first resonant circuit.

4,047,157

SECONDARY STORAGE FACILITY FOR DATA PROCESSING

Stephen R. Jenkins, Acton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 1, 1974, Ser. No. 438,952
Int. Cl.² G06F 3/00
U.S. Cl. 364—900 22 Claims



1. A controller for a secondary storage facility in a data processing system, said controller being adapted for connection to first and second system buses connected to addressed storage locations and at least one drive including direct access storage means and said controller comprising:

A. buffer storage means for data,

B. means for transmitting address signals for identifying an addressed storage location connected to a system bus,

C. means for transmitting control signals for effecting a system bus data transfer between said controller and the system buses

D. means for transferring data between a drive and said buffer storage means,

E. register means for assuming at least two states,

F. first routing means connected to said address signal transmitting means, said control signal transmitting means and

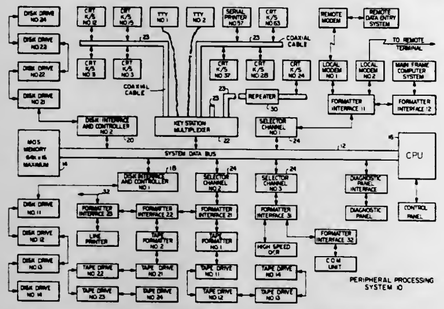
said buffer storage means for transferring address signals to and control signals and data to and from the first system bus in response to a first state of said register means, and

G. second routing means connected to said address signal transmitting means, said control signal transmitting means and said buffer storage means for transferring address signals to and control signals and data to or from the second system bus in response to a second state of said register means.

4,047,158
PERIPHERAL PROCESSING SYSTEM

Alan K. Jennings, Anaheim, Calif., assignor to Pertec Corporation, Los Angeles, Calif.

Filed Dec. 13, 1974, Ser. No. 532,636
Int. Cl.² G06F *3/00*
U.S. Cl. 364—900 **30 Claims**



1. In a peripheral processing system having a bus, a memory storing program information operatively connected to the bus, and a central processing unit operatively connected to the bus which is responsive to program information stored in the memory, a data terminal subsystem which is operatively connected to the bus comprising:

a coaxial cable;

a plurality of data terminals having preassigned mutually exclusive address codes connected both physically and electrically in parallel for bidirectional communication solely along the coaxial cable, each terminal including electronic circuitry for passively monitoring the coaxial cable for the appearance on the calbe of the preassigned address code thereof, and actively communicating along the cable only in response to the appearance of the preassigned address code on the coaxial cable; and

a key station multiplexer operatively connected to both the bus and the coaxial cable, the multiplexer being responsive to the central processing unit and including electronic circuitry for transmitting and receiving encoded messages along the coaxial cable and the bus.

4,047,159
DATA TRANSMISSION SYSTEMS

Michael Robert Boudry, London, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 8, 1975, Ser. No. 594,066
Claims priority, application United Kingdom, July 30, 1974, 33587/74
Int. Cl.² G06F *3/04*
U.S. Cl. 364—900 **11 Claims**

1. An interface system for a computer comprising:

a RELEASE line connected to said computer;

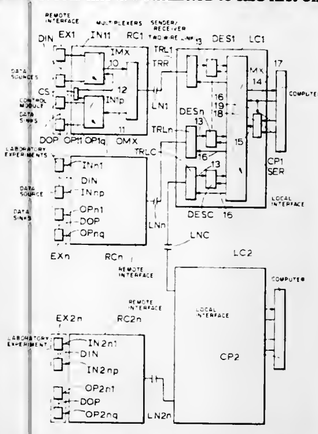
a plurality of data word sources and data word sinks;

a plurality of communications links;

a plurality of remote interface units connected to said data sources and data sinks, each one of said remote interface units connected to a corresponding one of said communications links for transferring data words therebetween via a first I/O sub-channel; each of said remote interface units comprising a serializer and a deserializer for converting said data words between serial and parallel form; an input multiplexer connected to said serializer, and an output multiplexer connected to said deserializer

a local interface unit, connected to said computer and at least one of said communications links for transferring input data words via a plurality of second I/O sub-channels therebetween, and comprising

a plurality of buffers each buffer connected to a corresponding one of said communication links, each buffer comprising a plurality of locations for storing in parallel form a single input data word transferred from one of said data sources and received in bit serial form from one of said corresponding links; said RELEASE line connected to each of said buffers for clearing a first one of said buffers when a RELEASE signal generated by said computer on said RELEASE line is transmitted to said first one buffer,



said RELEASE signal being indicative that said computer has received an input data word from said local interface unit; means for polling each of said buffers in turn, and being responsive to the presence of an input data word in a second one of said buffers for temporarily stopping polling of said buffers at said second one of said buffers, said means for polling being connected to said RELEASE line and responsive to said RELEASE signal from said computer to resume polling of said buffers at the next one of said buffers in turn; and

transmitting means for transmitting an acknowledge data word in bit serial form to a corresponding one of said remote interface units along a corresponding one of said communications links from whose corresponding buffer an input data word has just been received by said computer for informing said remote interface unit that it may send another input data word to said local interface unit.

4,047,160
STORAGE ARRANGEMENT HAVING A DEVICE TO DETERMINE FREE STORAGE LOCATIONS

Gerhard Wolf, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 2, 1976, Ser. No. 654,645
Claims priority, application Germany, Feb. 10, 1975, 2505478
Int. Cl.² G06F *13/00*
U.S. Cl. 364—900 **11 Claims**

1. A storage arrangement for use as an associative memory, comprising:

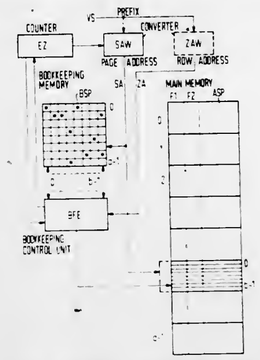
a main memory for storing data composed of an associative component and a non-associative component;

a comparator device connected to said main memory to compare the associative part of data therefrom with a search word;

said main memory comprising a linearly addressed storage bank divided into *a* pages each including *b* rows, each of said rows including a storage position for the data and a portion for storing reference characteristics;

page and row address converters for providing page and row addresses in response to receipt of a prefix;

an extension counter connected to said page address converter to co-determine page address in accordance with its relavant count and whose count is increased by one when an initially addressed storage position is engaged;



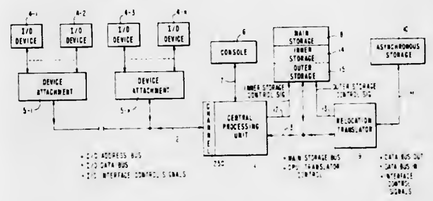
a book-keeping memory connected to said page address converters and operated to be read row-by-row, said book-keeping memory comprising *a* rows each including *b* bit positions, where each row corresponds to a page and each bit position corresponds to a row of said main memory, each bit position storing a mark indicating seizure of the corresponding row of said main memory; and

a book-keeping control unit connected to said counter, to said row address converters, to said book-keeping memory and to said main memory, and operable to control the setting and interrogation of the seizure marks and the selection of equivalent storage positions in said main memory.

4,047,161
TASK MANAGEMENT APPARATUS

Michael Ian Davis, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 681,953
Int. Cl.² G06F *9/19, 9/20*
U.S. Cl. 364—200 **11 Claims**



1. In a data processing system of the type in which each set of a plurality of sets of registers, one set being provided for each interrupt priority level in the system, interacts with a common main storage and common arithmetic and logic control circuits to execute respective tasks of a program, and in which a task dispatching program means operates in conjunction with priority/interrupt controls to dispatch tasks in a desired sequence to the sets of registers so that each set of registers, the arithmetic and logic unit and the main storage can process a respective task currently assigned to the latter set of registers when its priority is highest,

in combination with said register sets, storage, control circuits, program means and priority/interrupt controls,

apparatus, controlled in accordance with the execution of one machine level task instruction for assisting the dispatching of tasks, comprising

a main storage area for holding a task address and status block (LSB) for each task for which execution is to be initiated or continued,

means for fetching from main storage the LSB of a selected task and for storing the fetched LSB in the register set of a selected level,

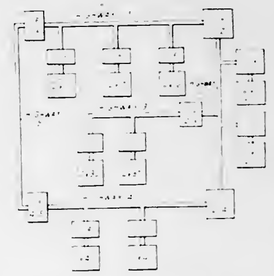
means for determining the in-process status of the selected task and the relative priority levels on which said one instruction of a current task is being executed and on which the selected task is intended for execution, and

means responsive to said in-process status and said relative priority levels for initiating the execution of the selected task when the in-process status is "on" and the priority level of the selected task is higher than that of the current task.

4,047,162
INTERFACE CIRCUIT FOR COMMUNICATING BETWEEN TWO DATA HIGHWAYS

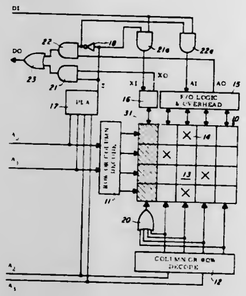
Howard Anthony Dorey, Godalming, and Robert John Cooke, Farnborough, both of England, assignors to The Solartron Electronic Group Limited, Farnborough, England

Filed Apr. 28, 1975, Ser. No. 572,052
Claims priority, application United Kingdom, May 2, 1974, 19366/74
Int. Cl.² G06F *3/04*
U.S. Cl. 364—200 **11 Claims**



1. An interface comprising two symmetrical ports connectable to data highways, each of said ports including data terminals, handshake terminals, at least one control terminal to which can be applied a special command signal indicative of whether a data byte on said data terminals is information or a command, and status control means responsive to command bytes accompanied by said special command signal received from a data highway at either port to establish different statuses of the interface, including statuses in which the data terminals of the ports are placed in communication for the flow of data therebetween; means responsive to a predetermined command byte on one of said data highways which addresses the interface at one of said ports for causing the interface to enter a particular status; and means responsive to the existence of said particular status and a byte received from said one data highway at said one port for generating a modified byte as a command byte at the other port.

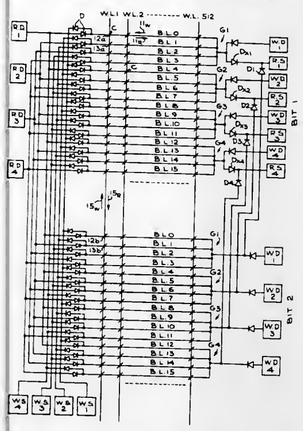
4,047,163
FAULT-TOLERANT CELL ADDRESSABLE ARRAY
William Clay Choate, Dallas, and Dileep P. Bhandarkar, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed July 3, 1975, Ser. No. 592,979
Int. Cl.² G11C *11/40, 13/00*
U.S. Cl. 340—173 R 53 Claims



1. A defect-tolerant cell addressable array comprising:
a. an array of functional cells arranged in rows and columns;
b. a plurality of redundant functional cells;
c. cell selection means responsive to cell address code signals for selectively addressing an individual functional cell in a respective row and column and simultaneously addressing a corresponding redundant cell;
d. memory means in which address codes of the row and column addresses of defective functional cells are selectively storable, said memory means being responsive to said cell address code signals for detecting when the cell address code signals correspond to the address codes of defective ones of said functional cells and for generating a signal indicative thereof; and
e. logic means responsive to the signal generated by said memory means for directing data into and/or out of the respectively addressed redundant cell instead of an addressed defective cell.

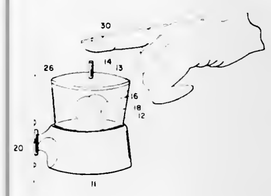
4,047,164
READ AND WRITE DRIVE SYSTEM FOR A 2½D COINCIDENT CURRENT MAGNETIC CORE MEMORY
Michael F. Boice, Torrance, Calif., assignor to Electronic Memories & Magnetics Corporation, Los Angeles, Calif.
Filed Sept. 8, 1975, Ser. No. 611,227
Int. Cl.² G11C *11/02*
U.S. Cl. 340—174 M 3 Claims

1. In a 2½D magnetic core memory for storing n-bit words, a plurality, N, of groups of bit lines, being provided for each word bit, each group having the same number, M, of bit lines, each bit line being threaded through a plurality of cores, each core storing a bit of a different word, for an n-bit word there being provided a total of n.N groups of bit lines, each bit in a word being stored in a correspondingly placed core in a different one of said N groups of bit lines, a switching system for said memory comprising:
a separate write drive switch means for each group of bit lines in all of said n.N groups,
means connecting each one of said write drive switch means to one of the ends of a different one of the groups of bit lines,
a plurality of write sink switch means, the number in said plurality equalling the number, N, of groups of bit lines,
means connecting each one of said write sink switch means to the other ends of different but correspondingly located bit lines in all of said n.N groups of bit lines,
a plurality of read drive switch means, the number in said plurality equalling the number, N, of groups of bit lines,
means connecting each one of said read drive switch means to said other ends of different but correspondingly located bit lines in all of said n.N groups of bit lines,



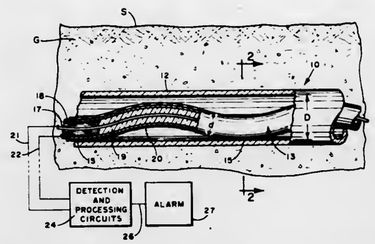
a plurality of read sink switch means, the number of read sink switch means in said plurality equalling the number N of groups of bit lines, and
means coupling each read sink switch means to said one ends of a different but correspondingly located group of bit lines in all of said n.N groups of bit lines.

4,047,165
EMERGENCY SIGNAL LIGHT
Betty Andreasson, and Rebecca M. Anderson, both of 50 Russell Hill Road, Ashburnham, Mass. 01430
Filed May 20, 1976, Ser. No. 688,173
Int. Cl.² G08B *21/00*
U.S. Cl. 340—227 R 6 Claims



1. An emergency warning signal light comprising a base to which is attached a transluscent housing, an electrical energy source, a first flashing lamp electrically connected to the energy source through a depressable electrical switch, and a second flashing lamp electrically connected to the energy source through a heat-sensing switch; the combination providing a selective signaling and automatic warning system.

4,047,166
ELECTROSTATICALLY CHARGED CABLE TRANSDUCER
G. Kirby Miller, Saratoga, and John F. Lawler, Los Altos, both of Calif., assignors to GTE Sylvania Incorporated, Mountain View, Calif.
Continuation-in-part of Ser. No. 652,375, Jan. 26, 1976, abandoned. This application Aug. 30, 1976, Ser. No. 718,844
Int. Cl.² G08B *13/10*
U.S. Cl. 340—261 15 Claims



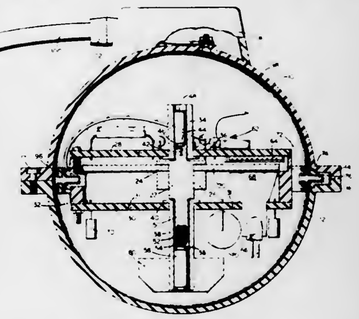
1. Mechanism for detecting disturbances which propagate waves in a medium comprising
an elongated generally rigid hollow member adapted to be buried in said medium and responsive to said waves, and
a cable disposed within and engageable with said member, said cable having first and second conductors spaced by an electrostatically charged material and having an outside transverse dimension less than the inside transverse dimension of said member whereby the member and cable are movable relative to each other in response to said waves for generating electrical signals between said conductors.

4,047,167
RELAXATION SWITCH
Bill F. Helena, 6365 Greenway Road, Fort Worth, Tex. 76116
Filed Aug. 12, 1976, Ser. No. 713,698
Int. Cl.² G08B *13/14*
U.S. Cl. 340—280 4 Claims



1. An electrical switch, comprising:
electrically conducting switch means having a resilient normally bowed portion,
said normally bowed portion being adapted to be flattened by the application of pressure thereto,
a base member,
an electrically conducting means located in a given position relative to said base member,
connection means for securing said switch means to said base member with an engaging portion of said switch means being free to move relative to said electrically conducting means when said normally bowed portion is flattened and when said normally bowed portion is allowed to assume its normally bowed position,
said electrically conducting means being located such that said engaging portion of said switch means is out of engagement with said electrically conducting means when said normally bowed portion is flattened but engages said electrically conducting means when said normally bowed portion is allowed to assume its normally bowed position, and
removable holding means adapted to be located in a predetermined position for normally flattening said normally bowed portion of said switch means to cause said engaging portion to be located out of engagement with said electrically conducting means.

4,047,168
DIGITAL COMPASS AND GIMBAL ASSEMBLY FOR TWO CONDUCTOR CONNECTION
John T. Fowler, Winthrop, Mass., assignor to The Laitram Corporation, Harahan, La.
Filed May 22, 1975, Ser. No. 579,973
Int. Cl.² G01C *17/26;* H03K *13/02*
U.S. Cl. 340—310 R 19 Claims

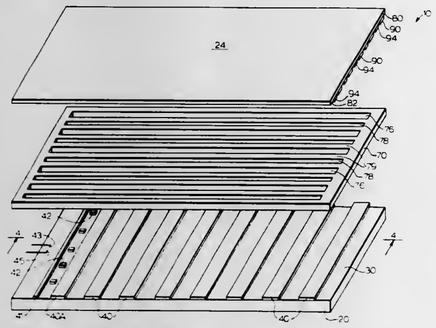


1. A remote reading compass comprising:
a compass disc having a plurality of optically coded tracks providing coded representations of compass headings;
magnetic means affixed to and rotatable with said compass disc about a normally vertical axis;
means for mounting said compass disc for rotation about said normally vertical axis;
photoelectric means for sensing said coded tracks to provide digital signal representations of compass headings;
electronic circuit means including said photoelectric means and having only first and second terminals by which energizing power is applied to said circuit means and by which digital output signals are coupled from said circuit means representative of compass heading;
current source means for providing a limited energizing current; and
means for coupling said current source means to said first and second terminals of said circuit means;
said electronic circuit means further including means for selectively shunting said first and second terminals to transmit said digital signals.

4,047,169
DISPLAY PANEL HAVING IMPROVED ARRANGEMENT OF RESET CELLS FOR FACILITATING SCANNING OF THE PANEL

George E. Holz, North Plainfield, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 9, 1976, Ser. No. 656,657
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—324 M 6 Claims

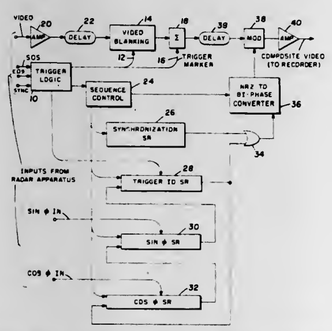


1. A display panel comprising
a gas-filled envelope having a base plate and face plate hermetically sealed together, said face plate having a viewing window,
an array of rows and columns of first gas-filled cells for displaying characters in said envelope, said cells including a first column, a last column and intermediate columns,
electrodes coupled to said cells for scanning said cells, column by column sequentially, beginning with the first column, and
a plurality of auxiliary cells adjacent to said first column of first cells, said auxiliary cells being used not for veiwing but for insuring turn-on of all of the cells in said first column of cells, said auxiliary cells including a column of auxiliary cells adjacent to said first column of first cells and a plurality of rows of auxiliary cells between said column of auxiliary cells and said first column of first cells.

4,047,170
MONOTRACK RADAR RECORDING/PLAYBACK SYSTEM

Robert E. Miller, Ellicott City, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Nov. 10, 1975, Ser. No. 630,506
Int. Cl.[2] G01S 9/02, 7/30
U.S. Cl. 343—5 PC 16 Claims

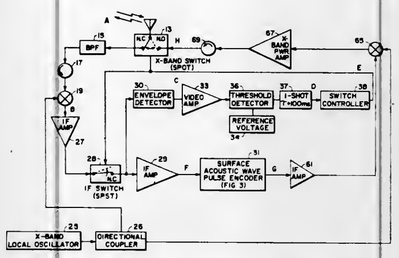


1. A system for recording and reproducing an informational first signal and a plurality of related event demarcating second signals comprising, in combination,
a recording medium,
recorder apparatus for recording signals on said recording medium and including,
means responsive to the occurrence of an event demarcating second signal for generating a time marker signal demarcating said occurrence,
adder means connected to receive and add together as an output said informational first signal and said time marker signal in a time alignment corresponding to the time alignment of said first and second signals,
means responsive to said event demarcating second signal for producing a code identifying each of said plurality of event demarcating second signals as they occur and the associated time marker signal, and
means for combining said identification code and the output of said adder means, with said identification code preceding in time the associated time marker signal at the output of said adder means, and
reproducing apparatus for reproducing said recorded signals from said recording medium and including,
means responsive to said recorded identification code for registering prior to the occurrence of the associated time marker signal in said recorded signals the identity of the event demarcating signal represented by said recorded associated time marker signal, and
means responsive to said identification code registering means and said recorded associated time marker signal for reproducing each event demarcating signal in said correct time alignment with said informational first signal.

4,047,171
TRANSPONDER

Brian Blair Fugit, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sept. 15, 1975, Ser. No. 613,374
Int. Cl.[2] G01S 9/56; H03H 7/30
U.S. Cl. 343—6.8 R 10 Claims

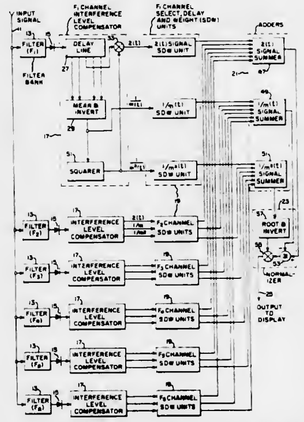


1. A frequency agile transponder, comprising:
means for receiving a relatively narrow interrogating signal pulse of a particular frequency falling within a given frequency band, and
means responsive to said interrogating signal pulse for transmitting a coded series of reply pulses that are frequency synchronized with said interrogating signal pulse, said responsive means including frequency memory means for receiving a frequency coherent pulse indicative of the interrogating signal pulse and converting the frequency coherent pulse to a coded series of frequency coherent pulses, said frequency memory means being phase coded to prevent envelope cancellation in the series of pulses.

4,047,172
SIGNAL PROCESSOR FOR PULSE-ECHO SYSTEM PROVIDING INTERFERENCE LEVEL COMPENSATION AND FEED-FORWARD NORMALIZATION

Lowell W. Bauer, Liverpool, and John P. Costas, Fayetteville, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed May 30, 1972, Ser. No. 257,879
Int. Cl.[2] G01S 7/28, 9/44, 9/66
U.S. Cl. 343—17.1 R 5 Claims



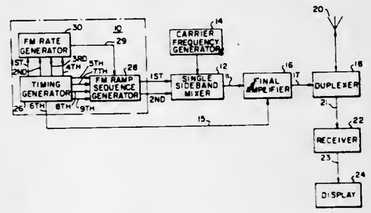
5. For use in an object detection system including transmitter means for illuminating the object with wave energy transmitted as a plurality of subpulses of different frequencies ordered in particular sequence and including receiver means for detecting echo returns of transmitted energy as reflected by the object, received signal processor means comprising:
a. a plurality of signal processor channels of number at least equal to the number of different frequencies of the transmitted subpulses;
b. means responsive to frequencies of said received signal subpulses for routing each selectively into said processor channels;
c. interference level compensation means in each of said processor channels including means for deriving an estimate of interference level for the respective channel and compensating the channel signals in accordance with an inverse function of such estimate;
d. means for summing said interference level compensated signals corresponding to each of said transmitted subpulses; and
e. output normalizing means including means for deriving a normalization signal from each of said interference level estimates, summing the normalization signals thus derived, and combining such sum with said summed interference level compensated signals so as to minimize change in mean of the processor output level.

4,047,173
FM PULSE COMPRESSION RADAR

Coleman J. Miller, Arnold, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 24, 1976, Ser. No. 699,271
Int. Cl.[2] G01S 17/28
U.S. Cl. 343—17.2 PC 12 Claims

1. A method for operating an FM pulse compression radar for detecting moving targets in a single range cell comprising the steps of:
generating a predetermined sequence of spaced apart FM signals, each successive signal in said sequence having an FM rate determined by a function of the amount of time since said sequence started;
transmitting said sequence of FM signals; and



receiving reflected FM signals whereby signals indicative of a target may be integrated in a receiver at constant range.

4,047,174
METHOD OF REDUCING THE RADAR CROSS-SECTION OF A DIELECTRIC BODY

Robert J. Wohlers, Orchard Park, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 7, 1968, Ser. No. 736,935
Int. Cl.[2] H01Q 15/18
U.S. Cl. 343—18 B 1 Claim

1. A method of reducing the radar cross-section of a dielectric covered nosecone, including the steps of:
coating said nosecone with an electrically resistive material, and
applying an electrically conductive material to said resistive coating in a predetermined pattern.

4,047,175
TELEVISION ANTENNA DIRECTING AND TRACKING SYSTEM FOR TELEVISION PROGRAM NETWORK BETWEEN AIR-BORNE AND GROUND OFFICES

Hideya Taira, and Kuniaki Shimizu, both of Tokyo, Japan, assignors to Tokyo Keiki Company Limited, Tokyo, Japan

Filed Mar. 3, 1976, Ser. No. 663,529
Claims priority, application Japan, Mar. 5, 1975, 50-26089; July 24, 1975, 50-89641
Int. Cl.[2] G01S 3/04
U.S. Cl. 343—100 CS 11 Claims



5. An automatic television antenna directing and trackin system comprising
1. a repeating antenna mounted on an aircraft for repeating television video singals to a ground office,
2. an air-borne station including an antenna driving unit for automatically directing said repeating antenna toward said ground station, direction angle self setting means and coordinate transforming means, said direction angle self setting means including means responsive to a flight information for applying to said coordinate transforming means an azimuth angle and an elevation angle required to

direct said repeating antenna toward said ground office, said coordinate transforming means transforming the azimuth angle and the elevation angle on the longitude-latitude coordinate into the azimuth angle and the elevation angle on the air-borne coordinate based on the azimuth angle of the craft head, the pitching angle and the rolling angle of said aircraft, and said antenna driving unit including servo-loops respectively containg a servo-motor and a gear train for rotating the azimuth shaft and the elevation shaft of said repeating antenna, and

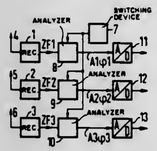
3. a ground station in said ground office, and ground station including a receiving installation provided with a receiving parabola antenna, and a tracking installation provided with a tracking parabola antenna and means for directing said receiving parabola antenna of said receiving installation toward said aircraft.

4,047,176

METHOD FOR THE COMPARATIVE VECTOR MEASUREMENT OF SIGNAL PULSES ARRIVING NEARLY SIMULTANEOUSLY AT SEVERAL RADIO RECEIVING STATIONS

Klaus V. Pieverling, Wolfratshausen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 6, 1975, Ser. No. 629,282
Claims priority, application Germany, Nov. 13, 1974, 2453904
Int. Cl.² G01S 1/44
U.S. Cl. 343—106 R 10 Claims



1. A method of comparative vector measurement of keyed radio signal pulses, in particular DME pulses, arriving nearly simultaneously at several receivers and which can have great level differences, comprising the steps of:

feeding the received pulses to a variable signal transfer function circuit and automatically reducing the signal level in response to the rising of the leading edge of a respective signal pulse;

measuring the instantaneous amplitudes of the transferred signals at a fixed time common to all receivers;

producing second measuring signals corresponding to and in phase quadrature to the measured transferred signals; and

measuring the instantaneous amplitudes of the second signals at the same time as the measuring of the transferred signals.

4,047,177

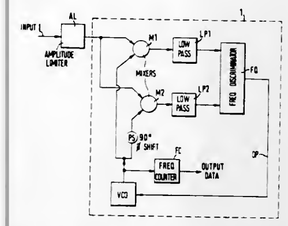
DOPPLER SCANNING GUIDANCE SYSTEM RECEIVER

Francis G. Overbury, Cuffley, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 5, 1975, Ser. No. 637,941
Claims priority, application United Kingdom, Dec. 23, 1974, 55381/74
Int. Cl.² G01S 5/02
U.S. Cl. 343—113 DE 4 Claims

1. In a Doppler scanning guidance system receiver responsive to Doppler scanning ground Beacon transmissions including a main bearing signal and an offset reference signal, the combination comprising:

first means comprising a phase-lock loop, said loop including mixing means responsive to said main and reference received signals in a predetermined frequency band, a frequency discriminator responsive to said mixing means output, and a variable frequency oscillator responsive to a frequency controlling signal derived by said discriminator, said oscillator providing a local oscillator signal to said mixing means;



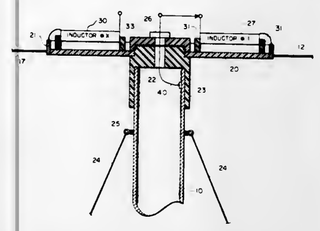
and second means operative at the input of said mixing means for suppressing amplitude variations to suppress the effect of near angle multipath interferences which cause amplitude variations at said input.

4,047,178

LOW LOSS TOP TERMINATION FOR SHORT MONOPOLES

Watson Peter Czerwinski, Forked River, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 22, 1976, Ser. No. 725,217
Int. Cl.² H01Q 9/36
U.S. Cl. 343—750 1 Claim



1. A capacitor and inductor compensated monopole antenna comprising:

A monopole antenna having an upper and lower end;

capacitor means comprising a plurality of metallic whips insulated from said monopole antenna and located at the upper end thereof;

a plurality of inductors, physically positioned above said capacitor means; and,

coupling means for electrically coupling said capacitor means to said monopole antenna selectively through any of said plurality of inductors.

4,047,179

IFF ANTENNA ARRANGEMENT

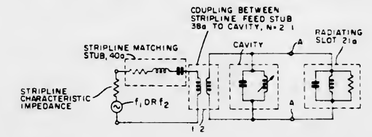
Alfred J. Appelbaum, Newton Center, Mass.; Michael J. Collins, Merrimack, N.H., and Jerome D. Hanfling, Framingham, Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 3, 1976, Ser. No. 682,428
Int. Cl.² H01Q 3/26
U.S. Cl. 343—768 7 Claims

1. An antenna arrangement adapted to transmit radio frequency energy at a first frequency, f_1, and to receive radio

frequency at a second frequency, f_2, such arrangement comprising:

a. a stripline having a center conductor disposed between opposing ground planes and a radiating slot formed in one of such ground planes, the resonant frequency of such slot being equal to the average of the frequencies f_1 and f_2; and



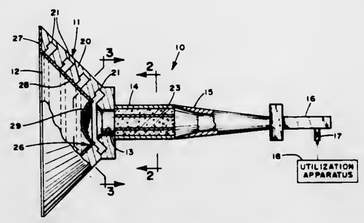
b. electrically conductive means connecting the opposing ground planes to form a generally rectangular cavity into which the center conductor projects and the radiating slot opens, said slot being coupled to said cavity at an end opposite the electrically conductive the resonant frequency of such cavity being equal to the average of the frequencies f_1 and f_2.

4,047,180

BROADBAND CORRUGATED HORN ANTENNA WITH RADOME

Samuel Chung-Shu Kuo, Saratoga, and William D. Rosser, Los Altos, both of Calif., assignors to GTE Sylvania Incorporated, Mountain View, Calif.

Filed June 1, 1976, Ser. No. 691,321
Int. Cl.² H01Q 13/06
U.S. Cl. 343—784 4 Claims



1. An antenna system operable over a wide frequency range comprising

a conical corrugated horn antenna having an inner surface formed broadband slots and having an aperture and a feed port,

a radome on said antenna, said radome having a frustoconical portion adjacent to the inner surface of said horn with an outer end coincident with said aperture and an inner end proximate to said feed port, said radome also having a spherically-shaped transverse wall across said inner end, the convex side of said wall facing the outer end of said radome,

waveguide means connected to said port, said waveguide means comprising

a ridged rectangular waveguide,

a tapered transition waveguide connected to said ridged waveguide, and

a cylindrical waveguide connected between said transition waveguide and said feed port of the horn, and

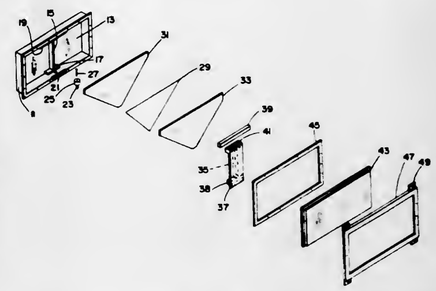
hybrid mode suppressor means disposed within said cylindrical waveguide whereby to suppress higher order hybrid wave modes in said horn and correspondingly increase its operating bandwidth.

4,047,181

OMNIDIRECTIONAL ANTENNA

Gary R. Hoople, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 17, 1976, Ser. No. 686,868
Int. Cl.² H01Q 1/28
U.S. Cl. 343—789 10 Claims



1. In an antenna of the type having an input channel to receive electromagnetic energy transmitted by a coaxial cable and a cavity having a solid rear wall and having an aperture at its front to allow the radiation of said electromagnetic energy into free space wherein the improvement comprises:

a. a metallic probe positioned interior to said cavity;

b. said probe for electrical connection with said coaxial cable;

c. a first and a second T-guide each made of conductive material; and

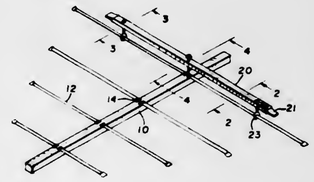
d. said first T-guide located between said probe and said aperture and said second T-guide located between said probe and said rear wall.

4,047,182

DAMPENING GUARD FOR TV ANTENNAS

Jack Fares, 12 Manito Ave., Oakland, N.J. 07436

Filed Sept. 20, 1976, Ser. No. 724,842
Int. Cl.² H01Q 13/00
U.S. Cl. 343—904 14 Claims



1. An element guard dampening apparatus for attachment to the extending metal transverse signal collecting elements of the antenna such as is used for TV and FM and collecting such signals as VHF, UHF and FM, said dampener engaging and reducing to an extent the destructive effect caused by vibrations of the metal elements carried by a spine, said vibrations developing as the result of high winds, said element guard apparatus including: (a) a transverse member which is adapted to be placed adjacent oppositely disposed metal signal collecting elements of an antenna and to extend at least to the mid-length of each element; (b) a pair of hanger element retainers, each retainer having one end secured to the transverse member and an opposite hook-like end sized and adapted to slide on and retain the extending metal collecting elements of the antenna,

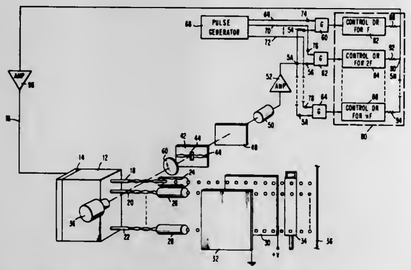
said hangers secured to the transverse member so as to permit the transverse member to extend from said one collecting element to the oppositely disposed collecting element mounted to the spine portion of the antenna, and (c) a screw mounted and turnable in a threaded aperture of the transverse member, the element guard in a mounted condition having an end of the screw in engagement with the spine of the antenna and when the screw is turned inwardly the transverse member and the attached hanger retainers are moved vertically to bring the metal tubular signal collecting elements into a tensioned condition whereby wind induced vibrations are inhibited, and the components forming the element guard are sufficiently nonconductive so that the received electrical signals of and by the said elements are unaffected by the presence of the mounted element guard.

4,047,183

METHOD AND APPARATUS FOR CONTROLLING THE FORMATION AND SHAPE OF DROPLETS IN AN INK JET STREAM

Howard Hyman Taub, Mount Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 4, 1976, Ser. No. 738,777
Int. Cl.² G01D *15/13*
U.S. Cl. 346—1 **10 Claims**



1. In an ink jet printing system, a method of controlling the formation of droplets in an ink jet stream, said method comprising the steps of:

illuminating said ink jet stream in a region where the stream has yet to break up to form droplets;

sensing the surface wave profile of the illuminated ink jet stream;

responding to the sensed surface wave profile for providing a first signal at a frequency F;

responding to the sensed surface wave profile for providing at least a second signal at a freuqency nF, where n is an integer ≥ 2; and

combining said first and second signals to provide a control signal which is used to excite said ink jet stream, which excitation controls the formation of droplets.

4,047,184

CHARGE ELECTRODE ARRAY AND COMBINATION FOR INK JET PRINTING AND METHOD OF MANUFACTURE

Ernest Bassous, Riverdale, and Lawrence Kuhn, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

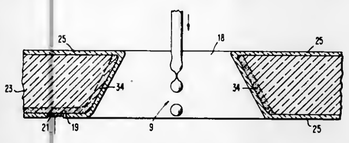
Filed Jan. 28, 1976, Ser. No. 653,168
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **30 Claims**

1. A charge electrode array in an ink jet recording apparatus for controlling the charge of droplets formed from a plurality of liquid streams comprising:

a monocrystalline silicon substrate of (110) orientation having a plurality of apertures extending therethrough, with each of the apertures having one of the liquid streams pass therethrough with droplets being produced from the stream while in the aperture;

a first diffused region of the opposite type of conductivity to the type of conductivity of said substrate in the walls of each said aperture;

a second diffused region of the same conductivity as the first diffused region extending from and connected to said first



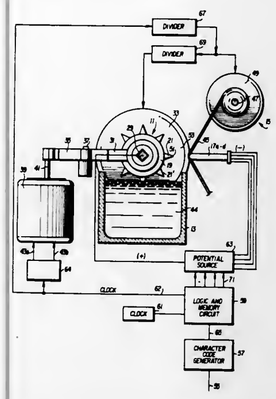
diffused region to provide an electrical contact surface for receiving a voltage to control the charge electrode during the printing operation; a third diffused region of the same conductivity type as the substrate and having an electrical contact surface for receiving a bias in said substrate and located on the side with said second diffused region; and an insulating layer over the entire array, other than the external contact surfaces.

4,047,185

MULTI-JET INK PRINTER USING STAR-WHEEL JET FORMERS

Edwin R. Phillips, Rosemont, and Raymond J. Stankiewicz, Philadelphia, both of Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,032
Int. Cl.² G01G *15/16*
U.S. Cl. 346—140 R **11 Claims**



1. Apparatus for producing imprints of selective shapes on a recording carrier comprising:

a recording-carrier support means for supporting a recording carrier;

a printing-head means comprising at least one protruding prong having a pointed tip adapted to be directed toward said recording carrier, said at least one protruding prong having a pyramidal shape;

an ink reservoir positioned adjacent to said printing-head means for holding ink;

a resupply means for dipping the pointed tip of said at least one protruding prong into ink held by said ink reservoir and thereafter directing said pointed tip toward said recording carrier; and

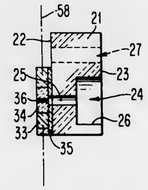
an electrostatic-field means for selectively establishing an electrostatic field between said printing head and said recording carrier during printing modes of operation.

4,047,186

PRE-AIMED NOZZLE FOR INK JET RECORDER AND METHOD OF MANUFACTURE

Arthur Harry Kendall, Franklin Lakes, N.J., and Robert Lewis Rohr, Scarsdale, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1976, Ser. No. 652,280
Int. Cl.² G01D *15/18*; B23P *15/00*
U.S. Cl. 346—140 R **14 Claims**



1. A nozzle apparatus comprising:

a support block having an ink passageway therein connectable to a source of liquid ink under pressure,

said passageway terminating at one end in an opening in a first flat surface of said support block, and

an orifice wafer mounted on said first flat surface of said support block comprising

a wafer body having front and rear surfaces,

an annular orifice element circumferentially fixed held by said wafer body and having an opening the central axis of which is perpendicular with said front and rear flat surfaces of said wafer body,

said orifice element having an inner annular diameter less and an outer annular diameter greater than the diameter of said ink passageway of said support block,

said orifice element having annular end surfaces on front and rear surfaces thereof which are coplanar with said front and rear flat surfaces, respectively, of said wafer body,

said coplanar rear surfaces of said orifice element and said wafer body being attached to said support block with a fluid tight seal between said first flat surface of said support block and said coplanar rear surfaces, with the opening in said orifice element aligned with said opening in said support block.

4,047,187

SYSTEM FOR EXPOSURE MEASUREMENT AND/OR FOCUS DETECTION BY MEANS OF IMAGE SENSER

Yukio Mashimo, Tokyo; Nobuaki Sakurada, Kanagawa; Tadashi Ito, Kanagawa; Fumio Ito, Kanagawa, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1975, Ser. No. 563,462
Claims priority, application Japan, Apr. 1, 1974, 49-36790; Apr. 1, 1974, 49-36791; Apr. 1, 1974, 49-36792
Int. Cl.² G03B *7/08*
U.S. Cl. 354—23 D **38 Claims**

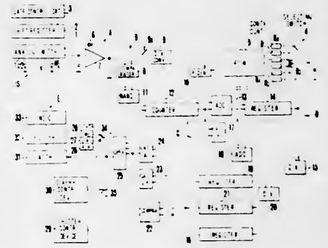
26. A system for exposure measurement and focus adjustment of an image forming optical system settable along an optical axis to form an image of an object at a predetermined position, comprising

photoelectric converting means for converting a light beam into electrical signals, said converting means being arranged at the predetermined position, and including a number of photoelectric converting elements producing electric outputs corresponding to the light beam,

time series producing means coupled to said converting elements for producing a time series of the outputs of the photoelectric converting elements by successively transmitting the outputs of the photoelectric converting elements,

digital converting means for successively converting the time series output of the photoelectric converting elements produced by the time series means into digital values, said converting means being electrically connected with the photoelectric converting means,

a first processing device for processing the outputs of the photographic converting elements converted into digital values in accordance with a first predetermined estimation function so as to detect the focusing condition of the optical system, said device being electrically connected with the digital converting means,



a second processing device for processing the outputs of the photoelectric converting elements converted into digital values by means of the digital converting means on the basis of a second predetermined estimation function, so as to determine an exposure value, said second processing device being electrically connected with the digital converting means, and

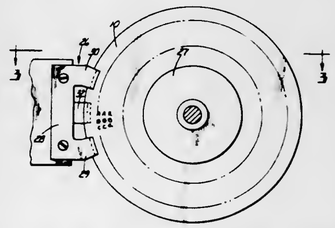
adjusting means for adjusting the image forming optical system in accordance with the output of the first processing device, so that the image of the object may be formed at the predetermined position, said means being functionally engaged with the image forming optical system and electrically connected with the first processing device.

4,047,188

STABILIZER FOR PHOTOCOMPOSITION MATRIX

Felix R. Masiello, Parsippany, N.J., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed June 28, 1976, Ser. No. 700,409
Int. Cl.² G03B *21/134*
U.S. Cl. 354—15 **3 Claims**



1. In a photocomposition machine having a rotating flexible matrix, an optical system, and means for illuminating selected areas of the matrix as the area passes through a position to project into the optical system, the provision of an improved edge guide for the matrix, comprising:

at least two guide surfaces offset with respect to a plane, said offset being substantially equal to the thickness of said matrix;

said guides being spaced relative to one another out of direct facing relationship; and

means for positioning said edge guide with the matrix edge confined within the space defined by said guide surfaces.

4,047,189

ELECTRONIC STORAGE, INDICATOR AND EXPOSURE TIME CONTROL DEVICE FOR PHOTOGRAPHIC CAMERAS

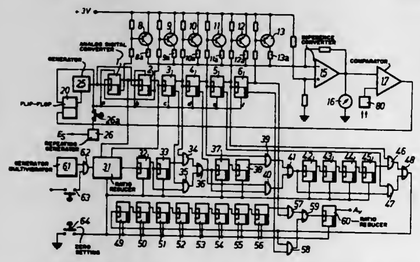
Walter Bletz, Braunfels, and Werner Holle, Wetzlar, both of Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Continuation of Ser. No. 437,142, Jan. 28, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 666,944

Claims priority, application Germany, Feb. 5, 1973, 2305523

Int. Cl.² G03B 7/08

U.S. Cl. 354—23 D 12 Claims



1. In an electronic device for storing and indicating illumination parameters and for controlling the exposure time for photographic cameras having means for measuring the exposure time and means for generating said time, the improvement comprising said means for measuring exposure time including an analog/digital first binary counters and having a plurality of stages which correspond to different exposure times depending on the exposure parameters, and wherein said means for generating said exposure time comprise:

a. a pulse generator admitting pulses at a frequency the numerical value of which consitutes a multiple of the reciprocal value of the shortest exposure time;

b. a pulse frequency reducer connected to said pulse generator and controlled by said first sequential first binary counters of said analog/digital converter to reduce said pulse generator frequency by a predetermined ratio in dependence on the stage ov said first sequential counters; and

c. said second sequential binary counters connected to said pulse frequency reducer and having a plurality of AND and OR gates for subdividing into counting chains controlled by said first binary counters, said counting chains switchingly connected to said pulse frequency reducer by said AND and OR gates the reduction of the pulse frequency achieved thereby corresponding to the frequency of said sequential first binary counters.

4,047,190

HYBRID EXPOSURE CONTROL SYSTEM EMPLOYING DUAL MAXIMUM BLADE DISPLACEMENT

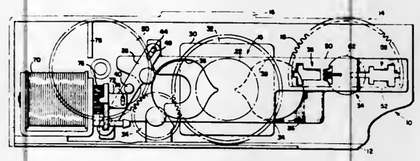
Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 10, 1975, Ser. No. 621,397

The portion of the term of this patent subsequent to July 22, 1992, has been disclaimed.

Int. Cl.² G03B 7/14

U.S. Cl. 354—27 7 Claims



4. A photographic exposure control system for a camera, said camera having means for mounting photographic film material at a given focal plane so as to receive image-carrying rays transmitted from the photographic scene along a given optical path, and means for selecting either ambient or artificial illumination operation, said system comprising:

means for sensing the brightness of the scene to be photographed;

a blade mechanism operative for unblocking and blocking at least said given optical path and for defining a primary aperture value in operative relation to said given optical path and a secondary aperture value in operative relation to said brightness sensing means, means for mounting said blade mechanism for displacement in a given direction between a first terminal arrangement wherein said blade mechanism is in blocking relation to at least said given optical path and a second terminal arrangement wherein said blade mechanism is in unblocking relation to both said given optical path and said sensing means, said blade mechanism defining primary and secondary aperture values progressively enlarging from a minimum to a maximum as said blade mechanism is displaced from said first terminal arrangement to a given blade arrangement just short of said second terminal arrangement and a reduced secondary aperture value as said blade mechanism is displaced from said given arrangement to said second terminal arrangement, said reduced secondary aperture value providing a reduction in brightness sensed by said sensing means so as to accommodate low light level brightness conditions of the photographic scene;

actuatable means operative in both ambient or artificial illumination operation for displacing said blade mechanism from its said first terminal arrangement toward its said second terminal arrangement to unblock said given optical path and initiate an exposure interval during which scene light is directed to the focal plane and, responsive to said scene brightness sensing means, for subsequently displacing said blade mechanism into a blocking arrangement to terminate the exposure interval; and

means responsive to selection of said artificial illumination operation for precluding displacement of said blade member beyond said given blade arrangement.

4,047,191

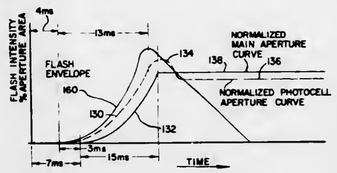
EXPOSURE CONTROL SYSTEM HAVING DYNAMIC APERTURE FLASH ARRANGEMENT

Richard J. Coppa, Westwood, and Nathan Gold, Framingham, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 22, 1975, Ser. No. 642,986

Int. Cl.² G03B 7/14

U.S. Cl. 354—27 12 Claims



7. A photographic exposure control system for use with a source of flash illumination for transmitting light from a scene along a given optical path to expose photographic material located at a given film plane, said source of illumination being configured upon actuation to provide flash illumination whose intensity increases at a given rate smoothly from zero to a given peak intensity in approximately 13 milliseconds, said system comprising:

a blade mechanism mounted for displacement between a first terminal position wherein said blade mechanism is in blocking relation to said given optical path and a second terminal position wherein said blade mechanism is in unblocking relation to said given optical path, said blade mechanism defining primary aperture values progressively increasing from a minimum to a maximum value in operative relation to said given optical path during displacement from said first to said second position;

drive means actuatable for displacing said blade mechanism between its said first and second positions at a given rate of displacement providing a predetermined rate of increase of aperture value approximating said given rate of increase of illumination;

means for sensing the brightness of the scene to be photographed and for providing an exposure value in accordance therewith;

control means for actuating said drive means to displace said blade mechanism from its said first position toward its said second position to define said increasing aperture values and initiate an exposure interval during which scene light is passed along said given optical path, for actuating said source to initiate illumination therefrom approximately 3 milliseconds prior to said blade mechanism defining said minimum aperture value, and in response to said brightness sensing means for displacing said blade mechanism into blocking relationship with said given optical path to terminate said exposure interval.

4,047,192

PHOTOGRAPHIC APPARATUS WITH SEQUENCING SYSTEM

Bruce K. Johnson, Andover; David E. Van Allen, Malden, and George D. Whiteside, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 3, 1975, Ser. No. 554,777

Int. Cl.² G03B 17/50

U.S. Cl. 354—83 52 Claims

1. Photographic apparatus for use in a cycle of operation which includes the exposure of a film unit, said apparatus comprising:

a housing;

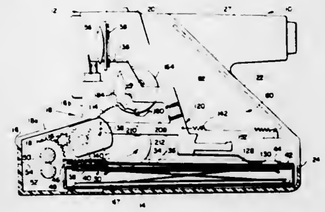
means within said housing for locating a film unit in position for exposure;

exposure means for exposing a film unit located at said exposure position, said exposure means including shutter means having at least one component thereof which is movable between positions blocking and unblocking the transmission of image-bearing light through said shutter means for exposing a film unit, said at least one movable component being configured to be located in said light-blocking position at the beginning and end of a cycle of operation of said apparatus;

biasing means providing a force on said shutter means for urging said at least one movable component of said shutter means from said light-blocking position to said unblocking position;

means being selectively operable to move said at least one movable component of said shutter means from said unblocking position to said blocking position against the urging force of biasing means;

latching means being operable for latching said at least one movable component of said shutter means at said light-blocking position at the beginning and end of a cycle of



operation and for unlatching said at least one movable component of said shutter means for movement between said blocking and unblocking positions during the exposure portion of a cycle of operation;

sequencing means, mounted in said housing for rotation through a single 360° revolution during the course of a cycle of operation of said apparatus, for controlling the sequence of at least some of the events comprising the cycle of operation; and

means responsive to rotating said sequencing means through a first angular segment of said single revolution for causing said latching means to unlatch said at least one movable component of said shutter means located at said light-blocking position prior to exposure of a film unit and responsive to rotating said sequencing means through a second angular segment of said single revolution for causing said latching means to relatch said at least one movable component of said shutter means at said light-blocking position subsequent to exposure of the film unit.

4,047,193

APPARATUS FOR OPENING RADIOGRAPHIC CASSETTES

Emile Franz Stievenart, Hoboken; Hendrik Sylvester Plessers, Boechout; Georges Josef Neujens, Mariakerke, and Leo Pa ul Van Bouwel, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed July 3, 1975, Ser. No. 592,879

Claims priority, application United Kingdom, July 5, 1974, 29998/74

Int. Cl.² G03B 17/24; G11B 1/02

U.S. Cl. 354—105 8 Claims

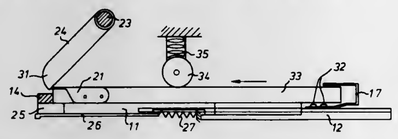
1. An unlocking and opening apparatus for radiographic film cassettes of the type having a bottom, a cover and a locking-unlocking mechanism actuated by exteriorly situated levers, which apparatus comprises

a platform (11) for supporting a cassette for sliding movement along the surface thereof in a lengthwise direction, cassette advancing means (12) mounted on said platform (11)

for back and forth relative movement in said lengthwise direction, said advancing means including fingers (17, 18) for engaging the rear end of a cassette resting on said platform and pushing said cassette along the platform as said advancing means is advanced,

spaced apart cassette aligning and arresting means (13, 14) projecting above the platform surface at a locus intermediate its ends for engaging the cassette on said platform along its front edge and being movable relative to said platform,

guide means (15, 16, 25) for guiding said aligning and arresting means in a direction parallel to said lengthwise direc-



tion from said locus toward the forward end of said platform,

spring means connected to said aligning and arresting means for yieldably allowing said guided movement thereof as the advancing means is advanced to push said cassette and for returning said aligning and arresting means to said locus together with said cassette after opening, and

means disposed forwardly of said locus for engaging the actuating levers of said cassette locking-unlocking mechanism as said cassette is pushed forward by said advancing means to unlock and open said cassette for removal of the film therefrom.

4,047,194

CAMERA SYSTEM WITH MEANS FOR AUTOMATICALLY SWITCHING TO FLASH OPERATION

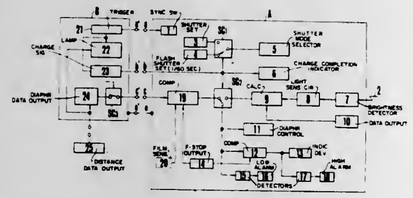
Zenzo Nakamura, Urawa; Takashi Uchiyama, Yokohama; Masanori Uchidoi; Tetsuya Taguchi, both of Kawasaki; Hiroshi Aizawa, Machida, and Tokuichi Tsunekawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1975, Ser. No. 575,002

Claims priority, application Japan, May 8, 1974, 49-50916; May 20, 1974, 49-56275; May 20, 1974, 49-56276; May 20, 1974, 49-56277; May 20, 1974, 49-56278; May 20, 1974, 49-56279; May 20, 1974, 49-56280; July 12, 1974, 49-80009; July 17, 1974, 49-83060; July 18, 1974, 49-82462; July 27, 1974, 49-86371; Sept. 26, 1976, 49-111288

Int. Cl.² G03B 15/05

U.S. Cl. 354—149 **27 Claims**



1. A flash camera system, comprising:

A. A flash device, having:

a. a flash discharge tube,

b. energy accumulation means connected to said discharge tube for accumulating energy to energize the flash discharge tube,

c. accumulation completion signal forming means connected to said energy accumulation means for forming an energy accumulation completion signal when the energy accumulated at said energy accumulation means reaches a prescribed level,

d. diaphragm information forming means to form a diaphragm information signal corresponding to a constant diaphragm aperture value prescribed for flash photography, and

e. a flash control circuit coupled to said discharge tube to control the amount of light from said flash discharge tube on the basis of data depending on the distance to an object, and

B. a camera, including an objective having a diaphragm defining an exposure opening, and automatic means coupled to the diaphragm for setting the diaphragm aperture to the prescribed aperture value in response to the energy accumulation completion signal at a time of flash photography, said automatic means including;

a. exposure opening control means coupled to said diaphragm to control the exposure opening,

b. an exposure opening control circuit coupled to said exposure opening control means, said circuit having a flash control mode which controls the exposure opening control means based on said prescribed diaphragm aperture value information signal, and

c. a designating circuit connected to said exposure opening control circuit and responding to said energy accumulation completion signal by forming a mode designation signal for setting said exposure opening control circuit to the flash control mode so that the exposure opening control circuit is automatically set to the flash control mode.

4,047,195

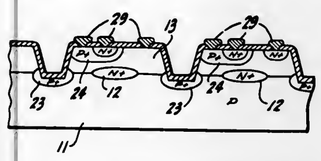
SEMICONDUCTOR STRUCTURE

David F. Allison, Los Altos, Calif., assignor to Scientific Micro Systems, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 414,764, Nov. 12, 1973, abandoned, and a continuation-in-part of Ser. No. 169,294, Aug. 5, 1971. This application Sept. 22, 1975, Ser. No. 615,465

Int. Cl.² H01L 29/06, 27/04, 27/12, 27/02

U.S. Cl. 357—55 **7 Claims**



1. In a semiconductor structure, a body of crystalline semiconductor material and having an upper surface lying in the 21 100> crystalline plane, isolation moats extending downwardly through said surface and being defined by side walls lying in a crystalline plane different from the <100> crystalline plane and having a bottom wall lying generally in the <100> crystalline plane to provide at said surface isolated islands, bipolar devices formed in the isolated islands, a layer of insulating material insufficient to fill the moats covering said side walls and said bottom walls of said moats regions of higher impurity concentration than that of the semiconductor body extending downardly from the moats and into the semiconductor body, and a PN junction formed in the body of semiconductor material extending between the moats and below the bipolar devices, said regions extending through the PN junction and making contact with the side walls of the moats.

4,047,196

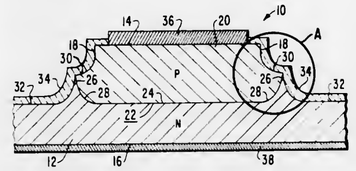
HIGH VOLTAGE SEMICONDUCTOR DEVICE HAVING A NOVEL EDGE CONTOUR

Joseph Paul White, Somerville, and Peter Joseph Kaanam, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 24, 1976, Ser. No. 717,335

Int. Cl.² H01L 29/06, 29/34, 23/30

U.S. Cl. 357—55 **11 Claims**



1. A semiconductor device comprising:

a body of semiconductor material having first and second major opposing surfaces and a peripheral edge extending therebetween, said body initially having a one type conductivity;

a first region having a second type conductivity extending within said body, said first region forming a first PN junction with said body at the interface therewith, said junction comprising an edge segment extending substantially perpendicular to said first surface, a bottom segment extending substantially parallel with said first surface and a radius segment connecting said edge segment and said bottom segment;

a contoured portion of said edge, said contour beginning at said first surface in said region and extending toward said second surface to a first terrace, said first terrace intersecting said edge segment of said first PN junction, said contour, from a point near said intersection, further extending toward said second surface to a second terrace, said contour being concave between said intersection and said second terrace.

4,047,197

HOUSING AND LEAD STRUCTURE FOR A SERIES CONNECTED SEMICONDUCTOR RECTIFIER ARRANGEMENT

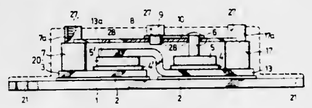
Winfried Schierz, Roth, Germany, assignor to SEMIKRON Gesellschaft fur Gleichrichterbau und Elektronik m.b.H., Nuraburg, Germany

Filed Apr. 16, 1976, Ser. No. 677,851

Claims priority, application Germany, Apr. 19, 1975, 7512573[U]

Int. Cl.² H01L 23/02, 23/28, 23/16, 39/02

U.S. Cl. 357—81 **19 Claims**



1. A semiconductor rectifier arrangement comprising in combination:

a metal base plate;

a layer of electrically insulating but thermally conductive material fastened to the upper surface of said base plate;

a pair of electrical contact layers fastened to the surface of said layer of insulating material and electrically isolated from one another;

a pair of semiconductor rectifier devices, each having at least one pn junction and a connecting contact on each of its two opposite major surfaces, each of said semiconductor devices being mounted on and having one of its said connecting contacts electrically connected to a respective one of said electrical contact layers;

conductive means for electrically connecting one connecting contact on one of said semiconductor rectifier devices to one connecting contact on the other of said semiconductor rectifier devices to connect said semiconductor devices in a series circuit;

first, second and third current conducting terminals connected to the input of said series circuit, to the output of said series circuit, and to said conductive means, respectively, said first, second and third current conducting terminals being arranged in a row with each of the two outer current conducting terminals of said row being electrically conductively connected to one of said electrical contact layers; and

a plastic housing connected to said base plate and in which said series circuit, including its connecting parts is disposed.

4,047,198

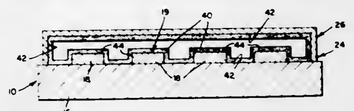
TRANSISTOR COOLING BY HEAT PIPES HAVING A WICK OF DIELECTRIC POWDER

Kalwant S. Sekhon, Fullerton; Lloyd A. Nelson, Villa Park, and John E. Fritz, Jr., Anaheim, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 19, 1976, Ser. No. 678,336

Int. Cl.² H01L 23/02, 25/04

U.S. Cl. 357—82 **8 Claims**



1. A microelectronic package capable of operating with power densities extending at least to 10 kW/cm² comprising:

means for defining a sealed enclosure coupled to an external heat sink;

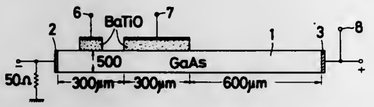
means for defining electronic devices and circuitry sealed within said enclosure means;

electrical coupling means from said electronic devices and circuitry means and extending outside of said enclosure means for electrically coupling said electronic devices and circuitry means to further electronic circuits;

means including dielectric powder adhered substantially to all interior surfaces of said enclosure means and to all exposed surfaces of said electronic devices and circuitry means for defining a heat pipe wick substantially completely and conformally coating said interior and exposed surfaces; and

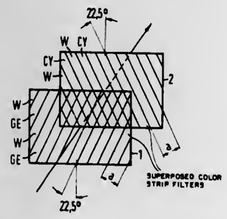
means for defining a dielectric working fluid in said enclosure means and intimately contactable with all said interior and exposed surfaces, thereby for minimizing the occurrence of local hot spots on said electric devices and circuitry means and for maximizing heat transfer therefrom to said external heat sink.

4,047,199
SEMICONDUCTOR DEVICE
Shoei Kataoka, Tanashi; Yasuo Komatiya, Kikuna; Nobuo Hashizume, Higashikurume; Kazutaka Tomizawa, Kamagaya, and Mitsuo Kawashima, Tokorozawa, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan
Division of Ser. No. 417,300, Nov. 19, 1973, abandoned, which is a continuation of Ser. No. 165,636, July 23, 1971, abandoned.
This application Oct. 1, 1975, Ser. No. 618,554
Claims priority, application Japan, July 23, 1970, 45-63955; Feb. 27, 1971, 46-9661
Int. Cl.² H01L 27/26, 47/00
U.S. Cl. 357—3 13 Claims



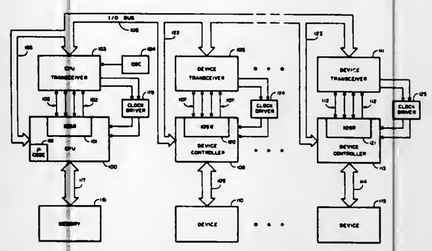
1. A bulk semiconductor device comprising in combination, a semiconductor element exhibiting a negative conductivity under a high electric field and being capable of generating a high electric field domain therein, two ohmic electrodes one at either end of said semiconductor element disposed to apply a bias voltage, at least one means for generating a high electric field domain in said semiconductor element by means applying an input signal to increase the electrical field in a region adjacent the generating means, at least one means for inhibiting the generation of a high electric field domain in said semiconductor element by means applying another input signal to increase the electric field in a region adjacent the inhibiting means, and means for detecting the existence of the high electric field domain in said semiconductor element to produce an output signal.

4,047,200
SINGLE TUBE COLOR TELEVISION CAMERA WITH COLOR STRIP FILTERS
Michael Koubek, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Aug. 30, 1973, Ser. No. 392,860
Claims priority, application Germany, Sept. 6, 1972, 2243698
Int. Cl.² H04N 9/07
U.S. Cl. 358—47 2 Claims



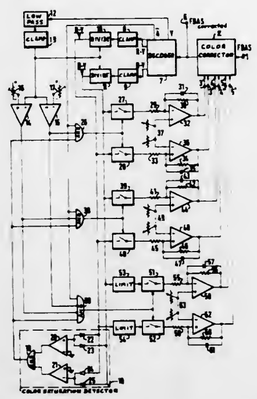
1. A single tube color television camera comprising a picture tube and two color strip filters disposed one behind the other on the optical image axis, said color strip filters having different color filters effects, both of said filters being oriented at the same angle of rotation in respect of the vertical image axis and oriented in opposite directions with respect to each other, whereby the output signal of the picture tube is composed of three frequency spectrums which are interleaned with each other in the frequency axis, a first of said frequency spectrums corresponding to a luminance signal and consists of spectral lines for integral multiples of the line frequency, and the other two frequency spectrums corresponding to respective color signals and consist of spectral lines which occur in the individual frequency spectrum and in intervals of the value of the line frequency and shifted in respect of the spectral lines of said first frequency spectrum by a fraction of the line frequency in opposite directions for the two color signals, and said television camera further comprising a decoding arrangement including a comb filter for splitting the output signals of the picture tube, said comb filter including an input connected to receive the output signal of the picture tube, a first output for said luminance signal, a second output for one of said color signals, and a third output for the other of said color signals, so that all three frequency spectrums are available at said outputs in their entire scope and separated from each other.

4,047,201
I/O BUS TRANSCEIVER FOR A DATA PROCESSING SYSTEM
Natalio Kerilenevich, Lexington, Mass., assignor to Data General Corporation, Westboro, Mass.
Filed Feb. 27, 1976, Ser. No. 662,177
Int. Cl.² G06F 3/04
U.S. Cl. 364—200 11 Claims



1. In a data processing system including (*a*) CPU, (*b*) a main memory interfacing with said CPU, (*c*) I/O means, incuding a plurality of device controllers, for connecting between said CPU and a like plurality of peripheral devices, and (*d*) a clock source, transceiver means contained within said I/O means for serially transmitting and receiving unmodulated signals between said CPU and said plurality of device controllers, said transceiver means comprising:
a CPU transceiver;
a first group of conductors for connecting said CPU transceiver from said CPU:
a like plurality of device control transceivers;
a like plurality of second groups of conductors each of said second groups for connecting each of said device control transceivers to each of said device controllers respectively;
an I/O bus connected at least between said CPU transceiver and said device control transceivers, said I/O bus including multiple data signal paths, clock signal paths, and control signal paths;
said CPU transceiver including means for (1) receiving pulses from said clock source, (2) employing said pulses as a local clock, (3) transmitting said pulses to one of said clock signal paths of said I/O bus, and (4) conducting said pulses to certain of said first group of conductors;
each of said device control transceivers including means for (1) receiving said transmitted pulses from said one of said clock signal paths, (2) employing said transmitted pulses as its respective local clock, and (3) conducting said transmitted pulses to certain conductors of a respective one of said second groups of conductors;
said CPU transceiver including mode control means normally operative to maintain said CPU transceiver in a receiving mode and responsive to a mode control signal on one of said conductors of said first group for establishing a transmit mode for said CPU transceiver; and, each of said device control transceivers including other mode control means normally operative to maintain said device control transceivers in a receiving mode and responsive to other mode control signals from respective ones of said device controllers for establishing a transmit mode for respective ones of said device control transceivers.

4,047,202
AUTOMATIC COLOR BALANCING SYSTEM
Dieter Poetsch, Ober Ramstadt, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Oct. 7, 1975, Ser. No. 620,409
Claims priority, application Germany, Oct. 11, 1974, 2448505
Int. Cl.² H04N 9/535
U.S. Cl. 358—29 17 Claims



1. A system for automatic correction of at least two color difference signals which determine the color and luminosity of a color television signal comprising:
A. first means responsive to said signal for providing a first indication when a predetermined luminosity gradation is present in a picture represented by said signal,
B. second means responsive to the color difference signals for providing a second indication when said at least two color difference signals remain within respective predetermined color saturation thresholds,
C. storage means responsive to the simultaneous presence of the first and second indications for storing values indicative of the chromaticity of said picture prevailing at that moment,
D. deriving means for deriving a regulating signal as a function of the stored value of the chromaticity, and
E. adjusting means responsive to the regulating signal for correcting defects in the color balance of the signals that determine color and luminosity of the color television picture,
wherey defects in the color and luminosity of the picture are lessened.

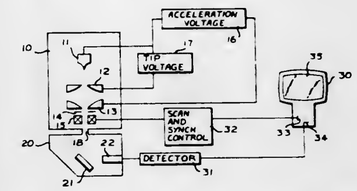
4,047,203
COLOR IMAGING ARRAY
Peter L. P. Dillon, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed May 12, 1976, Ser. No. 685,824
Int. Cl.² H04N 9/07
U.S. Cl. 358—44 8 Claims

1. A color imaging device comprising a rectangular array of interrogable photoelectric elements, such elements being selectively responsive to respective colors which correspond to a preselected three color basis, one color of which corresponds essentially to luminance;
said elements being arranged in a configuration wherein alignments along one major dimension of the array consist essentially of a repeated four element grouping having



two luminance-responsive elements alternating with elements responsive respectively to the other two colors of said basis, each successive such alignment being shifted by one element position but otherwise having substantially the same color pattern.

4,047,204
VARIABLE INTERLACE DISPLAY
James J. Gold, Mountain View, Calif., assignor to American Optical Corporation, Southbridge, Mass.
Continuation of Ser. No. 534,975, Dec. 20, 1974, abandoned.
This application Sept. 7, 1976, Ser. No. 720,912
Int. Cl.² H04N 3/16
U.S. Cl. 358—93 3 Claims

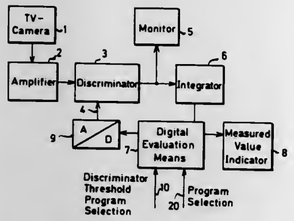


1. In apparatus for varying according to a predetermined selection range the interlace rate of a rastered display, such as on a cathode ray tube including a horizontal deflection control circuit and a vertical deflection control circuit connected respectively to a horizontal drive and a vertical drive, the improvement comprising: variable oscillation means to generate a principal frequency to drive said horizontal and vertical drives, said frequency being a multiple of the horizontal deflection rate and the predetermined interlace rates; horizontal counter means for reducing the oscillation frequency to a frequency equal to the horizontal rate for the predetermined interlace rate; vertical counter means for reducing the oscillation frequency equal to the vertical rate for the predetermined interlace rate; and control means for said vertical counter and said oscillation means which cause the quotient of said horizontal rate divided by said vertical rate to be a fractional number, the fractional portion of which represents the desired interlace rate.

4,047,205
METHOD AND MEANS FOR MEASURING SUBSTANCE VOLUMES IN LIGHT-TRANSMITTING SAMPLES
Rudolf Grosskopf, Koenigsbronn, Germany, assignor to Carl Zeiss-Stiftung, Oberkochen, Wurttemberg, Germany
Filed Apr. 7, 1976, Ser. No. 674,841
Claims priority, application Germany, Apr. 9, 1975, 2515513
Int. Cl.² H04N 7/18
U.S. Cl. 358—107 12 Claims

1. In the method of measuring substance volumes in light-transmitting objects through electronic-image analysis within a field of raster-scanned subject matter, in which each scanning line lying within the boundaries of an object to be evaluated

supplies by means of a discriminator a binary signal corresponding to the line length between object-boundary intercepts for the particular line, the improvement which comprises subjecting at least the object region of the field to a first frame of raster scanning at a first amplitude level of video-signal discrimination throughout said first frame scan, integrating the discriminator output signal for all scan lines between the object-boundary intercepts of said lines for said first frame, thereby developing a first integrated-frame value corresponding to the total area of the scanned object; subjecting said region to a second frame of raster scanning at a second amplitude level of video-signal discrimination throughout the second frame scan, integrating the discriminator-output signal for all scan lines between the object-boundary intercepts of said



lines for said second frame, thereby developing a second integrated-frame value which corresponds to an object-scanned area that is less than said total area; developing a difference signal corresponding to the difference between said values, whereby said difference signal corresponds to the ring-like incremental area between said total area and said lesser area; multiplying said difference signal by a calibrating value which relates light-transmittance of said first ring-shaped incremental area with volume of the substance; and repeating such frame scans at successive different levels of discrimination with accompanying integration and difference-signal development and calibrating multiplication, for each of the resulting lesser ring-shaped incremental areas involved until no such incremental areas are applicable; and then adding the calibration-corrected values.

4,047,206

SINGLE LENS REFLEX CAMERA

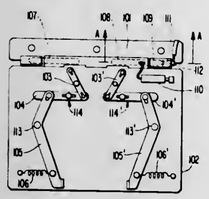
Kazuo Kitagami, Tokyo; Katsuhiko Miyata, Tsurugashima, and Akihiro Arai, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 17, 1976, Ser. No. 696,984

Claims priority, application Japan, June 17, 1975, 50-73437

Int. Cl.² G03B *19/12*

U.S. Cl. 354—152 **4 Claims**



1. A single lens reflex camera system of the type having a camera body and multiple interchangeable lens systems for selective attachment to said camera body to accomplish different photography objectives, and a finder optical system receiving light having passed through the selected lens system and reflected towards said finder optical system by reflecting mirror means, said reflex camera system further including means active upon depression of a shutter release button to swing the mirror means away from the path of optical rays passing through said selected lens system, the improvement characterized by a set of individually removeable mirrors for selective placement in said camera body as the reflecting mirror means, said individual mirrors being different that one another to accomplish different photography objectives.

4,047,207

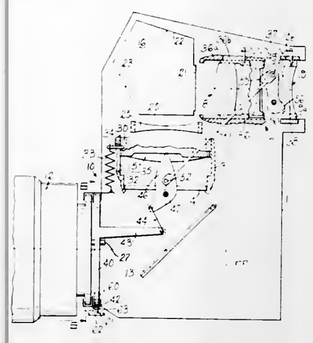
VIEWING SYSTEM FOR REFLEX CAMERA

Richard M. Altman, Woodland Hills, and Thomas D. McLaughlin, Thousand Oaks, both of Calif., assignors to Optigon Research & Development Corporation, Santa Monica, Calif.

Filed Jan. 13, 1976, Ser. No. 648,779

Int. Cl.² G03B *13/12, 19/12*

U.S. Cl. 354—155 **20 Claims**



1. In a viewing system for a single lens reflex camera having a focal plane comprising a viewing screen, a field lens, a prism and an eyepiece, said camera having the ability to accept lenses having exit pupils of varying location with respect to the focal plane of said camera, the improvement comprising a movable field lens between said screen and said prism, and means for positioning said movable field lens between said prism and said screen as a function of the location of the exit pupil of a lens mounted to said camera.

4,047,208

SUPPORTING DEVICE FOR SUPPORTING A ROLL FILM IN A CAMERA

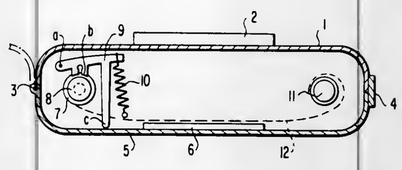
Heizo Kawaguchi, Oyaguchi Kita, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1975, Ser. No. 639,687

Claims priority, application Japan, Dec. 11, 1974, 49-150633[U]

Int. Cl.² G03B *1/00*

U.S. Cl. 354—203 **4 Claims**



1. In a camera of the type having, a support shaft for engaging and rotating with a film roll, a take-up spool for receiving the leader part of the film from said roll, and a back cover which can be opened to load and unload film rolls and is closed during picture-taking operation, the improvement comprising,

means operative only when said back cover is open to frictionally restrict the unwinding of said film from said roll, said means engaged with said support shaft only when said back cover is open.

4,047,209

FILM TRANSPORT

Abraham Groeneweg, Ridderkerk, Netherlands, assignor to N.V. Optische Industrie "De Oude Delft", Netherlands

Filed May 16, 1975, Ser. No. 578,012

Claims priority, application Netherlands, May 20, 1974, 7406745

Int. Cl.² G03B *1/00*

U.S. Cl. 354—212 **1 Claim**



1. In a camera, apparatus for supplying and discharging predetermined lengths of film to and from a position between an exposure window and a hold-down frame movable towards, and away from, said exposure window, there being a gap between said exposure window and said hold-down frame, said hold-down frame having a supply end and a discharge end, at each of which ends there are disposed a pair of shafts in tranverse parallel relationship to, and on opposite sides of, the plane of a path of travel of said lengths of film, said shafts carrying transporting rollers adjacent their ends with opposing rollers movable into, and out of, cooperative association, means for separating a length of film from a stack in a supply cassette and transporting the separated length of film from said supply cassette to within reach of the transporting rollers on said supply end, a stop on the discharge end of said gap, downstream of the transporting rollers, said stop being movable to a position in the path of travel of the lengths of film for retaining a length of film, and to a position outside said path of travel for allowing the discharge of a length of film from said gap to a collecting cassette disposed on the discharge end of said gap, a motor operatively associated with a mainshaft, cam disks on said mainshaft for respectively moving said hold-down frame, said means for separating and transporting a length of film, said stop, and said transporting rollers relatively to each other, the rotary movements of said transporting rollers and of said mainshaft being derived from a power take-off shaft of said motor, and characterized in that, in operation, said motor runs at a constant speed, and in that said mainshaft is coupled to said power take-off shaft of the motor by a single-stroke clutch operable by electromagnetic means.

4,047,210

CAMERA WITH AN ELECTRONIC TIMER AND INCLUDING AN ELECTRO-MECHANICAL DELAYED ACTION STOP FOR THE SHUTTER DRIVE

Winfried Eggig, Calmbach, Black Forest, Germany, assignor to Prontor-Werk, Alfred Gauthier GmbH, Postfach, Germany

Continuation of Ser. No. 143,200, May 13, 1971, abandoned, which is a continuation of Ser. No. 770,737, Oct. 25, 1968, abandoned. This application June 19, 1975, Ser. No. 588,269

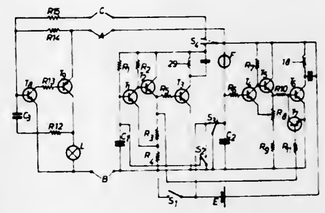
Claims priority, application Germany, Oct. 26, 1967, 1597365

The portion of the term of this patent subsequent to July 27, 1988, has been disclaimed.

Int. Cl.² G03B *9/64*

U.S. Cl. 354—238 **5 Claims**

1. A camera having an electronic timer controlled by ambient light including an electro-mechanical delayed action stop for the shutter to stop the action of the shutter upon shutter release, an electronic delay device for delaying temporarily the action of the shutter after shutter release, and electronic switching means, including a battery-energizable signal lamp, responsive to the action of said delay device, and having means electronically controlled in dependence upon the action of said



delay device for specifically generating distinctive and different light signals via said lamp respectively during the action of said delay device and the subsequent exposure period whereby to indicate to the operator the corresponding state of the shutter action continuously throughout the duration of the shutter operation upon shutter release and during both the action of said delay device and the subsequent exposure period.

4,047,211

MECHANICAL EXPOSURE CONTROL MEANS FOR ELECTRIC SHUTTERS

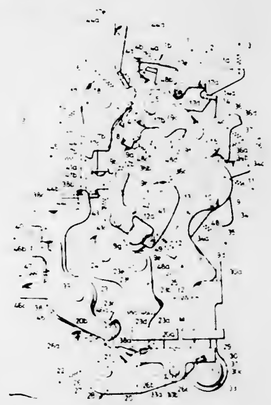
Nobuyoshi Inoue, and Munetaka Shimizu, both of Kawagoe, Japan, assignors to Copal Company Limited, Japan

Filed Sept. 26, 1975, Ser. No. 617,165

Claims priority, application Japan, Sept. 28, 1974, 49-116348[U]

Int. Cl.² G03B *9/58*

U.S. Cl. 354—258 **4 Claims**



1. A mechanical exposure control means for electric shutters comprising:

a base plate,

a front blade actuating member supported rotatably on said base plate and movable between its released position and cocked position, rear blade actuating member supported rotatably on said base plate and movable between its released position and cocked position,

a mechanical exposure controlling member supported rotatably on said base plate and capable of locking said rear

blade actuating member in its cocked position by directly engaging with said rear blade actuating member and capable of being moved by said front blade actuating member in order to release said rear blade actuating member,

an exposure time controlling circuit including an RC delay circuit and an electromagnet therein and capable of electrically controlling the operation time of said rear blade actuating member through said electromagnet,

a shutter speed dial supported rotatably on said base plate and capable of bringing said mechanical exposure controlling member into engagement with said rear blade actuating member, and

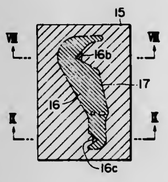
an auxiliary switch arranged adjacently to said shutter speed dial and capable of being operated by said shutter speed dial to make said exposure time controlling circuit inoperative when said rear blade actuating member is brought into engagement with said mechanical exposure controlling member.

4,047,212

DIAPHRAGM BLADE FOR CAMERAS AND METHOD OF MAKING THE SAME

Mineo Yamada, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Feb. 4, 1976, Ser. No. 655,016
Claims priority, application Japan, Feb. 6, 1975, 50-15715
Int. Cl.[2] G03B 9/02
U.S. Cl. 354—270 9 Claims



9. A diaphragm blade for cameras comprising an ND filter sheet, a blade portion formed by depositing a light intercepting substance on said sheet, and a filter portion integral with said blade portion so as to be effective within a small diaphragm range.

4,047,213

METHOD AND APPARATUS FOR HEATING CASSETTE CONTAINED FILM STRIP DURING PROCESSING

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 9, 1976, Ser. No. 647,740
Int. Cl.[2] G03D 13/00
U.S. Cl. 354—299 10 Claims

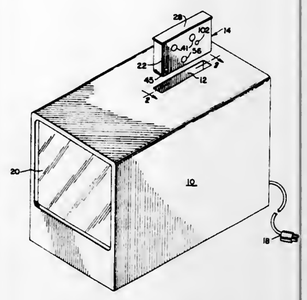
9. Photographic apparatus comprising:

means for receiving a film cassette containing an elongated strip of exposed, undeveloped film, film advance means when driven for advancing said film strip along a predetermined path within said cassette, a processing fluid applicator actuatable responsive to advancement of said film strip for applying a coating of processing fluid to said film strip to develop said film strip, a heating element energizeable to increase the temperature of said processing fluid, and externally accessible contacts electrically coupled to said heating element;

selectively operative means for driving said film advance means;

switch means actuatable for coupling said contacts to an electrical source to heat said element; and

means for controlling said switch means and said driving means to energize said heating element and initially drive said film advance means to actuate said fluid applicator, then halt said driving of said film advance means for an interval during which said element is raised to its operating temperature, and subsequently again drive said film advance means to apply a coating of said fluid to substantially the full extent of said film strip.



4,047,214

ELECTROSTATICALLY BONDED DIELECTRIC-ON-SEMICONDUCTOR DEVICE, AND A METHOD OF MAKING THE SAME

Maurice H. Francombe, and Shu-Yau Wu, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 4, 1975, Ser. No. 610,364
Int. Cl.[2] H01L 29/78, 27/12, 29/84, 23/48
U.S. Cl. 357—23 7 Claims

1. An electrostatically bonded ferroelectric-on-semiconductor field-effect transistor comprising:

A. a ferroelectric body of a bulk material having opposed first and second major surfaces with at least said first major surface of planar configuration, and having ferroelectric properties;

B. a semiconductor body of a bulk material and given conductivity type and having opposed first and second major surfaces with at least said first major surface of planar configuration, said first major surface being electrostatically bonded to said first major surface of said body;

C. at least one electrode, such as a gate electrode, ferroelectric substrate to provide for interaction between transport carriers in the semiconductor body and electrical polarization changes in the ferroelectric body;

D. source and drain impurity regions of conductivity type opposite to said semiconductor body, said impurity regions spaced apart in said semiconductor body adjoining said first major surface; and

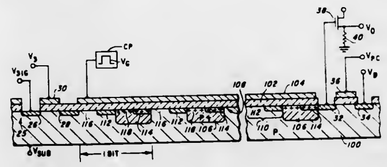
E. source and drain electrodes positioned on said first major surface of the semiconductor body to make ohmic contact with said source and drain impurity regions, respectively, spaced apart from each other with said ferroelectric body positioned at least therebetween.

4,047,215

UNIPHASE CHARGE COUPLED DEVICES

Robert Charles Frye, Plano; Horng-Sen Fu, Dallas, and Al F. Tasch, Jr., Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 31, 1975, Ser. No. 545,954
Int. Cl.[2] H01L 29/78, 29/04; G11C 19/28
U.S. Cl. 357—24 9 Claims



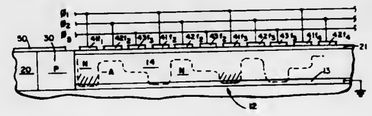
1. A uniphase charge coupled device structure comprising a semiconductor substrate of one conductivity type including therein a channel for said device, an insulating layer on said substrate having a uniform thickness over said channel, a continuous planar conductive layer covering said channel for receiving charge transfer clock pulses, said planar conductive layer being separated from said channel only by said insulating layer, said substrate further including input structure for inputting charge packets to one end of said channel and output structure for extracting charge packets from the opposite end of said channel, and wherein along the length of said channel first substrate regions are separated by second substrate regions comprising packets of semiconductor material of said one conductivity type and having higher impurity concentration than said substrate, each of the first and second regions including a transfer and storage portion at the interface of the insulating layer and the regions, the transfer portion of a region located between the input structure and the storage portion of a region, a layer of immobile charge comprised of dopant impurities of opposite conductivity type from that of said substrate included in the storage portion of each first region but not in the transfer portion of any first region, and included in the storage and transfer portions of said second regions, said layer of immobile charge having a higher impurity concentration in the storage portion of each second region that the transfer portion of a second regions.

4,047,216

HIGH SPEED LOW CAPACITANCE CHARGE COUPLED DEVICE IN SILICON-SAPPHIRE

Barry T. French, Ontario, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 457,675, April 3, 1974, abandoned. This application Jan. 20, 1976, Ser. No. 650,594
Int. Cl.[2] H01L 29/78; G11C 19/28; H01L 27/12
U.S. Cl. 357—24 2 Claims



1. In combination:

an electrically insulating substrate;

a strip of material capable of supporting charge coupled device action disposed on said substrate and comprising a charge transfer channel of a charge coupled device;

said strip including a first layer of semiconductor material adjacent said substrate having relatively high conductivity and a second layer of semiconductor material which has a relatively low conductivity;

insulation means disposed on said strip of material and on said substrate;

a set of charge coupled device control electrodes disposed on said insulation means for controlling the transfer of charge within said charge transfer channel when appropriate control signals are applied thereto;

said insulation being thick enough to insulate said control electrodes from said underlying strip of material and thin enough to enable control signals applied to said set of charge coupled device control electrodes to control the transfer of charge within said charge coupled device; and

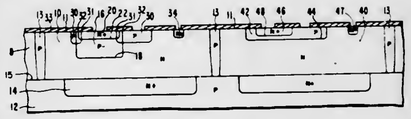
said second layer of semiconductor material is thin enough that when control potentials are applied to the device, all of potential wells of the charge coupled device will extend substantially entirely through said second layer at all times whereby variations in the depths of the potential wells are accommodated by variations in the depth of the penetration of said potential wells into said first layer of semiconductor material whereby transfer inefficiencies induced by traps in the second layer of said semiconductor material are minimized by avoiding repetitive filling and emptying of those traps.

4,047,217

HIGH-GAIN, HIGH-VOLTAGE TRANSISTOR FOR LINEAR INTEGRATED CIRCUITS

Terence McCaffrey, Cupertino; Hassan Raza, Sunnyvale, and Bruce C. Williams, San Jose, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Apr. 12, 1976, Ser. No. 676,038
Int. Cl.[2] H01L 29/72, 29/00, 27/02
U.S. Cl. 357—34 13 Claims



1. An improved bipolar transistor device having a high breakdown voltage and high gain comprising:

a first collector region of semiconductor material of one conductivity type having a principal surface;

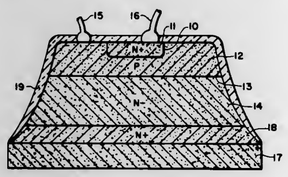
a second base region of opposite conductivity type located within the first collector region and forming a first p-n junction herewith that has an edge at the principal surface, the second base region having a relatively low charge density;

a third emitter region of one conductivity type located within the second base region and forming a second p-n junction therewith that has an edge at the principal surface; and a fourth base region of opposite conductivity type located along a portion of the principal surface abutting the entire periphery of said third region and exteading into portions of the first, second, and third regions, the fourth region having a charge density about an order of magnitude greater than that of the second region, said fourth base region and said second base region providing the equivalent of a base function with a dual charge density.

4,047,218
SEMICONDUCTOR DEVICES WITH IMPROVED TURN-OFF CHARACTERISTICS

Lowell E. Clark; Raymond M. Roop, and Charles E. Volk, all of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 543,584, Jan. 23, 1975, abandoned. This application July 16, 1976, Ser. No. 705,970
Int. Cl.² H01L *29/72, 29/48, 29/90, 23/48*
U.S. Cl. 357—34 **5 Claims**

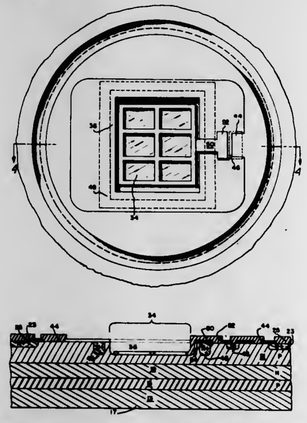


1. In a high voltage semiconductor device including a first region of first conductivity-type, a second semiconductor region of second conductivity-type having at least lightly-doped portion, said lightly-doped portion forming a p-n junction with said first region, and separate first and second metallic means for contacting respectively each of said first and second regions remote from their p-n junction, wherein the improvement comprises said second region having a net impurity doping density of said second type between 3×10^{12} and 10^{15} atoms per square centimeter between said p-n junction and said second metallic means.

4,047,219
RADIATION SENSITIVE THYRISTOR STRUCTURE WITH ISOLATED DETECTOR

Victor A. K. Temple, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,135
Int. Cl.² H01L *29/74*
U.S. Cl. 357—38 **4 Claims**

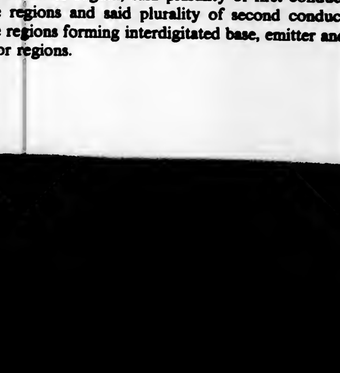


1. A radiation sensitive semiconductor device comprising:
a semiconductor substrate;
a radiation sensitive region on said substrate operative to generate an electrical current in response to the incidence of radiation thereon;
a gate region responsive to the flow of current therein to turn on said semiconductor device;
an isolating region interposed between said radiation sensitive region and said region for increasing the lateral resistance of said substrate layer between said radiation sensitive region and said gate region to a value greater than the lateral resistance of the remainder of said substrate, said isolating region further characterized by a region of locally higher base resistance than the remainder of said substrate surrounding said radiation sensitive region and by a lower impurity concentration than the remainder of said substrate layer; and
means for coupling said electrical current from said radiation sensitive region to said gate region for turning on said device in response to the incidence of radiation on said radiation sensitive region.

4,047,220
BIPOLAR TRANSISTOR STRUCTURE HAVING LOW SATURATION RESISTANCE

Armand P. Ferro, Schenectady, N.Y., and Bruno F. Kurz, deceased, late of Schenectady, N.Y. (by Elizabeth Kurz-Beerli, executrix, also known as Elizabeth Kurz Chinoy), assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 24, 1975, Ser. No. 644,338
Int. Cl.² H01L *27/10*
U.S. Cl. 357—48 **7 Claims**

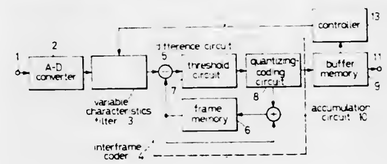


1. A monolithic semiconductor device structure characterized by low saturation resistance comprising:
a first conductivity type substrate;
a second conductivity type epitaxial layer on said substrate;
a buried layer region of second conductivity type and substantially lower resistivity than said epitaxial layer selectively positioned between said epitaxial layer and said substrate;
a narrow region of first conductivity type extending from the surface of said epitaxial layer through said layer to said substrate and isolating a portion of said epitaxial layer from other portions of said substrate and epitaxial layer;
a deep collector contact region of second conductivity type extending from the surface of said epitaxial layer, partially through said layer and contacting said buried layer region;
a pocket region of second conductivity type and substantially lower resistivity than said epitaxial layer formed within the isolated region, said pocket region comprising the collector region of said semiconductor device;
a plurality of first conductivity type regions formed in said pocket region and comprising the base region of said semiconductor device; and
a plurality of second conductivity type regions a first portion thereof formed in said plurality of first conductivity type regions and comprising the emitter region of said device and a second portion thereof formed in said pocket region and interdigitated with said plurality of first conductivity type regions, said second portion comprising portions of said collector region, said plurality of first conductivity type regions and said plurality of second conductivity type regions forming interdigitated base, emitter and collector regions.

4,047,221
INTERFRAME CODING APPARATUS

Hiroshi Yasuda, Tokorozawa, and Fumio Kanaya, Tokyo, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Sept. 30, 1976, Ser. No. 728,082
Claims priority, application Japan, Oct. 6, 1975, 50-120458
Int. Cl.² H04N *7/12*
U.S. Cl. 358—136 **8 Claims**



1. Interframe coding apparatus comprising:
a variable characteristics filter supplied with an input signal and capable of changing its filtering characteristic with a control signal;
a coder connected to the output side of the variable characteristics filter to encode the filtered output into an interframe code;
a buffer memory connected to the output side of the coder, the output code of the coder being written in the buffer memory and read out therefrom at a constant bit rate; and
a controller connected between the buffer memory and the variable characteristics filter to detect the occupancy of the buffer memory and generate the control signal.

4,047,222
CAMERA VIEWFINDING SYSTEM

Jacob Moskovich, Hollywood; Gary E. Wiese, Canoga Park; Richard M. Altman, Woodland Hills, and Thomas D. McLaughlin, Thousand Oaks, all of Calif., assignors to Optigon Research & Development Corporation, Santa Monica, Calif.

Filed Jan. 13, 1976, Ser. No. 648,780
Int. Cl.² G03B *13/06, 19/12*
U.S. Cl. 354—155 **12 Claims**

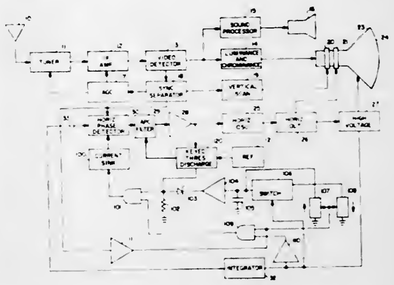


1. A viewfinder system for a single lens reflex camera having a defined image frame comprising a substantially rectangular focusing screen of dimensions essentially equal to the image frame of the camera, a field lens, a pentaprism having substantially rectangular entrance and exit surfaces of essentially the same width, and reflecting surfaces therebetween, and an eyepiece disposed behind said exit surface, all on an optical axis which is changed from normally vertical to normally horizontal in said prism, a lens of negative power disposed between said field lens and said entrance surface, said entrance surface having an area substantially less than the area of said screen, said exit surface having a height of at least 0.70 of the height of said entrance surface.

4,047,223
FREQUENCY SCANNING AUTOMATIC PHASE CONTROL SYSTEM

Judson A. Hofmann, Schaumburg, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 16, 1976, Ser. No. 649,954
Int. Cl.² H04N *5/05*; H01S *1/00*; H03F *3/68*
U.S. Cl. 358—158 **14 Claims**
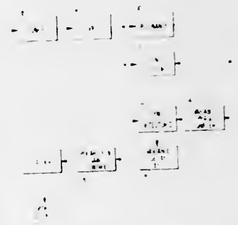


8. In an automatic phase control system including an oscillator producing a pulse signal, a phase detector and filter synchronizing the output of said oscillator with a source of synchronizing pulse information, the improvement comprising:
coincidence means detecting coincidence between said oscillator pulse and said synchronizing pulse information;
lock detecting means determining the existence of an out-of-sync condition by comparing the relative durations of intervals of coincidence and non-coincidence; and
configuring means responsive to said coincidence means and said lock detecting means causing cyclic variation of said oscillator frequency only if an out-of-sync condition and non-coincidence simultaneously occur.

4,047,224
GHOST REMOVING SYSTEM FOR USE IN TELEVISION RECEIVER

Namio Yamaguti, Ibaragi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 26, 1976, Ser. No. 661,598
Claims priority, application Japan, Feb. 28, 1975, 50-25136
Int. Cl.² H04N *5/14*
U.S. Cl. 358—166 **18 Claims**



1. A method for removing a ghost wave received together with a desired wave in a television receiver, comprising the steps of
synchronously detecting a video intermediate frequency

signal in the television receiver at a first reference phase to provide a first composite video output;

synchronously detecting the video intermediate frequency signal at a second reference phase, which differs from said first reference phase by an angle corresponding to a phase difference between the ghost wave and the desired wave, to provide a second composite video output;

delaying at least one of said video intermediate frequency signal, said first composite video, and said second composite video, an amount to cause said ghost wave in one of said composite video outputs to be in time coincidence with the desired wave in the other of said composite video outputs, and

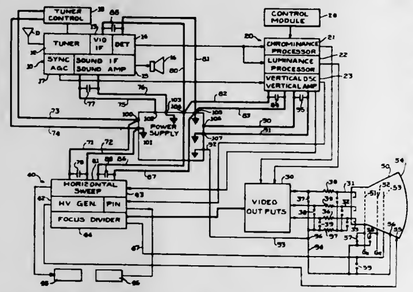
combining said composite video outputs after said delay in a suitable ratio to cause said time coincident ghost wave in one of said composite video outputs and desired wave in the other of said composite video outputs to cancel each other.

4,047,225

MULTI-ARRANGEMENT MODULARIZED TELEVISION RECEIVER

Daniel I. Pittenger, Libertyville, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 2, 1976, Ser. No. 645,978
Int. Cl.² H04N 3/18
U.S. Cl. 358—190 **6 Claims**



1. A television receiver comprising:

display means including a cathode ray tube susceptible to arcing;

a centralized regulated power supply defining a first node maintained at a substantially constant first DC voltage and a second node maintained at a second substantially constant DC voltage;

a plurality of satellite modules, including signal translating circuitry processing signals of varied amplitude and frequency tending to interfere with each other, said circuitry susceptible to being damaged by said arcing;

support means supporting said modules; and

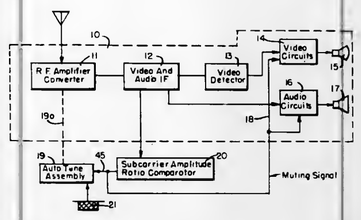
flexible connecting means, including a plurality of conductor pairs each having a first and second conductor connected to said first and second nodes, respectively, said conductor pairs providing individual operating voltage and isolated ground return connections for each of said modules exclusive of said support means thereby avoiding interference of said signals, minimizing damage to said circuitry, permitting multiple arrangements of said modules.

4,047,226

TELEVISION SIGNAL-SEEKING AUTOMATIC TUNING SYSTEM

Rhey Warren Hedges, Miami, Fla., assignor to Louis W. Parker, Fort Lauderdale, Fla.

Continuation-in-part of Ser. No. 627,318, Oct. 30, 1975, abandoned. This application Aug. 23, 1976, Ser. No. 716,862
Int. Cl.² H04N 5/44, 3/24
U.S. Cl. 358—193 **15 Claims**



1. In an intercarrier television receiver of the type comprising tunable signal translating means responsive to correct reception of a television transmission for producing picture subcarrier and sound subcarrier signals having frequencies spaced from one another by an intercarrier frequency, a signal seeker coupled to said tunable signal translating means for continuously varying the tuning of said receiver over a predetermined television frequency spectrum, and a control circuit for interrupting the tuning operation of said signal seeker at points of correct tuning in said spectrum, the improvement wherein said control circuit comprises first tuned circuit means coupled to said signal translating means and tuned to the frequency of said picture subcarrier for producing a first signal having an amplitude related to the amplitude of said picture subcarrier, second tuned circuit means coupled to said signal translating means and tuned to the frequency of said sound subcarrier for producing a second signal having an amplitude related to the amplitude of said sound subcarrier, and comparator means for monitoring the comparative amplitudes and the amplitude ratio of said first and second signals, said comparator means including signal generating means for producing a control signal operative to interrupt the tuning operation of said signal seeker only when the amplitude of said first signal is higher than the amplitude of said second signal and said first and second signal amplitudes are in a predetermined ratio to one another.

4,047,227

AUXILIARY SIGNAL PROCESSING CIRCUIT

Theodore S. Rzeszewski, Lombard, Ill., assignor to Matsushita Electric Corporation of America, Franklin Park, Ill.

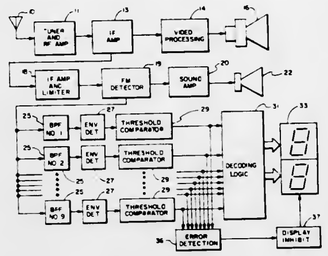
Filed Sept. 2, 1975, Ser. No. 609,307
Int. Cl.² H04N 5/44
U.S. Cl. 358—194 **16 Claims**

9. A wave signal receiver including means for receiving auxiliary signals always comprising various combinations of exactly N signals out of a total of M possible signals, where N and M each are positive integers greater than one and N is less than M, said receiver including in combination:

M first means for identifying each of said M auxiliary signals and producing output signals in response to such identification unique to each of said M auxiliary signals;

second means for simultaneously supplying the N signals of each auxiliary combination to said M first means;

third means coupled with said M first means and responsive to different combinations of N auxiliary signals identified



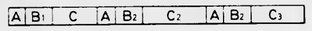
by said first means for producing a unique output signal for each different combination of N signals.

4,047,228

RECEIVING SYSTEM FOR FACSIMILE AND THE LIKE

Tohmi Yagishita, and Hiroshi Hagiya, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1975, Ser. No. 604,119
Claims priority, application Japan, Aug. 20, 1974, 49-95159
Int. Cl.² H04N 1/40, 7/12
U.S. Cl. 358—261 **3 Claims**



1. A receiver in a facsimile system which transmits signals corresponding to a plurality of scanning lines via a continuous serial repetition of signal arrays, each signal array corresponding to a given scanning line and including a synchronizing signal, group weight indicator signals, and picture signals corresponding to that line, said receiver including means for receiving and processing each given signal array comprising: means for receiving said synchronizing signal of said given signal array; means for receiving said group weight indicator signals of said given signal array which follow said synchronizing signal of said given signal array, and for storing said group weight indicator signals of said given signal array in a temporary memory; means for reading said stored group weight indicator signals from said temporary memory and for deciphering the signals thus read, prior to recording the picture signals of said given signal array on a recording paper; means for performing predetermined addition on a selective address register, based on the result of said deciphering; means for receiving the picture signals of said given signal array and for immediately distribution and applying said received picture signals upon receipt to selected recording elements in accordance with addressing by said selective address register; means for recording said applied picture signals on a recording paper, and; means for performing auxiliary scanning during a period for receiving said synchronizing signal and said group weight indicator signals of said given signal array.

4,047,229

VELOCITY CONTROLLED MANUAL MOVEMENT CREDIT CARD READER

Lawrence P. Kobylarz, Howell, and Ronald H. Mack, Plymouth, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

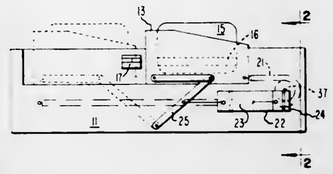
Filed Nov. 18, 1975, Ser. No. 633,129
Int. Cl.² G11B 19/24
U.S. Cl. 360—2 **5 Claims**

1. A manually-operable credit card reader for reading information from an information bearing credit card comprising:

a base member;

carriage means adapted to carry an information bearing credit card, and slidably mounted on said base member for manual movement along a linear path;

an information read head mounted on said base member in alignment with the path of movement of the credit card and operable during said manual movement of said carriage means, for effectuating proper sensing of the information borne by the card; and



restraining means cooperating with said carriage means during said manual movement thereof for limiting the velocity of said carriage means to a prescribed range of velocities as said carriage means is moved past said informational read head, said restraining means comprising:

a. first means for applying a substantially constant force opposed to the direction of movement of said carriage means; and

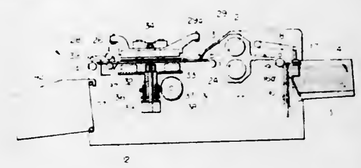
b. second means operating in parallel with said first means for applying a force responsive to the magnitude of velocity of said carriage means.

4,047,230

METHOD AND APPARATUS FOR TRANSFERRING MAGNETIC SIGNAL FROM A MASTER SHEET TO COPY SHEETS

Tsutomu Kume; Kazuo Kasai; Hidefumi Kaneko; Shigeo Sugiyama, and Shigeo Mitsuhashi, all of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1976, Ser. No. 745,137
Claims priority, application Japan, Dec. 22, 1975, 50-151934
Int. Cl.² G11B 5/86
U.S. Cl. 360—17 **11 Claims**



1. A method of transferring magnetic signals from a master sheet to a copy sheet, comprising the steps of:

a. pressing the master and copy sheets together;

b. applying a magnetic field to the master and copy sheets to transfer the magnetic signals from the master sheet to the copy sheet;

c. separating the copy sheet from the master sheet in a direction substantially perpendicular to surfaces of the master and copy sheets; and

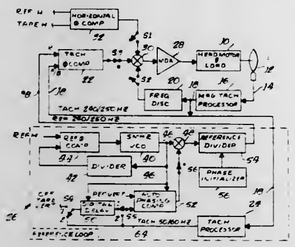
d. moving the copy sheet away from the master sheet in a direction parallel to the surfaces of the master and copy sheets.

4,047,231

HIGH STABILITY DIGITAL HEAD SERVO FOR VIDEO RECORDERS

Gary B. Garagnon, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 19, 1976, Ser. No. 668,418
Int. Cl.² H04N 1/28; G11B 21/04
U.S. Cl. 360—36 10 Claims



1. A servo system for regulating an operating time variable of a driven load comprising:

means responsive to the driven load for providing a feedback signal at a rate that is proportional to the operating time variable of the load;

means responsive to a first standard rate signal for providing a reference signal of a rate which is equal in rate to that of said feedback signal, said first standard rate signal being related to the desired rate of rotation of the load;

first means for comparing said reference signal and said feedback signal and providing a first error signal indicative of the time difference between the rates of the compared signals;

means electrically coupling said first error signal provided by said comparing means to the load for driving the load such that said reference signal and said feedback signal are in locked synchronism; and

control means responsive to said feedback signal and a second standard rate signal for incrementally adjusting the rate of said reference signal in accordance with time variations in said feedback signal, and said second standard rate signal having a rate substantially lower than said first standard rate signal and having a timing related to the desired position of the angular position of the load.

4,047,232

LEADER TAPE

Yoshiaki Hisagen, Sendai, and Kazuo Hoshi, Iwanuma, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 244,421, April 17, 1972, abandoned.
This application Oct. 6, 1975, Ser. No. 619,923
Claims priority, application Japan, Apr. 20, 1971, 46-25468
Int. Cl.² G11B 5/78
U.S. Cl. 360—134 5 Claims

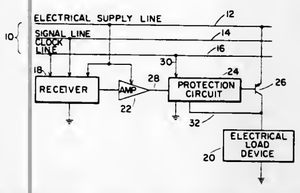
1. In a combination of a magnetic recording tape for operation from reel to reel under tension and at high lineal velocity in cooperation with a magnetic recording and/or playback head and a flexible leader tape having a nonmagnetic light-transmissive base, the improvement comprising an abrasion resistant coating layer formed on the nonmagnetic base, the coating layer consisting of a binder of 100 parts by weight and a pigment of 50 to 400 parts by weight, in which the pigment and the coating formed therewith has a light color, the surface resistivity of the coating layer being less than 10^{12} ohms/sq. and the transmissivity of the coated leader tape being 20% or greater, said pigment including one or two of materials selected from zinc oxide, titanium oxide, calcium carbonate, zinc sulfide, silicon monoxide, antimony oxide, white lead, aluminum oxide, barium sulfate, lead sulfate, talc, clay, lithopone, and white carbon black.

4,047,233

SHORT CIRCUIT PROTECTION CIRCUIT

Robert G. Yorks, W. Bloomfield, and David W. Junker, Novi, both of Mich., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Apr. 14, 1976, Ser. No. 676,824
Int. Cl.² H02H 3/20
U.S. Cl. 361—88 5 Claims



1. In a switching circuit for controlling the application of power to a load including a semiconductor switch in series with said load connected across a source of power, means for providing a clock signal switching between first and second states, means for providing a command signal switching from a first state to a second state when it is desired to energize said load, a protection circuit for protecting said semiconductor switch in the event said load is short circuited, comprising:

sensing circuit means for sensing the voltage across said load and for providing an output signal indicative of whether or not said load is shorted; and

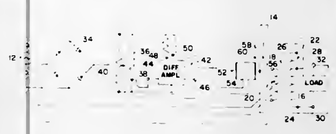
circuit means responsive to the output signal of said sensing circuit, said command signal and said clock signal for actuating said semiconductor switch when said command signal switches from said first state to said second state or shortly thereafter, said circuit means thereafter maintaining said semiconductor switch in said actuated state as long as said command signal remains in said second state and the output of said sensing circuit means indicates said load is not shorted, said circuit means momentarily energizing said semiconductor switch when said command signal is in said second state and the output of said sensing circuit means indicates said load is short circuited.

4,047,234

LOW VOLTAGE PROTECTION CIRCUIT

Harry S. Oyler, 1004 St. Clair St., Manitowoc, Wis. 54220

Filed Mar. 26, 1976, Ser. No. 670,635
Int. Cl.² H02H 3/24
U.S. Cl. 361—92 1 Claim



1. In a load-protection circuit operative with an alternating-current voltage-source including circuit means for sensing an undervoltage condition to control the voltage supplied to the load upon occurrence of said undervoltage condition, the improvement comprising:

a transformer having input and output windings, said output winding having two output taps and at least one additional tap, said input winding being connected to said voltage source, the load being connected across one of said output taps and said additional tap, the other of said taps and said additional tap being connected to said circuit means for causing the latter to switch the load from said additional tap to said other of said taps upon occurrence of said undervoltage condition, wherein the load has two terminals and said circuit means further includes:

a rectifier connected across said alternating current voltage source for providing a direct-current potential;

a resistor in series with a zener diode connected across said direct-current potential;

a potentiometer shunted across said direct current potential for providing a variable direct-current voltage output;

a difference amplifier having two inputs and output terminals, respectively, said input terminals being connected across the junction of said resistor and said zener diode, and said variable direct-current voltage output, respectively; and

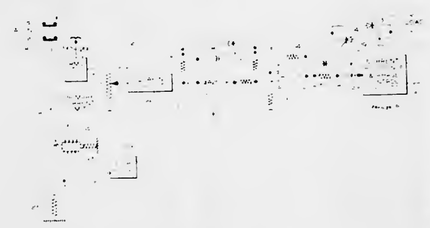
a relay having a winding and two single pole, double throw contacts, said winding being connected across said output terminals, said single pole contact being connected to one of said terminals of said load, one of said double throw contacts being connected to said additional tap, the other of said double throw contacts being connected to said other of said taps, whereby the voltage across the load is substantially restored to a normal condition.

4,047,235

CURRENT LIMIT AND OVERCURRENT CUT OFF SYSTEM

Richard Kent Davis, Salem, Va., assignor to General Electric Company, New York, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,151
Int. Cl.² H02H 7/14
U.S. Cl. 361—100 5 Claims



1. In an electric power system, electric current is applied to an electric load through serially coupled circuit breaker contact means, adapted to be opened by a triggering circuit, and semiconductor switching means, regulated by a firing circuit, a control circuit for inhibiting the electric current in said power system from exceeding predetermined limit values, comprising:

a. first means responsive to the actual value of said electric current in said electric current circuit for deriving therefrom a DC signal having a magnitude dependent upon a predetermined non-linear function of said electric current;

b. integrating means comprising an input and an output;

c. clamping means for clamping the output of said integrating means at a first predetermined potential while said electric current has an actual value below said predetermined limit value;

d. said integrating means being responsive to said DC signal to commence integration in a first direction to modify the potential at said output when the actual value of said electric current attains said predetermined limit value and upon said actual value exceeding said predetermined value to attain at its output a second predetermined potential responsive to the time integral of a function of the value of electric current in excess of said predetermined limit value;

e. first circuit means coupled from the output of said integrating means being responsive to commencement of integration in said first direction by said integrating means to provide a current limit signal to said firing circuit to limit current in said electric power system within said predetermined limit value; and

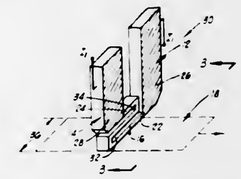
f. second circuit means coupled from the output of said integrating means being responsive to the output of said integrating means attaining said second predetermined potential to provide a trigger signal to said triggering circuit to open said contact means.

4,047,236

SUPERSENSITIVE MAGNETORESISTIVE SENSOR FOR HIGH DENSITY MAGNETIC READ HEAD

Fred S. Lee, Oklahoma City, Okla., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 9, 1975, Ser. No. 576,162
Int. Cl.² G11B 5/22
U.S. Cl. 360—113 1 Claim



1. A read head for reading high density data recorded as discrete magnetized areas along a track of a magnetic medium, said head comprising:

A. a magnetoresistive sensor strip including at least one open loop, said sensor strip being configured such that the arms of said loop lie completely within the effective field of each discrete magnetized area passing said sensor strip during relative motion between the latter and said magnetic medium, and electrical connecting means coupled to the ends of said sensor strip;

B. wherein the arm of said loops are mutually superposed in parallel alignment with said medium, the dimensions of said arms being defined by a pair of planes substantially normal to said medium and spaced in the direction of relative medium motion;

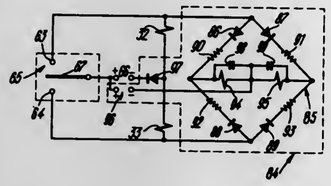
C. wherein said electrical connecting means include first and second separate parallel core portions each attached to one of said strip ends, the dimensions of said core portions in the direction of medium motion being defined by said plane; and

D. wherein said strip is formed as a flattened S-shaped double loop comprising three parallel arms stacked between said planes, the lowest and middle arms each substantially spanning the width of said track in a direction transverse thereto, the highest arm terminating in one of said strip ends connected to said first core portion and substantially dividing said track width with the latter, said first core portion being positioned entirely above said middle arm, said lowest arm terminating in the other end of said strip connected to said second core portion, said second core portion being positioned adjacent said double loop outside said track width.

4,047,237
MEANS FOR CONTROLLING ELECTROMAGNETIC DEVICE HAVING HERMETICALLY SEALED CONTACTS

Vladimir Alexeevich Smirnov, ulitsa Lavochkina, 52, kv. 208, and Vadim Nikolaevich Shoffa, ulitsa Tashkentskaya 15/22, kv. 288, both of Moscow, U.S.S.R.

Division of Ser. No. 505,981, Sept. 13, 1974, Pat. No. 3,952,271.
This application Sept. 29, 1975, Ser. No. 617,574
Int. Cl.² H01H 47/36
U.S. Cl. 361—210 9 Claims

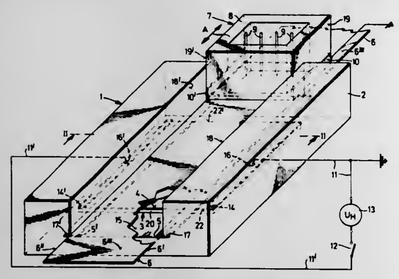


1. An electromagnetic device comprising: a capsule; at least two peripheral elastically mounted magnetically controlled cores; said peripheral magnetically controlled cores being enclosed in said capsule and permanently anchored in its ends; an elastic supporting member arranged in said capsule intermediate of the inner ends of said peripheral magnetically controlled cores; a central elastically mounted magnetically controlled core overlapping said peripheral magnetically controlled cores and rigidly secured in said supporting member; at least one magnetizing coil arranged externally of said capsule; and a power supply connected to said magnetizing coil.

4,047,238
APPARATUS AND PROCESS FOR ELECTROSTATICALLY CHARGING A RECORDING MATERIAL

Roland Moraw, Neured, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 14, 1976, Ser. No. 695,922
Claims priority, application Germany, June 13, 1975, 2526418
Int. Cl.² H01T 19/00
U.S. Cl. 361—229 22 Claims

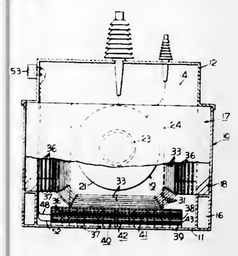


1. An electrostatic charging apparatus, comprising
a. means for producing a corona discharge;
b. a counter-electrode positioned below the discharge means adapted for supporting a recording material to be charged;
c. means for supporting said counter-electrode, including a pair of opposed vertical side walls defining a guide channel of substantially rectangular cross-section along which the recording material can pass; and
d. a pair of elongated strip-like members of electrically insulative material extending within the channel at least from the side walls laterally along the opposed marginal regions of the counter-electrode and longitudinally along the whole length of the counter-electrode.

4,047,239
STATIONARY INDUCTION APPARATUS HAVING MEANS TO MONITOR INSULATION DRYNESS

Michael W. Waterman, Milwaukee, and Samuel L. Foster, Eagle, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Division of Ser. No. 521,743, Nov. 7, 1974, Pat. No. 3,961,246.
This application Mar. 12, 1976, Ser. No. 666,475
Int. Cl.² G01R 27/26, 31/12
U.S. Cl. 361—270 6 Claims

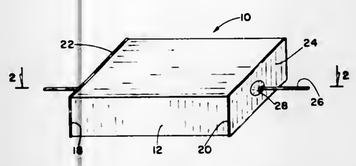


1. A shunt reactor comprising, in combination:
a tank;
insulating oil within said tank;
a shunt reactor coil and yoke assembly including insulation means at the sides and bottom thereof, said coil and yoke assembly being immersed in said oil within said tank;
a pair of electrodes at the bottom of said coil and yoke assembly, said pair of electrodes being spaced apart by at least one layer of insulation which is representative of the insulation utilized with said shunt reactor coil and yoke assembly; and,
a conductor lead connected to each electrode and having their terminal ends exteriorly of said tank.

4,047,240
MULTIPLE ELECTRODE CAPACITOR ASSEMBLY

Victor Insetta, 540 Asharoken Ave., Northport, N.Y. 11768

Filed June 1, 1976, Ser. No. 691,857
Int. Cl.² H01G 4/12
U.S. Cl. 361—275 6 Claims

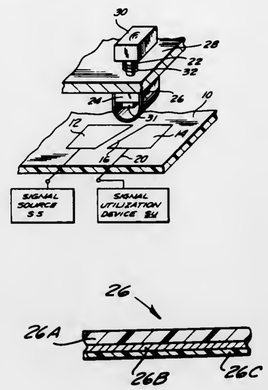


1. A multiple electrode capacitor assembly for use at very high frequencies comprising:
a monolothic ceramic block;
a pair of conductive electrode plates embedded in said block and disposed in coplanar array, adjacent respective inner ends of said electrodes being spaced apart inside said block; there being no floating electrode electrically coupled to said conductive electrodes; and
conductive terminals in direct electrical contact with respective outer ends of said conductive electrodes, whereby said assembly has low capacitance and high Q, where Q is a figure of merit of said capacitor assembly.

4,047,241
CAPACITIVE SWITCH

Edward H. Lau, Old Westbury, and Francis C. Marino, Dix Hills, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 12, 1976, Ser. No. 676,122
Int. Cl.² H01G 5/01
U.S. Cl. 361—288 5 Claims



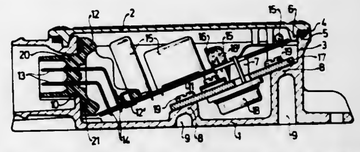
1. A capacitive switch comprising: an electrical circuit, said circuit having a substrate of insulative material, first and second pads of conductive material on a surface said substrate, each of said pads having a terminal adapted to transfer electrical signals, said pads being separated by a region of the surface of said substrate and having coupling surfaces remote from said substrate; and a capacitive coupling member, said member having a switch stem positioned opposite said pads and said region, said stem including a transverse portion extending so as to span said pads but displaced therefrom, a ribbon of resilient conductive material having ends fixed to respective ends of said transverse portion and having such a length that the ribbon is bowed toward said pads, said ribbon comprising a substrate of resilient plastic material, a layer of metallic material deposited on one surface of said substrate of resilient plastic material, and a coating of insulative material on said layer of metallic material, a buffer layer of elastic material on the face of said transverse portion opposite the bowed portion of said ribbon, and means for guiding said switch for reciprocating movement in the direction of said substrate so that as said switch stem

4,047,242
COMPACT ELECTRONIC CONTROL AND POWER UNIT STRUCTURE

Gert Jakob, Stuttgart, and Siegfried Goetzke, Heemingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Apr. 30, 1976, Ser. No. 682,061
Claims priority, application Germany, July 5, 1975, 2530157
Int. Cl.² H05K 7/20
U.S. Cl. 361—389 11 Claims

1. Compact electronic control and power unit structure having
a housing (1) of essentially rectangular cross section, a printed circuit board (11) located in the housing and carrying control elements and electrical conductors having relatively low heat generation, and a power stage (18), having relatively high heat generation, located in the housing;
wherein, in accordance with the invention, said printed circuit board is located essentially diagonally across said substantially rectangular cross section in the housing and

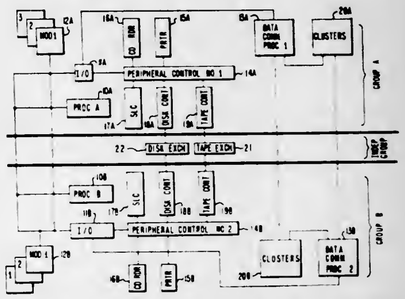


sub-dividing the interior of the space in the housing into two chambers, one chamber having said control elements and electrical conductors having relatively low heat generation located therein and the other chamber having said power stage (18) located therein.

4,047,243
SEGMENT REPLACEMENT MECHANISM FOR VARYING PROGRAM WINDOW SIZES IN A DATA PROCESSING SYSTEM HAVING VIRTUAL MEMORY

Edsger W. Dijkstra, Nuenen (NB), Netherlands, assignor to Burroughs Corporation, Detroit, Mich.

Filed May 27, 1975, Ser. No. 581,161
Int. Cl.² G06F 7/00, 13/00; G11C 9/06
U.S. Cl. 364—200 1 Claim



1. A segment replacement mechanism in a data processing system having virtual memory, said system including at least one processor unit, main memory unit, secondary memory and means to transfer information segments from said secondary memory to said main memory unit when such information segments do not reside in said main memory unit at the time of their request, said processor unit including said segment replacement mechanism, an arithmetic unit and a real time counter, said mechanism comprising:
a first plurality of registers coupled together in an order to receive designations of information segments as said segments are transferred from said secondary memory to said main memory unit and to store said designations in the order in which they are most recently received;
circuit means coupled to said first plurality of registers to retrieve a segment designation from one of said first plurality of registers and reenter it at the beginning of said order of said first plurality of registers when the corresponding information segment is requested and resides in said main memory unit, each segment designation before said retrieved segment designation in said order being transferred to the next register in said order of first plurality of registers;
said real time counter providing timing signals representing

the time duration during which said processor unit is processing a process;

a second plurality of registers each coupled to said circuit means and associated with a corresponding one of said first plurality of registers, each of said second plurality of registers being coupled to said real time counter to receive timing signals therefrom each time a segment designation is transferred out of its corresponding one of said first plurality of registers, each of said second plurality of registers being coupled to said arithmetic unit to transmit the stored timing signals thereto; and

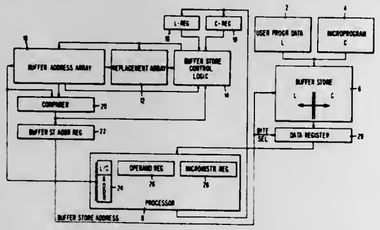
a third plurality of registers each coupled to said circuit means and associated with corresponding ones of said first and second plurality of registers to receive signals from said arithmetic unit and store such signals which represent the average time duration between transfers of segment designations out of the corresponding register of said first plurality of registers as a function of the timing signals supplied to said arithmetic unit by the corresponding one of said second plurality of registers such that the numerical value of the signals stored in said third plurality of registers will approximately increase in an ascending order corresponding to the order of said first plurality of registers.

4,047,244

MICROPROGRAMMED DATA PROCESSING SYSTEM

Karl-Friedrich Finkenzeyer, Gaertringen; Kuno M. Roehr, and Guenther Sonntag, both of Boeblingen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 19, 1976, Ser. No. 687,831
Claims priority, application Germany, Oct. 23, 1975, 2547488
Int. Cl.² G06F *9/10, 13/00*
U.S. Cl. 364—200 **9 Claims**



1. A microprogrammed data processing system including a processor said system having a first main storage device for storing user data and micro instructions defined as L data and a second main storage device for storing micro instructions defined as C data the improvement comprising:

a. a buffer storage device having data storage space less than either said L information main store and C information main store and commonly connected between each of said main stores and the processor;

b. a buffer address array for storing block addresses of the data available in the buffer store each block address including an L or C indicator dependent on whether the related stored data is L or C data;

c. an address register for receiving address signal representations from said processor of the data item required by said processor, each address signal including a representation of the block of data desired, an associated L/C representation indicating whether the block is L or C data, and area address portions;

d. means responsive to said address register representation for interogating said buffer address array to determine if the block address of data specified in the address register is in the buffer store and for generating a HIT signal if the block address is present or a MISS signal if the matching block address is not present in the buffer array, and also generating a coded block signal representation;

e. buffer store address means responsive to a HIT signal, said area address portions in said address register and said coded block signal representable for reading the corresponding L or C buffer storage data item out to a buffer data register for utilization by said data processor;

f. a replacement array storing indications of the sequence in which data in said buffer array are to be replaced;

g. and control logic responsive to said MISS signal indicating the desired data item is not in said buffer store for transferring the desired data item resident in said L or C main storage to an available storage slot in said buffer store as determined by said replacement array for utilization by said buffer and further inserting block address data of said transferred data item into said buffer address array to indicate that said data is now resident in the buffer store and available for future access.

4,047,245

INDIRECT MEMORY ADDRESSING

Gary L. Knipper, Bolingbrook, Ill., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed July 12, 1976, Ser. No. 704,594
Int. Cl.² G06F *13/00*
U.S. Cl. 364—200 **3 Claims**

1. In a system for indirectly addressing dedicated locations in a memory 34, wherein each of said dedicated locations contain a data address signal to another location in said memory, and said system includes a central processing unit (CPU) 12 for interrogating or writing into said memory and for generating indirect address signals comprising most significant bits addressed to said dedicated location and least significant bits not addressed to said dedicated location:

a register means 36 connected to receive and store address signals from said dedicated locations in said memory;

a switchable multiplexer means 30 for switching a normal connection from said CPU to said memory to a connection from said register means to said memory;

a decoder means 50 responsive to the indirect address signal for interrupting operation of said CPU;

a sequencer means 68 actuated by said decoder means ascertaining an indirect address signal for generating a series of successive timing pulses;

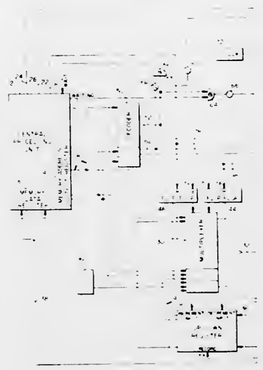
a source of signals 42 rendered effective by a first of said timing pulses T-1 to changing the least significant bits in the indirect address signals applied to said multiplexer means to bits addressed to the dedicated location;

means responsive to the signal now applied by the multiplexer means to the dedicated location in the memory and a second timing pulse T-2 for reading and applying the data address signal in said dedicated location to said register means;

means responsive to a third timing pulse T-3 for triggering the register means to store the data address signal;

means responsive to a subsequent timing pulse T-6 for switching the multiplexer to apply the data address stored in the register means to the memory; and

means responsive to the next subsequent timing pulse T-7 for





reinitiating operation of the CPU to interrogate or write into the memory location at the data address.

4,047,246

I/O BUS TRANSCEIVER FOR A DATA PROCESSING SYSTEM

Natalio Kerlenevich, Lexington, and Daniel Michael Clemson, Weston, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Jan. 10, 1977, Ser. No. 758,110
Int. Cl.² G06F *3/04*; H04L *5/14*
U.S. Cl. 364—200 **1 Claim**

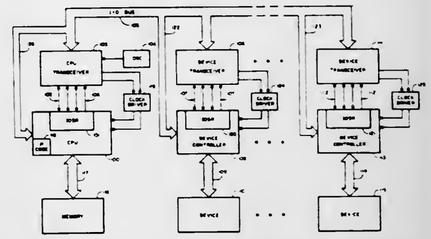
1. In a data processing system including a CPU and at least one peripheral device controller, transceiver means including a CPU transceiver and at least one peripheral device controller transceiver for transmitting and receiving signals between said CPU and said peripheral device controller, said transceiver means comprising:

means for developing local clock pulses of predetermined frequency in said CPU transceiver and said peripheral device controller transceiver, the local clock pulses of said peripheral device controller transceiver being phase shifted from the local clock pulses of said CPU transceiver as a function of conductive distance therebetween;

first deriving means responsive to said developing means for deriving CPU clock pulses of less than said predetermined frequency from said local clock puleses of said CPU transceiver and for conducting said CPU clock pulses to said CPU;

second deriving means responsive to said developing means for deriving peripheral device controller clock pulses of said less than said predetermined frequency from said local clock pulses of said peripheral device controller transceiver and for conducting said peripheral device controller clock pulses to said peripheral device controller;

first means for receiving said signals from said CPU synchronized by a burst of said CPU clock pulses and for transmitting said signals synchronously with a burst of said local clock pulses of said CPU transceiver to said peripheral device controller transceiver;



second means, operative mutually exclusively with the operation of said first means, for receiving said signals from said peripheral device controller sychronized by a burst of said peripheral device controller clock pulses and for transmitting said signals synchronously with a burst of said local clock pulses of said peripheral device controller transceiver to said CPU transceiver; and

differential bus means for transmitting said signals differentially over said conductive distance and for receiving and combining said signals in a manner to provide self-cancellation of any extraneous noise signals superimposed on said differentially transmitted signals over said conductive distance.

4,047,247

ADDRESS FORMATION IN A MICROPROGRAMMED DATA PROCESSING SYSTEM

Philip E. Stanley, Westboro; William E. Woods, Natick, and Kenneth J. Izbicki, Hudson, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Apr. 7, 1976, Ser. No. 674,517
Int. Cl.² G06F *9/20*
U.S. Cl. 364—200 **3 Claims**

1. A data processing system comprising:

A. an instruction register for storing an instruction word for indicating both a code of an operation to be performed in said system and an address indicator for pointing to a control word which is to provide control signals for effecting said operation indicated by said code;

B. a control storage device having a plurality of said control words stored therein, each of said control words including a plurality of fields, said fields providing said control signals for controlling the operation of said system, one of said fields for indicating an address of the next location to be addressed dependent upon a specified test result;

C. a memory device having a plurality of locations, each location for storing a word, some of said words including an operand;

D. a base register for use primarily in storing a base address of a said location in said memory device;

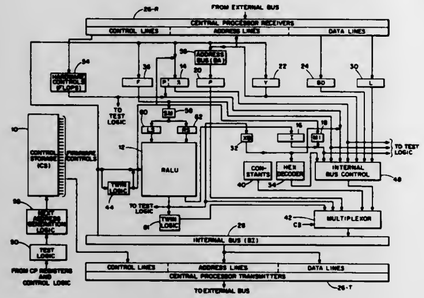
E. an index register for storing an index value for use with said base address in computing a final effective address of

a said location in said memory device, said index value equal to zero if there is no such indexing required;

F. a data register;

G. means, responsive to the contents of said base register and said index register, for reading said operand from said memory device and writing said operand into said data register;

H. means for transferring the contents of said data register



into said instruction register so as to modify the code of operation; and

I. control store device addressing logic, responsive to said address indicator in said instruction word in said instruction register and said field for indicating a next location address from a most recently addressed one of said control words, for generating said next location address of a location in said control storage device.

4,047,248

LINKED LIST DATA ENCODING METHOD AND CONTROL APPARATUS FOR A VISUAL DISPLAY

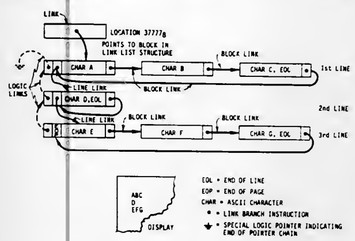
Richard Ricker Lyman, Palo Alto, and Thomas Frank Waltman, Cupertino, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 508,600, Sept. 23, 1974, Pat. No. 3,972,026. This application Mar. 11, 1976, Ser. No. 665,829

The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.

Int. Cl.[2] G06F *3/14*

U.S. Cl. 364—900 **54 Claims**



1. A method for displaying visual information comprising the steps of:

encoding data representing figures to be displayed as data characters;

encoding data representing enhancement features and execution path instructions as control characters;

combining the data and control characters to form linked list data blocks;

interpreting the linked list data blocks to form data representative of displayable lines; and

applying said data representative of displayable lines to a display apparatus.

DESIGNS

SEPTEMBER 6, 1977

245,646

HELMET FACE SHIELD MOUNTING BRACKET

Elvert H. Land, Jr., 16205 E. Pawnee, Wichita, Kans. 67230

Filed Nov. 19, 1975, Ser. No. 633,568

Term of patent 14 years

Int. Cl. D2—*03*

U.S. Cl. D2—232



245,647

SHOE

David W. Gadd, P.O. Box 5403, Concord, Calif. 94524

Filed July 18, 1975, Ser. No. 597,244

Term of patent 3½ years

Int. Cl. D2—*04*

U.S. Cl. D2—275



245,648

BOOT JACK

Harold L. Taylor, 1255 Dodgin Lane, Fallon, Nev. 89406

Filed Mar. 1, 1976, Ser. No. 662,572

Term of patent 14 years

Int. Cl. D7—*99*

U.S. Cl. D2—378.2



245,649

CLIP ON POCKET

Jerry G. Hughes, 210 S. Harry Jr. St., Desloge, Mo. 63601

Filed July 25, 1975, Ser. No. 598,944

Term of patent 14 years

Int. Cl. D10—*07*

U.S. Cl. D2—400



245,650

EARRING HOLDER

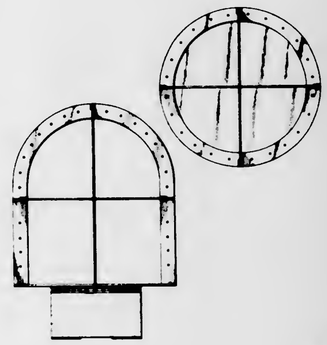
Ray E. Mueller, and Dorothy M. Mueller, both of Greenfield, Wis., assignors to Doray Industries, Greenfield, Wis.

Filed Nov. 18, 1975, Ser. No. 633,080

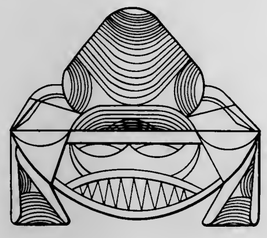
Term of patent 14 years

Int. Cl. D6—*04*

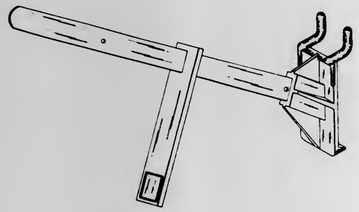
U.S. Cl. D6—23



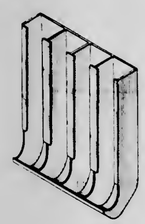
245,651
SEA MONSTER CHAIR
Ramon Rivera Albert, c/o George Spector, 3615 Woolworth Building, 233 Broadway, New York, N.Y. 10007
Filed Nov. 11, 1975, Ser. No. 630,813
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—68



245,652
DISPLAY BRACKET TO BE USED WITH PERFORATED SUPPORTS OR THE LIKE
Donald T. Crysdale, 2800 E. Edgewood Ave., Shorewood, Wis. 53211
Filed Nov. 28, 1975, Ser. No. 636,081
Term of patent 14 years
Int. Cl. D20—*02;* D8—*08*
U.S. Cl. D6—114



245,653
COMBINED STORAGE AND DISPENSING RACK OR THE LIKE
Lowell R. Kent, and Lacy E. Kent, both of 1082 Tradewinds Road, Virginia Beach, Va. 23462
Filed May 8, 1975, Ser. No. 575,806
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130



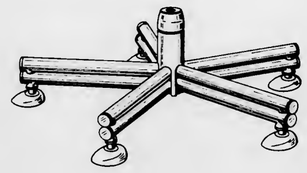
245,654
KITCHEN CABINET
George Henry Robinson, Liverpool, England, assignor to Hygena Limited, Liverpool, England
Filed Oct. 10, 1975, Ser. No. 621,348
Claims priority, application United Kingdom, Apr. 14, 1975, 970695/75
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—167



245,655
PANELING FOR A KITCHEN CABINET OR SIMILAR ARTICLE
Horst Friedrich, Bad Kreuznach, Germany, assignor to Milewski Moebelwerk Zell KG, Zell, Main, Germany
Filed June 9, 1975, Ser. No. 585,279
Claims priority, application Germany, Dec. 10, 1974, 671676
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192



245,656
BASE FOR A CHAIR
Gregory S. Gabourie, Ajax, Canada, assignor to Global Upholstery Company Limited
Filed Mar. 23, 1976, Ser. No. 669,502
Claims priority, application Canada, Sept. 30, 1975, 3009751
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—196



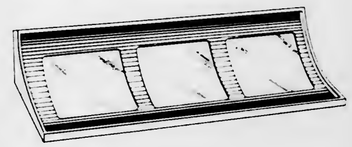
245,657
SLING CHAIR BODY
Gerry D. Welton, 910 E. Tripp, Peoria, Ill. 61603
Continuation-in-part of Ser. No. 162,759, July 14, 1971, Pat. No. D 226,794. This application May 1, 1973, Ser. No. 356,108
The portion of the term of this patent subsequent to May 1, 1987, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197



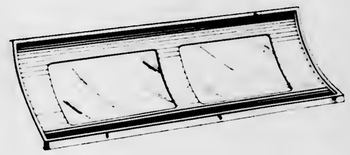
245,658
PICTURE FRAME OR THE LIKE
Gerald M. Grusin, Chicago, Ill., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Nov. 12, 1975, Ser. No. 631,002
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—235



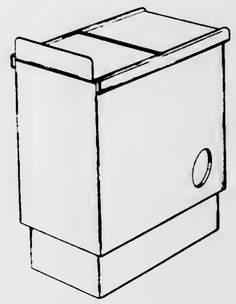
245,659
PICTURE FRAME OR THE LIKE
Gerald M. Grusin, Chicago, Ill., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Nov. 12, 1975, Ser. No. 631,003
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—284



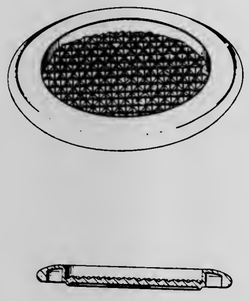
245,660
PICTURE FRAME OR THE LIKE
Gerald M. Grusin, Chicago, Ill., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Nov. 12, 1975, Ser. No. 631,292
The portion of the term of this patent subsequent to Sept. 6, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234



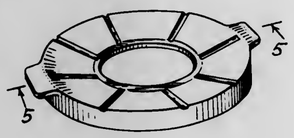
245,661
CHEESE-SLICER
Martin Gustav Dackeryd, Vastergatan 23, Hoor, Sweden S-24300
Filed Sept. 18, 1975, Ser. No. 614,666
Claims priority, application Sweden, Mar. 21, 1975, 619/75
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—43



245,662
COASTER
John L. Hall, 1491 Mar Vista Ave., Pasadena, Calif. 91104
Filed Dec. 8, 1975, Ser. No. 638,335
Term of patent 14 years
Int. Cl. D7—06
U.S. Cl. D7—45



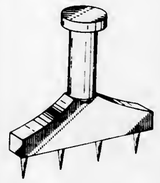
245,663
BURNER HEAT DISTRIBUTOR
Norman Gordon, Skokie, Ill., assignor to Consumer Products Industries, Chicago, Ill.
Filed June 23, 1975, Ser. No. 589,252
Term of patent 14 years
Int. Cl. D7—04
U.S. Cl. D7—136



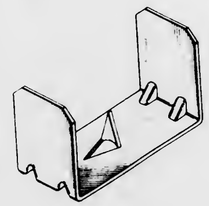
245,664
DIGGING TOOL
Brooks H. Holcombe, 10319 State, Rte. 5 NE., Kinsman, Ohio 44428
Filed July 10, 1975, Ser. No. 594,769
Term of patent 14 years
Int. Cl. D8—01
U.S. Cl. D8—10



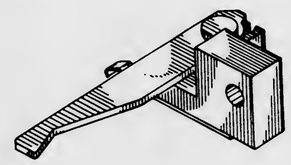
245,665
CARPET TOOL
William J. Klingensmith, 3148 Mogadore Road, Akron, Ohio 44312
Filed June 14, 1976, Ser. No. 695,859
Term of patent 14 years
Int. Cl. D8—05
U.S. Cl. D8—15



245,666
CAN PUNCTURING TOOL OR SIMILAR ARTICLE
James Stewart Calkins, and Alfred Nilsen, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Aug. 15, 1975, Ser. No. 605,115
Term of patent 14 years
Int. Cl. D7—99
U.S. Cl. D8—18



245,667
WIRE CUTTER
Edward C. Malhoit, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed May 24, 1976, Ser. No. 689,320
Term of patent 14 years
Int. Cl. D8—03
U.S. Cl. D8—52



245,668
ADJUSTABLE JIG FOR PORTABLE POWER SAWS, ROUTERS AND THE LIKE
Frank N. Bretthauer, Putnam Valley, N.Y., assignor to Brett-Hauer Co., Inc., Putnam Valley, N.Y.
Filed May 14, 1976, Ser. No. 686,329
Term of patent 14 years
Int. Cl. D8—05
U.S. Cl. D8—71



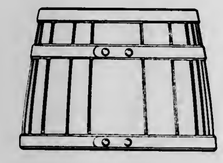
245,669
PULLEY
Robert L. Woods, 1033 Norton St., Mesquite, Tex. 75149
Filed Jan. 19, 1976, Ser. No. 650,128
Term of patent 14 years
Int. Cl. D12—05
U.S. Cl. D8—360



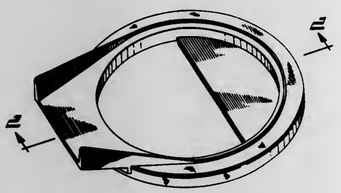
245,670
VITAMIN DISPENSER
William M. Clover, Jr., Costa Mesa, Calif., assignor to Kirstine/Hendricks, Irvine, Calif.
Filed June 23, 1976, Ser. No. 698,991
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216



245,671
BOTTLE CLOSURE
Gordon A. Strand, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Mar. 23, 1976, Ser. No. 669,786
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—269



245,672
PAINT CAN ACCESSORY
John P. Grantham, 9645 Mentor Road, Chardon, Ohio 44024
Filed June 20, 1975, Ser. No. 588,776
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—289



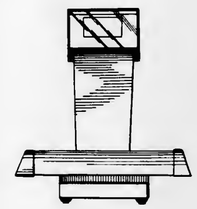
245,673
CLOCK
Shirley Ann Bartlett, 717 Park Drive, Hillsboro, Tex. 76645
Filed Mar. 17, 1975, Ser. No. 558,771
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—7



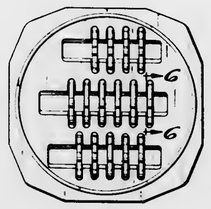
245,674
WRIST WATCH
Eugene Joseph Sulek, Plano, and William James Lawrence, Dallas, both of Tex., assignors to Texas Instruments Inc., Dallas, Tex.
Filed Jan. 26, 1976, Ser. No. 652,699
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



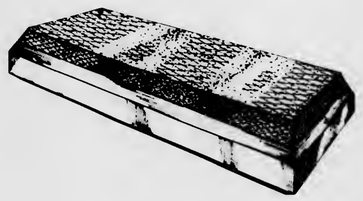
245,675
WEIGHING SCALE
Walter P. Kushmuk, Niles, Ill., assignor to Continental Scale Corporation, Bridgeview, Ill.
Filed Aug. 18, 1975, Ser. No. 605,237
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91



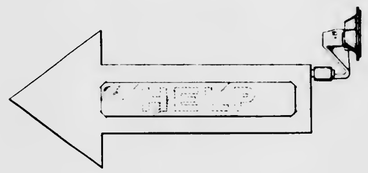
245,676
FLIGHT INFORMATION INDICATOR FOR AIRCRAFT
Stephen F. Jakobowski, P.O. Box 5714, Pompano Beach, Fla. 33064
Filed Mar. 1, 1976, Ser. No. 662,718
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—67



245,677
INTRUSION DETECTOR
Kenneth R. Hackett, Boulder, Colo., assignor to Sontrix Division of Pittway Corporation, Boulder, Colo.
Filed Mar. 25, 1976, Ser. No. 670,276
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



245,678
AUTOMOBILE SAFETY SIGNAL
John V. Medeiros, 89 Norwood St., Swansea, Mass. 02777
Filed June 21, 1976, Ser. No. 698,766
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—109



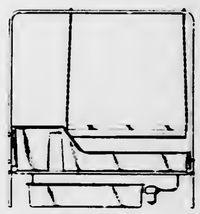
245,679
CROSS
Rodney Keith Parkison, 5816 Australian Pine Drive, Tamarac, Fla. 33319
Filed Jan. 26, 1976, Ser. No. 652,164
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D11—81



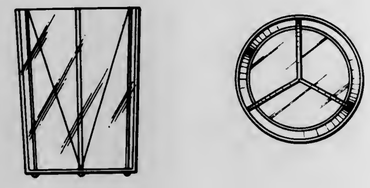
245,680
CHARM
William S. Klitzner, 400 Narragansett Parkway, Warwick, R.I. 02888
Filed Jan. 19, 1976, Ser. No. 650,932
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—83



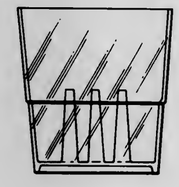
245,681
HYDROPONIC GROWING SYSTEM
Ted L. Farmer, 714 W. McCord St., Neosho, Mo. 64850
Filed Dec. 19, 1975, Ser. No. 642,465
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—144



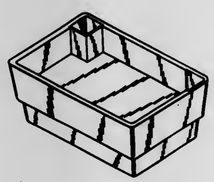
245,682
AVOCADO SEED STARTER CUP
Richard R. Thomas, 773 Heflin St., Milpitas, Calif. 95035
Filed Dec. 15, 1975, Ser. No. 640,463
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152



245,683
AVOCADO SEED STARTER CUP
Richard R. Thomas, 773 Heflin St., Milpitas, Calif. 95035
Filed Dec. 15, 1975, Ser. No. 640,464
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152



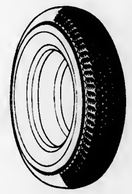
245,684
TRAY FOR HYDROPONIC GARDENING
Helmut D. Juilnot, 3455 Havenwood Avenue, House 30, Mississauga, Canada
Filed Feb. 6, 1976, Ser. No. 655,761
Claims priority, application Canada, Aug. 13, 1975, 130875
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—155



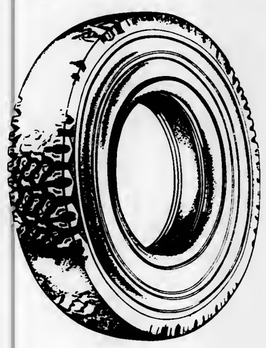
245,685
LIVE POULTRY MOVER
Gary L. Squier, Gaylord, Minn. 55334
Filed Sept. 23, 1974, Ser. No. 508,192
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—58



245,686
VEHICLE TIRE
Toshio Hakayawa, Kodaira; Hiroshi Kojima, Hino, and Masafumi Yoshihara, Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Kyobashi, Japan
Filed Jan. 7, 1976, Ser. No. 647,198
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143

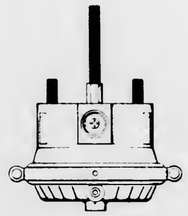


245,687
TIRE FOR A VEHICLE WHEEL
Masahiro Kawabata, Anjyo, and Haruo Kusabe, Toyota, both of Japan, assignors to Dunlop Limited, London, England
Filed May 19, 1975, Ser. No. 578,936
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—136

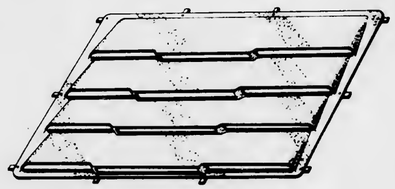


245,688
AIR BRAKE
Edward H. Clapp, 4117 Druid Hills, Dallas, Tex. 75224
Filed Apr. 19, 1976, Ser. No. 678,176
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—179

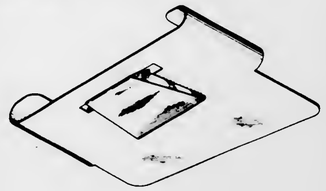




245,689
PASSENGER CAR WINDOW SUN LOUVER
Elwood J. Simpson, Rancho Palos Verdes, Calif., assignor to Cragar Industries
Filed Apr. 28, 1976, Ser. No. 681,339
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181

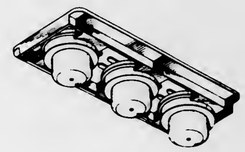


245,690
COMBINED AUXILIARY VISOR AND CLIP
Anton Tony Egersdorf, 3835 McGuire St., Meridian, Idaho 83642
Filed Apr. 12, 1976, Ser. No. 657,779
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—191

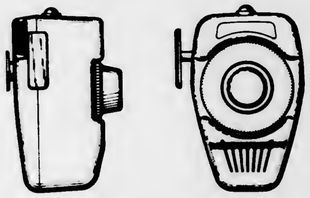


245,691
STORAGE BATTERY GANG VENT CAP
Philip White, Toronto, Canada, assignor to Varta Batteries Ltd., Canada
Filed Apr. 7, 1976, Ser. No. 674,567
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—10

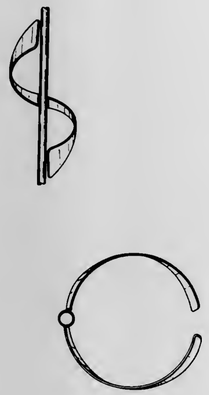




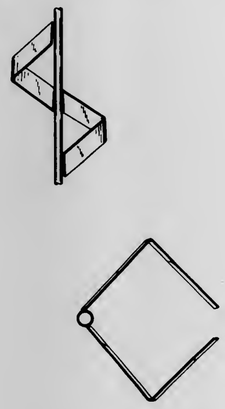
245,692
MICROPHONE
Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan
Filed Aug. 27, 1975, Ser. No. 608,021
Term of patent 14 years
Int. Cl. D14—*03, 01*
U.S. Cl. D14—12



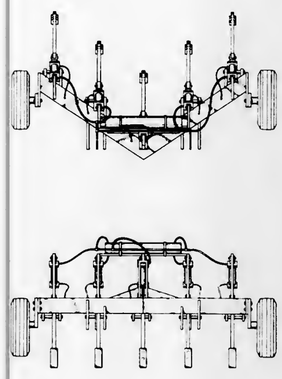
245,693
TRANSMITTING ANTENNA
Richard D. Bogner, 4 Hunters Lane, Roslyn, N.Y. 11576
Filed Feb. 12, 1976, Ser. No. 657,575
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—86



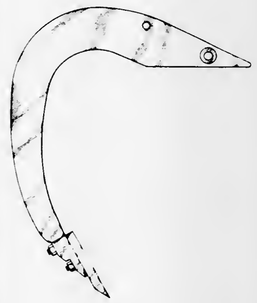
245,694
TRANSMITTING ANTENNA
Richard D. Bogner, 4 Hunters Lane, Roslyn, N.Y. 11576
Filed Feb. 12, 1976, Ser. No. 657,581
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—86



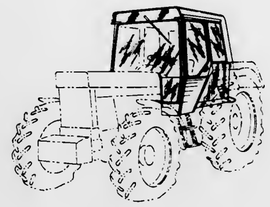
245,695
HYDRAULIC RESET GROUND RIPPER IMPLEMENT
Clifford V. Watts, McMinnville, Oreg., assignor to Watts Plow Company of Oregon, Inc., McMinnville, Oreg.
Filed Aug. 18, 1976, Ser. No. 715,438
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—11



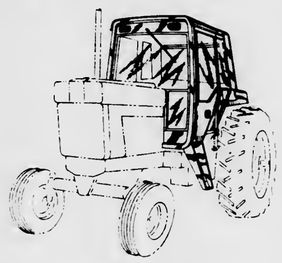
245,696
GROUND RIPPER TOOTH
Clifford V. Watts, McMinnville, Oreg., assignor to Watts Plow Company of Oregon, Inc., McMinnville, Oreg.
Filed Aug. 18, 1976, Ser. No. 715,437
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—29



245,697
TRACTOR CAB
Robert A. Skyer, Palatine, and George E. Bowman, Country Club Hills, both of Ill., assignors to International Harvester Company
Filed May 20, 1976, Ser. No. 688,433
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—30



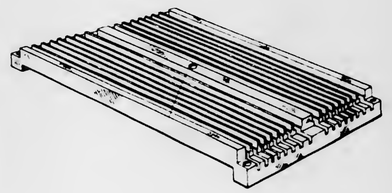
245,698
CAB
Robert A. Skyer, Palatine, and George E. Bowman, Country Club Hills, both of Ill., assignors to International Harvester Company
Continuation-in-part of Ser. No. 610,704, Sept. 5, 1975, abandoned. This application Aug. 23, 1976, Ser. No. 716,739
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—30



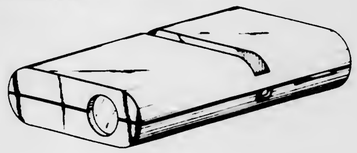
245,699
ICE TRAY COVER
Frank H. Lewis, 222 E. 93rd St., New York, N.Y. 10028
Filed July 13, 1976, Ser. No. 704,847
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—90



245,700
TRAY FOR QUARTZ CRYSTALS
Stephen Ozimec, 33391 Padina Circle, Laguna Niguel, Calif. 92677
Filed July 2, 1976, Ser. No. 702,277
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—140



245,701
KALEIDOSCOPIC PROJECTOR
William C. Kissinger, New York, N.Y., assignor to Qantix Corporation, Flemington, N.J.
Filed Feb. 11, 1976, Ser. No. 657,067
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—20



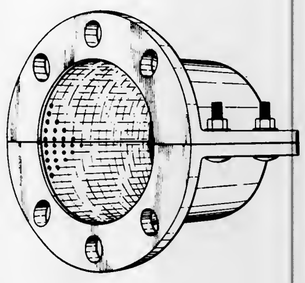
245,702
NOTE PAD HOLDER FOR A TELEPHONE OR THE LIKE
Andrew John Carpenter, Wembly, England, assignor to Darpex Manufacturing Company Limited, London, England
Filed Sept. 5, 1975, Ser. No. 610,528
Claims priority, application United Kingdom, Mar. 11, 1975, 976252
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—86



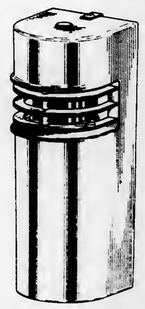
245,703
COMBINED MIXING AND FILTER BOWL
William Felix Hughes, Perth, Australia, assignor to Hughes Steel Products Pty. Ltd., Australia
Filed Sept. 30, 1975, Ser. No. 618,195
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



245,704
HOSE COUPLING
Sven-Erik Dyrup, Oxie, Sweden, assignor to Trelleborgs Gummifabriks AB
Filed July 26, 1973, Ser. No. 382,987
Claims priority, application Sweden, Jan. 29, 1973, 193/73
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—44



245,705
FRAGRANCE-EMITTER HOUSING
Rokuro Fukada, Ohtsu, Japan, assignor to Elkosha Co., Ltd., Kyoto, Japan
Filed June 10, 1976, Ser. No. 694,558
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



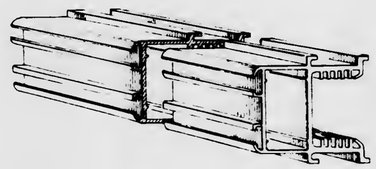
245,706
MOVIE VIEWING BOOTH
Wayne D. McAllister, 695 Busch Garden Drive, Pasadena, Calif. 91105
Filed Sept. 8, 1975, Ser. No. 611,512
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—16



245,707
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 5, 1976, Ser. No. 673,433
Claims priority, application Canada, Oct. 10, 1975, 10-10-75-5
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



245,708
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 5, 1976, Ser. No. 673,434
Claims priority, application Canada, Oct. 10, 1975, 10-10-75-2
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



245,709
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 5, 1976, Ser. No. 673,435
Claims priority, application Canada, Oct. 10, 1975, 10-10-75-4
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



245,710
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 5, 1976, Ser. No. 673,436
Claims priority, application Canada, Oct. 10, 1975, 10-10-75-3
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



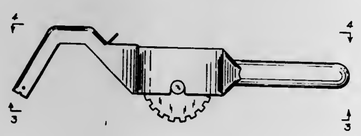
245,711
WINDOW COMPONENT EXTRUSION
Raymond Dallaire, P.O. Box 220, Levis, Quebec, Canada
Filed Apr. 5, 1976, Ser. No. 673,437
Claims priority, application Canada, Oct. 10, 1975, 10-10-75-1
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

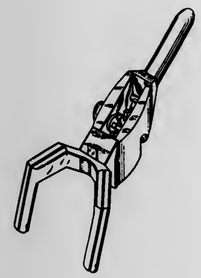


245,712
ROOFING TILE
John G. Wetherspoon, Anaheim, Calif., assignor to Martin E. Gerry, Santa Ana, Calif., a part interest
Continuation-in-part of Ser. No. 612,020, Sept. 10, 1975, abandoned. This application Apr. 22, 1976, Ser. No. 679,492
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—90

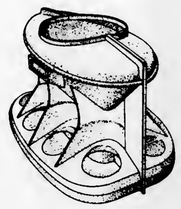


245,713
DENTAL FLOSS APPLICATOR
Wayne B. Jennings, 114 Cloverleaf Drive, Athens, Ala. 35611
Filed Dec. 10, 1976, Ser. No. 749,214
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D28—64

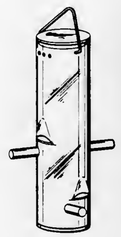




245,714
ANIMAL FEEDER
Julius C. Becker, Downs, Kans., assignor to Becker Manufacturing Company, Incorporated, Downs, Kans.
Filed Aug. 18, 1976, Ser. No. 715,446
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



245,715
BIRD FEEDER
Thomas M. Eldridge, Jr., 2571 Dellwood Drive, NW., Atlanta, Ga. 30305
Filed Aug. 23, 1976, Ser. No. 716,695
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—14



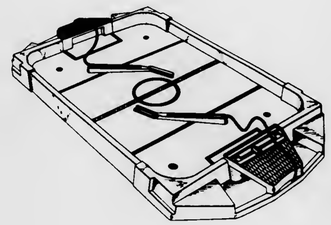
245,716
CAR SEAT FOR A DOMESTIC ANIMAL
Anthony J. Russo, 144 Beatwillow Drive, Niles, Ohio 44446
Filed Sept. 8, 1975, Ser. No. 611,403
Term of patent 14 years
Int. Cl. D30—*06*
U.S. Cl. D30—41



245,717
GAME BOARD
John David Jessie, 4385 Sunnyview Court, Las Vegas, Nev. 89117
Filed Dec. 17, 1974, Ser. No. 533,698
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



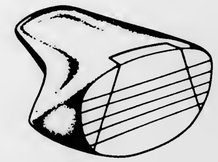
245,718
HOCKEY GAME BOARD
William J. Maloney, II, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 29, 1975, Ser. No. 644,428
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



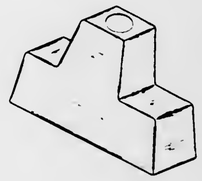
245,719
PIECE FOR GAME
Satoshi Hasegawa, 6-506 Keyakidai-danchi, 1-13-2 Wakaba-cho, Tachikawa, Tokyo, Japan
Filed Jan. 26, 1976, Ser. No. 652,082
Claims priority, application Japan, Aug. 7, 1975, 50-32283
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GP



245,720
GOLF CLUB HEAD OR SIMILAR ARTICLE
Eli Romero, R.R. No. 1, Goddard, Kans. 67052
Filed Mar. 8, 1976, Ser. No. 664,813
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



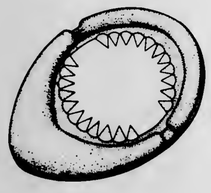
245,721
GOLF CLUB HEAD
Bernard C. Koch, 2107 Brandywood Drive, Wilmington, Del. 19810
Filed Mar. 15, 1976, Ser. No. 666,964
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



245,722
TOY SKUNK
Richard E. Cone, 249 Bowman Drive, Kent, Ohio 44266
Filed May 26, 1976, Ser. No. 690,092
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B



245,723
FLOAT TOY FOR WATER ASSOCIATED RECREATIONAL ACTIVITIES
Garry Rumbaugh, 621 Hillen Road, Towson, Md. 21204
Filed Dec. 22, 1975, Ser. No. 642,715
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—41



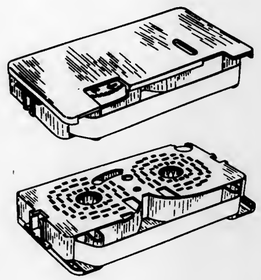
245,724
LIGHT FIXTURE
Dave E. Schoenauer, Three Rivers, Mich., assignor to Accessories by Sherwood, Elkhart, Ind.
Filed July 22, 1976, Ser. No. 707,879
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—4 B



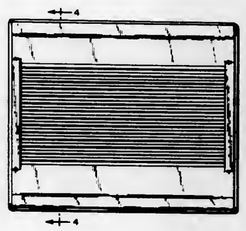
245,725
BANJO RESONATOR FLANGE
Geoffrey H. Stelling, 8815 Kenwood Drive, Spring Valley, Calif. 92077
Filed Dec. 29, 1975, Ser. No. 644,940
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D86—1 A



245,726
CARBON RIBBON CARTRIDGE
Ettore Sottsass, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy
Filed Nov. 26, 1975, Ser. No. 635,631
Claims priority, application Italy, June 9, 1975, 53158/75
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—11 A



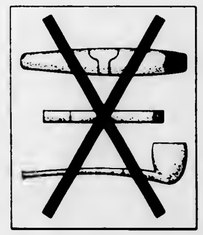
245,727
MAGNETIC DISK HOLDER
Bernard T. Coursoyer, Holden; David M. Wright, and Jerome M. O'Toole, both of Shrewsbury, all of Mass., assignors to Wright Line Inc., Worcester, Mass.
Filed June 20, 1975, Ser. No. 588,682
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D67—1 D



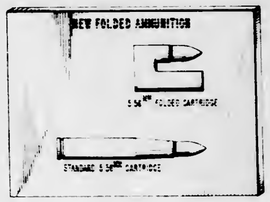
245,728
POCKET INSERTABLE TOWEL CARRIER
Elbert O. Rials, 3603 Oakhurst Drive, Midwest City, Okla. 73110
Filed Dec. 19, 1975, Ser. No. 642,498
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D67—1 R



245,729
SYMBOLIC NO-SMOKING SIGN
Thomas L. Gripe, 2719 El Rancho, Wichita, Kans. 67216
Filed Apr. 14, 1975, Ser. No. 567,684
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 E



245,730
ADVERTISING PLAQUE
Andrew J. Grandy, 2707 Grant Ave., North Hills, Pa. 15238
Filed Sept. 22, 1975, Ser. No. 615,498
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 E



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF SEPTEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.M. Liaaen A/S: *See—*
Liaaen, Anders Marius, 4,046,096, Cl. 115-35.000.

A. Monforts: *See—*
van Wersch, Kurt, 4,046,942, Cl. 428-255.000.

Aanstad, Ola J.: *See—*
Heiser, Richard S.; and Aanstad, Ola J., 4,047,005, Cl. 235-151.210.

AB ID-Kort: *See—*
Malmberg, Thor Anders Helge; Hogberg, Knut Goran; and Sjoquist, Stig Roland, 4,047,033, Cl. 250-341.000.

Abbott Laboratories: *See—*
Paris, Gerard Yvon; and Cimon, Denis Gaston, 4,046,887, Cl. 424-232.000.
Warawa, Edward John, 4,046,892, Cl. 424-248.570.

Abbott, Phillip Andrew. Apparatus and method of assisting pile driving by electro-osmosis. 4,046,657, Cl. 204-180.00R.

Abe, Hiroaki: *See—*
Ishino, Ken; Hashimoto, Yasuo; and Abe, Hiroaki, 4,046,983, Cl. 219-10.55D.

Abe, Mitsunobu: *See—*
Takechi, Hiroshi; Abe, Mitsunobu; Usuda, Matsuo; and Komiya, Kunihiko, 4,046,597, Cl. 148-12.00R.

Abrahams, Jacobus Hubertus; Collette, Joannes Jacobus Maria; and Walters, Robertus Aloysius Tarcisius Johannes, to U.S. Philips Corporation. Hot-gas reciprocating machine. 4,045,978, Cl. 60-521.000.

Ackeret, Peter, to IDN Inventions and Development of Novelties AG. Container for standard magnetic tape cassette. 4,046,255, Cl. 206-387.000.

Acorn Engineering Company: *See—*
Morris, Earl L.; and Fields, Larry D., 4,045,827, Cl. 4-3.000.

Acushnet Company: *See—*
Porter, Raymond P., 4,045,838, Cl. 15-250.360.

Adahan, Carmeli, to Aspro, Inc. Brake pressure modulator and system. 4,046,214, Cl. 180-109.000.

Adams, Derek William: *See—*
Smith, Kenneth Browning; and Adams, Derek William, 4,047,036, Cl. 250-359.000.

Addor, Roger William: *See—*
Kameswaran, Venkataraman; and Addor, Roger William, 4,046,799, Cl. 260-465.00D.

Addressograph Multigraph Corporation: *See—*
Booth, Thomas Allan; and Scholten, Frank Lynn, 4,046,475, Cl. 355-69.000.
Masiello, Felix R., 4,047,188, Cl. 354-15.000.
Miller, Norman Carlile, 4,046,565, Cl. 96-1.50R.

Adelaar, Hans Helmut, to International Standard Electric Corporation. Times slot switching. 4,046,963, Cl. 179-15.00A.

Adelmann, Siegfried; Margotte, Dieter; Merten, Josef; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Polycarbonate molding materials. 4,046,836, Cl. 260-860.000.

Adler, Franklin P., to Pullman Incorporated. Hopper door actuating mechanism. 4,046,268, Cl. 214-58.000.

Adlon, Bruce E.; Villiers, Walter H.; and Tarnoff, Sherwin S., to General Electric Company. X-ray film storage and viewing device. 4,045,896, Cl. 40-106.100.

Aerodyne Development Corporation: *See—*
Phillippi, John F., 4,046,526, Cl. 55-96.000.

Aerpat A.G.: *See—*
Alvi, Zia Raheem; Bradley, William David; Denham, Keith; and Summerlin, Frederick Arthur, 4,046,053, Cl. 85-72.000.

Aetna Bearing Company: *See—*
Brown, Villy, 4,046,436, Cl. 308-233.000.

AGA Aktiebolag: *See—*
Teiling, Carl Torbern, 4,047,087, Cl. 318-661.000.

Agency of Industrial Science & Technology: *See—*
Kataoka, Shoei; Komaniya, Yasuo; Hashizume, Nobuo; Tomizawa, Kazutaka; and Kawashima, Mitsuo, 4,047,199, Cl. 357-3.000.
Suzuki, Yoshikazu, 4,045,857, Cl. 29-420.000.
Takaoka, Sabro; Shinoda, Akira; and Kobayashi, Hideo, 4,046,204, Cl. 175-76.000.
Tarui, Yasuo; Sakamoto, Tsunenori; and Komiya, Yoshio, 4,046,594, Cl. 136-89.0SJ.

AGFA-Gevaert, Aktiengesellschaft: *See—*
Boie, Immo; and Lowski, Dieter, 4,046,575, Cl. 96-100.00N.
Odenwalder, Heinrich; Ranz, Erwin; Puschel, Walter; and Vetter, Hans, 4,046,574, Cl. 96-99.000.
Zahn, Wolfgang; Zangenfeind, Helmut; and Domges, Gunther, 4,046,614, Cl. 156-353.000.

AGFA-GEVAERT N.V.: *See—*
Fierens, Marcel Robert; and Heylen, Renaat Frans, 4,046,570, Cl. 96-61.00R.
Stievenart, Emile Frans; Plessers, Hendrik Sylvester; Neujens, Georges Jozef; and Van Bouwel, Leo Pa ul, 4,047,193, Cl. 354-105.000.

Agnew, S. J.: *See—*
Jones, Allen Jacob, 4,045,924, Cl. 52-125.000.

Ahlstrom, Allan. Vending machine operated by a check ticket to record use thereon. 4,046,242, Cl. 194-4.00R.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Thyristor switching circuit. 4,047,054, Cl. 307-252.00J.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Monostable switching circuit. 4,047,057, Cl. 307-273.000.

Aikoh Co., Ltd.: *See—*
Matsuyama, Shigeru; and Mikami, Hiroshi, 4,046,187, Cl. 164-53.000.

Airco, Inc.: *See—*
Cormia, Robert L.; Trumbly, Terry A.; and Andresen, Sigurd, 4,046,659, Cl. 204-192.00C.

Aizawa, Hiroshi: *See—*
Nakamura, Zenzo; Uchiyama, Takashi; Uchidoi, Masanori; Taguchi, Tetsuya; Aizawa, Hiroshi; and Tsunekawa, Tokuichi, 4,047,194, Cl. 354-149.000.

Ajax Hardware Corporation: *See—*
Gorton, Howard Byron; and Lyons, Richard B., 4,045,982, Cl. 70-90.000.

Ajax Magnethermic Corporation: *See—*
Bendzsak, Gabor J., 4,047,092, Cl. 363-135.000.

Ajdukovic, Djordje: *See—*
Bharucha, Kekhusroo R.; Ajdukovic, Djordje; Pavilanis, Vytautas; and Mackay, Angus Campbell, 4,046,811, Cl. 260-578.000.

Akahane, Fumitake: *See—*
Kobayakawa, Masaki; and Akahane, Fumitake, 4,047,066, Cl. 313-217.000.

Akao, Takeshi; Sakasai, Toshio; Matsuyama, Yoshikazu; and Kasuga, Yukio, to Kikkoman Shoyu Co., Ltd. Process for cultivating microorganisms by means of fluidized bed. 4,046,921, Cl. 426-46.000.

Akebono Brake Industry Co., Ltd.: *See—*
Kurata, Masayuki, 4,046,234, Cl. 188-73.300.
Miyake, Katsuya, 4,046,426, Cl. 303-100.000.

Akeley, Lloyd Thomas, to Beckman Instruments, Inc. Pressure transducer with welded tantalum diaphragm. 4,046,010, Cl. 73-406.000.

Akita, Sigeyuki; and Kitagawa, Junji, to Nippon Soken, Inc. Brake checking system. 4,047,149, Cl. 340-52.00B.

Akman, Alptekin, to Xerox Corporation. Electroresistive paper. 4,046,928, Cl. 427-12.000.

Aktiebolaget Electrolux: *See—*
Johansson, Erik Karl Gustav, 4,045,840, Cl. 15-397.000.

Akutsu, Hidezo; Iwama, Katsuaki; Saito, Naoki; Takagawa, Masanori; Kobayashi, Yoshichika; and Atsumi, Tamisuke, to Matsushita Electronics Corporation. High-pressure mercury-vapor lamp having a plural phosphor coating. 4,047,069, Cl. 313-487.000.

Alar Engineering Corporation: *See—*
White, Harold R., 4,045,853, Cl. 29-163.50F.

Albany International Corporation: *See—*
Ashare, Edward; Rulison, Richard N.; Wright, Lawrence T.; and Coplan, Myron J., 4,045,851, Cl. 29-157.00R.

Albert Obrist & Co.: *See—*
Ruch, Heinz, 4,046,282, Cl. 220-270.000.

Albrecht, Konrad: *See—*
Frensch, Heinz; Albrecht, Konrad; and Hartel, Kurt, 4,046,906, Cl. 424-273.00R.

Alcan Research and Development Limited: *See—*
Innes, Robert Arthur; Enright, Gregory Preston Michael; and Derrick, Garnet Lloyd, 4,046,931, Cl. 427-428.000.

Aleite, Werner; and Bock, Heinz-Wilhelm, to Siemens Aktiengesellschaft. Method of operating a nuclear reactor. 4,046,624, Cl. 176-22.000.

Alexander, Wilson E., to Fairchild Camera and Instrument Corporation. RF oscillator and modulator having regulated low harmonic output. 4,047,127, Cl. 332-31.00T.

Alfa-Laval AB: *See—*
Stenstrom, Lennart Arvid, 4,046,208, Cl. 177-19.000.

Allaire, Roger: *See—*
Asel, John R.; Allaire, Roger; Thalmann, Peter; and Castonguay, Rene, 4,046,088, Cl. 112-265.000.
Asel, John R.; Allaire, Roger; Thalmann, Peter; and Castonguay, Rene, 4,046,089, Cl. 112-265.000.

Allen, Carling D. Wheel-support structures for vehicles. 4,046,211, Cl. 180-41.000.

Allen, Wilbur J.: *See—*
Bryant, Nelson H.; Hobler, Ross L.; Allen, Wilbur J.; and Poliseo, Joseph W., 4,047,000, Cl. 235-151.100.

Allied Chemical Corporation: *See—*
Armor, John N.; and Pez, Guido P., 4,046,790, Cl. 260-429.500.
Seeling, Philip F.; and Bean, Samuel L., 4,046,867, Cl. 423-543.000.
Wheeler, Walter Morris; and Ocker, Klaus Frederick, 4,046,332, Cl. 242-107.40A.

Allied Paper Incorporated: *See—*
Shaw, Michael J., 4,046,946, Cl. 428-325.000.

Allis-Chalmers Corporation: *See—*
Waterman, Michael W.; and Foster, Samuel L., 4,047,239, Cl. 361-270.000.

Allison, David F., to Scientific Micro Systems, Inc. Semiconductor structure. 4,047,195, Cl. 357-55.000.

Allison, William D., to Ford Motor Company. Ball joint suspension for a motor vehicle. 4,046,402, Cl. 280-674.000.

Allport, John J. Self-compensating X-ray or γ-ray thickness gauge. 4,047,029, Cl. 250-273.000.

Almquist, Edgar; and Almquist, Richard. Spark boosting device. 4,046,127, Cl. 123-148.00A.

Almquist, Richard: *See—*
Almquist, Edgar; and Almquist, Richard, 4,046,127, Cl. 123-148.00A.

Alps Electric Co., Ltd.: *See—*
Takeyama, Fumimasa, 4,047,146, Cl. 338-176.000.

Alsberg, Henry: *See—*
Meiner, Roger D.; Haines, James M.; and Alsberg, Henry, 4,046,726, Cl. 260-27.00R.

Altman, Richard M.; and McLaughlin, Thomas D., to Optigon Research & Development Corporation. Viewing system for reflex camera. 4,047,207, Cl. 354-155.000.

Altman, Richard M.: *See—*
Moskovich, Jacob; Wiese, Gary E.; Altman, Richard M.; and McLaughlin, Thomas D., 4,047,222, Cl. 354-155.000.

Altor Box Board Company: *See—*
Wilkinson, Robert M.; and Lyon, James R., 4,046,935, Cl. 428-182.000.

Aluminum Company of America: *See—*
Das, Subodh K.; and Milito, Richard A., 4,046,558, Cl. 75-68.00A.

Alund, Torsten. Sliding vane machine. 4,046,493, Cl. 417-220.000.

Alvi, Zia Raheem; Bradley, William David; Denham, Keith; and Summerlin, Frederick Arthur, to Aerpat A.G. Blind rivet. 4,046,053, Cl. 85-72.000.

Amax Inc.: *See—*
Vertes, Michael A.; Ronzio, Richard A.; and Kearns, Tommy C., 4,046,852, Cl. 423-58.000.

Ambasz, Emilio, to Center for Design Research and Development N.V. Chair. 4,046,422, Cl. 297-248.000.

American Cyanamid Company: *See—*
Bernstein, Seymour; Lenhard, Robert Herman; and Heller, Milton David, 4,046,805, Cl. 260-506.000.
Cross, Barrington, 4,046,797, Cl. 260-453.00R.
Cross, Barrington, 4,046,808, Cl. 260-553.00A.
Hardy, William Baptist, 4,046,736, Cl. 260-45.80N.
Kameswaran, Venkataraman; and Addor, Roger William, 4,046,799, Cl. 260-465.00D.
Schaub, Robert Eugene; and Weiss, Martin Joseph, 4,046,787, Cl. 260-399.000.

American Filtrona Corporation: *See—*
Berger, Richard M., 4,046,063, Cl. 93-1.00C.

American Hoechst Corporation: *See—*
Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, 4,046,900, Cl. 424-267.000.

American Hospital Supply Corporation: *See—*
Choksi, Pradip Vinobchandra; and Seemayer, Walter, 4,046,145, Cl. 128-215.000.
Schwartz, Robert S.; and Pfister, Ronald R., 4,046,150, Cl. 128-328.000.

American Motors Corporation: *See—*
MacAfee, James E., 4,046,349, Cl. 248-424.000.

American Newspaper Publishers Association, Incorporated: *See—*
Merker, George; Navi, Menashe; and Krupp, Joseph, 4,046,367, Cl. 270-55.000.

American Optical Corporation: *See—*
Gold, James J., 4,047,204, Cl. 358-93.000.
Metcalfe, Richard T.; Granitsas, George A.; and Elliott, Edgar H., 4,046,596, Cl. 148-2.000.
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,046,586, Cl. 106-194.000.

American Sign and Indicator Corporation: *See—*
Work, Gerald L., 4,045,895, Cl. 40-28.00C.

American Standard Inc.: *See—*
Liska, John Joseph, 4,046,644, Cl. 204-37.00R.

American Tennis Systems, Inc.: *See—*
Clark, Thomas S.; Kennedy, William S.; and Piziali, Robert L., 4,046,131, Cl. 124-71.000.

Amezcua, Saul Ortega. Painting palette. 4,046,250, Cl. 206-1.700.

Ammon, J. Preston; Weaver, Harry R.; and Rodriguez, Claude, to Elfab Corporation. Method of fabrication and assembly of electrical connector. 4,045,868, Cl. 29-629.000.

AMP Incorporated: *See—*
Cassarly, James William, 4,046,452, Cl. 339-198.00H.
Loose, Winfield Warren; and Thomas, Anthony Francis, 4,045,843, Cl. 24-16.0PB.
Reavis, Robert Philmore, Jr., 4,046,446, Cl. 339-99.00R.

Ampex Corporation: *See—*
Garagnon, Gary B., 4,047,231, Cl. 360-36.000.

Amtel, Inc.: *See—*
Griffiths, Evan, 4,045,992, Cl. 72-279.000.

Anderson, Bruce Olen, to Dolese Company, The. Method and apparatus for providing an output indication proportional to the moisture content of particulate material. 4,047,105, Cl. 324-65.00R.

Anderson-Cook Inc.: *See—*
Anderson, Marvin R., 4,045,988, Cl. 72-108.000.

Anderson, Gary L., to United States of America, Navy. Solid state klystron. 4,047,126, Cl. 331-96.000.

Anderson, Jay. Organic digester apparatus and method. 4,046,551, Cl. 71-10.000.

Anderson, John Erling, to Union Carbide Corporation. Slag quenching method for pyrolysis furnaces. 4,046,541, Cl. 65-19.000.

Anderson, Marvin R., to Anderson-Cook Inc. Rotary forming machine and tool. 4,045,988, Cl. 72-108.000.

Anderson, Paul T.; and Dobrosielski, Stephen S., to Westinghouse Electric Corporation. Thermal overload relay. 4,047,140, Cl. 337-75.000.

Anderson, Rebecca M.: *See—*
Andreasson, Betty; and Anderson, Rebecca M., 4,047,165, Cl. 340-227.00R.

Anderson, Richard M.; McGill, Robert S., III; and Ramsey, Robert W., to Heil-Quaker Corporation. Air conditioner control. 4,045,973, Cl. 62-158.000.

Ando, Yujiro; Ohara, Katsunobu; and Shinohara, Yukimasa, to Canon Kabushiki Kaisha. Method and apparatus for electrophotography. 4,046,466, Cl. 355-3.00R.

Andrascek, Ernst; and Hadersbeck, Hans, to Siemens Aktiengesellschaft. Process for improving the solderability of electric circuit boards. 4,046,620, Cl. 156-666.000.

Andreasson, Betty; and Anderson, Rebecca M. Emergency signal light. 4,047,165, Cl. 340-227.00R.

Andresen, Sigurd: *See—*
Cormia, Robert L.; Trumbly, Terry A.; and Andresen, Sigurd, 4,046,659, Cl. 204-192.00C.

Andrew Corporation: *See—*
Juds, Richard C.; and Healy, Dennis M., 4,046,451, Cl. 339-177.00R.
Merle, Michel, 4,047,133, Cl. 333-95.00A.

Andriska, Viktor; Gorog nee Privitzer, Katalin; Bruckner, Gyorgyi; Nemessanyi nee Szekely, Zsuzsanna; Havasi, Miklos; Raskay, Bela; Grega nee Toth, Erzsebet; Szigeti nee Haranghy, Terez; Dudas, Jozsef; Szilagyi, Gyula; Marosvolgyi, Sandor; Gribovszky, Pal; Pinter, Zoltan; and Bors, Gyozo, to Nehezvegyipari Kutato Intezet; and Eszakmagyarorszagi Vegyimuvek. Carbamoyl-imidazole derivative having pesticidal activity. 4,046,773, Cl. 548-339.000.

Anhalt, John W., to International Telephone and Telegraph Corporation. Spring bushing for conductive back-plane connection. 4,046,445, Cl. 339-95.00D.

ANPA Research Institute: *See—*
Navi, Menashe, 4,046,370, Cl. 271-3.100.

Anritsu Electric Co., Ltd.: *See—*
Toda, Koichi; Miki, Tetsuya; and Yamaguchi, Haruo, 4,047,115, Cl. 328-151.000.

Antos, George J., to UOP Inc. Method of catalyst manufacture. 4,046,711, Cl. 252-441.000.

Aono, Shigeo, to Nissan Motor Co., Ltd. Air fuel mixture control apparatus for carbureted internal combustion engines. 4,046,118, Cl. 123-119.0EC.

Appel, Adolf; and Reymann, Wolfgang, to Gildemeister Corpoplast GmbH. Apparatus for blow-molding hollow articles, in particular bottles. 4,046,498, Cl. 425-526.000.

Appelbaum, Alfred J.; Collins, Michael J.; and Hanfling, Jerome D., to Raytheon Company. IFF antenna arrangement. 4,047,179, Cl. 343-768.000.

Applied Display Services, Inc.: *See—*
Barker, Ronald C., 4,046,986, Cl. 219-121.0LM.

Aquafilter Corporation: *See—*
Kaye, Paul, 4,046,153, Cl. 131-187.000.

Arai, Akihiro: *See—*
Kitagami, Kazuo; Miyata, Katsuhiko; and Arai, Akihiro, 4,047,206, Cl. 354-152.000.

Arai, Hiroshi: *See—*
Kuno, Akira; Shinoda, Yoshio; and Arai, Hiroshi, 4,046,998, Cl. 235-150.210.

Arant, Gene W. Analog module for reconversion of jaw movement information. 4,045,872, Cl. 32-32.000.

Arcamone, Federico: *See—*
Patelli, Bianca; Bernardi, Luigi; Arcamone, Federico; and Di Marco, Aurelio, 4,046,878, Cl. 424-180.000.

Archibald, John Leheup: *See—*
Cavalla, John Frederick; and Archibald, John Leheup, 4,046,767, Cl. 260-293.770.

Argyll, Marion H. Method and apparatus for transporting sludge while rendering it for conversion into fertilizer. 4,046,689, Cl. 210-59.000.

Arizona Chemical Company: *See—*
Schluenz, Robert William; and Davis, Curry Beach, 4,046,748, Cl. 260-78.0UA.

Armco Steel Corporation: *See—*
Hook, Rollin E., 4,046,601, Cl. 148-15.000.

Armerad Betong Vagforbattringar Aktiebolag: *See—*
Hansson, Bengt; and Svensson, Sigfrid, 4,045,963, Cl. 61-.500.

Armor, John N.; and Pez, Guido P., to Allied Chemical Corporation. Catalytically active complex of titanium, cyclopentadienyl ligands, and ammonia. 4,046,790, Cl. 260-429.500.

Armstrong Cork Company: *See—*
Heckles, John S., 4,046,803, Cl. 560-172.000.

Armstrong, Lee R.; and Mercik, Henry J., Jr., to United Technologies Corporation. Engine turbocharger diagnostics. 4,046,003, Cl. 73-118.000.

Arnold, Dan M., to Texaco Inc. Resolution of through tubing fluid flow and behind casing fluid flow in multiple completion wells. 4,047,028, Cl. 250-266.000.

Arny, Deane C.; and Lindow, Steven E., to Wisconsin Alumni Research Foundation. Method for reducing frost damage of plants. 4,045,910, Cl. 47-2.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Mizuno, Masayoshi; Kawamoto, Tadashi; and Iida, Kiichi, 4,046,071, Cl. 101-395.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kawaguchi, Heizo, 4,047,208, Cl. 354-203.000.
Kitagami, Kazuo; Miyata, Katsuhiko; and Arai, Akihiro, 4,047,206, Cl. 354-152.000.

Asayama, Kingo, to Kabushiki Kaisha Takechi Koumusho. Earth auger and method for driving piles and the like by means of said earth auger. 4,046,205, Cl. 175-292.000.

Asel, John R.; Allaire, Roger; Thalmann, Peter; and Castonguay, Rene, to Canadian Lady-Canadelle Inc. Apparatus for sewing rings, buckles and the like elements onto tape. 4,046,088, Cl. 112-265.000.

Asel, John R.; Allaire, Roger; Thalmann, Peter; and Castonguay, Rene, to Canadian Lady-Canadelle Inc. Machine for making shoulder straps. 4,046,089, Cl. 112-265.000.

Ashare, Edward; Rulison, Richard N.; Wright, Lawrence T.; and Coplan, Myron J., to Albany International Corporation. Method of fabrication of hollow filament separatory module. 4,045,851, Cl. 29-157.00R.

Ashland Oil, Inc.: *See—*
Langer, Heimo J.; Robinson, Kenneth R.; and Throckmorton, Peter E., 4,046,812, Cl. 260-583.00B.

Aspro, Inc.: *See—*
Adahan, Carmeli, 4,046,214, Cl. 180-109.000.

Asselin, George F., to UOP Inc. Aromatic hydrocarbon separation via solvent extraction. 4,046,675, Cl. 208-321.000.

Asselin, George F., to UOP Inc. Aromatic hydrocarbon separation via solvent extraction. 4,046,676, Cl. 208-321.000.

Associated Engineering Limited: *See—*
Brown, Dennis Cockburn; and Murray, Reginald, 4,046,305, Cl. 228-194.000.

Astra Nutrition AB: *See—*
Hallgren, Bo Erik; and Stallberg, Gunnel Anna Maria, 4,046,914, Cl. 424-312.000.

Atkins, Carl E., to Wagner Electric Corporation. Reactively decoupled dual channel keying circuit for wide-band frequency modulated keyable control circuit. 4,047,156, Cl. 340-171.00A.

Atlantic Products Corporation: *See—*
Jeninga, John, 4,046,413, Cl. 294-19.00A.

Atlas Pacific Engineering Company: *See—*
Loveland, Malcolm W.; and Matthews, Rudolph, 4,046,067, Cl. 99-543.000.

Atsumi, Tamisuke: *See—*
Akutsu, Hidezo; Iwama, Katsuaki; Saito, Naoki; Takagawa, Masanori; Kobayashi, Yoshichika; and Atsumi, Tamisuke, 4,047,069, Cl. 313-487.000.

Attwood, Brian William; and Hicklin, Dennis Raymond, to Karl Kroyer St. Anne's Limited. Multi-ply fibrous sheets having a wet-laid ply and a dry-laid ply. 4,046,622, Cl. 162-132.000.

Au, Frederick H. F.; and Beckert, Werner F., to United States of America, Energy Research and Development Administration. Method for collecting spores from a mold. 4,046,593, Cl. 134-21.000.

Auphan, Michel Joseph, to U.S. Philips Corporation. Automatic system for continuously calibrating a gamma camera. 4,047,034, Cl. 250-354.000.

Auracher, Franz: *See—*
Deserno, Ulrich; and Auracher, Franz, 4,046,537, Cl. 65-2.000.

Ausnit, Steven. Omni-directional fastener. 4,046,408, Cl. 285-188.000.

Austerman, Stanley B.: *See—*
Ehman, Michael F.; and Austerman, Stanley B., 4,046,954, Cl. 428-446.000.

Austin, Thomas H.; and Speranza, George P., to Texaco Development Corporation. Low friability polyisocyanurate foams. 4,046,721, Cl. 260-2.5AW.

Avco Corporation: *See—*
Curless, Richard W.; and Federico, Armando, 4,046,137, Cl. 128-1.00D.

B. F. Goodrich Company, The: *See—*
Carman, Charles Jerry; Batiuk, Martin; and Herman, Richard Michael, 4,046,840, Cl. 260-897.00A.

Baba, Toshinori: *See—*
Tsunoda, Shogo; Kataoka, Katsuyuki; and Baba, Toshinori, 4,046,683, Cl. 210-20.000.

Babitzka, Rudolf: *See—*
Schlagmuller, Walter; and Babitzka, Rudolf, 4,046,240, Cl. 192-104.00C.

Baccini, Peter; and Fory, Werner, to Ciba-Geigy Corporation. Chelates for the regulation of metal-deficiency phenomena in plants. 4,046,793, Cl. 260-439.00R.

Backerud, Stig Lennart. Method for checking and regulating the conditions of crystallization in the solidification of melts. 4,046,509, Cl. 23-230.00A.

Badon, Aime, to Merlin Gerin. Contact structure for puffer-type gas-blast circuit interrupter. 4,046,978, Cl. 200-148.00A.

Bailey, Denis M., to Sterling Drug Inc. 4,5-Dihalopyrrole-2-carboxamides. 4,046,775, Cl. 260-326.200.

Bajars, Laimonis: *See—*
Croce, Louis J.; Bajars, Laimonis; and Gabliks, Maigonis, 4,046,821, Cl. 260-654.00A.

Balgemann, Dennis Erwin; and Wong, Michael. Feeding device. 4,046,108, Cl. 119-18.000.

Ballast-Nedam Groep, N.V.: *See—*
Irons, Eric, 4,046,691, Cl. 210-83.000.

Balz, Werner: *See—*
Hartmann, Hans-Joerg; Falk, Roland; Gawlik, Peter; Balz, Werner; Uhl, Karl; Schaefer, Dieter; and Motz, Herbert, 4,046,932, Cl. 428-64.000.

Balzers Patent-und Beteiligungs-Aktiengesellschaft: *See—*
Lobach, Ernst, 4,047,030, Cl. 250-281.000.
Winkler, Otto, 4,046,101, Cl. 118-49.100.

Ban, Itsuki. Semiconductor motor controlled for energization by a single position sensing element. 4,047,084, Cl. 318-254.000.

Bandag Incorporation: *See—*
Brodie, Edwin T., 4,046,947, Cl. 428-352.000.

Bandrowski, Michael, Jr.: *See—*
Hamparian, Nshan; and Bandrowski, Michael, Jr., 4,046,114, Cl. 123-41.760.

Banerjea, Tara N.: *See—*
Chieger, George; Schwartz, Robert B.; and Banerjea, Tara N., 4,046,278, Cl. 220-1.500.

Bar, Vilmos; Mercz, Jeno; Szvoboda, Janos; Pollak, Zsuszanna B.; and Matyas, Jakab, to Material Ksz. Dihydroquinoline derivatives of antioxidant activity and a process for the preparation thereof. 4,046,765, Cl. 260-288.0CE.

Barber-Colman Company: *See—*
Kulczycki, Karol, 4,046,173, Cl. 139-48.000.

Barber, Ellery H., to Bucyrus-Erie Company. Method of machining the upper pad on the swing bearing of a large excavator. 4,046,035, Cl. 82-1.00C.

Barclay, James A. Subterranean panel drain. 4,045,964, Cl. 61-11.000.

Bareis, Alfred: *See—*
Bergmann, Ewald; Bareis, Alfred; Dangelmaier, Karl; and Kottmann, Alfred, 4,046,264, Cl. 214-8.000.

Barker, Ronald C., to Applied Display Services, Inc. Apparatus for making printing plates and other materials having a surface in relief. 4,046,986, Cl. 219-121.0LM.

Barnes, Anthony John: *See—*
Laycock, David Brian; and Barnes, Anthony John, 4,045,986, Cl. 72-60.000.

Barnfield, Rhydwyn William: *See—*
Cairns, James Anthony; Nelson, Richard Stuart; and Barnfield, Rhydwyn William, 4,046,712, Cl. 252-447.000.

Barnsdale, Arthur Derrick. Insert. 4,046,181, Cl. 151-41.730.

Baron, George B.; and Padrutt, Paul W., to Marion Power Shovel Company, Inc. Power shovel and crowd system therefor. 4,046,270, Cl. 214-138.00R.

Barr, Paul N., to General Motors Corporation. Tuning system for AM/FM receivers. 4,047,111, Cl. 325-315.000.

Barrier Pressure Container, Inc.: *See—*
Hansen, Harold M., 4,045,938, Cl. 53-22.00R.

Barry, Louis T.; and Czop, Gordon W., to Nichols Engineering & Research Corporation. Method and apparatus for treating waste material in a counter-current incinerator. 4,046,085, Cl. 110-12.000.

Barsa, John J.; Farris, Edward T.; and Lagow, Richard J. Synthesis for crystalline hydroxyapatite. 4,046,858, Cl. 423-305.000.

Barthe, Alexandre Jean-Paul: *See—*
Cazalaa, Jean Michel; Barthe, Alexandre Jean-Paul; and Derrien, Andre Robert, 4,046,157, Cl. 137-94.000.

BASF Aktiengesellschaft: *See—*
Hartmann, Hans-Joerg; Falk, Roland; Gawlik, Peter; Balz, Werner; Uhl, Karl; Schaefer, Dieter; and Motz, Herbert, 4,046,932, Cl. 428-64.000.

Bassous, Ernest; and Kuhn, Lawrence, to International Business Machines Corporation. Charge electrode array and combination for ink jet printing and method of manufacture. 4,047,184, Cl. 346-75.000.

Bateman, Richard M.; and Clavier, Christian M., to Schlumberger Technology Corporation. Neutron well logging technique for gas detection. 4,047,027, Cl. 250-264.000.

Batiuk, Martin: *See—*
Carman, Charles Jerry; Batiuk, Martin; and Herman, Richard Michael, 4,046,840, Cl. 260-897.00A.

Bauer, James A.: *See—*
Elco, Richard A.; Bauer, James A.; and Treese, Willard E., 4,046,649, Cl. 204-58.000.

Bauer, John R., to Goodyear Tire & Rubber Company, The. Traction shoe seal. 4,046,428, Cl. 305-11.000.

Bauer, Lowell W.; and Costas, John P., to General Electric Company. Signal processor for pulse-echo system providing interference level compensation and feed-forward normalization. 4,047,172, Cl. 343-17.10R.

Bauerle, James E.; Reed, William H.; and Berkey, Edgar, to Westinghouse Electric Corporation. Filament for alkali metal ionization detector. 4,047,101, Cl. 324-33.000.

Baugh, David F., Jr.: *See—*
Kilmer, Bill G.; and Baugh, David F., Jr., 4,047,061, Cl. 310-164.000.

Baum, Allen J.: *See—*
Dickinson, Peter D.; Osborne, Thomas E.; Rode, France; Baum, Allen J.; Cochran, David S.; and Tung, Chung C., 4,047,012, Cl. 235-156.000.

Bauman, Robert Andrew, to Colgate Palmolive Company. Alicyclic amido-quaternary ammonium anti-bacterial agents. 4,046,873, Cl. 424-54.000.

Baumhauer, John Charles, Jr.; Brzezinski, Alex Michael; Warren, Joe Edward; and Whitesell, Stephen Reed, to Bell Telephone Laboratories, Incorporated. Electroacoustic transducer with springs forming electrical interconnections as a result of assembly. 4,046,974, Cl. 179-111.00R.

Baumstingl, Herbert, to Papeteries de Belgique. Process for the production of a packaging receiving a sterile liquid. 4,045,939, Cl. 53-22.00A.

Baumstingl, Herbert, to Papeteries de Belgique. Apparatus for packaging sterile products. 4,045,943, Cl. 53-112.00A.

Bausch, Franz Hubert: *See—*
Moller, Erwin; Bausch, Franz Hubert; and Frolich, Martin, 4,045,945, Cl. 53-167.000.

Baxmann, Fritz; Frese, Albert; Roben, Hermann; and Wolpers, Jurgen, to Chemische Werke Huls Aktiengesellschaft. Process for the bonding of films and molded components. 4,046,945, Cl. 428-282.000.

Baxter Travenol Laboratories, Inc.: *See—*
Winchell, David A.; Miller, Joe A.; and Martin, Jerry D., 4,046,276, Cl. 215-250.000.

Bayer Aktiengesellschaft: *See—*
Adelmann, Siegfried; Margotte, Dieter; Merten, Josef; and Vernaleken, Hugo, 4,046,836, Cl. 260-860.000.
Becker, Wolf-Jurgen; Deprez, Jacques; and Lehnert, Horst, 4,046,510, Cl. 23-230.00R.
Beecken, Hermann, 4,046,771, Cl. 260-307.00D.
Dahn, Ursula; Hagenmaier, Hanspaul; Hohne, Helmut; Konig, Wilfried; Scheinpflug, Hans; and Zahner, Hans, 4,046,881, Cl. 424-181.000.
Eimers, Erich; Dhein, Rolf; and Wiedermann, Rolf, 4,046,742, Cl. 260-77.5AN.
Lehnert, Gunther; Maertens, Dieter; Pampus, Gottfried; and Witte, Josef, 4,046,710, Cl. 252-429.00B.
Rottloff, Gunther; Sundermann, Rudolf; Grigat, Ernst; and Putter, Rolf, 4,046,796, Cl. 260-453.00P.
Schafer, Rolf, 4,046,865, Cl. 423-499.000.

Bayer, Gerhard: *See—*
Schepers, Bernhard; Bayer, Gerhard; Urmann, Ernst; and Schanz, Klaus, 4,046,855, Cl. 423-130.000.

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4'nitrodiphenyl ethers. 4,046,798, Cl. 260-465.00D.

Baynes, Gene P.; and Brooks, Frank W., to General Motors Corporation. Mechanical wheel lock control. 4,046,427, Cl. 303-115.000.

BBC Brown, Boveri & Company, Limited: *See—*
van Iseghem, Paul; Vlasak, Thomas; and Zimmermann, Wolfgang, 4,046,608, Cl. 148-188.000.

Bean, Samuel L.: *See—*
Seeling, Philip F.; and Bean, Samuel L., 4,046,867, Cl. 423-543.000.

Becker, Kunibert; and Weirich, Walter, to Gewerkschaft Eisenhutte Westfalia. Hydraulic control systems for use with mining apparatus. 4,046,060, Cl. 91-414.000.

Becker, Otto Alfred. Insulating flexible composite element. 4,045,931, Cl. 52-406.000.

Becker, Wolf-Jurgen; Deprez, Jacques; and Lehnert, Horst, to Bayer Aktiengesellschaft. Method and an apparatus for determining the inorganic carbon content of a liquid. 4,046,510, Cl. 23-230.00R.

Beckert, Werner F.: *See—*
Au, Frederick H. F.; and Beckert, Werner F., 4,046,593, Cl. 134-21.000.

Beckley, Charles R. Folding furniture piece. 4,046,417, Cl. 297-16.000.

Beckman Instruments, Inc.: *See—*
Akeley, Lloyd Thomas, 4,046,010, Cl. 73-406.000.

Beckmann, Georg: *See—*
Fritz, Kurt; and Beckmann, Georg, 4,046,110, Cl. 122-32.000.

Becton, Dickinson Electronics Company: *See—*
Wong, Herbert Vernon, 4,047,144, Cl. 338-2.000.

Beecken, Hermann, to Bayer Aktiengesellschaft. Styryl dyestuffs. 4,046,771, Cl. 260-307.00D.

Beggs, Donald, to Midrex Corporation. Method for producing metallic iron particles. 4,046,557, Cl. 75-35.000.

Bell, Lawrence D. Heart patient aid. 4,046,143, Cl. 128-133.000.

Bell Telephone Laboratories, Incorporated: *See—*
Baumhauer, John Charles, Jr.; Brzezinski, Alex Michael; Warren, Joe Edward; and Whitesell, Stephen Reed, 4,046,974, Cl. 179-111.00R.
Bjorkholm, John Ernst; and Liao, Paul Foo-Hung, 4,047,026, Cl. 250-251.000.
Dalley, James Edwin, 4,046,969, Cl. 179-18.0FA.
Daugherty, Thomas Henry; and Stone, Dale Eugene, 4,046,964, Cl. 179-15.0BF.
Embree, Milton Luther; Goldthorp, David Clayton; and O'Neill, John Francis, 4,046,968, Cl. 179-18.0FA.
Fraser, David Bruce, 4,046,660, Cl. 204-192.00C.
Huizinga, Donald Dean; Underhill, Edward William; and Whitcomb, James Arthur, 4,046,972, Cl. 179-99.000.
O'Neill, John Francis, 4,046,967, Cl. 179-18.0FA.
Pugh, William Edward, III, 4,046,454, Cl. 350-96.00C.
Rogers, Barry William, 4,046,962, Cl. 179-6.30R.
Rosebrock, Frederick Allen, 4,046,980, Cl. 200-153.0LA.
Shenk, Walter James, 4,046,225, Cl. 184-15.00R.
Sparber, Richard Grant, 4,047,104, Cl. 324-62.000.

Bellan, Heinrich: *See—*
Eggenmuller, Alfred; Bellan, Heinrich; Scherer, Lorenz; Notter, Eugen; and Wagler, Werner, 4,046,068, Cl. 100-65.000.

Benasutti, Louis D.; Neubauer, Jerry L.; and Meyer, Ronald E., to General Motors Corporation. Vertical sliding closure panel for refrigeration door. 4,046,438, Cl. 312-138.00A.

Bender, Horst, to WIBAU (Westdeutsche Industrie- und Strassenbau-Maschinen Gesellschaft m.b.H.). Reciprocating valve for a double piston concrete pump. 4,046,166, Cl. 137-625.480.

Benditalia S.p.A.: *See—*
Cadeddu, Leonardo, 4,046,977, Cl. 200-84.00C.

Bendzsak, Gabor J., to Ajax Magnethermic Corporation. High frequency inverter. 4,047,092, Cl. 363-135.000.

Benerito, Ruth R.: *See—*
Ward, Truman L.; Benerito, Ruth R.; and Hebert, Jacques J., 4,046,953, Cl. 428-426.000.

Benkoe, Erwin: *See—*
Goldfarb, Adolph E.; and Benkoe, Erwin, 4,045,906, Cl. 46-44.000.
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 4,046,380, Cl. 273-119.00R.

Bennett, Walter Scott, to Burroughs Corporation. Modular apparatus for binary quotient, binary product, binary sum and binary difference generation. 4,047,011, Cl. 235-164.000.

Benson, Robert C.: *See—*
Tuchyner, Harold J.; and Benson, Robert C., 4,047,117, Cl. 330-4.300.

Berg, Cecilia. Sanitary napkin. 4,046,147, Cl. 128-290.00R.

Berger, Lawrence A.; and Hunt, Robert Carroll, to Uniloc, Incorporated. Method and apparatus for determining boiler water conductivity. 4,047,099, Cl. 324-30.00R.

Berger, Richard M., to American Filtrona Corporation. Method and apparatus for making tobacco smoke filter. 4,046,063, Cl. 93-1.00C.

Bergman, Carl. Plural chamber dispenser. 4,046,288, Cl. 222-135.000.

Bergmann, Ewald; Bareis, Alfred; Dangelmaier, Karl; and Kottmann, Alfred, to L. Schuler GmbH. Apparatus for stacking articles in sheet form for electrical machines. 4,046,264, Cl. 214-8.000.

Berkey, Edgar: *See—*
Bauerle, James E.; Reed, William H.; and Berkey, Edgar, 4,047,101, Cl. 324-33.000.

Bernard, Armand: *See—*
de la Taille, Olivier; Bernard, Armand; and Labadie, Jean-Francois, 4,046,420, Cl. 297-216.000.

Bernardi, Luigi: *See—*
Patelli, Bianca; Bernardi, Luigi; Arcamone, Federico; and Di Marco, Aurelio, 4,046,878, Cl. 424-180.000.

Bernatt, Joseph; and Guleserian, John E., to S&C Electric Company. Breather assembly for electrical apparatus. 4,047,142, Cl. 337-186.000.

Bernstein, Seymour; Lenhard, Robert Herman; and Heller, Milton David, to American Cyanamid Company. Substituted-hydroxy-naphthalenedisulfonic acid compounds. 4,046,805, Cl. 260-506.000.

Bessler, Donald U.; and Tacchi, Kenneth J., to Petrolite Corporation. Distillate fuel containing dehazing compositions. 4,046,521, Cl. 44-62.000.

Best, Anthony; and Harman, Harold, to Moulton Developments Limited. Rubber flap damper valves. 4,046,360, Cl. 267-65.00B.

Best, Stanley Gordon, to United Technologies Corporation. Fluidic temperature sensor. 4,046,008, Cl. 73-349.000.

Better Packages, Inc.: *See—*
Ellner, Edwin, 4,047,006, Cl. 235-151.330.

Bhandarkar, Dileep P.: *See—*
Choate, William Clay; and Bhandarkar, Dileep P., 4,047,163, Cl. 340-173.00R.

Bharucha, Kekhusroo R.; Ajdukovic, Djordje; Pavilanis, Vytautas; and Mackay, Angus Campbell, to Canada Packers Limited. Antiviral 1,2,3,4-tetrahydro-1,4-alkanonaphthalenamine derivatives. 4,046,811, Cl. 260-578.000.

Bigalke, Erhard; Wolf, Jurgen; and Schmelzer, Gunther, to Volkswagenwerk Aktiengesellschaft. Regulating arrangement for internal combustion engines, especially those with a fuel injection system. 4,046,129, Cl. 123-32.0EA.

Bijker, Arnold Jan; and Riemens, Karel, to U.S. Philips Corporation. Digital transmission system for transmitting speech signals at a low bit rate, and transmission for use in such a system. 4,047,108, Cl. 325-38.00B.

Binard, William J.: *See—*
Libman, Gary; Binard, William J.; and Patel, Harish A., 4,046,138, Cl. 128-2.00F.

Bione, Angelo A., to Hammond Corporation. Digital touch responsive tempo generating device. 4,046,048, Cl. 84-1.030.

Bissinger, William E., to PPG Industries, Inc. S-p-Methoxyphenyl N-2,3-dibromopropylthiolcarbamate and its use in the control of plant nematodes. 4,046,912, Cl. 424-300.000.

Bjorkholm, John Ernst; and Liao, Paul Foo-Hung, to Bell Telephone Laboratories, Incorporated. Deflection of atomic beams with isotope separation by optical resonance radiation using stimulated emission and the A.C. Stark effect. 4,047,026, Cl. 250-251.000.

Blackman, Ralph Eugene: *See—*
Parise, Carl; Blackman, Ralph Eugene; and Wimsatt, James M., 4,046,989, Cl. 219-437.000.

Blaine, Geneva, executrix: *See—*
Blaine, Neal Franklin, deceased; and Blaine, Geneva, executrix, 4,046,669, Cl. 208-11.0LE.

Blaine, Neal Franklin, deceased; and Blaine, Geneva, executrix. Solvent extraction of oil from tar sands utilizing a trichloroethylene solvent. 4,046,669, Cl. 208-11.0LE.

Blaisdell, Donald S.; and Walter, Llewellyn L., to Towmotor Corporation. Floating steering axle. 4,046,218, Cl. 180-155.000.

Bland, Herbert; and Schaul, Joseph B. Vehicle bumper mounted carrier for cycles. 4,046,297, Cl. 224-42.03B.

Bletz, Walter; and Holle, Werner, to Ernst Leitz GmbH. Electronic storage, indicator and exposure time control device for photographic cameras. 4,047,189, Cl. 354-23.00D.

Bloom, Stanley M.: *See—*
Land, Edwin H.; Bloom, Stanley M.; and Rogers, Howard G., 4,046,457, Cl. 350-164.000.

Blount, Richard, to General Electric Company. Photoflash array construction. 4,047,015, Cl. 240-1.300.

Bock, Heinz-Wilhelm: *See—*
Aleite, Werner; and Bock, Heinz-Wilhelm, 4,046,624, Cl. 176-22.000.

Bodor, Nicolae S., to INTERNx Research Corporation. Labile quaternary ammonium salts useful in binding bile acids in warm-blooded animals. 4,046,899, Cl. 424-266.000.

Boehringer Ingelheim GmbH: *See—*
Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; and Traunecker, Werner, 4,046,913, Cl. 424-311.000.
Swetly, Peter, 4,046,879, Cl. 424-180.000.

Boehringer, John R.; and Lecky, John. Sealable activated charcoal gas sampler. 4,046,014, Cl. 73-421.50R.

Boeing Company, The: *See—*
Bryan, Darold Ray, 4,046,347, Cl. 248-346.000.

Bogert, Allen Z. Joint system for wall panel construction. 4,045,932, Cl. 52-460.000.

Boice, Michael F., to Electronic Memories & Magnetics Corporation. Read and write drive system for a 2½D coincident current magnetic core memory. 4,047,164, Cl. 340-174.00M.

Boie, Immo; and Lowski, Dieter, to AGFA-Gevaert, Aktiengesellschaft. Color photographic material containing 2-equivalent yellow couplers. 4,046,575, Cl. 96-100.00N.

Bom, Cornelis Johannes Gerardus: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,046,202, Cl. 172-72.000.

Bonar & Bemis Ltd.: *See—*
Flantua, Gysbertus, 4,045,941, Cl. 53-35.000.

Bonds, James Vaull, to McEvoy Oilfield Equipment Co. Run-in and tie back apparatus. 4,046,405, Cl. 285-3.000.

Bonne, Ulrich, to Honeywell Inc. Electro-optic cell with transverse electric field. 4,046,456, Cl. 350-160.00R.

Bonneau, Benoit. Non-return valve for preventing back flow of waste waters. 4,046,161, Cl. 137-247.170.

Booth, Thomas Allan; and Scholten, Frank Lynn, to Addressograph Multigraph Corporation. Exposure control system for photocomposition machines. 4,046,475, Cl. 355-69.000.

Booth, Vernard S.; and Oswalt, Billy W., to Olinkraft, Inc. Two cell bulk container. 4,046,307, Cl. 229-15.000.

Borba, Paul A.: *See—*
Miller, Harry R.; and Borba, Paul A., 4,046,109, Cl. 119-92.000.

Borg-Warner Corporation: *See—*
Rickert, Paul Ellis, 4,046,844, Cl. 261-34.00A.
van Hesden, Jan Willem, 4,046,524, Cl. 51-306.000.

Born, Grant R. Cervix photographic method. 4,046,140, Cl. 128-2.00R.

Bors, Gyozo: *See—*
Andriska, Viktor; Gorog nee Privitzer, Katalin; Bruckner, Gyorgyi; Nemessanyi nee Szekely, Zsuzsanna; Havasi, Miklos; Raskay, Bela; Grega nee Toth, Erzsebet; Szigeti nee Haranghy, Terez; Dudas, Jozsef; Szilagyi, Gyula; Marosvolgyi, Sandor; Gribovszky, Pal; Pinter, Zoltan; and Bors, Gyozo, 4,046,773, Cl. 548-339.000.

Boudry, Michael Robert, to U.S. Philips Corporation. Data transmission systems. 4,047,159, Cl. 364-900.000.

Boughton, Edward M.: *See—*
Kuonen, Frederick L.; and Boughton, Edward M., 4,046,100, Cl. 118-8.000.

Bourdo, Charles A. Progressive die sensor. 4,046,040, Cl. 83-63.000.

Bowen, James H., to W. G. Jaques Company. Liquid level indicator and flow measuring device. 4,045,876, Cl. 33-126.600.

Bowman, James Lee, to Long-Lok Fasteners Corporation. Apparatus and method of forming self-locking fastener. 4,046,106, Cl. 118-620.000.

Boyd, George F., Sr., to Tri-State Motor Transit Company. Retentive base for shipping cask. 4,046,345, Cl. 248-154.000.

Boysen, Mogens Bredal, to 4K - International A/S. Pulse generator. 4,047,047, Cl. 307-106.000.

BP Chemicals Limited: *See—*
Thornburrow, Peter Robert, 4,046,740, Cl. 260-75.00N.

Brackenridge, Alexander Robertson, executor: *See—*
Paterson, Donald MacDougal, deceased; and Brackenridge, Alexander Robertson, executor, 4,046,044, Cl. 83-489.000.

Bradley, William David: *See—*
Alvi, Zia Raheem; Bradley, William David; Denham, Keith; and Summerlin, Frederick Arthur, 4,046,053, Cl. 85-72.000.

Brandes, Guenther. Rolling pin with dough thickness control. 4,045,850, Cl. 29-111.000.

Brandt, Bernd; Jansen, Peter; and Liesenfeld, Heinz, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, DT. System for venting the heating pipes of a tubular rotary dryer. 4,045,881, Cl. 34-138.000.

Branham, Charles Escom; Steury, Thomas Dean; and Woodward, John Maury, to International Business Machines Corporation. Dual mode electrophotographic apparatus having dual function printing beam. 4,046,471, Cl. 355-14.000.

Brannstrom, Roine; and Nilsson, Goran, to Stal-Laval Turbin AB. Regulating means for gas turbine plant. 4,045,955, Cl. 60-39.28R.

Bratyshev, Igor Petrovich: *See—*
Feinzilber, Mikhail Leibovich; Kuzin, Eduard Nikolaevich; Timofeev, Gennady Ivanovich; Roitershtein, Semen Semenovich; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Bratyshev, Igor Petrovich; Omelyan, Fedor Evstafievich; Sheinis, Efim Iosifovich; Pak, Vladimir Grigorievich; Romanov, Vladimir Ivanovich; Garbuzov, Zalman Eremeevich; and Naret, Grigory Borisovich, deceased, 4,045,893, Cl. 37-108.00A.

Braukmann Armaturen AG: *See—*
Braukmann, Bernhard W.; and Vollmer, Rudolph, 4,046,692, Cl. 210-108.000.

Braukmann, Bernhard W.; and Vollmer, Rudolph, to Braukmann Armaturen AG. Domestic water control unit. 4,046,692, Cl. 210-108.000.

Braun, Anton. Free piston engine fuel feeding apparatus. 4,046,115, Cl. 123-46.00R.

Braun, Eugene R.; and Richards, Elmer A., to Eaton Corporation. Start control. 4,046,032, Cl. 74-865.000.

Bray, Donald Thedore, to Desalination Systems, Inc. Simultaneous production of multiple grades of purified water by reverse osmosis. 4,046,685, Cl. 210-23.00H.

Brazerol, William A.: *See—*
Briggs, Southwick W.; and Brazerol, William A., 4,046,697, Cl. 210-457.000.

Brennen, Michael B.: *See—*
Gyugyi, Laszlo; Stacey, Eric J.; and Brennen, Michael B., 4,047,097, Cl. 323-119.000.

Brenner, George John, Jr., to Emerson Electric Co. Frost detector. 4,045,971, Cl. 62-140.000.

Brenner, Wolf, to Hoffmann-La Roche Inc. Process for producing ketoisophorone. 4,046,813, Cl. 260-586.00P.

Breyley, Thomas E. Walking aid. 4,046,374, Cl. 272-70.300.

Bridgestone Tire Company Limited: *See—*
Takahashi, Hidenori; Tamura, Hiroshi; Watanabe, Shigeo; and Sogi, Toshiyuki, 4,046,183, Cl. 152-362.00R.

Briggs, Southwick W.; and Brazerol, William A. Pleated paper filter. 4,046,697, Cl. 210-457.000.

Brinlee, Homer L. Vacuum subjugated accelerator. 4,046,117, Cl. 123-103.00C.

Briody, Ronald Francis: *See—*
Coast, Geoffrey; and Briody, Ronald Francis, 4,046,630, Cl. 176-39.000.

Bristol-Myers Company: *See—*
Samour, Carlos M.; and Vida, Julius A., 4,046,894, Cl. 424-254.000.

British Petroleum Company Limited, The: *See—*
Burbidge, Bernard Whiting; Cook, Terence John; and Crowson, Roger, 4,046,671, Cl. 208-138.000.

Brodie, Edwin T., to Bandag Incorporation. Material and methods for bonding treads to tires. 4,046,947, Cl. 428-352.000.

Brokenshire, John Leslie: *See—*
Showalter, Lane Crawford; Brokenshire, John Leslie; and Watts, Geoffrey B., 4,045,997, Cl. 73-23.000.

Brooker, Lenon G.: *See—*
McCaskey, Harold O., Jr.; and Brooker, Lenon G., 4,046,937, Cl. 428-211.000.

Brooks, Frank W.: *See—*
Baynes, Gene P.; and Brooks, Frank W., 4,046,427, Cl. 303-115.000.

Brorein, William J., to General Cable Corporation. Connector for use with printed wiring circuits. 4,046,444, Cl. 339-91.00R.

Broucksou, Robert H., to Eaton Corporation. Adjustable steering column support. 4,046,024, Cl. 74-493.000.

Brown, Alfred; Hager, Stephen F.; Chichakli, Moutaz; and Wu, Ching H., to Texaco Inc. Secondary oil recovery process. 4,046,196, Cl. 166-273.000.

Brown, Dennis Cockburn; and Murray, Reginald, to Associated Engineering Limited. Metallic bonding method. 4,046,305, Cl. 228-194.000.

Brown, Michael Kenneth, to Burroughs Corporation. Conditioning system for transducer signals. 4,046,961, Cl. 179-1.00P.

Brown, Villy, to Aetna Bearing Company. Articulated thrust bearing. 4,046,436, Cl. 308-233.000.

Brown, William B., to General Motors Corporation. Process for electrocoating aminimide containing compositions. 4,046,658, Cl. 204-181.000.

Bruckner, Gyorgyi: *See—*
Andriska, Viktor; Gorog nee Privitzer, Katalin; Bruckner, Gyorgyi; Nemessanyi nee Szekely, Zsuzsanna; Havasi, Miklos; Raskay, Bela; Grega nee Toth, Erzsebet; Szigeti nee Haranghy, Terez; Dudas, Jozsef; Szilagyi, Gyula; Marosvolgyi, Sandor; Gribovszky, Pal; Pinter, Zoltan; and Bors, Gyozo, 4,046,773, Cl. 548-339.000.

Bruml, Norman A. Display package. 4,046,251, Cl. 206-45.140.

Bruning, William E., to OMNI Corporation. Temporary door installation for grain carrying freight car. 4,046,185, Cl. 160-368.00G.

Brunninger, Manfred: *See—*
Theurer, Josef; and Brunninger, Manfred, 4,046,077, Cl. 104-2.000.

Brunswick Corporation: *See—*
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Bryan, Darold Ray, to Boeing Company, The. Adaptor assembly. 4,046,347, Cl. 248-346.000.

Bryant, Nelson H.; Hobler, Ross L.; Allen, Wilbur J.; and Polseo, Joseph W., to Powers Manufacturing, Inc. Control system for computer controlled identification of bottles. 4,047,000, Cl. 235-151.100.

Bryant, Richard: *See—*
Kruk, Anthony Richard; Bryant, Richard; and Harper, Samuel, 4,045,855, Cl. 29-252.000.

Brzezinski, Alex Michael: *See—*
Baumhauer, John Charles, Jr.; Brzezinski, Alex Michael; Warren, Joe Edward; and Whitesell, Stephen Reed, 4,046,974, Cl. 179-111.00R.

Bucyrus-Erie Company: *See—*
Barber, Ellery H., 4,046,035, Cl. 82-1.00C.
Sterner, Russell L., 4,045,936, Cl. 52-632.000.

Budinski, John A.; and Flora, Raymond A., to General Motors Corporation. Windshield wiper drive mechanism having a depressed park position. 4,046,020, Cl. 74-70.000.

Buehler, Arthur: *See—*
Zweifel, Hans Heini; Buehler, Arthur; and Fasciati, Alfred, 4,046,507, Cl. 8-79.000.

Buffington, James F.; and Norris, Lee E. Grain drying apparatus and process. 4,045,882, Cl. 34-171.000.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,046,786, Cl. 260-396.00N.

Buono, Dennis F.; Carlson, Nils G.; Hibner, David H.; and Moringiello, Donald C., to United Technologies Corporation. Damped intershaft bearing and stabilizer. 4,046,430, Cl. 308-26.000.

Burbidge, Bernard Whiting; Cook, Terence John; and Crowson, Roger, to British Petroleum Company Limited, The. Reduction of platinum group metal catalysts. 4,046,671, Cl. 208-138.000.

Burden, David M.; and Malaney, Frank N., to Western Electric Company, Inc. Fused resistive electrical protection device. 4,047,143, Cl. 337-239.000.

Burg, Karlheinz: *See—*
Sextro, Gunter; Burg, Karlheinz; Leugering, Hans Joachim; Schlaf, Helmut; and Heller, Alwin, 4,046,738, Cl. 260-67.0FP.

Burkwall, Morris P., Jr., to Quaker Oats Company, The. Shelf stable, semi-moist simulated egg. 4,046,922, Cl. 426-104.000.

Burnett, Joseph C., Jr.; Hicks, John J.; and Hovey, Leonard L., to Monsanto Company. Electrolytic hydrodimerization process improvement. 4,046,651, Cl. 204-73.00R.

Burnett, Walter L. Dental articulator. 4,045,873, Cl. 32-32.000.

Burnham, Emily A. Female urinal apparatus. 4,045,828, Cl. 4-110.000.

Burnham, William E. Internal combustion engines. 4,046,116, Cl. 123-48.00R.

Burns, Dallas D., to Honeywell Inc. Expanded ring bellows. 4,045,959, Cl. 60-632.000.

Burroughs Corporation: *See—*
Bennett, Walter Scott, 4,047,011, Cl. 235-164.000.
Brown, Michael Kenneth, 4,046,961, Cl. 179-1.00P.
Dijkstra, Edsger W., 4,047,243, Cl. 364-200.000.
Holz, George E., 4,047,169, Cl. 340-324.00M.
Hutchison, Robert V., 4,046,442, Cl. 339-17.0CF.
Kobylarz, Lawrence P.; and Mack, Ronald H., 4,047,229, Cl. 360-2.000.
Lau, Edward H.; and Marino, Francis C., 4,047,241, Cl. 361-288.000.
Sevak, Nitin M., 4,046,371, Cl. 271-178.000.

Burton, David C., to Phillips Petroleum Company. Device for installation of plastic fifth wheel liner on a truck trailer. 4,045,854, Cl. 29-235.000.

Burton, Pamela M.: *See—*
White, Abraham; and Burton, Pamela M., 4,046,877, Cl. 424-177.000.

Burton, Vance P.; and Mikulicz, Michael Z., to UOP Inc. Hydrogen fluoride-catalyzed alkylation apparatus. 4,046,516, Cl. 23-288.00E.

Busam, Donald H.: *See—*
Redelman, Paul E.; and Busam, Donald H., 4,046,267, Cl. 214-16.40B.

Busby, Llewellyn D.: *See—*
Toft, Kaj; and Busby, Llewellyn D., 4,045,894, Cl. 38-77.830.

Busch, Lothar; and Franck, Gunter, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. Lamp having amalgam contained in a porous silicate mass. 4,047,071, Cl. 313-490.000.

Buschmann, Sylvester. Fence wire stretching device. 4,046,353, Cl. 254-83.000.

Buzzard, Kenneth J., to Westinghouse Air Brake Company. Wayside signaling system for railroad cab signals and speed control. 4,046,342, Cl. 246-34.00R.

Bye, Carolyn N., to National Casein of New Jersey. Proteinaceous adhesive composition. 4,046,955, Cl. 428-479.000.

Byer, John A. Gun cleaner. 4,045,900, Cl. 42-1.00R.

C. van der Lely N. V.: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,046,202, Cl. 172-72.000.

Cadeddu, Leonardo, to Benditalia S.p.A. Fluid reservoir. 4,046,977, Cl. 200-84.00C.

Cairns, James Anthony; Nelson, Richard Stuart; and Barnfield, Rhydwyn William, to United Kingdom Atomic Energy Authority. Catalysts sputtered on substantially nonporous low surface area particulate supports. 4,046,712, Cl. 252-447.000.

California and Hawaiian Sugar Company: *See—*
Riffer, Richard, 4,046,590, Cl. 127-46.00B.

California Institute of Technology: *See—*
Rembeum, Alan; Yen, Shiao-Ping S.; and Dreyer, William J., 4,046,720, Cl. 260-2.50B.
Rembaum, Alan, 4,046,750, Cl. 526-310.000.

Campbell, Kenneth J., to United States of America, Navy. RF signal generator. 4,047,121, Cl. 331-76.000.

Canada, Her Majesty the Queen in Right of: *See—*
Hart, John A. H., 4,046,939, Cl. 428-311.000.

Canada Packers Limited: *See—*
Bharucha, Kekhusroo R.; Ajdukovic, Djordje; Pavilanis, Vytautas; and Mackay, Angus Campbell, 4,046,811, Cl. 260-578.000.

Canadian International Paper Company: *See—*
Sexton, Ernest Arthur, 4,046,621, Cl. 162-40.000.

Canadian Lady-Canadelle Inc.: *See—*
Asel, John R.; Allaire, Roger; Thalmann, Peter; and Castonguay, Rene, 4,046,088, Cl. 112-265.000.
Asel, John R.; Allaire, Roger; Thalmann, Peter; and Castonguay, Rene, 4,046,089, Cl. 112-265.000.

Canadian Pacific Limited: *See—*
Kruk, Anthony Richard; Bryant, Richard; and Harper, Samuel, 4,045,855, Cl. 29-252.000.

Canadian Patents and Development Limited: *See—*
Moroz, Leonard Arthur, 4,046,635, Cl. 195-103.700.
Shen, Kuo-Cheng, 4,046,585, Cl. 106-123.0LC.

Canon Kabushiki Kaisha: *See—*
Ando, Yujiro; Ohara, Katsunobu; and Shinohara, Yukimasa, 4,046,466, Cl. 355-3.00R.
Kawamura, Naoto, 4,046,459, Cl. 350-214.000.
Mashimo, Yukio; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,047,187, Cl. 354-23.00D.
Nakamura, Zenzo; Uchiyama, Takashi; Uchidoi, Masanori; Taguchi, Tetsuya; Aizawa, Hiroshi; and Tsunekawa, Tokuichi, 4,047,194, Cl. 354-149.000.
Shimazaki, Mamoru; Toyama, Masamichi; Ichiyanagi, Toshikazu; and Iwama, Hideto, 4,046,464, Cl. 352-141.000.
Toyama, Masamichi; Takigawa, Tomoshi; Shimazaki, Mamoru; Okajima, Hidekazu; Ichiyanagi, Toshikazu; and Iwama, Hideto, 4,046,465, Cl. 352-175.000.

Capeling, Thomas W.; and Lovins, Robert G. Apparatus and method for making decorative tiles. 4,046,090, Cl. 113-1.00K.

Capelle, Anton; and Scholten, Heinz, to Chemische Werke Huls Aktiengesellschaft. Additive for improving the adhesion to textiles of hot melt adhesives based on copolyamides. 4,046,747, Cl. 260-78.00S.

Cardinal Extrusions Co.: *See—*
Reinhardt, James Donald, 4,045,898, Cl. 40-156.000.

Carl Hurth Maschinen- und Zahnradfabrik: *See—*
Loos, Herbert; Seitz, Max; and Erhardt, Manfred, 4,045,917, Cl. 51-123.00G.

Carl Still Recklinghausen, Firma: *See—*
Tippmer, Kurt, 4,045,970, Cl. 62-95.000.

Carl Wurth Maschinen- und Zahnradfabrik: *See—*
Seitz, Max, 4,045,916, Cl. 51-123.00G.

Carl Zeiss-Stiftung: *See—*
Grosskopf, Rudolf, 4,047,205, Cl. 358-107.000.

Carlson, Nils G.: *See—*
Buono, Dennis F.; Carlson, Nils G.; Hibner, David H.; and Moringiello, Donald C., 4,046,430, Cl. 308-26.000.

Carman, Charles Jerry; Batiuk, Martin; and Herman, Richard Michael, to B. F. Goodrich Company, The. Thermoplastic polymer blends of an EPDM polymer having a high ethylene length index with polyethylene. 4,046,840, Cl. 260-897.00A.

Caron, Aristide Leon; and Caron, Paulette Marie Laure. Combination cabinet for audio-visual teaching. 4,046,437, Cl. 312-20.000.

Caron, Paulette Marie Laure: *See—*
Caron, Aristide Leon; and Caron, Paulette Marie Laure, 4,046,437, Cl. 312-20.000.

Carr, David M.; and Chandler, Thomas O., to Monsanto Company. Core transfer process. 4,045,858, Cl. 29-427.000.

Carrie, George W., to Garrett Corporation, The. Pneumatic gun system and method. 4,046,056, Cl. 89-12.000.

Carroll, Max L., Jr., to Eastman Kodak Company. Polyester-polyolefin blend film or coating composition. 4,046,837, Cl. 260-873.000.

Carson, Don B., to UOP Inc. Power generation and potable water recovery from salinous water. 4,046,639, Cl. 203-11.000.

Carson, Don B., to UOP Inc. Power generation and potable water recovery from salinous water. 4,046,640, Cl. 203-11.000.

Carson, Edward H. D.: *See—*
Smith, Royal; and Carson, Edward H. D., 4,046,618, Cl. 297-118.000.

Carter, Neil: *See—*
Lewis, Cyril John; Carter, Neil; and Ray, Neil Hunter, 4,046,540, Cl. 65-18.000.

Case Existological Laboratories, Ltd.: *See—*
Case, John N., 4,046,178, Cl. 141-1.000.

Case, John N., to Case Existological Laboratories, Ltd. Floating bag for pollution study. 4,046,178, Cl. 141-1.000.

Cashion, Charles M.: *See—*
Paxton, Grady W., Jr.; Howeth, Bobby W.; Mehal, Edward W.; Cashion, William F.; and Cashion, Charles M., 4,047,045, Cl. 250-551.000.

Cashion, William F.: *See—*
Paxton, Grady W., Jr.; Howeth, Bobby W.; Mehal, Edward W.; Cashion, William F.; and Cashion, Charles M., 4,047,045, Cl. 250-551.000.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 4,045,952, Cl. 58-23.00R.

Cass, Ann E., to Continental Group, Inc., The. Composite end panel for can or similar container. 4,046,306, Cl. 229-5.700.

Cassarly, James William, to AMP Incorporated. Electrical connector housing having an improved locking means. 4,046,452, Cl. 339-198.00H.

Cassidy, John Edward, to Imperial Chemical Industries Limited. Refractory binder. 4,046,581, Cl. 106-85.000.

Castel Mac S.p.A.: *See—*
Mazzini, Leone, 4,045,979, Cl. 62-352.000.

Castleman, Cordell V., to Magnetic Controls Company. Ringing detector for telephone circuits. 4,046,970, Cl. 179-84.00L.

Castonguay, Rene: *See—*
Asel, John R.; Allaire, Roger; Thalmann, Peter; and Castonguay, Rene, 4,046,088, Cl. 112-265.000.
Asel, John R.; Allaire, Roger; Thalmann, Peter; and Castonguay, Rene, 4,046,089, Cl. 112-265.000.

Catlett, John C., to Stanley Works, The. Automatic door operator. 4,045,914, Cl. 49-334.000.

Cavalla, John Frederick; and Archibald, John Leheup, to John Wyeth & Brother Limited. Piperidino compounds. 4,046,767, Cl. 260-293.770.

Cavitt, Stanley B., to Texaco Development Corporation. Method of olefin epoxidation. 4,046,783, Cl. 260-348.330.

Cazalaa, Jean Michel; Barthe, Alexandre Jean-Paul; and Derrien, Andre Robert. Electrical control for inflating valve for containers for compressed liquefied or dissolved gas. 4,046,157, Cl. 137-74.000.

Cebal: *See—*
Winckler, Richard, 4,045,860, Cl. 29-451.000.

Cebrian, Gregorio Ramon, to Fundacion de Estudios Farmaco-Biologicos. Treatment of cells. 4,046,918, Cl. 424-331.000.

Cebrian, Gregorio Ramon, to Fundacion de Estudios Farmaco-Biologicos. Treatment of cells. 4,046,919, Cl. 424-338.000.

Cecil, Richard R.: *See—*
Paynter, John D.; Fuqua, Beverly B.; and Cecil, Richard R., 4,046,673, Cl. 208-140.000.

Celada, Juan; and MacKay, Patrick W., to Fierro Esponja, S.A. Direct gaseous reduction of oxidic metal ores with dual temperature cooling of the reduced product. 4,046,556, Cl. 75-35.000.

Center for Design Research and Development N.V.: *See—*
Ambasz, Emilio, 4,046,422, Cl. 297-248.000.

Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie: *See—*
Economopoulos, Mario, 4,046,599, Cl. 148-12.00B.

Centre Electronique Horloger S.A.: *See—*
Perotto, Jean Felix; and Vittoz, Eric, 4,047,010, Cl. 235-156.000.

Chad, Kenneth Ernest: *See—*
Sefton, Philip Charles; and Chad, Kenneth Ernest, 4,046,991, Cl. 219-497.000.

Challen, Richard F., to General Electric Company. Digital tone generator for use with radio transmitters and the like. 4,047,009, Cl. 235-152.000.

Chambers, Joseph W. Solid waste comminutor. 4,046,324, Cl. 241-46.060.

Champagne, Patrick Joseph, to Control Data Corporation. Printed circuit card guide. 4,046,443, Cl. 339-66.00M.

Champion International Corporation: *See—*
Wright, John T., 4,045,913, Cl. 49-307.000.

Chandler, Thomas O.: *See—*
Carr, David M.; and Chandler, Thomas O., 4,045,858, Cl. 29-427.000.

Chang, Wen-Hsuan: *See—*
Scriven, Roger L.; and Chang, Wen-Hsuan, 4,046,729, Cl. 260-29.2TN.

Chapman, William L.; and Newlin, Larry L., to Continental Oil Company. Digital controlled low frequency power amplifier. 4,047,090, Cl. 363-34.000.

Charamella, John Barrie; Long, John Warren; and Stone, Jerry Lloyd, to Du Pont de Nemours, E. I., and Company. Color design method. 4,046,476, Cl. 355-77.000.

Charlton Company, Inc.: *See—*
Spound, Albert M.; and Day, Robert C., 4,046,421, Cl. 297-232.000.

Chase, Ascher, to General Foam Plastics Corporation. Shuttle toy having two orifices and shock absorbing means. 4,046,379, Cl. 273-95.0AA.

Chase, Paul Herbert, to Combustion Engineering, Inc. Digital-storage filter. 4,046,997, Cl. 235-150.500.

Chaudhari, Praveen; Cuomo, Jerome John; and Matthews, John Wauchope, to International Business Machines Corporation. Method for preparing large single crystal thin films. 4,046,618, Cl. 156-603.000.

Chemap AG: *See—*
Muller, Hans; and Grob, Louis, 4,046,789, Cl. 260-412.800.

Chemcut Corporation: *See—*
Goffredo, Daniel L.; and Shakley, Conrad Dale, 4,046,248, Cl. 198-583.000.

Chemetics International Ltd.: *See—*
Westerlund, Gothe Oscar, 4,046,665, Cl. 204-282.000.

Chemische Werke Huls Aktiengesellschaft: *See—*
Baxmann, Fritz; Frese, Albert; Roben, Hermann; and Wolpers, Jurgen, 4,046,945, Cl. 428-282.000.
Capelle, Anton; and Scholten, Heinz, 4,046,747, Cl. 260-78.00S.
Sridhar, Srinivasan; and Hedden, Horst, 4,046,746, Cl. 260-78.00S.

Chen, Nai Yuen; and Heinemann, Heinz, to Mobil Oil Corporation. Pre-engine converter for use with fuels containing oxygenated compounds. 4,046,522, Cl. 48-102.00A.

Cheng, Paul J., to Phillips Petroleum Company. Process to produce carbon black. 4,046,864, Cl. 423-450.000.

Cherry, Kenneth F. Prismatic perspective control device. 4,046,461, Cl. 350-287.000.

Chesley, Ronald F.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 4,046,380, Cl. 273-119.00R.

Chevron Research Company: *See—*
Kemp, Jacob D.; and Sieg, Robert P., 4,046,520, Cl. 44-56.000.
Liston, Thomas V., 4,046,702, Cl. 252-33.400.
Olund, Sven A., 4,046,533, Cl. 62-468.000.
Ransley, Derek L., 4,046,824, Cl. 260-667.000.

Chiba, Shigeo: *See—*
Izumi, Takichiro; Chiba, Shigeo; and Kobayashi, Kazumitsu, 4,046,136, Cl. 126-271.000.

Chichakli, Moutaz: *See—*
Brown, Alfred; Hager, Stephen F.; Chichakli, Moutaz; and Wu, Ching H., 4,046,196, Cl. 166-273.000.

Chieger, George; Schwartz, Robert B.; and Banerjea, Tara N., to Fruehauf Corporation. Air cargo container. 4,046,278, Cl. 220-1.500.

Chloride Group Limited: *See—*
Edwards, William Howard, 4,046,642, Cl. 204-2.100.

Choate, William Clay; and Bhandarkar, Dileep P., to Texas Instruments Incorporated. Fault-tolerant cell addressable array. 4,047,163, Cl. 340-173.00R.

Choksi, Pradip Vinobchandra; and Seemayer, Walter, to American Hospital Supply Corporation. Syringe connector. 4,046,145, Cl. 128-215.000.

Chomerics, Inc.: *See—*
Seeger, Richard E., Jr., 4,046,975, Cl. 200-5.00A.

Chu, Nori Y. C.: *See—*
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,046,586, Cl. 106-194.000.

Chugoku Marine Paints, Ltd.: *See—*
Matsuda, Sumio; and Kudara, Hajime, 4,046,791, Cl. 260-429.700.

Chung, William John: *See—*
Mitchell, Robert Lee; and Chung, William John, 4,046,872, Cl. 424-52.000.

Ciba-Geigy AG: *See—*
Marthaler, Max, 4,046,566, Cl. 96-7.000.
Zweifel, Hans Heini; Buehler, Arthur; and Fasciati, Alfred, 4,046,507, Cl. 8-79.000.

Ciba-Geigy Corporation: *See—*
Baccini, Peter; and Fory, Werner, 4,046,793, Cl. 260-439.00R.
Garner, Robert; and Petitpierre, Jean-Claude, 4,046,776, Cl. 260-326.14R.
Holt, Brian; and Randell, Donald Richard, 4,046,737, Cl. 260-45.80N.
Hubele, Adolf, 4,046,911, Cl. 424-285.000.
Mory, Rudolf; and Muller, Rolf, 4,046,755, Cl. 260-174.000.
Mueller, Karl Friedrich; and Falk, Robert A., 4,046,944, Cl. 428-262.000.
Muller, Albrecht, 4,046,777, Cl. 260-326.260.
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 4,046,788, Cl. 260-404.000.
Zimmerli, Willi, 4,046,734, Cl. 260-38.000.

Ciba Geigy (UK) Limited: *See—*
Smith, Malcolm John; Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, 4,046,707, Cl. 252-180.000.

Ciliberti, David F.: *See—*
Westervelt, Dean C.; Scala, Luciano C.; Saunders, Howard E.; and Ciliberti, David F., 4,046,592, Cl. 134-1.000.

Cimon, Denis Gaston: *See—*
Paris, Gerard Yvon; and Cimon, Denis Gaston, 4,046,887, Cl. 424-232.000.

City Products Corporation: *See—*
Richardson, William H., 4,045,899, Cl. 40-322.000.

City Tank Corporation: *See—*
McKenzie, Roland W., 4,046,269, Cl. 214-83.300.

Clapham, Leslie, to United Kingdom Atomic Energy Authority. Plugs. 4,046,631, Cl. 176-79.000.

Clark, John A., Jr., to Harsco Corporation. Water heater. 4,046,189, Cl. 165-39.000.

Clark, Lowell E.; Roop, Raymond M.; and Volk, Charles E., to Motorola, Inc. Semiconductor devices with improved turn-off characteristics. 4,047,218, Cl. 357-34.000.

Clark, Thomas S.; Kennedy, William S.; and Piziali, Robert L., to American Tennis Systems, Inc. Tennis ball collection, pick-up and propelling system. 4,046,131, Cl. 124-71.000.

Clark, William F. Bed sheet. 4,045,831, Cl. 5-334.00R.

Clark, William H.: *See—*
Dermond, Hartley P., 4,046,485, Cl. 404-123.000.

Clausen, Edward M., to General Electric Company. Sodium halide discharge lamp with an alumina silicate barrier zone in fused silica envelope. 4,047,067, Cl. 313-221.000.

Clausen, Eva: *See—*
Reinhardt, Helmut; Gratzfeld, Everhard; and Clausen, Eva, 4,046,861, Cl. 423-367.000.

Clavier, Christian M.: *See—*
Bateman, Richard M.; and Clavier, Christian M., 4,047,027, Cl. 250-264.000.

Clemson, Daniel Michael: *See—*
Kerllenevich, Natalio; and Clemson, Daniel Michael, 4,047,246, Cl. 364-200.000.

Cleveland, Joseph J.: *See—*
Warner, Leadom A.; and Cleveland, Joseph J., 4,046,612, Cl. 156-205.000.

Clissett, Dennis Edward, to Imperial Chemical Industries Limited. Process for bulking knitted fabric articles. 4,045,981, Cl. 66-147.000.

Cloud, Nathan; and Smith, James Edwin, to Du Pont de Nemours, E. I., and Company. Apparatus to assist doffing pckages in a yarn windup. 4,046,328, Cl. 242-18.00A.

Cloud, Wayne B., to Mobil Oil Corporation. Electrolinking method for

improving permeability of hydrocarbon formation. 4,046,194, Cl. 166-248.000.
Clovis, James S.: *See—*
Cunningham, Virginia L.; Clovis, James S.; and Hurwitz, Marvin J., 4,046,688, Cl. 210-37.00R.
Coast Catamaran Corporation: *See—*
Lomas, James Arthur, III; Lee, Ronald La Verne; and Holland, Andrew Macdonald, 4,046,091, Cl. 114-39.000.
Coast, Geoffrey; and Briody, Ronald Francis, to United Kingdom Atomic Energy Authority. Process plant. 4,046,630, Cl. 176-39.000.
Cobb, Malcolm Carnie; and Elliott, Pamela, to Imperial Chemical Industries Limited. Post dyeing resin particles fixed to resin base. 4,046,505, Cl. 8-18.00R.
Cochran, David S.: *See—*
Dickinson, Peter D.; Osborne, Thomas E.; Rode, France; Baum, Allen J.; Cochran, David S.; and Tung, Chung C., 4,047,012, Cl. 235-156.000.
Cocksedge, Kenneth W., to Xerox Corporation. Phase-sensitive transducer apparatus. 4,047,086, Cl. 318-608.000.
Cohen, Edward M.; and Oberholtzer, Earl R., to Merck & Co., Inc. Process for preparing a novel benzylamine hydrate. 4,046,804, Cl. 260-501.210.
Colbers, Gerardus Johannes Baptist: *See—*
Einerhand, Johan Jozef; Colbers, Gerardus Johannes Baptist; Huck, Wilhelmus Martha Andreas; and Geurts, Herman Jozef Johannes Maria, 4,046,588, Cl. 106-298.000.
Cole, Marc. Process for desalination with chlor-alkali production in a mercury diaphragm cell. 4,046,654, Cl. 204-99.000.
Colgate Palmolive Company: *See—*
Bauman, Robert Andrew, 4,046,873, Cl. 424-54.000.
Mitchell, Robert Lee; and Chung, William John, 4,046,872, Cl. 424-52.000.
Collepardi, Mario, to Emesa Aktiengesellshaft. Method of producing expansive and high strength cementitious pastes, mortars and concretes. 4,046,583, Cl. 106-90.000.
Collette, Joannes Jacobus Maria: *See—*
Abrahams, Jacobus Hubertus; Collette, Joannes Jacobus Maria; and Walters, Robertus Aloysius Tarcisius Johannes, 4,045,978, Cl. 60-521.000.
Collins, Michael J.: *See—*
Appelbaum, Alfred J.; Collins, Michael J.; and Hanfling, Jerome D., 4,047,179, Cl. 343-768.000.
Combustion Engineering, Inc.: *See—*
Chase, Paul Herbert, 4,046,997, Cl. 235-150.500.
Madewell, George Robison, 4,047,096, Cl. 323-19.000.
Musick, Charles Ronald; and Torres, Jose Marcelo, 4,046,625, Cl. 176-24.000.
Comeaux, George E. Board game with selector die. 4,046,381, Cl. 273-134.0AD.
Comerford, Liam David; and Zory, Peter Stephen, Jr., to International Business Machines Corporation. Planar solid state laser array. 4,047,124, Cl. 331-94.50H.
Commonwealth Scientific and Industrial Research Organization: *See—*
Stringer, Robert Kenneth; and Johnston, Kenneth Alan, 4,046,661, Cl. 204-195.00S.
Compressor Controls Corporation: *See—*
Rutshtein, Alexander; and Staroselsky, Naum, 4,046,490, Cl. 417-28.000.
Congleton, Wayne L., to Dolco Packaging Corporation. Container construction. 4,046,256, Cl. 206-497.000.
Conklin, Thomas, to North American Philips Corporation. Pyroelectric vidicon having target heating means on accelerating anode. 4,047,070, Cl. 313-388.000.
Conlee, Charles J.: *See—*
James, Arthur M.; and Conlee, Charles J., 4,046,414, Cl. 294-81.00R.
Connell, Robert I. Four way security door. 4,046,410, Cl. 292-36.000.
Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, to Warner-Lambert Company. 4,10-Dihydro-4,10-dioxo-1H-1-benzopyrano[3,2-b]pyridine-2-carboxylic acids and esters. 4,046,769, Cl. 260-295.00T.
Consolidation Coal Company: *See—*
Gorin, Everett; Jasulaitis, William A.; Wasson, George E.; and Theodore, Frank William, 4,046,496, Cl. 425-222.000.
Consortium fur Elektrochemische Industrie GmbH: *See—*
Deinhammer, Wolfgang; Wick, Manfred; and Macri, Antonio, 4,046,792, Cl. 260-429.700.
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Continental Group, Inc., The: *See—*
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Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,046,399, Cl. 280-420.000.
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Champagne, Patrick Joseph, 4,046,443, Cl. 339-66.00M.
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Cook, Thomas E. Solar panel assembly for fluid heating and method. 4,046,133, Cl. 126-270.000.
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Inoue, Nobuyoshi; and Shimizu, Munetaka, 4,047,211, Cl. 354-258.000.
Yamada, Misao, 4,047,212, Cl. 354-270.000.
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Coppa, Richard J.; and Gold, Nathan, to Polaroid Corporation. Exposure control system having dynamic aperture flash arrangement. 4,047,191, Cl. 354-27.000.
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Cornelius, Gerhard; Marschner, Friedemann; Supp, Emil; and Varlam, Toma, to Metallgesellschaft Aktiengesellschaft. Process for producing energy. 4,045,960, Cl. 60-648.000.
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Hertl, William; and Odstrchel, Gerald, 4,046,870, Cl. 424-1.000.
Sanford, Leon M.; and Wu, Che-Kuang, 4,046,545, Cl. 65-30.00R.
Zine, Anthony R., Jr., 4,046,699, Cl. 210-516.000.
Corsette, Douglas F. Manual container mounted pump. 4,046,292, Cl. 222-383.000.
Cortez, Raul Chajon. Ellipsograph drafting apparatus. 4,045,875, Cl. 33-30.00D.
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Coulboy, Rene Henri: *See—*
Darnborough, Eric; and Coulboy, Rene Henri, 4,046,192, Cl. 166-.600.
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Scheuer, Paul R.; Cox, Karmen D.; and Sample, Steven B., 4,047,082, Cl. 318-221.00E.
Cox, Robert N.; and Grober, Melvin G., to UMC Industries, Inc. Vendor with door and shelf interlock. 4,046,440, Cl. 312-215.000.
Cram, Phillip J.; and Redford, David A., to Texaco Exploration Canada Ltd. Thermal recovery of hydrocarbons from tar sands. 4,046,195, Cl. 166-272.000.
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Goldstein, Melvin, 4,046,686, Cl. 210-23.00H.
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Cranor, Dennis A., to ESCO Corporation. Releasable lock. 4,046,327, Cl. 241-197.000.
Crawford, Patrick J. Cross-cut shear for trees. 4,046,179, Cl. 144-34.00E.
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Stucky, Fritz Christoph, 4,045,937, Cl. 52-745.000.
Crimes, Peter B., to Kennecott Copper Corporation. Pyrometallurgical system for liquid-liquid contacting. 4,046,559, Cl. 75-93.00R.
Croce, Louis J.; Bajars, Laimonis; and Gabliks, Maigonis, to Petro-Tex Chemical Corporation. Oxychlorination of hydrocarbons in the presence of non-halide copper containing catalysts. 4,046,821, Cl. 260-654.00A.
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Cunningham, Virginia L.; Clovis, James S.; and Hurwitz, Marvin J., to Rohm and Haas Company. Removal of antimony from industrial streams. 4,046,688, Cl. 210-37.00R.
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Chaudhari, Praveen; Cuomo, Jerome John; and Matthews, John Wauchope, 4,046,618, Cl. 156-603.000.
Curless, Richard W.; and Federico, Armando, to Avco Corporation. Solenoid operated blood pump drive system. 4,046,137, Cl. 128-1.00D.
Curran, Adrian Charles Ward; and Shepherd, Robin Gerald, to John Wyeth & Brother Limited. Phenanthridine derivatives and related compounds. 4,046,895, Cl. 424-258.000.
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Czerwinski, Watson Peter, to United States of America, Army. Low loss top termination for short monopoles. 4,047,178, Cl. 343-750.000.
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Barry, Louis T.; and Czop, Gordon W., 4,046,085, Cl. 110-12.000.
Dahn, Ursula; Hagenmaier, Hanspaul; Hohne, Helmut; Konig, Wilfried; Scheinpflug, Hans; and Zahner, Hans, to Bayer Aktiengesellschaft. Fungicidally active antibiotic from streptomyces tendae Ettlinger et al. Tu 901. 4,046,881, Cl. 424-181.000.
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Izumo, Masanori; and Nakakita, Sigeru, 4,046,530, Cl. 55-181.000.
D'Alessandro, John A.; and Tuohino, Lawrence A. Ski boot cleat. 4,045,890, Cl. 36-132.000.
Dalley, James Edwin, to Bell Telephone Laboratories, Incorporated. Dial pulse repeating line circuit using miniature line transformer. 4,046,969, Cl. 179-18.0FA.
Dalzell, Charles J. Solid fuel element and process of manufacturing. 4,046,518, Cl. 44-10.00B.
Damm, David A., to Owens-Illinois, Inc. Method and apparatus for measuring the eccentricity of containers. 4,046,258, Cl. 209-111.500.
Dangelmaier, Karl: *See—*
Bergmann, Ewald; Bareis, Alfred; Dangelmaier, Karl; and Kottmann, Alfred, 4,046,264, Cl. 214-8.000.
Darnborough, Eric; and Coulboy, Rene Henri, to Seal Petroleum Limited. Method and apparatus for installing a control valve assembly on an underwater well head. 4,046,192, Cl. 166-.600.
Das, Subodh K.; and Milito, Richard A., to Aluminum Company of America. Method for the production of aluminum-silicon alloys. 4,046,558, Cl. 75-68.00A.
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Daugherty, Thomas Henry; and Stone, Dale Eugene, to Bell Telephone Laboratories, Incorporated. Testing of digital systems. 4,046,964, Cl. 179-15.0BF.
Davies, George Edward; and Foulkes, David Mackie, to Imperial Chemical Industries Limited. Herbicidal compositions of bipyridylium quaternary salts and emetic amounts of s-triazolo pyrimidine derivatives. 4,046,552, Cl. 71-92.000.
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Elliott, John Scotchford; Davis, Bryan Terence; and Howlett, Richard Martin, 4,046,802, Cl. 560-61.00G.
Davis, Charles W.: *See—*
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Davis, Curry Beach: *See—*
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Davis, Michael Ian, to International Business Machines Corporation. Task management apparatus. 4,047,161, Cl. 364-200.000.
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Paton, George A.; Nichols, Sterling M.; and Sanders, John H., 4,045,949, Cl. 57-140.0BY.
Day, Clifford K.; and Stringer, James L., to Westinghouse Electric Corporation. Eddy current position indicating apparatus for measuring displacements of core components of a liquid metal nuclear reactor. 4,047,103, Cl. 324-34.00D.
Day, Robert C.: *See—*
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Dayco Corporation: *See—*
Henderson, Dewey D., 4,046,022, Cl. 74-220.000.
De la Rue Giori S.A.: *See—*
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de la Taille, Olivier; Bernard, Armand; and Labadie, Jean-Francois, to Societe Industrielle Bertrand Faure. Child's safety chair. 4,046,420, Cl. 297-216.000.
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Deckard, John I., to General Motors Corporation. Electromagnetic fuel injector. 4,046,112, Cl. 123-32.0JV.
Decker, William Springall, Sr. Wire roller. 4,046,331, Cl. 242-54.00R.
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Head, Glenn Dale, 4,046,069, Cl. 100-255.000.
Rodeghiero, Reno Antonio, 4,046,162, Cl. 137-489.000.
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de Leeuw, Jan. Diluting and agitating device. 4,046,515, Cl. 23-259.000.
DeLuca, Carlo J., to Liberty Mutual Insurance Company. Method and apparatus for interfacing to anatomic signal sources. 4,046,141, Cl. 128-2.10R.
Demido, Michael, to General Motors Corporation. Master cylinder with combined reservoir cover, seal and fluid level sensor assembly. 4,047,048, Cl. 307-118.000.
Denham, Keith: *See—*
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Dennhoven, Manfred; Kunze, Claus; and Kuehn, Rainhard, to Heimann GmbH. Baggage inspection device. 4,047,035, Cl. 250-355.000.
de Nora, Oronzio; de Nora, Vittorio; and Spaziante, Placido M., to Oronzio de Nora Impianti Elettrochimici S.p.A. Novel electrolysis method and apparatus. 4,046,653, Cl. 204-95.000.
de Nora, Vittorio: *See—*
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Derrien, Andre Robert: *See—*
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Desalination Systems, Inc.: *See—*
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Deserno, Ulrich; and Auracher, Franz, to Siemens Aktiengesellschaft. Method for the production of one-material optical fibers. 4,046,537, Cl. 65-2.000.
Design & Manufacturing Corporation: *See—*
Scheuer, Paul R.; Cox, Karmen D.; and Sample, Steven B., 4,047,082, Cl. 318-221.00E.
Yake, William H., 4,046,261, Cl. 211-41.000.
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Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Brandt, Bernd; Jansen, Peter; and Liesenfeld, Heinz, 4,045,881, Cl. 34-138.000.
Heimberger, Werner; and Schreyer, Gerd, 4,046,862, Cl. 423-383.000.
Reinhardt, Helmut; Gratzfeld, Everhard; and Clausen, Eva, 4,046,861, Cl. 423-367.000.
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Diaz, D. Angel Chocarro, to Iberica del Frio S.A. Wall construction. 4,045,927, Cl. 52-127.000.
Dickinson, Harvey Frank, to Ferranti Limited. Pulse width responsive security system. 4,047,107, Cl. 325-37.000.
Dickinson, Peter D.; Osborne, Thomas E.; Rode, France; Baum, Allen J.; Cochran, David S.; and Tung, Chung C., to Hewlett-Packard Company. General purpose calculator having factorial capability. 4,047,012, Cl. 235-156.000.
Diehl, John A. Safety means for preventing demounting of low or flat tires from vehicle wheels. 4,046,184, Cl. 152-407.000.
Dieling, Hans; and Schindehutte, Manfred, to Wegmann & Co. Motorized swiveling streetcar trucks. 4,046,080, Cl. 105-133.000.
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DiForti, Paula Anne; and DiForti, Thomas. Fitted sheet construction. 4,045,832, Cl. 5-334.00C.
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DiForti, Paula Anne; and DiForti, Thomas, 4,045,832, Cl. 5-334.00C.
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Jenkins, Stephen R., 4,047,157, Cl. 364-900.000.
Digoy, Jean-Louis, to U.S. Philips Corporation. Method of manufactur-

ing photo-diodes utilizing sequential diffusion. 4,046,609, Cl. 148-189.000.
Dijet Industrial Co, Ltd.: *See—*
Soga, Yasuyuki, 4,046,517, Cl. 539.5-.
Dijkstra, Edsger W., to Burroughs Corporation. Segment replacement mechanism for varying program window sizes in a data processing system having virtual memory. 4,047,243, Cl. 364-200.000.
Dillon, Peter L. P., to Eastman Kodak Company. Color imaging array. 4,047,203, Cl. 358-44.000.
Di Maio, Anthony E.; and Swier, Willem, to Marson Fastener Corporation. Compressed air rivet setting tool. 4,045,994, Cl. 72-391.000.
Di Marco, Aurelio: *See—*
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DiSabato, Vincent J., to United Technologies Corporation. Combined guide vane and mixer for a gas turbine engine. 4,045,957, Cl. 60-262.000.
Dixon, Bernard, to Dixon International Limited. Fire resistant seals. 4,045,930, Cl. 52-232.000.
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Djurickovic, Slobodan M., to Richardson-Merrell Inc. Attenuated TGE virus. 4,046,875, Cl. 424-89.000.
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Dolco Packaging Corporation: *See—*
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Dominion Auto Accessories Limited: *See—*
Nagel, Robert I., 4,047,019, Cl. 240-8.200.
Dorawala, Tansukhlal G.; and Reinhard, Russell R., to Texaco Inc. Steam reforming process. 4,046,869, Cl. 423-652.000.
Dorey, Howard Anthony; and Cooke, Robert John, to Solartron Electronic Group Limited, The. Interface circuit for communicating between two data highways. 4,047,162, Cl. 364-200.000.
Dorman, Linneaus C., to Dow Chemical Company, The. Azide bonding of a protein to a latex. 4,046,723, Cl. 260-8.000.
Dorn, Conrad P.; Jones, Howard; and Jacobus, David P., to Merck & Co., Inc. 5-Mercaptopyridoxine alkanesulfonates and methods of use and pharmaceutical compositions. 4,046,897, Cl. 424-263.000.
Dorn, Conrad P., Jr.: *See—*
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Dougherty, Michael L., to Westinghouse Electric Corporation. Closed electrical apparatus cabinet embodying a vaporization chamber and cabinet top thereof. 4,046,193, Cl. 165-105.000.
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Newman, Ritchey O., Jr., 4,046,497, Cl. 425-313.000.
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Dreyfus, Russell Warren, to International Business Machines Corporation. Electron beam pumped gas laser. 4,047,125, Cl. 331-94.5PE.
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Dufrene, Alex. Tubing plug apparatus for performing down-hole pressure tests. 4,046,006, Cl. 73-151.000.
Duling, Irl N.; and Gates, David S., to Sun Oil Company of Pennsylvania. Traction fluids. 4,046,703, Cl. 252-59.000.
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Dunderdale, John, to Laporte Industries Limited. Recovery of titanium tetrachloride. 4,046,854, Cl. 423-77.000.
Dungan, Shirley A. Stirrup guard for medical examinations. 4,046,365, Cl. 269-328.000.
Dunham-Bush, Inc.: *See—*
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Dunham, Russell H., 4,046,390, Cl. 279-1.00S.
Dunlap, Clifford E., to W. A. Krueger Co. Stacking method. 4,046,259, Cl. 209-111.70R.
Dunlop Limited: *See—*
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Nazarenko, Nicholas, 4,046,815, Cl. 260-606.50B.
Pye, Donald George, 4,046,567, Cl. 96-27.00R.
Rushmere, John Derek, 4,046,648, Cl. 204-55.00R.
Vaughan, Lawrence G., 4,046,868, Cl. 423-588.000.
Durant, Graham John; Emmett, John Colin; Ganellin, Charon Robin; and Prain, Hunter Douglas, to Smith Kline & French Laboratories Limited. Imidazole alkylaminoethylene compounds. 4,046,907, Cl. 424-273.00R.
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Thyoux, George A., 4,046,550, Cl. 65-229.000.
Duroux, Jean. Process and a device for prospecting the ocean bed by measuring electromagnetic fields. 4,047,098, Cl. 324-6.000.
Durston, John Graham; and Hind, John Richard, to United Kingdom Atomic Energy Authority. Nuclear reactors. 4,046,629, Cl. 176-38.000.
Dyform Concrete (Prestressed) Ltd.: *See—*
Putti, George, 4,046,848, Cl. 264-70.000.
E. R. Squibb & Sons, Inc.: *See—*
Haugwitz, Rudiger D.; and Maurer, Barbara V., 4,046,908, Cl. 424-273.00R.
Ondetti, Miguel Angel; and Cushman, David W., 4,046,889, Cl. 424-244.000.
Eagle Motive Industries, Inc.: *See—*
Fairchild, Jack E.; Maurer, Bruce E.; and Woods, Robert L., 4,046,489, Cl. 416-223.00R.
Easthope, Frederick James: *See—*
Gosling, Alexander Bennett; Ridler, Keith Douglas; Easthope, Frederick James; and Stanwell-Smith, Colin Howard, 4,046,386, Cl. 274-23.00A.
Eastman Kodak Company: *See—*
Carroll, Max L., Jr., 4,046,837, Cl. 260-873.000.
Dillon, Peter L. P., 4,047,203, Cl. 358-44.000.
Frank, Lee Fitzpatrick, 4,047,031, Cl. 250-335.000.
Gysling, Henry J.; and Lelental, Mark, 4,046,569, Cl. 96-48.0PD.
Isett, Lawrence Clair, 4,046,950, Cl. 428-411.000.
Jansen, John R., 4,046,615, Cl. 156-544.000.
Stryjewski, Walter A., 4,046,468, Cl. 355-3.00R.
Terwilliger, James P.; Gingello, Anthony D.; and Wey, Jong-Shinn, 4,046,576, Cl. 96-108.000.
White, William E., 4,046,990, Cl. 219-471.000.
Eaton Corporation: *See—*
Braun, Eugene R.; and Richards, Elmer A., 4,046,032, Cl. 74-865.000.
Broucksou, Robert H., 4,046,024, Cl. 74-493.000.
Larson, Gerald L., 4,046,213, Cl. 180-105.00E.
Nelson, Robert K., 4,046,210, Cl. 180-24.100.
Novak, Thomas A., 4,046,163, Cl. 137-512.300.
Tinholt, Thomas H., 4,046,239, Cl. 192-58.00B.
Eaves, Arthur E.: *See—*
McCain, William B.; Cosgrove, James F.; and Eaves, Arthur E., 4,046,366, Cl. 270-21.000.
Ebara Infilco Kabushiki Kaisha: *See—*
Tsunoda, Shogo; Kataoka, Katsuyuki; and Baba, Toshinori, 4,046,683, Cl. 210-20.000.
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Ebner, Peter R. S., to Itek Corporation. Phototypesetter film feed device. 4,046,372, Cl. 271-273.000.
Economopoulos, Mario, to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie. Processing wire rod. 4,046,599, Cl. 148-12.00B.

Eda, Yasuko: *See—*
Yamada, Hirotada; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Okamura, Kosaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,046,904, Cl. 424-271.000.
Edenfield, Neal M. Saddle support. 4,046,221, Cl. 182-155.000.
Edwards, Eva Irene; Epton, Roger; and Marr, George. Organometallic derivatives of penicillin. 4,046,903, Cl. 424-271.000.
Edwards, Michael S.: *See—*
Rodgers, Billy R.; and Edwards, Michael S., 4,046,690, Cl. 210-75.000.
Edwards, William Howard, to Chloride Group Limited. Method of making electric storage batteries. 4,046,642, Cl. 204-2.100.
Edwin Cooper and Company Limited: *See—*
Elliott, John Scotchford; Davis, Bryan Terence; and Howlett, Richard Martin, 4,046,802, Cl. 560-61.00G.
Eggenmuller, Alfred; Bellan, Heinrich; Scherer, Lorenz; Notter, Eugen; and Wagler, Werner, to Gebruder Eberhard. Apparatus for forming mats or strands of fodder feed material for flat storage thereof. 4,046,068, Cl. 100-65.000.
Ehman, Michael F.; and Austerman, Stanley B., to Rockwell International Corporation. Monocrystalline silicates. 4,046,954, Cl. 428-446.000.
Ehrlinger, Friedrich: *See—*
Ott, Anton; Ehrlinger, Friedrich; Knodler, Dietrich; and Zdansevicius, Roland, 4,046,031, Cl. 74-764.000.
Eichler, Jay H., to Motorola, Inc. Carrying device for portable article. 4,046,295, Cl. 224-5.00H.
Eichorn, Roger H., deceased; Silverberg, Morton; and by Mandrino, Russell J., executor, to Xerox Corporation. Electrostatic imaging apparatus. 4,046,472, Cl. 355-14.000.
Eimers, Erich; Dhein, Rolf; and Wiedermann, Rolf, to Bayer Aktiengesellschaft. Compositions containing hydroxyl groups and their use for the production of flameproof plastics. 4,046,742, Cl. 260-77.5AN.
Einerhand, Johan Jozef; Colbers, Gerardus Johannes Baptist; Huck, Wilhelmus Martha Andreas; and Geurts, Herman Jozef Johannes Maria, to Hercules Incorporated. Method for the manufacture of a lead chromate-containing pigment having a low acid soluble lead content. 4,046,588, Cl. 106-298.000.
Eisenberg, Arnold J.; and Klink, Jerome P., to Owens-Corning Fiberglas Corporation. Method and apparatus for packaging linear material. 4,046,329, Cl. 242-18.00G.
Elco, Richard A.; Bauer, James A.; and Treese, Willard E., to Westinghouse Electric Corporation. Forward-reverse pulse cycling anodizing and electroplating process. 4,046,649, Cl. 204-58.000.
Electronic Memories & Magnetics Corporation: *See—*
Boice, Michael F., 4,047,164, Cl. 340-174.00M.
Elettronica San Giorgio - ELSAG - S.p.A.: *See—*
Giuliao, Ercole; Paita, Orazio; and Stringa, Luigi, 4,047,152, Cl. 340-146.3AG.
Elfab Corporation: *See—*
Ammon, J. Preston; Weaver, Harry R.; and Rodriguez, Claude, 4,045,868, Cl. 29-629.000.
Eli Lilly and Company: *See—*
Paget, Charles J.; and Wikel, James H., 4,046,770, Cl. 260-305.000.
Ellingson Timber Co.: *See—*
Shoemaker, Philip D.; and McQueary, Hobert O., 4,046,952, Cl. 428-423.000.
Elliott, Edgar H.: *See—*
Metcalfe, Richard T.; Granitsas, George A.; and Elliott, Edgar H., 4,046,596, Cl. 148-2.000.
Elliott, Frank S. Insulative roof apparatus for mobile homes and the like. 4,045,922, Cl. 52-94.000.
Elliott, John Scotchford; Davis, Bryan Terence; and Howlett, Richard Martin, to Edwin Cooper and Company Limited. Process for making a high molecular weight alkylphenoxy substituted aliphatic carboxylic ester. 4,046,802, Cl. 560-61.00G.
Elliott, Pamela: *See—*
Cobb, Malcolm Carnie; and Elliott, Pamela, 4,046,505, Cl. 8-18.00R.
Ellis, John Frederick, to United Kingdom Atomic Energy Authority. Apparatus for separating particulate solids from liquids. 4,046,694, Cl. 210-297.000.
Ellner, Edwin, to Better Packages, Inc. Electronic postage scale. 4,047,006, Cl. 235-151.330.
Embree, Milton Luther; Goldthorp, David Clayton; and O'Neill, John Francis, to Bell Telephone Laboratories, Incorporated. Integrable line circuit for use with miniature line transformer. 4,046,968, Cl. 179-18.0FA.
Emerson Electric Co.: *See—*
Brenner, George John, Jr., 4,045,971, Cl. 62-140.000.
Emesa Aktiengesellshaft: *See—*
Collepardi, Mario, 4,046,583, Cl. 106-90.000.
EMF, Inc.: *See—*
Griesbach, Melbourne L., 4,046,039, Cl. 83-13.000.
Emhart Corporation: *See—*
Murdoch, Robert N.; Travaglio, Vincent M.; and Magnifico, Michael L., 4,046,083, Cl. 108-107.000.
Emmett, John Colin: *See—*
Durant, Graham John; Emmett, John Colin; Ganellin, Charon Robin; and Prain, Hunter Douglas, 4,046,907, Cl. 424-273.00R.
Engineered Systems, Inc.: *See—*
Salley, Ernest J., 4,046,995, Cl. 235-61.60R.
Enright, Gregory Preston Michael: *See—*
Innes, Robert Arthur; Enright, Gregory Preston Michael; and Derrick, Garnet Lloyd, 4,046,931, Cl. 427-428.000.
Ensmann, Burt; Nielsen, Edwin A.; Snyder, Edward, III; and Ventura, Frank D., to Ideal Toy Corporation. Powered vehicle transport vehicle and track having a well therein. 4,045,908, Cl. 46-204.000.
Enviro-Blast International: *See—*
Gilbert, Neal J.; and Horton, Edward L., 4,045,915, Cl. 51-427.000.
Epton, Roger: *See—*
Edwards, Eva Irene; Epton, Roger; and Marr, George, 4,046,903, Cl. 424-271.000.
Erhardt, Manfred: *See—*
Loos, Herbert; Seitz, Max; and Erhardt, Manfred, 4,045,917, Cl. 51-123.00G.
Erickson, Fred William; and Nakahara, Roy Hiroshi, to Litton Systems, Inc. Drive circuit with constant current output. 4,047,049, Cl. 307-157.000.
Ernst Leitz GmbH: *See—*
Bletz, Walter; and Holle, Werner, 4,047,189, Cl. 354-23.00D.
Holle, Werner H., 4,047,022, Cl. 250-201.000.
Ernsthausen, Roger E., to Owens-Illinois, Inc. Gas dielectric overcoat for panel. 4,047,065, Cl. 313-201.000.
ESCO Corporation: *See—*
Cranor, Dennis A., 4,046,327, Cl. 241-197.000.
Espig, Winfried, to Prontor-Werk, Alfred Gauthier GmbH. Camera with an electronic timer and including an electro-mechanical delayed action stop for the shutter drive. 4,047,210, Cl. 354-238.000.
Esquire, Inc.: *See—*
McNamara, Albert C., Jr., 4,047,076, Cl. 315-88.000.
Essex Group, Inc.: *See—*
Furtah, Reginald D., Jr., 4,046,241, Cl. 192-150.000.
Yorks, Robert G.; and Junker, David W., 4,047,233, Cl. 361-88.000.
Estradier, Francoise: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,046,786, Cl. 260-396.00N.
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Andriska, Viktor; Gorog nee Privitzer, Katalin; Bruckner, Gyorgyi; Nemessanyi nee Szekely, Zsuzsanna; Havasi, Miklos; Raskay, Bela; Grega nee Toth, Erzsebet; Szigeti nee Haranghy, Terez; Dudas, Jozsef; Szilagyi, Gyula; Marosvolgyi, Sandor; Gribovszky, Pal; Pinter, Zoltan; and Bors, Gyozo, 4,046,773, Cl. 548-339.000.
Etat Francais: *See—*
Le Gall, Jean C., 4,046,176, Cl. 140-92.100.
Eto, Yoshizumi: *See—*
Kumada, Akio; Takano, Hiroshi; Eto, Yoshizumi; and Hibi, Masao, 4,046,455, Cl. 350-150.000.
Etud: *See—*
Tanguy, Pierre, 4,046,924, Cl. 426-502.000.
Europe Container Terminus B.V.: *See—*
Wormmeester, Gerhardus J.; and Rijsenbrij, Joannes C., 4,046,265, Cl. 214-14.000.
Evans, William J., to P. R. Mallory & Co., Inc. Electronic component and method. 4,045,862, Cl. 29-570.000.
Everitt, Delmar K.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 4,046,380, Cl. 273-119.00R.
Excel Industries, Inc.: *See—*
Mullet, David L.; Rilling, Raymond J.; and Voth, Elmer D., 4,046,200, Cl. 172-14.000.
Exxon Production Research Company: *See—*
Gruesbeck, Clay; Salathiel, William M.; Muecke, Thomas W.; and Cooke, Claude E., Jr., 4,046,198, Cl. 166-278.000.
Gruesbeck, Clay, Jr.; Penberthy, Walter L., Jr.; and Muecke, Thomas W., 4,046,197, Cl. 166-305.00R.
Neath, Robert Arthur, 4,046,191, Cl. 166-.500.
Exxon Research and Engineering Company: *See—*
Kalina, Theodore; and Moore, Roger E., 4,046,523, Cl. 48-197.00R.
Paynter, John D.; Fuqua, Beverly B.; and Cecil, Richard R., 4,046,673, Cl. 208-140.000.
Wittman, Robert H.; and Howell, William G., 4,046,301, Cl. 228-108.000.
Fairchild Camera and Instrument Corporation: *See—*
Alexander, Wilson E., 4,047,127, Cl. 332-31.00T.
McCaffrey, Terence; Raza, Hassan; and Williams, Bruce C., 4,047,217, Cl. 357-34.000.
Fairchild, Jack E.; Maurer, Bruce E.; and Woods, Robert L., to Eagle Motive Industries, Inc. Aerodynamic fan blade. 4,046,489, Cl. 416-223.00R.
Falk, Robert A.: *See—*
Mueller, Karl Friedrich; and Falk, Robert A., 4,046,944, Cl. 428-262.000.
Falk, Roland: *See—*
Hartmann, Hans-Joerg; Falk, Roland; Gawlik, Peter; Balz, Werner; Uhl, Karl; Schaefer, Dieter; and Motz, Herbert, 4,046,932, Cl. 428-64.000.
Fanciullo, Salvatore, to United Technologies Corporation. Process for controlling the output of a selective oxidizer. 4,046,956, Cl. 429-20.000.
Farcasiu, Malvina; and Whitehurst, Darrell Duayne, to Mobil Oil Corporation. Double solvent extraction of organic constituents from tar sands. 4,046,668, Cl. 208-11.0LE.
Faren, Jack. Dampening guard for TV antennas. 4,047,182, Cl. 343-904.000.
Farnsworth, Frank, to Dunlop Limited. Safety tire and wheel assemblies. 4,046,182, Cl. 152-158.000.
Farrell, Eugene A., to Frink Sno-Plows. Hydraulically operated front and rear wing hangers for snow plows. 4,045,892, Cl. 37-50.000.

Farris, Edward T.: *See—*
Barsa, John J.; Farris, Edward T.; and Lagow, Richard J., 4,046,858, Cl. 423-305.000.
Fasciati, Alfred: *See—*
Zweifel, Hans Heini; Buehler, Arthur; and Fasciati, Alfred, 4,046,507, Cl. 8-79.000.
Federal Pacific Electric Co.: *See—*
MacPhee, Colin A. A., 4,047,079, Cl. 361-45.000.
Federico, Armando: *See—*
Curless, Richard W.; and Federico, Armando, 4,046,137, Cl. 128-1.00D.
Feeney, George W., to Goodyear Tire & Rubber Company, The. Adhesive compositions of a block copolymer and tackifying resin. 4,046,838, Cl. 260-876.00B.
Feess, Erich; and Maier, Hans-Peter, to Hoechst Aktiengesellschaft. Process and device for the continuous dyeing of texile webs of synthetic or mostly synthetic fibre materials. 4,046,506, Cl. 8-21.00R.
Feinzilber, Mikhail Leibovich; Kuzin, Eduard Nikolaevich; Timofeev, Gennady Ivanovich; Roitershtein, Semen Semenovich; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Bratyshev, Igor Petrovich; Omelyan, Fedor Evstafievich; Sheinis, Efim Iosifovich; Pak, Vladimir Grigorievich; Romanov, Vladimir Ivanovich; Garbuzov, Zalman Eremeevich; and Naret, Grigory Borisovich, deceased (by Naret, Avgustina Alexandrovna, administrator). Automated planer. 4,045,893, Cl. 37-108.00A.
Fekete, Thomas M.; and Start, John F., to FMC Corporation. Continuous process for the production of phosphonitrilic chlorides. 4,046,857, Cl. 423-300.000.
Fender, C. Leo. String post for musical instruments. 4,046,050, Cl. 84-304.000.
Ferranti Limited: *See—*
Dickinson, Harvey Frank, 4,047,107, Cl. 325-37.000.
Harley, David Murray, 4,046,441, Cl. 339-8.00R.
Ferro, Armand P.; and Kurz, Bruno F., deceased (by Kurz-Beerli, Elizabeth, executrix, also known as Elizabeth Kurz Chinoy), to General Electric Company. Bipolar transistor structure having low saturation resistance. 4,047,220, Cl. 357-48.000.
Ferro Corporation: *See—*
Veeder, Richard K., 4,046,845, Cl. 261-122.000.
FIAT Societa per Azioni: *See—*
Formia, Antonio, 4,046,128, Cl. 123-195.00C.
Fickel, R. Gene, to UOP Inc. Method for controlling heat input to the reboiler section of a distillation column. 4,046,638, Cl. 203-1.000.
Fidelity Electric Company, Incorporated: *See—*
Hofmann, Charles J.; and Suess, Frederick F., 4,046,432, Cl. 308-189.00R.
Fiebelkorn, Klaus Dieter; and Spitzer, Gunther, to Siemens Aktiengesellschaft. Plug connection for optical fibers. 4,046,453, Cl. 350-96.00C.
Fields, Ellis K.: *See—*
Puskas, Imre; and Fields, Ellis K., 4,046,779, Cl. 260-346.220.
Fields, Larry D.: *See—*
Morris, Earl L.; and Fields, Larry D., 4,045,827, Cl. 4-3.000.
Fierens, Marcel Robert; and Heylen, Renaat Frans, to AGFA-GEVAERT N.V. Hardening fixer for photographic silver halide material. 4,046,570, Cl. 96-61.00R.
Fierro Esponja, S.A.: *See—*
Celada, Juan; and MacKay, Patrick W., 4,046,556, Cl. 75-35.000.
Fike, Don G. Marine vessel scrubbing device and method. 4,046,095, Cl. 114-222.000.
Filper Corporation: *See—*
White, Thomas J.; Spence, Henry L.; and McClelland, Etheridge R., 4,045,940, Cl. 53-26.000.
Finan, Michael Anthony: *See—*
Smith, Malcolm John; Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, 4,046,707, Cl. 252-180.000.
Finkemeyer, Karl-Friedrich; Roehr, Kuno M.; and Sonntag, Guenther, to International Business Machines Corporation. Microprogrammed data processing system. 4,047,244, Cl. 364-200.000.
Firestone Tire & Rubber Company, The: *See—*
Schonfeld, Steven Edward, 4,046,743, Cl. 260-77.5AB.
Fisher, Michael H.; and Wu, Mu Tsu, to Merck & Co., Inc. Substituted 2-phenylhydrazino and 2-phenylazo thiazolines. 4,046,753, Cl. 260-158.000.
Fisher Scientific Company: *See—*
Louder, Nevitt M., 4,046,290, Cl. 222-267.000.
Flam, Fred; and Hart, Dennis L., to Under Sea Industries, Inc. Power deflator mechanism for scuba buoyancy vests. 4,045,835, Cl. 9-313.000.
Flantua, Gysbertus, to Bonar & Bemis Ltd. Method and apparatus for casing flexible containers. 4,045,941, Cl. 53-35.000.
Fleet, Bernard; and Das Gupta, Sankar, to 308489 Ontario Limited. Carbon fiber electrode. 4,046,663, Cl. 204-280.000.
Fleet, Bernard; and Das Gupta, Sankar, to 308489 Ontario Limited. Metallic filament electrode. 4,046,664, Cl. 204-280.000.
Fleetwood, Charles M., Jr.: *See—*
Rice, Stephen H.; Spencer, Rodney S.; and Fleetwood, Charles M., Jr., 4,046,619, Cl. 156-645.000.
Fleischman, George L.: *See—*
Marcus, Bruce D.; and Fleischman, George L., 4,046,190, Cl. 165-105.000.
Flewelling, Harry J. Adjustable wrench. 4,046,034, Cl. 81-165.000.
Flinchbaugh, Henry K., to Flinchbaugh-Murray Corporation. Elevator system for transporting wheelchair patients. 4,046,226, Cl. 187-12.000.
Flinchbaugh-Murray Corporation: *See—*
Flinchbaugh, Henry K., 4,046,226, Cl. 187-12.000.
Flora, Raymond A.: *See—*
Budinski, John A.; and Flora, Raymond A., 4,046,020, Cl. 74-70.000.
Flow Pharmaceuticals, Inc.: *See—*
Krezanoski, Joseph Zenon, 4,046,706, Cl. 252-106.000.
FMC Corporation: *See—*
Fekete, Thomas M.; and Start, John F., 4,046,857, Cl. 423-300.000.
Henle, Richard G.; Merkert, Clifton S.; and Thomas, David C., 4,046,023, Cl. 74-242.800.
Hill, Jerry M., 4,046,017, Cl. 73-462.000.
Fogarassy, Elemer: *See—*
Tucsok, Steve; and Fogarassy, Elemer, 4,046,325, Cl. 241-73.000.
Fogleman, Floyd F.: *See—*
Kline, Richard L.; and Fogleman, Floyd F., 4,046,338, Cl. 244-213.000.
Forano Limitee: *See—*
Payeur, Marcel, 4,046,042, Cl. 83-418.000.
Ford, Gregory A., to Phillips Petroleum Company. Temperature control system. 4,045,998, Cl. 73-23.100.
Ford Motor Company: *See—*
Allison, William D., 4,046,402, Cl. 280-674.000.
Formia, Antonio, to FIAT Societa per Azioni. Cylinder heads for internal combustion compression-ignition engines. 4,046,128, Cl. 123-195.00C.
Forster, Herbert: *See—*
Landgraf, Helmut; Forster, Herbert; and Meurer, Karl, 4,046,603, Cl. 148-144.000.
Fory, Werner: *See—*
Baccini, Peter; and Fory, Werner, 4,046,793, Cl. 260-439.00R.
Foster Grant Co., Inc.: *See—*
Papetti, Stelvio, 4,046,839, Cl. 260-880.00R.
Foster, Robert; Preston, Roger Edwin; and Robinson, Graham Ernest, to Imperial Chemical Industries Limited. Phosphonates containing protected ketone group. 4,046,841, Cl. 260-923.000.
Foster, Samuel L.: *See—*
Waterman, Michael W.; and Foster, Samuel L., 4,047,239, Cl. 361-270.000.
Foulkes, David Mackie: *See—*
Davies, George Edward; and Foulkes, David Mackie, 4,046,552, Cl. 71-92.000.
Fournier, Joseph T., Jr.: *See—*
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,046,586, Cl. 106-194.000.
Fowler, John T., to Laitram Corporation, The. Digital compass and gimbal assembly for two conductor connection. 4,047,168, Cl. 340-310.00R.
Franck, Gunter: *See—*
Busch, Lothar; and Franck, Gunter, 4,047,071, Cl. 313-490.000.
Francombe, Maurice H.; and Wu, Shu-Yau, to Westinghouse Electric Corporation. Electrostatically bonded dielectric-on-semiconductor device, and a method of making the same. 4,047,214, Cl. 357-23.000.
Frank, Lee Fitzpatrick, to Eastman Kodak Company. Apparatus for obtaining radiographs. 4,047,031, Cl. 250-335.000.
Frank, Thomas E.; Gum, Roy E.; Shoupe, J. T.; and Warner, Dennis L., to Graphic Enterprises. Photocopy machine having photoelectric paper cut-off sensor. 4,046,469, Cl. 355-13.000.
Franken, Adrianus Jacobus Jozef: *See—*
Smulders, Hendricus Franciscus Gerardus; and Franken, Adrianus Jacobus Jozef, 4,046,458, Cl. 350-178.000.
Frankshun, Robert A.: *See—*
Jones, Howard; and Frankshun, Robert A., 4,046,760, Cl. 260-239.55R.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; and Brunninger, Manfred, 4,046,077, Cl. 104-2.000.
Theurer, Josef, 4,046,078, Cl. 104-7.00R.
Theurer, Josef, 4,046,079, Cl. 104-7.00R.
Fraser, David Bruce, to Bell Telephone Laboratories, Incorporated. Sputter coating with charged particle flux control. 4,046,660, Cl. 204-192.00C.
Frech, Kenneth J.: *See—*
Nowak, Edward N.; and Frech, Kenneth J., 4,046,832, Cl. 260-683.00D.
Freche, John C.; and Waters, William J., to United States of America, National Aeronautics and Space Administration. Nickel base alloy. 4,046,560, Cl. 75-170.000.
Frechette, Kenneth R., to Xerox Corporation. Carriage stabilization means for a serial printer. 4,046,245, Cl. 197-60.000.
Fred Whitaker Company: *See—*
Whitaker, Ralph, 4,045,848, Cl. 28-218.000.
Frederick, Carlton L.: *See—*
Witriol, Norman M.; and Frederick, Carlton L., 4,047,001, Cl. 235-151.300.
Freedman, Robert Nathan, to Natural Science Industries, Ltd. Abrading and polishing tumbler apparatus. 4,045,918, Cl. 51-164.000.
French, Barry T., to Rockwell International Corporation. High speed low capacitance charge coupled device in silicon-sapphire. 4,047,216, Cl. 357-24.000.
Frensch, Heinz; Albrecht, Konrad; and Hartel, Kurt, to Hoechst Aktiengesellschaft. Salts of alkyl 2-benzimidazole-carbamate. 4,046,906, Cl. 424-273.00R.
Frese, Albert: *See—*
Baxmann, Fritz; Frese, Albert; Roben, Hermann; and Wolpers, Jurgen, 4,046,945, Cl. 428-282.000.

Fried, John H.: *See—*
Kluge, Arthur F.; Untch, Karl G.; and Fried, John H., 4,046,801, Cl. 560-121.000.
Frierdich, Richard D.: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 4,046,380, Cl. 273-119.00R.
Frink Sno-Plows: *See—*
Farrell, Eugene A., 4,045,892, Cl. 37-50.000.
Fritz, Alan J., to Itasca Magnetics, Inc. Permanent magnet high intensity separator. 4,046,680, Cl. 209-214.000.
Fritz, John E., Jr.: *See—*
Sekhon, Kalwant S.; Nelson, Lloyd A.; and Fritz, John E., Jr., 4,047,198, Cl. 357-82.000.
Fritz, Kurt; and Beckmann, Georg, to Waagner-Biro Aktiengesellschaft. Steam generators. 4,046,110, Cl. 122-32.000.
Frolich, Martin: *See—*
Moller, Erwin; Bausch, Franz Hubert; and Frolich, Martin, 4,045,945, Cl. 53-167.000.
Fronek, Donald K.: *See—*
Lane, Richard A.; and Fronek, Donald K., 4,047,114, Cl. 328-140.000.
Fruehauf Corporation: *See—*
Chieger, George; Schwartz, Robert B.; and Banerjea, Tara N., 4,046,278, Cl. 220-1.500.
Frye, Robert Charles; Fu, Horng-Sen; and Tasch, Al F., Jr., to Texas Instruments Incorporated. Uniphase charge coupled devices. 4,047,215, Cl. 357-24.000.
Fu, Horng-Sen: *See—*
Frye, Robert Charles; Fu, Horng-Sen; and Tasch, Al F., Jr., 4,047,215, Cl. 357-24.000.
Fugit, Brian Blair, to Motorola, Inc. Transponder. 4,047,171, Cl. 343-6.80R.
Fuji Kogyo Co., Ltd.: *See—*
Ohmura, Ryuichi, 4,045,902, Cl. 43-22.000.
Fuji Photo Film Co., Ltd.: *See—*
Hinata, Masanao; Mihara, Yuji; Sato, Akira; and Ikeda, Tadashi, 4,046,572, Cl. 96-69.000.
Inouye, Kozo; Nakamura, Kotaro; Yokota, Yukio; Nakazyo, Kiyoshi; and Okumura, Akio, 4,046,573, Cl. 96-74.000.
Tada, Sugihiko; Nakai, Setsuo; Irie, Kazuo; Saito, Hirokazu; and Suzuki, Hideaki, 4,046,154, Cl. 134-65.000.
Fujikawa, Kanichi: *See—*
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, 4,046,553, Cl. 71-94.000.
Fujimori, Tokuzo. Method of producing hard foamed materials. 4,046,846, Cl. 264-45.300.
Fujimoto, Shoji: *See—*
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Fujino, Takashi: *See—*
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Fujita, Tatsu: *See—*
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,046,600, Cl. 148-12.400.
Fukuda, Teruo; and Otomo, Tetuo, to Hitachi, Ltd. Transformers of large capacity for ultra-high voltages. 4,047,139, Cl. 336-150.000.
Fukuma, Nobuo; and Matsubara, Hideyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Cam-controlled grinding machine. 4,045,920, Cl. 51-165.880.
Fukushima, Osamu, to Kuraray Co., Ltd. Process for preparation of colored suede sheet materials. 4,046,504, Cl. 8-17.000.
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Cebrian, Gregorio Ramon, 4,046,918, Cl. 424-331.000.
Cebrian, Gregorio Ramon, 4,046,919, Cl. 424-338.000.
Fuqua, Beverly B.: *See—*
Paynter, John D.; Fuqua, Beverly B.; and Cecil, Richard R., 4,046,673, Cl. 208-140.000.
Furr, Robert L., to Hayes, Robert I., Jr., a part interest. Table soccer playing figure. 4,046,378, Cl. 273-85.00D.
Furtah, Reginald D., Jr., to Essex Group, Inc. Over-ride mechanism for screw drive actuator. 4,046,241, Cl. 192-150.000.
Futaba Denshi Kogyo Kabushiki Kaisha: *See—*
Kishino, Takao; Morimoto, Kiyoshi; and Utamura, Yukihiko, 4,047,072, Cl. 313-496.000.
Kishino, Takao, 4,047,073, Cl. 313-497.000.
Kishino, Takao; Yamaguchi, Nobuo; and Utamura, Yukihiko, 4,047,074, Cl. 313-497.000.
G. D. Searle & Co. Limited: *See—*
Rowland, George Ferdinand, 4,046,722, Cl. 260-6.000.
Gabby, John Lester; Corbin, Dennis Dale; and Lowe, Jack Bruner, to Mead Johnson & Company. Soapless shave composition. 4,046,874, Cl. 424-73.000.
Gable, Ronald L.: *See—*
Gardner, Alexander C.; and Gable, Ronald L., 4,046,175, Cl. 140-92.100
Gabliks, Maigonis: *See—*
Croce, Louis J.; Bajars, Laimonis; and Gabliks, Maigonis, 4,046,821, Cl. 260-654.00A.
Gabriele, Leonard A., to Lear Siegler, Inc. Gear rolling equipment. 4,045,987, Cl. 72-84.000.
GAF Corporation: *See—*
Mertz, John R., 4,046,571, Cl. 96-66.0HD.
Gainer, John L., to University of Virginia, The. Method of treating hypertension. 4,046,880, Cl. 424-180.000.
Ganellin, Charon Robin: *See—*
Durant, Graham John; Emmett, John Colin; Ganellin, Charon Robin; and Prain, Hunter Douglas, 4,046,907, Cl. 424-273.00R.
Ganter, Wolfgang; and Ginter, Albert, to Gebruder Junghans GmbH. Safety mechanism for a watertight watch having a piezo electric buzzer. 4,045,954, Cl. 58-38.00R.
Garagnon, Gary B., to Ampex Corporation. High stability digital head servo for video recorders. 4,047,231, Cl. 360-36.000.
Garbuzov, Zalman Eremeevich: *See—*
Feinzilber, Mikhail Leibovich; Kuzin, Eduard Nikolaevich; Timofeev, Gennady Ivanovich; Roitershtein, Semen Semenovich; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Bratyshev, Igor Petrovich; Omelyan, Fedor Evstafievich; Sheinis, Efim Iosifovich; Pak, Vladimir Grigorievich; Romanov, Vladimir Ivanovich; Garbuzov, Zalman Eremeevich; and Naret, Grigory Borisovich, deceased, 4,045,893, Cl. 37-108.00A.
Gardiner, David Stirling, to General Foods Ltd. Non-dairy creamer compositions. 4,046,926, Cl. 426-613.000.
Gardner, Alexander C.; and Gable, Ronald L., to Machine Products Corporation. Precision level coil winding apparatus. 4,046,175, Cl. 140-92.100.
Gardner, Beth Ann: *See—*
Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, 4,046,900, Cl. 424-267.000.
Gardner, Charles Stanley; and Molloy, Denis Edward, to Rolls-Royce (1971) Limited. Electro-chemical machine tools. 4,046,662, Cl. 204-275.000.
Gardocki, Joseph Francis: *See—*
Rasmussen, Chris Royce; Gardocki, Joseph Francis; and Plampin, James Nelson, 4,046,909, Cl. 424-274.000.
Garner, Robert; and Petitpierre, Jean-Claude, to Ciba-Geigy Corporation. Heterocyclic substituted lactone compounds. 4,046,776, Cl. 260-326.14R.
Garrett Corporation, The: *See—*
Carrie, George W., 4,046,056, Cl. 89-12.000.
Stokes, Richard F., 4,046,061, Cl. 91-459.000.
Garrison, Judd F., to John Thomas Batts, Inc. Detachable bar for garment hanger. 4,046,293, Cl. 223-88.000.
Gates, David S.: *See—*
Duling, Irl N.; and Gates, David S., 4,046,703, Cl. 252-59.000.
Gates, Gerald Alan, to International Business Machines Corporation. Semiconductor wafer alignment apparatus. 4,046,985, Cl. 219-121.00L.
Gates, Victor Genez. Cohesive display board. 4,045,897, Cl. 40-125.00A.
Gawlik, Peter: *See—*
Hartmann, Hans-Joerg; Falk, Roland; Gawlik, Peter; Balz, Werner; Uhl, Karl; Schaefer, Dieter; and Motz, Herbert, 4,046,932, Cl. 428-64.000.
Gebruder Eberhard: *See—*
Eggenmuller, Alfred; Bellan, Heinrich; Scherer, Lorenz; Notter, Eugen; and Wagler, Werner, 4,046,068, Cl. 100-65.000.
Gebruder Giulini GmbH: *See—*
Schepers, Bernhard; Bayer, Gerhard; Urmann, Ernst; and Schanz, Klaus, 4,046,855, Cl. 423-130.000.
Gebruder Junghans GmbH: *See—*
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Gele, Pierre J.: *See—*
Laprade, Bernard R.; Laprade, Xavier J.; and Gele, Pierre J., 4,046,120, Cl. 123-120.000.
Gellert, Jobst Ulrich. Injection molding filter assembly. 4,046,359, Cl. 259-193.000.
Gendlina, Ljudmila Ivanovna: *See—*
Kreimer, Vladimir Isakovich; Tishkov, Anatoly Yakovlevich; Grigoriev, Vitaly Markovich; Gendlina, Ljudmila Ivanovna; and Zimonin, Leonid Vasilievich, 4,046,249, Cl. 198-758.000.
General Bathroom Products Corporation: *See—*
Palka, James J., 4,047,016, Cl. 240-4.000.
General Cable Corporation: *See—*
Brorein, William J., 4,046,444, Cl. 339-91.00R.
General Electric Company: *See—*
Adlon, Bruce E.; Villiers, Walter H.; and Tarnoff, Sherwin S., 4,045,896, Cl. 40-106.100.
Bauer, Lowell W.; and Costas, John P., 4,047,172, Cl. 343-17.10R.
Blount, Richard, 4,047,015, Cl. 240-1.300.
Challen, Richard F., 4,047,009, Cl. 235-152.000.
Clausen, Edward M., 4,047,067, Cl. 313-221.000.
Davis, Richard Kent, 4,047,235, Cl. 361-100.000.
Ferro, Armand P.; and Kurz, Bruno F., deceased, 4,047,220, Cl. 357-48.000.
Houston, John M., 4,047,039, Cl. 250-385.000.
Houston, John M., 4,047,040, Cl. 250-385.000.
Houston, John M., 4,047,041, Cl. 250-385.000.
Kresge, James S., 4,046,847, Cl. 264-61.000.
Lever, Ray Clarence; and Wilkus, Edward Vincent, 4,046,849, Cl. 264-174.000.
McCarty, William J., 4,045,974, Cl. 62-196.00B.
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McHugh, James D., 4,046,223, Cl. 184-6.110.
Murphy, Bartholomew D.; and Gonyea, David C., 4,046,002, Cl. 73-116.000.
Plunkett, Allan Barr, 4,047,083, Cl. 318-231.000.
Quinlivan, Richard Paul, 4,046,341, Cl. 244-181.000.
Steigerwald, Robert L., 4,047,138, Cl. 336-100.000.
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Toft, Kaj; and Busby, Llewellyn D., 4,045,894, Cl. 38-77.830.
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General Electric Company Limited, The: *See—*
Reece, Albert Benjamin John; and Walkden, Anthony John, 4,047,063, Cl. 310-232.000.

General Foam Plastics Corporation: *See—*
Chase, Ascher, 4,046,379, Cl. 273-95.0AA.

General Foods Ltd.: *See—*
Gardiner, David Stirling, 4,046,926, Cl. 426-613.000.

General Motors Corporation: *See—*
Barr, Paul N., 4,047,111, Cl. 325-315.000.
Baynes, Gene P.; and Brooks, Frank W., 4,046,427, Cl. 303-115.000.
Benasutti, Louis D.; Neubauer, Jerry L.; and Meyer, Ronald E., 4,046,438, Cl. 312-138.00A.
Brown, William B., 4,046,658, Cl. 204-181.000.
Budinski, John A.; and Flora, Raymond A., 4,046,020, Cl. 74-70.000.
Cwycyshyn, Walter; and Holroyd, Floyd M., 4,046,263, Cl. 214-1.0BC.
Deckard, John I., 4,046,112, Cl. 123-32.0JV.
Demido, Michael, 4,047,048, Cl. 307-118.000.
Hamparian, Nshan; and Bandrowski, Michael, Jr., 4,046,114, Cl. 123-41.760.
Hansen, Kai H., 4,046,212, Cl. 180-44.00R.
Himmler, Dennis W., 4,047,088, Cl. 320-6.000.
Kellogg, George Edward, 4,046,232, Cl. 188-73.100.
Klees, Gerard T.; Meacham, Robert A.; Ruby, Harry M.; and Sich, Edward, 4,046,415, Cl. 296-35.00R.
Knape, Richard S.; and Straub, Robert D., 4,046,322, Cl. 239-533.700.
Matter, Robert C., 4,046,062, Cl. 29-623.100.
Prikkel, John, III, 4,046,940, Cl. 428-313.000.
Richard, Raymond L., Jr., 4,046,411, Cl. 293-88.000.
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General Signal Corporation: *See—*
Montagno, William J.; and MacIntyre, Allan L., 4,046,352, Cl. 254-29.00R.

Gerwick, Benjamin C., Jr., to Kajima Corporation. Offshore platform and method for its installation. 4,045,968, Cl. 61-86.000.

Geurts, Herman Jozef Johannes Maria: *See—*
Einerhand, Johan Jozef; Colbers, Gerardus Johannes Baptist; Huck, Wilhelmus Martha Andreas; and Geurts, Herman Jozef Johannes Maria, 4,046,588, Cl. 106-298.000.

Gewerkschaft Eisenhutte Westfalia: *See—*
Becker, Kunibert; and Weirich, Walter, 4,046,060, Cl. 91-414.000.
Grisebach, Hans Theodor, 4,046,058, Cl. 91-32.000.

Geyer, Manvel A.: *See—*
Kernick, Andress; and Geyer, Manvel A., 4,046,229, Cl. 187-29.00R.

Gibbs, Louis L. Easily erected roof structure for modular buildings. 4,045,926, Cl. 52-127.000.

Gilbert, Neal J.; and Horton, Edward L., to Enviro-Blast International. Portable sandblaster. 4,045,915, Cl. 51-427.000.

Gildemeister Corpoplast GmbH: *See—*
Appel, Adolf; and Reymann, Wolfgang, 4,046,498, Cl. 425-526.000.

Gim Metal Products: *See—*
Winant, Arnold Francis, 4,047,021, Cl. 240-78.00E.

Gingello, Anthony D.: *See—*
Terwilliger, James P.; Gingello, Anthony D.; and Wey, Jong-Shinn, 4,046,576, Cl. 96-108.000.

Ginter, Albert: *See—*
Ganter, Wolfgang; and Ginter, Albert, 4,045,954, Cl. 58-38.00R.

Giori, Gualtiero, to De la Rue Giori S.A. Processing of sheets of printed security papers into bundles and packets. 4,045,944, Cl. 53-123.000.

Gipson, Robert Malone, to Texaco Development Corporation. Boride catalyst for epoxidizing olefinic compounds. 4,046,784, Cl. 260-348.290.

Girling Limited: *See—*
Klassen, Horst Willi, 4,046,233, Cl. 188-73.300.

Gist-Brocades N.V.: *See—*
Verweij, Jan; and Tan, Hong Sheng, 4,046,761, Cl. 544-17.000.

Giuliso, Ercole; Paita, Orazio; and Stringa, Luigi, to Elettronica San Giorgio - ELSAG - S.p.A. Electronic character-reading system. 4,047,152, Cl. 340-146.3AG.

Givaudan Corporation: *See—*
Naegeli, Peter, 4,046,716, Cl. 252-522.000.

Glaum, Gerald Vernon: *See—*
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Glenn, Edwin E., Jr., to Mobil Oil Corporation. Method for distinguishing between single-phase gas and single-phase liquid leaks in well casings. 4,046,220, Cl. 181-105.000.

Glenn, Robert M. Automobile polishing apparatus. 4,045,836, Cl. 15-4.000.

Glover, Nolan S., to Harsco Corporation. Scum skimmer apparatus. 4,046,693, Cl. 210-195.00S.

Glover, Nolan S., to Harsco Corporation. Sludge scraper mechanism. 4,046,700, Cl. 210-523.000.

Glowinski, Wolf; Dulken, Hartmut; Guder, Gottfried; and Kassel, Karl-Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Electrophotographic recording material and its method of manufacture. 4,046,562, Cl. 96-1.50R.

Goda, George. Device for pipetting and/or diluting. 4,046,291, Cl. 222-309.000.

Goetz, Philip J., to Pen Kem, Inc. Microelectrophoresis apparatus. 4,046,667, Cl. 204-299.00R.

Goetzke, Siegfried: *See—*
Jakob, Gert; and Goetzke, Siegfried, 4,047,242, Cl. 361-389.000.

Goffredo, Daniel L.; and Shakley, Conrad Dale, to Chemcut Corporation. Connecting and alignment means for modular chemical treatment system. 4,046,248, Cl. 198-583.000.

Gold, James J., to American Optical Corporation. Variable interlace display. 4,047,204, Cl. 358-93.000.

Gold, Nathan: *See—*
Coppa, Richard J.; and Gold, Nathan, 4,047,191, Cl. 354-27.000.

Goldfarb, Adolph E.; and Benkoe, Erwin. Play device for suspending and moving a floatable object relative to movable areas. 4,045,906, Cl. 46-44.000.

Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Friendich, Richard D., to Goldfarb, Adolph E.; and Benkoe, Erwin. Game apparatus with positional strikers. 4,046,380, Cl. 273-119.00R.

Goldstein, Melvin, to Crane Co. Reverse osmosis treatment of battery waste. 4,046,686, Cl. 210-23.00H.

Goldthorp, David Clayton: *See—*
Embree, Milton Luther; Goldthorp, David Clayton; and O'Neill, John Francis, 4,046,968, Cl. 179-18.0FA.

Gomez, Nicolas Gueco, to Xerox Corporation. Laminar deep wave generator. 4,046,105, Cl. 118-429.000.

Gonyea, David C.: *See—*
Murphy, Bartholomew D.; and Gonyea, David C., 4,046,002, Cl. 73-116.000.

Goodner, Willis Ray; Smith, James Nelson; and Horvath, John, to Motorola, Inc. Stabilization of 1,1,1-trichloroethane. 4,046,820, Cl. 260-652.50R.

Goodwin, John E. Adjustable height stool. 4,046,348, Cl. 248-423.000.

Goodyear Tire & Rubber Company, The: *See—*
Bauer, John R., 4,046,428, Cl. 305-11.000.
Feeney, George W., 4,046,838, Cl. 260-876.00B.
Nowak, Edward N.; and Frech, Kenneth J., 4,046,832, Cl. 260-683.00D.

Gordon, Roanie D.; and Starks, Charles M., to Continental Oil Company. Process for producing 1,2-dichloroethane. 4,046,823, Cl. 260-662.00R.

Gorin, Everett; Jasulaitis, William A.; Wasson, George E.; and Theodore, Frank William, to Consolidation Coal Company. Apparatus for agglomerating finely divided agglomerative materials in a rotating drum. 4,046,496, Cl. 425-222.000.

Gorog nee Privitzer, Katalin: *See—*
Andriska, Viktor; Gorog nee Privitzer, Katalin; Bruckner, Gyorgyi; Nemessanyi nee Szekely, Zsuzsanna; Havasi, Miklos; Raskay, Bela; Grega nee Toth, Erzsebet; Szigeti nee Haranghy, Terez; Dudas, Jozsef; Szilagyi, Gyula; Marosvolgyi, Sandor; Gribovszky, Pal; Pinter, Zoltan; and Bors, Gyozo, 4,046,773, Cl. 548-339.000.

Goroski, Robert D., to Measurement Systems, Incorporated. Three axis joystick control. 4,046,005, Cl. 73-133.00R.

Gorton, Howard Byron; and Lyons, Richard B., to Ajax Hardware Corporation. Compact portable lock for sliding windows and doors. 4,045,982, Cl. 70-90.000.

Gosling, Alexander Bennett; Ridler, Keith Douglas; Easthope, Frederick James; and Stanwell-Smith, Colin Howard, to Strathearn Audio Limited. Control device. 4,046,386, Cl. 274-23.00A.

Goto, Toru: *See—*
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Gould Inc.: *See—*
Lee, Timothy Charles Philip; and Millns, William, 4,046,834, Cl. 260-752.000.

Graco Inc.: *See—*
Hoekstra, Joop Frans; Lumby, Donovan Harold; and Vork, William Duncan, 4,046,287, Cl. 222-16.000.

Granitsas, George A.: *See—*
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Graphic Enterprises: *See—*
Frank, Thomas E.; Gum, Roy E.; Shoupe, J. T.; and Warner, Dennis L., 4,046,469, Cl. 355-13.000.

Gratzfeld, Everhard: *See—*
Reinhardt, Helmut; Gratzfeld, Everhard; and Clausen, Eva, 4,046,861, Cl. 423-367.000.

Green, Aaron F. Alternating controller comprising pair of mutually exclusively-operated timers. 4,047,058, Cl. 307-293.000.

Green, Cyril Robert, to Medio, Mario D.; and Medio, Grace E. Combination drill and plug and method and apparatus for using same for extracting a fluid sample from an electrical cable. 4,046,013, Cl. 73-422.00R.

Greenwald, Richard B., to Polaroid Corporation. Disulfonyl silver halide solvents substituted with piperazine at one sulfonyl group. 4,046,568, Cl. 96-29.00R.

Greer Hydraulics, Inc.: *See—*
Zahid, Abduz, 4,045,861, Cl. 29-454.000.

Grega nee Toth, Erzsebet: *See—*
Andriska, Viktor; Gorog nee Privitzer, Katalin; Bruckner, Gyorgyi; Nemessanyi nee Szekely, Zsuzsanna; Havasi, Miklos; Raskay, Bela; Grega nee Toth, Erzsebet; Szigeti nee Haranghy, Terez; Dudas, Jozsef; Szilagyi, Gyula; Marosvolgyi, Sandor; Gribovszky, Pal; Pinter, Zoltan; and Bors, Gyozo, 4,046,773, Cl. 548-339.000.

Grew, Leonard A. Device for digging, balling and relocating a tree and other material. 4,045,891, Cl. 37-2.00R.

Gribovszky, Pal: *See—*
Andriska, Viktor; Gorog nee Privitzer, Katalin; Bruckner, Gyorgyi; Nemessanyi nee Szekely, Zsuzsanna; Havasi, Miklos; Raskay, Bela; Grega nee Toth, Erzsebet; Szigeti nee Haranghy, Terez; Dudas, Jozsef; Szilagyi, Gyula; Marosvolgyi, Sandor; Gribovszky, Pal; Pinter, Zoltan; and Bors, Gyozo, 4,046,773, Cl. 548-339.000.

Griesbach, Melbourne L., to EMF, Inc. Thickness responsive variable position die set. 4,046,039, Cl. 83-13.000.

Griffiths, Evan, to Amtel, Inc. Dancer pulley mechanism. 4,045,992, Cl. 72-279.000.

Grigat, Ernst: *See—*
Rottloff, Gunther; Sundermann, Rudolf; Grigat, Ernst; and Putter, Rolf, 4,046,796, Cl. 260-453.00P.

Grigoriev, Vitaly Markovich: *See—*
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Grillo, Joseph R. Prefabricated panel structure. 4,045,933, Cl. 52-475.000.

Grimes, Charles, to National Service Industries, Inc. Method and apparatus for mixing and dispensing material. 4,046,358, Cl. 259-147.000.

Grimm, Bruce F., Jr. Dispenser pump. 4,046,495, Cl. 417-268.000.

Grisebach, Hans Theodor, to Gewerkschaft Eisenhutte Westfalia. Control systems and arrangements for use in mineral mining installations. 4,046,058, Cl. 91-32.000.

Grob, Louis: *See—*
Muller, Hans; and Grob, Louis, 4,046,789, Cl. 260-412.800.

Grober, Melvin G.: *See—*
Cox, Robert N.; and Grober, Melvin G., 4,046,440, Cl. 312-215.000.

Groeneweg, Abraham, to N.V. Optische Industrie "De Oude Delft". Film transport. 4,047,209, Cl. 354-212.000.

Grosskopf, Rudolf, to Carl Zeiss-Stiftung. Method and means for measuring substance volumes in light-transmitting samples. 4,047,205, Cl. 358-107.000.

Groves, David John; and Mason, Albert, to Imperial Chemical Industries Limited. Casting of polymeric film. 4,046,842, Cl. 264-22.000.

Gruesbeck, Clay; Salathiel, William M.; Muecke, Thomas W.; and Cooke, Claude E., Jr., to Exxon Production Research Company. Method and apparatus for gravel packing wells. 4,046,198, Cl. 166-278.000.

Gruesbeck, Clay, Jr.; Penberthy, Walter L., Jr.; and Muecke, Thomas W., to Exxon Production Research Company. Well completion and workover method. 4,046,197, Cl. 166-305.00R.

Gruffaz, Max; and Locatelli, Jean-Louis, to Rhone-Poulenc Industries. Polymers with imide groups, and comprising a polyester free from aliphatic unsaturation. 4,046,835, Cl. 260-857.0PA.

GTE Sylvania Incorporated: *See—*
Cosco, Robert J.; Lima, Joseph V.; and Soucy, Frank, 4,047,064, Cl. 313-201.000.
Kuo, Samuel Chung-Shu; and Rosser, William D., 4,047,180, Cl. 343-784.000.
Miller, G. Kirby; and Lawler, John F., 4,047,166, Cl. 340-261.000.
Warner, Leadom A.; and Cleveland, Joseph J., 4,046,612, Cl. 156-205.000.

Guder, Gottfried: *See—*
Glowinski, Wolf; Dulken, Hartmut; Guder, Gottfried; and Kassel, Karl-Heinz, 4,046,562, Cl. 96-1.50R.

Guglielmo, Richard J., Sr. Primer composition, process for using same and product obtained thereby. 4,046,587, Cl. 106-271.000.

Guillaume, Jacques: *See—*
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Guleserian, John E.: *See—*
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Gulistan, Bulent, to Deutsch Fastener Corporation. Flarable threaded fastener. 4,046,054, Cl. 85-74.000.

Gum, Roy E.: *See—*
Frank, Thomas E.; Gum, Roy E.; Shoupe, J. T.; and Warner, Dennis L., 4,046,469, Cl. 355-13.000.

Gunzel, Peter: *See—*
Rosskamp, Gunter; Kolberg, Reiner; Gunzel, Peter; and Porep, Hans-Jurgen, 4,046,146, Cl. 128-266.000.

Gusev, Alexandr Mikhailovich: *See—*
Kholmogorov, Mikhail Vladimirovich; Katkov, Jury Vasilievich; Vorbiev, Grigory Vasilievich; Gusev, Alexandr Mikhailovich; and Nazaretian, Eduard Gurgenovich, 4,045,991, Cl. 72-251.000.

Gustafson, Hans Hjalmar. Fibrous building elements. 4,046,934, Cl. 428-155.000.

Gustafsson, Nils-Ake, to Sprinter Pack AB. Container. 4,046,310, Cl. 229-30.000.

Gutridge, Jack E.; Hallam, Keith J.; and Marsh, Ronald W., to Pullman Incorporated. Headrest ladder. 4,046,081, Cl. 105-326.000.

Gysling, Henry J.; and Lelental, Mark, to Eastman Kodak Company. Physical development of Pd(II) photosensitive complexes with a leucophthalocyanine dye and a reducing agent therefor. 4,046,569, Cl. 96-48.0PD.

Gyugyi, Laszlo; Stacey, Eric J.; and Brennen, Michael B., to Westinghouse Electric Corporation. Apparatus and method for transient free energization and deenergization of static VAR generators. 4,047,097, Cl. 323-119.000.

Habib, Edward T., Jr.: *See—*
Owen, Hartley; Venuto, Paul B.; and Habib, Edward T., Jr., 4,046,827, Cl. 260-672.00T.

Hackett, Robert J. Molten steel samplers. 4,046,016, Cl. 73-425.40R.

Hadersbeck, Hans: *See—*
Andrascek, Ernst; and Hadersbeck, Hans, 4,046,620, Cl. 156-666.000.

Hagemann, Julius, to United States of America, Navy. Piston type underwater sound generator. 4,047,148, Cl. 340-12.00R.

Hagenmaier, Hanspaul: *See—*
Dahn, Ursula; Hagenmaier, Hanspaul; Hohne, Helmut; Konig, Wilfried; Scheinpflug, Hans; and Zahner, Hans, 4,046,881, Cl. 424-181.000.

Hager, Stephen F.: *See—*
Brown, Alfred; Hager, Stephen F.; Chichakli, Moutaz; and Wu, Ching H., 4,046,196, Cl. 166-273.000.

Hagiya, Hiroshi: *See—*
Yagishita, Tohmi; and Hagiya, Hiroshi, 4,047,228, Cl. 358-261.000.

Hahnke, Manfred: *See—*
Hohmann, Kurt; Mohr, Reinhard; and Hahnke, Manfred, 4,046,752, Cl. 260-158.000.

Haines, James M.: *See—*
Meiner, Roger D.; Haines, James M.; and Alsberg, Henry, 4,046,726, Cl. 260-27.00R.

Hallam, Keith J.: *See—*
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Halley, Angus Murray, to James Halley & Sons Limited. Rotary printing presses. 4,046,070, Cl. 101-216.000.

Hallgren, Bo Erik; and Stallberg, Gunnel Anna Maria, to Astra Nutrition AB. Therapeutically active substituted saturated and mono-and polyunsaturated alkyl-glycerylethers. 4,046,914, Cl. 424-312.000.

Hamba-Maschinenfabrik Hans A. Muller, Firma: *See—*
Moller, Erwin; Bausch, Franz Hubert; and Frolich, Martin, 4,045,945, Cl. 53-167.000.

Hammarstrand, Sten Ove, to Sveska Hymas Aktiebolag. Linkage and motion system, especially for accomplishing a swinging movement in equipment such as buckets for power shovels and the like. 4,046,026, Cl. 74-519.000.

Hammond Corporation: *See—*
Bione, Angelo A., 4,046,048, Cl. 84-1.030.

Hamparian, Nshan; and Bandrowski, Michael, Jr., to General Motors Corporation. Insulated, high efficiency, low heat rejection, engine cylinder head. 4,046,114, Cl. 123-41.760.

Hampton, Thomas W., to United States of America, Navy. Impulsive rocket motor safety-arming device. 4,046,076, Cl. 102-70.20A.

Hanfling, Jerome D.: *See—*
Appelbaum, Alfred J.; Collins, Michael J.; and Hanfling, Jerome D., 4,047,179, Cl. 343-768.000.

Hanni, Stephen Leroy: *See—*
Johnson, Dudley Bruce; and Hanni, Stephen Leroy, 4,046,981, Cl. 200-159.00B.

Hannibal, Alan J., to Lord Corporation. Vibration attenuating support for rotating member. 4,045,948, Cl. 57-129.000.

Hansen, Franklin A., to Continental Disc Corporation. Direct mounting reverse buckling disc. 4,046,280, Cl. 220-89.00A.

Hansen, Harold M., to Barrier Pressure Container, Inc. Method of filling barrier pressure container. 4,045,938, Cl. 53-22.00R.

Hansen, Kai H., to General Motors Corporation. Steerable front wheel drive transmitting mechanism. 4,046,212, Cl. 180-44.00R.

Hansson, Bengt; and Svensson, Sigfrid, to Armerad Betong Vagforbattringar Aktiebolag. Underground installation for storing petrol products. 4,045,963, Cl. 61-.500.

Harbulak, Edward P., to M&T Chemicals Inc. Additive for improved electroplating process. 4,046,647, Cl. 204-43.00T.

Hardman, Harley F., to Standard Oil Company, The. Dehydrogenation of paraffins. 4,046,833, Cl. 260-683.300.

Hardy, Michel; and Humbert, Daniel, to Roussel Uclaf. Hypolipemiant composition and method using thiazole-5-methanols. 4,046,902, Cl. 424-270.000.

Hardy, William Baptist, to American Cyanamid Company. 1,3-bis[(2,2,6,6-Tetraalkyl-4-piperidylidene)amino]guanidines as light stabilizers for polyolefins. 4,046,736, Cl. 260-45.80N.

Harley, David Murray, to Ferranti Limited. Assemblies including electrical interconnections. 4,046,441, Cl. 339-8.00R.

Harman, Harold: *See—*
Best, Anthony; and Harman, Harold, 4,046,360, Cl. 267-65.00B.

Harmuth, Charles M., to Du Pont de Nemours, E. I., and Company. Polyvinyl chloride terpolymer powder coating composition. 4,046,728, Cl. 260-28.50A.

Harper, Samuel: *See—*
Kruk, Anthony Richard; Bryant, Richard; and Harper, Samuel, 4,045,855, Cl. 29-252.000.

Harris, Alva F., to Monsanto Company. Stabilizers of nitrile polymers using triazine derivatives. 4,046,735, Cl. 260-45.8NT.

Harris Corporation: *See—*
Perkins, Frank A., 4,047,008, Cl. 235-152.000.

Harris, Frank W.; and Reinhardt, Bruce A., to Wright State University. Preparation of diketones. 4,046,814, Cl. 260-590.00E.

Harris, Mervyn George, to Lucas Electrical Company Limited, The. Lamp assembly. 4,047,018, Cl. 240-7.10R.

Harris, Robert D., to United States of America, Interior. Water lubricated bearing assembly for mining machine. 4,046,431, Cl. 308-76.000.

Harsco Corporation: *See—*
Clark, John A., Jr., 4,046,189, Cl. 165-39.000.
Glover, Nolan S., 4,046,693, Cl. 210-195.00S.

Glover, Nolan S., 4,046,700, Cl. 210-523.000.

Hart, Dennis L.: *See—*
Flam, Fred; and Hart, Dennis L., 4,045,835, Cl. 9-313.000.

Hart, John A. H., to Canada, Her Majesty the Queen in Right of. Gas resistant foam materials. 4,046,939, Cl. 428-311.000.

Hartel, Kurt: *See—*
Frensch, Heinz; Albrecht, Konrad; and Hartel, Kurt, 4,046,906, Cl. 424-273.00R.

Hartmann, Gunter; and Winckler, Rudolf, to Siemens Aktiengesellschaft. Method for producing electrical connector strips. 4,045,869, Cl. 29-630.00A.

Hartmann, Hans-Joerg; Falk, Roland; Gawlik, Peter; Balz, Werner; Uhl, Karl; Schaefer, Dieter; and Motz, Herbert, to BASF Aktiengesellschaft. Magnetic recording discs. 4,046,932, Cl. 428-64.000.

Harukawa, Junichi: *See—*
Kato, Yasuo; Kato, Katsuhiko; Sugino, Masahiro; Ikegami, Jun; and Harukawa, Junichi, 4,046,724, Cl. 260-9.000.

Harvey, Leslie E.; and Spiva, Stephan D. Bowling practice device. 4,046,376, Cl. 273-54.00D.

Hashimoto, Masanao; and Suzuki, Takaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Control apparatus for automatic transmission. 4,046,033, Cl. 74-869.000.

Hashimoto, Shinichiro; Goto, Toru; and Kajino, Yukio, to Mitsubishi Denki Kabushiki Kaisha. DC arc welding apparatus using high-frequency pulse current. 4,046,987, Cl. 219-135.000.

Hashimoto, Yasuo: *See—*
Ishino, Ken; Hashimoto, Yasuo; and Abe, Hiroaki, 4,046,983, Cl. 219-10.55D.

Hashizume, Nobuo: *See—*
Kataoka, Shoei; Komaniya, Yasuo; Hashizume, Nobuo; Tomizawa, Kazutaka; and Kawashima, Mitsuo, 4,047,199, Cl. 357-3.000.

Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, to Hoffmann-La Roche Inc. Substituted phenyl ketones. 4,046,751, Cl. 260-112.50R.

Hatsuoka, Nobuyasu: *See—*
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,046,600, Cl. 148-12.400.

Haugwitz, Rudiger D.; and Maurer, Barbara V., to E. R. Squibb & Sons, Inc. Benzimidazole derivatives, compositions thereof and methoú of use as anthelmintics. 4,046,908, Cl. 424-273.00R.

Hauni-Werke Korber & Co. KG: *See—*
Rudszinat, Willy, 4,046,027, Cl. 74-567.000.
Wahle, Gunter, 4,046,064, Cl. 93-1.00C.

Havasi, Miklos: *See—*
Andriska, Viktor; Gorog nee Privitzer, Katalin; Bruckner, Gyorgyi; Nemessanyi nee Szekely, Zsuzsanna; Havasi, Miklos; Raskay, Bela; Grega nee Toth, Erzsebet; Szigeti nee Haranghy, Terez; Dudas, Jozsef; Szilagyi, Gyula; Marosvolgyi, Sandor; Gribovszky, Pal; Pinter, Zoltan; and Bors, Gyozo, 4,046,773, Cl. 548-339.000.

Hawkins, Richard T., to Phillips Petroleum Company. Phenylene sulfide oligomer production. 4,046,749, Cl. 260-79.000.

Hayashi, Osamu; Inagaki, Takahumi; and Yanagita, Yoshio, to Standard Technology, Inc. Apparatus for diluting gas. 4,046,158, Cl. 137-88.000.

Hayes, John C.: *See—*
Mitsche, Roy T.; Kuntz, Hillard L.; and Hayes, John C., 4,046,713, Cl. 252-455.00Z.
Pollitzer, Ernest L.; and Hayes, John C., 4,046,672, Cl. 208-139.000.
Pollitzer, Ernest L.; and Hayes, John C., 4,046,828, Cl. 260-673.500.

Hayes, Robert I., Jr.: *See—*
Furr, Robert L., 4,046,378, Cl. 273-85.00D.

Hayward, Donald J. Device for upending a ceramic mold. 4,046,272, Cl. 214-312.000.

Head, Glenn Dale, to Deere & Company. Means for controlling discharge door movement. 4,046,069, Cl. 100-255.000.

Healy, Dennis M.: *See—*
Juds, Richard C.; and Healy, Dennis M., 4,046,451, Cl. 339-177.00R.

Heard, Norris K.: *See—*
Korby, Leonard A.; and Heard, Norris K., 4,046,252, Cl. 206-95.000.

Heath (Gloucester) Ltd.: *See—*
Smith, Kenneth Browning; and Adams, Derek William, 4,047,036, Cl. 250-359.000.

Hebert, Jacques J.: *See—*
Ward, Truman L.; Benerito, Ruth R.; and Hebert, Jacques J., 4,046,953, Cl. 428-426.000.

Heckles, John S., to Armstrong Cork Company. Method of preparing β-amino derivatives of α,β-unsaturated esters. 4,046,803, Cl. 560-172.000.

Hedden. Horst: *See—*
Sridhar, Srinivasan; and Hedden, Horst, 4,046,746, Cl. 260-78.00S.

Hedges, Rhey Warren, to Parker, Louis W. Television signal-seeking automatic tuning system. 4,047,226, Cl. 358-193.000.

Heemaf B.V.: *See—*
Wijnterp, Wierd, 4,047,095, Cl. 322-17.000.

Heil-Quaker Corporation: *See—*
Anderson, Richard M.; McGill, Robert S., III; and Ramsey, Robert W., 4,045,973, Cl. 62-158.000.

Heimann GmbH: *See—*
Dennhoven, Manfred; Kunze, Claus; and Kuehn, Rainhard, 4,047,035, Cl. 250-355.000.

Heimberger, Werner; and Schreyer, Gerd, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of cyanogen chloride using hydrogen peroxide with pressure. 4,046,862, Cl. 423-383.000.

Hein, George Norton, Jr. Snap ring magnetic stopping system for an air driven centrifuge. 4,046,316, Cl. 233-23.00R.

Hein, George Norton, Jr. Air levitation device for an air driven centrifuge. 4,046,317, Cl. 233-23.00R.

Heinemann, Heinz: *See—*
Chen, Nai Yuen; and Heinemann, Heinz, 4,046,522, Cl. 48-102.00A.

Heiser, Richard S.; and Aanstad, Ola J., to Westinghouse Electric Corporation. Combined cycle electric power plant with a steam turbine having a throttle pressure limiting control. 4,047,005, Cl. 235-151.210.

Helena, Bill F. Relaxation switch. 4,047,167, Cl. 340-280.000.

Helf, Harald: *See—*
Winkler, Franz; and Helf, Harald, 4,046,626, Cl. 176-38.000.

Heller, Alwin: *See—*
Sextro, Gunter; Burg, Karlheinz; Leugering, Hans Joachim; Schlaf, Helmut; and Heller, Alwin, 4,046,738, Cl. 260-67.0FP.

Heller, Lawrence Griffith, to International Business Machines Corporation. Method and apparatus for replicating a charge packet. 4,047,051, Cl. 307-221.00D.

Heller, Milton David: *See—*
Bernstein, Seymour; Lenhard, Robert Herman; and Heller, Milton David, 4,046,805, Cl. 260-506.000.

Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, to American Hoechst Corporation. Benzoylpiperidylalkylindoles. 4,046,900, Cl. 424-267.000.

Henderson, Benjamin B., to Westinghouse Electric Corporation. Photoelectric disc reader with alternate reading locations. 4,047,024, Cl. 250-231.0SE.

Henderson, Dewey D., to Dayco Corporation. Belt drive system. 4,046,022, Cl. 74-220.000.

Henderson, Joseph E. Printing die rotary gluing table. 4,046,072, Cl. 101-415.100.

Henkel & Cie GmbH: *See—*
Kubersky, Hans Peter, 4,046,503, Cl. 8-10.200.

Henle, Richard G.; Merkert, Clifton S.; and Thomas, David C., to FMC Corporation. Adjusting mechanism for transmission band tensioner. 4,046,023, Cl. 74-242.800.

Hercules Incorporated: *See—*
Einerhand, Johan Jozef; Colbers, Gerardus Johannes Baptist; Huck, Wilhelmus Martha Andreas; and Geurts, Herman Jozef Johannes Maria, 4,046,588, Cl. 106-298.000.

Herman, Richard Michael: *See—*
Carman, Charles Jerry; Batiuk, Martin; and Herman, Richard Michael, 4,046,840, Cl. 260-897.00A.

Herring, Bernard D. Adjustable flashlight swingable bracket for a writing instrument. 4,047,017, Cl. 240-6.460.

Hershman, Gordon L.; and Datta, Arthur S., to International Harvester Company. Locking control device. 4,046,236, Cl. 192-8.00R.

Hertl, William; and Odstrchel, Gerald, to Corning Glass Works. Assay for free thyroid hormones. 4,046,870, Cl. 424-1.000.

Hertz, Walter; Stroh, Jan; and Mentel, Jurgen, to Siemens Aktiengesellschaft. Arc quenching arrangement for a gas-flow type circuit breaker. 4,046,979, Cl. 200-148.00A.

Hessler, Edward J., to Upjohn Company, The. Cis-β-[Trimethylammonium]-acrylonitrile tosylate. 4,046,800, Cl. 260-465.00E.

Hewett, Charley L., to Kem-O-Kleen, Inc. High pressure spray cleaning head. 4,046,321, Cl. 239-420.000.

Hewlett-Packard Company: *See—*
Dickinson, Peter D.; Osborne, Thomas E.; Rode, France; Baum, Allen J.; Cochran, David S.; and Tung, Chung C., 4,047,012, Cl. 235-156.000.
Lyman, Richard Ricker; and Waitman, Thomas Frank, 4,047,248, Cl. 364-900.000.

Heylen, Renaat Frans: *See—*
Fierens, Marcel Robert; and Heylen, Renaat Frans, 4,046,570, Cl. 96-61.00R.

Hibi, Masao: *See—*
Kumada, Akio; Takano, Hiroshi; Eto, Yoshizumi; and Hibi, Masao, 4,046,455, Cl. 350-150.000.

Hibner, David H.: *See—*
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Hicklin, Dennis Raymond: *See—*
Attwood, Brian William; and Hicklin, Dennis Raymond, 4,046,622, Cl. 162-132.000.

Hicks, John J.: *See—*
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Hietanen, Ari, deceased: *See—*
Hietanen, Esko; Hietanen, Ari, deceased; and Hietanen, Margo-Ritta, heiress, 4,046,215, Cl. 180-116.000.

Hietanen, Esko; Hietanen, Ari, deceased; and by Hietanen, Margo-Ritta, heiress. Vessel mobile on air cushion or the like. 4,046,215, Cl. 180-116.000.

Hietanen, Margo-Ritta, heiress: *See—*
Hietanen, Esko; Hietanen, Ari, deceased; and Hietanen, Margo-Ritta, heiress, 4,046,215, Cl. 180-116.000.

Higgins, James Francis, to Du Pont de Nemours, E. I., and Company. Calcium-silico-zirconate primer pigment. 4,046,589, Cl. 106-299.000.

Hijikata, Akiko: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,046,876, Cl. 424-177.000.

Hill, Jerry M., to FMC Corporation. Wheel balancing apparatus. 4,046,017, Cl. 73-462.000.

Hill, William L. Handles for cardboard or corrugated paper boxes. 4,046,314, Cl. 229-52.0AW.

Hill, Winfield: *See—*
Huhn, Mary Susan; Horowitz, Paul; and Hill, Winfield, 4,046,992, Cl. 235-54.00F.

Hilti Aktiengesellschaft: *See—*
Rosler, Peter, 4,046,279, Cl. 220-8.000.

Himmler, Dennis W., to General Motors Corporation. Dual voltage charging system. 4,047,088, Cl. 320-6.000.

Hinata, Masanao; Mihara, Yuji; Sato, Akira; and Ikeda, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide photographic light sensitive material. 4,046,572, Cl. 96-69.000.

Hind, John Richard: *See—*
Durston, John Graham; and Hind, John Richard, 4,046,629, Cl. 176-38.000.

Hirai, Yutaka; Miyata, Katsuharu; Osawa, Tagui; Samecima, Muneyasu; Mukai, Ken; Yoshiura, Koichi; and Mori, Hidetoshi, to Mitsui Toatsu Chemicals, Inc. Process for preparing aminoanthraquinones. 4,046,785, Cl. 260-380.000.

Hirano, Goro: *See—*
Kawamura, Yuichi; Hirano, Goro; Nagai, Makoto; and Miura, Yasunobu, 4,046,582, Cl. 106-88.000.

Hirasawa, Kazuhiko; and Okamoto, Yasuo, to Sumitomo Aluminum Smelting Co., Ltd.; and Kyowa Carbon Company, Limited. Carbon block for cathodes of aluminum. 4,046,650, Cl. 204-67.000.

Hisagen, Yoshiaki; and Hoshi, Kazuo, to Sony Corporation. Leader tape. 4,047,232, Cl. 360-134.000.

Hitachi Chemical Company, Ltd.: *See—*
Izumi, Takichiro; Chiba, Shigeo; and Kobayashi, Kazumitsu, 4,046,136, Cl. 126-271.000.

Hitachi, Ltd.: *See—*
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Kumada, Akio; Takano, Hiroshi; Eto, Yoshizumi; and Hibi, Masao, 4,046,455, Cl. 350-150.000.
Ohmura, Yoshito; Okabe, Takahiro; and Morozumi, Hiroshi, 4,047,119, Cl. 330-30.00D.
Sakamoto, Yoshio; and Kominami, Yasuo, 4,047,118, Cl. 330-22.000.

HMW Industries, Inc.: *See—*
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Hobler, Ross L.: *See—*
Bryant, Nelson H.; Hobler, Ross L.; Allen, Wilbur J.; and Poliseo, Joseph W., 4,047,000, Cl. 235-151.100.

Hochberg, Frederick, deceased (by Hochberg, Lee, administratrix); and Pennington, Keith Samuel, to International Business Machines Corporation. Non-impact printing system. 4,046,074, Cl. 101-426.000.

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Mitchell, Joan LaVerne; Pennington, Keith Samuel; and Hochberg, Frederick, deceased, 4,046,073, Cl. 101-426.000.

Hochberg, Lee, administratrix: *See—*
Hochberg, Frederick, deceased; and Pennington, Keith Samuel, 4,046,074, Cl. 101-426.000.
Mitchell, Joan LaVerne; Pennington, Keith Samuel; and Hochberg, Frederick, deceased, 4,046,073, Cl. 101-426.000.

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Frensch, Heinz; Albrecht, Konrad; and Hartel, Kurt, 4,046,906, Cl. 424-273.00R.
Hohmann, Kurt; Mohr, Reinhard; and Hahnke, Manfred, 4,046,752, Cl. 260-158.000.
Kuckertz, Herbert, 4,046,807, Cl. 260-549.000.
Meininger, Fritz; and Springer, Hartmut, 4,046,754, Cl. 260-162.000.
Moraw, Roland, 4,047,238, Cl. 361-229.000.
Muller, Werner Heinrich, 4,046,816, Cl. 260-613.00R.
Otten, Joachim; and Troster, Helmut, 4,046,501, Cl. 8-1.00E.
Pistorius, Rudolf; and Millauer, Hans, 4,046,652, Cl. 204-78.000.
Sextro, Gunter; Burg, Karlheinz; Leugering, Hans Joachim; Schlaf, Helmut; and Heller, Alwin, 4,046,738, Cl. 260-67.0FP.
Winkelmann, Erhardt; and Raether, Wolfgang, 4,046,896, Cl. 424-263.000.

Hoekstra, Joop Frans; Lumby, Donovan Harold; and Vork, William Duncan, to Graco Inc. Automatic metering and dispensing system. 4,046,287, Cl. 222-16.000.

Hoffmann-La Roche Inc.: *See—*
Brenner, Wolf, 4,046,813, Cl. 260-586.00P.
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,046,751, Cl. 260-112.50R.
Szente, Andre, 4,046,890, Cl. 424-244.000.

Hofmann, Charles J.; and Suess, Frederick F., to Fidelity Electric Company, Incorporated. Bearing assembly and anchor therefor. 4,046,432, Cl. 308-189.00R.

Hofmann, Judson A., to Zenith Radio Corporation. Frequency scanning automatic phase control system. 4,047,223, Cl. 358-158.000.

Hogberg, Knut Goran: *See—*
Malmberg, Thor Anders Helge; Hogberg, Knut Goran; and Sjoquist, Stig Roland, 4,047,033, Cl. 250-341.000.

Hohmann, Kurt; Mohr, Reinhard; and Hahnke, Manfred, to Hoechst Aktiengesellschaft. Process for preparing an azo compound from a 2-aminothiazole diazo component. 4,046,752, Cl. 260-158.000.

Hohne, Helmut: *See—*
Dahn, Ursula; Hagenmaier, Hanspaul; Hohne, Helmut; Konig, Wilfried; Scheinpflug, Hans; and Zahner, Hans, 4,046,881, Cl. 424-181.000.

Holden, Ronald L., to Therm-O-Disc, Inc. Calibration and mounting structure for motor controllers or the like. 4,047,141, Cl. 337-89.000.

Holland, Andrew Macdonald: *See—*
Lomas, James Arthur, III; Lee, Ronald La Verne; and Holland, Andrew Macdonald, 4,046,091, Cl. 114-39.000.

Hollandsche Beton Groep N. V.: *See—*
Jansz, Joost W., 4,045,969, Cl. 61-535.000.

Holle, Werner: *See—*
Bletz, Walter; and Holle, Werner, 4,047,189, Cl. 354-23.00D.

Holle, Werner H., to Ernst Leitz GmbH. Auto focus with spatial filtering and pairwise interrogation of photoelectric diodes. 4,047,022, Cl. 250-201.000.

Hollins, Brian E.: *See—*
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Holloway, David G.: *See—*
Massey, Roger G.; and Holloway, David G., 4,046,350, Cl. 251-58.000.

Holroyd, Floyd M.: *See—*
Cwycyshyn, Walter; and Holroyd, Floyd M., 4,046,263, Cl. 214-1.0BC.

Holt, Brian; and Randell, Donald Richard, to Ciba-Geigy Corporation. Piperidine derivatives. 4,046,737, Cl. 260-45.80N.

Holz, George E., to Burroughs Corporation. Display panel having improved arrangement of reset cells for facilitating scanning of the panel. 4,047,169, Cl. 340-324.00M.

Holz, Norbert J.: *See—*
Holz, Orville H., Sr.; and Holz, Norbert J., 4,046,484, Cl. 404-112.000.

Holz, Orville H., Jr.: *See—*
Holz, Orville H., Sr.; and Holz, Norbert J., 4,046,484, Cl. 404-112.000.

Holz, Orville H., Sr.; and Holz, Norbert J., to Holz, Orville H., Jr., a part interest. Spaced-rotor ride-type surface working machine with single-stick control of all movements. 4,046,484, Cl. 404-112.000.

Holzenberger, Kurt, to Klein, Schanzlin & Becker Aktiengesellschaft. Stuffing box. 4,046,389, Cl. 277-113.000.

Honda, Hidemasa: *See—*
Kobayashi, Kazuo; Ogawa, Ichitaro; Honda, Hidemasa; and Matsushita, Yasuhiro, 4,046,863, Cl. 423-448.000.

Honeywell Farms Inc.: *See—*
Virog, John J., Jr.; Von Hagel, Leo; and Platte, Richard L., 4,046,275, Cl. 215-1.00C.

Honeywell Inc.: *See—*
Bonne, Ulrich, 4,046,456, Cl. 350-160.00R.
Burns, Dallas D., 4,045,959, Cl. 60-632.000.
Kompelien, Arlon D., 4,047,038, Cl. 250-372.000.
Nakagawa, Kazuyoshi, 4,047,056, Cl. 307-271.000.
Nelson, Lorne W.; and Sutton, David J., 4,046,531, Cl. 62-202.000.
Nelson, Lorne W., 4,046,532, Cl. 62-215.000.

Honeywell Information Systems Inc.: *See—*
Lee, Fred S., 4,047,236, Cl. 360-113.000.
Nowell, John Rawson, 4,045,887, Cl. 361-98.000.
Stanley, Philip E.; Woods, William E.; and Izbicki, Kenneth J., 4,047,247, Cl. 364-200.000.

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Schmidt, Kees J., 4,046,542, Cl. 65-19.000.

Hook, Rollin E., to Armco Steel Corporation. Method of nitride-strengthening low carbon steel articles. 4,046,601, Cl. 148-15.000.

Hoople, Gary R., to United States of America, Navy. Omnidirectional antenna. 4,047,181, Cl. 343-789.000.

Horn, Bernard. Medical temperature measuring device. 4,046,139, Cl. 128-2.00H.

Hornung, Arthur Charles. Collar for redirecting propeller energy. 4,046,097, Cl. 115-42.000.

Horowitz, Paul: *See—*
Huhn, Mary Susan; Horowitz, Paul; and Hill, Winfield, 4,046,992, Cl. 235-54.00F.

Horsch, Joachim, to International Harvester Company. Transmission clutches with sequence valve and piston-controlled pressure modulator. 4,046,160, Cl. 137-115.000.

Horton, Edward L.: *See—*
Gilbert, Neal J.; and Horton, Edward L., 4,045,915, Cl. 51-427.000.

Horvath, John: *See—*
Goodner, Willis Ray; Smith, James Nelson; and Horvath, John, 4,046,820, Cl. 260-652.50R.

Horvath, Louis T., to Detroit Marine Engineering Corporation. Gland nut retaining means. 4,046,481, Cl. 403-320.000.

Horwitt, Laurence G., to Sun Chemical Corporation. Method of making an electrical igniting unit. 4,045,865, Cl. 29-611.000.

Hosford, Charles D.; and Simpson, Barry. Folding stool and table. 4,046,084, Cl. 108-112.000.

Hoshi, Kazuo: *See—*
Hisagen, Yoshiaki; and Hoshi, Kazuo, 4,047,232, Cl. 360-134.000.

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Troyer, William J., 4,046,230, Cl. 188-1.00B.

Houston, John M., to General Electric Company. Two-dimensional x-ray detector array. 4,047,039, Cl. 250-385.000.

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Burnett, Joseph C., Jr.; Hicks, John J.; and Hovey, Leonard L., 4,046,651, Cl. 204-73.00R.

Hovey, Richard J.: *See—*
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,046,586, Cl. 106-194.000.

Howell, William G.: *See—*
Wittman, Robert H.; and Howell, William G., 4,046,301, Cl. 228-108.000.

Howeth, Bobby W.: *See—*
Paxton, Grady W., Jr.; Howeth, Bobby W.; Mehal, Edward W.; Cashion, William F.; and Cashion, Charles M., 4,047,045, Cl. 250-551.000.

Howlett, Richard Martin: *See—*
Elliott, John Scotchford; Davis, Bryan Terence; and Howlett, Richard Martin, 4,046,802, Cl. 560-61.00G.

Hubbard, S. Eugene: *See—*
Papp, Joseph; Meisterheim, Richard A.; and Hubbard, S. Eugene, 4,046,167, Cl. 138-31.000.

Hubele, Adolf, to Ciba-Geigy Corporation. N-(substituted phenyl)-n-furanoyl-alanine methyl esters and their use in fungicidal composition and methods. 4,046,911, Cl. 424-285.000.

Huck, Wilhelmus Martha Andreas: *See—*
Einerhand, Johan Jozef; Colbers, Gerardus Johannes Baptist; Huck, Wilhelmus Martha Andreas; and Geurts, Herman Jozef Johannes Maria, 4,046,588, Cl. 106-298.000.

Hudson, Frederick W., to Xerox Corporation. Toner reclaiming system. 4,046,682, Cl. 209-250.000.

Hudson, Thomas H.: *See—*
Wells, William M., 4,045,958, Cl. 60-325.000.

Hughes Aircraft Company: *See—*
Sekhon, Kalwant S.; Nelson, Lloyd A.; and Fritz, John E., Jr., 4,047,198, Cl. 357-82.000.
Tuchyner, Harold J.; and Benson, Robert C., 4,047,117, Cl. 330-4.300.

Hughes, Donald R. Universal barrel key apparatus. 4,045,983, Cl. 70-404.000.

Hughes, Douglas W. Canoe loading apparatus. 4,046,273, Cl. 214-450.000.

Huhn, Mary Susan; Horowitz, Paul; and Hill, Winfield. Compact electronic voting. 4,046,992, Cl. 235-54.00F.

Huizinga, Donald Dean; Underhill, Edward William; and Whitcomb, James Arthur, to Bell Telephone Laboratories, Incorporated. Key telephone station set circuit. 4,046,972, Cl. 179-99.000.

Humbert, Daniel: *See—*
Hardy, Michel; and Humbert, Daniel, 4,046,902, Cl. 424-270.000.

Hunt, Brian Keith, to Plessey Handel und Investments AG. Record players. 4,046,385, Cl. 274-10.00R.

Hunt, Robert Carroll: *See—*
Berger, Lawrence A.; and Hunt, Robert Carroll, 4,047,099, Cl. 324-30.00R.

Hunter, Don L.: *See—*
Woods, William G.; and Hunter, Don L., 4,046,758, Cl. 260-239.00E.

Hurlburt, Harvey Zeh; and Sumner, Clark A., to Stauffer Chemical Company. Production of liquid sulfur trioxide. 4,046,866, Cl. 423-533.000.

Hurwitz, Marvin J.: *See—*
Cunningham, Virginia L.; Clovis, James S.; and Hurwitz, Marvin J., 4,046,688, Cl. 210-37.00R.

Hutchines, Jimmy L.; and Meyer, John E., to National Semiconductor Corporation. Capacitive voltage multiplier. 4,047,091, Cl. 321-15.000.

Hutchison, Robert V., to Burroughs Corporation. Pluggable semiconductor device package. 4,046,442, Cl. 339-17.0CF.

Hynd, William Christie, to Pilkington Brothers Limited. Method and apparatus for refining glass in a melting tank. 4,046,546, Cl. 65-135.000.

IBEC Industries, Inc.: *See—*
Rose, Robert C., Sr.; and McClelland, Harold H., 4,046,165, Cl. 137-624.270.

Iberica del Frio S.A.: *See—*
Diaz, D. Angel Chocarro, 4,045,927, Cl. 52-127.000.

Ichiyanagi, Toshikazu: *See—*
Shimazaki, Mamoru; Toyama, Masamichi; Ichiyanagi, Toshikazu; and Iwama, Hideto, 4,046,464, Cl. 352-141.000.
Toyama, Masamichi; Takigawa, Tomoshi; Shimazaki, Mamoru; Okajima, Hidekazu; Ichiyanagi, Toshikazu; and Iwama, Hideto, 4,046,465, Cl. 352-175.000.

Ide, Allan R. Retractable cargo transfer apparatus. 4,046,266, Cl. 214-14.000.

Ideal Toy Corporation: *See—*
Ensmann, Burt; Nielsen, Edwin A.; Snyder, Edward, III; and Ventura, Frank D., 4,045,908, Cl. 46-204.000.

IDN Inventions and Development of Novelties AG: *See—*
Ackeret, Peter, 4,046,255, Cl. 206-387.000.

Igoe, Robert S., to Merck & Co., Inc. Acidified milk product and method of producing the same. 4,046,925, Cl. 426-573.000.

Iida, Kiichi: *See—*
Mizuno, Masayoshi; Kawamoto, Tadashi; and Iida, Kiichi, 4,046,071, Cl. 101-395.000.

Iijima, Katsuhiko; and Yoshida, Katsuhiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Slide mechanism having means for fixing movable frames. 4,046,346, Cl. 248-298.000.

Ikeda, Tadashi: *See—*
Hinata, Masanao; Mihara, Yuji; Sato, Akira; and Ikeda, Tadashi, 4,046,572, Cl. 96-69.000.

Ikegami, Jun: *See—*
Kato, Yasuo; Kato, Katsuhiko; Sugino, Masahiro; Ikegami, Jun; and Harukawa, Junichi, 4,046,724, Cl. 260-9.000.

Imamura, Yoshiaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Propeller milling machine. 4,046,057, Cl. 90-14.000.

IMC Chemical Group, Inc.: *See—*
Shipchandler, Mohammed T., 4,046,817, Cl. 260-621.00R.

Imperial Chemical Industries Limited: *See—*
Cassidy, John Edward, 4,046,581, Cl. 106-85.000.
Clissett, Dennis Edward, 4,045,981, Cl. 66-147.000.
Cobb, Malcolm Carnie; and Elliott, Pamela, 4,046,505, Cl. 8-18.00R.
Davies, George Edward; and Foulkes, David Mackie, 4,046,552, Cl. 71-92.000.
Foster, Robert; Preston, Roger Edwin; and Robinson, Graham Ernest, 4,046,841, Cl. 260-923.000.
Groves, David John; and Mason, Albert, 4,046,842, Cl. 264-22.000.
Lewis, Cyril John; Carter, Neil; and Ray, Neil Hunter, 4,046,540, Cl. 65-18.000.
Shaw, Andrew, 4,046,898, Cl. 424-263.000.

Inada, Kazuyoshi: *See—*
Seguchi, Koji; Sugita, Minoru; Inada, Kazuyoshi; Tagaya, Kiyoshi; and Nakamura, Yuji, 4,046,670, Cl. 208-48.0AA.

Inagaki, Takahumi: *See—*
Hayashi, Osamu; Inagaki, Takahumi; and Yanagita, Yoshio, 4,046,158, Cl. 137-88.000.

Industrial Fasteners Corporation: *See—*
Lovisek, Louis J., 4,046,051, Cl. 85-47.000.

Infante, Samuel J. Dispersant for the application of dental ceramic. 4,046,732, Cl. 260-31.20R.

Ing. C. Olivetti & C., S.p.A.: *See—*
Romano, Antonio, 4,047,055, Cl. 307-262.000.

Inglis, Leslie K., to Vortec Corporation. Air flow amplifier. 4,046,492, Cl. 417-197.000.

Innes, Robert Arthur; Enright, Gregory Preston Michael; and Derrick, Garnet Lloyd, to Alcan Research and Development Limited. Method and apparatus for applying coating compositions to strip material. 4,046,931, Cl. 427-428.000.

Inoue, Nobuyoshi; and Shimizu, Munetaka, to Copal Company Limited. Mechanical exposure control means for electric shutters. 4,047,211, Cl. 354-258.000.

Inoue, Yasuhiko: *See—*
Itoh, Iko; Inoue, Yasuhiko; Ito, Shojiro; and Kawamura, Kazumitsu, 4,046,727, Cl. 260-28.50R.

Inoue, Yasukazu; and Fujimoto, Shoji, to Nippon Electric Co., Ltd. Method of manufacturing a semiconductor device. 4,046,607, Cl. 148-187.000.

Inouye, Kozo; Nakamura, Kotaro; Yokota, Yukio; Nakazyo, Kiyoshi; and Okumura, Akio, to Fuji Photo Film Co., Ltd. Color photographic materials. 4,046,573, Cl. 96-74.000.

Insetta, Victor. Multiple electrode capacitor assembly. 4,047,240, Cl. 361-275.000.

Instituto Luso Farmaco D'Italia S.r.l.: *See—*
Manghisi, Elso; and Salimbeni, Aldo, 4,046,762, Cl. 544-148.000.

Interkal, Inc.: *See—*
Molloy, Richard P., 4,045,921, Cl. 52-9.000.

Interlake, Inc.: *See—*
Redelman, Paul E.; and Busam, Donald H., 4,046,267, Cl. 214-16.40B.

International Business Machines Corporation: *See—*
Bassous, Ernest; and Kuhn, Lawrence, 4,047,184, Cl. 346-75.000.
Branham, Charles Escom; Steury, Thomas Dean; and Woodward, John Maury, 4,046,471, Cl. 355-14.000.
Chaudhari, Praveen; Cuomo, Jerome John; and Matthews, John Wauchope, 4,046,618, Cl. 156-603.000.
Comerford, Liam David; and Zory, Peter Stephen, Jr., 4,047,124, Cl. 331-94.50H.
Davis, Michael Ian, 4,047,161, Cl. 364-200.000.
Dreyfus, Russell Warren, 4,047,125, Cl. 331-94.5PE.
Finkemeyer, Karl-Friedrich; Roehr, Kuno M.; and Sonntag, Guenther, 4,047,244, Cl. 364-200.000.
Gates, Gerald Alan, 4,046,985, Cl. 219-121.00L.
Heller, Lawrence Griffith, 4,047,051, Cl. 307-221.00D.
Hochberg, Frederick, deceased; and Pennington, Keith Samuel, 4,046,074, Cl. 101-426.000.
Kendall, Arthur Harry; and Rohr, Robert Lewis, 4,047,186, Cl. 346-140.00R.
Milewski, Andrzej, 4,047,013, Cl. 235-156.000.
Mitchell, Joan LaVerne; Pennington, Keith Samuel; and Hochberg, Frederick, deceased, 4,046,073, Cl. 101-426.000.
Stuckert, Paul Edward, 4,047,135, Cl. 335-58.000.
Taub, Howard Hyman, 4,047,183, Cl. 346-1.000.
Thirion, Philippe Emmanuel, 4,047,153, Cl. 340-146.3AQ.

International Computers Limited: *See—*
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International Harvester Company: *See—*
Hershman, Gordon L.; and Datta, Arthur S., 4,046,236, Cl. 192-8.00R.
Horsch, Joachim, 4,046,160, Cl. 137-115.000.
McKee, Kenneth E.; and McAllister, Alex J., 4,046,021, Cl. 74-110.000.
Ward, Gerald G., 4,046,203, Cl. 172-456.000.

International Nickel Company, Inc., The: *See—*
Subramanian, Kohur Nagaraja; and Glaum, Gerald Vernon, 4,046,851, Cl. 423-41.000.

International Standard Electric Corporation: *See—*
Adelaar, Hans Helmut, 4,046,963, Cl. 179-15.00A.
Kirkby, Paul Anthony, 4,047,123, Cl. 331-94.50H.
Overbury, Francis G., 4,047,177, Cl. 343-113.0DE.

International Telephone and Telegraph Corporation: *See—*
Anhalt, John W., 4,046,445, Cl. 339-95.00D.
Kontomerkos, Andrew, 4,046,965, Cl. 179-18.0DA.
Stevens, Charles H., 4,046,045, Cl. 83-620.000.

INTERNIx Research Corporation: *See—*
Bodor, Nicolae S., 4,046,899, Cl. 424-266.000.

Ireland, Henry R.; and Stein, Thomas R., to Mobil Oil Corporation. Method for improving the Fischer-Tropsch synthesis product distribution. 4,046,829, Cl. 260-676.00R.

Irie, Kazuo: *See—*
Tada, Sugihiko; Nakai, Setsuo; Irie, Kazuo; Saito, Hirokazu; and Suzuki, Hideaki, 4,046,154, Cl. 134-65.000.

Irie, Kenji: *See—*
Yamada, Hirotada; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Okamura, Kosaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,046,904, Cl. 424-271.000.

Irons, Eric, to Ballast-Nedam Groep, N.V. Method for collecting light-weight substance floating on a liquid surface. 4,046,691, Cl. 210-83.000.

Isett, Lawrence Clair, to Eastman Kodak Company. Chalcogenated tetracene organic metals. 4,046,950, Cl. 428-411.000.

Ishihara Sangyo Kaisha, Ltd.: *See—*
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, 4,046,553, Cl. 71-94.000.

Ishii, Takashi; Nishida, Katsutoshi; Komatsu, Michiyasu; and Tsuge, Akihiko, to Tokyo Shibaura Electric Co., Ltd. Silicon nitride-based sintered material and method for manufacturing the same. 4,046,580, Cl. 106-55.000.

Ishimaru, Toshiyasu. Penicillin esters. 4,046,759, Cl. 260-239.100.

Ishino, Ken; Hashimoto, Yasuo; and Abe, Hiroaki, to TDK Electronics Co., Ltd. Microwave heating oven having seal means for preventing the leakage of microwave energy. 4,046,983, Cl. 219-10.55D.

Ishiyama, Hideki, to Murata Manufacturing Co., Ltd. Elastic surface wave filter. 4,047,129, Cl. 333-72.000.

Island Lumber Specialties Ltd.: *See—*
Marshall, Henry James; Windblad, Stuart Walter; and Wagner, William, 4,046,180, Cl. 144-117.00B.

Itai, Reiichi; and Murakami, Katsuyuki, to Japan Carlit Company, Ltd., The. Process for electrolytically purifying a photographic developer waste solution. 4,046,655, Cl. 204-149.000.

Itasca Magnetics, Inc.: *See—*
Fritz, Alan J., 4,046,680, Cl. 209-214.000.

Itek Corporation: *See—*
Ebner, Peter R. S., 4,046,372, Cl. 271-273.000.
Root, Ernest F.; Kunica, Serge; and Simmons, Harry M., 4,046,135, Cl. 126-271.000.

Ito, Fumio: *See—*
Mashimo, Yukio; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,047,187, Cl. 354-23.00D.

Ito, Shojiro: *See—*
Itoh, Iko; Inoue, Yasuhiko; Ito, Shojiro; and Kawamura, Kazumitsu, 4,046,727, Cl. 260-28.50R.

Ito, Tadashi: *See—*
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Itoh, Iko; Inoue, Yasuhiko; Ito, Shojiro; and Kawamura, Kazumitsu, to Sumitomo Chemical Company, Limited. Thermosettable acrylic resin composition for powder coating. 4,046,727, Cl. 260-28.50R.

Itoo, Hayami; Takahashi, Noriaki; and Kouda, Hiromasa, to Kawasaki Jukogyo Kabushiki Kaisha. Method for removing sulfur oxide from stack gas. 4,046,856, Cl. 423-166.000.

Iwama, Hideto: *See—*
Shimazaki, Mamoru; Toyama, Masamichi; Ichiyanagi, Toshikazu; and Iwama, Hideto, 4,046,464, Cl. 352-141.000.
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Iwama, Katsuaki: *See—*
Akutsu, Hidezo; Iwama, Katsuaki; Saito, Naoki; Takagawa, Masanori; Kobayashi, Yoshichika; and Atsumi, Tamisuke, 4,047,069, Cl. 313-487.000.

Iwasaki, Yuji; and Kashima, Koichi, to Diesel Kiki Co., Ltd. Diesel Engine diagnosing device. 4,046,004, Cl. 73-119.00A.

Izawa, Akio: *See—*
Yamada, Hirotada; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Okamura, Kosaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,046,904, Cl. 424-271.000.

Izbicki, Kenneth J.: *See—*
Stanley, Philip E.; Woods, William E.; and Izbicki, Kenneth J., 4,047,247, Cl. 364-200.000.

Izumi, Sumio: *See—*
Saitoh, Kozo; Tanaka, Hiroshi; Nagahama, Tatsuya; and Izumi, Sumio, 4,046,677, Cl. 209-166.000.

Izumi, Takichiro; Chiba, Shigeo; and Kobayashi, Kazumitsu, to Hitachi Chemical Company, Ltd. Solar energy collecting device. 4,046,136, Cl. 126-271.000.

Izumo, Masanori; and Nakakita, Sigeru, to Daikin Kogyo Co. Ltd. Multi-stage fluidized-bed activated carbon regeneration apparatus. 4,046,530, Cl. 55-181.000.

J. M. Voith GmbH: *See—*
Schmid, Heinrich, 4,046,623, Cl. 162-306.000.

J. N. Johnson Company, Inc.: *See—*
Lee, Walter F., 4,046,412, Cl. 292-200.000.

J. P. Burroughs & Son, Inc.: *See—*
Wood, Michael J., 4,046,066, Cl. 99-323.700.

Jacobus, David P.: *See—*
Dorn, Conrad P.; Jones, Howard; and Jacobus, David P., 4,046,897, Cl. 424-263.000.

Jakob, Gert; and Goetzke, Siegfried, to Robert Bosch G.m.b.H. Compact electronic control and power unit structure. 4,047,242, Cl. 361-389.000.

James, Arthur M.; and Conlee, Charles J. Apparatus for hoisting a structural member. 4,046,414, Cl. 294-81.00R.

James Halley & Sons Limited: *See—*
Halley, Angus Murray, 4,046,070, Cl. 101-216.000.

Janek, Klaus: *See—*
Skrivanek, Karl; and Janek, Klaus, 4,046,222, Cl. 184-6.110.

Janning, Eugene A., to Xetron Corporation. Transmitter coupled active filter. 4,047,110, Cl. 325-123.000.

Jansen, John R., to Eastman Kodak Company. Apparatus for laminating film strips to a transport web. 4,046,615, Cl. 156-544.000.

Jansen, Peter: *See—*
Brandt, Bernd; Jansen, Peter; and Liesenfeld, Heinz, 4,045,881, Cl. 34-138.000.

Jansz, Joost W., to Hollandsche Beton Groep N. V. Submergible pile driving method and apparatus for continuous operation. 4,045,969, Cl. 61-535.000.

Janzon, Bo Lennart, to Uddehoms Aktiebolag. Procedure for manufacture of steel band or strip. 4,046,598, Cl. 148-12.00R.

Japan Carlit Company, Ltd., The: *See—*
Itai, Reiichi; and Murakami, Katsuyuki, 4,046,655, Cl. 204-149.000.

Jarman, Alonzo B.: *See—*
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Jasulaitis, William A.: *See—*
Gorin, Everett; Jasulaitis, William A.; Wasson, George E.; and Theodore, Frank William, 4,046,496, Cl. 425-222.000.

Jeninga, John, to Atlantic Products Corporation. Golf ball retriever. 4,046,413, Cl. 294-19.00A.

Jenkins, Raymond F., to Rohm and Haas Company. Thermosetting coatings based on ketoxime-blocked isocyanates and oxazolidines. 4,046,744, Cl. 260-77.5AQ.

Jenkins, Stephen R., to Digital Equipment Corporation. Secondary storage facility for data processing. 4,047,157, Cl. 364-900.000.

Jennings, Alan K., to Pertec Corporation. Peripheral processing system. 4,047,158, Cl. 364-900.000.

Jeno's, Inc.: *See—*
Moline, Roy V., 4,046,920, Cl. 426-19.000.

Johansson, Erik Karl Gustav, to Aktiebolaget Electrolux. Vacuum cleaner tool for cleaning deep pile carpets. 4,045,840, Cl. 15-397.000.

John Thomas Batts, Inc.: *See—*
Garrison, Judd F., 4,046,293, Cl. 223-88.000.

John Wyeth & Brother Limited: *See—*
Cavalla, John Frederick; and Archibald, John Leheup, 4,046,767, Cl. 260-293.770.
Curran, Adrian Charles Ward; and Shepherd, Robin Gerald, 4,046,895, Cl. 424-258.000.

Johns Hopkins University, The: *See—*
Miller, Robert E., 4,047,170, Cl. 343-5.0PC.

Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Hybrid exposure control system employing dual maximum blade displacement. 4,047,190, Cl. 354-27.000.

Johnson, Bruce K.; Van Allen, David E.; and Whiteside, George D., to Polaroid Corporation. Photographic apparatus with sequencing system. 4,047,192, Cl. 354-83.000.

Johnson, Dudley Bruce; and Hanni, Stephen Leroy, to Texas Instruments Incorporated. Keyboard switch with printed wiring board structure and its method of manufacture. 4,046,981, Cl. 200-159.00B.

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Johnson, Herbert G., to Upjohn Company, The. Dosage schedule. 4,046,910, Cl. 424-278.000.

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Mesek, Frederick K.; and Repke, Virginia L., 4,045,833, Cl. 5-335.000.
Mouwen, Herman Charles, 4,046,696, Cl. 210-431.000.

Johnson, Leighton Clifford, to Miles Laboratories, Inc. Printed reagent test devices and method of making same. 4,046,513, Cl. 23-253.0TP.

Johnson, Roy O.: *See—*
Johnson, William A.; and Johnson, Roy O., 4,046,320, Cl. 237-8.00C.

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Johnson, William Henry: *See—*
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,046,751, Cl. 260-112.50R.

Johnston, Gordon Francis; Martin, Alexander; and Tomlinson, Alan Digby, to Lever Brothers Company. Detergent bars. 4,046,717, Cl. 252-546.000.

Johnston, Katharine Gentry; and Smith, Melvin Dee, to Miles Laboratories, Inc. Test device and method for determining a component in a sample. 4,046,514, Cl. 23-253.0TP.

Johnston, Kenneth Alan: *See—*
Stringer, Robert Kenneth; and Johnston, Kenneth Alan, 4,046,661, Cl. 204-195.00S.
Jones, Allen Jacob, to Agnew, S. J. Furnace roof construction. 4,045,924, Cl. 52-125.000.
Jones, Howard; and Frankshun, Robert A., to Merck & Co., Inc. Process for preparing 1-α-hydroxy cholesterol derivatives. 4,046,760, Cl. 260-239.55R.
Jones, Howard: *See—*
Dorn, Conrad P.; Jones, Howard; and Jacobus, David P., 4,046,897, Cl. 424-263.000.
Jones, Thomas H.: *See—*
Muzyczko, Thaddeus M.; and Jones, Thomas H., 4,046,577, Cl. 96-115.00R.
Jordan, John W. Box top kite, and method of making same. 4,046,340, Cl. 244-153.00R.
Jordan, Richard J.; and Travis, Charles W. Contactless photoelectric ignition system. 4,046,123, Cl. 123-146.50A.
Jordan, Rodney W.: *See—*
McDanolds, Richard T.; and Jordan, Rodney W., 4,046,055, Cl. 86-1.00B.
Joslyn Mfg. and Supply Co.: *See—*
Lusk, George E., 4,046,958, Cl. 174-73.00R.
Judge, John F. X.; and Salpeter, Jerome, to Technicon Instruments Corporation. Standard for spectral reflectance. 4,047,032, Cl. 250-338.000.
Juds, Richard C.; and Healy, Dennis M., to Andrew Corporation. Connector for coaxial cable with annularly corrugated outer conductor. 4,046,451, Cl. 339-177.00R.
Juillard, Yves; and Riner, Victor, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Looms. 4,046,170, Cl. 139-20.000.
Junker, David W.: *See—*
Yorks, Robert G.; and Junker, David W., 4,047,233, Cl. 361-88.000.
Kabushiki Kaisha Daini Seikosha: *See—*
Miyazaki, Joichi, 4,045,953, Cl. 58-23.00R.
Tanaka, Kojiro, 4,045,951, Cl. 58-23.00R.
Kabushiki Kaisha Seikosha: *See—*
Kumazawa, Shoichiro, 4,045,950, Cl. 58-23.00D.
Kabushiki Kaisha Takechi Koumusho: *See—*
Asayama, Kingo, 4,046,205, Cl. 175-292.000.
Kabushiki Kaisha Teranishi Denki Seisaku-Sho: *See—*
Teranishi, Akihiko, 4,046,289, Cl. 222-146.0HE.
Kabushikikaisha Yokogawa Denki Seisakusho: *See—*
Watanabe, Kazutaka; Shimizu, Misao; and Sugawara, Akihiro, 4,046,959, Cl. 178-68.000.
Kaczmarek, Thomas D.; and Phillips, David C., to Westinghouse Electric Corporation. Device for indicating overheating in generators. 4,046,512, Cl. 23-253.0TP.
Kagerhuber, Franz; and Scheurecker, Werner, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Arcuate supporting and guiding construction for continuously cast strands. 4,046,188, Cl. 164-282.000.
Kaiser Aluminum & Chemical Corporation: *See—*
Morris, Frank E., 4,045,935, Cl. 52-599.000.
Kajima Corporation: *See—*
Gerwick, Benjamin C., Jr., 4,045,968, Cl. 61-86.000.
Kajino, Yukio: *See—*
Hashimoto, Shinichiro; Goto, Toru; and Kajino, Yukio, 4,046,987, Cl. 219-135.000.
Kalina, Theodore; and Moore, Roger E., to Exxon Research and Engineering Company. Synthesis gas production. 4,046,523, Cl. 48-197.00R.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. Indoanilines. 4,046,786, Cl. 260-396.00N.
Kambara, Kyosaku, to Tokyo Tekko Kabushiki Kaisha. Cable tray. 4,046,343, Cl. 248-49.000.
Kameswaran, Venkataraman; and Addor, Roger William, to American Cyanamid Company. α-Cyano benzyl-2-naphthaleneacetates. 4,046,799, Cl. 260-465.00D.
Kamiya, Ko: *See—*
Maeda, Fumiaki; Naruse, Seiji; and Kamiya, Ko, 4,046,001, Cl. 73-100.000.
Kanaya, Fumio: *See—*
Yasuda, Hiroshi; and Kanaya, Fumio, 4,047,221, Cl. 358-136.000.
Kando, Akiyoshi, to Yoshida Kogyo Kabushiki Kaisha. Top stop device for slide fasteners. 4,045,845, Cl. 24-205.11F.
Kaneda, Tsugio: *See—*
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,046,600, Cl. 148-12.400.
Kaneko, Hidefumi: *See—*
Kume, Tsutomu; Kasai, Kazuo; Kaneko, Hidefumi; Sugiyama, Shigeo; and Mithuhashi, Shigeo, 4,047,230, Cl. 360-17.000.
Kannam, Peter Joseph: *See—*
White, Joseph Paul; and Kannam, Peter Joseph, 4,047,196, Cl. 357-55.000.
Kanojia, Ramesh Maganlal, to Ortho Pharmaceutical Corporation. Isolation of utero-evacuant substances from plant extracts. 4,046,882, Cl. 424-195.000.
Kanzaki Paper Manufacturing Company, Ltd.: *See—*
Saito, Toranosuke; Kohno, Jujiro; Tanaka, Daiichiro; and Oda, Shinichi, 4,046,941, Cl. 428-323.000.
Kao Soap Co., Ltd.: *See—*
Yagi, Kouichi; Yamanaka, Makoto; and Fujino, Takashi, 4,046,705, Cl. 252-99.000.
Karl Kroyer St. Anne's Limited: *See—*
Attwood, Brian William; and Hicklin, Dennis Raymond, 4,046,622, Cl. 162-132.000.
Karsten, Carl G.: *See—*
Price, Jerome J.; Karsten, Carl G.; and Paggen, William D., 4,046,976, Cl. 200-61.930.
Kasai, Kazuo: *See—*
Kume, Tsutomu; Kasai, Kazuo; Kaneko, Hidefumi; Sugiyama, Shigeo; and Mithuhashi, Shigeo, 4,047,230, Cl. 360-17.000.
Kashima, Koichi: *See—*
Iwasaki, Yuji; and Kashima, Koichi, 4,046,004, Cl. 73-119.00A.
Kashio, Toshio, to Casio Computer Co., Ltd. Electronic timepiece apparatus. 4,045,952, Cl. 58-23.00R.
Kassai Kabushikikaisha: *See—*
Kassai, Kenzou, 4,046,401, Cl. 280-650.000.
Kassai, Kenzou, to Kassai Kabushikikaisha. Folding baby carriage. 4,046,401, Cl. 280-650.000.
Kassel, Karl-Heinz: *See—*
Glowinski, Wolf; Dulken, Hartmut; Guder, Gottfried; and Kassel, Karl-Heinz, 4,046,562, Cl. 96-1.50R.
Kasuga, Yukio: *See—*
Akao, Takeshi; Sakasai, Toshio; Matsuyama, Yoshikazu; and Kasuga, Yukio, 4,046,921, Cl. 426-46.000.
Kataoka, Katsuyuki: *See—*
Tsunoda, Shogo; Kataoka, Katsuyuki; and Baba, Toshinori, 4,046,683, Cl. 210-20.000.
Tsunoda, Shogo; and Kataoka, Katsuyuki, 4,046,684, Cl. 210-20.000.
Kataoka, Shoei; Komaniya, Yasuo; Hashizume, Nobuo; Tomizawa, Kazutaka; and Kawashima, Mitsuo, to Agency of Industrial Science & Technology. Semiconductor device. 4,047,199, Cl. 357-3.000.
Katkov, Jury Vasilievich: *See—*
Kholmogorov, Mikhail Vladimirovich; Katkov, Jury Vasilievich; Vorbiev, Grigory Vasilievich; Gusev, Alexandr Mikhailovich; and Nazaretian, Eduard Gurgenovich, 4,045,991, Cl. 72-251.000.
Kato, Katsuhiko: *See—*
Kato, Yasuo; Kato, Katsuhiko; Sugino, Masahiro; Ikegami, Jun; and Harukawa, Junichi, 4,046,724, Cl. 260-9.000.
Kato, Saburo; and Takemoto, Takeshi, to Ricoh Co., Ltd. Automatic reversal mechanism. 4,046,334, Cl. 242-201.000.
Kato, Yasuo; Kato, Katsuhiko; Sugino, Masahiro; Ikegami, Jun; and Harukawa, Junichi, to Toyo Boseki Kabushiki Kaisha. Fireproof polyester composition. 4,046,724, Cl. 260-9.000.
Kato, Yasuyuki; Moritani, Masahiko; and Suzuki, Seiichi, to Sumitomo Chemical Company, Limited. Continuous casting of a polymerizable composition between moving endless belts. 4,046,850, Cl. 264-216.000.
Katsuoka, Ritsu; Kawai, Hisasi; and Morino, Seiji, to Nippon Soken, Inc. Logarithmic function generating system. 4,046,999, Cl. 235-150.530.
Kaule, Walter, to Krautkramer-Branson, Incorporated. Interferometric method and apparatus for sensing surface deformation of a workpiece subjected to acoustic energy. 4,046,477, Cl. 356-109.000.
Kaup, Friedel: *See—*
Warnke, Heinrich; and Kaup, Friedel, 4,046,646, Cl. 204-38.00B.
Kawaguchi, Heizo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Supporting device for supporting a roll film in a camera. 4,047,208, Cl. 354-203.000.
Kawai, Hisasi: *See—*
Katsuoka, Ritsu; Kawai, Hisasi; and Morino, Seiji, 4,046,999, Cl. 235-150.530.
Kawamoto, Tadashi: *See—*
Mizuno, Masayoshi; Kawamoto, Tadashi; and Iida, Kiichi, 4,046,071, Cl. 101-395.000.
Kawamura, Kazumitsu: *See—*
Itoh, Iko; Inoue, Yasuhiko; Ito, Shojiro; and Kawamura, Kazumitsu, 4,046,727, Cl. 260-28.50R.
Kawamura, Naoto, to Canon Kabushiki Kaisha. Retrofocus wide angle objective lens system. 4,046,459, Cl. 350-214.000.
Kawamura, Yuichi; Hirano, Goro; Nagai, Makoto; and Miura, Yasunobu, to Nitto Chemical Industry Co., Ltd. Air-entraining water-reducing agents for cement composition. 4,046,582, Cl. 106-88.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Itoo, Hayami; Takahashi, Noriaki; and Kouda, Hiromasa, 4,046,856, Cl. 423-166.000.
Kawasaki, Shinkichi: *See—*
Wada, Masami; Kodama, Masahiro; and Kawasaki, Shinkichi, 4,047,042, Cl. 250-390.000.
Kawashima, Mitsuo: *See—*
Kataoka, Shoei; Komaniya, Yasuo; Hashizume, Nobuo; Tomizawa, Kazutaka; and Kawashima, Mitsuo, 4,047,199, Cl. 357-3.000.
Kawneer Company, Inc.: *See—*
Papp, Joseph; Meisterheim, Richard A.; and Hubbard, S. Eugene, 4,046,167, Cl. 138-31.000.
Kaye, Paul, to Aquafilter Corporation. Cigarette holder. 4,046,153, Cl. 131-187.000.
Kearns, Tommy C.: *See—*
Vertes, Michael A.; Ronzio, Richard A.; and Kearns, Tommy C., 4,046,852, Cl. 423-58.000.
Kelley, Dale T. Bicycle safety flasher with optional mounting means for other uses. 4,047,150, Cl. 340-84.000.
Kellogg, George Edward, to General Motors Corporation. Disc brake sliding caliper assembly with brake pads of a common pattern, and method of construction. 4,046,232, Cl. 188-73.100.

Kem-O-Kleen, Inc.: *See—*
Hewett, Charley L., 4,046,321, Cl. 239-420.000.
Kemp, Jacob D.; and Sieg, Robert P., to Chevron Research Company. Gasoline production. 4,046,520, Cl. 44-56.000.
Kendall, Arthur Harry; and Rohr, Robert Lewis, to International Business Machines Corporation. Pre-aimed nozzle for ink jet recorder and method of manufacture. 4,047,186, Cl. 346-140.00R.
Kendall Company, The: *See—*
Libman, Gary; Binard, William J.; and Patel, Harish A., 4,046,138, Cl. 128-2.00F.
Kennecott Copper Corporation: *See—*
Crimes, Peter B., 4,046,559, Cl. 75-93.00R.
Kennedy, William S.: *See—*
Clark, Thomas S.; Kennedy, William S.; and Piziali, Robert L., 4,046,131, Cl. 124-71.000.
Kent Feeds, Inc.: *See—*
Sun, Paul L. F., 4,045,912, Cl. 47-58.000.
Kerllenevich, Natalio, to Data General Corporation. I/O Bus transceiver for a data processing system. 4,047,201, Cl. 364-200.000.
Kerllenevich, Natalio; and Clemson, Daniel Michael, to Data General Corporation. I/O bus transceiver for a data processing system. 4,047,246, Cl. 364-200.000.
Kernick, Andress; and Geyer, Manvel A., to Westinghouse Electric Corporation. Elevator system. 4,046,229, Cl. 187-29.00R.
KEURO Maschinenbau Gesellschaft mit beschrankter Haftung & Co Kommanditgesellschaft: *See—*
Stolzer, Paul, 4,046,041, Cl. 83-210.000.
Keutel, Hans J., to University of Utah. Direct renin assay system and method. 4,046,633, Cl. 195-103.50R.
Key, Paul Franklyn; and Lazzara, Anthony Ross, to Scientific Technology Inc. Color mark detector with pulsed source and synchronous demodulation. 4,047,023, Cl. 250-214.00B.
Khazzam, Joseph N., to Regent Sports Corporation. Tennis racquet. 4,046,377, Cl. 273-73.00G.
Kholmogorov, Mikhail Vladimirovich; Katkov, Jury Vasilievich; Vorbiev, Grigory Vasilievich; Gusev, Alexandr Mikhailovich; and Nazaretian, Eduard Gurgenovich. Automatic forge rolling machine. 4,045,991, Cl. 72-251.000.
Kidde, Gustave E. Ammonium fluoride process for defluorinating phosphoric acids and production of ammonium fluosilicate. 4,046,860, Cl. 423-341.000.
Kiener, Heinz, to SKF Industries, Inc. Wheel bearing unit for motor vehicles. 4,046,433, Cl. 308-191.000.
Kikkoman Shoyu Co., Ltd.: *See—*
Akao, Takeshi; Sakasai, Toshio; Matsuyama, Yoshikazu; and Kasuga, Yukio, 4,046,921, Cl. 426-46.000.
Kikumoto, Ryoji: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,046,876, Cl. 424-177.000.
Kilmer, Bill G.; and Baugh, David F., Jr., to P. R. Mallory & Co., Inc. Coil protector for permanent magnet synchronous motor. 4,047,061, Cl. 310-164.000.
Kim, Chong Chan. Multi-purpose parallel bar exercising apparatus. 4,046,373, Cl. 272-63.000.
King, Reginald F.: *See—*
Vykukal, Hubert C.; King, Reginald F.; and Vallotton, Wilbur C., 4,046,262, Cl. 214-1.0CM.
Kirk, Walter. Yarn minder and organizer. 4,046,333, Cl. 242-137.100.
Kirkby, Paul Anthony, to International Standard Electric Corporation. Double heterostructure lasers having reduced microstress. 4,047,123, Cl. 331-94.50H.
Kirsch, Andrew F.; and Winkler, Charles L., to Westinghouse Electric Corporation. Elevator system. 4,046,227, Cl. 187-29.00R.
Kirschner, Thomas Francis, to RCA Corporation. Stylus cleaning system for disc record player. 4,046,384, Cl. 274-47.000.
Kishino, Takao; Morimoto, Kiyoshi; and Utamura, Yukihiko, to Futaba Denshi Kogyo Kabushiki Kaisha. Multi-digit fluorescent display tube. 4,047,072, Cl. 313-496.000.
Kishino, Takao, to Futaba Denshi Kogyo Kabushiki Kaisha. Multi-digit fluorescent indicating apparatus. 4,047,073, Cl. 313-497.000.
Kishino, Takao; Yamaguchi, Nobuo; and Utamura, Yukihiko, to Futaba Denshi Kogyo Kabushiki Kaisha. Multi-digit fluorescent display tube with cathode filament support. 4,047,074, Cl. 313-497.000.
Kistemaker, Jacob, to Ultracentrifuge Nederland N.V. Apparatus for the stable confinement of an ionized gas column inside a magnetic field. 4,046,527, Cl. 55-100.000.
Kistner, Hermann; and Lehmann, Gunthart, to Maschinenbau Oppenweiler GmbH. Device for conveying and cutting a pile of sheets. 4,046,043, Cl. 83-425.400.
Kitagami, Kazuo; Miyata, Katsuhiko; and Arai, Akihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Single lens reflex camera. 4,047,206, Cl. 354-152.000.
Kitagawa, Junji: *See—*
Akita, Sigeyuki; and Kitagawa, Junji, 4,047,149, Cl. 340-52.00B.
Kitrell, John V. Reflector device for bicycles. 4,046,397, Cl. 280-289.00R.
Klassen, Horst Willi, to Girling Limited. Sliding caliper disc brake. 4,046,233, Cl. 188-73.300.
Klees, Gerard T.; Meacham, Robert A.; Ruby, Harry M.; and Sich, Edward, to General Motors Corporation. Body mount system for a motor vehicle. 4,046,415, Cl. 296-35.00R.
Klein, Edward, to V-Mark Automation Ltd. Automatic assembly apparatus of syringes. 4,046,616, Cl. 156-559.000.
Klein, Gerald I.: *See—*
Milberger, Walter E.; and Klein, Gerald I., 4,047,046, Cl. 307-101.000.
Klein, Norman E., to Milliken Research Corporation. Endless reinforcement. 4,045,990, Cl. 72-190.000.
Klein, Schanzlin & Becker Aktiengesellschaft: *See—*
Holzenberger, Kurt, 4,046,389, Cl. 277-113.000.
Kline, Richard L.; and Fogleman, Floyd F. Airfoil for aircraft having improved lift generating device. 4,046,338, Cl. 244-213.000.
Klingenberg, James C.; Patel, Hiralal V.; and Morse, Philip W., to Weatherhead Company, The. Centrifugal separator with discharge pump. 4,046,315, Cl. 233-4.000.
Klink, Jerome P.: *See—*
Eisenberg, Arnold J.; and Klink, Jerome P., 4,046,329, Cl. 242-18.00G.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Skrivanek, Karl; and Janek, Klaus, 4,046,222, Cl. 184-6.110.
Klosk, Lawrence. Method for collecting, handling and disposal of waste materials. 4,046,271, Cl. 214-152.000.
Kluge, Arthur F.; Untch, Karl G.; and Fried, John H., to Syntex (U.S.A.) Inc. 13-Cis prostaglandin derivatives. 4,046,801, Cl. 560-121.000.
Kluge, Reinhard: *See—*
Kluge, Willi; and Kluge, Reinhard, 4,046,369, Cl. 271-3.100.
Kluge, Willi; and Kluge, Reinhard. Machine for feeding inserts to a separating device. 4,046,369, Cl. 271-3.100.
Knape, Richard S.; and Straub, Robert D., to General Motors Corporation. Fuel injection nozzle assembly with stretch element. 4,046,322, Cl. 239-533.700.
Knipper, Gary L., to Western Electric Company, Incorporated. Indirect memory addressing. 4,047,245, Cl. 364-200.000.
Knodler, Dietrich: *See—*
Ott, Anton; Ehrlinger, Friedrich; Knodler, Dietrich; and Zdansevicius, Roland, 4,046,031, Cl. 74-764.000.
Kobayakawa, Masaki; and Akahane, Fumitake, to Nippon Electric Kagoshima, Limited. Flat display panel comprising an envelope including a substrate having terminal-receiving grooves. 4,047,066, Cl. 313-217.000.
Kobayashi, Hideo: *See—*
Takaoka, Sabro; Shinoda, Akira; and Kobayashi, Hideo, 4,046,204, Cl. 175-76.000.
Kobayashi, Kazumitsu: *See—*
Izumi, Takichiro; Chiba, Shigeo; and Kobayashi, Kazumitsu, 4,046,136, Cl. 126-271.000.
Kobayashi, Kazuo; Ogawa, Ichitaro; Honda, Hidemasa; and Matsushita, Yasuhiro, to Director-General of the Agency of Industrial Science and Technology. Process for the production of shaped articles of high density graphite. 4,046,863, Cl. 423-448.000.
Kobayashi, Yoshichika: *See—*
Akutsu, Hidezo; Iwama, Katsuaki; Saito, Naoki; Takagawa, Masanori; Kobayashi, Yoshichika; and Atsumi, Tamisuke, 4,047,069, Cl. 313-487.000.
Ohkubo, Yoshio; and Kobayashi, Yoshichika, 4,046,595, Cl. 148-1.500.
Kobe Steel Ltd.: *See—*
Okuda, Naoki; and Tanaka, Kazuo, 4,046,988, Cl. 219-137.00R.
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,046,600, Cl. 148-12.400.
Kobylarz, Lawrence P.; and Mack, Ronald H., to Burroughs Corporation. Velocity controlled manual movement credit card reader. 4,047,229, Cl. 360-2.000.
Kodama, Masahiro: *See—*
Wada, Masami; Kodama, Masahiro; and Kawasaki, Shinkichi, 4,047,042, Cl. 250-390.000.
Kohata, Teruo: *See—*
Matsuo, Tatsuki; and Kohata, Teruo, 4,046,525, Cl. 55-59.000.
Kohn, Leo S.: *See—*
Torossian, Kevork A.; and Kohn, Leo S., 4,046,938, Cl. 428-285.000.
Kohno, Jujiro: *See—*
Saito, Toranosuke; Kohno, Jujiro; Tanaka, Daiichiro; and Oda, Shinichi, 4,046,941, Cl. 428-323.000.
Koizumi, Toshimichi, to Olympus Optical Co., Ltd. Objective for video disks. 4,046,460, Cl. 350-216.000.
Kolb, Werner Bernard, to Turbo-Lufttechnik GmbH. Lubrication of fan blade bearings. 4,046,486, Cl. 416-157.00R.
Kolberg, Reiner: *See—*
Rosskamp, Gunter; Kolberg, Reiner; Gunzel, Peter; and Porep, Hans-Jurgen, 4,046,146, Cl. 128-266.000.
Kollar, John. Process for the industrial production of ethylene oxide and aromatic acid. 4,046,782, Cl. 260-348.320.
Komaniya, Yasuo: *See—*
Kataoka, Shoei; Komaniya, Yasuo; Hashizume, Nobuo; Tomizawa, Kazutaka; and Kawashima, Mitsuo, 4,047,199, Cl. 357-3.000.
Komatsu, Michiyasu: *See—*
Ishii, Takashi; Nishida, Katsutoshi; Komatsu, Michiyasu; and Tsuge, Akihiko, 4,046,580, Cl. 106-55.000.
Komatsu, Tokuji, to Tsudakoma Kogyo Kabushiki Kaisha. Apparatus for sizing a yarn sheet. 4,046,099, Cl. 118-6.000.
Komatsu, Toshiaki: *See—*
Yamada, Hirotada; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Okamura, Kosaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,046,904, Cl. 424-271.000.

Kominami, Yasuo: *See*—
Sakamoto, Yoshio; and Kominami, Yasuo, 4,047,118, Cl. 330-22.000.
Komiya, Kunihiko: *See*—
Takechi, Hiroshi; Abe, Mitsunobu; Usuda, Matsuo; and Komiya, Kunihiko, 4,046,597, Cl. 148-12.00R.
Komiya, Osamu, to Olympus Optical Co., Ltd. Instrument for removing a foreign substance from the body cavity of human being. 4,046,149, Cl. 128-328.000.
Komiya, Yoshio: *See*—
Tarui, Yasuo; Sakamoto, Tsunenori; and Komiya, Yoshio, 4,046,594, Cl. 136-89.0SJ.
Kompelien, Arlon D., to Honeywell Inc. U.V. detector. 4,047,038, Cl. 250-372.000.
Kondur, Nicholas, Jr., to LRC, Inc. Serial impact calculator printer. 4,046,246, Cl. 197-160.000.
Konig, Wilfried: *See*—
Dahn, Ursula; Hagenmaier, Hanspaul; Hohne, Helmut; Konig, Wilfried; Scheinpflug, Hans; and Zahner, Hans, 4,046,881, Cl. 424-181.000.
Kontomerkos, Andrew, to International Telephone and Telegraph Corporation. Toll restrictor for a time division telecommunication system. 4,046,965, Cl. 179-18.0DA.
Koppers Company, Inc.: *See*—
Lacona, Joseph, 4,046,739, Cl. 260-75.00M.
Leston, Gerd, 4,046,818, Cl. 260-627.00G.
Korby, Leonard A.; and Heard, Norris K. Cigarette pack. 4,046,252, Cl. 206-95.000.
Korelin, Vladimir Fedorovich: *See*—
Feinzilber, Mikhail Leibovich; Kuzin, Eduard Nikolaevich; Timofeev, Gennady Ivanovich; Roitershtein, Semen Semenovich; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Bratyshev, Igor Petrovich; Omelyan, Fedor Evstafievich; Sheinis, Efim Iosifovich; Pak, Vladimir Grigorievich; Romanov, Vladimir Ivanovich; Garbuzov, Zalman Eremeevich; and Naret, Grigory Borisovich, deceased, 4,045,893, Cl. 37-108.00A.
Kosaric, Naim: *See*—
Zajic, James Edward; and Kosaric, Naim, 4,046,678, Cl. 209-166.000.
Kottmann, Alfred: *See*—
Bergmann, Ewald; Bareis, Alfred; Dangelmaier, Karl; and Kottmann, Alfred, 4,046,264, Cl. 214-8.000.
Koubek, Michael; and Mallon, Dietmar, to Siemens Aktiengesellschaft. Circuit arrangement for regulating the amplitude of a sawtooth generator. 4,047,052, Cl. 307-228.000.
Koubek, Michael, to Siemens Aktiengesellschaft. Single tube color television camera with color strip filters. 4,047,200, Cl. 358-47.000.
Kouda, Hiromasa: *See*—
Itoo, Hayami; Takahashi, Noriaki; and Kouda, Hiromasa, 4,046,856, Cl. 423-166.000.
Kozlov, Jury Stepanovich: *See*—
Feinzilber, Mikhail Leibovich; Kuzin, Eduard Nikolaevich; Timofeev, Gennady Ivanovich; Roitershtein, Semen Semenovich; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Bratyshev, Igor Petrovich; Omelyan, Fedor Evstafievich; Sheinis, Efim Iosifovich; Pak, Vladimir Grigorievich; Romanov, Vladimir Ivanovich; Garbuzov, Zalman Eremeevich; and Naret, Grigory Borisovich, deceased, 4,045,893, Cl. 37-108.00A.
Kozlowski, John H., to Crown Zellerbach Corporation. Method of preparing a disalt of 3,3-sulfonylbis (6-hydroxybenzene sulfonic acid). 4,046,806, Cl. 260-512.00C.
Kraft, Inc.: *See*—
Perry, George S., 4,046,313, Cl. 206-611.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Puchelt, Manfred; and Seidelberger, Hartmut, 4,046,632, Cl. 176-87.000.
Winkler, Franz; and Helf, Harald, 4,046,626, Cl. 176-38.000.
Krajewski, Ignacy, to International Computers Limited. Multilayer printed circuit boards. 4,047,132, Cl. 333-84.00M.
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MacPhee, Colin A. A., to Federal Pacific Electric Co. Ground leakage current protection system. 4,047,079, Cl. 361-45.000.
Macri, Antonio: *See—*
Deinhammer, Wolfgang; Wick, Manfred; and Macri, Antonio, 4,046,792, Cl. 260-429.700.
Maderni, Piero; and Mueller, Curt, to Sandoz Ltd. 2,5-Dihalo-4-dialkylsulfamoyl 4'-(N-cyanoalkyl-N-alkyl-amino)-1,1'-azobenzene disperse dyes. 4,046,756, Cl. 260-205.000.
Madewell, George Robison, to Combustion Engineering, Inc. Apparatus for instantly compensating for line voltage irregularities. 4,047,096, Cl. 323-19.000.
Maeda, Fumiaki; Naruse, Seiji; and Kamiya, Ko, to Lion Fat & Oil Co. Limited; and Toyo Sieki Seisakusho Ltd. Apparatus for measuring restoring force necessary for raising folded portions of hard paper boxes. 4,046,001, Cl. 73-100.000.
Maeda Industries, Ltd.: *See—*
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Maertens, Dieter: *See—*
Lehnert, Gunther; Maertens, Dieter; Pampus, Gottfried; and Witte, Josef, 4,046,710, Cl. 252-429.00B.
Maeshima, Tsugio; Nishikawa, Eiichiroh; and Nakamura, Mitsuko, to Toa Nenryo Kogyo Kabushiki Kaisha. Methods for catalytic reduction of nitrogen oxides. 4,046,888, Cl. 423-239.000.
Mages, Bernhard: *See—*
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Magnetic Controls Company: *See—*
Castleman, Cordell V., 4,046,970, Cl. 179-84.00L.
Magnifico, Michael L.: *See—*
Murdoch, Robert N.; Travaglio, Vincent M.; and Magnifico, Michael L., 4,046,083, Cl. 108-107.000.
Magnuson, Allen H. Roll, pitch, and heave stabilization device for air-cushion-borne vehicles. 4,046,217, Cl. 180-126.000.
Maguire, James B., Sr. Method for recovering fresh water from brine. 4,046,534, Cl. 62-534.000.
Maier, Alfred E.; and Stephenson, William I., Jr., to Westinghouse Electric Corporation. Circuit breaker. 4,047,134, Cl. 335-23.000.
Maier, Hans-Peter: *See—*
Feess, Erich; and Maier, Hans-Peter, 4,046,506, Cl. 8-21.00R.
Malaney, Frank N.: *See—*
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Mallon, Dietmar: *See—*
Koubek, Michael; and Mallon, Dietmar, 4,047,052, Cl. 307-228.000.
Malmberg, Thor Anders Helge; Hogberg, Knut Goran; and Sjoquist, Stig Roland, to AB ID-Kort. Checking an identity, authority or check document or the like. 4,047,033, Cl. 250-341.000.
Malott, Richard C., to Leigh Products, Inc. End cap and connectors for roof ridge ventilator. 4,045,928, Cl. 52-199.000.
Mancinelli, Anthony R.: *See—*
Mancinelli, Ralph A.; and Mancinelli, Anthony R., 4,046,098, Cl. 116-56.000.
Mancinelli, Ralph A.; and Mancinelli, Anthony R. Rotatable multi-surface reflectors for bicycles. 4,046,098, Cl. 116-56.000.

Mandras, Christian Maurice, to Societe Metallurgique de Revigny. Machine for polishing rods or wires. 4,045,837, Cl. 15-104.040.
Mandrino, Russell J., executor: *See—*
Eichorn, Roger H., deceased; Silverberg, Morton; and Mandrino, Russell J., executor, 4,046,472, Cl. 355-14.000.
Manduley, Flavio M.: *See—*
Dlugos, Daniel F.; and Manduley, Flavio M., 4,047,007, Cl. 235-151.330.
Manetti, Orlando, to Sigismondo Piva S.p.A. Automatic apparatus for conjointly sewing two elastic cloths having different elasticity. 4,046,087, Cl. 112-121.150.
Manghisi, Elso; and Salimbeni, Aldo, to Instituto Luso Farmaco D'Italia S.r.l. Esters and amides of 3-aryl-1,4 benzodioxan-2-carboxylic acids. 4,046,762, Cl. 544-148.000.
Mannesmann Aktiengesellschaft: *See—*
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Mansson, Martin, to Stal-Laval Turbin AB. Washing apparatus for a compound compressor. 4,046,155, Cl. 134-167.00R.
Marchese, Anthony: *See—*
Luce, David A.; and Marchese, Anthony, 4,046,049, Cl. 84-1.110.
Marcus, Bruce D.; and Fleischman, George L., to United States of America, National Aeronautics and Space Administration. Flat-plate heat pipe. 4,046,190, Cl. 165-105.000.
Margotte, Dieter: *See—*
Adelmann, Siegfried; Margotte, Dieter; Merten, Josef; and Vernaleken, Hugo, 4,046,836, Cl. 260-860.000.
Margreither, Alan R.: *See—*
Wood, Thomas K.; and Margreither, Alan R., 4,046,548, Cl. 65-142.000.
Marino, Francis C.: *See—*
Lau, Edward H.; and Marino, Francis C., 4,047,241, Cl. 361-288.000.
Marion Power Shovel Company, Inc.: *See—*
Baron, George B.; and Padrutt, Paul W., 4,046,270, Cl. 214-138.00R.
Markowski, Stanley J.; and Nolan, James J., to United Technologies Corporation. Low emission combustion chamber. 4,045,956, Cl. 60-39.650.
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Marquis, Gerald L., to Dresser Industries, Inc. Method and apparatus for measuring the thermal neutron absorption rate in earth formations. 4,046,764, Cl. 250-262.000.
Marr, George: *See—*
Edwards, Eva Irene; Epton, Roger; and Marr, George, 4,046,903, Cl. 424-271.000.
Marschner, Friedemann: *See—*
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Marsden, James G.: *See—*
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Gutridge, Jack E.; Hallam, Keith J.; and Marsh, Ronald W., 4,046,081, Cl. 105-326.000.
Marshall, Henry James; Windblad, Stuart Walter; and Wagner, William, to Island Lumber Specialties Ltd. Automatic control apparatus for waney edge forming machines. 4,046,180, Cl. 144-117.00B.
Marsland Engineering Limited: *See—*
Showalter, Lane Crawford; Brokenshire, John Leslie; and Watts, Geoffrey B., 4,045,997, Cl. 73-23.000.
Marson Fastener Corporation: *See—*
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Marston, Peter G.; and Nolan, John J., to Sala Magnetics, Inc. Multiple matrix assembly and matrix unit for magnetic separator with simplified sealing. 4,046,681, Cl. 209-224.000.
Marthaler, Max, to Ciba-Geigy AG. Process for the production of masked positive color images by the silver dye bleach process using silver complex diffusion. 4,046,566, Cl. 96-7.000.
Martin, Alexander: *See—*
Johnston, Gordon Francis; Martin, Alexander; and Tomlinson, Alan Digby, 4,046,717, Cl. 252-546.000.
Martin, Eugene Ray, to SWS Silicones Corporation. Process for preparing thiofunctional polysiloxane polymers. 4,046,795, Cl. 260-448.20E.
Martin, Jerry D.: *See—*
Winchell, David A.; Miller, Joe A.; and Martin, Jerry D., 4,046,276, Cl. 215-250.000.
Martin, T. Edward. Drawworks control apparatus. 4,046,355, Cl. 254-173.00R.
Martin, Tom. Disposable pattern composition. 4,046,579, Cl. 106-38.800.
Maschinenbau Oppenweiler GmbH: *See—*
Kistner, Hermann; and Lehmann, Gunthart, 4,046,043, Cl. 83-425.400.
Maschinenfabrik J. Dieffenbacher & Co.: *See—*
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Mashimo, Yukio; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. System for exposure measurement and/or focus detection by means of image senser. 4,047,187, Cl. 354-23.00D.
Masiello, Felix R., to Addressograph Multigraph Corporation. Stabilizer for photocomposition matrix. 4,047,188, Cl. 354-15.000.
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Mason, David R. Back-rest attachment. 4,045,834, Cl. 9-7.000.
Mass, Robert O.; and Tomkinson, Donald L., to Dow Chemical Company, The. Polymerization method employing tubular reactor. 4,046,718, Cl. 260-2.00R.
Massey, Roger G.; and Holloway, David G., to Parker & Harper Manufacturing Company, Inc., The. Power actuated valve. 4,046,350, Cl. 251-58.000.
Mast, Aquila D., to Sperry Rand Corporation. Front and rear upper aprons in a crop material roll forming machine. 4,045,947, Cl. 56-343.000.
Material Ksz.: *See—*
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Matsubara, Hideyuki: *See—*
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Matsuda, Sumio; and Kudara, Hajime, to Chugoku Marine Paints, Ltd. Method for producing monoalkyl-tin-trihalides. 4,046,791, Cl. 260-429.700.
Matsuo, Tatsuki; and Kohata, Teruo, to Toyobo Co., Ltd. Method for adsorbing harmful substance. 4,046,525, Cl. 55-59.000.
Matsushita Electric Corporation of America: *See—*
Rzeszewski, Theodore S., 4,047,227, Cl. 358-194.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Sakamoto, Yoichi, 4,047,112, Cl. 325-455.000.
Sumita, Isao, 4,046,704, Cl. 252-63.200.
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Matsushita Electronics Corporation: *See—*
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Matsushita, Yasuhiro: *See—*
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Matsuyama, Shigeru; and Mikami, Hiroshi, to Aikoh Co., Ltd. Process of manufacturing killed steel ingots of superior quality. 4,046,187, Cl. 164-53.000.
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Bar, Vilmos; Mercz, Jeno; Szvoboda, Janos; Pollak, Zsuszanna B.; and Matyas, Jakab, 4,046,765, Cl. 260-288.0CE.
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Mazur, Richard A.: *See—*
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McCaffrey, Terence; Raza, Hassan; and Williams, Bruce C., to Fairchild Camera and Instrument Corporation. High-gain, high-voltage transistor for linear integrated circuits. 4,047,217, Cl. 357-34.000.
McCain Manufacturing Corporation: *See—*
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McCain, William B.; Cosgrove, James F.; and Eaves, Arthur E., to McCain Manufacturing Corporation. Method for producing books. 4,046,366, Cl. 270-21.000.
McCarty, William J., to General Electric Company. Combination motor cooler and storage coil for heat pump. 4,045,974, Cl. 62-196.00B.
McCarty, William J., to General Electric Company. Combination motor cooler and storage coil for heat pump. 4,045,975, Cl. 62-196.00B.
McCaskey, Harold O., Jr.; and Brooker, Lenon G., to Westinghouse Electric Corporation. Melamine-aldehyde resin and postformable laminate made therefrom. 4,046,937, Cl. 428-211.000.

McCauley, Herbert J., to McCauley Metal Products, Inc. Fender flanging apparatus. 4,045,993, Cl. 72-387.000.
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McClanahan, Edwin D.; and Moss, Ronald W., to United States of America, Energy Research and Development Administration. Device for providing high-intensity ion or electron beam. 4,046,666, Cl. 204-298.000.
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McClelland, Harold H.: *See—*
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McDanolds, Richard T.; and Jordan, Rodney W., to United States of America, Army. Apparatus for safely neutralizing explosive devices. 4,046,055, Cl. 86-1.00B.
McDonald, Wallace. Key holder. 4,045,984, Cl. 70-456.00R.
McDonald, William M. Sanitary handle. 4,046,508, Cl. 21-77.000.
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McFarlane, Richard H. Catheter placement assembly. 4,046,144, Cl. 128-214.400.
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McGill, Robert S., III: *See—*
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McHugh, James D., to General Electric Company. Bearing sump cooling arrangement. 4,046,223, Cl. 184-6.110.
McKee, Kenneth E.; and McAllister, Alex J., to International Harvester Company. Free floating actuating linkage. 4,046,021, Cl. 74-110.000.
McKeever, Bruce T.: *See—*
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McKerrow, George C.; Pelletier, Albert; and Newman, Christopher J., to Noranda Mines Limited. Process for controlled slow cooling of non-ferrous smelting slags. 4,046,323, Cl. 241-23.000.
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McNamara, Albert C., Jr., to Esquire, Inc. Emergency lighting system for gaseous discharge lamps. 4,047,076, Cl. 315-88.000.
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McNeil Laboratories, Incorporated: *See—*
Rasmussen, Chris Royce; Gardocki, Joseph Francis; and Plampin, James Nelson, 4,046,909, Cl. 424-274.000.
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Mead Corporation, The: *See—*
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Parsonage, Harry N., 4,045,839, Cl. 15-302.000.
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Mead Johnson & Company: *See—*
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Wu, Yao Hua; and Lobeck, Walter G., Jr., 4,046,891, Cl. 424-248.400.
Meador, Lawrence Dean. Severing and cauterizing instrument for use in severing tails and navel cords. 4,046,148, Cl. 128-303.100.
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Medio, Grace E.: *See—*
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Meehan, David H., to Zenith Radio Corporation. Pulse differentiating high voltage shutdown circuit. 4,047,078, Cl. 315-411.000.
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Meiner, Roger D.; Haines, James M.; and Alsberg, Henry, to Richardson Company, The. Floor finish composition and components thereof. 4,046,726, Cl. 260-27.00R.
Meininger, Fritz; and Springer, Hartmut, to Hoechst Aktiengesellschaft. Water-soluble naphyhyl-azo-pyrazolone fiber reactive dyestuffs. 4,046,754, Cl. 260-162.000.
Meisterheim, Richard A.: *See—*
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Mello, Raymond M.: *See—*
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Melnyk, John. Process for semi-automated production of mammalian cell slides. 4,046,927, Cl. 427-2.000.
Mendoza-Orozco, Hector. Free-wheeling mechanism for bicycles. 4,046,238, Cl. 192-45.000.
Meng, John C.; and Driessen, Gerald J., to L. D. Schreiber Cheese Co., Inc. Package with staggered product slices and process for producing the same. 4,046,923, Cl. 426-130.000.
Mentel, Jurgen: *See—*
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Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; and Traunecker, Werner, to Boehringer Ingelheim GmbH. 1-(M-alkanoyloxy-phenyl)-1-hydroxy-2-(N-lower alkyl-amino)-ethanes and salts thereof. 4,046,913, Cl. 424-311.000.
Mercer, Donald W. Assay of isoenzymes by ion exchange chromatography. 4,046,634, Cl. 195-103.50R.
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Dorn, Conrad P.; Jones, Howard; and Jacobus, David P., 4,046,897, Cl. 424-263.000.
Fisher, Michael H.; and Wu, Mu Tsu, 4,046,753, Cl. 260-158.000.
Igoe, Robert S., 4,046,925, Cl. 426-573.000.
Jones, Howard; and Frankshun, Robert A., 4,046,760, Cl. 260-239.55R.
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Merker, George; Navi, Menashe; and Krupp, Joseph, to American Newspaper Publishers Association, Incorporated. Modified high speed paper inserting apparatus and method. 4,046,367, Cl. 270-55.000.
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Merle, Michel, to Andrew Corporation. Continuous corrugated waveguide and method of producing the same. 4,047,133, Cl. 333-95.00A.
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Mertz, John R., to GAF Corporation. Processing solution for use as photographic developer bath and replenisher therefor. 4,046,571, Cl. 96-66.0HD.
Mesek, Frederick K.; and Repke, Virginia L., to Johnson & Johnson. Absorbent bed pad. 4,045,833, Cl. 5-335.000.
Messerschmidt, Friedrich, to Robert Bosch G.m.b.H. Securing means for fuel injection nozzles. 4,046,478, Cl. 403-262.000.
Metallgesellschaft Aktiengesellschaft: *See—*
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Metcalf, Eric: *See—*
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Metcalfe, Richard T.; Granitsas, George A.; and Elliott, Edgar H., to American Optical Corporation. Process for producing spectacle frames using an age-hardenable nickel-bronze alloy. 4,046,596, Cl. 148-2.000.
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Meyer, Charles A., to Westinghouse Electric Corporation. Seal arrangement utilizing deflector seals of reduced radial dimension. 4,046,388, Cl. 277-53.000.
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Meyer, Rudolf, to Siemens Aktiengesellschaft. Irradiation installation for ionizing radiation. 4,047,043, Cl. 250-401.000.
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Middleton, John Ernest, to Nulcear Power Company (Whetstone) Limited. Nuclear reactors. 4,046,627, Cl. 176-38.000.

Middleton, John Ernest, to Nuclear Power Company (Whetstone) Limited. Nuclear reactors. 4,046,628, Cl. 176-38.000.
Midrex Corporation: *See—*
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Mikulicz, Michael Z.: *See—*
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Milberger, Walter E.; and Klein, Gerald I., to Westinghouse Electric Corporation. Circuit for setting magnetic remanence in a magnetizable core. 4,047,046, Cl. 307-101.000.
Miles Laboratories, Inc.: *See—*
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Mumford, Michael Anthony, 4,045,907, Cl. 46-93.000.
Miles, Peter: *See—*
Smith, Malcolm John; Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, 4,046,707, Cl. 252-180.000.
Milewski, Andrzej, to International Business Machines Corporation. Method and apparatus for fast determination of initial transversal equalizer coefficient values. 4,047,013, Cl. 235-156.000.
Milito, Richard A.: *See—*
Das, Subodh K.; and Milito, Richard A., 4,046,558, Cl. 75-68.00A.
Millauer, Hans: *See—*
Pistorius, Rudolf; and Millauer, Hans, 4,046,652, Cl. 204-78.000.
Miller, Arthur O. Universal data recording system. 4,047,155, Cl. 340-147.00R.
Miller, Charles G.: *See—*
United States of America, National Aeronautics and Space Administration; Miller, Charles G.; and Pohl, Jens G., 4,046,462, Cl. 350-295.000.
Miller, Coleman J., to Westinghouse Electric Corporation. FM pulse compression radar. 4,047,173, Cl. 343-17.2PC.
Miller, G. Kirby; and Lawler, John F., to GTE Sylvania Incorporated. Electrostatically charged cable transducer. 4,047,166, Cl. 340-261.000.
Miller, Harry R.; and Borba, Paul A. Implements for such uses as animal grooming, fish scaling, and vegetable grating. 4,046,109, Cl. 119-92.000.
Miller, James W.; and Zarecky, Frederick D., to Libbey-Owens-Ford Company. Retractable support for float glass apparatus. 4,046,549, Cl. 65-182.00R.
Miller, Joe A.: *See—*
Winchell, David A.; Miller, Joe A.; and Martin, Jerry D., 4,046,276, Cl. 215-250.000.
Miller, Keith G. Lighting fixture accessory. 4,046,448, Cl. 339-153.000.
Miller, Norman Carlile, to Addressograph Multigraph Corporation. Amorphous selenium coating. 4,046,565, Cl. 96-1.50R.
Miller, Robert E., to Johns Hopkins University, The. Monotrack radar recording/playback system. 4,047,170, Cl. 343-5.0PC.
Milliken Research Corporation: *See—*
Klein, Norman E., 4,045,990, Cl. 72-190.000.
Millns, William: *See—*
Lee, Timothy Charles Philip; and Millns, William, 4,046,834, Cl. 260-752.000.
Mills, John W. Valve for soft ice cream machine. 4,045,976, Cl. 62-308.000.
Milne, John D., to MM Plastic (Mfg) Company, Inc. Closure plugs. 4,046,168, Cl. 138-89.000.
Minami, Hidehiro: *See—*
Nakagawa, Ryoichi; Nambu, Shuya; and Minami, Hidehiro, 4,046,122, Cl. 123-139.0AW.
Minneapolis Electric Steel Castings Company: *See—*
Larsen, Darrell R., 4,046,326, Cl. 241-182.000.
Minolta Camera Kabushiki Kaisha: *See—*
Yamamoto, Shunji, 4,046,470, Cl. 355-13.000.
Mitchell, Howard Earl, to Dresser Industries, Inc. Locking apparatus for earth boring cutter or stabilizer. 4,046,206, Cl. 175-364.000.
Mitchell, Joan LaVerne; Pennington, Keith Samuel; and Hochberg, Frederick, deceased (by Hochberg, Lee, administratrix), to International Business Machines Corporation. Ultrasonic transfer printing with multi-copy, color and low audible noise capability. 4,046,073, Cl. 101-426.000.
Mitchell, Robert Lee; and Chung, William John, to Colgate Palmolive Company. Dental cream. 4,046,872, Cl. 424-52.000.
Mithuhashi, Shigeo: *See—*
Kume, Tsutomu; Kasai, Kazuo; Kaneko, Hidefumi; Sugiyama, Shigeo; and Mithuhashi, Shigeo, 4,047,230, Cl. 360-17.000.
Mitsche, Roy T.; Kuntz, Hillard L.; and Hayes, John C., to UOP Inc. Method of manufacturing an extruded catalyst composition. 4,046,713, Cl. 252-455.00Z.
Mitsubishi Chemical Industries Limited: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,046,876, Cl. 424-177.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Hashimoto, Shinichiro; Goto, Toru; and Kajino, Yukio, 4,046,987, Cl. 219-135.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Takemoto, Takashi, 4,046,126, Cl. 123-148.0DS.
Yoshida, Hiroshi, 4,046,403, Cl. 280-701.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Iijima, Katsuhiko; and Yoshida, Katsuhiko, 4,046,346, Cl. 248-298.000.
Imamura, Yoshiaki, 4,046,057, Cl. 90-14.000.
Mitsui Mining & Smelting Co., Ltd.: *See—*
Saitoh, Kozo; Tanaka, Hiroshi; Nagahama, Tatsuya; and Izumi, Sumio, 4,046,677, Cl. 209-166.000.
Mitsui Toatsu Chemicals, Inc.: *See—*
Hirai, Yutaka; Miyata, Katsuharu; Osawa, Tagui; Samecima, Muneyasu; Mukai, Ken; Yoshiura, Koichi; and Mori, Hidetoshi, 4,046,785, Cl. 260-380.000.
Mitterhummer, Gerhard; Peltz, Hanns-Heinz; Mayer, Heinrich; and Conzelmann, Fritz, to Siemens Aktiengesellschaft. Method of producing metallic carrier system for a multi-electrode semiconductor strip. 4,045,863, Cl. 29-588.000.
Miura, Yasunobu: *See—*
Kawamura, Yuichi; Hirano, Goro; Nagai, Makoto; and Miura, Yasunobu, 4,046,582, Cl. 106-88.000.
Miyake, Katsuya, to Akebono Brake Industry Co., Ltd. Antiskid device. 4,046,426, Cl. 303-100.000.
Miyata, Katsuharu: *See—*
Hirai, Yutaka; Miyata, Katsuharu; Osawa, Tagui; Samecima, Muneyasu; Mukai, Ken; Yoshiura, Koichi; and Mori, Hidetoshi, 4,046,785, Cl. 260-380.000.
Miyata, Katsuhiko: *See—*
Kitagami, Kazuo; Miyata, Katsuhiko; and Arai, Akihiro, 4,047,206, Cl. 354-152.000.
Miyazaki, Joichi, to Kabushiki Kaisha Daini Seikosha. Circuit board for an electronic timepiece. 4,045,953, Cl. 58-23.00R.
Mizuno, Masayoshi; Kawamoto, Tadashi; and Iida, Kiichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Relief printing plate having projections in non-image areas. 4,046,071, Cl. 101-395.000.
Mizuta, Atsuo: *See—*
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,046,600, Cl. 148-12.400.
MM Plastic (Mfg) Company, Inc.: *See—*
Milne, John D., 4,046,168, Cl. 138-89.000.
Mobil Oil Corporation: *See—*
Chen, Nai Yuen; and Heinemann, Heinz, 4,046,522, Cl. 48-102.00A.
Cloud, Wayne B., 4,046,194, Cl. 166-248.000.
Farcasiu, Malvina; and Whitehurst, Darrell Duayne, 4,046,668, Cl. 208-11.0LE.
Glenn, Edwin E., Jr., 4,046,220, Cl. 181-105.000.
Ireland, Henry R.; and Stein, Thomas R., 4,046,829, Cl. 260-676.00R.
Kuo, James C., 4,046,830, Cl. 260-676.00R.
Kuo, James C., 4,046,831, Cl. 260-676.00R.
Napier, Roger P., 4,046,774, Cl. 260-315.000.
Owen, Hartley; and Venuto, Paul B., 4,046,825, Cl. 260-668.00R.
Owen, Hartley; Venuto, Paul B.; and Habib, Edward T., Jr., 4,046,827, Cl. 260-672.00T.
Peiser, Alfred M., 4,047,004, Cl. 235-151.120.
Piotrowski, Alfred B., 4,046,519, Cl. 44-51.000.
Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., 4,046,859, Cl. 423-328.000.
Moertel, George B., to Textron, Inc. Folded tape slide fastener stringer with external cord. 4,045,846, Cl. 24-205.16C.
Moggi, Pietro Antonio; and Romano, Ugo, to SNAM Progetti S.p.A. Process for the preparation of diphenylamine and derivatives thereof. 4,046,810, Cl. 260-571.000.
Mohr, Reinhard: *See—*
Hohmann, Kurt; Mohr, Reinhard; and Hahnke, Manfred, 4,046,752, Cl. 260-158.000.
Mohrbacher, Richard J.: *See—*
Schwartz, Norman; and Mohrbacher, Richard J., 4,046,763, Cl. 260-250.00B.
Moline, Roy V., to Jeno's, Inc. Method for forming dough shells. 4,046,920, Cl. 426-19.000.
Moller, Erwin; Bausch, Franz Hubert; and Frolich, Martin, to Hamba-Maschinenfabrik Hans A. Muller, Firma. Apparatus for the sterile filling of foods into containers. 4,045,945, Cl. 53-167.000.
Molloy, Denis Edward: *See—*
Gardner, Charles Stanley; and Molloy, Denis Edward, 4,046,662, Cl. 204-275.000.
Molloy, Richard P., to Interkal, Inc. Alignment device for telescoping gymnasium seating. 4,045,921, Cl. 52-9.000.
Monsanto Company: *See—*
Burnett, Joseph C., Jr.; Hicks, John J.; and Hovey, Leonard L., 4,046,651, Cl. 204-73.00R.
Carr, David M.; and Chandler, Thomas O., 4,045,858, Cl. 29-427.000.
Harris, Alva F., 4,046,735, Cl. 260-45.8NT.
Mortimer, George A.; Pelezo, Chris A.; and Richardson, John C., 4,046,731, Cl. 260-30.60R.
Montagno, William J.; and MacIntyre, Allan L., to General Signal

Corporation. Hydraulic apparatus for raising and lowering an impeller shaft. 4,046,352, Cl. 254-29.00R.

Montgomery, Warren G. Continuous mining machine with hinged cutter guide extensions. 4,046,424, Cl. 299-56.000.

Moore, John Howard, to Lucas Electrical Company Limited, The. Internal combustion engine fuel injection control system. 4,046,113, Cl. 123-32.0EA.

Moore, Roger E.: *See—*
Kalina, Theodore; and Moore, Roger E., 4,046,523, Cl. 48-197.00R.

Moran, Patrick J.: *See—*
Wilson, Charles A.; and Moran, Patrick J., 4,046,993, Cl. 235-61.50D.

Moraw, Roland, to Hoechst Aktiengesellschaft. Apparatus and process for electrostatically charging a recording material. 4,047,238, Cl. 361-229.000.

Moreman, Otis S., III, to United States of America, National Aeronautics and Space Administration. Deformable bearing seat. 4,046,434, Cl. 308-195.000.

Moreman, Otis S., III, to United States of America, National Aeronautics and Space Administration. Bearing seat usable in a gas turbine engine. 4,046,435, Cl. 308-195.000.

Mori, Hidetoshi: *See—*
Hirai, Yutaka; Miyata, Katsuharu; Osawa, Tagui; Samecima, Muneyasu; Mukai, Ken; Yoshiura, Koichi; and Mori, Hidetoshi, 4,046,785, Cl. 260-380.000.

Morimoto, Kiyoshi: *See—*
Kishino, Takao; Morimoto, Kiyoshi; and Utamura, Yukihiko, 4,047,072, Cl. 313-496.000.

Morin, Raymond O. Electrical instrument holder. 4,046,294, Cl. 224-5.00H.

Moringiello, Donald C.: *See—*
Buono, Dennis F.; Carlson, Nils G.; Hibner, David H.; and Moringiello, Donald C., 4,046,430, Cl. 308-26.000.

Morino, Seiji: *See—*
Katsuoka, Ritsu; Kawai, Hisasi; and Morino, Seiji, 4,046,999, Cl. 235-150.530.

Moritani, Masahiko: *See—*
Kato, Yasuyuki; Moritani, Masahiko; and Suzuki, Seiichi, 4,046,850, Cl. 264-216.000.

Moritomo, Sadao, to Seiko Seiki Kabushiki Kaisha. High speed grinding spindle. 4,045,919, Cl. 51-165.770.

Morokuma, Tadashi; and Tsuda, Naotsune, to Olympus Optical Co. Ltd. Method of manufacturing magnetic heads. 4,045,864, Cl. 29-603.000.

Moroz, Leonard Arthur, to Canadian Patents and Development Limited. Method for detecting enzymes capable of digesting fibrinogen or fibrin. 4,046,635, Cl. 195-103.700.

Morozumi, Hiroshi: *See—*
Ohmura, Yoshito; Okabe, Takahiro; and Morozumi, Hiroshi, 4,047,119, Cl. 330-30.00D.

Morris, Earl L.; and Fields, Larry D., to Acorn Engineering Company. Combination lavatory and toilet assembly. 4,045,827, Cl. 4-3.000.

Morris, Frank E., to Kaiser Aluminum & Chemical Corporation. Metal cased refractory and method of making same. 4,045,935, Cl. 52-599.000.

Morrison, Hadley F., to McDonnell Douglas Corporation. Flexible bottom containers. 4,046,277, Cl. 220-1.500.

Morrison, Steven; and Williams, George A., to Westinghouse Electric Corporation. Coordinate converter. 4,047,014, Cl. 235-189.000.

Morse, Philip W.: *See—*
Klingenberg, James C.; Patel, Hiralal V.; and Morse, Philip W., 4,046,315, Cl. 233-4.000.

Morse, Robert L., to Mechanisms, Inc. Impact energy absorption device. 4,046,361, Cl. 267-139.000.

Mortimer, George A.; Pelezo, Chris A.; and Richardson, John C., to Monsanto Company. Process for preparing dopes from which shaped articles of oxadiazole/N-alkylhydrazide copolymers are obtained. 4,046,731, Cl. 260-30.60R.

Morton-Norwich Products, Inc.: *See—*
Yu, Chia-Nien, 4,046,781, Cl. 260-347.700.

Mory, Rudolf; and Muller, Rolf, to Ciba-Geigy Corporation. Disazo pigments containing naphthalene coupling components. 4,046,755, Cl. 260-174.000.

Morz, Gunter, to Licentia Patent-Verwaltungs-G.m.b.H. System filter for double frequency utilization. 4,047,128, Cl. 333-11.000.

Moser, Helmut; and von Tobel, Hans, to Sandoz Ltd. Basic disazo dyes having two 2-hydroxy-3-substituted carbamoylnaphthyl-1-azophenyl groups for dyeing paper. 4,046,502, Cl. 8-7.000.

Moser, Paul: *See—*
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 4,046,788, Cl. 260-404.000.

Moskovich, Jacob; Wiese, Gary E.; Altman, Richard M.; and McLaughlin, Thomas D., to Optigon Research & Development Corporation. Camera viewfinding system. 4,047,222, Cl. 354-155.000.

Moss, John H. Hydroponic nutrient feeding and draining system. 4,045,909, Cl. 47-1.200.

Moss, Ronald W.: *See—*
McClanahan, Edwin D.; and Moss, Ronald W., 4,046,666, Cl. 204-298.000.

Motorola, Inc.: *See—*
Clark, Lowell E.; Roop, Raymond M.; and Volk, Charles E., 4,047,218, Cl. 357-34.000.
Eichler, Jay H., 4,046,295, Cl. 224-5.00H.
Fugit, Brian Blair, 4,047,171, Cl. 343-6.80R.
Goodner, Willis Ray; Smith, James Nelson; and Horvath, John, 4,046,820, Cl. 260-652.50R.
Schafft, Hugo Willy, 4,047,060, Cl. 310-322.000.

Motz, Herbert: *See—*
Hartmann, Hans-Joerg; Falk, Roland; Gawlik, Peter; Balz, Werner; Uhl, Karl; Schaefer, Dieter; and Motz, Herbert, 4,046,932, Cl. 428-64.000.

Moulton Developments Limited: *See—*
Best, Anthony; and Harman, Harold, 4,046,360, Cl. 267-65.00B.

Mouwen, Herman Charles, to Johnson & Johnson; and Purolator, Inc. Extracorporeal circuit blood filter. 4,046,696, Cl. 210-431.000.

Muecke, Thomas W.: *See—*
Gruesbeck, Clay; Salathiel, William M.; Muecke, Thomas W.; and Cooke, Claude E., Jr., 4,046,198, Cl. 166-278.000.
Gruesbeck, Clay, Jr.; Penberthy, Walter L., Jr.; and Muecke, Thomas W., 4,046,197, Cl. 166-305.00R.

Mueller, Curt: *See—*
Maderni, Piero; and Mueller, Curt, 4,046,756, Cl. 260-205.000.
Meybeck, Jacques; Mueller, Curt; and Mueller, Fred, 4,046,757, Cl. 260-207.000.

Mueller, Dale R., to Owens-Corning Fiberglas Corporation. Strand collecting apparatus and method. 4,046,330, Cl. 242-18.00G.

Mueller, Fred: *See—*
Meybeck, Jacques; Mueller, Curt; and Mueller, Fred, 4,046,757, Cl. 260-207.000.

Mueller, Karl Friedrich; and Falk, Robert A., to Ciba-Geigy Corporation. Fluorinated condensation polymers and their use as soil release agents. 4,046,944, Cl. 428-262.000.

Mukai, Ken: *See—*
Hirai, Yutaka; Miyata, Katsuharu; Osawa, Tagui; Samecima, Muneyasu; Mukai, Ken; Yoshiura, Koichi; and Mori, Hidetoshi, 4,046,785, Cl. 260-380.000.

Muller, Albrecht, to Ciba-Geigy Corporation. Fluorine substituted maleimides. 4,046,777, Cl. 260-326.260.

Muller, Hans; and Grob, Louis, to Chemap AG. Process for the separation of waste products of the food industry. 4,046,789, Cl. 260-412.800.

Muller, Helmut: *See—*
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 4,046,788, Cl. 260-404.000.

Muller, Rolf, to Mead Corporation, The. Apparatus for forming a wrapper about a group of articles. 4,045,942, Cl. 53-48.000.

Muller, Rolf: *See—*
Mory, Rudolf; and Muller, Rolf, 4,046,755, Cl. 260-174.000.

Muller, Werner Heinrich, to Hoechst Aktiengesellschaft. Process for preparing resorcinol monoethers. 4,046,816, Cl. 260-613.00R.

Mullet, David L.; Rilling, Raymond J.; and Voth, Elmer D., to Excel Industries, Inc. Lawn edger attachment. 4,046,200, Cl. 172-14.000.

Mumford, Michael Anthony, to Miles Mumford Limited. Floatable toys. 4,045,907, Cl. 46-93.000.

Munson, Lowell W.: *See—*
Coope, Robert L.; and Munson, Lowell W., 4,046,364, Cl. 269-244.000.

Murakami, Katsuyuki: *See—*
Itai, Reiichi; and Murakami, Katsuyuki, 4,046,655, Cl. 204-149.000.

Murata Manufacturing Co., Ltd.: *See—*
Ishiyama, Hideki, 4,047,129, Cl. 333-72.000.

Murdoch, Robert N.; Travaglio, Vincent M.; and Magnifico, Michael L., to Emhart Corporation. Merchandise display shelving assembly. 4,046,083, Cl. 108-107.000.

Murphy, Bartholomew D.; and Gonyea, David C., to General Electric Company. Method and apparatus for determining rotor life expended. 4,046,002, Cl. 73-116.000.

Murray, David P. Sock lock device. 4,045,844, Cl. 24-81.0DM.

Murray, Reginald: *See—*
Brown, Dennis Cockburn; and Murray, Reginald, 4,046,305, Cl. 228-194.000.

Musgrave, Daniel Dennis. Apparatus for making barbed material. 4,045,985, Cl. 72-56.000.

Musick, Charles Ronald; and Torres, Jose Marcelo, to Combustion Engineering, Inc. Automatic motion inhibit system for a nuclear power generating system. 4,046,625, Cl. 176-24.000.

Muzyczko, Thaddeus M.; and Jones, Thomas H., to Richardson Company, The. Photoreactive compositions comprising polymers containing alkoxyaromatic glyoxy groups. 4,046,577, Cl. 96-115.00R.

Myers, David C., to Lawrence Peska Associates, Inc., a part interest. Adjustable auto thermostat. 4,046,319, Cl. 236-34.500.

N L Industries, Inc.: *See—*
Stridde, George E., 4,046,826, Cl. 260-671.00C.

Naegeli, Peter, to Givaudan Corporation. Novel odorant compositions. 4,046,716, Cl. 252-522.000.

Nagahama, Tatsuya: *See—*
Saitoh, Kozo; Tanaka, Hiroshi; Nagahama, Tatsuya; and Izumi, Sumio, 4,046,677, Cl. 209-166.000.

Nagai, Makoto: *See—*
Kawamura, Yuichi; Hirano, Goro; Nagai, Makoto; and Miura, Yasunobu, 4,046,582, Cl. 106-88.000.

Nagano, Tetsuro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Combustion chamber of internal combustion engine. 4,046,111, Cl. 123-32.0SP.

Nagel, Robert I., to Dominion Auto Accessories Limited. Combined clearance and marker lamp. 4,047,019, Cl. 240-8.200.

Najarian, George. Target practice attachment for a firearm. 4,046,130, Cl. 124-28.000.

Nakagawa, Kazuyoshi, to Honeywell Inc. Voltage-frequency converter. 4,047,056, Cl. 307-271.000.

Nakagawa, Ryoichi; Nambu, Shuya; and Minami, Hidehiro, to Nissan Motor Co., Ltd. Fuel feed control system of internal combustion engine. 4,046,122, Cl. 123-139.0AW.

Nakagome, Takenari: *See—*
Yamada, Hirotada; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Okamura, Kosaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,046,904, Cl. 424-271.000.

Nakahara, Roy Hiroshi: *See—*
Erickson, Fred William; and Nakahara, Roy Hiroshi, 4,047,049, Cl. 307-157.000.

Nakai, Setsuo: *See—*
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Nakakita, Sigeru: *See—*
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Nakamura, Kotaro: *See—*
Inouye, Kozo; Nakamura, Kotaro; Yokota, Yukio; Nakazyo, Kiyoshi; and Okumura, Akio, 4,046,573, Cl. 96-74.000.

Nakamura, Mitsuko: *See—*
Maeshima, Tsugio; Nishikawa, Eiichiroh; and Nakamura, Mitsuko, 4,046,888, Cl. 423-239.000.

Nakamura, Shigeru: *See—*
Nakanishi, Yoshiyuki; Nakamura, Shigeru; and Ono, Tetsuji, 4,046,780, Cl. 260-346.400.

Nakamura, Yuji: *See—*
Seguchi, Koji; Sugita, Minoru; Inada, Kazuyoshi; Tagaya, Kiyoshi; and Nakamura, Yuji, 4,046,670, Cl. 208-48.0AA.

Nakamura, Zenzo; Uchiyama, Takashi; Uchidoi, Masanori; Taguchi, Tetsuya; Aizawa, Hiroshi; and Tsunekawa, Tokuichi, to Canon Kabushiki Kaisha. Camera system with means for automatically switching to flash operation. 4,047,194, Cl. 354-149.000.

Nakanishi, Yoshiyuki; Nakamura, Shigeru; and Ono, Tetsuji, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Preparation of phthalic anhydride. 4,046,780, Cl. 260-346.400.

Nakazyo, Kiyoshi: *See—*
Inouye, Kozo; Nakamura, Kotaro; Yokota, Yukio; Nakazyo, Kiyoshi; and Okumura, Akio, 4,046,573, Cl. 96-74.000.

Nambu, Shuya: *See—*
Nakagawa, Ryoichi; Nambu, Shuya; and Minami, Hidehiro, 4,046,122, Cl. 123-139.0AW.

Napier, Roger P., to Mobil Oil Corporation. Process for N-phosphorylation of heterocyclic amines. 4,046,774, Cl. 260-315.000.

Naret, Avgustina Alexandrovna, administrator: *See—*
Feinzilber, Mikhail Leibovich; Kuzin, Eduard Nikolaevich; Timofeev, Gennady Ivanovich; Roitershtein, Semen Semenovich; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Bratyshev, Igor Petrovich; Omelyan, Fedor Evstafievich; Sheinis, Efim Iosifovich; Pak, Vladimir Grigorievich; Romanov, Vladimir Ivanovich; Garbuzov, Zalman Eremeevich; and Naret, Grigory Borisovich, deceased, 4,045,893, Cl. 37-108.00A.

Naret, Grigory Borisovich, deceased: *See—*
Feinzilber, Mikhail Leibovich; Kuzin, Eduard Nikolaevich; Timofeev, Gennady Ivanovich; Roitershtein, Semen Semenovich; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Bratyshev, Igor Petrovich; Omelyan, Fedor Evstafievich; Sheinis, Efim Iosifovich; Pak, Vladimir Grigorievich; Romanov, Vladimir Ivanovich; Garbuzov, Zalman Eremeevich; and Naret, Grigory Borisovich, deceased, 4,045,893, Cl. 37-108.00A.

Naruse, Seiji: *See—*
Maeda, Fumiaki; Naruse, Seiji; and Kamiya, Ko, 4,046,001, Cl. 73-100.000.

National Casein of New Jersey: *See—*
Bye, Carolyn N., 4,046,955, Cl. 428-479.000.

National Semiconductor Corporation: *See—*
Hutchines, Jimmy L.; and Meyer, John E., 4,047,091, Cl. 321-15.000.
Nelson, Carl T.; and Hollins, Brian E., 4,046,605, Cl. 148-175.000.

National Service Industries, Inc.: *See—*
Grimes, Charles, 4,046,358, Cl. 259-147.000.

Natural Science Industries, Ltd.: *See—*
Freedman, Robert Nathan, 4,045,918, Cl. 51-164.000.

Navi, Menashe, to ANPA Research Institute. Method and apparatus for inserting a bundle of newspaper inserts into a hopper. 4,046,370, Cl. 271-3.100.

Navi, Menashe: *See—*
Merker, George; Navi, Menashe; and Krupp, Joseph, 4,046,367, Cl. 270-55.000.

Nazarenko, Nicholas, to Du Pont de Nemours, E. I., and Company. Process for the preparation of triarylborane. 4,046,815, Cl. 260-606.50B.

Nazaretian, Eduard Gurgenovich: *See—*
Kholmogorov, Mikhail Vladimirovich; Katkov, Jury Vasilievich; Vorbiev, Grigory Vasilievich; Gusev, Alexandr Mikhailovich; and Nazaretian, Eduard Gurgenovich, 4,045,991, Cl. 72-251.000.

Neath, Robert Arthur, to Exxon Production Research Company. Subsea hydraulic choke. 4,046,191, Cl. 166-.500.

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Nelson, Carl T.; and Hollins, Brian E., to National Semiconductor Corporation. Method of electrically isolating individual semiconductor circuits in a wafer. 4,046,605, Cl. 148-175.000.

Nelson, John E., to HMW Industries, Inc. Palatal expander. 4,045,871, Cl. 32-14.00E.

Nelson, Lloyd A.: *See—*
Sekhon, Kalwant S.; Nelson, Lloyd A.; and Fritz, John E., Jr., 4,047,198, Cl. 357-82.000.

Nelson, Lorne W.; and Sutton, David J., to Honeywell Inc. Refrigeration load shedding control device. 4,046,531, Cl. 62-202.000.

Nelson, Lorne W., to Honeywell Inc. Refrigeration load shedding control device. 4,046,532, Cl. 62-215.000.

Nelson, Richard Stuart: *See—*
Cairns, James Anthony; Nelson, Richard Stuart; and Barnfield, Rhydwyn William, 4,046,712, Cl. 252-447.000.

Nelson, Robert K., to Eaton Corporation. Multiple drive axle assembly. 4,046,210, Cl. 180-24.100.

Nemessanyi nee Szekely, Zsuzsanna: *See—*
Andriska, Viktor; Gorog nee Privitzer, Katalin; Bruckner, Gyorgyi; Nemessanyi nee Szekely, Zsuzsanna; Havasi, Miklos; Raskay, Bela; Grega nee Toth, Erzsebet; Szigeti nee Haranghy, Terez; Dudas, Jozsef; Szilagyi, Gyula; Marosvolgyi, Sandor; Gribovszky, Pal; Pinter, Zoltan; and Bors, Gyozo, 4,046,773, Cl. 548-339.000.

Neoloy Products, Inc.: *See—*
Prosen, Emil M., 4,046,561, Cl. 75-172.00R.

Neubauer, Jerry L.: *See—*
Benasutti, Louis D.; Neubauer, Jerry L.; and Meyer, Ronald E., 4,046,438, Cl. 312-138.00A.

Neujens, Georges Jozef: *See—*
Stievenart, Emile Frans; Plessers, Hendrik Sylvester; Neujens, Georges Jozef; and Van Bouwel, Leo Pa ul, 4,047,193, Cl. 354-105.000.

Newco Fireplace Equipment Limited, Inc.: *See—*
White, Charles R., 4,046,132, Cl. 126-9.00R.

Newlin, Larry L.: *See—*
Chapman, William L.; and Newlin, Larry L., 4,047,090, Cl. 363-34.000.

Newman, Christopher J.: *See—*
McKerrow, George C.; Pelletier, Albert; and Newman, Christopher J., 4,046,323, Cl. 241-23.000.

Newman, Ritchey O., Jr., to Dow Chemical Company, The. Cutting apparatus. 4,046,497, Cl. 425-313.000.

Nichols Engineering & Research Corporation: *See—*
Barry, Louis T.; and Czop, Gordon W., 4,046,085, Cl. 110-12.000.
von Dreusche, Charles F., Jr., 4,046,086, Cl. 110-12.000.

Nichols, Sterling M.: *See—*
Paton, George A.; Nichols, Sterling M.; and Sanders, John H., 4,045,949, Cl. 57-140.0BY.

Nickerson, Harvey R.: *See—*
Press, Irving D.; Rink, Helm A.; and Nickerson, Harvey R., 4,046,406, Cl. 285-47.000.

Nielsen, Edwin A.: *See—*
Ensmann, Burt; Nielsen, Edwin A.; Snyder, Edward, III; and Ventura, Frank D., 4,045,908, Cl. 46-204.000.

Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.): *See—*
Satto, Seiichi, 4,047,136, Cl. 335-222.000.

Nilsson, Goran: *See—*
Brannstrom, Roine; and Nilsson, Goran, 4,045,955, Cl. 60-39.28R.

Nippon Electric Co., Ltd.: *See—*
Inoue, Yasukazu; and Fujimoto, Shoji, 4,046,607, Cl. 148-187.000.

Nippon Electric Kagoshima, Limited: *See—*
Kobayakawa, Masaki; and Akahane, Fumitake, 4,047,066, Cl. 313-217.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Ogita, Minoru, 4,047,116, Cl. 329-124.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Yamagishi, Hidehisa; and Tanaka, Mizuo, 4,046,604, Cl. 148-156.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Nakanishi, Yoshiyuki; Nakamura, Shigeru; and Ono, Tetsuji, 4,046,780, Cl. 260-346.400.

Nippon Soken, Inc.: *See—*
Akita, Sigeyuki; and Kitagawa, Junji, 4,047,149, Cl. 340-52.00B.
Katsuoka, Ritsu; Kawai, Hisasi; and Morino, Seiji, 4,046,999, Cl. 235-150.530.
Kuno, Akira; Shinoda, Yoshio; and Arai, Hiroshi, 4,046,998, Cl. 235-150.210.

Nippon Steel Corporation: *See—*
Takechi, Hiroshi; Abe, Mitsunobu; Usuda, Matsuo; and Komiya, Kunihiko, 4,046,597, Cl. 148-12.00R.

Nippon Telegraph and Telephone Public Corporation: *See—*
Toda, Koichi; Miki, Tetsuya; and Yamaguchi, Haruo, 4,047,115, Cl. 328-151.000.
Yasuda, Hiroshi; and Kanaya, Fumio, 4,047,221, Cl. 358-136.000.

Nippon Zoki Pharmaceutical Co., Ltd.: *See—*
Takino, Masuichi; Kurosaki, Teikichi; and Odaka, Munehiko, 4,046,893, Cl. 424-251.000.

Nishida, Katsutoshi: *See—*
Ishii, Takashi; Nishida, Katsutoshi; Komatsu, Michiyasu; and Tsuge, Akihiko, 4,046,580, Cl. 106-55.000.

Nishikawa, Eiichiroh: *See—*
Maeshima, Tsugio; Nishikawa, Eiichiroh; and Nakamura, Mitsuko, 4,046,888, Cl. 423-239.000.

Nishino, Atsushi: *See—*
Yoshida, Akihiko; and Nishino, Atsushi, 4,046,645, Cl. 204-37.00R.

Nissan Motor Co., Ltd.: *See—*
Aono, Shigeo, 4,046,118, Cl. 123-119.0EC.
Nakagawa, Ryoichi; Nambu, Shuya; and Minami, Hidehiro, 4,046,122, Cl. 123-139.0AW.
Suzuki, Kunihiko, 4,046,030, Cl. 74-710.000.

Nitto Chemical Industry Co., Ltd.: *See—*
Kawamura, Yuichi; Hirano, Goro; Nagai, Makoto; and Miura, Yasunobu, 4,046,582, Cl. 106-88.000.

Noguchi, Hiroshi: *See—*
Yamada, Hirotada; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Okamura, Kosaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,046,904, Cl. 424-271.000.

Nolan, James J.: *See—*
Markowski, Stanley J.; and Nolan, James J., 4,045,956, Cl. 60-39.650.

Nolan, John J.: *See—*
Marston, Peter G.; and Nolan, John J., 4,046,681, Cl. 209-224.000.

Nolde, George V.: *See—*
Ress, Thomas I.; and Nolde, George V., 4,047,068, Cl. 313-359.000.

Noranda Mines Limited: *See—*
McKerrow, George C.; Pelletier, Albert; and Newman, Christopher J., 4,046,323, Cl. 241-23.000.

Norddeutsche Affinerie: *See—*
Schulze, Reinhold, 4,046,687, Cl. 210-32.000.

Nordstrom, Arnold B., to Transequip Inc. Cargo container opening cover. 4,046,186, Cl. 160-368.00R.

Nordstrom, Donald B., to Solitron Devices, Inc. Torque limiting RF connector. 4,046,052, Cl. 85-61.000.

Noren, Don W., to Noren Products, Inc. Disguised emergency light. 4,047,020, Cl. 240-46.590.

Noren Products, Inc.: *See—*
Noren, Don W., 4,047,020, Cl. 240-46.590.

Norlin Music, Inc.: *See—*
Luce, David A.; and Marchese, Anthony, 4,046,049, Cl. 84-1.110.

Norris, Lee E.: *See—*
Buffington, James F.; and Norris, Lee E., 4,045,882, Cl. 34-171.000.

North American Philips Corporation: *See—*
Conklin, Thomas, 4,047,070, Cl. 313-388.000.

Notter, Eugen: *See—*
Eggenmuller, Alfred; Bellan, Heinrich; Scherer, Lorenz; Notter, Eugen; and Wagler, Werner, 4,046,068, Cl. 100-65.000.

Novak, Thomas A., to Eaton Corporation. Relief valve. 4,046,163, Cl. 137-512.300.

Nowak, Edward N.; and Frech, Kenneth J., to Goodyear Tire & Rubber Company, The. Catalytic process for the preparation of butenes from propylene. 4,046,832, Cl. 260-683.00D.

Nowell, John Rawson, to Honeywell Information Systems Inc. Switching regulator control circuit. 4,045,887, Cl. 361-98.000.

Nuclear Power Company (Whetstone) Limited: *See—*
Middleton, John Ernest, 4,046,628, Cl. 176-38.000.

Nulcear Power Company (Whetstone) Limited: *See—*
Middleton, John Ernest, 4,046,627, Cl. 176-38.000.

Nuova San Giorgio S.p.A.: *See—*
Piro, Mario, 4,046,102, Cl. 118-78.000.

Nutting Truck and Caster Company: *See—*
Restad, Everett L.; and Pitan, Roger W., 4,046,391, Cl. 280-5.240.

N.V. Optische Industrie "De Oude Delft": *See—*
Groeneweg, Abraham, 4,047,209, Cl. 354-212.000.

Oberholtzer, Earl R.: *See—*
Cohen, Edward M.; and Oberholtzer, Earl R., 4,046,804, Cl. 260-501.210.

Ocker, Klaus Frederick: *See—*
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Oda, Shinichi: *See—*
Saito, Toranosuke; Kohno, Jujiro; Tanaka, Daiichiro; and Oda, Shinichi, 4,046,941, Cl. 428-323.000.

Odaka, Munehiko: *See—*
Takino, Masuichi; Kurosaki, Teikichi; and Odaka, Munehiko, 4,046,893, Cl. 424-251.000.

Odenwalder, Heinrich; Ranz, Erwin; Puschel, Walter; and Vetter, Hans, to AGFA-Gevaert, Aktiengesellschaft. Color photographic material with homophthalimide thioether development inhibitor. 4,046,574, Cl. 96-99.000.

Odstrchel, Gerald: *See—*
Hertl, William; and Odstrchel, Gerald, 4,046,870, Cl. 424-1.000.

O'Farrell, James T.: *See—*
Wood, Kenneth E.; and O'Farrell, James T., 4,047,147, Cl. 340-3.00R.

Ogawa, Ichitaro: *See—*
Kobayashi, Kazuo; Ogawa, Ichitaro; Honda, Hidemasa; and Matsushita, Yasuhiro, 4,046,863, Cl. 423-448.000.

Ogita, Minoru, to Nippon Gakki Seizo Kabushiki Kaisha. FM multiplex stereo demodulating circuit. 4,047,116, Cl. 329-124.000.

Ohara, Katsunobu: *See—*
Ando, Yujiro; Ohara, Katsunobu; and Shinohara, Yukimasa, 4,046,466, Cl. 355-3.00R.

O'Hara, Mark J., to UOP Inc. Method of manufacturing a hydrorefining catalyst. 4,046,714, Cl. 252-455.00R.

Ohio State University, The: *See—*
Schlosser, Philip A.; and Steidley, John W., 4,047,037, Cl. 250-370.000.

Ohkubo, Kazuo: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,046,876, Cl. 424-177.000.

Ohkubo, Yoshio; and Kobayashi, Yoshichika, to Matsushita Electronics Corporation. Method for forming semiconductor devices. 4,046,595, Cl. 148-1.500.

Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Fastening device for a reel on fishing rods. 4,045,902, Cl. 43-22.000.

Ohmura, Yoshito; Okabe, Takahiro; and Morozumi, Hiroshi, to Hitachi, Ltd. Transistor differential amplifier circuit. 4,047,119, Cl. 330-30.00D.

Ohori, Harumi; and Shibatani, Juichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Disc brake. 4,046,231, Cl. 188-71.100.

Okabe, Takahiro: *See—*
Ohmura, Yoshito; Okabe, Takahiro; and Morozumi, Hiroshi, 4,047,119, Cl. 330-30.00D.

Okajima, Hidekazu: *See—*
Toyama, Masamichi; Takigawa, Tomoshi; Shimazaki, Mamoru; Okajima, Hidekazu; Ichiyanagi, Toshikazu; and Iwama, Hideto, 4,046,465, Cl. 352-175.000.

Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, to Mitsubishi Chemical Industries Limited. N^2-alkoxynaphthalenesulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,046,876, Cl. 424-177.000.

Okamoto, Yasuo: *See—*
Hirasawa, Kazuhiko; and Okamoto, Yasuo, 4,046,650, Cl. 204-67.000.

Okamura, Kosaku: *See—*
Yamada, Hirotada; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Okamura, Kosaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,046,904, Cl. 424-271.000.

Oki Electric Industry Co., Ltd.: *See—*
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Okuda, Naoki; and Tanaka, Kazuo, to Kobe Steel Ltd. Method of preventing base metal end crack in arc welding and end tab used therefor. 4,046,988, Cl. 219-137.00R.

Okumura, Akio: *See—*
Inouye, Kozo; Nakamura, Kotaro; Yokota, Yukio; Nakazyo, Kiyoshi; and Okumura, Akio, 4,046,573, Cl. 96-74.000.

Olin Corporation: *See—*
Spangler, Perry Kay, 4,046,075, Cl. 102-37.800.

Olinkraft, Inc.: *See—*
Booth, Vernard S.; and Oswalt, Billy W., 4,046,307, Cl. 229-15.000.
Poggiali, Lewis D., 4,046,309, Cl. 229-23.00R.

Oliver, James W., Jr., to Dunham-Bush, Inc. Self operating excess refrigerant storage system for a heat pump. 4,045,977, Cl. 62-324.000.

Ollendick, Gary B., to Teletype Corporation. Method and apparatus for controlling a web handling device. 4,047,085, Cl. 318-601.000.

Olsen, Donald W. One-way valve for fluid sampler device. 4,046,011, Cl. 73-421.00B.

Olund, Sven A., to Chevron Research Company. Refrigeration working fluid containing branched chain alkylbenzene lubricant. 4,046,533, Cl. 62-468.000.

Olympus Optical Co., Ltd.: *See—*
Koizumi, Toshimichi, 4,046,460, Cl. 350-216.000.
Komiya, Osamu, 4,046,149, Cl. 128-328.000.
Morokuma, Tadashi; and Tsuda, Naotsune, 4,045,864, Cl. 29-603.000.
Sato, Masaaki, 4,046,973, Cl. 179-100.110.

Omelyan, Fedor Evstafievich: *See—*
Feinzilber, Mikhail Leibovich; Kuzin, Eduard Nikolaevich; Timofeev, Gennady Ivanovich; Roitershtein, Semen Semenovich; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Bratyshev, Igor Petrovich; Omelyan, Fedor Evstafievich; Sheinis, Efim Iosifovich; Pak, Vladimir Grigorievich; Romanov, Vladimir Ivanovich; Garbuzov, Zalman Eremeevich; and Naret, Grigory Borisovich, deceased, 4,045,893, Cl. 37-108.00A.

OMNI Corporation: *See—*
Bruning, William E., 4,046,185, Cl. 160-368.00G.

Ondetti, Miguel Angel; and Cushman, David W., to E. R. Squibb & Sons, Inc. Azetidine-2-carboxylic acid derivatives. 4,046,889, Cl. 424-244.000.

O'Neal, Larry. Inflatable dock seal and mounting therefor. 4,045,925, Cl. 52-2.000.

O'Neill, John Francis, to Bell Telephone Laboratories, Incorporated. Line circuit using miniature line transformer. 4,046,967, Cl. 179-18.0FA.

O'Neill, John Francis: *See—*
Embree, Milton Luther; Goldthorp, David Clayton; and O'Neill, John Francis, 4,046,968, Cl. 179-18.0FA.

Ono, Tetsuji: *See—*
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Ontario Paper Company Limited, The: *See—*
Sexton, Ernest Arthur, 4,046,621, Cl. 162-40.000.

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Altman, Richard M.; and McLaughlin, Thomas D., 4,047,207, Cl. 354-155.000.

Moskovich, Jacob; Wiese, Gary E.; Altman, Richard M.; and McLaughlin, Thomas D., 4,047,222, Cl. 354-155.000.

Ordonez, Marino Paneda. Lifting members for truck bodies and similar units. 4,046,423, Cl. 298-22.00D.

Oronzio de Nora Impianti Elettrochimici S.p.A.: *See—*
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Ortho Diagnostics Inc.: *See—*
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Kanojia, Ramesh Maganlal, 4,046,882, Cl. 424-195.000.

Osawa, Tagui: *See—*
Hirai, Yutaka; Miyata, Katsuharu; Osawa, Tagui; Samecima, Muneyasu; Mukai, Ken; Yoshiura, Koichi; and Mori, Hidetoshi, 4,046,785, Cl. 260-380.000.

Osberger, Helmut. Helicopters safety drive. 4,046,335, Cl. 244-17.190.

Osborne, Thomas E.: *See—*
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Oswalt, Billy W.: *See—*
Booth, Vernard S.; and Oswalt, Billy W., 4,046,307, Cl. 229-15.000.

Otomo, Tetuo: *See—*
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Ott, Anton; Ehrlinger, Friedrich; Knodler, Dietrich; and Zdansevicius, Roland, to Zahnradfabrik Friedrichshafen AG. Planetary-gear transmission. 4,046,031, Cl. 74-764.000.

Otten, Joachim; and Troster, Helmut, to Hoechst Aktiengesellschaft. Process for the dyeing and printing of synthetic polyamides. 4,046,501, Cl. 8-1.00E.

Overbury, Francis G., to International Standard Electric Corporation. Doppler scanning guidance system receiver. 4,047,177, Cl. 343-113.0DE.

Owen, Hartley; and Venuto, Paul B., to Mobil Oil Corporation. Conversion of oxygenated compounds to gasoline. 4,046,825, Cl. 260-668.00R.

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Owens-Corning Fiberglas Corporation: *See—*
Eisenberg, Arnold J.; and Klink, Jerome P., 4,046,329, Cl. 242-18.00G.
Mueller, Dale R., 4,046,330, Cl. 242-18.00G.
Pitt, Richard E., 4,046,539, Cl. 65-6.000.
Stalego, Charles J., 4,046,535, Cl. 65-1.000.
Thomas, David Whitfield, 4,046,538, Cl. 65-4.00A.
Yakuboff, Paul D., 4,046,103, Cl. 118-125.000.

Owens-Illinois, Inc.: *See—*
Damm, David A., 4,046,258, Cl. 209-111.500.
Ernsthausen, Roger E., 4,047,065, Cl. 313-201.000.

Oxenberg, Bruce. Athletic shoe. 4,045,888, Cl. 36-114.000.

Oyler, Harry S. Low voltage protection circuit. 4,047,234, Cl. 361-92.000.

Ozaki, Nobuo, to Maeda Industries, Ltd. Bicycle speed change lever device. 4,046,025, Cl. 74-501.00R.

P. R. Mallory & Co., Inc.: *See—*
Evans, William J., 4,045,862, Cl. 29-570.000.
Kilmer, Bill G.; and Baugh, David F., Jr., 4,047,061, Cl. 310-164.000.

Paasch, Harold R. Protective cover for sewer grates. 4,046,482, Cl. 404-4.000.

Padrutt, Paul W.: *See—*
Baron, George B.; and Padrutt, Paul W., 4,046,270, Cl. 214-138.00R.

Paget, Charles J.; and Wikel, James H., to Eli Lilly and Company. N-(6-acyloxybenzothiazol-2-yl)-N'-phenyl (or substituted phenyl-)ureas. 4,046,770, Cl. 260-305.000.

Paggen, William D.: *See—*
Price, Jerome J.; Karsten, Carl G.; and Paggen, William D., 4,046,976, Cl. 200-61.930.

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Giuliao, Ercole; Paita, Orazio; and Stringa, Luigi, 4,047,152, Cl. 340-146.3AG.

Pak, Vladimir Grigorievich: *See—*
Feinzilber, Mikhail Leibovich; Kuzin, Eduard Nikolaevich; Timofeev, Gennady Ivanovich; Roitershtein, Semen Semenovich; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Bratyshev, Igor Petrovich; Omelyan, Fedor Evstafievich; Sheinis, Efim Iosifovich; Pak, Vladimir Grigorievich; Romanov, Vladimir Ivanovich; Garbuzov, Zalman Eremeevich; and Naret, Grigory Borisovich, deceased, 4,045,893, Cl. 37-108.00A.

Paley, Hyman W. Removable locking connector for Luer fittings. 4,046,479, Cl. 403-306.000.

Palka, James J., to General Bathroom Products Corporation. Bathroom cabinet lighting fixture. 4,047,016, Cl. 240-4.000.

Palmer, Alexander Allan, to Sydney Hospital. Rotational viscometers. 4,045,999, Cl. 73-59.000.

Pampus, Gottfried: *See—*
Lehnert, Gunther; Maertens, Dieter; Pampus, Gottfried; and Witte, Josef, 4,046,710, Cl. 252-429.00B.

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Papetti, Stelvio, to Foster Grant Co., Inc. Compositions having high impact at low rubber levels. 4,046,839, Cl. 260-880.00R.

Papp, Joseph; Meisterheim, Richard A.; and Hubbard, S. Eugene, to Kawneer Company, Inc. Mechanical accumulator. 4,046,167, Cl. 138-31.000.

Paris, Gerard Yvon; and Cimon, Denis Gaston, to Abbott Laboratories. Glycerides with anti-inflammatory properties. 4,046,887, Cl. 424-232.000.

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Parise & Sons, Inc.: *See—*
Parise, Carl; Blackman, Ralph Eugene; and Wimsatt, James M., 4,046,989, Cl. 219-437.000.

Parker, Douglas W. Artificial fishing lure. 4,045,903, Cl. 43-42.110.

Parker & Harper Manufacturing Company, Inc., The: *See—*
Massey, Roger G.; and Holloway, David G., 4,046,350, Cl. 251-58.000.

Parker, Louis W.: *See—*
Hedges, Rhey Warren, 4,047,226, Cl. 358-193.000.

Parsonage, Harry N., to Mead Corporation, The. Apparatus for recycling photographic wash water. 4,045,839, Cl. 15-302.000.

Parsons, Roger R., to Raven Industries, Inc. Hinged control surfaces for pressurized hot air airship. 4,046,337, Cl. 244-96.000.

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Klingenberg, James C.; Patel, Hiralal V.; and Morse, Philip W., 4,046,315, Cl. 233-4.000.

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Richardson Company, The: *See—*
Meiner, Roger D.; Haines, James M.; and Alsberg, Henry, 4,046,726, Cl. 260-27.00R.
Muzyczko, Thaddeus M.; and Jones, Thomas H., 4,046,577, Cl. 96-115.00R.
Richardson, John C.: *See—*
Mortimer, George A.; Pelezo, Chris A.; and Richardson, John C., 4,046,731, Cl. 260-30.60R.
Richardson-Merrell Inc.: *See—*
Djurickovic, Slobodan M., 4,046,875, Cl. 424-89.000.
Richardson, Norman: *See—*
Smith, Malcolm John; Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, 4,046,707, Cl. 252-180.000.
Richardson, William H., to City Products Corporation. Indicator device for a garment hanger. 4,045,899, Cl. 40-322.000.
Rickert, Paul Ellis, to Borg-Warner Corporation. Carburetor construction. 4,046,844, Cl. 261-34.00A.
Ricoh Co., Ltd.: *See—*
Kato, Saburo; and Takemoto, Takeshi, 4,046,334, Cl. 242-201.000.
Kume, Tsutomu; Kasai, Kazuo; Kaneko, Hidefumi; Sugiyama, Shigeo; and Mithuhashi, Shigeo, 4,047,230, Cl. 360-17.000.
Ridler, Keith Douglas: *See—*
Gosling, Alexander Bennett; Ridler, Keith Douglas; Easthope, Frederick James; and Stanwell-Smith, Colin Howard, 4,046,386, Cl. 274-23.00A.
Riedl, Frederick J.; and Schimmelpfennig, George A., to UOP Inc. Glass sampling tube. 4,046,015, Cl. 73-421.50R.
Riemens, Karel: *See—*
Bijker, Arnold Jan; and Riemens, Karel, 4,047,108, Cl. 325-38.00B.
Riffer, Richard, to California and Hawaiian Sugar Company. Process for the production of a colorless sugar syrup from cane molasses. 4,046,590, Cl. 127-46.00B.
Riganati, John P.: *See—*
Vitols, Visvaldis A.; and Riganati, John P., 4,047,154, Cl. 340-146.30E.
Rijsenbrij, Joannes C.: *See—*
Wormmeester, Gerhardus J.; and Rijsenbrij, Joannes C., 4,046,265, Cl. 214-14.000.
Rikagaku Kenkyusho: *See—*
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Rilling, Raymond J.: *See—*
Mullet, David L.; Rilling, Raymond J.; and Voth, Elmer D., 4,046,200, Cl. 172-14.000.
Riner, Victor: *See—*
Juillard, Yves; and Riner, Victor, 4,046,170, Cl. 139-20.000.
Rink, Helm A.: *See—*
Press, Irving D.; Rink, Helm A.; and Nickerson, Harvey R., 4,046,406, Cl. 285-47.000.
Ripley, Mervyn. Automatic boiler damper. 4,046,318, Cl. 236-1.00G.
Rippere, Ralph E. Production of multi-metal particles for powder metallurgy alloys. 4,046,643, Cl. 204-10.000.
Roben, Hermann: *See—*
Baxmann, Fritz; Frese, Albert; Roben, Hermann; and Wolpers, Jurgen, 4,046,945, Cl. 428-282.000.
Robert Bosch G.m.b.H.: *See—*
Jakob, Gert; and Goetzke, Siegfried, 4,047,242, Cl. 361-389.000.
Messerschmidt, Friedrich, 4,046,478, Cl. 403-262.000.
Poetsch, Dieter, 4,047,202, Cl. 358-29.000.
Schlagmuller, Walter; and Babitzka, Rudolf, 4,046,240, Cl. 192-104.00C.
Roberts, Patrick S., to Warwick Electronics Inc. Note selector circuit for electronic musical instrument. 4,046,047, Cl. 84-1.010.
Robinson, Charles Elbert. Motor speed sensor. 4,047,106, Cl. 324-175.000.
Robinson, Graham Ernest: *See—*
Foster, Robert; Preston, Roger Edwin; and Robinson, Graham Ernest, 4,046,841, Cl. 260-923.000.
Robinson, Kenneth R.: *See—*
Langer, Heimo J.; Robinson, Kenneth R.; and Throckmorton, Peter E., 4,046,812, Cl. 260-583.00B.
Robinson, Michael, to Laporte Industries Limited. Production of titanium tetrachloride. 4,046,853, Cl. 423-77.000.
Robinson, Myron L., to Simekus, Inc. Meter for measuring syrup ratio in soft drinks and the like. 4,047,100, Cl. 324-30.00B.
Roblin Industries, Inc.: *See—*
Thompson, William A., Jr., 4,046,394, Cl. 280-33.99B.
Rock, Erich; and Mages, Bernhard. Hinge. 4,045,841, Cl. 16-129.000.
Rockwell International Corporation: *See—*
Ehman, Michael F.; and Austerman, Stanley B., 4,046,954, Cl. 428-446.000.
French, Barry T., 4,047,216, Cl. 357-24.000.
Lee, Soo N., 4,046,474, Cl. 355-43.000.
Lim, Teong C.; Tarakci, Umit; and Vasile, Carmine F., 4,047,130, Cl. 333-72.000.
Pool, Eldert B., 4,046,164, Cl. 137-514.700.
Vitols, Visvaldis A.; and Riganati, John P., 4,047,154, Cl. 340-146.30E.
Rode, France: *See—*
Dickinson, Peter D.; Osborne, Thomas E.; Rode, France; Baum, Allen J.; Cochran, David S.; and Tung, Chung C., 4,047,012, Cl. 235-156.000.
Rodeghiero, Reno Antonio, to Deere & Company. Modulation control valve for clutches. 4,046,162, Cl. 137-489.000.
Rodgers, Billy R.; and Edwards, Michael S., to United States of America, Energy Research and Development Administration. Filtering coal-derived oil through a filter media precoated with particles partially solubilized by said oil. 4,046,690, Cl. 210-75.000.
Rodriguez, Claude: *See—*
Ammon, J. Preston; Weaver, Harry R.; and Rodriguez, Claude, 4,045,868, Cl. 29-629.000.
Rody, Jean: *See—*
Rasberger, Michael; Rody, Jean; Moser, Paul; and Muller, Helmut, 4,046,788, Cl. 260-404.000.
Roeder, Malcholm O. Tennis ball preserver. 4,046,491, Cl. 417-44.000.
Roehr, Kuno M.: *See—*
Finkemeyer, Karl-Friedrich; Roehr, Kuno M.; and Sonntag, Guenther, 4,047,244, Cl. 364-200.000.
Rogers, Barry William, to Bell Telephone Laboratories, Incorporated. Called party fraud detection in an automated coin system. 4,046,962, Cl. 179-6.30R.
Rogers, Howard G.: *See—*
Land, Edwin H.; Bloom, Stanley M.; and Rogers, Howard G., 4,046,457, Cl. 350-164.000.
Rogers, Jimmy Dale: *See—*
Lord, Harold Wilbur; and Rogers, Jimmy Dale, 4,047,120, Cl. 330-207.00P.
Rohm and Haas Company: *See—*
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,046,798, Cl. 260-465.00D.
Costin, Charles Richard, 4,046,766, Cl. 260-290.0HL.
Cunningham, Virginia L.; Clovis, James S.; and Hurwitz, Marvin J., 4,046,688, Cl. 210-37.00R.
Jenkins, Raymond F., 4,046,744, Cl. 260-77.5AQ.
Rohr, Robert Lewis: *See—*
Kendall, Arthur Harry; and Rohr, Robert Lewis, 4,047,186, Cl. 346-140.00R.
Roitershtein, Semen Semenovich: *See—*
Feinzilber, Mikhail Leibovich; Kuzin, Eduard Nikolaevich; Timofeev, Gennady Ivanovich; Roitershtein, Semen Semenovich; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Bratyshev, Igor Petrovich; Omelyan, Fedor Evstafievich; Sheinis, Efim Iosifovich; Pak, Vladimir Grigorievich; Romanov, Vladimir Ivanovich; Garbuzov, Zalman Eremeevich; and Naret, Grigory Borisovich, deceased, 4,045,893, Cl. 37-108.00A.
Rolls-Royce (1971) Limited: *See—*
Gardner, Charles Stanley; and Molloy, Denis Edward, 4,046,662, Cl. 204-275.000.
Roman, Richard C. Dental drill guide attachment. 4,045,874, Cl. 32-40.00R.
Romano, Antonio, to Ing. C. Olivetti & C., S.p.A. Line control unit for teleprinters. 4,047,055, Cl. 307-262.000.
Romano, Ugo: *See—*
Moggi, Pietro Antonio; and Romano, Ugo, 4,046,810, Cl. 260-571.000.
Romanov, Vladimir Ivanovich: *See—*
Feinzilber, Mikhail Leibovich; Kuzin, Eduard Nikolaevich; Timofeev, Gennady Ivanovich; Roitershtein, Semen Semenovich; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Bratyshev, Igor Petrovich; Omelyan, Fedor Evstafievich; Sheinis, Efim Iosifovich; Pak, Vladimir Grigorievich; Romanov, Vladimir Ivanovich; Garbuzov, Zalman Eremeevich; and Naret, Grigory Borisovich, deceased, 4,045,893, Cl. 37-108.00A.
Ronzio, Richard A.: *See—*
Vertes, Michael A.; Ronzio, Richard A.; and Kearns, Tommy C., 4,046,852, Cl. 423-58.000.
Roop, Raymond M.: *See—*
Clark, Lowell E.; Roop, Raymond M.; and Volk, Charles E., 4,047,218, Cl. 357-34.000.
Root, Ernest F.; Kunica, Serge; and Simmons, Harry M., to Itek Corporation. Highly efficient solar collector including means for preventing cover plate fluid condensation. 4,046,135, Cl. 126-271.000.
Root, Robert S.; Taylor, Frederick P.; and MacKendrick, William J., to Lipe-Rollway Corporation. Clutch with torque limiting brake. 4,046,237, Cl. 192-13.00R.
Rosa, Richard J., to United States of America, Energy Research and Development Administration. MHD generator with improved network coupling electrodes to a load. 4,047,094, Cl. 322-7.000.
Rose, Byron W., to United States Steel Corporation. Plastic fence posts and enclosures. 4,046,356, Cl. 256-10.000.
Rose, Maria M., to Medtronic, Inc. Body implantable lead with stiffening stylet. 4,046,151, Cl. 128-404.000.
Rose, Robert C., Sr.; and McClelland, Harold H., to IBEC Industries, Inc. Valve-positioning apparatus. 4,046,165, Cl. 137-624.270.
Rosebrock, Frederick Allen, to Bell Telephone Laboratories, Incorporated. Cam actuated switch. 4,046,980, Cl. 200-153.0LA.
Rosenthal, Bruce David, to RCA Corporation. Comparator circuit. 4,047,059, Cl. 307-355.000.
Rosinski, Edward J.: *See—*
Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., 4,046,859, Cl. 423-328.000.

Rosler, Peter, to Hilti Aktiengesellschaft. Packing container for objects of variable lengths. 4,046,279, Cl. 220-8.000.
Rosser, William D.: *See—*
Kuo, Samuel Chung-Shu; and Rosser, William D., 4,047,180, Cl. 343-784.000.
Rosskamp, Gunter; Kolberg, Reiner; Gunzel, Peter; and Porep, Hans-Jurgen, to Schering Aktiengesellschaft. Apparatus for the inhalation of medicinal agents. 4,046,146, Cl. 128-266.000.
Rottloff, Gunther; Sundermann, Rudolf; Grigat, Ernst; and Putter, Rolf, to Bayer Aktiengesellschaft. Process for the production of polyfunctional cyanic acid esters. 4,046,796, Cl. 260-453.00P.
Roussel Uclaf: *See—*
Hardy, Michel; and Humbert, Daniel, 4,046,902, Cl. 424-270.000.
Nedelec, Lucien; Guillaume, Jacques; and Dumont, Claude, 4,046,901, Cl. 424-267.000.
Rowland, George Ferdinand, to G. D. Searle & Co. Limited. Immunological materials. 4,046,722, Cl. 260-6.000.
Rowland, Walter: *See—*
Sopcak, James E.; and Rowland, Walter, 4,045,996, Cl. 73-1.00R.
Rubenstein, Kenneth E.: *See—*
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Rubin, Mae K.: *See—*
Plank, Charles J.; Rosinski, Edward J.; and Rubin, Mae K., 4,046,859, Cl. 423-328.000.
Ruby, Harry M.: *See—*
Klees, Gerard T.; Meacham, Robert A.; Ruby, Harry M.; and Sich, Edward, 4,046,415, Cl. 296-35.00R.
Ruch, Heinz, to Albert Obrist & Co. Molded plastic covers for containers. 4,046,282, Cl. 220-270.000.
Rudolf Schadow, GmbH: *See—*
Schadow, Rudolf; and Michalski, Dieter, 4,046,982, Cl. 200-159.00R.
Rudszinat, Willy, to Hauni-Werke Korber & Co. KG. Apparatus for transmitting motion to tools in cigarette packing machines or the like. 4,046,027, Cl. 74-567.000.
Rulison, Richard N.: *See—*
Ashare, Edward; Rulison, Richard N.; Wright, Lawrence T.; and Coplan, Myron J., 4,045,851, Cl. 29-157.00R.
Rusche, Fredric. Casingless pile method and apparatus. 4,045,966, Cl. 61-53.640.
Rushmere, John Derek, to Du Pont de Nemours, E. I., and Company. Polyamine additives in alkaline zinc electroplating. 4,046,648, Cl. 204-55.00R.
Russell, Carolyn G. Weaving device. 4,046,172, Cl. 139-33.000.
Ruti Machinery Works Ltd.: *See—*
Smutny, Viktor, 4,046,224, Cl. 184-15.00R.
Rutshtein, Alexander; and Staroselsky, Naum, to Compressor Controls Corporation. Method and apparatus for antisurge protection of a dynamic compressor. 4,046,490, Cl. 417-28.000.
Rutter, Harold T., to Sunnen Products Company. Retractable dial bore gauge. 4,045,877, Cl. 33-178.00R.
Ryan, Marshall John, to Lockformer Company, The. Sheet metal bending apparatus. 4,045,989, Cl. 72-133.000.
Ryan, Wilfred Edward. Identification kit and method. 4,045,883, Cl 35-28.000.
Rydbeck, Nils R. C.; and Sundberg, Carl-Erik Wilhelm. Adaptive error correcting transmission system. 4,047,151, Cl. 340-146.1AX.
Rzeszewski, Theodore S., to Matsushita Electric Corporation of America. Auxiliary signal processing circuit. 4,047,227, Cl. 358-194.000.
S&C Electric Company: *See—*
Bernatt, Joseph; and Guleserian, John E., 4,047,142, Cl. 337-186.000.
Saito, Hirokazu: *See—*
Tada, Sugihiko; Nakai, Setsuo; Irie, Kazuo; Saito, Hirokazu; and Suzuki, Hideaki, 4,046,154, Cl. 134-65.000.
Saito, Naoki: *See—*
Akutsu, Hidezo; Iwama, Katsuaki; Saito, Naoki; Takagawa, Masanori; Kobayashi, Yoshichika; and Atsumi, Tamisuke, 4,047,069, Cl. 313-487.000.
Saito, Shinroku, to Shinagawa Firebrick Co., Ltd. Dry rubber compression molding apparatus. 4,046,499, Cl. 425-405.00H.
Saito, Toranosuke; Kohno, Jujiro; Tanaka, Daiichiro; and Oda, Shinichi, to Sanko Chemical Company Ltd.; and Kanzaki Paper Manufacturing Company, Ltd. Support sheet with sensitized coating of organic acid substance and organic high molecular compound particulate mixture. 4,046,941, Cl. 428-323.000.
Saitoh, Kozo; Tanaka, Hiroshi; Nagahama, Tatsuya; and Izumi, Sumio, to Mitsui Mining & Smelting Co., Ltd. Method for separating large-sized film-like plastics. 4,046,677, Cl. 209-166.000.
Sakamoto, Tsunenori: *See—*
Tarui, Yasuo; Sakamoto, Tsunenori; and Komiya, Yoshio, 4,046,594, Cl. 136-89.0SJ.
Sakamoto, Yoichi, to Matsushita Electric Industrial Co., Ltd. Channel selector employing variable capacitance elements for tuning. 4,047,112, Cl. 325-455.000.
Sakamoto, Yoshio; and Kominami, Yasuo, to Hitachi, Ltd. Transistor amplifier circuit. 4,047,118, Cl. 330-22.000.
Sakasai, Toshio: *See—*
Akao, Takeshi; Sakasai, Toshio; Matsuyama, Yoshikazu; and Kasuga, Yukio, 4,046,921, Cl. 426-46.000.
Sakashita, Nobuyuki: *See—*
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, 4,046,553, Cl. 71-94.000.
Sakurada, Nobuaki: *See—*
Mashimo, Yukio; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,047,187, Cl. 354-23.00D.
Sala Magnetics, Inc.: *See—*
Marston, Peter G.; and Nolan, John J., 4,046,681, Cl. 209-224.000.
Salathiel, William M.: *See—*
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Salimbeni, Aldo: *See—*
Manghisi, Elso; and Salimbeni, Aldo, 4,046,762, Cl. 544-148.000.
Salley, Ernest J., to Engineered Systems, Inc. Memory fullness indicator. 4,046,995, Cl. 235-61.60R.
Salpeter, Jerome: *See—*
Judge, John F. X.; and Salpeter, Jerome, 4,047,032, Cl. 250-338.000.
Salzgeber, Daniel Edwin; Raufeisen, Robert; and Davis, Charles W., to Stanadyne, Inc. Fuel injection pump and replaceable check valve therefor. 4,046,494, Cl. 417-253.000.
Samecima, Muneyasu: *See—*
Hirai, Yutaka; Miyata, Katsuharu; Osawa, Tagui; Samecima, Muneyasu; Mukai, Ken; Yoshiura, Koichi; and Mori, Hidetoshi, 4,046,785, Cl. 260-380.000.
Samour, Carlos M.; and Vida, Julius A., to Bristol-Myers Company. Certain barbituric acid derivatives used as anticonvulsant agents. 4,046,894, Cl. 424-254.000.
Sample, Steven B.: *See—*
Scheuer, Paul R.; Cox, Karmen D.; and Sample, Steven B., 4,047,082, Cl. 318-221.00E.
Samuelsson, Frank A. Tennis ball container indicating players turns. 4,046,284, Cl. 221-45.000.
Sanders, John H.: *See—*
Paton, George A.; Nichols, Sterling M.; and Sanders, John H., 4,045,949, Cl. 57-140.0BY.
Sandoz Ltd.: *See—*
Maderni, Piero; and Mueller, Curt, 4,046,756, Cl. 260-205.000.
Meybeck, Jacques; Mueller, Curt; and Mueller, Fred, 4,046,757, Cl. 260-207.000.
Moser, Helmut; and von Tobel, Hans, 4,046,502, Cl. 8-7.000.
Scholtysik, Gunter, 4,046,917, Cl. 424-326.000.
Sanford, Leon M.; and Wu, Che-Kuang, to Corning Glass Works. Method for making molded glass articles having bulk homogeneity and optical quality surface. 4,046,545, Cl. 65-30.00R.
Sanko Chemical Company Ltd.: *See—*
Saito, Toranosuke; Kohno, Jujiro; Tanaka, Daiichiro; and Oda, Shinichi, 4,046,941, Cl. 428-323.000.
Sano, Takezo; Shimomura, Takatoshi; and Sasaki, Masao, to Sumitomo Chemical Company, Limited. Process for preparing membranes for separation of substances. 4,046,843, Cl. 264-22.000.
Sanson, Joseph F. Manufacture of cushions. 4,046,611, Cl. 156-79.000.
Santley, J. Sterling: *See—*
Prindle, Geoffrey C.; and Santley, J. Sterling, 4,046,093, Cl. 114-165.000.
Sardinha, Manuel Domingos. Wheel. 4,046,425, Cl. 301-12.00R.
Sasaki, Masao: *See—*
Sano, Takezo; Shimomura, Takatoshi; and Sasaki, Masao, 4,046,843, Cl. 264-22.000.
Sasaki, Shosuke, to Sasaki, Shosuke; and Sasaki Takashi. Distillatory apparatus. 4,046,637, Cl. 202-174.000.
Sasaki Takashi: *See—*
Sasaki, Shosuke, 4,046,637, Cl. 202-174.000.
Sato, Akira: *See—*
Hinata, Masanao; Mihara, Yuji; Sato, Akira; and Ikeda, Tadashi, 4,046,572, Cl. 96-69.000.
Sato, Masaaki, to Olympus Optical Co., Ltd. Combined portable tape recorder and stereophonic receiver system. 4,046,973, Cl. 179-100.110.
Satto, Seiichi, to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.). Moving magnet type instrument. 4,047,136, Cl. 335-222.000.
Sauer, Charles A., to Swiss Aluminium Ltd. Thermocouple for continuously measuring the temperature along the length of a surface. 4,046,009, Cl. 73-359.00R.
Saunders, Howard E.: *See—*
Westervelt, Dean C.; Scala, Luciano C.; Saunders, Howard E.; and Ciliberti, David F., 4,046,592, Cl. 134-1.000.
Scala, Luciano C.: *See—*
Westervelt, Dean C.; Scala, Luciano C.; Saunders, Howard E.; and Ciliberti, David F., 4,046,592, Cl. 134-1.000.
Scanlan, Robert J. Conduit clamping device. 4,046,344, Cl. 248-72.000.
Schachter, Joseph D. Imprinted compressible foam article and method of manufacture. 4,046,936, Cl. 428-195.000.
Schadow, Rudolf; and Michalski, Dieter, to Rudolf Schadow, GmbH. Switch means for short-stroke push-button keys. 4,046,982, Cl. 200-159.00R.
Schaefer, Dieter: *See—*
Hartmann, Hans-Joerg; Falk, Roland; Gawlik, Peter; Balz, Werner; Uhl, Karl; Schaefer, Dieter; and Motz, Herbert, 4,046,932, Cl. 428-64.000.
Schaefer, Jean E., to Procter & Gamble Company, The. Apparatus for continuously forming and filling tampon sacks. 4,045,946, Cl. 53-180.00M.
Schafer, Rolf, to Bayer Aktiengesellschaft. Process for producing sodium chloride brines suitable for electrolysis. 4,046,865, Cl. 423-499.000.
Schafft, Hugo Willy, to Motorola, Inc. Acoustic transducer with elastomeric coupling. 4,047,060, Cl. 310-322.000.

Schanz, Klaus: *See—*
Schepers, Bernhard; Bayer, Gerhard; Urmann, Ernst; and Schanz, Klaus, 4,046,855, Cl. 423-130.000.

Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. Novel 15-substituted prostanoic acids and esters. 4,046,787, Cl. 260-399.000.

Schaul, Joseph B.: *See—*
Bland, Herbert; and Schaul, Joseph B., 4,046,297, Cl. 224-42.03B.

Scheidler, Rollin G.: *See—*
Taylor, Philip W.; and Scheidler, Rollin G., 4,046,957, Cl. 174-72.00A.

Scheinpflug, Hans: *See—*
Dahn, Ursula; Hagenmaier, Hanspaul; Hohne, Helmut; Konig, Wilfried; Scheinpflug, Hans; and Zahner, Hans, 4,046,881, Cl. 424-181.000.

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Scher, Herbert B., to Stauffer Chemical Company. Post-treatment of polyurea microcapsules. 4,046,741, Cl. 260-77.50A.

Scherer, Lorenz: *See—*
Eggenmuller, Alfred; Bellan, Heinrich; Scherer, Lorenz; Notter, Eugen; and Wagler, Werner, 4,046,068, Cl. 100-65.000.

Schering Aktiengesellschaft: *See—*
Rosskamp, Gunter; Kolberg, Reiner; Gunzel, Peter; and Porep, Hans-Jurgen, 4,046,146, Cl. 128-266.000.

Scheuer, Paul R.; Cox, Karmen D.; and Sample, Steven B., to Design & Manufacturing Corporation. Variable threshold starting circuit for induction motor. 4,047,082, Cl. 318-221.00E.

Scheurecker, Werner: *See—*
Kagerhuber, Franz; and Scheurecker, Werner, 4,046,188, Cl. 164-282.000.

Schierz, Winfried, to SEMIKRON Gesellschaft fur Gleichrichterbau und Elektronik m.b.H. Housing and lead structure for a series connected semiconductor rectifier arrangement. 4,047,197, Cl. 357-81.000.

Schimmel, Karl F.; and Wismer, Marco, to PPG Industries, Inc. Novel polymers from reaction of tricarboxylic anhydrides and hydrazines or hydrazides coated on substrate. 4,046,949, Cl. 428-411.000.

Schimmelpfennig, George A.: *See—*
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Schindehutte, Manfred: *See—*
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Schirtzinger, Joseph F., to Sea-Log Corporation. Apparatus for supporting a drilling platform on the ocean floor. 4,045,967, Cl. 61-86.000.

Schladitz, Hermann J. Methods of manufacturing bodies of conglomerated particles. 4,046,302, Cl. 228-121.000.

Schlaf, Helmut: *See—*
Sextro, Gunter; Burg, Karlheinz; Leugering, Hans Joachim; Schlaf, Helmut; and Heller, Alwin, 4,046,738, Cl. 260-67.0FP.

Schlagmuller, Walter; and Babitzka, Rudolf, to Robert Bosch G.m.b.H. Centrifugal friction clutch. 4,046,240, Cl. 192-104.00C.

Schloemann, Ernst F. R. A., to Raytheon Company. Magnetic drum materials separator. 4,046,679, Cl. 209-212.000.

Schlosser, Philip A.; and Steidley, John W., to Ohio State University, The. Gamma ray camera for nuclear medicine. 4,047,037, Cl. 250-370.000.

Schluenz, Robert William; and Davis, Curry Beach, to Arizona Chemical Company. Polymers of terpene-maleic anhydride adducts with aliphatic diamines. 4,046,748, Cl. 260-78.0UA.

Schlumberger Technology Corporation: *See—*
Bateman, Richard M.; and Clavier, Christian M., 4,047,027, Cl. 250-264.000.

Schmelzer, Gunther: *See—*
Bigalke, Erhard; Wolf, Jurgen; and Schmelzer, Gunther, 4,046,129, Cl. 123-32.0EA.

Schmerling, Louis, to UOP Inc. Alkylation of alkyl, cycloalkyl and aralkyl halides. 4,046,819, Cl. 260-648.00R.

Schmid, Heinrich, to J. M. Voith GmbH. Apparatus for shifting component parts of paper machines. 4,046,623, Cl. 162-306.000.

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Scholten, Frank Lynn: *See—*
Booth, Thomas Allan; and Scholten, Frank Lynn, 4,046,475, Cl. 355-69.000.

Scholten, Heinz: *See—*
Capelle, Anton; and Scholten, Heinz, 4,046,747, Cl. 260-78.00S.

Scholtysik, Gunter, to Sandoz Ltd. Method of treating migraine. 4,046,917, Cl. 424-326.000.

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Schoonman, Willem, to Lummus Company, The. Control of freezing in air-cooled steam condensers. 4,045,961, Cl. 60-686.000.

Schreyer, Gerd: *See—*
Heimberger, Werner; and Schreyer, Gerd, 4,046,862, Cl. 423-383.000.

Schroeder, Charles Martin, Jr., to Western Electric Company, Inc. Methods and apparatus for stripping optical fiber ribbons. 4,046,298, Cl. 225-2.000.

Schromm, Kurt: *See—*
Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; and Traunecker, Werner, 4,046,913, Cl. 424-311.000.

Schulze, Reinhold, to Norddeutsche Affinerie. Process for the adsorptive removal of arsenic, antimony and/or bismuth from an aqueous solution. 4,046,687, Cl. 210-32.000.

Schwartz, Norman; and Mohrbacher, Richard J., to McNeil Laboratories, Incorporated. 2,3-Diphenyl-5-ethylpyrazine. 4,046,763, Cl. 260-250.00B.

Schwartz, Robert B.: *See—*
Chieger, George; Schwartz, Robert B.; and Banerjea, Tara N., 4,046,278, Cl. 220-1.500.

Schwartz, Robert S.; and Pfister, Ronald R., to American Hospital Supply Corporation. Medical instrument for locating and removing occlusive objects. 4,046,150, Cl. 128-328.000.

Schwehr, Richard A., to Towmotor Corporation. Pivotally actuated speed control means of an apparatus. 4,047,145, Cl. 338-67.000.

Scientific Micro Systems, Inc.: *See—*
Allison, David F., 4,047,195, Cl. 357-55.000.

Scientific Technology Inc.: *See—*
Key, Paul Franklyn; and Lazzara, Anthony Ross, 4,047,023, Cl. 250-214.00B.

Scott, Eldred D., to Precision Engineered Products, Inc. Socket inserter. 4,045,870, Cl. 29-741.000.

Scott, Paul B., to Xonics, Inc. Solar heater with automatic venting. 4,046,134, Cl. 126-270.000.

Scriven, Roger L.; and Chang, Wen-Hsuan, to PPG Industries, Inc. Water-reduced urethane coating compositions. 4,046,729, Cl. 260-29.2TN.

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Schirtzinger, Joseph F., 4,045,967, Cl. 61-86.000.

Seal Petroleum Limited: *See—*
Darnborough, Eric; and Coulboy, Rene Henri, 4,046,192, Cl. 166-.600.

Seeger, Richard E., Jr., to Chomerics, Inc. Keyboard switch assembly having internal gas passages preformed in spacer member. 4,046,975, Cl. 200-5.00A.

Seeling, Philip F.; and Bean, Samuel L., to Allied Chemical Corporation. Method for making sulfur dioxide-containing gas stream. 4,046,867, Cl. 423-543.000.

Seemayer, Walter: *See—*
Choksi, Pradip Vinobchandra; and Seemayer, Walter, 4,046,145, Cl. 128-215.000.

Sefton, Philip Charles; and Chad, Kenneth Ernest, to Thorn Domestic Appliances (Electrical) Limited. Power control apparatus. 4,046,991, Cl. 219-497.000.

Seguchi, Koji; Sugita, Minoru; Inada, Kazuyoshi; Tagaya, Kiyoshi; and Nakamura, Yuji, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for the treatment of heavy petroleum oil. 4,046,670, Cl. 208-48.0AA.

Seidelberger, Hartmut: *See—*
Puchelt, Manfred; and Seidelberger, Hartmut, 4,046,632, Cl. 176-87.000.

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Moritomo, Sadao, 4,045,919, Cl. 51-165.770.

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Seitz, Max: *See—*
Loos, Herbert; Seitz, Max; and Erhardt, Manfred, 4,045,917, Cl. 51-123.00G.

Sekhar, Neel C., to Upjohn Company, The. Process for treating elevated platelet adhesiveness. 4,046,915, Cl. 424-317.000.

Sekhon, Kalwant S.; Nelson, Lloyd A.; and Fritz, John E., Jr., to Hughes Aircraft Company. Transistor cooling by heat pipes having a wick of dielectric powder. 4,047,198, Cl. 357-82.000.

Sekiguchi, Kiichi. Drive-in theater audio system. 4,047,109, Cl. 325-54.000.

Selman, Charles M.; and Uraneck, Carl A., to Phillips Petroleum Company. Preparation of functional polymers. 4,046,745, Cl. 260-77.5CR.

SEMIKRON Gesellschaft fur Gleichrichterbau und Elektronik m.b.H.: *See—*
Schierz, Winfried, 4,047,197, Cl. 357-81.000.

Sevak, Nitin M., to Burroughs Corporation. Document stacking device. 4,046,371, Cl. 271-178.000.

Severino, Frank Titus, to Stauffer Chemical Company. Method for recovering ethylene values. 4,046,822, Cl. 260-659.00A.

Sexton, Ernest Arthur, to Ontario Paper Company Limited, The; and Canadian International Paper Company. Process for treating a slurry of cellulosic material. 4,046,621, Cl. 162-40.000.

Sextro, Gunter; Burg, Karlheinz; Leugering, Hans Joachim; Schlaf, Helmut; and Heller, Alwin, to Hoechst Aktiengesellschaft. Process for the manufacture of granular oxymethylene polymers. 4,046,738, Cl. 260-67.0FP.

Shaikh, Nisar, to Brunswick Corporation. Exhaust silencer apparatus for internal combustion engine. 4,046,219, Cl. 181-211.000.

Shakley, Conrad Dale: *See—*
Goffredo, Daniel L.; and Shakley, Conrad Dale, 4,046,248, Cl. 198-583.000.

Shanmugasundaram, Venkatachalam, to Walter Kidde & Company, Inc. Telescopic swingaway jib. 4,045,923, Cl. 52-118.000.

Sharp, Russell G.: *See—*
Cooley, Denton A.; Reed, Charles C.; and Sharp, Russell G., 4,045,859, Cl. 29-451.000.

Shaw, Andrew, to Imperial Chemical Industries Limited. 6-Aryl-pyrrolo[1,2-a]imidazole derivatives which possess anti-hypertensive activity. 4,046,898, Cl. 424-263.000.

Shaw, Michael J., to Allied Paper Incorporated. Lithographic printing plate. 4,046,946, Cl. 428-325.000.

Sheahan, James P.; and Putnam, Lowell E., to Dow Chemical Company, The. Roof and method of preparation. 4,045,934, Cl. 52-514.000.

Sheinis, Efim Iosifovich: *See—*
Feinzilber, Mikhail Leibovich; Kuzin, Eduard Nikolaevich; Timofeev, Gennady Ivanovich; Roitershtein, Semen Semenovich; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Bratyshev, Igor Petrovich; Omelyan, Fedor Evstafievich; Sheinis, Efim Iosifovich; Pak, Vladimir Grigorievich; Romanov, Vladimir Ivanovich; Garbuzov, Zalman Eremeevich; and Naret, Grigory Borisovich, deceased, 4,045,893, Cl. 37-108.00A.

Sheller-Globe Corporation: *See—*
Stuermer, Karl, 4,047,113, Cl. 328-2.000.

Shen, Kuo-Cheng, to Canadian Patents and Development Limited Composition and method for binding lignocellulosic materials. 4,046,585, Cl. 106-123.0LC.

Shen, Tsung-Ying; Li, Jorge P.; and Dorn, Conrad P., Jr., to Merck & Co., Inc. Anti-inflammatory, analgesic and antipyretic phenylacetic acids 4,046,905, Cl. 424-272.000.

Shenk, Walter James, to Bell Telephone Laboratories, Incorporated Lubrication method. 4,046,225, Cl. 184-15.00R.

Shepherd, Robin Gerald: *See—*
Curran, Adrian Charles Ward; and Shepherd, Robin Gerald, 4,046,895, Cl. 424-258.000.

Shibatani, Juichi: *See—*
Ohori, Harumi; and Shibatani, Juichi, 4,046,231, Cl. 188-71.100.

Shields, George B., to PPG Industries, Inc. Method and apparatus for tempering moving glass sheets. 4,046,543, Cl. 65-25.00A.

Shimago, Kozo: *See—*
Yamada, Hirotada; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Okamura, Kosaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,046,904, Cl. 424-271.000.

Shimazaki, Mamoru; Toyama, Masamichi; Ichiyanagi, Toshikazu; and Iwama, Hideto, to Canon Kabushiki Kaisha. Exposure control system and a motion picture camera using the same. 4,046,464, Cl. 352-141.000.

Shimazaki, Mamoru: *See—*
Toyama, Masamichi; Takigawa, Tomoshi; Shimazaki, Mamoru; Okajima, Hidekazu; Ichiyanagi, Toshikazu; and Iwama, Hideto, 4,046,465, Cl. 352-175.000.

Shimazu, Shinichi: *See—*
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,046,600, Cl. 148-12.400.

Shimizu, Kuniaki: *See—*
Taira, Hideya; and Shimizu, Kuniaki, 4,047,175, Cl. 343-100.0CS.

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Watanabe, Kazutaka; Shimizu, Misao; and Sugawara, Akihiro, 4,046,959, Cl. 178-68.000.

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Inoue, Nobuyoshi; and Shimizu, Munetaka, 4,047,211, Cl. 354-258.000.

Shimomura, Takatoshi: *See—*
Sano, Takezo; Shimomura, Takatoshi; and Sasaki, Masao, 4,046,843, Cl. 264-22.000.

Shinagawa Firebrick Co., Ltd.: *See—*
Saito, Shinroku, 4,046,499, Cl. 425-405.00H.

Shinoda, Akira: *See—*
Takaoka, Sabro; Shinoda, Akira; and Kobayashi, Hideo, 4,046,204, Cl. 175-76.000.

Shinoda, Nobuhiko: *See—*
Mashimo, Yukio; Sakurada, Nobuaki; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 4,047,187, Cl. 354-23.00D.

Shinoda, Yoshio: *See—*
Kuno, Akira; Shinoda, Yoshio; and Arai, Hiroshi, 4,046,998, Cl. 235-150.210.

Shinohara, Yukimasa: *See—*
Ando, Yujiro; Ohara, Katsunobu; and Shinohara, Yukimasa, 4,046,466, Cl. 355-3.00R.

Shipchandler, Mohammed T., to IMC Chemical Group, Inc. Method of synthesis of pyrogallol. 4,046,817, Cl. 260-621.00R.

Shoemaker, Philip D.; and McQueary, Hobert O., to Ellingson Timber Co. Manufacture of overlayed product with phenol-formaldehyde barrier for polyisocyanate binder. 4,046,952, Cl. 428-423.000.

Shoffa, Vadim Nikolaevich: *See—*
Smirnov, Vladimir Alexeevich; and Shoffa, Vadim Nikolaevich, 4,047,237, Cl. 361-210.000.

Shoupe, J. T.: *See—*
Frank, Thomas E.; Gum, Roy E.; Shoupe, J. T.; and Warner, Dennis L., 4,046,469, Cl. 355-13.000

Showalter, Lane Crawford; Brokenshire, John Leslie; and Watts, Geoffrey B., to Marsland Engineering Limited. Air curtain device. 4,045,997, Cl. 73-23.000.

Shutt, Donald P., to Western Gear Corporation. Automatic load brake. 4,046,235, Cl. 188-134.000.

Sich, Edward: *See—*
Klees, Gerard T.; Meacham, Robert A.; Ruby, Harry M.; and Sich, Edward, 4,046,415, Cl. 296-35.00R.

Sieg, Robert P.: *See—*
Kemp, Jacob D., and Sieg, Robert P., 4,046,520, Cl. 44-56.000.

Siemens Aktiengesellschaft: *See—*
Aleite, Werner; and Bock, Heinz-Wilhelm, 4,046,624, Cl. 176-22.000
Andrascek, Ernst; and Hadersbeck, Hans, 4,046,620, Cl. 156-666.000.
Deserno, Ulrich; and Auracher, Franz, 4,046,537, Cl. 65-2.000.
Fiebelkorn, Klaus Dieter; and Spitzer, Gunther, 4,046,453, Cl. 350-96.00C.
Hartmann, Gunter; and Winckler, Rudolf, 4,045,869, Cl. 29-630.00A.
Hertz, Walter; Stroh, Jan; and Mentel, Jurgen, 4,046,979, Cl. 200-148.00A.
Koubek, Michael; and Mallon, Dietmar, 4,047,052, Cl. 307-228.000.
Koubek, Michael, 4,047,200, Cl. 358-47.000.
Laurent, Estan, 4,047,050, Cl. 307-108.000.
Liska, Manfred, 4,047,081, Cl. 318-138.000.
Losehand, Helmut, 4,046,971, Cl. 179-90.00K.
Meyer, Rudolf, 4,047,043, Cl. 250-401.000.
Mitterhummer, Gerhard; Peltz, Hanns-Heinz; Mayer, Heinrich; and Conzelmann, Fritz, 4,045,863, Cl. 29-588.000
Pieverling, Klaus V., 4,047,176, Cl. 343-106.00R.
Reier, Richard; and Kuelzer, Peter, 4,046,303, Cl. 228-173.000.
Veith, Werner, 4,047,077, Cl. 315-169.0TV.
Wolf, Gerhard, 4,047,160, Cl. 364-900.000.

Sigismondo Piva S.p.A.: *See—*
Manetti, Orlando, 4,046,087, Cl. 112-121.150.

Silver, Stanley Milton, to Paxall, Inc. Packaging. 4,046,308, Cl. 229-17.00R.

Silverberg, Morton: *See—*
Eichorn, Roger H., deceased; Silverberg, Morton; and Mandrino, Russell J., executor, 4,046,472, Cl. 355-14.000.

Simekus, Inc.: *See—*
Robinson, Myron L., 4,047,100, Cl. 324-30.00B.

Simmons, Harry M.: *See—*
Root, Ernest F.; Kunica, Serge; and Simmons, Harry M., 4,046,135, Cl. 126-271.000.

Simpson, Barry: *See—*
Hosford, Charles D.; and Simpson, Barry, 4,046,084, Cl. 108-112.000.

Sjoquist, Stig Roland: *See—*
Malmberg, Thor Anders Helge; Hogberg, Knut Goran; and Sjoquist, Stig Roland, 4,047,033, Cl. 250-341.000.

SKF Industries, Inc.: *See—*
Kiener, Heinz, 4,046,433, Cl. 308-191.000.

Skrivanek, Karl; and Janek, Klaus, to Klockner-Humboldt-Deutz Aktiengesellschaft. Pressure system for a transmission, especially for an auxiliary gearbox for driving auxiliary devices in aircraft. 4,046,222, Cl. 184-6.110.

Sloane, Edwin A.; McKeever, Bruce T.; and Wong, Eugene, to Time/-Data Corporation. Laplace transform system. 4,047,002, Cl. 235-151.300.

Smirnov, Vladimir Alexeevich; and Shoffa, Vadim Nikolaevich. Means for controlling electromagnetic device having hermetically sealed contacts. 4,047,237, Cl. 361-210.000.

Smith, David F. Type of adhesive cement and certain improved products made possible thereby. 4,046,578, Cl. 106-35.000.

Smith, Donald Edward, to Procter & Gamble Company, The. Dermatological compositions. 4,046,886, Cl. 424-227.000.

Smith International, Inc.: *See—*
Liljestrand, Walter E., 4,046,528, Cl. 55-160.000.

Smith, James D. B.; and Phillips, David C., to Westinghouse Electric Corporation. Sulfonic acid composition for forming thermoparticulating coating. 4,046,733, Cl. 260-33.6EP.

Smith, James D. B.; and Phillips, David C., to Westinghouse Electric Corporation. Malonic acid derivative composition for forming thermoparticulating coating. 4,046,943, Cl. 428-339.000.

Smith, James Edwin: *See—*
Cloud, Nathan; and Smith, James Edwin, 4,046,328, Cl. 242-18.00A.

Smith, James Nelson: *See—*
Goodner, Willis Ray; Smith, James Nelson; and Horvath, John, 4,046,820, Cl. 260-652.50R.

Smith, Kenneth Browning; and Adams, Derek William, to Heath (Gloucester) Ltd. Strip profile measurement. 4,047,036, Cl. 250-359.000.

Smith Kline & French Laboratories Limited: *See—*
Durant, Graham John; Emmett, John Colin; Ganellin, Charon Robin; and Prain, Hunter Douglas, 4,046,907, Cl. 424-273.00R.

Smith, Malcolm John; Miles, Peter; Richardson, Norman; and Finan, Michael Anthony, to Ciba Geigy (UK) Limited. Treatment of aqueous systems. 4,046,707, Cl. 252-180.000.

Smith, Melvin Dee: *See—*
Johnston, Katharine Gentry; and Smith, Melvin Dee, 4,046,514, Cl. 23-253.0TP.

Smith, Paul W., III. Method and apparatus for reducing vehicle side sway. 4,046,395, Cl. 280-106.50R.

Smith, Ray E., to Velsicol Chemical Corporation. Durable flame retardant finishes for textile materials. 4,046,701, Cl. 252-8.100.

Smith, Royal; and Carson, Edward H. D. Wheelchairs. 4,046,418, Cl. 297-118.000.

Smithen, Carey Ernest: *See—*
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,046,751, Cl. 260-112.50R.

Smithgall, David Harry, Sr., to Western Electric Company, Inc. Monitoring and control of optical fiber diameters. 4,046,536, Cl. 65-2.000.

Smulders, Hendricus Franciscus Gerardus; and Franken, Adrianus Jacobus Jozef, to U.S. Philips Corporation. Centering of lenses. 4,046,458, Cl. 350-178.000.

Smutny, Viktor, to Ruti Machinery Works Ltd. Apparatus for lubricating the gripper band of a shuttleless loom. 4,046,224, Cl. 184-15.00R.

SNAM Progetti S.p.A.: *See—*
Moggi, Pietro Antonio; and Romano, Ugo, 4,046,810, Cl. 260-571.000.

Sneed, John E. Pulling tool. 4,045,856, Cl. 29-262.000.

Snitzer, Elias: *See—*
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., 4,046,586, Cl. 106-194.000.

Snyder, Edward, III: *See—*
Ensmann, Burt; Nielsen, Edwin A.; Snyder, Edward, III; and Ventura, Frank D., 4,045,908, Cl. 46-204.000.

Snyder, Paul F.: *See—*
Snyder, Raymond C.; and Snyder, Paul F., 4,046,584, Cl. 106-90.000.

Snyder, Raymond C.; and Snyder, Paul F. Liquid concrete accelerating mixtures and methods for use thereof. 4,046,584, Cl. 106-90.000.

Snyder, Robert S.: *See—*
United States of America, National Aeronautics and Space Administration; Walter, Hans U.; and Snyder, Robert S., 4,046,617, Cl. 156-601.000.

Societa' Farmaceutici Italia S.p.A.: *See—*
Patelli, Bianca; Bernardi, Luigi; Arcamone, Federico; and Di Marco, Aurelio, 4,046,878, Cl. 424-180.000.

Societe Alsacienne de Constructions Mecaniques de Mulhouse: *See—*
Juillard, Yves; and Riner, Victor, 4,046,170, Cl. 139-20.000.

Societe Anonyme Cortial S.A.: *See—*
Negrevergne, Georges, 4,046,916, Cl. 424-319.000.

Societe Anonyme de Telecommunications: *See—*
Le Gall, Jean C., 4,046,176, Cl. 140-92.100.

Societe Industrielle Bertrand Faure: *See—*
de la Taille, Olivier; Bernard, Armand; and Labadie, Jean-Francois, 4,046,420, Cl. 297-216.000.

Societe Industrielle de Brevets et d'Etudes S.I.B.E.: *See—*
Pierlot, Michel E., 4,046,121, Cl. 123-139.0AW.

Societe Metallurgique de Revigny: *See—*
Mandras, Christian Maurice, 4,045,837, Cl. 15-104.040.

Societe Nationale des Poudres et Explosifs: *See—*
Loeb, Jean; and Plantif, Bernard E., 4,045,830, Cl. 5-81.00R.

Soga, Yasuyuki, to Dijet Industrial Co, Ltd. Cemented carbide material for cutting operation. 4,046,517, Cl. 539.5-.

Sogi, Toshiyuki: *See—*
Takahashi, Hidenori; Tamura, Hiroshi; Watanabe, Shigeo; and Sogi, Toshiyuki, 4,046,183, Cl. 152-362.00R.

Solartron Electronic Group Limited, The: *See—*
Dorey, Howard Anthony; and Cooke, Robert John, 4,047,162, Cl. 364-200.000.
Ley, Anthony John; and Metcalf, Eric, 4,047,053, Cl. 307-238.000.

Solitron Devices, Inc.: *See—*
Nordstrom, Donald B., 4,046,052, Cl. 85-61.000.

Sonntag, Guenther: *See—*
Finkemeyer, Karl-Friedrich; Roehr, Kuno M.; and Sonntag, Guenther, 4,047,244, Cl. 364-200.000.

Sony Corporation: *See—*
Hisagen, Yoshiaki; and Hoshi, Kazuo, 4,047,232, Cl. 360-134.000.
Suzuki, Tadao; Yoshida, Tadao; and Wachi, Shigeaki, 4,047,089, Cl. 363-49.000.

Sopcak, James E.; and Rowland, Walter, to Continental Group, Inc., The. Test fixture for leak detectors. 4,045,996, Cl. 73-1.00R.

Sorg GmbH & Co. KG: *See—*
Pieper, Helmut, 4,046,547, Cl. 65-135.000.

Soucy, Frank: *See—*
Cosco, Robert J.; Lima, Joseph V.; and Soucy, Frank, 4,047,064, Cl. 313-201.000.

Souza, Anthony J., to Woodstream Corporation. Animal trap. 4,045,905, Cl. 43-88.000.

Spangler, Perry Kay, to Olin Corporation. Fusee cap closure. 4,046,075, Cl. 102-37.800.

Sparber, Richard Grant, to Bell Telephone Laboratories, Incorporated. Ohmmeter for circuits carrying unknown currents. 4,047,104, Cl. 324-62.000.

Sparks, Charles H., to Steel Structures, Inc. Fluid-mechanical drive for press brake. 4,045,995, Cl. 72-450.000.

Spaziante, Placido M.: *See—*
de Nora, Oronzio; de Nora, Vittorio; and Spaziante, Placido M., 4,046,653, Cl. 204-95.000.

Spence, Henry L.: *See—*
White, Thomas J.; Spence, Henry L.; and McClelland, Etheridge R., 4,045,940, Cl. 53-26.000.

Spencer Foods, Inc.: *See—*
Pearson, Gerald L.; and Tuma, Harold J., 4,046,046, Cl. 83-745.000.

Spencer, Rodney S.: *See—*
Rice, Stephen H.; Spencer, Rodney S.; and Fleetwood, Charles M., Jr., 4,046,619, Cl. 156-645.000.

Speranza, George P.: *See—*
Austin, Thomas H.; and Speranza, George P., 4,046,721, Cl. 260-2.5AW.

Sperry Rand Corporation: *See—*
Mast, Aquila D., 4,045,947, Cl. 56-343.000.
Phillips, Edwin R.; and Stankiewicz, Raymond J., 4,047,185, Cl. 346-140.00R.

Spillers, Milton L. Board holding device. 4,046,362, Cl. 269-43.000.

Spitzer, Gunther: *See—*
Fiebelkorn, Klaus Dieter; and Spitzer, Gunther, 4,046,453, Cl. 350-96.00C.

Spiva, Stephan D.: *See—*
Harvey, Leslie E.; and Spiva, Stephan D., 4,046,376, Cl. 273-54.00D.

Spound, Albert M.; and Day, Robert C., to Charlton Company, Inc. Modular article of furniture. 4,046,421, Cl. 297-232.000.

Springer, Hartmut: *See—*
Meininger, Fritz; and Springer, Hartmut, 4,046,754, Cl. 260-162.000.

Sprinter Pack AB: *See—*
Gustafsson, Nils-Ake, 4,046,310, Cl. 229-30.000.

Sridhar, Srinivasan; and Hedden, Horst, to Chemische Werke Huls Aktiengesellschaft. Method for extracting granular polyamides and for preparing polyamide powders. 4,046,746, Cl. 260-78.00S.

Stabile, James, to Union Carbide Corporation. Pipettor apparatus. 4,046,511, Cl. 23-259.000.

Stacey, Eric J.: *See—*
Gyugyi, Laszlo; Stacey, Eric J.; and Brennen, Michael B., 4,047,097, Cl. 323-119.000.

Stach, Leonard J., to Velsicol Chemical Corporation. N-(α-Aminoalkylidene)phosphor- and phosphonamidates, and method for controlling insects. 4,046,884, Cl. 424-210.000.

Stal-Laval Turbin AB: *See—*
Brannstrom, Roine; and Nilsson, Goran, 4,045,955, Cl. 60-39.28R.
Mansson, Martin, 4,046,155, Cl. 134-167.00R.

Stalego, Charles J., to Owens-Corning Fiberglas Corporation. Glass melter having reflective top wall and method for using same. 4,046,535, Cl. 65-1.000.

Stallberg, Gunnel Anna Maria: *See—*
Hallgren, Bo Erik; and Stallberg, Gunnel Anna Maria, 4,046,914, Cl. 424-312.000.

Stanaback, Robert J.; and Reale, Michael J., to Tenneco Chemicals, Inc. Flame-retardant resinous compositions containing trihaloneopentyl haloalkyl phosphates. 4,046,719, Cl. 260-2.5FP.

Stanadyne, Inc.: *See—*
Salzgeber, Daniel Edwin; Raufeisen, Robert; and Davis, Charles W., 4,046,494, Cl. 417-253.000.

Stancliffe, Floyd S. Landing gear for an aircraft including expansible wheels. 4,046,339, Cl. 244-103.00R.

Standard Oil Company, The: *See—*
Hardman, Harley F., 4,046,833, Cl. 260-683.300.

Standard Oil Company (Indiana): *See—*
Puskas, Imre; and Fields, Ellis K., 4,046,779, Cl. 260-346.220.

Standard Technology, Inc.: *See—*
Hayashi, Osamu; Inagaki, Takahumi; and Yanagita, Yoshio, 4,046,158, Cl. 137-88.000.

Stankiewicz, Raymond J.: *See—*
Phillips, Edwin R.; and Stankiewicz, Raymond J., 4,047,185, Cl. 346-140.00R.

Stanley, Edward B., to United States Steel Corporation. Process for producing nonoriented silicon sheet steel having excellent magnetic properties in the rolling direction. 4,046,602, Cl. 148-111.000.

Stanley, Philip E.; Woods, William E.; and Izbicki, Kenneth J., to Honeywell Information Systems Inc. Address formation in a microprogrammed data processing system. 4,047,247, Cl. 364-200.000.

Stanley Works, The: *See—*
Catlett, John C., 4,045,914, Cl. 49-334.000.

Stanwell-Smith, Colin Howard: *See—*
Gosling, Alexander Bennett; Ridler, Keith Douglas; Easthope, Frederick James; and Stanwell-Smith, Colin Howard, 4,046,386, Cl. 274-23.00A.

Stark, Marvin: *See—*
Tedesco, George A.; and Stark, Marvin, 4,046,082, Cl. 105-377.000.

Starks, Charles M.: *See—*
Gordon, Ronnie D.; and Starks, Charles M., 4,046,823, Cl. 260-662.00R.

Staroselsky, Naum: *See—*
Rutshtein, Alexander; and Staroselsky, Naum, 4,046,490, Cl. 417-28.000.

Start, John F.: *See—*
Fekete, Thomas M.; and Start, John F., 4,046,857, Cl. 423-300.000.

Stauffer Chemical Company: *See—*
Hurlburt, Harvey Zeh; and Sumner, Clark A., 4,046,866, Cl. 423-533.000.
Scher, Herbert B., 4,046,741, Cl. 260-77.50A.
Severino, Frank Titus, 4,046,822, Cl. 260-659.00A.
Walsh, Edward N., 4,046,885, Cl. 424-210.000.

Steel Structures, Inc.: *See—*
Sparks, Charles H., 4,045,995, Cl. 72-450.000.

Stefanik, John E., to PPG Industries, Inc. Laminated window structure and its method of fabrication. 4,046,933, Cl. 428-81.000.

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Steffen, Sylvester L. Ventilation process for inducing biochemical reactions in stored food grain while preserving dormancy. 4,045,878, Cl. 34-26.000.

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Steidley, John W.: *See—*
Schlosser, Philip A.; and Steidley, John W., 4,047,037, Cl. 250-370.000.

Steigerwald, Robert L., to General Electric Company. Power inductor and transformer with low acoustic noise air gap. 4,047,138, Cl. 336-100.000.

Stein, Thomas R.: *See—*
Ireland, Henry R.; and Stein, Thomas R., 4,046,829, Cl. 260-676.00R.

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Laskowski, Kenneth W.; and Steiner, Edward L., 4,046,467, Cl. 355-3.00R.

Stenstrom, Lennart Arvid, to Alfa-Laval AB. Apparatus for weighing a flowing material. 4,046,208, Cl. 177-19.000.

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Maier, Alfred E.; and Stephenson, William I., Jr., 4,047,134, Cl. 335-23.000.

Sterling Drug Inc.: *See—*
Bailey, Denis M., 4,046,775, Cl. 260-326.200.

Stern, Philip. Planetarium with star identifying means. 4,045,885, Cl. 35-42.500.

Sterner, Russell L., to Bucyrus-Erie Company. Telescopic boom with sections of beam and truss construction. 4,045,936, Cl. 52-632.000.

Steury, Thomas Dean: *See—*
Branham, Charles Escom; Steury, Thomas Dean; and Woodward, John Maury, 4,046,471, Cl. 355-14.000.

Stevens, Charles H., to International Telephone and Telegraph Corporation. Wire splitter for round conductor flat ribbon cable. 4,046,045, Cl. 83-620.000.

Stevens Engineering: *See—*
Coope, Robert L.; and Munson, Lowell W., 4,046,364, Cl. 269-244.000.

Stievenart, Emile Frans; Plessers, Hendrik Sylvester; Neujens, Georges Jozef; and Van Bouwel, Leo Pa ul, to AGFA-GEVAERT N.V. Apparatus for opening radiographic cassettes. 4,047,193, Cl. 354-105.000.

Stith, Morris Randall, Jr. Apparatus for positioning and supporting a machine. 4,046,354, Cl. 254-93.00R.

Stokes, Richard F., to Garrett Corporation, The. Four-way clevis valve and method. 4,046,061, Cl. 91-459.000.

Stolzer, Paul, to KEURO Maschinenbau Gesellschaft mit beschrankter Haftung & Co Kommanditgesellschaft. Clamping and feeding device for cold saws. 4,046,041, Cl. 83-210.000.

Stone, Dale Eugene: *See—*
Daugherty, Thomas Henry; and Stone, Dale Eugene, 4,046,964, Cl. 179-15.0BF.

Stone, Jerry Lloyd: *See—*
Charamella, John Barrie; Long, John Warren; and Stone, Jerry Lloyd, 4,046,476, Cl. 355-77.000.

Stork Amsterdam B.V.: *See—*
Witte, Johan Frederik, 4,045,879, Cl. 34-31.000.

Strathearn Audio Limited: *See—*
Gosling, Alexander Bennett; Ridler, Keith Douglas; Easthope, Frederick James; and Stanwell-Smith, Colin Howard, 4,046,386, Cl. 274-23.00A.

Straub, Robert D.: *See—*
Knape, Richard S.; and Straub, Robert D., 4,046,322, Cl. 239-533.700.

Stridde, George E., to N L Industries, Inc. Process for alkylating aromatic hydrocarbons with synthetic hectorite-type clay catalyst. 4,046,826, Cl. 260-671.00C.

Stringa, Luigi: *See—*
Giuliao, Ercole; Paita, Orazio; and Stringa, Luigi, 4,047,152, Cl. 340-146.3AG.

Stringer, James L.: *See—*
Day, Clifford K.; and Stringer, James L., 4,047,103, Cl. 324-34.00D.

Stringer, Robert Kenneth; and Johnston, Kenneth Alan, to Commonwealth Scientific and Industrial Research Organization. Ceramic oxygen probe. 4,046,661, Cl. 204-195.00S.

Stroh, Jan: *See—*
Hertz, Walter; Stroh, Jan; and Mentel, Jurgen, 4,046,979, Cl. 200-148.00A.

Strom, Arne Gudmund, to Telefonaktieholaget L M Ericsson. Method for encapsulating electrical components. 4,045,867, Cl. 29-628.000.

Stroot, Jerome H. Humerus prosthesis. 4,045,825, Cl. 3-1.910.

Stroot, Jerome H. Glenoid component for shoulder prosthesis. 4,045,826, Cl. 3-1.910.

Strupczewski, Joseph T.: *See—*
Helsley, Grover C.; Strupczewski, Joseph T.; and Gardner, Beth Ann, 4,046,900, Cl. 424-267.000.

Stryjewski, Walter A., to Eastman Kodak Company. Method and apparatus for cleaning fusing members of electrographic copiers. 4,046,468, Cl. 355-3.00R.

Stuckert, Paul Edward, to International Business Machines Corporation. Cylindrical, linear, stopless mercury switch and relay. 4,047,135, Cl. 335-58.000.

Stucky, Fritz Christoph, to Credelca A.G. Method of constructing a prefabricated room element and a building of a plurality of said elements. 4,045,937, Cl. 52-745.000.

Studenick, David K., to United States of America, National Aeronautics and Space Administration. Fluid sampling device. 4,046,012, Cl. 73-421.50R.

Stuermer, Karl, to Sheller-Globe Corporation. Feedback circuitry for charge digitizer. 4,047,113, Cl. 328-2.000.

Stuhlman, Frank. Flow coat head for curtain coating machines. 4,046,104, Cl. 118-300.000.

Subramanian, Kohur Nagaraja; and Glaum, Gerald Vernon, to International Nickel Company, Inc., The. Two stage sulfuric acid leaching of sea nodules. 4,046,851, Cl. 423-41.000.

Suess, Frederick F.: *See—*
Hofmann, Charles J.; and Suess, Frederick F., 4,046,432, Cl. 308-189.00R.

Sugawara, Akihiro: *See—*
Watanabe, Kazutaka; Shimizu, Misao; and Sugawara, Akihiro, 4,046,959, Cl. 178-68.000.

Sugden, Kenneth B., to Sundstrand Corporation. Hydromechanical transmission. 4,046,029, Cl. 74-687.000.

Sugino, Masahiro: *See—*
Kato, Yasuo; Kato, Katsuhiko; Sugino, Masahiro; Ikegami, Jun; and Harukawa, Junichi, 4,046,724, Cl. 260-9.000.

Sugita, Minoru: *See—*
Seguchi, Koji; Sugita, Minoru; Inada, Kazuyoshi; Tagaya, Kiyoshi; and Nakamura, Yuji, 4,046,670, Cl. 208-48.0AA.

Sugiyama, Shigeo: *See—*
Kume, Tsutomu; Kasai, Kazuo; Kaneko, Hidefumi; Sugiyama, Shigeo; and Mithuhashi, Shigeo, 4,047,230, Cl. 360-17.000.

Sumita, Isao, to Matsushita Electric Industrial Co., Ltd. High polymer electret. 4,046,704, Cl. 252-63.200.

Sumitomo Aluminum Smelting Co., Ltd.: *See—*
Hirasawa, Kazuhiko; and Okamoto, Yasuo, 4,046,650, Cl. 204-67.000.

Sumitomo Chemical Company, Limited: *See—*
Itoh, Iko; Inoue, Yasuhiko; Ito, Shojiro; and Kawamura, Kazumitsu, 4,046,727, Cl. 260-28.50R.
Kato, Yasuyuki; Moritani, Masahiko; and Suzuki, Seiichi, 4,046,850, Cl. 264-216.000.
Sano, Takezo; Shimomura, Takatoshi; and Sasaki, Masao, 4,046,843, Cl. 264-22.000.
Yamada, Hirotada; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Okamura, Kosaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,046,904, Cl. 424-271.000.

Summerlin, Frederick Arthur: *See—*
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Sumner, Clark A.: *See—*
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Sun Chemical Corporation: *See—*
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Sun Oil Company of Pennsylvania: *See—*
Duling, Irl N.; and Gates, David S., 4,046,703, Cl. 252-59.000.

Sun, Paul L. F., to Kent Feeds, Inc. Production of alfalfa seeds. 4,045,912, Cl. 47-58.000.

Sundberg, Carl-Erik Wilhelm: *See—*
Rydbeck, Nils R. C.; and Sundberg, Carl-Erik Wilhelm, 4,047,151, Cl. 340-146.1AX.

Sundermann, Rudolf: *See—*
Rottloff, Gunther; Sundermann, Rudolf; Grigat, Ernst; and Putter, Rolf, 4,046,796, Cl. 260-453.00P.

Sundstrand Corporation: *See—*
Sugden, Kenneth B., 4,046,029, Cl. 74-687.000.

Sunnen Products Company: *See—*
Rutter, Harold T., 4,045,877, Cl. 33-178.00R.

Supp, Emil: *See—*
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Surfglas, Inc.: *See—*
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Surgical Microsystems, Inc.: *See—*
La Russa, Joseph A.; and Troutman, Richard C., 4,046,463, Cl. 351-13.000.

Sutherland, John W. Troweling machine. 4,046,483, Cl. 404-112.000.

Sutton, David J.: *See—*
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Suzuki, Hideaki: *See—*
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Suzuki, Kunihiko, to Nissan Motor Co., Ltd. Final drive unit. 4,046,030, Cl. 74-710.000.

Suzuki, Seiichi: *See—*
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Suzuki, Tadao; Yoshida, Tadao; and Wachi, Shigeaki, to Sony Corporation. Starting circuit for inverter. 4,047,089, Cl. 363-49.000.

Suzuki, Takaaki: *See—*
Hashimoto, Masanao; and Suzuki, Takaaki, 4,046,033, Cl. 74-869.000.

Suzuki, Yoshikazu, to Agency of Industrial Science & Technology. Method for manufacture of aluminum sheet and sintered high-density aluminum laminate by direct powder rolling process. 4,045,857, Cl. 29-420.000.

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Sveska Hymas Aktiebolag: *See—*
Hammarstrand, Sten Ove, 4,046,026, Cl. 74-519.000.

Swartzfager, John G. Glass cutting method. 4,046,299, Cl. 225-3.000.

Swetly, Peter, to Boehringer Ingelheim GmbH. Antiviral compositions. 4,046,879, Cl. 424-180.000.

Swier, Willem: *See—*
Di Maio, Anthony E.; and Swier, Willem, 4,045,994, Cl. 72-391.000.

Swiss Aluminium Ltd.: *See—*
Sauer, Charles A., 4,046,009, Cl. 73-359.00R.

Swithenbank, Colin: *See—*
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SWS Silicones Corporation: *See—*
Martin, Eugene Ray, 4,046,795, Cl. 260-448.20E.
Sycor, Inc.: *See—*
Velazquez, Juan F., 4,046,244, Cl. 197-1.00R.
Sydney Hospital: *See—*
Palmer, Alexander Allan, 4,045,999, Cl. 73-59.000.
Syntex (U.S.A.) Inc.: *See—*
Kluge, Arthur F.; Untch, Karl G.; and Fried, John H., 4,046,801, Cl. 560-121.000.
White, Abraham; and Burton, Pamela M., 4,046,877, Cl. 424-177.000.
Systron-Donner Corporation: *See—*
Cook, Kenneth C., 4,046,156, Cl. 137-68.00A.
Syva Company: *See—*
Ullman, Edwin F.; and Rubenstein, Kenneth E., 4,046,636, Cl. 195-63.000.
Szente, Andre, to Hoffmann-La Roche Inc. Benzodiazepine derivatives. 4,046,890, Cl. 424-244.000.
Szigeti nee Haranghy, Terez: *See—*
Andriska, Viktor; Gorog nee Privitzer, Katalin; Bruckner, Gyorgyi; Nemessanyi nee Szekely, Zsuzsanna; Havasi, Miklos; Raskay, Bela; Grega nee Toth, Erzsebet; Szigeti nee Haranghy, Terez; Dudas, Jozsef; Szilagyi, Gyula; Marosvolgyi, Sandor; Gribovszky, Pal; Pinter, Zoltan; and Bors, Gyozo, 4,046,773, Cl. 548-339.000.
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Szvoboda, Janos: *See—*
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Tabata, Sanetoshi; and Takeuchi, Toshiaki, to Teikoku Piston Ring Co., Ltd. Process for producing metal composite material. 4,046,304, Cl. 228-187.000.
Tacchi, Kenneth J.: *See—*
Bessler, Donald U.; and Tacchi, Kenneth J., 4,046,521, Cl. 44-62.000.
Tada, Sugihiko; Nakai, Setsuo; Irie, Kazuo; Saito, Hirokazu; and Suzuki, Hideaki, to Fuji Photo Film Co., Ltd. Apparatus for continuously removing film coating materials from film. 4,046,154, Cl. 134-65.000.
Tafoya, Vincent G., to Union Oil Company of California. Steam injection apparatus and method. 4,046,199, Cl. 166-303.000.
Tagaya, Kiyoshi: *See—*
Seguchi, Koji; Sugita, Minoru; Inada, Kazuyoshi; Tagaya, Kiyoshi; and Nakamura, Yuji, 4,046,670, Cl. 208-48.0AA.
Taguchi, Tetsuya: *See—*
Nakamura, Zenzo; Uchiyama, Takashi; Uchidoi, Masanori; Taguchi, Tetsuya; Aizawa, Hiroshi; and Tsunekawa, Tokuichi, 4,047,194, Cl. 354-149.000.
Taira, Hideya; and Shimizu, Kuniaki, to Tokyo Keiki Company Limited. Television antenna directing and tracking system for television program network between air-borne and ground offices. 4,047,175, Cl. 343-100.0CS.
Takagawa, Masanori: *See—*
Akutsu, Hidezo; Iwama, Katsuaki; Saito, Naoki; Takagawa, Masanori; Kobayashi, Yoshichika; and Atsumi, Tamisuke, 4,047,069, Cl. 313-487.000.
Takahashi, Hidenori; Tamura, Hiroshi; Watanabe, Shigeo; and Sogi, Toshiyuki, to Bridgestone Tire Company Limited. Radial tire having a highly durable bead structure. 4,046,183, Cl. 152-362.00R.
Takahashi, Noriaki: *See—*
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Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, to Ishihara Sangyo Kaisha, Ltd. Herbicidal compound, herbicidal composition containing the same and method of use thereof. 4,046,553, Cl. 71-94.000.
Takano, Hiroshi: *See—*
Kumada, Akio; Takano, Hiroshi; Eto, Yoshizumi; and Hibi, Masao, 4,046,455, Cl. 350-150.000.
Takaoka, Sabro; Shinoda, Akira; and Kobayashi, Hideo, to Agency of Industrial Science & Technology. Controlled directional drilling tool. 4,046,204, Cl. 175-76.000.
Takechi, Hiroshi; Abe, Mitsunobu; Usuda, Matsuo; and Komiya, Kunihiko, to Nippon Steel Corporation. Vibration damping steel material and process for producing the same. 4,046,597, Cl. 148-12.00R.
Takeda Chemical Industries, Ltd.: *See—*
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Takemoto, Takashi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Ignition apparatus. 4,046,126, Cl. 123-148.0DS.
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Takeuchi, Toshiaki: *See—*
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Takino, Masuichi; Kurosaki, Teikichi; and Odaka, Munehiko, to Nippon Zoki Pharmaceutical Co., Ltd. Trioxopteridine derivatives suitable as medicament. 4,046,893, Cl. 424-251.000.
Tallon, James I., to McNeil Corporation. Display stand. 4,046,260, Cl. 211-24.000.
Tally, Joseph O., Jr. Combined lighthouse and wind direction indicator. 4,046,007, Cl. 73-188.000.
Tamao, Yoshikuni: *See—*
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Tanaka, Daiichiro: *See—*
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Tanaka, Hiroshi: *See—*
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Tangler, James L., to Textron, Inc. Vortex diffusion and dissipation. 4,046,336, Cl. 244-198.000.
Tanguy, Pierre, to Etud. Method for pancake cooking. 4,046,924, Cl. 426-502.000.
Tanno, Norihiko: *See—*
Yamada, Hirotada; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Okamura, Kosaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,046,904, Cl. 424-271.000.
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Taub, Howard Hyman, to International Business Machines Corporation. Method and apparatus for controlling the formation and shape of droplets in an ink jet stream. 4,047,183, Cl. 346-1.000.
Tawada, Hiroyuki: *See—*
Kuwada, Yutaka; Tawada, Hiroyuki; and Meguro, Kanji, 4,046,772, Cl. 260-308.00R.
Tax, Hans. Crane and method of building the same. 4,045,866, Cl. 29-628.000.
Taylor, Frederick P.: *See—*
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Taylor Industries, Inc.: *See—*
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Taylor, James Michael Morrison; and Troke, Gene R. Heavy duty dirt bicycle and frame therefor. 4,046,396, Cl. 280-281.00R.
Taylor, Philip W.; and Scheidler, Rollin G., to Taylor Industries, Inc. Pin structure for modular wiring duct and wire holder system. 4,046,957, Cl. 174-72.00A.
Taylor, Thomas Lee. Earth drilling tools. 4,046,207, Cl. 175-391.000.
TDK Electronics Co., Ltd.: *See—*
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Technicon Instruments Corporation: *See—*
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Teiling, Carl Torbern, to AGA Aktiebolag. Electromechanical transducer. 4,047,087, Cl. 318-661.000.
Teledyne Industries, Inc.: *See—*
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Teletype Corporation: *See—*
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Ollendick, Gary B., 4,047,085, Cl. 318-601.000.
Temple, Victor A. K., to General Electric Company. Radiation sensitive thyristor structure with isolated detector. 4,047,219, Cl. 357-38.000.
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Tepper, Edward H.: *See—*
United States of America, National Aeronautics and Space Administration; and Tepper, Edward H., 4,046,529, Cl. 55-179.000.
Teranishi, Akihiko, to Kabushiki Kaisha Teranishi Denki Seisaku-Sho. Lathering device. 4,046,289, Cl. 222-146.0HE.
Terasaki, Katsuhisa. Means for reducing fatigue from wearing footgear. 4,045,886, Cl. 36-44.000.
Terwilliger, James P.; Gingello, Anthony D.; and Wey, Jong-Shinn, to Eastman Kodak Company. Process for preparing silver halide emulsion using a sulfur-containing ripening agent. 4,046,576, Cl. 96-108.000.
Texaco Development Corporation: *See—*
Austin, Thomas H.; and Speranza, George P., 4,046,721, Cl. 260-2.5AW.
Cavitt, Stanley B., 4,046,783, Cl. 260-348.330.
Gipson, Robert Malone, 4,046,784, Cl. 260-348.290.
Texaco Exploration Canada Ltd.: *See—*
Cram, Phillip J.; and Redford, David A., 4,046,195, Cl. 166-272.000.
Texaco Inc.: *See—*
Arnold, Dan M., 4,047,028, Cl. 250-266.000.
Brown, Alfred; Hager, Stephen F.; Chichakli, Moutaz; and Wu, Ching H., 4,046,196, Cl. 166-273.000.
Dorawala, Tansukhlal G.; and Reinhard, Russell R., 4,046,869, Cl. 423-652.000.
Texas Instruments Incorporated: *See—*
Choate, William Clay; and Bhandarkar, Dileep P., 4,047,163, Cl. 340-173.00R.
Frye, Robert Charles; Fu, Horng-Sen; and Tasch, Al F., Jr., 4,047,215, Cl. 357-24.000.
Johnson, Dudley Bruce; and Hanni, Stephen Leroy, 4,046,981, Cl. 200-159.00B.
Texas Medical Products, Inc.: *See—*
Cooley, Denton A.; Reed, Charles C.; and Sharp, Russell G., 4,045,859, Cl. 29-451.000.
Textron, Inc.: *See—*
Moertel, George B., 4,045,846, Cl. 24-205.16C.
Tangler, James L., 4,046,336, Cl. 244-198.000.
Tezuka, Tohru: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,046,876, Cl. 424-177.000.
Thall, Earle Solomon, to RCA Corporation. Method for assembling a thermally-set getter spring in a CRT. 4,045,849, Cl. 29-25.130.
Thalmann, Peter: *See—*
Asel, John R.; Allaire, Roger; Thalmann, Peter; and Castonguay, Rene, 4,046,088, Cl. 112-265.000.
Asel, John R.; Allaire, Roger; Thalmann, Peter; and Castonguay, Rene, 4,046,089, Cl. 112-265.000.
Theodore, Frank William: *See—*
Gorin, Everett; Jasulaitis, William A.; Wasson, George E.; and Theodore, Frank William, 4,046,496, Cl. 425-222.000.
Theriault, Roland. Detachable handle for aiding in the manipulation of transport carts. 4,045,842, Cl. 16-114.00R.
Therm-O-Disc, Inc.: *See—*
Holden, Ronald L., 4,047,141, Cl. 337-89.000.
Theurer, Josef; and Brunninger, Manfred, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Track renewal method and apparatus. 4,046,077, Cl. 104-2.000.
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Thirion, Philippe Emmanuel, to International Business Machines Corporation. Statistical data detection method and apparatus. 4,047,153, Cl. 340-146.3AQ.
Thomas, Anthony Francis: *See—*
Loose, Winfield Warren; and Thomas, Anthony Francis, 4,045,843, Cl. 24-16.0PB.
Thomas, David C.: *See—*
Henle, Richard G.; Merkert, Clifton S.; and Thomas, David C., 4,046,023, Cl. 74-242.800.
Thomas, David Whitfield, to Owens-Corning Fiberglas Corporation. Oscillating mechanism and method of and means for promoting motion accuracy of the mechanism in a fiber forming operation. 4,046,538, Cl. 65-4.00A.
Thomas, William Anthony: *See—*
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,046,751, Cl. 260-112.50R.
Thompson, William A., Jr., to Roblin Industries, Inc. Shopping cart. 4,046,394, Cl. 280-33.99B.
Thomson-CSF: *See—*
Dubois, Jean-Claude, 4,046,708, Cl. 252-299.000.
Thorn Domestic Appliances (Electrical) Limited: *See—*
Sefton, Philip Charles; and Chad, Kenneth Ernest, 4,046,991, Cl. 219-497.000.
Thornburrow, Peter Robert, to BP Chemicals Limited. Novel polyester compositions. 4,046,740, Cl. 260-75.00N.
Throckmorton, Peter E.: *See—*
Langer, Heimo J.; Robinson, Kenneth R.; and Throckmorton, Peter E., 4,046,812, Cl. 260-583.00B.
Thyoux, George A., to Durobor S.A. Glass container making machine. 4,046,550, Cl. 65-229.000.
Thyssen Purofe GmbH: *See—*
Lange, Georg, 4,046,555, Cl. 75-35.000.
Ticker, Arthur: *See—*
Preiser, Herman S.; and Ticker, Arthur, 4,046,094, Cl. 114-222.000.
Time/Data Corporation: *See—*
Sloane, Edwin A.; McKeever, Bruce T.; and Wong, Eugene, 4,047,002, Cl. 235-151.300.
Timofeev, Gennady Ivanovich: *See—*
Feinzilber, Mikhail Leibovich; Kuzin, Eduard Nikolaevich; Timofeev, Gennady Ivanovich; Roitershtein, Semen Semenovich; Kozlov, Jury Stepanovich; Korelin, Vladimir Fedorovich; Dmitrievsky, Nikolai Vasilievich; Bratyshev, Igor Petrovich; Omelyan, Fedor Evstafievich; Sheinis, Efim Iosifovich; Pak, Vladimir Grigorievich; Romanov, Vladimir Ivanovich; Garbuzov, Zalman Eremeevich; and Naret, Grigory Borisovich, deceased, 4,045,893, Cl. 37-108.00A.
Tinholt, Thomas H., to Eaton Corporation. Viscous driven overrunning clutch. 4,046,239, Cl. 192-58.00B.
Tippmer, Kurt, to Carl Still Recklinghausen, Firma. Method and apparatus for the indirect cooling of hot gases, particularly, coke oven gases. 4,045,970, Cl. 62-95.000.
Tishkov, Anatoly Yakovlevich: *See—*
Kreimer, Vladimir Isakovich; Tishkov, Anatoly Yakovlevich; Grigoriev, Vitaly Markovich; Gendlina, Ljudmila Ivanovna; and Zimonin, Leonid Vasilievich, 4,046,249, Cl. 198-758.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Maeshima, Tsugio; Nishikawa, Eiichiroh; and Nakamura, Mitsuko, 4,046,888, Cl. 423-239.000.
Tobiki, Hisao: *See—*
Yamada, Hirotada; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Okamura, Kosaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, 4,046,904, Cl. 424-271.000.
Toda, Koichi; Miki, Tetsuya; and Yamaguchi, Haruo, to Anritsu Electric Co., Ltd.; and Nippon Telegraph and Telephone Public Corporation. Sample pulse generating apparatus. 4,047,115, Cl. 328-151.000.
Toft, Kaj; and Busby, Llewellyn D., to General Electric Company. Iron with thermostat mount. 4,045,894, Cl. 38-77.830.
Tokyo Keiki Company Limited: *See—*
Taira, Hideya; and Shimizu, Kuniaki, 4,047,175, Cl. 343-100.0CS.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Ishii, Takashi; Nishida, Katsutoshi; Komatsu, Michiyasu; and Tsuge, Akihiko, 4,046,580, Cl. 106-55.000.
Urui, Kiyoshi, 4,046,966, Cl. 179-18.0BC.
Tokyo Tekko Kabushiki Kaisha: *See—*
Kambara, Kyosaku, 4,046,343, Cl. 248-49.000.
Tomizawa, Kazutaka: *See—*
Kataoka, Shoei; Komaniya, Yasuo; Hashizume, Nobuo; Tomizawa, Kazutaka; and Kawashima, Mitsuo, 4,047,199, Cl. 357-3.000.
Tomkinson, Donald L.: *See—*
Mass, Robert O.; and Tomkinson, Donald L., 4,046,718, Cl. 260-2.00R.
Tomlinson, Alan Digby: *See—*
Johnston, Gordon Francis; Martin, Alexander; and Tomlinson, Alan Digby, 4,046,717, Cl. 252-546.000.
Tonomura, Shinji: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,046,876, Cl. 424-177.000.
Tornqvist, Bengt Wilhelm. Ship's hull. 4,046,092, Cl. 114-56.000.
Torossian, Kevork A.; and Kohn, Leo S., to General Electric Company. Insulating material. 4,046,938, Cl. 428-285.000.
Torres, Jose Marcelo: *See—*
Musick, Charles Ronald; and Torres, Jose Marcelo, 4,046,625, Cl 176-24.000.
Tortai, Jean-Pierre, to Produits Chimiques Ugine Kuhlmann. Vinyl chloride polymer latexes with two monodisperse modes. 4,046,730, Cl. 260-29.6RB.
Towmotor Corporation: *See—*
Blaisdell, Donald S.; and Walter, Llewellyn L., 4,046,218, Cl. 180-155.000.
Schwehr, Richard A., 4,047,145, Cl. 338-67.000.
Toyama, Masamichi; Takigawa, Tomoshi; Shimazaki, Mamoru; Okajima, Hidekazu; Ichiyanagi, Toshikazu; and Iwama, Hideto, to Canon Kabushiki Kaisha. Self-timer device for motion picture camera. 4,046,465, Cl. 352-175.000.
Toyama, Masamichi: *See—*
Shimazaki, Mamoru; Toyama, Masamichi; Ichiyanagi, Toshikazu; and Iwama, Hideto, 4,046,464, Cl. 352-141.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Kato, Yasuo; Kato, Katsuhiko; Sugino, Masahiro; Ikegami, Jun; and Harukawa, Junichi, 4,046,724, Cl. 260-9.000.
Toyo Sicki Seisakusho Ltd.: *See—*
Maeda, Fumiaki; Naruse, Seiji; and Kamiya, Ko, 4,046,001, Cl. 73-100.000.
Toyobo Co., Ltd.: *See—*
Matsuo, Tatsuki; and Kohata, Teruo, 4,046,525, Cl. 55-59.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Fukuma, Nobuo; and Matsubara, Hideyuki, 4,045,920, Cl. 51-165.880

Hashimoto, Masanao; and Suzuki, Takaaki, 4,046,033, Cl. 74-869.000.
Kuno, Akira; Shinoda, Yoshio; and Arai, Hiroshi, 4,046,998, Cl. 235-150.210.
Nagano, Tetsuro, 4,046,111, Cl. 123-32.0SP.
Ohori, Harumi; and Shibatani, Juichi, 4,046,231, Cl. 188-71.100.
Trainor, John W., to Xerox Corporation. Photoreceptor method and system. 4,046,473, Cl. 355-16.000.
Transequip Inc.: *See—*
Nordstrom, Arnold B., 4,046,186, Cl. 160-368.00R.
Traunecker, Werner: *See—*
Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; and Traunecker, Werner, 4,046,913, Cl. 424-311.000.
Travaglio, Vincent M.: *See—*
Murdoch, Robert N.; Travaglio, Vincent M.; and Magnifico, Michael L., 4,046,083, Cl. 108-107.000.
Travis, Charles W.: *See—*
Jordan, Richard J.; and Travis, Charles W., 4,046,123, Cl. 123-146.50A.
Treese, Willard E.: *See—*
Elco, Richard A.; Bauer, James A.; and Treese, Willard E., 4,046,649, Cl. 204-58.000.
Treier, George, to Xerox Corporation. Carbonless paper for use in electrostatographic copiers. 4,046,404, Cl. 282-27.500.
Tri-State Motor Transit Company: *See—*
Boyd, George F., Sr., 4,046,345, Cl. 248-154.000.
Troke, Gene R.: *See—*
Taylor, James Michael Morrison; and Troke, Gene R., 4,046,396, Cl. 280-281.00R.
Troster, Helmut: *See—*
Otten, Joachim; and Troster, Helmut, 4,046,501, Cl. 8-1.00E.
Troutman, Richard C.: *See—*
La Russa, Joseph A.; and Troutman, Richard C., 4,046,463, Cl. 351-13.000.
Troyer, William J., to Houdaille Industries, Inc. Tuned torsional viscous dampers. 4,046,230, Cl. 188-1.00B.
Trumbly, Terry A.: *See—*
Cormia, Robert L.; Trumbly, Terry A.; and Andresen, Sigurd, 4,046,659, Cl. 204-192.00C.
TRW Inc.: *See—*
Kuonen, Frederick L.; and Boughton, Edward M., 4,046,100, Cl. 118-8.000.
Tsuda, Naotsune: *See—*
Morokuma, Tadashi; and Tsuda, Naotsune, 4,045,864, Cl. 29-603.000.
Tsudakoma Kogyo Kabushiki Kaisha: *See—*
Komatsu, Tokuji, 4,046,099, Cl. 118-6.000.
Tsuge, Akihiko: *See—*
Ishii, Takashi; Nishida, Katsutoshi; Komatsu, Michiyasu; and Tsuge, Akihiko, 4,046,580, Cl. 106-55.000.
Tsujii, Yasuhiro: *See—*
Takahashi, Ryohei; Fujikawa, Kanichi; Yokomichi, Isao; Tsujii, Yasuhiro; and Sakashita, Nobuyuki, 4,046,553, Cl. 71-94.000.
Tsunekawa, Tokuichi: *See—*
Nakamura, Zenzo; Uchiyama, Takashi; Uchidoi, Masanori; Taguchi, Tetsuya; Aizawa, Hiroshi; and Tsunekawa, Tokuichi, 4,047,194, Cl. 354-149.000.
Tsunoda, Shogo; Kataoka, Katsuyuki; and Baba, Toshinori, to Ebara Infilco Kabushiki Kaisha. Process for separating suspended metal oxide and metal hydroxide solids from a mother liquor. 4,046,683, Cl. 210-20.000.
Tsunoda, Shogo; and Kataoka, Katsuyuki, to Ebara Infilco Kabushiki Kaisha. Process for the treatment of a colloidal suspension. 4,046,684, Cl. 210-20.000.
Tuchyner, Harold J.; and Benson, Robert C., to Hughes Aircraft Company. Multi-level laser illuminator. 4,047,117, Cl. 330-4.300.
Tucker, John W. Duplex basket strainer arrangement. 4,046,695, Cl. 210-340.000.
Tucsok, Steve; and Fogarassy, Elemer. Apparatus for crushing rock, stone and like material. 4,046,325, Cl. 241-73.000.
Tuma, Harold J.: *See—*
Pearson, Gerald L.; and Tuma, Harold J., 4,046,046, Cl. 83-745.000.
Tung, Chung C.: *See—*
Dickinson, Peter D.; Osborne, Thomas E.; Rode, France; Baum, Allen J.; Cochran, David S.; and Tung, Chung C., 4,047,012, Cl. 235-156.000.
Tuohino, Lawrence A.: *See—*
D'Alessandro, John A.; and Tuohino, Lawrence A., 4,045,890, Cl. 36-132.000.
Turbo-Lufttechnik GmbH: *See—*
Kolb, Werner Bernard, 4,046,486, Cl. 416-157.00R.
Turner, Sam R., to Xerox Corporation. Electrophotographic imaging members with photoconductive layer containing electron acceptor monomers or polymers. 4,046,564, Cl. 96-1.50R.
Twitchell, F. Shawn, to Construction Systems & Equipment, Inc. Shotcrete accelerator injection apparatus and method. 4,046,357, Cl. 259-147.000.
Tyree, Lewis, Jr. CO_2 Cooling of vehicles. 4,045,972, Cl. 62-156.000.
Uchidoi, Masanori: *See—*
Nakamura, Zenzo; Uchiyama, Takashi; Uchidoi, Masanori; Taguchi, Tetsuya; Aizawa, Hiroshi; and Tsunekawa, Tokuichi, 4,047,194, Cl. 354-149.000.
Uchiyama, Takashi: *See—*
Nakamura, Zenzo; Uchiyama, Takashi; Uchidoi, Masanori; Taguchi, Tetsuya; Aizawa, Hiroshi; and Tsunekawa, Tokuichi, 4,047,194, Cl. 354-149.000.
Uddeholms Aktiebolag: *See—*
Janzon, Bo Lennart, 4,046,598, Cl. 148-12.00R.
Uhl, Karl: *See—*
Hartmann, Hans-Joerg; Falk, Roland; Gawlik, Peter; Balz, Werner; Uhl, Karl; Schaefer, Dieter; and Motz, Herbert, 4,046,932, Cl. 428-64.000.
Uhlmann, Donald R.; Snitzer, Elias; Hovey, Richard J.; Chu, Nori Y. C.; and Fournier, Joseph T., Jr., to American Optical Corporation. Stabilized photochromic materials. 4,046,586, Cl. 106-194.000.
Ullman, Edwin F.; and Rubenstein, Kenneth E., to Syva Company. Diazepam enzyme conjugates. 4,046,636, Cl. 195-63.000.
Ullrich, Hansjurgen, to Dr. C. Otto & Comp. G.m.b.H. Process and apparatus for the separation of crude benzol and naphthalene from washing oil. 4,046,641, Cl. 203-39.000.
Ultracentrifuge Nederland N.V.: *See—*
Kistemaker, Jacob, 4,046,527, Cl. 55-100.000.
UMC Industries, Inc.: *See—*
Cox, Robert N.; and Grober, Melvin G., 4,046,440, Cl. 312-215.000.
Under Sea Industries, Inc.: *See—*
Flam, Fred; and Hart, Dennis L., 4,045,835, Cl. 9-313.000.
Underhill, Edward William: *See—*
Huizinga, Donald Dean; Underhill, Edward William; and Whitcomb, James Arthur, 4,046,972, Cl. 179-99.000.
Uniloc, Incorporated: *See—*
Berger, Lawrence A.; and Hunt, Robert Carroll, 4,047,099, Cl. 324-30.00R.
Union Carbide Corporation: *See—*
Anderson, John Erling, 4,046,541, Cl. 65-19.000.
Johnson, Gordon Carlton; and Metzler, Richard Bruce, 4,046,930, Cl. 427-387.000.
Pepe, Enrico J.; and Marsden, James G., 4,046,794, Cl. 260-448.20N.
Stabile, James, 4,046,511, Cl. 23-259.000.
Union Oil Company of California: *See—*
Tafoya, Vincent G., 4,046,199, Cl. 166-303.000.
Young, Dean Arthur, 4,046,674, Cl. 208-251.00H.
Unit Process Assemblies, Inc.: *See—*
Prohaska, Raymond James, 4,046,994, Cl. 235-61.11A.
United Kingdom Atomic Energy Authority: *See—*
Cairns, James Anthony; Nelson, Richard Stuart; and Barnfield, Rhydwyn William, 4,046,712, Cl. 252-447.000.
Clapham, Leslie, 4,046,631, Cl. 176-79.000.
Coast, Geoffrey; and Briody, Ronald Francis, 4,046,630, Cl. 176-39.000.
Durston, John Graham; and Hind, John Richard, 4,046,629, Cl. 176-38.000.
Ellis, John Frederick, 4,046,694, Cl. 210-297.000.
United States Borax & Chemical Corporation: *See—*
Woods, William G.; and Hunter, Don L., 4,046,758, Cl. 260-239.00E.
United States of America
Agriculture: *See—*
Ward, Truman L.; Benerito, Ruth R.; and Hebert, Jacques J., 4,046,953, Cl. 428-426.000.
Army: *See—*
Czerwinski, Watson Peter, 4,047,178, Cl. 343-750.000.
Lane, Richard A.; and Fronek, Donald K., 4,047,114, Cl. 328-140.000.
McDanolds, Richard T.; and Jordan, Rodney W., 4,046,055, Cl. 86-1.00B.
Price, Jerome J.; Karsten, Carl G.; and Paggen, William D., 4,046,976, Cl. 200-61.930.
Wohlers, Robert J., 4,047,174, Cl. 343-18.00B.
Energy Research and Development Administration: *See—*
Au, Frederick H. F.; and Beckert, Werner F., 4,046,593, Cl. 134-21.000.
McClanahan, Edwin D.; and Moss, Ronald W., 4,046,666, Cl. 204-298.000.
Pollono, Louis P.; and Mello, Raymond M., 4,046,169, Cl. 138-106.000.
Rodgers, Billy R.; and Edwards, Michael S., 4,046,690, Cl. 210-75.000.
Rosa, Richard J., 4,047,094, Cl. 322-7.000.
Interior: *See—*
Harris, Robert D., 4,046,431, Cl. 308-76.000.
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Miller, Charles G.; and Pohl, Jens G. Three-dimensional tracking solar energy concentrator and method for making same. 4,046,462, Cl. 350-295.000.
Tepper, Edward H. Regenerable device for scrubbing breathable air of CO_2 and moisture without special heat exchanger equipment. 4,046,529, Cl. 55-179.000.
Walter, Hans U.; and Snyder, Robert S. Method of crystallization. 4,046,617, Cl. 156-601.000.
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Freche, John C.; and Waters, William J., 4,046,560, Cl. 75-170.000.
Marcus, Bruce D.; and Fleischman, George L., 4,046,190, Cl. 165-105.000.
Moreman, Otis S., III, 4,046,434, Cl. 308-195.000.
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Rice, Stephen H.; Spencer, Rodney S.; and Fleetwood, Charles M., Jr., 4,046,619, Cl. 156-645.000.
Studenick, David K., 4,046,012, Cl. 73-421.50R.

Vykukal, Hubert C.; King, Reginald F.; and Vallotton, Wilbur C., 4,046,262, Cl. 214-1.0CM.
Navy: *See—*
Anderson, Gary L., 4,047,126, Cl. 331-96.000.
Campbell, Kenneth J., 4,047,121, Cl. 331-76.000.
Hagemann, Julius, 4,047,148, Cl. 340-12.00R.
Hampton, Thomas W., 4,046,076, Cl. 102-70.20A.
Hoople, Gary R., 4,047,181, Cl. 343-789.000.
Lord, Harold Wilbur; and Rogers, Jimmy Dale, 4,047,120, Cl. 330-207.00P.
Wilson, Charles A.; and Moran, Patrick J., 4,046,993, Cl. 235-61.50D.
U.S. Philips Corporation: *See—*
Abrahams, Jacobus Hubertus; Collette, Joannes Jacobus Maria; and Walters, Robertus Aloysius Tarcisius Johannes, 4,045,978, Cl. 60-521.000.
Auphan, Michel Joseph, 4,047,034, Cl. 250-354.000.
Bijker, Arnold Jan; and Riemens, Karel, 4,047,108, Cl. 325-38.00B.
Boudry, Michael Robert, 4,047,159, Cl. 364-900.000.
Digoy, Jean-Louis, 4,046,609, Cl. 148-189.000
Ludikhuize, Adrianus Willem, 4,047,131, Cl. 333-81.00R.
Smulders, Hendricus Franciscus Gerardus; and Franken, Adrianus Jacobus Jozef, 4,046,458, Cl. 350-178.000.
United States Steel Corporation: *See—*
Pringle, William L., 4,045,829, Cl. 5-18.00R.
Rose, Byron W., 4,046,356, Cl. 256-10.000.
Stanley, Edward B., 4,046,602, Cl. 148-111.000.
West, Theodore V., 4,046,038, Cl. 82-47.000.
United Technologies Corporation: *See—*
Armstrong, Lee R.; and Mercik, Henry J., Jr., 4,046,003, Cl. 73-118.000.
Best, Stanley Gordon, 4,046,008, Cl. 73-349.000.
Buono, Dennis F.; Carlson, Nils G.; Hibner, David H.; and Moringiello, Donald C., 4,046,430, Cl. 308-26.000.
DiSabato, Vincent J., 4,045,957, Cl. 60-262.000.
Fanciullo, Salvatore, 4,046,956, Cl. 429-20.000.
Markowski, Stanley J.; and Nolan, James J., 4,045,956, Cl. 60-39.650.
Universal Oil Products Company: *See—*
Wilhelm, Frederick C., 4,046,715, Cl. 252-466.00B.
University of Utah: *See—*
Keutel, Hans J., 4,046,633, Cl. 195-103.50R.
University of Virginia, The: *See—*
Gainer, John L., 4,046,880, Cl. 424-180.000.
Untch, Karl G.: *See—*
Kluge, Arthur F.; Untch, Karl G.; and Fried, John H., 4,046,801, Cl. 560-121.000.
UOP Inc.: *See—*
Antos, George J., 4,046,711, Cl. 252-441.000.
Asselin, George F., 4,046,675, Cl. 208-321.000.
Asselin, George F., 4,046,676, Cl. 208-321.000.
Burton, Vance P.; and Mikulicz, Michael Z., 4,046,516, Cl. 23-288.00E.
Carson, Don B., 4,046,639, Cl. 203-11.000.
Carson, Don B., 4,046,640, Cl. 203-11.000.
Fickel, R. Gene, 4,046,638, Cl. 203-1.000.
Mitsche, Roy T.; Kuntz, Hillard L.; and Hayes, John C., 4,046,713, Cl. 252-455.00Z.
O'Hara, Mark J., 4,046,714, Cl. 252-455.00R.
Pollitzer, Ernest L.; and Hayes, John C., 4,046,672, Cl. 208-139.000.
Pollitzer, Ernest L.; and Hayes, John C., 4,046,828, Cl. 260-673.500.
Riedl, Frederick J.; and Schimmelpfennig, George A., 4,046,015, Cl. 73-421.50R.
Schmerling, Louis, 4,046,819, Cl. 260-648.00R.
Upjohn Company, The: *See—*
Hessler, Edward J., 4,046,800, Cl. 260-465.00E.
Johnson, Herbert G., 4,046,910, Cl. 424-278.000.
Sekhar, Neel C., 4,046,915, Cl. 424-317.000.
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Selman, Charles M.; and Uraneck, Carl A., 4,046,745, Cl. 260-77.5CR.
Urmann, Ernst: *See—*
Schepers, Bernhard; Bayer, Gerhard; Urmann, Ernst; and Schanz, Klaus, 4,046,855, Cl. 423-130.000.
Urui, Kiyoshi, to Tokyo Shibaura Electric Co., Ltd. Conference trunk circuit for an exchange. 4,046,966, Cl. 179-18.0BC.
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Takechi, Hiroshi; Abe, Mitsunobu; Usuda, Matsuo; and Komiya, Kunihiko, 4,046,597, Cl. 148-12.00R.
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Kishino, Takao; Morimoto, Kiyoshi; and Utamura, Yukihiko, 4,047,072, Cl. 313-496.000.
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Ward, Truman L.; Benerito, Ruth R.; and Hebert, Jacques J., to United States of America, Agriculture. Glassy materials from plumbites and cellulosics. 4,046,953, Cl. 428-426.000.
Ware, R. Louis. Versatile horticultural growth apparatus. 4,045,911, Cl. 47-39.000.
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Witriol, Norman M.; and Frederick, Carlton L. Encoding altimeter 4,047,001, Cl. 235-151.300.
Witte, Johan Frederik, to Stork Amsterdam B.V. Process for treating oil containing vegetable raw materials. 4,045,879, Cl. 34-31.000.
Witte, Josef: *See—*
Lehnert, Gunther; Maertens, Dieter; Pampus, Gottfried; and Witte, Josef, 4,046,710, Cl. 252-429.00B.
Wittman, Robert H.; and Howell, William G., to Exxon Research and Engineering Company. Process for explosively joining two pipe sections. 4,046,301, Cl. 228-108.000.
Wohlers, Robert J., to United States of America, Army. Method of reducing the radar cross-section of a dielectric body. 4,047,174, Cl. 343-18.00B.
Wolf, Gerhard, to Siemens Aktiengesellschaft. Storage arrangement having a device to determine free storage locations. 4,047,160, Cl. 364-900.000.
Wolf, Jurgen: *See—*
Bigalke, Erhard; Wolf, Jurgen; and Schmelzer, Gunther, 4,046,129, Cl. 123-32.0EA.
Wolpers, Jurgen: *See—*
Baxmann, Fritz; Frese, Albert; Roben, Hermann; and Wolpers, Jurgen, 4,046,945, Cl. 428-282.000.
Wong, Eugene: *See—*
Sloane, Edwin A.; McKeever, Bruce T.; and Wong, Eugene, 4,047,002, Cl. 235-151.300.
Wong, Herbert Vernon, to Becton, Dickinson Electronics Company. Transducer. 4,047,144, Cl. 338-2.000.
Wong, Michael: *See—*
Balgemann, Dennis Erwin; and Wong, Michael, 4,046,108, Cl. 119-18.000.
Wood, Kenneth E.; and O'Farrell, James T., to Westinghouse Electric

Corporation. Dual beam sonar display system. 4,047,147, Cl. 340-3.00R.
Wood, Michael J., to J. P. Burroughs & Son, Inc. Continuous flow expander for expanding particulate material. 4,046,066, Cl. 99-323.700.
Wood, Thomas K.; and Margreither, Alan R., to Potters Industries, Inc. Apparatus for producing spherical particles. 4,046,548, Cl. 65-142.000.
Woods, Robert L.: *See—*
Fairchild, Jack E.; Maurer, Bruce E.; and Woods, Robert L., 4,046,489, Cl. 416-223.00R.
Woods, William E.: *See—*
Stanley, Philip E.; Woods, William E.; and Izbicki, Kenneth J., 4,047,247, Cl. 364-200.000.
Woods, William G.; and Hunter, Don L., to United States Borax & Chemical Corporation. 3-Halo-2,6-dinitro-4-trifluoromethylanilines. 4,046,758, Cl. 260-239.00E.
Woodstream Corporation: *See—*
Souza, Anthony J., 4,045,905, Cl. 43-88.000.
Woolworth, Richard G., 4,045,889, Cl. 36-122.000.
Woodward, John Maury: *See—*
Branham, Charles Escom; Steury, Thomas Dean; and Woodward, John Maury, 4,046,471, Cl. 355-14.000.
Woodward, Thomas D.; and Worsley, Gail G., to Rexnord Inc. Retainer for slip sleeve liners. 4,045,980, Cl. 64-23.000.
Woolworth, Richard G., to Woodstream Corporation. Snowshoe. 4,045,889, Cl. 36-122.000.
Work, Gerald L., to American Sign and Indicator Corporation. Display sign. 4,045,895, Cl. 40-28.00C.
Wormmeester, Gerhardus J.; and Rijsenbrij, Joannes C., to Europe Container Terminus B.V. Loading and unloading bridge for containers. 4,046,265, Cl. 214-14.000.
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Worthington Compressors, Inc.: *See—*
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Wright, John T., to Champion International Corporation. Fire resistant, sound attenuating, drop seal door. 4,045,913, Cl. 49-307.000.
Wright, Lawrence T.: *See—*
Ashare, Edward; Rulison, Richard N.; Wright, Lawrence T.; and Coplan, Myron J., 4,045,851, Cl. 29-157.00R.
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Wu, Chin Ching: *See—*
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Wu, Ching H.: *See—*
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Wu, Mu Tsu: *See—*
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Wu, Shu-Yau: *See—*
Francombe, Maurice H.; and Wu, Shu-Yau, 4,047,214, Cl. 357-23.000.
Wu, Yao Hua; and Lobeck, Walter G., Jr., to Mead Johnson & Company. Smooth muscle relaxant process employing 10-imidoylphenoxazines. 4,046,891, Cl. 424-248.400.
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Xonics, Inc.: *See—*
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Yagi, Kouichi; Yamanaka, Makoto; and Fujino, Takashi, to Kao Soap Co., Ltd. Stable bleaching detergent composition. 4,046,705, Cl. 252-99.000.
Yagishita, Tohmi; and Hagiya, Hiroshi, to Oki Electric Industry Co., Ltd. Receiving system for facsimile and the like. 4,047,228, Cl. 358-261.000.
Yake, William H., to Design & Manufacturing Corporation. Dishwasher rack. 4,046,261, Cl. 211-41.000.
Yakuboff, Paul D., to Owens-Corning Fiberglas Corporation. Impregnating die. 4,046,103, Cl. 118-125.000.
Yamada, Hirotada; Tobiki, Hisao; Tanno, Norihiko; Shimago, Kozo; Okamura, Kosaku; Nakagome, Takenari; Komatsu, Toshiaki; Izawa, Akio; Noguchi, Hiroshi; Irie, Kenji; and Eda, Yasuko, to Sumitomo Chemical Company, Limited. Novel penicillin, and its preparation and use. 4,046,904, Cl. 424-271.000.
Yamada, Misao, to Copal Company Limited. Diaphragm blade for cameras and method of making the same. 4,047,212, Cl. 354-270.000.
Yamada, Tetsuo: *See—*
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,046,600, Cl. 148-12.400.
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Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,046,600, Cl. 148-12.400.
Yamagishi, Hidehisa; and Tanaka, Mizuo, to Nippon Kokan Kabushiki Kaisha. Method for continuously quenching electrolytic tin-plated steel strip while preventing quench stains. 4,046,604, Cl. 148-156.000.
Yamaguchi, Haruo: *See—*
Toda, Koichi; Miki, Tetsuya; and Yamaguchi, Haruo. 4,047,115, Cl. 328-151.000.
Yamaguchi, Nobuo: *See—*
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Yamaguti, Namio, to Matsushita Electric Industrial Co., Ltd. Ghost removing system for use in television receiver. 4,047,224, Cl. 358-166.000.
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, to Kobe Steel Ltd. Method of producing large diameter steel rods. 4,046,600, Cl. 148-12.400.
Yamamoto, Shunji, to Minolta Camera Kabushiki Kaisha. Printing paper cutting device for an electrical copier. 4,046,470, Cl. 355-13.000.
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Yasuda, Hiroshi; and Kanaya, Fumio, to Nippon Telegraph and Telephone Public Corporation. Interframe coding apparatus. 4,047,221, Cl. 358-136.000.
Yearsley, Norman, to Wickman Machine Tool Sales Limited. Bar feed mechanism for lathes. 4,046,036, Cl. 82-2.700.
Yen, Shiao-Ping S.: *See—*
Rembaum, Alan; Yen, Shiao-Ping S.; and Dreyer, William J., 4,046,720, Cl. 260-2.50B.
Yih, Roy Y.: *See—*
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,046,798, Cl. 260-465.00D.
Yokomichi, Isao: *See—*
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Yokota, Yukio: *See—*
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Yorks, Robert G.; and Junker, David W., to Essex Group, Inc. Short circuit protection circuit. 4,047,233, Cl. 361-88.000.
Yoshida, Akihiko; and Nishino, Atsushi, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing solid electrolytic capacitor. 4,046,645, Cl. 204-37.00R.
Yoshida, Hiroshi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Strut type independent suspension system for automobiles. 4,046,403, Cl. 280-701.000.
Yoshida, Katsuhiko: *See—*
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Yoshida, Tadao: *See—*
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Young, Dean Arthur, to Union Oil Company of California. Process for removing arsenic from hydrocarbons. 4,046,674, Cl. 208-251.00H.
Young, Patricia A.: *See—*
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Yu, Chia-Nien, to Morton-Norwich Products, Inc. Bis-[5-(4-chlorophenyl)furfuryl]dialkylammonium bromides. 4,046,781, Cl. 260-347.700.
Yuki, Nakaji, to Director-General of the Agency of Industrial Science and Technology. Method of manufacturing carbonaceous granular molecular sieve. 4,046,709, Cl. 252-421.000.
Yurtin, John A., to General Motors Corporation. Electrical terminal with retracted latch and electrical connector having same. 4,046,450, Cl. 339-217.00S.
Zahid, Abduz, to Greer Hydraulics, Inc. Method of forming a pressure accumulator. 4,045,861, Cl. 29-454.000.
Zahn, Wolfgang; Zangenfeind, Helmut; and Domges, Gunther, to AGFA-Gevaert, Aktiengesellschaft. Splicing apparatus for photographic films or the like. 4,046,614, Cl. 156-353.000.
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Zajic, James Edward; and Kosaric, Naim. Flotation of scheelite from calcite with a microbial based collector. 4,046,678, Cl. 209-166.000.
Zand, Frances Lee. Teaching device for the correction of reading, spelling and writing learning disabilities. 4,045,884, Cl. 35-35.00R.
Zangenfeind, Helmut: *See—*
Zahn, Wolfgang; Zangenfeind, Helmut; and Domges, Gunther, 4,046,614, Cl. 156-353.000.
Zarecky, Frederick D.: *See—*
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Zdansevicius, Roland: *See—*
Ott, Anton; Ehrlinger, Friedrich; Knodler, Dietrich; and Zdansevicius, Roland, 4,046,031, Cl. 74-764.000.
Zenith Radio Corporation: *See—*
Hofmann, Judson A., 4,047,223, Cl. 358-158.000.
Meehan, David H., 4,047,078, Cl. 315-411.000.
Pittenger, Daniel I., 4,047,225, Cl. 358-190.000.
Zeuner, Kenneth W.; and Jarman, Alonzo B., to Control Concepts, Inc. Electrohydraulic system for towed vehicle. 4,046,399, Cl. 280-420.000.
Zimmerli, Willi, to Ciba-Geigy Corporation. Process for the manufacture of aminoplast and phenoplast moulding compositions using a thin layer evaporator or a roller drier. 4,046,734, Cl. 260-38.000.
Zimmermann, Wolfgang: *See—*
van Iseghem, Paul; Vlasak, Thomas; and Zimmermann, Wolfgang, 4,046,608, Cl. 148-188.000.
Zimonin, Leonid Vasilievich: *See—*
Kreimer, Vladimir Isakovich; Tishkov, Anatoly Yakovlevich; Grigoriev, Vitaly Markovich; Gendlina, Ljudmila Ivanovna; and Zimonin, Leonid Vasilievich, 4,046,249, Cl. 198-758.000.
Zine, Anthony R., Jr., to Corning Glass Works. Access device for centrifugal separation assemblies. 4,046,699, Cl. 210-516.000.
Zinnes, Harold; and Linda, Neil A., to Warner-Lambert Company. Processes for the preparation of 4-hydroxy-2H-1-benzothiopyran-3-carboxamide 1,1-dioxides. 4,046,778, Cl. 260-326.340.
Zlochower, Isaac A., to PPG Industries, Inc. Acid resistant glass fibers. 4,046,948, Cl. 428-392.000.
Zory, Peter Stephen, Jr.: *See—*
Comerford, Liam David; and Zory, Peter Stephen, Jr., 4,047,124, Cl. 331-94.50H.
Zweifel, Hans Heini; Buehler, Arthur; and Fasciati, Alfred, to Ciba-Geigy AG. Commercial packages containing dyestuffs. 4,046,507, Cl. 8-79.000.
308489 Ontario Limited: *See—*
Fleet, Bernard; and Das Gupta, Sankar, 4,046,663, Cl. 204-280.000.
Fleet, Bernard; and Das Gupta, Sankar, 4,046,664, Cl. 204-280.000.
4K - International A/S: *See—*
Boysen, Mogens Bredal, 4,047,047, Cl. 307-106.000.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 6TH DAY OF SEPTEMBER, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Atlantic Richfield Company: *See—*
Breault, Homer; and Witt, Alvin E., T962,005, Cl. 156-71.000.

Breault, Homer; and Witt, Alvin E., to Atlantic Richfield Company. Simply installed floor tile. T962,005, 9-6-77, Cl. 156-71.000.

Caunt, Anthony David; Newton, Alan Branford; Williams, Ian Gabriel; and Fortuin, Michael Stanley, to Imperial Chemical Industries Limited. Treatment of transition metal compound. T962,007, 9-6-77, Cl. 252-429.00B.

Chandra, Bala Perampalam; Greaves, Jeffrey Chester; and Lovelock, Victor Gordon, to Imperial Chemical Industries Limited. Method of treating polymer latices. T962,008, 9-6-77, Cl. 528-500.000.

Clark, Raymond D.: *See—*
Pacifici, James G.; Clark, Raymond D.; and Newland, Gordon C., T962,006, Cl. 204-159.230.

Dostes, Claude G.; Dubromel, Dany C.; and Le Guen, Jean-Francois. Method of preparing silver halide grains of improved photographic and handling characteristics. T962,004, 9-6-77, Cl. 96-110.000.

Dubromel, Dany C.: *See—*
Dostes, Claude G.; Dubromel, Dany C.; and Le Guen, Jean-Francois, T962,004, Cl. 96-110.000.

Fortuin, Michael Stanley: *See—*
Caunt, Anthony David; Newton, Alan Branford; Williams, Ian Gabriel; and Fortuin, Michael Stanley, T962,007, Cl. 252-429.00B.

Fugitt, Robert Benson. Reduction of 2-acyl-1-naphthols to 2-alkyl-1-naphthols. T962,009, 9-6-77, Cl. 260-624.00C.

Greaves, Jeffrey Chester: *See—*
Chandra, Bala Perampalam; Greaves, Jeffrey Chester; and Lovelock, Victor Gordon, T962,008, Cl. 528-500.000.

Harrison, Cecil P., to Tennessee Valley Authority. Concentrated phosphate rock-water suspension fertilizer. T962,003, 9-6-77, Cl. 71-33.000.

Imperial Chemical Industries Limited: *See—*
Caunt, Anthony David; Newton, Alan Branford; Williams, Ian Gabriel; and Fortuin, Michael Stanley, T962,007, Cl. 252-429.00B.
Chandra, Bala Perampalam; Greaves, Jeffrey Chester; and Lovelock, Victor Gordon, T962,008, Cl. 528-500.000.

Inkpen, Terence: *See—*
Newbury, Frank T.; and Inkpen, Terence, T962,010, Cl. 261-41.00D.

Le Guen, Jean-Francois: *See—*
Dostes, Claude G.; Dubromel, Dany C.; and Le Guen, Jean-Francois, T962,004, Cl. 96-110.000.

Lovelock, Victor Gordon: *See—*
Chandra, Bala Perampalam; Greaves, Jeffrey Chester; and Lovelock, Victor Gordon, T962,008, Cl. 528-500.000.

McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., to Tennessee Valley Authority. Preparation of dicalcium phosphate from phosphate rock by the use of sulfur dioxide, water, and carbonyl compounds. T962,001, 9-6-77, Cl. 423-307.000.

Moore, Francis Paul. Elastic warp knit fabric. T962,002, 9-6-77, Cl. 66-195.000.

Muehlner, Roland O., to Shell Oil Company. Coextruded laminate. T962,011, 9-6-77, Cl. 428-517.000.

Newbury, Frank T.; and Inkpen, Terence. Variable venturi carburetor idle speed fuel control. T962,010, 9-6-77, Cl. 261-41.00D.

Newland, Gordon C.: *See—*
Pacifici, James G.; Clark, Raymond D.; and Newland, Gordon C., T962,006, Cl. 204-159.230.

Newton, Alan Branford: *See—*
Caunt, Anthony David; Newton, Alan Branford; Williams, Ian Gabriel; and Fortuin, Michael Stanley, T962,007, Cl. 252-429.00B.

Pacifici, James G.; Clark, Raymond D.; and Newland, Gordon C. Photopolymerizable polymeric compositions containing aromatic diacrylates. T962,006, 9-6-77, Cl. 204-159.230.

Phillips, John F., Jr.: *See—*
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., T962,001, Cl. 423-307.000.

Shell Oil Company: *See—*
Muehlner, Roland O., T962,011, Cl. 428-517.000.

Tate, Leslie R.: *See—*
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., T962,001, Cl. 423-307.000.

Tennessee Valley Authority: *See—*
Harrison, Cecil P., T962,003, Cl. 71-33.000.
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., T962,001, Cl. 423-307.000.

Williams, Ian Gabriel: *See—*
Caunt, Anthony David; Newton, Alan Branford; Williams, Ian Gabriel; and Fortuin, Michael Stanley, T962,007, Cl. 252-429.00B.

Witt, Alvin E.: *See—*
Breault, Homer; and Witt, Alvin E., T962,005, Cl. 156-71.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF SEPTEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Akzona Incorporated: *See—*
Fontijn, Wilhelmus J., Re. 29,382, Cl. 57-140.00R.

Atkinson, Alan W., to Turner & Newall Limited. Glass compositions and fibers made therefrom. Re. 29,388, Cl. 106-50.000.

Evers, Hendrikus Willemina, to U.S. Philips Corporation. Electric discharge tube, comprising a highly loaded anode. Re. 29,390, Cl. 313-293.000.

Fontijn, Wilhelmus J., to Akzona Incorporated. Multifilament yarns for reinforcing articles. Re. 29,382, Cl. 57-140.00R.

Gallatin, Robert A.; and Langill, Addison W., Jr., to Process Systems, Inc. Digital fluid flow rate measurement or control system. Re. 29,383, Cl. 137-14.000.

Hudson, Doyle R., to Olinkraft, Inc. Expanding fill spout for bag filling machine. Re. 29,384, Cl. 141-10.000.

Joslyn Mfg. and Supply Co.: *See—*
Kawiecki, Chester J., Re. 29,391, Cl. 337-28.000.

Kawiecki, Chester J., to Joslyn Mfg. and Supply Co. Surge protector assembly. Re. 29,391, Cl. 337-28.000.

Langill, Addison W., Jr.: *See—*
Gallatin, Robert A.; and Langill, Addison W., Jr., Re. 29,383, Cl. 137-14.000.

Lund, Robert S., to Pettibone Corporation. Apparatus for the continuous mixing of granular materials. Re. 29,387, Cl. 259-6.000.

Merkl, George G. Method of preparing aluminum organoiodides. Re. 29,389, Cl. 260-448.00A.

Miksits, Alfred L.: *See—*
Miksitz, Frank J., Re. 29,386, Cl. 222-404.000.

Miksitz, Frank J., to Universal Feeders, Inc. Gravity discharge apparatus. Re. 29,385, Cl. 222-1.000.

Miksitz, Frank J., to Miksits, Alfred L. Gravity discharge apparatus. Re. 29,386, Cl. 222-404.000.

Olinkraft, Inc.: *See—*
Hudson, Doyle R., Re. 29,384, Cl. 141-10.000.

Pettibone Corporation: *See—*
Lund, Robert S., Re. 29,387, Cl. 259-6.000.

Process Systems, Inc.: *See—*
Gallatin, Robert A.; and Langill, Addison W., Jr., Re. 29,383, Cl. 137-14.000.

Turner & Newall Limited: *See—*
Atkinson, Alan W., Re. 29,388, Cl. 106-50.000.

U.S. Philips Corporation: *See—*
Evers, Hendrikus Willemina, Re. 29,390, Cl. 313-293.000.

Universal Feeders, Inc.: *See—*
Miksitz, Frank J., Re. 29,385, Cl. 222-1.000.

LIST OF PLANT PATENTEES

Denver Wholesale Florists Company: *See—*
Euser, Anthony, 4,100, Cl. 70.000.
Krapes, David A., 4,098, Cl. 73.000.
Quinn, Vincent P., 4,099, Cl. 70.000.

Euser, Anthony, to Denver Wholesale Florists Company. Carnation plant named Apache. 4,100, 9-6-77, Cl. 70.000.

Gruis, Jake T.; Riordan, Terrance P.; and Long, John A., to O.M. Scott & Sons Company, The. St. Augustine grass. 4,097, 9-6-77, Cl. 88.000.

Krapes, David A., to Denver Wholesale Florists Company. Carnation plant named Matador. 4,098, 9-6-77, Cl. 73.000.

Long, John A.: *See—*
Gruis, Jake T.; Riordan, Terrance P.; and Long, John A., 4,097, Cl. 88.000.

O.M. Scott & Sons Company, The: *See—*
Gruis, Jake T.; Riordan, Terrance P.; and Long, John A., 4,097, Cl. 88.000.

Quinn, Vincent P., to Denver Wholesale Florists Company. Carnation plant named Georgia Ann. 4,099, 9-6-77, Cl. 70.000.

Riordan, Terrance P.: *See—*
Gruis, Jake T.; Riordan, Terrance P.; and Long, John A., 4,097, Cl. 88.000.

LIST OF DESIGN PATENTEES

Accessories by Sherwood: *See—*
Schemenauer, Dave E., 245,724, Cl. D48-4.00B.

Albert, Ramon Rivera. Sea monster chair. 245,651, 9-6-77, Cl. D6-68.000.

Bartlett, Shirley Ann. Clock. 245,673, 9-6-77, Cl. D10-7.000.

Becker, Julius C., to Becker Manufacturing Company, Incorporated. Animal feeder. 245,714, 9-6-77, Cl. D30-13.000.

Becker Manufacturing Company, Incorporated: *See—*
Becker, Julius C., 245,714, Cl. D30-13.000.

Bogner, Richard D. Transmitting antenna. 245,693, 9-6-77, Cl. D14-86.000.

Bogner, Richard D. Transmitting antenna. 245,694, 9-6-77, Cl. D14-86.000.

Bowman, George E.: *See—*
Skyer, Robert A.; and Bowman, George E., 245,697, Cl. D15-30.000.
Skyer, Robert A.; and Bowman, George E., 245,698, Cl. D15-30.000.

Brett-Hauer Co., Inc.: *See—*
Bretthauer, Frank N., 245,668, Cl. D8-71.000.

Bretthauer, Frank N., to Brett-Hauer Co., Inc. Adjustable jig for portable power saws, routers and the like. 245,668, 9-6-77, Cl. D8-71.000.

Bridgestone Tire Company Limited: *See—*
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Carpenter, Andrew John, to Darpex Manufacturing Company Limited. Note pad holder for a telephone or the like. 245,702, 9-6-77, Cl. D19-86.000.

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32 4,046,110

CLASS 123
32 EA 4,046,113
4,046,129
32 JV 4,046,112
32 SP 4,046,111
41.76 4,046,114
46 R 4,046,115
48 R 4,046,116
103 C 4,046,117
119 A 4,046,119
119 EC 4,046,118
120 4,046,120
139 AW 4,046,121
4,046,122
146.5 A 4,046,123
148 A 4,046,127
148 DS 4,046,126
148 E 4,046,124
4,046,125
195 C 4,046,128

CLASS 124
28 4,046,130
71 4,046,131

CLASS 126
9 R 4,046,132
270 4,046,133
4,046,134
271 4,046,135
4,046,136

CLASS 127
46 B 4,046,590

CLASS 128
1 D 4,046,137
2 F 4,046,138
2 H 4,046,139
2 R 4,046,140
2.1 R 4,046,141
55 4,046,142

133 4,046,143
214.4 4,046,144
215 4,046,145
266 4,046,146
290 R 4,046,147
303.1 4,046,148
328 4,046,149
4,046,150
404 4,046,151

CLASS 131

170 R 4,046,152
187 4,046,153

CLASS 134

1 4,046,591
4,046,592
21 4,046,593
65 4,046,154
167 R 4,046,155

CLASS 136

89 SJ 4,046,594

CLASS 137

14 Re.29,383
68 A 4,046,156
74 4,046,157
88 4,046,158
112 4,046,159
115 4,046,160
247.17 4,046,161
489 4,046,162
512.3 4,046,163
514.7 4,046,164
624.27 4,046,165
625.48 4,046,166

CLASS 138

31 4,046,167
89 4,046,168
106 4,046,169

CLASS 139

20 4,046,170
29 4,046,171
33 4,046,172
48 4,046,173
437 4,046,174

CLASS 140

92.1 4,046,175
4,046,176
147 4,046,177

CLASS 141

1 4,046,178
10 Re.29,384

CLASS 144

34 E 4,046,179
117 B 4,046,180

CLASS 148

1.5 4,046,595
2 4,046,596
12 B 4,046,599
12 R 4,046,597
4,046,598
12.4 4,046,600
15 4,046,601
111 4,046,602
144 4,046,603
156 4,046,604
175 4,046,605
187 4,046,606
4,046,607
188 4,046,608
189 4,046,609

CLASS 151

41.73 4,046,181

CLASS 152

158 4,046,182
362 R 4,046,183
407 4,046,184

CLASS 156

73.1 4,046,610
79 4,046,611
205 4,046,612
249 4,046,613
353 4,046,614
544 4,046,615
559 4,046,616
601 4,046,617
603 4,046,618
645 4,046,619
666 4,046,620

CLASS 160

368 G 4,046,185
368 R 4,046,186

CLASS 162

40 4,046,621
132 4,046,622
306 4,046,623

CLASS 164

53 4,046,187
282 4,046,188

CLASS 165

39 4,046,189
105 4,046,190
4,046,193

CLASS 166

.5 4,046,191
.6 4,046,192
248 4,046,194
272 4,046,195
273 4,046,196
278 4,046,198
303 4,046,199
305 R 4,046,197

CLASS 172

14 4,046,200
59 4,046,201
72 4,046,202
456 4,046,203

CLASS 174

76 4,046,204
292 4,046,205
364 4,046,206
391 4,046,207

CLASS 176

22 4,046,624
24 4,046,625
38 4,046,626
4,046,627
4,046,628
4,046,629
39 4,046,630
79 4,046,631
87 4,046,632

CLASS 177

19 4,046,208

CLASS 178

68 4,046,959

CLASS 179

1 D 4,046,960
1 P 4,046,961
6.3 R 4,046,962
15 A 4,046,963
15 BF 4,046,964
18 BC 4,046,966
18 DA 4,046,965
18 FA 4,046,967
4,046,968
4,046,969
84 L 4,046,970
90 K 4,046,971
99 4,046,972
100.11 4,046,973
111 R 4,046,974

CLASS 180

9.52 4,046,209
24.1 4,046,210
41 4,046,211
44 R 4,046,212
105 E 4,046,213
109 4,046,214
116 4,046,215
126 4,046,217
127 4,046,216
155 4,046,218

CLASS 181

105 4,046,220
211 4,046,219

CLASS 182

155 4,046,221

CLASS 184

6.11 4,046,222
4,046,223
15 R 4,046,224
4,046,225

CLASS 187

12 4,046,226
29 R 4,046,227
4,046,228
4,046,229

CLASS 188

1 B 4,046,230
71.1 4,046,231
73.1 4,046,232
73.3 4,046,233
4,046,234
134 4,046,235

CLASS 192

8 R 4,046,236
13 R 4,046,237
45 4,046,238
58 B 4,046,239
104 C 4,046,240
150 4,046,241

CLASS 194

4 R 4,046,242
10 4,046,243

CLASS 195

63 4,046,636
103.5 R 4,046,633
4,046,634
103.7 4,046,635

CLASS 197

1 R 4,046,244
60 4,046,245
160 4,046,246
168 4,046,247

CLASS 198

583 4,046,248
758 4,046,249

CLASS 200

5 A 4,046,975
61.93 4,046,976
84 C 4,046,977
148 A 4,046,978
4,046,979
153 LA 4,046,980
159 B 4,046,981
159 R 4,046,982

CLASS 202

174 4,046,637

CLASS 203

1 4,046,638
11 4,046,639
4,046,640
39 4,046,641

CLASS 204

2.1 4,046,642
10 4,046,643
37 R 4,046,644
4,046,645
38 B 4,046,646
43 T 4,046,647
55 R 4,046,648
58 4,046,649
67 4,046,650
73 R 4,046,651
78 4,046,652
95 4,046,653
99 4,046,654
149 4,046,655
158 HA 4,046,656
180 R 4,046,657
181 4,046,658
192 C 4,046,659
4,046,660
195 S 4,046,661
275 4,046,662
280 4,046,663
4,046,664
282 4,046,665
298 4,046,666
299 R 4,046,667

CLASS 206

1.7 4,046,250
45.14 4,046,251
95 4,046,252
278 4,046,253
370 4,046,254
387 4,046,255
497 4,046,256
544 4,046,257
611 4,046,313

CLASS 208

11 LE 4,046,668
4,046,669
48 AA 4,046,670
138 4,046,671
139 4,046,672
140 4,046,673
251 H 4,046,674
321 4,046,675
4,046,676

CLASS 209

111.5 4,046,258
111.7 R 4,046,259
166 4,046,677
4,046,678
212 4,046,679
214 4,046,680
224 4,046,681
250 4,046,682

CLASS 210

20 4,046,683
4,046,684
23 H 4,046,685
4,046,686
32 4,046,687
37 R 4,046,688
59 4,046,689
75 4,046,690
83 4,046,691
108 4,046,692
195 S 4,046,693
297 4,046,694
340 4,046,695
431 4,046,696
457 4,046,697
513 4,046,698
516 4,046,699
523 4,046,700

CLASS 211

24 4,046,260
41 4,046,261

CLASS 214

1 BC 4,046,263
1 CM 4,046,262
8 4,046,264
14 4,046,265
4,046,266
16.4 B 4,046,267
58 4,046,268
83.3 4,046,269
138 R 4,046,270
152 4,046,271
312 4,046,272
450 4,046,273
506 4,046,274

CLASS 215

1 C 4,046,275
250 4,046,276

CLASS 219

10.55 D 4,046,983
69 E 4,046,984
121 L 4,046,985
121 LM 4,046,986
135 4,046,987
137 R 4,046,988
437 4,046,989
471 4,046,990
497 4,046,991

CLASS 220

1.5 4,046,277
4,046,278
8 4,046,279
89 A 4,046,280
270 4,046,282
4,046,283

CLASS 221

45 4,046,284
157 4,046,285
251 4,046,286

CLASS 222

1 Re.29,385
16 4,046,287
135 4,046,288
146 HE 4,046,289
267 4,046,290
309 4,046,291
383 4,046,292
404 Re.29,386

CLASS 223

88 4,046,293

CLASS 224

5 H 4,046,294
4,046,295
26 D 4,046,296
42.03 B 4,046,297

CLASS 225

2 4,046,298
3 4,046,299
103 4,046,300

CLASS 228

108 4,046,301
121 4,046,302
173 4,046,303
187 4,046,304
194 4,046,305

CLASS 229

5.7 4,046,306
15 4,046,307
17 R 4,046,308
23 R 4,046,309
30 4,046,310
40 4,046,311
45 R 4,046,312
52 AW 4,046,314

CLASS 233

4 4,046,315
23 R 4,046,316
4,046,317

CLASS 235

54 F 4,046,992
61.11 A 4,046,994
61.5 D 4,046,993
61.6 R 4,046,995
92 PK 4,046,996
150.21 4,046,998
150.5 4,046,997
150.53 4,046,999
151.1 4,047,000
151.11 4,047,003
151.12 4,047,004
151.21 4,047,005
151.3 4,047,001
4,047,002
151.33 4,047,006
4,047,007
152 4,047,008
4,047,009
156 4,047,010
4,047,012
4,047,013
164 4,047,011
189 4,047,014

CLASS 236

1 G 4,046,318
34.5 4,046,319

CLASS 237

8 C 4,046,320

CLASS 239

420 4,046,321
533.7 4,046,322

CLASS 240

1.3 4,047,015
4 4,047,016
6.46 4,047,017
7.1 R 4,047,018
8.2 4,047,019
46.59 4,047,020
78 E 4,047,021

CLASS 241

23 4,046,323
46.06 4,046,324
73 4,046,325
182 4,046,326
197 4,046,327

CLASS 242

18 A 4,046,328
18 G 4,046,329
4,046,330
54 R 4,046,331
107.4 A 4,046,332
137.1 4,046,333
201 4,046,334

CLASS 244

17.19 4,046,335
96 4,046,337
103 R 4,046,339
153 R 4,046,340
181 4,046,341
198 4,046,336
213 4,046,338

CLASS 246

34 R 4,046,342

CLASS 248

49 4,046,343
72 4,046,344
154 4,046,345
298 4,046,346
346 4,046,347
423 4,046,348
424 4,046,349

CLASS 250

201 4,047,022
214 B 4,047,023
231 SE 4,047,024
237 G 4,047,025
251 4,047,026
262 4,046,764
264 4,047,027
266 4,047,028
273 4,047,029
281 4,047,030
335 4,047,031
338 4,047,032
341 4,047,033
354 4,047,034
355 4,047,035
359 4,047,036
370 4,047,037
372 4,047,038
385 4,047,039
4,047,040
4,047,041
390 4,047,042
401 4,047,043
402 4,047,044
551 4,047,045

CLASS 251

58 4,046,350
129 4,046,351

CLASS 252

8.1 4,046,701
33.4 4,046,702
59 4,046,703
63.2 4,046,704
99 4,046,705
106 4,046,706
180 4,046,707
299 4,046,708
421 4,046,709
429 B 4,046,710
441 4,046,711
447 4,046,712
455 R 4,046,714
455 Z 4,046,713
466 B 4,046,715
522 4,046,716
546 4,046,717

CLASS 254

29 R 4,046,352
83 4,046,353
93 R 4,046,354
173 R 4,046,355

CLASS 256

10 4,046,356

CLASS 259

6 Re.29,387
147 4,046,357
4,046,358
193 4,046,359

CLASS 260

2 R 4,046,718
2.5 AW 4,046,721
2.5 B 4,046,720
2.5 FP 4,046,719
6 4,046,722
8 4,046,723
9 4,046,724
4,046,725
27 R 4,046,726
28.5 A 4,046,721
28.5 R 4,046,727
29.2 TN 4,046,729
29.6 RB 4,046,730
30.6 R 4,046,731
31.2 R 4,046,732
33.6 EP 4,046,733
38 4,046,734
45.8 N 4,046,736
4,046,737
45.8 NT 4,046,735
67 FP 4,046,738
75 M 4,046,739
75 N 4,046,740
77.5 A 4,046,741
77.5 AB 4,046,743
77.5 AN 4,046,742
77.5 AQ 4,046,744
77.5 CR 4,046,745
78 S 4,046,746
4,046,747
78 UA 4,046,748
79 4,046,749
112.5 R 4,046,751
158 4,046,752
4,046,753
162 4,046,754
174 4,046,755
205 4,046,756
207 4,046,757
239 E 4,046,758
239.1 4,046,759
239.55 R 4,046,760
250 B 4,046,763
288 CE 4,046,765
290 HL 4,046,766
293.77 4,046,767
294.8 D 4,046,768
295 T 4,046,769
305 4,046,770
307 D 4,046,771
308 R 4,046,772
314 4,046,774
326.14 R 4,046,776
326.2 4,046,775
326.26 4,046,777
326.34 4,046,778
346.22 4,046,779
346.4 4,046,780
347.7 4,046,781
348.29 4,046,784
348.32 4,046,782

348.33 4,046,783
380 4,046,785
396 N 4,046,786
399 4,046,787
404 4,046,788
412.8 4,046,789
429.5 4,046,790
429.7 4,046,791
4,046,792
439 R 4,046,793
448 A Re.29,389
448.2 E 4,046,795
448.2 N 4,046,794
453 P 4,046,796
453 R 4,046,797
465 D 4,046,798
4,046,799
465 E 4,046,800
501.21 4,046,804
506 4,046,805
512 C 4,046,806
549 4,046,807
553 A 4,046,808
570.9 4,046,809
571 4,046,810
578 4,046,811
583 B 4,046,812
586 P 4,046,813
590 E 4,046,814
606.5 B 4,046,815
613 R 4,046,816
621 R 4,046,817
627 G 4,046,818
648 R 4,046,819
652.5 R 4,046,820
654 A 4,046,821
659 A 4,046,822
662 R 4,046,823
667 4,046,824
668 R 4,046,825
671 C 4,046,826
672 T 4,046,827
673.5 4,046,828
676 R 4,046,829
4,046,830
4,046,831
683 D 4,046,832
683.3 4,046,833
752 4,046,834
857 PA 4,046,835
860 4,046,836
873 4,046,837
876 B 4,046,838
880 R 4,046,839
897 A 4,046,840
923 4,046,841

CLASS 261

34 A 4,046,844
122 4,046,845

CLASS 264

22 4,046,842
4,046,843
45.3 4,046,846
61 4,046,847
70 4,046,848
174 4,046,849
216 4,046,850

CLASS 267

65 B 4,046,360
139 4,046,361

CLASS 269

43 4,046,362
228 4,046,363
244 4,046,364
328 4,046,365

CLASS 270

21 4,046,366
55 4,046,367
61 R 4,046,368

CLASS 271

3.1 4,046,369
4,046,370
178 4,046,371
273 4,046,372

CLASS 272

63 4,046,373
70.3 4,046,374
85 4,046,375

CLASS 273

54 D 4,046,376
73 G 4,046,377
85 D 4,046,378
95 AA 4,046,379
119 R 4,046,380
134 AD 4,046,381
135 B 4,046,382
148 R 4,046,383

CLASS 274

10 R 4,046,385
23 A 4,046,386
47 4,046,384

CLASS 277

2 4,046,387
53 4,046,388
113 4,046,389

CLASS 279

1 S 4,046,390

CLASS 280

5.24 4,046,391
8 4,046,392
19 4,046,393
33.99 B 4,046,394
106.5 R 4,046,395
281 R 4,046,396
289 R 4,046,397
415 R 4,046,398
420 4,046,399
626 4,046,400
650 4,046,401
674 4,046,402
701 4,046,403

CLASS 282

27.5 4,046,404

CLASS 285

3 4,046,405
47 4,046,406
133 R 4,046,407
188 4,046,408
305 4,046,409

CLASS 292

36 4,046,410
200 4,046,412

CLASS 293

88 4,046,411

CLASS 294

19 A 4,046,413
81 R 4,046,414

CLASS 296

35 R 4,046,415
98 4,046,416

CLASS 297

16 4,046,417
118 4,046,418
153 4,046,419
216 4,046,420
232 4,046,421
248 4,046,422

CLASS 298

22 D 4,046,423

CLASS 299

56 4,046,424

CLASS 301

12 R 4,046,425

CLASS 303

100 4,046,426
115 4,046,427

CLASS 305

11 4,046,428
35 EB 4,046,429

CLASS 307

101 4,047,046
106 4,047,047
108 4,047,050
118 4,047,048
157 4,047,049
221 D 4,047,051
228 4,047,052
238 4,047,053
252 J 4,047,054
262 4,047,055
271 4,047,056
273 4,047,057
293 4,047,058
355 4,047,059

CLASS 308

26 4,046,430
76 4,046,431
189 R 4,046,432
191 4,046,433
195 4,046,434
4,046,435
233 4,046,436

CLASS 310

164 4,047,061
216 4,047,062
232 4,047,063
322 4,047,060

CLASS 312

20 4,046,437
138 A 4,046,438
138 R 4,046,439
215 4,046,440

CLASS 313

201 4,047,064
4,047,065
217 4,047,066
221 4,047,067
293 Re.29,390
359 4,047,068
388 4,047,070
487 4,047,069
490 4,047,071
496 4,047,072
497 4,047,073
4,047,074
500 4,047,075

CLASS 315

88 4,047,076
169 TV 4,047,077
411 4,047,078

CLASS 318

79 4,047,080
138 4,047,081
221 E 4,047,082
231 4,047,083
254 4,047,084
601 4,047,085
608 4,047,086
661 4,047,087

CLASS 320

6 4,047,088

CLASS 321

15 4,047,091

CLASS 322

2 R 4,047,093
7 4,047,094
17 4,047,095

CLASS 323

19 4,047,096
119 4,047,097

CLASS 324

6 4,047,098
30 B 4,047,100
30 R 4,047,099
33 4,047,101
4,047,102
34 D 4,047,103
62 4,047,104
65 R 4,047,105
175 4,047,106

CLASS 325

37 4,047,107
38 B 4,047,108
54 4,047,109
123 4,047,110
315 4,047,111
455 4,047,112

CLASS 328

2 4,047,113
140 4,047,114
151 4,047,115

CLASS 329

124 4,047,116

CLASS 330

4.3 4,047,117
22 4,047,118
30 D 4,047,119
84 4,047,122
207 P 4,047,120

CLASS 331

76 4,047,121
94.5 H 4,047,123
4,047,124
94.5 PE 4,047,125
96 4,047,126

CLASS 332

31 T 4,047,127

CLASS 333

11 4,047,128
72 4,047,129
4,047,130
81 R 4,047,131
84 M 4,047,132
95 A 4,047,133

CLASS 335

23 4,047,134
58 4,047,135
222 4,047,136
234 4,047,137

CLASS 336

100 4,047,138
150 4,047,139

CLASS 337

28 Re.29,391
75 4,047,140
89 4,047,141
186 4,047,142
239 4,047,143

CLASS 338

2 4,047,144
67 4,047,145
176 4,047,146

CLASS 339

8 R 4,046,441
17 CF 4,046,442
66 M 4,046,443
91 R 4,046,444
95 D 4,046,445
99 R 4,046,446
103 M 4,046,447
126 R 4,046,449
153 4,046,448
177 R 4,046,451
198 H 4,046,452
217 S 4,046,450

CLASS 340

3 R 4,047,147
12 R 4,047,148
52 B 4,047,149
84 4,047,150
146.1 AX 4,047,151
146.3 AG 4,047,152
146.3 AQ 4,047,153
146.3 E 4,047,154
147 R 4,047,155
171 A 4,047,156
173 R 4,047,163
174 M 4,047,164
227 R 4,047,165
261 4,047,166
280 4,047,167
310 R 4,047,168
324 M 4,047,169

CLASS 343

5 PC 4,047,170
6.8 R 4,047,171
17.1 R 4,047,172
17.2 PC 4,047,173
18 B 4,047,174
100 CS 4,047,175
106 R 4,047,176
113 DE 4,047,177
750 4,047,178
768 4,047,179
784 4,047,180
789 4,047,181
904 4,047,182

CLASS 346

1 4,047,183
75 4,047,184
140 R 4,047,185
4,047,186

CLASS 350

96 C 4,046,453
4,046,454
150 4,046,455
160 R 4,046,456
164 4,046,457
178 4,046,458
214 4,046,459
216 4,046,460
287 4,046,461
295 4,046,462

CLASS 351

13 4,046,463

CLASS 352

141 4,046,464
175 4,046,465

CLASS 354

15 4,047,188
23 D 4,047,187
4,047,189
27 4,047,190
4,047,191
83 4,047,192
105 4,047,193
149 4,047,194
152 4,047,206
155 4,047,207
4,047,222
203 4,047,208
212 4,047,209
238 4,047,210
258 4,047,211
270 4,047,212
299 4,047,213

CLASS 355

3 R 4,046,466
4,046,467
4,046,468
13 4,046,469
4,046,470
14 4,046,471
4,046,472
16 4,046,473
43 4,046,474
69 4,046,475
77 4,046,476

CLASS 356

109 4,046,477

CLASS 357

3 4,047,199
23 4,047,214
24 4,047,215
4,047,216
34 4,047,217
4,047,218
38 4,047,219
48 4,047,220
55 4,047,195
4,047,196
81 4,047,197
82 4,047,198

CLASS 358

29 4,047,202
44 4,047,203
47 4,047,200
93 4,047,204
107 4,047,205
136 4,047,221
158 4,047,223
166 4,047,224
190 4,047,225
193 4,047,226
194 4,047,227
261 4,047,228

CLASS 360

2 4,047,229
17 4,047,230
36 4,047,231
113 4,047,236
134 4,047,232

CLASS 361

45 4,047,079
88 4,047,233
92 4,047,234
98 4,045,887
100 4,047,235
210 4,047,237
229 4,047,238
270 4,047,239
275 4,047,240
288 4,047,241
389 4,047,242

CLASS 363

34 4,047,090
49 4,047,089
135 4,047,092

CLASS 364

200 4,047,161
4,047,162
4,047,201
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900 4,047,157
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CLASS 403

262 4,046,478
306 4,046,479
320 4,046,481
398 4,046,480

CLASS 404

4 4,046,482
112 4,046,483
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123 4,046,485

CLASS 416

157 R 4,046,486
208 4,046,487
210 R 4,046,488
223 R 4,046,489

CLASS 417

28 4,046,490
44 4,046,491
197 4,046,492
220 4,046,493
253 4,046,494
268 4,046,495

CLASS 423

41 4,046,851
58 4,046,852
77 4,046,853
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448 4,046,863
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533 4,046,866
543 4,046,867
588 4,046,868
652 4,046,869

CLASS 424

1 4,046,870
11 4,046,871
52 4,046,872
54 4,046,873
73 4,046,874
89 4,046,875
177 4,046,876
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311 4,046,913
312 4,046,914
317 4,046,915
319 4,046,916
326 4,046,917
331 4,046,918
338 4,046,919

CLASS 425

222 4,046,496
313 4,046,497
405 H 4,046,499
407 4,046,500
526 4,046,498

CLASS 426

19 4,046,920
46 4,046,921
104 4,046,922
130 4,046,923
502 4,046,924
573 4,046,925
613 4,046,926

CLASS 427

2 4,046,927
12 4,046,928
164 4,046,929
387 4,046,930
428 4,046,931

CLASS 428

64 4,046,932
81 4,046,933
155 4,046,934
182 4,046,935
195 4,046,936
211 4,046,937
255 4,046,942
262 4,046,944
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411 4,046,949
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412 4,046,951
423 4,046,952
426 4,046,953
446 4,046,954
479 4,046,955

CLASS 429

20 4,046,956

CLASS 526

310 4,046,750

CLASS 544

17 4,046,761
148 4,046,762

CLASS 548

339 4,046,773

CLASS 560

61 G 4,046,802
121 4,046,801
172 4,046,803

CLASSIFICATION OF DESIGNS

D2—	232	245,646	D7—	43	245,661		67	245,676		181	245,689	D23—	4	245,703
	275	245,647		45	245,662		91	245,675		191	245,690		44	245,704
	378.2	245,648		136	245,663		106	245,677	D13—	10	245,691		150	245,705
	400	245,649	D8—	10	245,664		109	245,678	D14—	12	245,692	D25—	16	245,706
D6—	23	245,650		15	245,665	D11—	81	245,679		86	245,693		74	245,707
	68	245,651		18	245,666		83	245,680			245,694			245,708
	114	245,652		52	245,667		144	245,681	D15—	11	245,695			245,709
	130	245,653		71	245,668		152	245,682		29	245,696			245,710
	167	245,654		360	245,669			245,683		30	245,697			245,711
	192	245,655	D9—	216	245,670		155	245,684			245,698		80	245,712
	196	245,656		269	245,671	D12—	58	245,685		90	245,699	D28—	64	245,713
	197	245,657		289	245,672		136	245,687		140	245,700	D30—	13	245,714
	234	245,660	D10—	7	245,673		143	245,686	D16—	20	245,701		14	245,715
	235	245,658		38	245,674		179	245,688	D19—	86	245,702		41	245,716
	284	245,659												

D34—	5 GH	245,720			245,721
	5 GP	245,719			245,717
	5 SS	245,717			245,718
		245,718			245,722
	15 B	245,722			245,723
	41	245,723			245,724
D48—	4 B	245,724			245,725
D56—	1 A	245,725			245,726
D64—	11 A	245,726			245,727
D87—	1 D	245,727			245,728
	1 R	245,728			245,729
D96—	12 E	245,729			245,730

CLASSIFICATION OF PLANTS

P.—	70	4,099			4,100		73	4,098		88	4,097

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

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71—	33	T962,003	156—	71	T962,005	252—	429 B	T962,007	261—	41 D	T962,010	428—	517	T962,011	528—	500	T962,008

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

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Arkansas	5	Massachusetts	25	South Carolina	45
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Canal Zone	7	Minnesota	27	Tennessee	47
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 :	4,045,858	4,046,131	4,046,801	4,046,967	4,046,651	4,046,579
	4,045,958	4,046,134	4,046,824	4,046,968	4,046,731	4,046,638
	4,046,617	4,046,139	4,046,860	4,046,969	4,046,748	4,046,639
	4,046,686	4,046,145	4,046,877	4,047,011	4,046,809	4,046,640
	4,047,001	4,046,156	4,046,925	4,047,106	4,047,008	4,046,672
	4,047,114	4,046,186	4,046,927	9 :	4,045,842	4,047,148	4,046,675
4 :	4,045,887	4,046,190	4,046,954	4,045,865	4,047,161	4,046,676
	4,045,922	4,046,199	4,046,960	4,045,894	4,047,226	4,046,711
	4,046,056	4,046,214	4,046,993	4,045,956	13 :	4,045,873	4,046,713
	4,046,061	4,046,235	4,047,002	4,045,957	4,046,000	4,046,714
	4,046,364	4,046,254	4,047,012	4,045,992	4,046,307	4,046,715
	4,046,643	4,046,256	4,047,017	4,046,003	4,046,358	4,046,726
	4,046,820	4,046,259	4,047,020	4,046,005	4,046,454	4,046,768
	4,046,995	4,046,262	4,047,023	4,046,008	17 :	Re.29,387	4,046,779
	4,047,150	4,046,266	4,047,029	4,046,016	4,045,833	4,046,819
	4,047,171	4,046,277	4,047,049	4,046,351	4,045,853	4,046,828
	4,047,218	4,046,284	4,047,068	4,046,365	4,045,874	4,046,884
5 :	4,045,903	4,046,292	4,047,086	4,046,390	4,045,884	4,046,892
	4,046,017	4,046,314	4,047,091	4,046,430	4,045,896	4,046,922
	4,046,361	4,046,316	4,047,093	4,046,494	4,045,911	4,046,958
6 :	Re.29,383	4,046,317	4,047,099	4,046,529	4,045,972	4,046,962
	Re.29,391	4,046,324	4,047,100	4,046,625	4,045,989	4,047,003
	4,045,825	4,046,339	4,047,102	4,046,849	4,045,996	4,047,016
	4,045,826	4,046,376	4,047,117	4,046,852	4,046,009	4,047,019
	4,045,827	4,046,380	4,047,120	4,046,956	4,046,015	4,047,060
	4,045,832	4,046,395	4,047,121	4,046,997	4,046,018	4,047,078
	4,045,835	4,046,396	4,047,126	4,047,006	4,046,021	4,047,085
	4,045,861	4,046,442	4,047,127	4,047,007	4,046,029	4,047,104
	4,045,870	4,046,445	4,047,130	4,047,044	4,046,047	4,047,142
	4,045,872	4,046,462	4,047,144	4,047,053	4,046,048	4,047,223
	4,045,890	4,046,474	4,047,154	10 :	4,046,328	4,046,083	4,047,225
	4,045,897	4,046,479	4,047,158	4,046,567	4,046,104	4,047,227
	4,045,900	4,046,480	4,047,164	4,046,648	4,046,108	4,047,245
	4,045,906	4,046,508	4,047,166	4,046,728	4,046,138	18 :	4,045,834
	4,045,915	4,046,520	4,047,180	4,046,868	4,046,144	4,045,862
	4,045,940	4,046,533	4,047,181	11 :	4,046,007	4,046,148	4,045,882
	4,045,967	4,046,534	4,047,195	4,046,417	4,046,160	4,045,980
	4,045,968	4,046,584	4,047,198	4,046,518	4,046,203	4,046,038
	4,045,982	4,046,590	4,047,204	12 :	4,045,856	4,046,236	4,046,062
	4,045,983	4,046,605	4,047,207	4,045,885	4,046,247	4,046,075
	4,046,010	4,046,613	4,047,216	4,046,052	4,046,252	4,046,081
	4,046,045	4,046,636	4,047,217	4,046,119	4,046,267	4,046,082
	4,046,050	4,046,659	4,047,222	4,046,125	4,046,283	4,046,167
	4,046,054	4,046,669	4,047,231	4,046,171	4,046,297	4,046,261
	4,046,066	4,046,674	4,047,248	4,046,193	4,046,306	4,046,268
	4,046,067	4,046,685	8 :	4,046,097	4,046,221	4,046,344	4,046,384
	4,046,072	4,046,696	4,046,150	4,046,288	4,046,348	4,046,491
	4,046,076	4,046,702	4,046,301	4,046,295	4,046,366	4,046,514
	4,046,091	4,046,706	4,046,321	4,046,382	4,046,436	4,046,551
	4,046,093	4,046,720	4,046,398	4,046,418	4,046,451	4,046,770
	4,046,105	4,046,741	4,046,407	4,046,483	4,046,516	4,046,817
	4,046,117	4,046,750	4,046,471	4,046,484	4,046,554	4,046,874
	4,046,124	4,046,758	4,046,495	4,046,485	4,046,577	4,046,891

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21 : 4,045,854
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22 : Re.29,384
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23 : 4,045,850
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42 : 245,730
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PLANT PATENTS

8 : 4,098
4,099
4,100
12 : 4,097

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

1 : T962,001
T962,003
10 : T962,002
T962,009
42 : T962,005
47 : T962,006
48 : T962,011

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September 13, 1977 Volume 962 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 237,758, Re. S.N. 815,867, Filed July 14, 1977, Cl. D2/244, EYE SHADE WITH REMOVABLE CROWN, Erline L. Huffman, Owner of Record: *Inventor,* Attorney or Agent: Claude A. Patalidis, et al., Ex. Gp.: 290

3,499,685, Re. S.N. 807,026, Filed June 16, 1977, Cl. 299/86, PICK-TYPE MINING BIT WITH SUPPORT BLOCK HAVING ROTATABLE SEAT, Thomas J. Kniff, Owner of Record: *Kennametal Inc., Latrobe, Pa.,* Attorney or Agent: Lawrence R. Burns, Ex. Gp.: 354

3,554,132, Re. S.N. 816,505, Filed July 18, 1977, Cl. 104/172, VEHICLE CONVEYOR, Daniel C. Hanna, et al., Owner of Record: *Inventors,* Attorney or Agent: Kenneth S. Klarquist, et al., Ex. Gp.: 314

3,622,049, Re. S.N. 816,246, Filed July 18, 1977, Cl. 222/190, DISPENSING SYSTEM, Robert E. Thompson, Owner of Record: *Schering Corporation, Bloomfield, N.J.,* Attorney or Agent: Vincent H. Gifford, Ex. Gp.: 311

3,632,582, Re. S.N. 806,976, Filed June 16, 1977, Cl. 260/278, PROCESS FOR PREPARING NITRO-P-PHENYLENEDIAMINES, Milos S. Bil, Owner of Record: *Clairol Inc., New York, N.Y.,* Attorney or Agent: Irving Holtzman, et al., Ex. Gp.: 117

3,801,507, Re. S.N. 812,940, Filed July 5, 1977, Cl. 252/42 F, SULFURIZED METAL PHENATES, Yngve Gust Hendrickson, et al., Owner of Record: *Chevron Research Company, San Francisco, Calif.,* Attorney or Agent: J. A. Buchanan, Jr., et al., Ex. Gp.: 116

3,859,332, Re. S.N. 816,226, Filed July 18, 1977, Cl. 260/471 C, O-(HALOPHENYLCARBAMYL)-N-(HALOPHENYL) GLYCOLAMIDES, Don R. Baker, Owner of Record: *Stauffer Chemical Company, New York, N.Y.,* Attorney or Agent: Edwin H. Baker, et al., Ex. Gp.: 127

3,895,049, Re. S.N. 815,352, Filed July 12, 1977, Cl. 260/465.3, CATALYST AND PROCESS FOR OXIDATION OR AMMOXIDATION OF OLEFIN MIXTURE, Sumio Umemura, et al., Owner of Record: *Ube Industries, Limited, Ube-Shi, Yamaguchi-Ken, Japan,* Attorney or Agent: Eric H. Waters, et al., Ex. Gp.: 124

3,895,280, Re. S.N. 815,674, Filed July 14, 1977, Cl. 318/610, ELECTRONIC CONTROLLER WITH REMOTE TUNING, Neal D. Peterson, Owner of Record: *The Foxboro Company, Foxboro, Mass.,* Attorney or Agent: Howard M. Bollinger, et al., Ex. Gp.: 217

3,895,778, Re. S.N. 815,989, Filed July 15, 1977, Cl. 254/1, METHOD OF LOWERING AND RAISING LOADS BY MEANS OF A JACK ASSEMBLY AND LIFTING ELEMENT, Nils Harald Ahlgren, Owner of Record: *Inventor,* Attorney or Agent: Howard L. Rose, et al., Ex. Gp.: 323

3,903,502, Re. S.N. 808,800, Filed June 22, 1977, Cl. 340/146.3 SY, CHARACTER RECORDING SYSTEM, David Moss, Owner of Record: *Creative Ventures, Inc., Dayton, Ohio,* Attorney or Agent: Lawrence B. Biebel, et al., Ex. Gp.: 237

3,915,498, Re. S.N. 816,798, Filed July 18, 1977, Cl. 299/2, OIL SHALE RETORT FLUE GAS COOLING AND CLEANING, Robert S. Burton III, et al., Owner of Record: *Occidental Petroleum Corporation, Los Angeles, Calif.,* Attorney or Agent: Robert L. Parker, et al., Ex. Gp.: 354

3,931,922, Re. S.N. 811,834, Filed June 30, 1977, Cl. 228/6, APPARATUS FOR MOUNTING SEMICONDUCTOR DEVICES, Sydney Jackson, et al., Owner of Record: *Ferranti Limited, Hollinwood, England,* Attorney or Agent: Edward J. Kondracki, Ex. Gp.: 323

3,937,994, Re. S.N. 814,238, Filed July 8, 1977, Cl. 310/168, MAGNETIC SPEED SENSOR, Rex Wallace Presley, et al., Owner of Record: *The Bendix Corporation, South Bend, Ind.,* Attorney or Agent: Ken C. Decker, et al., Ex. Gp.: 212

3,973,421, Re. S.N. 815,259, Filed July 13, 1977, Cl. 70/364 R, KEY CONTROLLED SECURITY APPARATUS, George P. Patriquin, Owner of Record: *Hudson Lock, Inc., Hudson, Mass.,* Attorney or Agent: John E. Toupal, Ex. Gp.: 351

PATENT NOTICES

Certificates of Correction for the Week of Sept. 13, 1977

Re. 29,037	3,833,640	3,980,253	3,999,961	4,012,625	4,020,303	4,024,358	4,028,533
Re. 29,116	3,833,656	3,987,291	4,000,076	4,013,249	4,020,389	4,024,497	4,028,977
Re. 29,228	3,839,409	3,989,387	4,000,374	4,013,446	4,020,654	4,025,192	4,029,091
Re. 29,256	3,847,966	3,989,873	4,001,367	4,013,768	4,020,656	4,025,218	4,029,244
Re. 29,265	3,859,255	3,992,599	4,001,449	4,014,068	4,020,864	4,025,339	4,029,347
Re. 29,271	3,879,257	3,994,239	4,001,543	4,014,134	4,021,036	4,025,367	4,029,561
D. 243,196	3,879,437	3,994,427	4,001,621	4,014,258	4,021,060	4,025,576	4,029,688
D. 243,197	3,879,439	3,994,974	4,002,218	4,014,428	4,021,359	4,025,640	4,030,163
D. 243,198	3,897,208	3,995,333	4,002,702	4,014,725	4,021,390	4,025,841	4,030,176
D. 243,199	3,904,126	3,995,356	4,003,495	4,014,784	4,021,563	4,025,892	4,030,177
D. 243,200	3,917,864	3,995,641	4,004,237	4,014,894	4,021,934	4,025,901	4,030,342
D. 244,491	3,925,450	3,995,767	4,005,347	4,015,582	4,022,024	4,025,995	4,030,613
3,612,753	3,925,459	3,995,811	4,005,795	4,015,617	4,022,063	4,026,050	4,030,990
3,678,095	3,925,805	3,995,864	4,005,995	4,015,660	4,022,085	4,026,215	4,031,042
3,681,364	3,944,651	3,995,865	4,006,141	4,015,999	4,022,174	4,026,396	4,031,519
3,701,046	3,950,363	3,996,082	4,006,181	4,016,240	4,022,207	4,026,505	4,032,143
3,761,401	3,952,048	3,996,132	4,006,198	4,016,257	4,022,375	4,026,733	4,032,144
3,766,086	3,955,213	3,996,170	4,006,602	4,017,173	4,022,672	4,026,740	4,032,150
3,767,466	3,959,171	3,996,200	4,007,135	4,017,508	4,023,177	4,027,039	4,032,162
3,784,636	3,961,746	3,996,291	4,007,179	4,017,955	4,023,704	4,027,211	4,032,489
3,794,664	3,962,058	3,996,357	4,007,189	4,018,046	4,023,791	4,027,338	4,032,516
3,796,740	3,969,728	3,996,420	4,007,826	4,018,364	4,023,976	4,027,689	4,032,845
3,798,269	3,974,147	3,996,460	4,008,400	4,018,387	4,023,977	4,027,854	4,032,881
3,813,784	3,975,932	3,998,043	4,010,204	4,018,702	4,024,014	4,028,000	
3,816,508	3,976,746	3,998,972	4,011,689	4,018,914	4,024,118	4,028,127	
3,817,937	3,978,428	3,999,449	4,012,138	4,019,813	4,024,152	4,028,200	
3,823,119	3,979,117	3,999,468	4,012,349	4,019,927	4,024,212	4,028,469	

Disclaimers

3,958,225.—*Kenneth W. Turner,* Des Plaines, and *George C. Zobel,* Palatine, Ill. APPARATUS AND METHOD FOR CONSTROLLING A COMMUNICATIONS TERMINAL. Patent dated May 18, 1976. Disclaimer filed Apr. 18, 1977, by the assignee, *Teletype Corporation.*

Hereby enters this disclaimer to claim 6 of said patent.

3,958,824.—*Roy E. Crews,* Allison Park, and *Eugene D. Legg,* West Newton, Pa. LIFTING FRAME AND METHODS OF LIFTING PREFABRICATED BUILDING MODULES. Patent dated May 25, 1976. Disclaimer filed July 19, 1977, by the assignee, *Westinghouse Electric Corporation.*

Hereby enters this disclaimer to the remaining term of said patent.

4,003,145.—*Anton Liebscher,* Waynesville, *Sven Oberg,* Lake Junaluska, and *Kenneth Smatjers* and *Horace Auberry,* Waynesville, N.C. FOOTWEAR. Patent dated Jan. 18, 1977. Disclaimer filed July 18, 1977, by the assignee, *Ro-Search, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 2, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-23-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-3-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-19-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-12-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-14-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-29-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Tolletry; Printing; Typewriters; Stationery; Information Dissemination.	12-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	4-14-70
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during July 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,943,327 to 2,947,000, inclusive
Plant Patents..... Numbers 1,957 to 1,962, inclusive

REISSUES

SEPTEMBER 13, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,392

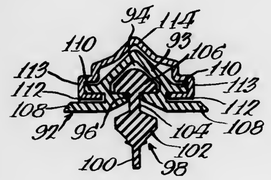
WINDSHIELD WIPER BLADE STRUCTURE

John P. Moorhead, Palos Verdes, Calif., and Donald W. Stratton, St. John, Ind., assignors to The Anderson Company, Gary, Ind.

Original No. 3,820,188, dated June 28, 1974, Ser. No. 328,649, Feb. 1, 1973. Application for reissue June 11, 1976, Ser. No. 695,066

Int. Cl.[2] B60S *1/04, 1/38*

U.S. Cl. 15—250.42 **21 Claims**



18. An elongate backing member adapted to be attached to a superstructure for holding a flexible windshield wiping element, comprising,

a. a tubular receiver having a longitudinal chamber for holding a retention bead on said wiping element,

b. the bottom of the receiver having a relatively narrow longitudinal slot opening into the chamber,

c. a pair of opposed flanges extending laterally outwardly in opposite directions from the receiver, and

d. a second pair of opposed flanges extending laterally outwardly in opposite directions on the receiver in vertically spaced relation above said first flanges to define laterally opening slots for receiving the claws of a superstructure.

Re. 29,393

APPARATUS FOR SEPARATING AND/OR COUNTING INDIVIDUAL ELEMENTS OF A PLURALITY

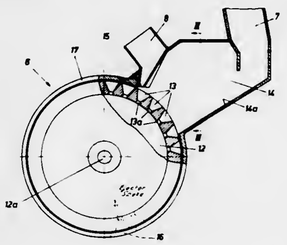
Reinhard Becker, Gieselwerder, Germany, assignor to Deere & Company, Moline, Ill.

Original No. 3,715,057, dated Feb. 6, 1973, Ser. No. 206,282, Dec. 9, 1971. Application for reissue Jan. 28, 1974, Ser. No. 437,179

Claims priority, application Germany, Dec. 29, 1970, 2064336

Int. Cl.[2] A01C *7/04*

U.S. Cl. 221—211 **29 Claims**



1. Apparatus for separating and counting individual ones of a plurality of substantially similar shaped particles, elements, grains, or the like, such as grains of seed, pills, etc., and including a rotating drum, feeder means for the particles and a housing for the drum, the improvement comprising:

the drum being hollow and [constructed to have plural] *having in its outer surface a plurality of* inwardly tapering indentations, *each indentation* terminating in a bore open to the interior of the drum and having at the bottom of the indentation dimensions smaller than the particles so that the particles cannot traverse the bore, the [indentations] *indentation* being wider than the particles at the surface of the drum, the indentation dimensioned to hold [at least] *therein more than* one particle each;

means including a nozzle for directing [an] *a defined* air jet towards the drum at direction and position so that the air jet is directed towards and into [an indentation] *successive indentations* striking along the leading wall [portion] *portions* thereof as the drum rotates; and

the feeder means constructed to feed particles towards the drum, so that at least one particle is in each indentation as it passes the jet.

Re. 29,394

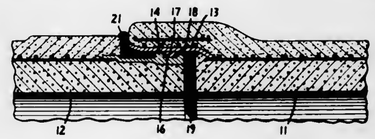
CORROSION PROTECTIVE BAND FOR UNDERGROUND PIPE JOINTS WITH METAL PARTS

Harold V. Swanson, Morris Plains, and Robert E. Bald, Roseland, both of N.J., assignors to Interpace Corporation, Parsippany, N.J.

Original No. 3,904,213, dated Sept. 9, 1975, Ser. No. 526,320, Nov. 22, 1974. Continuation-in-part of Ser. No. 359,967, May 14, 1973, Pat. No. 3,909,010. Application for reissue Feb. 2, 1976, Ser. No. 654,228

Int. Cl.[2] F16J *15/38*

U.S. Cl. 277—229 **3 Claims**



7. A distortable band, suitable for being fit into a joint between first and second continuous successive lengths of pipe made of concrete, wherein a bell formed on one end of the first length is engaged by a spigot formed on the end of a second length, the band made of a cellular water invadable material impregnated with a dry hydratable cement which is reactive with water to hydrate thereby depositing a water impervious hard substance in the joint, a water permeable sheath around the band.

Re. 29,395

METHOD OF FABRICATING A DOUBLE HETEROSTRUCTURE INJECTION LASER UTILIZING A STRIPE-SHAPED REGION

Hiroo Yonezu, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Original No. 3,920,491, dated Nov. 18, 1975, Ser. No. 492,262, July 26, 1974. Continuation of Ser. No. 413,923, Nov. 8, 1973, abandoned, which is a continuation of Ser. No. 267,068, June 28, 1972, abandoned. Application for reissue June 15, 1976, Ser. No. 696,394

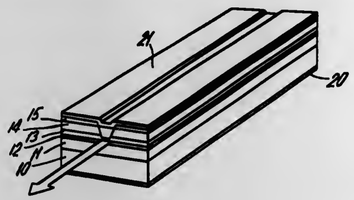
Claims priority, application Japan, July 30, 1971, 46-57665

Int. Cl.[2] H01L *21/205, 21/22, 33/00*

U.S. Cl. 148—175 **3 Claims**

1. A method of producing a $GaAs$-$Al_xGa_{1-x}As$ double

hetero-structure injection laser comprising the steps of preparing an n-type GaAs substrate, epitaxially growing a first layer of n-type $Al_xGa_{1-x}As$ on one major surface of said substrate, epitaxially growing a second layer of [P-type] GaAs on said first layer, epitaxially growing a third layer of p-type $Al_xGa_{1-x}As$ on said second layer, epitaxially growing a fourth layer of n-type GaAs on said third layer, selectively diffusing p-type impurities into an elongated surface portion of said



fourth layer to form a thin elongated p-type region on the surface of said fourth layer extending depthwise to a portion of said third layer, and forming first and second electrodes in ohmic contact with the whole surface of said fourth layer and with the other major surface of seid substrate, respectively, wherein excitation current supplied through said first electrode is allowed to flow substantially only through the deepest portion of said thin elongated p-type region as the result of a reverse bias developed between said third and fourth layers.

Re. 29,396

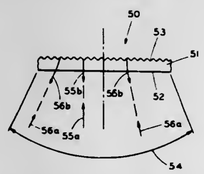
PIN HAVING NONALIGNED CUBE AXIS AND PIN AXIS AND BUNDLE OF SUCH PINS

Sidney A. Heenan, Park Ridge, Ill., assignor to Amerace Corporation, New York, N.Y.

Original No. 3,926,402, dated Dec. 16, 1975, Ser. No. 550,475, Feb. 18, 1975. Division of Ser. No. 354,153, April 24, 1973, Pat. No. 3,923,378. Application for reissue Jan. 16, 1976, Ser. No. 649,594

Int. Cl.² C25D *1/00, 1/06;* **B29C** *1/00;* **B29D** *11/00*

U.S. Cl. 204—281 **48 Claims**



1. A pin for use in making cube-corner reflectors capable of reflecting light back to the source thereof said pin comprising an elongated shank being of regular polygon outline and having a longitudinally extending pin axis, and a cube-corner formation at one end of said shank and having a cube axis at an angle to said pin axis of other than zero degrees, said cube-corner formation having three mutually perpendicular faces symmetrically arranged with respect to said cube axis and respectively intersecting in three mutually perpendicular edges.

Re. 29,397

SEPARATING APPARATUS

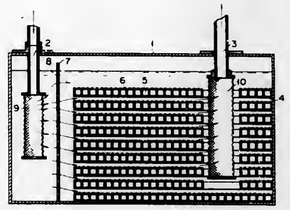
Masahiko Yamazaki, 15-2, 2 chome, Fujizuka, Kohoku, Yokohama, Japan

Original No. 3,812,970, dated May 28, 1974, Ser. No. 303,111, Nov. 2, 1972. Application for reissue May 15, 1975, Ser. No. 577,923

Claims priority, application Japan, Dec. 28, 1971, 46-2991

Int. Cl.² B01D *23/00*

U.S. Cl. 210—316 **10 Claims**



1. A settler type separating apparatus *for use with intermittent liquid flow thereto* comprising a vessel for holding liquid having an inlet and outlet spaced from each other towards opposite ends of said vessel; a plurality of longitudinal particle-receiving trays horizontally disposed in the vessel between at least said inlet and outlet and superimposed in parallel and vertically spaced relationship with each other at prescribed vertical intervals, each of said trays having *a plurality of* upwardly opening cavities *defined by walls therebetween, at least a portion of said walls being angularly disposed to the longitudinal direction of the tray;* a fine mesh screen mounted over each tray *and supported by the uppermost portion of said walls* to cover the upper opening of the cavities; [and] partition means disposed between said inlet and one side of said trays, *said partition means being* constructed and arranged so as to cause *intermittently flowing* liquid introduced through said inlet to run over said screens in laminar flow and the screens are constructed and arranged, so that the [flow of the] liquid *when flowing* over the screens forms a *laminar* boundary layer, said screens permitting particles in the liquid to settle from the liquid into the cavities *when the flow of liquid is interrupted,* but the escape of said particles from the cavities being obstructed *during liquid flow* by the boundary layer.

Re. 29,398

SERVOSYSTEM FOR ELECTRICAL MACHINING PROCESSES

Kiyoshi Inoue, 3-chome 16-8, Kamiyoga, Setagaya Tokyo, Japan

Original No. 3,781,507, dated Dec. 25, 1973, Ser. No. 272,463, July 17, 1972. Division of Ser. No. 19,364, March 13, 1970, Pat. No. 3,686,461. Application for reissue Nov. 17, 1976, Ser. No. 742,458

Claims priority, application Japan, Mar. 17, 1969, 44-20518; Apr. 8, 1969, 44-27070; Mar. 13, 1969, 44-18991; Apr. 2, 1969, 44-25317; Apr. 2, 1969, 44-25318; Apr. 30, 1969, 44-33960; May 30, 1969, 44-42188; Nov. 1, 1969, 44-87832; Nov. 26, 1969, 44-94741; Nov. 26, 1969, 44-94742

Int. Cl.² B23P *1/08. 1/14*

U.S. Cl. 219—69 G **9 Claims**

1. A servocontrol system for relatively positioning a pair of electrodes spacedly juxtaposed across a current-traversing gap, comprising:

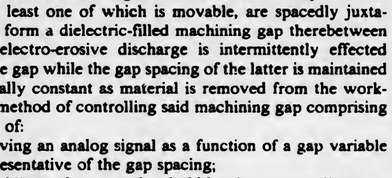
gap-monitoring means connected across said electrodes for producing an electrical signal representing the gap width;

a first SCHMITT trigger circuit connected to said gap-monitoring means and having an output element;

motive means including coil means energizable to displace said movable electrode in opposite directions;

a first electronic switch connected in circuit with an electrical power source and said coil means and connected to said element and responding to said first SCHMITT trigger for operating said motive means in one direction;

a second SCHMITT trigger connected to said element of said first SCHMITT trigger; and



a second electronic switch connected to said second SCHMITT trigger and in circuit with said source and said coil means for operating said motive means in the opposite direction upon detection by said second SCHMITT trigger of a condition at said first SCHMITT trigger rendering said first electronic switch ineffective.

Re. 29,399

SERVOSYSTEM FOR GAP ELECTRICAL MACHINING PROCESSES (ESPECIALLY ELECTROEROSION)

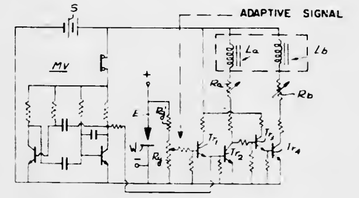
Kiyoshi Inoue, 3-chome 16-8, Kamiyoga, Setagaya, Tokyo, Japan

Original No. 3,686,461, dated Aug. 22, 1972, Ser. No. 19,364, Mar. 13, 1970. Application for reissue Nov. 17, 1976, Ser. No. 742,447

Claims priority, application Japan, Mar. 13, 1969, 44-18991; Apr. 2, 1969, 44-25317; Apr. 2, 1969, 44-25318; Apr. 30, 1969, 44-33960; May 30, 1969, 44-42188; Nov. 1, 1969, 44-87832; Nov. 26, 1969, 44-94741; Nov. 26, 1969, 44-94742; Mar. 17, 1969, 44-20518; Apr. 8, 1969, 44-27070

Int. Cl.² B23P *1/08, 1/14*

U.S. Cl. 219—69 G **3 Claims**



1. In the electric-discharge machining of a conductive workpiece wherein a machining electrode and the workpiece electrode, at least one of which is movable, are spacedly juxtaposed to form a dielectric-filled machining gap therebetween and an electro-erosive discharge is intermittently effected across the gap while the gap spacing of the latter is maintained substantially constant as material is removed from the workpiece, a method of controlling said machining gap comprising the steps of:

a. deriving an analog signal as a function of a gap variable representative of the gap spacing;

b. providing at least one threshold level corresponding generally to a preselected gap spacing, and establishing a first digital state upon said analog signal exceeding said threshold level and a second digital state upon said analog dropping below said threshold level;

c. deriving a first steep wavefront pulse signal of one polarity and a second steep wavefront pulse signal of the reverse polarity upon the establishment of said first and second digital states, respectively; and

d. shifting said movable electrode in response to said pulse signals in a direction determined by the presence and polarity of one of said pulse signals,

said first and second digital states being disestablished upon said analog signal dropping below said threshold level and upon said analog signal exceeding said threshold level respectively,

said first and second pulse signals each being maintained during the presence of said first and second digital states, respectively, and

said first digital signal being a signal driving said movable electrode upwardly; and intermittently canceling said first digital signal while the electrode is in upward movement.

Re. 29,400

DIRECT CURRENT POWER SUPPLY FOR MANUAL ARC WELDING

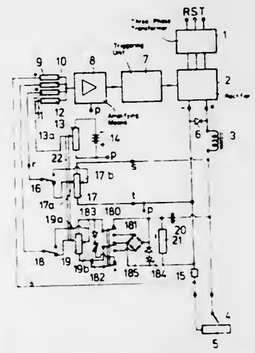
Rolf Ericson, Laxa, Sweden, assignor to Elektriska Svetsningsaktiebolaget, Goteborg, Sweden

Original No. 3,928,746, dated Dec. 23, 1975, Ser. No. 352,445, Apr. 18, 1973. Application for reissue May 17, 1976, Ser. No. 687,223

Claims priority, application Sweden, Apr. 18, 1972, 4964/72

Int. Cl.² B23K *9/10*

U.S. Cl. 219—135 **10 Claims**



1. A direct current power supply for manual arc welding having a steeply drooping, adjustable volt-ampere characteristic comprising

a polyphase transformer having a plurality of secondary output leads carrying mutually phase displaced voltages, a polyphase rectifier system connecting said secondary output leads to a pair of D.C. welding current conductors for supplying a direct current to a welding arc struck between a welding electrode and a workpiece, said polyphase rectifier system comprising a set of triggered rectifier valves connected one in series with each of said secondary output leads, said triggered rectifier valves having each a trigger terminal for initiating current flow through the valve,

means for periodically supplying igniting pulses to each of said trigger terminals, including means for causing the angular position of said pulses to vary in response to a direct current control signal,

means for generating said direction current control signal comprising the following means,

a. means for producing an adjustable direct current reference signal, including manually operable means for adjusting said reference signal,

b. means including a welding current sensing means for producing a welding current feed-back D.C. signal equal to the welding current flowing in the pair of

welding current conductors multiplied by a first factor of proportionality,

c. means including a welding voltage sensing means for producing a welding voltage feed-back D.C. signal equal to the voltage between the welding current conductors multiplied by a second factor of proportionality,

d. summing means for combining said reference signal, said welding current feed-back signal and said welding voltage feed-back signal into a compound signal constituting said control signal, both of said feed-back signals being supplied to said summing means in opposing relationship to said reference signal,

e. slope adjustment means comprising means for adjusting the proportion between said first and second factors of proportionality, and,

f. means linking said manually operable means for adjusting the reference signal and said proportion adjusting means to provide automatically a desired correlation between the slope of volt-ampere characteristic of the power supply and the reference signal setting.

Re. 29,401

METHOD AND APPARATUS FOR DIGITALLY MEASURING SPEED

John L. Aker, Chanute, Kans.; Donald L. Geist, Garland, Tex.; Freddie R. Kittle, St. John, and Fred M. Berry, Leawood, both of Kans., assignors to Kustom Electronics, Inc., Chanute, Kans.

Original No. 3,936,824, dated Feb. 3, 1976, Ser. No. 361,822, May 18, 1973. Application for reissue July 22, 1976, Ser. No. 707,535

Int. Cl.[2] G01S *9/46*

U.S. Cl. 343—8 **24 Claims**

23. A doppler radar device for use in law enforcement and service vehicle speed surveillance and for determining the speed of an approaching target vehicle when the radar platform vehicle is either moving or stationary, the device comprising:

a time base means;

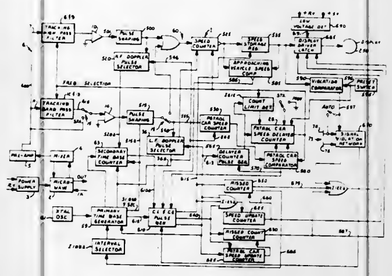
a single means for receiving a composite doppler signal having components relating to the speed of said target vehicle and the speed of the radar platform vehicle;

automatic gain control means for precluding said device from exceeding its dynamic range under preselected conditions;

means for separating said doppler signal frequency into a first frequency component and a second frequency component;

means for correlating the frequency of said first frequency component with said time base means;

means for correlating the frequency of said second frequency component with said time base means;



means for counting cycles of each of said time base correlated frequency components, said frequency components counting means operable to count each of said frequency components within preselected time increments, said time increments relating to said time base means;

means for subtracting said counter cycles of said first frequency component from said counted cycles of said second frequency components; and

means for displaying the result from said subtracting means in units indicative of speed of said approaching vehicle.

PLANT PATENTS

GRANTED SEPTEMBER 13, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,101

KALANCHOE PLANT

Adolf Grob, Saint Gall, Switzerland, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed July 27, 1976, Ser. No. 709,221

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe plant characterized particularly as to uniqueness by the combined characteristics of fast and compact growth; develops a large floral display with a minimum amount of basal growth required before removal of the apical tip; a relatively large flower having a bright red color; continuous flowering over a period of up to two months; suitable for production as small plants for pots, and by its production of vegetative cuttings that propagate very readily.

4,102

KALANCHOE PLANT

Adolf Grob, Saint Gall, Switzerland, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed July 28, 1976, Ser. No. 709,281

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe known by the cultivar name Feuerwerk II and particularly characterized as to uniqueness by the combined characteristics of relatively large foliage with highly crenated margins; relatively thick and strong peduncles which provide a more open placement of flowers; relatively large, dark red flowers; excellent growth qualities and vigor, with the growth being upright and compact; excellent flower placement, flower size and keeping qualities, and by its resistance to fading under high light and high temperature conditions.

4,103

KALANCHOE PLANT

Adolf Grob, Saint Gall, Switzerland, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed July 27, 1976, Ser. No. 709,282

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe plant known by the cultivar name Sirius and particularly characterized as to novelty by its vigorous growth; intense orange flower color; early flowering; excellent self branching; exceptionally large total flower size; excellent cutting production; well formed umbels that continue to develop over several weeks growth, and by its apparently great resistance to botrytis stem rot.

4,104

CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, both of Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed July 9, 1976, Ser. No. 703,901

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum known by the cultivar name Scintalizer and characterized particularly as to uniqueness by the combined characteristics of daisy inflorescence type with moderate longitudinal petal roll in opening stages, flat inflorescence from which reflexes slightly with age, diameter across face of inflorescence up to 4.0 inches at maturity, golden yellow ray floret color with slight bronzy overtones, medium green disc floret color at immature, unopened stage, minimal pollen development, uniform nine week flowering response, very tall plant height, semiupright branching habit, high percentage gradeout in top grades (SAF standards), and by its thin and weak peduncles during high light, high temperature periods (June through September).

4,105

CHRYSANTHEMUM PLANT

Sigvart Jorgensen, Shelby, N.C., assignor to Patterson's Flowers, Inc., Shelby, N.C.

Filed July 23, 1976, Ser. No. 708,288

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat. known by the cultivar name Snow Purple and particularly characterized as to uniqueness by the combined characteristics of decorative inflorescence type; flat inflorescence form; purple inflorescence color with uniform color oxidation; diameter across face of inflorescence up to 9 cm. at maturity; uniform eight week flowering response to photoperiodic short-day control; short plant height; and semi-spreading branching pattern.

PATENTS

GRANTED SEPTEMBER 13, 1977

ERRATA

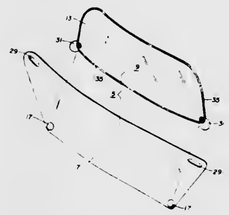
For CLASS	See PATENT NO.
051–106 R	4,047,338
051–313	4,047,343
215–224	4,047,495
206–620	4,047,660
180–141	4,047,728
428–539.5	4,047,897
096–115 R	4,047,963
096–126	4,047,964
108–155	4,048,059
260–002 AJ	4,048,100
260–002.5 E	4,048,101
260–002.5 AM	4,048,102
260–2.5 B	4,048,103
260–2.5 AN	4,048,104
260–2.5 AC	4,048,105
260.2.5 AV	4,048,106
260.002.5 AC	4,048,107
542–422	4,048,155
544–021	4,048,160
555–027	4,048,161
544–022	4,048,162
544–021	4,048,163
544–121	4,048,164
544–166	4,048,165
544–215	4,048,166
544–215	4,048,167
264–045.3	4,048,208
560–128	4,048,214
560–124	4,048,215
560–020	4,048,217
560–147	4,048,218
560–156	4,048,219
560–237	4,048,220
361–321	4,048,546
363–025	4,048,552
363–057	4,048,553
363–098	4,048,554
364–900	4,048,622
364–200	4,048,624
364–900	4,048,625
357–017	4,048,627

PATENTS

GRANTED SEPTEMBER 13, 1977

GENERAL AND MECHANICAL

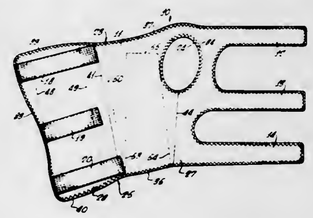
4,047,249
PROTECTIVE HELMET AND FACE SHIELD ASSEMBLY THEREFOR
Robert G. Booth, 6661 Banning Drive, Oakland, Calif. 94611
Filed Dec. 29, 1975, Ser. No. 644,848
Int. Cl.² A42B *3/00*; A61F *9/02*
U.S. Cl. 2—10 **3 Claims**



1. A helmet assembly comprising a helmet having an opening for the eyes, a face shield assembly for said helmet, said face shield assembly including a face shield adapted to cover an area substantially greater than said eye opening, means removably affixing said face shield to said helmet as a covering over said opening, and glare reducing means affixed to said face shield for reducing glare and removable with said face shield as a unit, said glare reducing means being protected by said face shield and covering said eye opening and having a rim on the periphery thereof and projecting outwardly from the plane of said glare reducing means to contact the surface of said helmet to maintain said glare reducing means spaced apart from said helmet to substantially prevent surface contact between said glare reducing means and said helmet, whereby marring of the surface of said glare reducing means is avoided, said glare reducing means and said face shield being spaced apart from each other by said rim to provide an air gap therebetween and spaced openings in said rim to provide air circulation between said face shield and said glare reducing means.

4,047,250
CONTOURED WRIST SUPPORT
Bill Norman, 14431 Galy, Tustin, Calif. 92680
Filed Oct. 12, 1976, Ser. No. 731,511
Int. Cl.² A11D *19/00*
U.S. Cl. 2—161 A **31 Claims**

1. A wrist support comprising
flexible sheet means adapted to extend around portions of the hand and wrist of the user thereof,
fastener means for holding said sheet means so extended around the hand and wrist, and reinforcement means for said sheet means, said reinforcement means including
a first reinforcing member carried by a first portion of said sheet means for overlying portions of the palm of the hand and inner surface of the wrist, said first reinforcing member having a compound curvature such that it is substantially complementary to said portions of the palm of the hand and inner surface of the wrist,
a second reinforcing member carried by a second portion of said sheet means for overlying portions of the back of the hand and wrist,
said second reinforcing member being substantially straight longitudinally and curved transversely such that it is substantially complementary to said portions of the back of the hand and wrist,



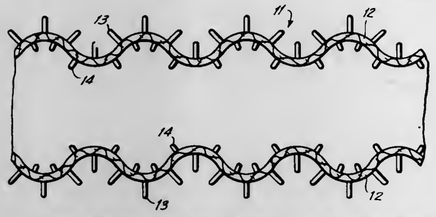
and a third reinforcing member carried by a third portion of said sheet means intermediate said first and second reinforcing members for overlying portions of the side edge of the hand and wrist.

4,047,251
GLOVE AND FORM AND METHOD FOR MAKING SAME
Glenn Francis Stockum, Arlington, Tex., assignor to Arbrook, Inc., Arlington, Tex.
Filed Sept. 20, 1976, Ser. No. 724,491
Int. Cl.² A41D *19/00*
U.S. Cl. 2—168 **4 Claims**



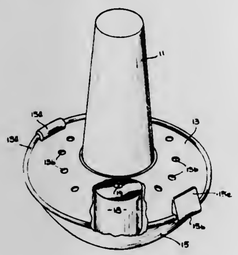
1. A medical glove adapted to tightly conform to the skin of a wearer's hand over the entire inner surface of said glove, comprising: a hand portion; an open end cuff portion; and a plurality of elongated finger-receiving compartments, each of said compartments having a top convexly curved section, a bottom convexly curved section and two opposed convexly curved side sections, said side sections being more sharply curved than said top and bottom sections and protruding outwardly to form air-venting channels when a finger of a wearer is partially inserted into said compartment.

4,047,252
DOUBLE-VELOUR SYNTHETIC VASCULAR GRAFT
William J. Liebig, Franklin Lakes, and German Rodriguez-M, Bergenfield, both of N.J., assignors to Meadox Medicals, Inc., Oakland, N.J.
Filed Jan. 29, 1976, Ser. No. 653,680
Int. Cl.² A61F 1/24
U.S. Cl. 3—1.4 30 Claims



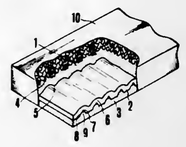
1. A warp-knitted, double-velour synthetic vascular graft of a material to which tissue can adhere, comprising a tubular trellis of a non-texturized yarn, said trellis being provided with a multiplicity of knitted fibrous loops of a texturized yarn projecting both outwardly and inwardly from the surfaces of said trellis and presenting a pile mat of filamentary material receptive to tissue ingrowth on the outer and inner surfaces of said trellis, the ratio of the length of said loop yarn to the length of said trellis yarn in said graft lying between 1.75 and 4.50 , said loops being effective to improve the rate of growth of tissue into said graft.

4,047,253
DEVICE AND METHOD FOR UNCLOGGING DRAINS
Tor H. Petterson, 31248 Palos Verdes Drive West, Palos Verdes Peninsula, Calif. 90274
Filed Nov. 28, 1975, Ser. No. 636,110
Int. Cl.² E03D 11/00
U.S. Cl. 4—255 14 Claims



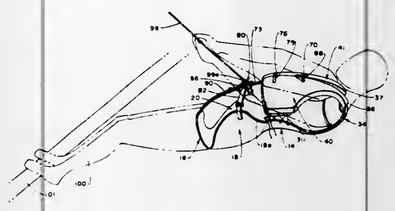
1. A device for use in unclogging a drain comprising:
means for forming a seal around the drain opening,
cartridge means having at least two materials retained thereby capable of effecting a reaction with each other to cause the immediate emission of gas at a substantial pressure,
means for retaining said cartridge means in fluid communication with said drain and within said seal, and
means for mixing said materials in said cartridge means with each other to effect said reaction whereby gas is immediately released into the drain at a substantial pressure to free the clogging substance therefrom.

4,047,254
MATTRESS CONSTRUCTION
Mituyoshi Hamasu, 31-13, 1-chome, Higashi Ikebukuro, Toshima, Tokyo, Japan
Filed Apr. 8, 1976, Ser. No. 674,910
Claims priority, application Japan, Dec. 13, 1975, 50-149000
Int. Cl.² A47C 27/08
U.S. Cl. 5—345 R 4 Claims



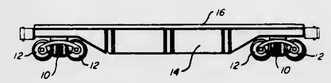
1. A mattress construction comprising an intermediate layer of a semi-rigid resin material having top and bottom surfaces with continuous outwardly projecting wave formations adjacent inwardly projecting concavities with the concavities of the bottom surface having a larger radiuus of concavities than that of the top surface and being formed in vertical alignment below the wave-shaped formations of said top surface, a top layer overlying said intermediate layer made of a resilient foam resin material and having a resiliency so as to become restored to its original shape after unloading, said top surface having a multiplicity of projections formed thereon in a regular spaced-apart pattern with concavities between adjacent projections, and a lower layer of a foamed resin material having a greater elastic restoring force than said top located below said intermediate layer.

4,047,255
FLOTATION HIKING HARNESS
James E. Kiefer, 2510 Lone Jack Road, Olivenhain, Calif. 92024
Filed May 4, 1976, Ser. No. 682,891
Int. Cl.² B63C 9/08
U.S. Cl. 9—337 11 Claims



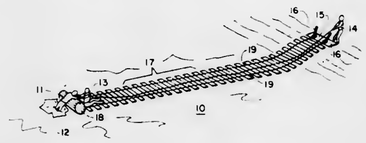
1. A flotation hiking harness comprising:
buckle means located approximately over the mid abdomen of the wearer;
a continuous back panel section covering the back of the wearer and having a bottom portion covering the buttock, said back section extending at one end up to the shoulders of the wearer;
a crotch section connected to the other end of the back section and extending between the legs of the wearer;
a pair of side sections each connected to one side of said back section and extending over the hips of the wearer and terminating short of said buckle means;
a shoulder section connected with said one end of said back section and extending across the shoulders of the wearer;
a pair of continuous front panel sections each connected at its upper end to said shoulder section and extending side by side down over the chest of the wearer and terminating above said buckle means; and
connecting means for connecting said buckle means to said crotch section, said side sections and said front sections.

4,047,256
BRIDGE CONSTRUCTION METHOD
Bernard Hasara, P.O. Drawer 2047, Coaroe, Tex. 77301
Filed Nov. 11, 1976, Ser. No. 740,807
Int. Cl.² E01D 1/00
U.S. Cl. 14—1 17 Claims



1. A bridge construction method comprising: removing the trucks and wheels from a flatbed type railroad car to provide a bridge substructure, preparing support means upstanding from an area to be bridged for emplacement of said substructure, and emplacing said substructure on said support means over said area.

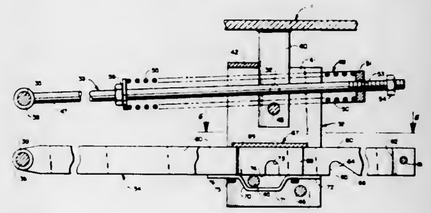
4,047,257
LIFE SAVING APPARATUS
Walter W. Bondarchuk, Sr., Greenport, N.Y., assignor to Lawrence Peska Assoc., Inc., New York, N.Y.
Filed May 21, 1976, Ser. No. 688,604
Int. Cl.² E01D 15/14
U.S. Cl. 14—27 4 Claims



1. A life saving device comprising a flexible elongated mat, which mat includes a plurality of rigid slats extending crosswise of the mat, each slat being affixed to the adjacent slats by means of at least one flexible member, which mat is terminated at its first end by a flotational member and at its second end by an anchoring member, the flotational member including a cylinder of rigid foamed polymer affixed to the mat in an orientation parallel to the slats.

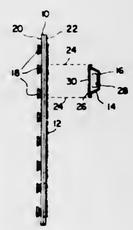
4,047,258
LIP LOCK WITH RELEASE AND COUNTERBALANCE FOR DOCK BOARD
Peter B. Burnham, Columbus, Ohio, assignor to Harsco Corporation, Camp Hill, Pa.
Filed Dec. 3, 1976, Ser. No. 747,078
Int. Cl.² E01D 1/00, 15/06
U.S. Cl. 14—71.3 12 Claims

1. A lip lock mechanism for releasable maintaining a lip pivoted to a leading edge of a loading ramp in a projected position comprising
a lock support suspended from the loading ramp for pivoted movement about a horizontal axis extending parallel to the leading edge of the ramp, said support displaced a distance rearwardly from the leading edge of the ramp with the horizontal axis being in downwardly spaced relationship to the ramp,
an elongated connector bar mechanically coupled with said lock support in vertically spaced relationship to the horizontal axis and extending forwardly with a leading end pivotally connected with the lip,
resilient biasing means interconnecting said bar with said lock support for normaly urging said bar in forwardly extending relationship but permitting relative rearward movement,
an elongated lock bar coupled with said lock support in vertically spaced relationship to the horizontal axis at a side opposite that to which said connector bar is coupled, said lock bar extending forwardly with a leading end thereof pivotally connected with the lip,
coupling means releasably connecting said lock bar with said lock support, said coupling means including a lock pin carried by said lock support in horizontally disposed relationship, and a lock plate connected in retained relationship with said lock pin for limited reciprocating movement thereto and engaged with said lock bar for sliding



movement longitudinally relative thereto, said lock plate having a notch formed therein for receiving said lock pin, said lock bar having a notch formed therein for receiving said lock pin, said lock bar notch having a surface formed at a forward side which, when said lock pin is received therein, prevents rearward movement of said lock bar and a surface formed at a rearward side which will cam the lock bar out of engagement with said lock pin as the lock bar is moved forwardly, and,
a lock release member carried by said lock support for engaging said lock bar upon pivoting of said lock support to move the lock bar out of locking engagement with said lock pin.

4,047,259
BODY WASHING APPARATUS
Leonard L. Lotis, 9115 Ridge Blvd., Brooklyn, N.Y. 11209
Filed May 20, 1976, Ser. No. 688,119
Int. Cl.² A47K 7/03
U.S. Cl. 15—104.92 4 Claims



1. A body washing apparatus comprising a flexible mat, first fastening means to removably secure a first lateral surface of said flexible mat to a mounting surface, a porous flexible soap container, second fastening means to removably secure said soap container to said mat, soap introducing means for selectively opening and closing said flexible soap container for the selective introduction and removal of a bar of soap therein, wherein said first fastening means includes a plurality of suction cups, said plurality of said suction cups fixedly secured to said first lateral surface, the open mouth portion of each of said

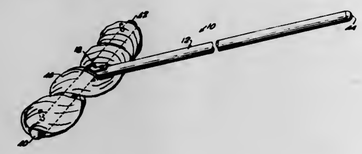
plurality of suction cups residing in a plane, said plane being disposed outwardly from and parallel with said first lateral surface, wherein said second fastening means comprises a fabric material, said fabric material being disposed outwardly on a second lateral surface of said mat, said second lateral surface being disposed on a side opposite to said first lateral surface of said mat, a gripping means on a surface of said soap container, said gripping means being fabricated from a plastic material, said second fastening means utilizing said plastic material having a plurality of fingers extending outwardly from said soap container, the free ends of said fingers being disposed in diverse directions, said free ends for releasably grasping said fabric material.

4,047,260

MOP AND DUSTING DEVICE

Bennett Deutsch, and Maria E. Deutsch, both of Rte. 1, Box 4820, Bonita Springs, Fla. 33923

Filed Dec. 29, 1975, Ser. No. 644,728
Int. Cl.² A47L *13/24*
U.S. Cl. 15—147 A **2 Claims**



1. A combination mop and dusting fabric holder comprising an elongated tubular handle member, and an elongated, substantially cylindrical tubular cross head member fixed at right angles relative to said handle member by a generally U-shaped bracket means defining a generally T-shaped assembly, said U-shaped bracket means comprising a pair of leg portions fixed to opposite sides of a first end portion of said tubular handle and a base portion fixed to the mid-portion of said cross head, said bracket leg portions being curved transversely, inwardly to conform with and engage against the contour of the outer circumference of said handle first end portion,

said bracket base portion being curved to conform with and engage against the contour of the outer circumference of said cross head, said handle first end portion terminating in an arcuate configuration bearing against and conforming with the contour of the outside diameter of said cross head,

a single rivet rigidly fixing said bracket leg portions and said handle first end portion,

a single rivet passing through the central portion of said cross head and said bracket at the juncture of said leg portions and said bracket base for rigidly coupling the same, a stud extending generally upwardly through each end portion of said cross head adjacent opposite ends of the cross head, each stud providing a headed lower end and an upwardly projecting portion, and

an elongated cap of a synthetic material press fitted over each said upwardly projecting portion and engaging the cross head to fix the stud.

4,047,261

MOP WRINGER

James M. Rones, P.O. Box 47200, Atlanta, Ga. 30340

Filed Aug. 24, 1976, Ser. No. 717,420
Int. Cl.² A47L *13/14, 13/58*
U.S. Cl. 15—261 **6 Claims**

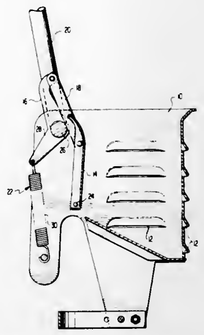
1. A downward pressure mop wringer comprising:

a. an open-topped hopper sized to receive a mop-head to be wrung and having apertures therein to permit exit of wrung out water;

b. a pressure plate mounted in said hopper for limited rotation about a first horizontal axis located towards the bottom of, and within, said hopper, said pressure plate being approximately vertically disposed in the normal state of the mop wringer;

c. a first crank-arm mounted for limited rotation about a second horizontal axis located towards the top of said hopper;

d. a link arm pivotably connecting said crank-arm to said pressure plate;



e. first means for causing rotation of said crank-arm so as to cause said pressure plate to rotate from its normal approximately vertical position to a position wherein it will exert downward pressure on a mop-head located in said hopper; and

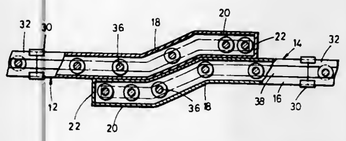
f. second means for causing rotation of said crank-arm so as to cause said pressure plate to rotate back to its normal position upon release of said first means.

4,047,262

DEVICE FOR INTERCONNECTING CURTAIN RODS

Takeshi Izawa, 1101, Shinmachi, Ikunocho, Asako, Hyogo, Japan

Filed Dec. 30, 1975, Ser. No. 645,352
Int. Cl.² A47H *1/04*
U.S. Cl. 16—96 D **4 Claims**



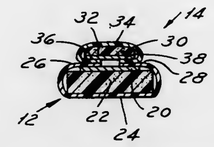
1. A device to be interposed between the opposed ends of two straight curtain rods aligned end-to-end for interconnecting the curtain rods, the device comprising two connecting rails joined together side by side in a horizontal plane and each having a track for guiding the movement of curtain carriers, each of the connecting rails including a straight portion having an open outer end to be connected to the corresponding straight curtain rod, a bent portion continuous with the straight portion and bent side-wise for a distance sufficient to deviate the the axis of said bent portion by the width of the rail in the horizontal plane; and an extension continuously extending from said bent portion with its axis in parallel to the axis of the straight portion and spaced apart therefrom by the width of the rail, the staight portion of each of the connecting rails being in axial alignment with the straight portion of the other connecting rail.

4,047,263

SOFT-FEEL HANDLE AND METHOD OF MAKING SAME

Kenneth V. Tietze, Algonac, Mich., assignor to Textile Trim, Inc., Fair Haven, Conn.

Filed Nov. 12, 1976, Ser. No. 741,303
Int. Cl.² B65D *25/28*
U.S. Cl. 16—125 **4 Claims**



1. An improved elongated soft-feel handle comprising:

a first handle part including an elongated metallic core having first and second sides, a first elongated cushioning member positioned on the first side of said core, and a first elongated thermoplastic sheath surrounding said core and said first cushioning member, and first sheath having first and second longitudinal edgespositioned on the second side of the metallic core;

a second handle part including a second elongated cushioning member and a second elongated thermoplastic sheath surrounding said second cushioning member, said second elongated sheath having first and second longitudinal edges positioned on one side of said second cushioning member; and

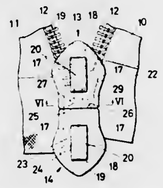
said first handle part and said second handle part joined together in an aligned relation so that each handle part overlies the longitudinal sheath edges of the opposite handle part.

4,047,264

SEPARABLE SLIDE FASTENER

Kibei Takahashi, Uozu, and Yositaka Higuchi, Kami-ichimachi, both of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 461,735, April 17, 1974, Pat. No. 3,900,926.
This application May 29, 1975, Ser. No. 581,811
Claims priority, application Japan, Apr. 20, 1973, 48-48146[U]
Int. Cl.² A44B *19/36*
U.S. Cl. 24—205.11 R **1 Claim**



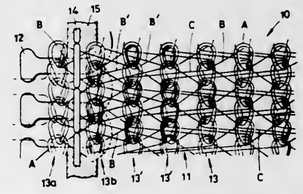
1. In a separable slide fastener of the class including a pair of stringers having longitudinal rows of interlocking fastener elements on their opposed edges respectively, a slider arranged on said rows of fastener elements for longitudinal movement therealong to engage and disengage the same, said slider having a pair of spaced-apart and interconnected wings disposed to define a generally Y-shaped guide channel therethrough, a box member arranged on one end of one of said stringers for limiting the movement of said slider, said box member having a pair of spaced-apart and interconnected plate portions having a guide channel therein, and a pin member arranged on the corresponding end of the other stringer for insertion through the guide channels of said slider and said box member, the improvement comprising means defining a pair of recesses and a pair of tongues having a configuration complementary to corrsponding recesses and disposed for insertion thereinto, each recess and corresponding tongue being disposed on respective confronting ends of said box member and slider, said tongues and recesses being generally trapezoidal to aid the in the alignment of said slider and box member when the tongues are received in the recesses, thereby aiding the insertion and removal through said guide channels of said pin member, said tongues and recesses each being positioned in generally central symmetrical relation to a corresponding one of said confronting ends of the box member and slider, each tongue being disposed for fully concealed insertion into a corresponding recess.

4,047,265

FASTENER STRINGER

Yoshio Matsuda, Nyuzen, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Feb. 23, 1976, Ser. No. 660,374
Claims priority, application Japan, Feb. 28, 1975, 50-25365
Int. Cl.² A44B *19/10*; D04B *23/12*
U.S. Cl. 24—205.16 C **5 Claims**



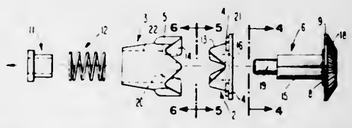
1. A fastener stringer which comprises a warp-knit tape and a row of interlocking fastener elements secured thereto by a line of stitching, said tape having a web portion of a relatively coarse interstice structure, a longitudinal edge portion consisting solely of knit-loop forming threads and bearing said row of fastener elements, and a connecting portion of a relatively fine interstice structure interconnecting said web portion and said edge portion transversely of the tape, said connecting portion being formed by threads constituting said web portion and said edge portion, respectively, the knit-loop forming threads of said longitudinal edge portion including chain stitches defining plural parallel longitudinal wales, a first tricot stitch spanning a plurality of wales, and a second tricot stitch spanning a greater plurality of wales than spanned by said first tricot stitch.

4,047,266

QUICK ACTION FASTENER

Robert H. Bisbing, Springfield, Pa., assignor to Southco, Inc., Concordville, Pa.

Filed Mar. 15, 1976, Ser. No. 666,766
Int. Cl.² A44B *17/00*
U.S. Cl. 24—221 R **3 Claims**



1. A quarter turn unitary snap fastener adapted for securing overlying outer and inner panels having coaxial and essentially orthogonal non-circular holes formed therein, comprising a rotatable stud having a head and a shank, said shank having a non-circular cross section over at least a portion of the length

of said stud, an outer cam element having an axial bore positioned over said shank with said shank free to rotate within said bore, said outer cam element comprising a flange adapted to engage the outer surface of the outer panel, inwardly extending cam surfaces integral with said flange adapted to be inserted through the holes formed in the outer and inner panels, a raised surface integral with the inner surface of said flange and adapted for engagement with the non-circular hole in the outer panel on insertion of the cam elements through said hole, thereby preventing rotation of said outer cam element relative to said panel, an inner cam element having an axial bore at least a portion of which is non-circular in cross section and which engages the non-circular portion of said shank and is adapted to rotate therewith while being free to move axially relative thereto and having outwardly extending cam surfaces adapted to engage the cam surfaces of said outer cam element thereby forming an enclosure for said stud, at least two projections integral with said inner cam element and extending radially a distance greater than the smaller diameter of the non-circular holes in said panels and less than the larger diameter of said holes, biasing means positioned to engage said inner cam element and urging said inner cam element toward the outer cam element, whereby said inner cam element is rotated and moved axially inward on rotation of said stud while said outer cam element is held in fixed position relative to said outer panel.

4,047,267

DEVICE IN CONNECTION WITH LOCKS FOR SAFETY BELTS

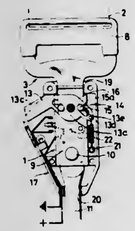
Oskar Leonart Lindblad, Hedasgatan, 16, Vargarda, Sweden

Continuation of Ser. No. 533,795, Dec. 18, 1974, abandoned. This application May 21, 1976, Ser. No. 688,767

Claims priority, application Sweden, Dec. 27, 1973, 7317454; Dec. 27, 1973, 7317453

Int. Cl.² A44B *19/00*; A62B *35/02*; B60R *21/10*

U.S. Cl. 24—230 AL **1 Claim**



1. A connector comprising a male tongue-shaped member, a female member having a pair of flat sidewalls, and means for releasably locking said male and female members to each other, said means comprising

a pair of opposed transverse slots in each of said side walls, said slots in one side wall registering with said slots in the other side wall,

a pair of pins each of which is guided by one of said slots in one side wall and the registering slot in the other side wall for transverse movement in said slots,

a pair of notches provided in the edges of said tongue-shaped member, each of said notches having a width sufficient to accommodate one of said pins, the edge of each of the notches nearest to the tip of said tongue-shaped member extending at right angles to the longitudinal axis of said tongue-shaped member,

a manually operable cam member for shifting said pins between an inner position in which said pins engage said notches and an outer position outside said notches, said cam member having a pair of opposed flat shanks each of which has a pair of camming slots engaging end portions of said pair of pins,

spring means urging said cam member towards a position in which said pins occupy their inner positions, and

said cam member being a lever pivotable about an axis extending at right angles to said parallel side walls between the inner ends of said opposed slots therein.

4,047,268

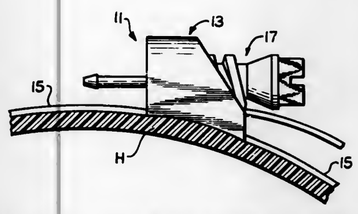
WORM GEAR CLAMPING APPARATUS

A. T. Buttriss, Fairview Park, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 21, 1976, Ser. No. 651,082

Int. Cl.² B65D *63/00*

U.S. Cl. 24—274 R **9 Claims**



1. A flexible, encircling, clamping apparatus comrpising:

a. a worm gear drive head;

b. a flexible strap member having a first end adapted to be attached to said worm gear drive head and a second end, said strap member having an inward side and an outward side, said outward side having a portion adjacent said second end defining partial internal threads;

c. worm member having external threads, threadably engageable with said internal threads, over a portion of its length, a flexible elongated guide portion projecting forwardly thereof; and means disposed at the rearward end thereof for rotating said worm member;

d. said worm gear drive head defining a strap-receiving opening extending axially therethrough for receiving said second end of said strap member;

e. said worm gear drive head defining a worm chamber adapted to receive said external threaded portion of said worm member rotatably disposed therein said worm chamber having a clearance with said worm when said worm is engaged with said partial internal threads of said second end within said chamber allowing rotation of said worm but preventing radial movement of said worm relative to said chamber sufficient to cause said worm to disengage from said partial internal threads;

f. said worm gear drive head including a forward wall portion defining a journal opening adapted to receive said elongated guide portion axially movable therein, said guide portion including a stop portion for limiting normal rearward axial movement of said guide portion relative to said journal opening;

g. said worm member defining an assembled position relative to said worm gear drive head with said external threads disposed within said worm chamber and in meshing engagement with said partial internal threads; and

h. said worm member defining a pre-assembled position relative to said worm gear drive head with said stop portion disposed adjacent said forward wall, said guide portion disposed within said worm chamber and said external threads disposed rearwardly of said worm gear drive head to permit said worm member to be pivoted away from said strap member, disengaging said external threads from said partial internal threads and permitting free axial movement of said strap member relative to said worm gear drive head.

4,047,269

METHOD AND APPARATUS FOR PRODUCING ORNAMENTALLY PATTERNED, NEEDLED, NONWOVEN PILE FABRICS

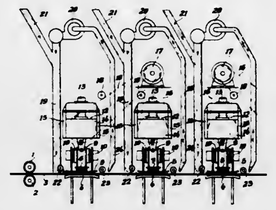
Herbert Lochner, Kempen, Germany, assignor to cikalon-Vliesstoff-werke GmbH, Kempen, Germany

Continuation-in-part of Ser. No. 455,897, March 28, 1974, abandoned. This application June 24, 1976, Ser. No. 699,599

Claims priority, application Germany, Apr. 7, 1973, 2317637

Int. Cl.² D04H *18/00, 11/00*

U.S. Cl. 28—109 **10 Claims**



1. A method for producing needle nonwoven pile fabric having a back side and a front side and consisting of a reinforced fabric web of backing material having needled thereinto loose staple fibers forming a visible pile layer on the front side of said fabric, said pile layer being composed of loose fibers of different types, said method comprising the steps of providing a needling machine for needling loose staple fibers into a backing web in an overall predetermined ornamental pattern, said needling machine including a plurality of needling stations each including needle means, said needle means of each one of said plurality of needling stations being arranged to needle loose fibers into said backing web in a pattern which consitutes one part only of said overall predetermined ornamental pattern, each of said plurality of needling stations being adapted to needle into said backing web one type of said different types of loose fibers, introducing said reinforced backing web into said needling machine with one side thereof facing upwardly and with the opposite side facing downwardly, intermittently passing the backing web through said needling stations in a given feed direction, delivering one type of said different types of loose staple fiber material upon said upwardly facing side of said web at a point upstream from each one of said plurality of needling stations, distributing said fiber material upon said web by operation of roller means extending across said web at a point upstream of each one of said plurality of needling stations to impart a predetermined thickness of fiber material upon said web, intermittently stopping said web with selected sections thereof located to be engaged by said needle means of each of said plurality of needling stations, operating said needle means of each of said plurality of needling stations to attach said fibers to said web at each of said plurality of needling stations in a pattern which forms a part of said overall predetermined ornamental pattern within the range of said selected sections of said web, said needle means operating to form said fibers as a visible pile on the downwardly facing side of said web to form said downwardly facing side as the front side of said fabric, with said upwardly facing side being formed as the back side of said fabric, and applying suction to the upwardly facing side of said web downstream of each one of said plurality of needling stations to withdraw from said web substantially all loose fibers of said one type delivered upstream of said one needling station and not attached to said web by said needle means of said one needling station, each of said needling stations having said needle means arranged thereat to apply said one type of fiber material delivered to each individual one of said plurality of needling stations in a pattern which constitutes one part only of said overall predetermined ornamental pattern to be produced, with intermittent passage of said web to all of said needling stations operating to provide the entire overall pattern upon said web, said suction means operating to insure that only said one type of loose fiber material delivered upstream of each one of said plurality of needling stations is needled into said web by said one needling station of said plurality of needling stations to avoid intermingling of one type of loose staple fiber material with another type of loose staple fiber material at an individual one of said plurality of needling stations.

4. Apparatus for producing needled nonwoven pile fabric having a back side and a front side, and consisting of a fabric web of backing material having needled thereinto loose staple fiber material forming a visible pile layer on the front side of said fabric comprising a plurality of needling stations each including needle means for needling said loose staple fiber material into said backing web in a predetermined pattern, means for intermittently passing said backing web through said needling stations with one side thereof facing upwardly and with its opposite side facing downwardly and for stopping said web with selected sections thereof located to be engaged by said needle means, means for delivering said loose staple fiber material upon said upwardly facing side of said web at a point upstream from each of said needling stations, said needle means being located on the upper side of said web and operable to attach said fiber material to said web in said predetermined pattern within the range of said selected sections of said web with said fiber material forming a visible pile on the downwardly facing side of said web to form said downwardly facing side as the front side of said fabric, with said upwardly facing side being formed as the backside of said fabric, and suction means located on the upper side of said web downstream of each of said needling stations to withdraw from said upwardly facing side of said web loose fiber material not attached thereto by said needle means, each of said needling stations having said needle means arranged thereat to apply said fiber material in a pattern which constitutes one section only of an overall predetermined pattern to be produced, with intermittent passage of said web through all of said needling stations operating to provide the entire overall pattern upon said web, said suction means operating to insure that only loose fiber material delivered upstream of each one of said needling stations is needled into said web by said one needling station to avoid intermingling between fiber material delivered upstream of different needling stations.

4,047,270

APPARATUS FOR SEPARATING OBJECTS

Heinz John, Berneck, Switzerland, assignor to Lindauer Dornier Gesellschaft mbH., Germany

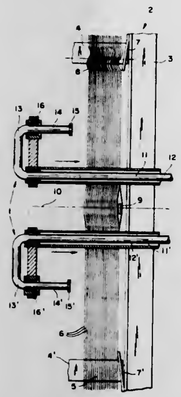
Filed Sept. 4, 1974, Ser. No. 495,087

Int. Cl.² D03J *1/14*; B66C *1/02*

U.S. Cl. 28—205 **1 Claim**

1. An apparatus for separating objects, particularly for drawing off individual heddles from a pack, comprising two substantially U-shaped, pivotal, reciprocatable pipe means adapted to be mounted adjacent a pack of heddles and to

contact a heddle with the end thereof in the working position thereof,



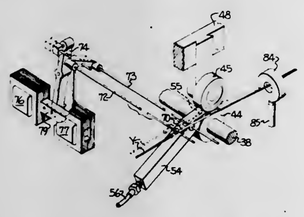
magnetic means slidably mounted on said pipe means, and means for creating a partial vacuum in said pipe means.

4,047,271

METHOD FOR SPACE DYEING YARN

James G. T. Paterson; Charles W. Watkins, both of Chattanooga, Tenn., and Grover G. Duckworth, Jr., Dalton, Ga., assignors to Interdye Technology Corporation, Dalton, Ga.

Filed Jan. 2, 1976, Ser. No. 646,352
Int. Cl.² D06B *1/14, 11/00*
U.S. Cl. 28—220 **16 Claims**



1. A method of applying dye to spaced apart portions of a yarn to provide a patterned color effect and characterized by high production and substantially complete penetration of the dye into the yarn, and comprising the steps of

advancing a yarn along a path of travel which is laterally spaced from the nip of a pair of operatively rotating applicator rollers, while

supplying a dye to the peripheral surface of at least one of the applicator rollers, and while

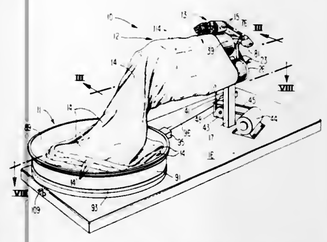
intermittently deflecting the advancing yarn into and out of the nip of the applicator rollers, such that those portions of the yarn which pass through the nip are subjected to a rapidly applied compressive force in the nip to cause the dye carried by the rollers to deeply penetrate into the yarn.

4,047,272

MACHINE FOR CONTINUOUS BIAS CUTTING OF TUBULAR FABRIC

J. Frank King, and Donald A. Sloan, both of Winston-Salem, N.C., assignors to Hanes Corporation, Winston-Salem, N.C.

Filed Dec. 29, 1975, Ser. No. 644,569
Int. Cl.² B21D *43/00;* **B26D** *3/16;* **B65H** *17/08*
U.S. Cl. 29—2.19 **14 Claims**



1. In a machine for continuously cutting an elongated tube of fabric into a plurality of individual helically cut strips and winding the cut strips into a plurality of fabric rolls, said machine including a support, fabric cutting and rolling means mounted on the support for cutting the fabric into strips and forming the strips into rolls, and a fabric supply spaced longitudinally from the support, the improvement comprising:

a. a plurality of skewable, longitudinally disposed, transversely spaced, rotatable cylinders mounted on the support for supporting the fabric tube in open condition and advancing the tubular fabric axially from the supply to the cutting means,

b. drive means for driving rotatably at least one of the cylinders, to cause the tubular fabric to rotate about its axis as the fabric advances to the cutting means,

c. adjustment means for skewing the cylinders selectively relative to the support, to cause the tube of fabric to advance to the cutting means at a selected rate of speed,

d. a rotatable receptacle for storing the supply of fabric,

e. drive means for rotating the receptacle,

f. speed adjustment means for correlating the speed of rotation of the receptacle with the speed of rotation of the tube of fabric as the fabric advances to the cutting means and

g. freely rotatable spreading means interposed between the receptacle and the cylinders to open and tension the fabric tube, said spreading means being rotated by the rotating and advancing tube of fabric to maintain the fabric under substantially uniform tension and to permit the fabric to remain substantially untwisted as it advances to the cylinders.

4,047,273

DEFLECTION COMPENSATING ROLL

Mario Biondetti, Schio, Italy, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Nov. 3, 1976, Ser. No. 738,561
Claims priority, application Switzerland, Nov. 5, 1975, 14255/75
Int. Cl.² B21B *13/02*
U.S. Cl. 29—116 AD **10 Claims**

1. A deflection compensating press roll comprising:

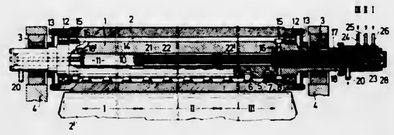
a. a stationary axial support beam having a central bore extending therethrough;

b. a roll shell rotatably disposed about said support beam to rotate thereabout;

c. a plurality of hydrostatic support elements positioned in engaged relation between said beam and said shell to exert forces therebetween;

d. a plurality of coaxial ducts disposed in the central bore of said axial support beam, said ducts being capable of transmitting hydrostatic pressure fluid therethrough to feed said hydrostatic support elements, each of said ducts having apertures selectively positioned for entry and exit of hydrostatic pressure fluid;

e. means to selectively direct hydrostatic pressure fluid to said ducts for feeding said hydrostatic support elements with said fluid; and



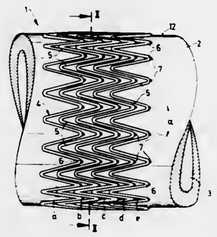
f. sealing means selectively disposed in engaged relation with said coaxial ducts to define a plurality of separate of distinct sealed hydrostatic pressure fluid paths, each sealed hydrostatic pressure fluid path being associated in communicating relation with a group of at least on hydrostatic support element such that the hydrostatic pressure fluid directed to each group of said elements is independently selectable.

4,047,274

SUPPORT FOR CONTINUOUSLY CAST HOT METAL COMPONENTS

Rolf Lehmann, Mutschellen, AG, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Aug. 16, 1976, Ser. No. 714,365
Claims priority, application Switzerland, Aug. 18, 1975, 10705/75
Int. Cl.² B65G *47/00*
U.S. Cl. 29—121.4 **14 Claims**



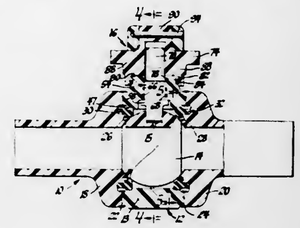
1. An apparatus for supporting hot metal components such as continuously cast slabs produced in a continuous casting plant which comprises a generally cylindrical roll member having at least one generally elongated member configured to form at least one coil defining a series of undulations disposed about surface portions of the roll member, said undulations having substantially straight portions which extend at acute angles to each other and are connected by generally arcuate portions, said coil being secured to surface portions of said roll member at positions spaced thereabout and adapted to support said hot metal components.

4,047,275

METHOD OF ASSEMBLING VALVES

Earl A. Bake, and Leonard J. Stephens, both of Pittsburgh, Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sept. 17, 1975, Ser. No. 614,206
Int. Cl.² F16K *27/10*
U.S. Cl. 29—157.1 R **15 Claims**



1. A method of assembling a plastic ball valve having a unipartite housing comprising the steps of:

a. inserting a valve stem through a main body portion of the valve;

b. positioning a valve member in said main body portion in engagement with and rotatably by said stem;

c. mounting a valve seat and seat retainer in an end body portion of the valve;

d. heating by bringing a heater into intimate contact with area of said plastic ball valve at or near the inner end of said end body portion and one end of said main body portion; and

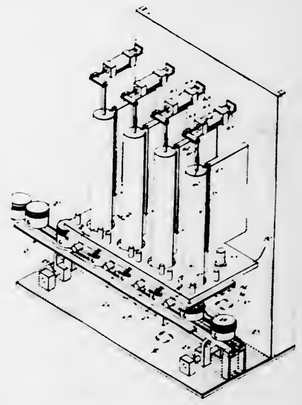
e. pressing said end of said body portions together for fusing.

4,047,276

APPARATUS FOR DISPENSING RINGS AND FOR APPLYING PISTON RINGS TO PISTONS

Norbert C. Albers, Cincinnati, Ohio, assignor to Designeers Midwest, Cincinnati, Ohio

Filed Nov. 28, 1975, Ser. No. 636,057
Int. Cl.² B23P *19/08, 15/10*
U.S. Cl. 29—222 **13 Claims**



2. Apparatus for applying rings to pistons comprising:

a plurality of longitudinally spaced vertical tubes, each tube adapted to receive a stack of rings,

a lip projecting from the lower end of each tube,

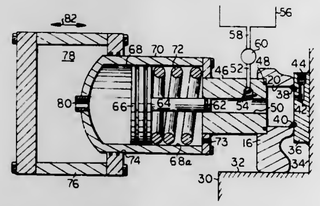
means for dropping rings one at a time onto said lip,
a ring spreader located adjacent each said lip to engage and spread open a ring,
means to lower each said spreader into position around a piston, and
conveyor means for advancing a series of longitudinally-spaced pistons sequentially into position under respective tubes, to receive rings one at a time.

4,047,277

TRACK LINK PIN BORE - HYDRAULICALLY PRESTRETCHED

Duane L. Burk, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 14, 1975, Ser. No. 595,650
Int. Cl.² B23P *17/00, 19/02*
U.S. Cl. 29—421 R **3 Claims**



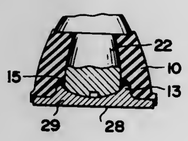
1. A method of preparing a pin in tight press-fitting relation within a bore in a workpiece, comprising:
sizing and locally strengthening a bore in a workpiece by the steps comprising:
establishing a predetermined size for the bore;
forming an undersized version of said bore in a workpiece;
increasing the size of said bore by the steps of applying a hydrostatic pressure to the walls of said bore, raising said pressure to exceed the yield strength of said workpiece locally of the walls of said bore and continuing said pressure until the walls of said bore have yielded and deformed to said predetermined size and been locally strengthened; and
press-fitting a pin within said bore.

4,047,278

METHOD OF MANUFACTURING HAMMER

Yoshio Kurata, 2-17, Joto 5-chome, Kofu, Yamanashi, Japan

Filed Nov. 8, 1976, Ser. No. 739,488
Claims priority, application United Kingdom, Apr. 20, 1976, 15914/76
Int. Cl.² B23P *17/00*
U.S. Cl. 29—424 **9 Claims**



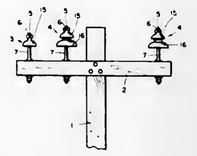
1. A method of manufacturing a hammer having a hammer head with a head face formed on one end of the hammer, and an adapter with an inner adapter face formed on the inner side of the adapter and a working face formed on the opposite side of the adapter for striking a workpiece, said hammer head and said adapter being secured to each other through a resilient connecting member and with said head face and said adapter inner face being in contact with each other in a predetermined positional relationship therebetween so that upon impact applied on said working face said adapter is rotated about its central axis with respect to said hammer head against the resilient force of said connecting member in a direction from a predetermined position, and upon removal of the impact force said adapter returns automatically to its original position by means of the resilient force of said connecting member, comprising the steps of:
a. applying lubricant to the contact area of said head face and said adapter face;
b. positioning said hammer head and said adapter to each other with said head face and said adapter inner face in contact with each other in said predetermined positional relationship;
c. applying a bonding agent onto adjoining peripheral portions of said hammer head and said adapter to temporarily bond said hammer head and said adapter to each other; and
d. providing heat melted thermo-meltable elastic material over peripheral portions of said hammer head and said adapter including therebetween said bonding agent which has been applied to said adjoining peripheral portions so as to form said resilient connecting member with said elastic material to permanently secure said hammer head and said adapter to each other.

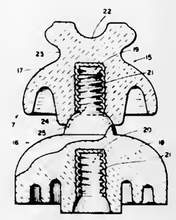
4,047,279

UPGRADING CURRENT DISTRIBUTION INSULATORS

Ernest E. Pettit, Independence, Mo., assignor to W. Leon Sell; Ernest E. Pettit and R. Don Sell, all of Independence, Mo.

Filed Oct. 26, 1976, Ser. No. 735,829
Int. Cl.² H02G *1/00*; H01B *17/20*
U.S. Cl. 29—426 **5 Claims**





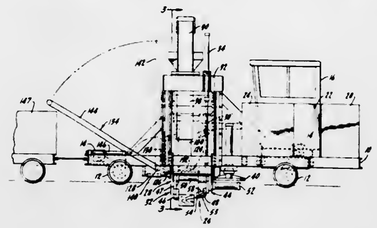
1. A method for upgrading a current distribution system which includes a support member for an insulator, a mounting stud that is externally threaded at one end and the other end of which is secured to the support member, an existing insulator having a threaded receptacle therein and which is thereby attached to the threaded end of the mounting stud, and a current conductor attached to the existing insulator, comprising the steps of:
a. unsecuring said mounting stud from said support member, said mounting stud when unsecured being rotatable within a channel which extends through said support member, the mounting stud having a base that abuts the support member externally of said channel and an extension below the base which passes through said channel and external threads on the outer end of said extension and a nut on said threads, and wherein the mounting stud is unsecured by loosening the nut without removing the same from said stud;
b. detaching the mounting stud from the existing insulator by rotation of the stud as it remains within said channel, said existing insulator including an upper conductor receiving means wherein the current conductor is received and including securing means connected with said insulator and said current conductor for retaining said current conductor with respect to said insulator and preventing relative rotation between said insulator and said current conductor;
c. attaching said stud to an additional insulator;
d. attaching the additional insulator to the existing insulator, and
e. resecuring said stud to the support member, and wherein said current conductor remains attached to the existing insulator during execution of the aforesaid steps.

4,047,280

METHOD FOR REMOVING TIES UNDER RAILROAD TRACK

Andrew M. Dieringer, Waterford, and Ervin M. Sheperd, Milwaukee, both of Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Continuation of Ser. No. 452,007, March 18, 1974, abandoned. This application Aug. 5, 1976, Ser. No. 711,804
Int. Cl.² B23P *19/02*
U.S. Cl. 29—427 **32 Claims**



1. A method usable in removing plate cut ties from beneath tie plate supported rails of a railroad track, including the step of simultaneously removing the wood from the top of the tie and removing the tie plates from between the rails and ties.

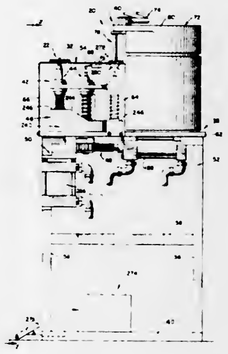
4,047,281

METHOD OF SETTING BLIND RIVETS

Anthony E. Di Maio, and Joseph G. Todisco, both of Georgetown, Mass., assignors to Marson Corporation, Chelsea, Mass.

Division of Ser. No. 581,954, May 28, 1975, Pat. No. 4,005,519. This application Aug. 17, 1976, Ser. No. 715,002
Int. Cl.² B23P *19/00*
U.S. Cl. 29—429 **5 Claims**

1. A method for enabling the continuous and automatic setting of blind rivets having a head portion and a mandrel which comprises the steps of feeding individual rivets to respective ones of a plurality of rivet holding assembly means at a loading station, successively and incrementally advancing the rivets in a first predetermined path such that they travel from at least the loading station to a working station, automatically displacing respective ones of the rivet mandrels operatively held by the holding assemblies at the working station in a second predetermined path such that the rivet mandrel is ruptured and the remainder of the rivet is set in the material, and supporting the material to be riveted in a generally horizontal plane at the working station such that the rivet is situated above the plane for enabling insertion into the workpieces.

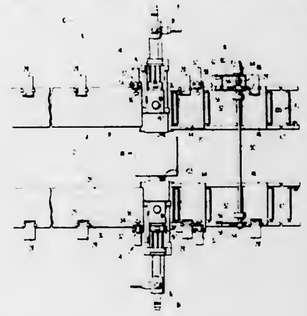


4,047,2?7

METHOD OF JOINING WOODEN MEMBERS

John Calvin Jarelt, Coral Gables; Adolfo Castillo; Roy Leutwyler, both of Miami; Larry Brodsky, Sunrise, and Ben Kushner, Miami, all of Fla., assignors to Automated Building Components, Inc., Miami, Fla.

Division of Ser. No. 565,756, April 7, 1975, Pat. No. 3,985,278, which is a continuation-in-part of Ser. No. 488,006, Dec. 12, 1974, Pat. No. 3,913,816, which is a continuation of Ser. No. 317,095, Dec. 20, 1972, abandoned. This application Apr. 19, 1976, Ser. No. 678,393
The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.
Int. Cl.² B23P *11/00*
U.S. Cl. 29—432 **28 Claims**



1. A method for joining a pair of wooden members by applying a sheet metal connector plate, of the type having integrally struck teeth projecting from one side thereof, to the wooden members at their juncture comprising the steps of:
providing a coiled strip of sheet metal,
feeding the metal strip from the coil through a die set,
actuating said die set to form teeth in the metal strip,
feeding the metal strip with the teeth formed therein into the path of movement of a presshead carrying a cutting edge thereby defining relative to the cutting edge a predetermined line of cut along the metal strip,

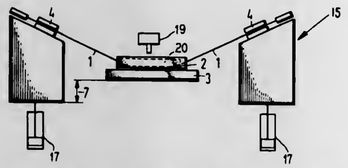
providing a reaction surface cooperable with the cutting edge and comprising a guide surface with a plurality of tines defining a plurality of laterally spaced recesses,
locating and guiding the teeth of the strip along the recesses as the strip is fed into the path of movement of the presshead, engaging the strip to the tines with the teeth of the strip within the recesses of the tines
advancing the tines to feed the strip into the path of movement of the presshead,
displacing the presshead to engage the cutting edge and reaction surface tines along opposite sides of the strip and along its predetermined line of cut and, upon continued displacement of the presshead, cutting the strip to form a connector plate of predetermined length, and
pressing the teeth of the connector plate thus formed into one side of the adjoining wooden members upon continued displacement of the presshead in the same stroke thereof.

4,047,283

METHOD AND APPARATUS FOR CONNECTING INDIVIDUAL LIGHT WAVEGUIDES

Dieter Kuaze, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 1, 1976, Ser. No. 701,497
Claims priority, application Germany, July 10, 1975, 2530883
Int. Cl.² G02B 5/14
U.S. Cl. 29—466 **12 Claims**



1. A method of connecting a pair of individual light waveguides in end-to-end light transmitting relationship in a splicing element, said method comprising providing a splicing element holder and a pair of spaced waveguide clamping devices which are spaced from the holder; securing a splicing element having a longitudinal extending centering groove with a base in the holder with the groove opening toward the pair of spaced clamping devices clamping a light waveguide in each clamping device with an end portion of each waveguide extending toward the base of the centering groove at an acute angle; creating relative movement between the holder and the pair of clamping devices to insert the end of each of the waveguides into the centering groove of the splicing element, to bring the end faces of the pair of waveguides in contact with each other and to cause the end portions of the waveguides to bend and to move into the centering groove for axial alignment therein; and then securing the aligned end portions in the splicing element.

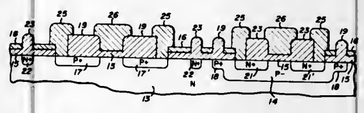
4,047,284

SELF-ALIGNED CMOS PROCESS FOR BULK SILICON AND INSULATING SUBSTRATE DEVICE

Gregorio Spadea, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 575,655, May 8, 1975, Pat. No. 3,983,620.
This application June 17, 1976, Ser. No. 697,178
Int. Cl.² B01J 17/00
U.S. Cl. 29—571 **2 Claims**

1. The method for manufacture of a silicon semiconductor device comprising the steps of:
forming a first oxide layer over the surface of a semiconductor substrate of a first conductivity type,
masking said first oxide layer and thereafter etching an opening in said first oxide layer over a first region in said substrate,
diffusing a dopant into said first region to form a region of a second conductivity type in said substrate,
removing the remainder of said first oxide layer,
forming a second oxide layer over the surface of said substrate,
forming a silicon nitride layer over said second oxide layer,
masking and etching said silicon nitride and said second oxide layer to form openings therein spaced from said first region,
diffusing a dopant through said latter openings to form source and drain regions of said second conductivity type in said substrate, thus forming a silicon oxide layer in said exposed opening,
masking and etching said silicon nitride and said second oxide layer to form openings therein over said first region,



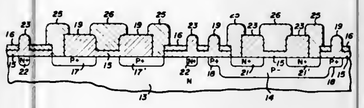
diffusing a dopant through said latter openings to form source and drain regions of said first conductivity type in said first region, thus forming a silicon oxide layer in said exposed openings,
masking and etching a portion of the silicon oxide layer over each of the source and drain regions to form contact openings to said regions, said silicon nitride layer serving as an outer boundary mask for said openings over said source and drain regions,
etching away said silicon nitride layer at said gate regions,
depositing a metallization layer over the device,
masking to define the metal connect and interconnect openings in said metal layer, and
etching the metal to form the gate electrodes and the source and drain connects.

4,047,285

SELF-ALIGNED CMOS FOR BULK SILICON AND INSULATING SUBSTRATE DEVICE

Gregorio Spadea, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 575,655, May 8, 1975, Pat. No. 3,983,620.
This application June 17, 1976, Ser. No. 697,290
Int. Cl.² B01J 17/00
U.S. Cl. 29—571 **1 Claim**



1. The method for manufacture of a silicon semiconductor device comprising the steps of:
forming a first oxide layer over the surface of a semiconductor substrate of a first conductivity type,
forming a silicon nitride layer over said first oxide layer,
masking said layers and thereafter etching openings through said layers such that said silicon nitride layer and said oxide layer are left at those regions where drain, source and gate regions are to be subsequently formed,
masking all those regions where channel transistors of said first conductivity type are not to be formed and leaving exposed those regions where such channel transistors are to be formed in said substrate,
ion implanting a thin layer of a second conductivity type in said first conductivity type channel transistor regions in said substrate,
removing said last mentioned mask and driving said ion implanted layer into said substrate,

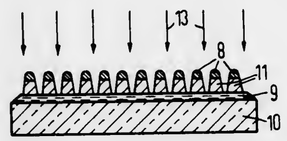
growing a thermal oxide layer over those regions not protected by a silicon nitride layer,
masking and etching said silicon nitride layer and first oxide layer to form openings at the second conductivity type channel transistor source and drain regions,
diffusing a dopant through said latter openings to form source and drain regions of said conductivity type in said substrate,
masking and etching said silicon nitride layer and first oxide layer to form openings at the first conductivity type channel transistor source and drain regions,
diffusing a dopant through said latter openings to form source and drain regions of said first conductivity type in said substrate,
etching the silicon nitride layer at the gate regions,
depositing a metallization layer over the device,
masking to define the metal connect and interconnect openings in said metal layer,
and etching the metal to form the gate electrodes and source and drain connects.

4,047,286

PROCESS FOR THE PRODUCTION OF SEMICONDUCTOR ELEMENTS

Udo Lob, Eichenau, and Fritz Scheidel, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 13, 1976, Ser. No. 686,137
Claims priority, application Germany, May 20, 1975, 2522346
Int. Cl.² B01J 17/00
U.S. Cl. 29—578 **7 Claims**



1. A method of manufacturing semiconductor elements which includes taking a large-area semiconductor wafer, forming at least two zones therein of different conductivity type, metallizing at least one side of said large area wafer, forming a soft-solder layer on one metallized side, bringing a perforated plate under pressure against said soft-solder layer while the soft-solder is raised to its melting temperature, the perforations in said perforated plate corresponding to the size and shape of the small-area wafers to be formed, whereby surfaces are formed some of which are covered by soft-solder and some of which are not covered by soft-solder, cooling the large-area wafer and withdrawing said perforated plate, subjecting the said surfaces to a sand blast with said soft-solder surfaces acting as a mask, thereby causing the unmasked non-soldered areas of said large area wafer to be removed leaving only the number of small areas still covered by the solder.

4,047,287

METHOD FOR FORMING A HIGH FREQUENCY ANTENNA

Howard H. Hubbard, Scituate, and Thomas P. Walsh, Marshfield, both of Mass., assignors to Antennas for Communications, Inc., Ocala, Fla.

Continuation of Ser. No. 328,370, Jan. 31, 1973, abandoned. This application Feb. 18, 1975, Ser. No. 550,629
Int. Cl.² H01Q 17/00; B28B 7/10
U.S. Cl. 29—600 **9 Claims**

1. A method for forming a horn-reflector antenna from a mold having at least two horn sections for forming the horn portion of the antenna and a reflector section for forming the reflector portion of the antenna, each of said horn sections having a lower apex end and an upper end of greater circumference than the apex end for forming respectively the apex end and upper end of the horn portion of the antenna, said reflector section including a front end for forming the antenna portion defining said open area, and the method comprising:
removably securing the horn sections together;
removably securing the reflector section to said secured horn sections, so that one of the horn sections is closer to the front end of the reflector section than the other horn section;
forming said antenna is a single piece so that the inner antenna surface conforms substantially to the outer surface of said attached horn and reflector sections of said mold without causing a permanent attachment of the mold with the formed antenna;





disconnecting the reflector section from the horn sections;
removing the reflector section from the antenna via said open area;
disconnecting the horn sections;
removing said one horn section closest to said open area from the antenna via said open area; and
removing the other said horn section from the antenna via said open area after removing said one horn section.

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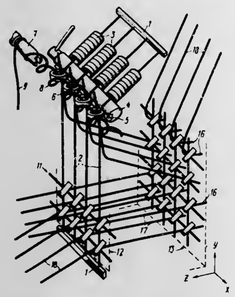
METHOD OF MANUFACTURING 3-D MEMORIES

Jury Alexandrovich Burkin, Tsvetnoi proezd, 29, kv. 24, Novosibirsk, U.S.S.R.

Continuation of Ser. No. 562,118, March 26, 1975, abandoned. This application Mar. 17, 1976, Ser. No. 667,585
Claims priority, application U.S.S.R., Apr. 3, 1974, 2011776; Apr. 8, 1974, 2016331
Int. Cl.² H01F 41/08
U.S. Cl. 29—604 **4 Claims**

1. A method of manufacturing triple coincidence access 3-D memories comprising the steps of:
a. providing a plurality of flat two dimensional matrices, threaded with wires along three directions of the Cartesian system, by the steps of:
arranging wires prestrung with cores in a first coordinate direction;
securing said wires under tension in pick-up assemblies;

detaching the cores on said wires and orienting said cores in rows along a second coordinate direction;
threading the cores in each of said rows in the second coordinate direction by wires coiled into helices;
threading the cores in each of said rows in a third coordinate direction;
straightening each of said helices to form lines of cores along said second coordinate direction; and



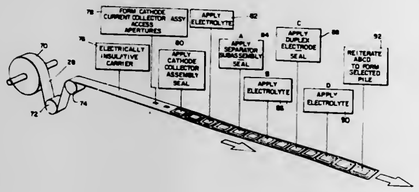
fixing said straightened wires and said pick-up assembly wires in a flat 2-dimensional matrix;
b. moving said flat two-dimensional matrix along the wires of said third coordinate direction; and
c. securing said third coordinate direction wires of said matrix in pick-up assemblies of the 3-D memory.

4,047,289

METHOD FOR FORMING A SLURRY BATTERY CELL

Otto E. Wolff, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 514,458, Oct. 15, 1974, abandoned. This application June 7, 1976, Ser. No. 694,026
Int. Cl.² H01M *4/04*
U.S. Cl. 29—623.4 **11 Claims**



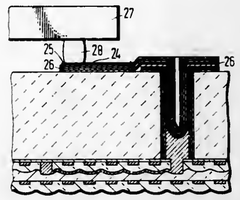
1. The method of forming a planar battery cell electrode comprising a particulate dispersion of active electrode material in aqueous electrolyte, comprising the steps of depositing a dispersion of said particulate active electrode material in a solution of water and a water-soluble binding agent on at least a portion of the surface of a select component of said cell, drying said dispersion sufficiently to provide a manipulatory laminar subassembly of said particulate material adhered to said component by said binding agent, positioning said subassembly at an electrode defining site, and wetting said particulate material with an aqueous electrolyte solution in which said binding agent is soluble to dissolve said binding agent and thereby form an aqueous slurry of said particulate material.

4,047,290

PROCESS FOR THE PRODUCTION OF A MULTI-CHIP WIRING ARRANGEMENT

Artur Weitze, and Michail Sapunarow, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 2, 1975, Ser. No. 609,687
Claims priority, application Germany, Sept. 10, 1974, 2443287
Int. Cl.² H05K *3/06, 3/10*
U.S. Cl. 29—625 **6 Claims**



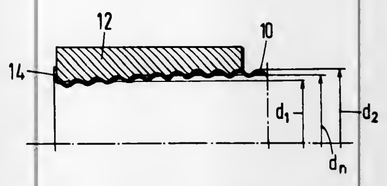
1. A method for producing a multi-chip wiring arrangement on a carrier comprising the steps of:
forming through holes in the carrier,
metallizing and galvanically strengthening the walls and edge zones of the holes on one side of the carrier,
filling the holes on the other side of the carrier with a conductive paste,
baking the conductive paste in the holes and thereby sealing the same,
forming multi-thick layer wiring on the other side of the carrier and
forming thin film wiring on said one side of the carrier.

4,047,291

METHOD OF RESHAPING TUBULAR CONDUCTOR SHEATH

Georg Spinner, Erzgiessereistr. 33, Munich 2, Germany

Continuation of Ser. No. 494,998, Aug. 5, 1974, abandoned. This application Dec. 23, 1975, Ser. No. 643,629
Claims priority, application Germany, Aug. 3, 1973, 2339443
Int. Cl.² H01P *11/00;* H01R *43/00*
U.S. Cl. 29—628 **12 Claims**



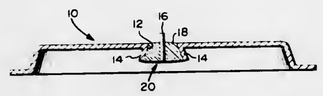
1. A method of reshaping a tubular conductor sheath or the like, comprising:
providing a conductor sheath or the like having a first, normal, external diameter; providing a clamping sleeve having an opening with an inside diameter that is smaller than the sheath normal diameter;
moving an end of the sheath or the like into and through the sleeve opening and by such movement radially deforming the sheath or the like inwardly to effect a transformation which permits a reflection free transition to an adjoining fitting or the like.

4,047,292

PROCESS FOR FORMING AN ELECTRICALLY INSULATING SEAL BETWEEN A METAL LEAD AND A METAL COVER

Paul C. Shaffer, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 19, 1976, Ser. No. 743,306
Int. Cl.² H01B *17/26*
U.S. Cl. 29—630 R **4 Claims**



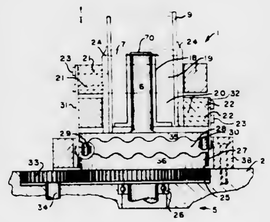
1. A process for producing a glass-to-metal seal in an apertured metal body which comprises the steps of: positioning said apertured metal body; positioning a metal lead substantially centrally located within said aperture; placing a sealing glass in said aperture; firing said body, lead and sealing glass at a temperature high enough to achieve melting of said sealing glass and effecting a bond between said body, said lead and said glass to form said glass-to-metal; grinding at least one surface of said lead flush with said glass; and refiring said body and said glass-to-metal seal.

4,047,293

OSCILLATING BLADE WINDING INSERTION DEVICE

Vernon E. Kieffer, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 5, 1976, Ser. No. 729,815
Int. Cl.² H02K *15/06*
U.S. Cl. 29—736 **12 Claims**



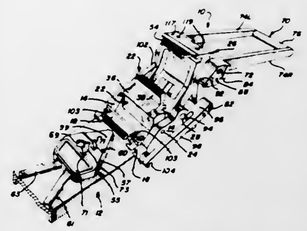
1. A winding insertion device, comprising:
a supporting platform:
a stripper operatively connected to and movable with respect to said supporting platform;
a plurality of wedge guides mounted to said supporting platform;
a first blade holder movably mounted on said supporting platform;
a second blade holder axially aligned with said first blade holder and movably mounted on said supporting platform, said first and said second blade holders being relatively movable with respect to one another independent of movement of said stripper;
a first plurality of blades arranged in an annular pattern, said first plurality of blades being mounted to said first blade holder;
a second plurality of blades arranged in an annular pattern and mounted to said second blade holder, the annular pattern of said first and said second blade pluralities forming a single annular array, blades of said first and said second blade pluralities being alternately arranged with respect to one another in said array; and
means for moving at least one of said first and said second blade holders with respect to the other of said first and said second blade holders so as to provide relative movement between said first and second blade pluralities during winding insertion.

4,047,294

WIRE TERMINATING TOOL

James R. Quigley, Lombard, Ill., assignor to TRW Inc., Elk Grove Village, Ill.

Filed Feb. 9, 1976, Ser. No. 656,580
Int. Cl.² H01R *43/04*
U.S. Cl. 29—749 **7 Claims**



1. In an apparatus for effecting solderless termination of a plurality of wires in a connector having oppositely disposed series of open-sided wire-receiving channels, each of said channels having wire-gripping means disposed therein, the combination comprising a base having a connector-mounting nest mounted thereon; said nest supportingly receiving said connector with one series of channels disposed upwardly in substantially the horizontal plane in the normal position of apparatus use; said nest being detachably mountable on said base in a plurality of positions and supportingly engaging a multi-wire connector of a particular construction in each of said positions; means defining guide passages movable between positions remote from and in overlying relation with said one series of channels; the guide passages of said means being in aligned superposed relation with said connector channels when in overlying relation therewith and including upwardly open portions for receiving said wires; stuffing blade means mounted on said apparatus; means for moving said stuffing blade means through a terminating stroke when said guide passages are in overlying relation with said one series of channels; said guide passages and connector channels being disposed in the path of said stuffing blades in the course of said terminating stroke whereby said stuffing blades drive wires disposed in said guide passages through said guide passages into said connector channels and into engagement with said wire gripping means.

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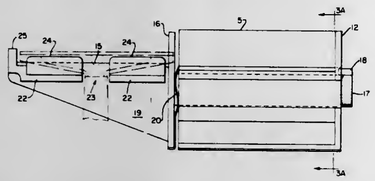
SHAVING UNIT DISPENSER CONTAINER

John Frederick Francis, Woking, England, assignor to The Gillette Company, Boston, Mass.

Filed Apr. 15, 1976, Ser. No. 677,491
Claims priority, application United Kingdom, Apr. 29, 1975, 17796/75
Int. Cl.² B26B *21/24;* B65D *83/10*
U.S. Cl. 30—40.2 **9 Claims**

1. A dispensing container for shaving units having blade means permanently fixed to a body member having a guard portion and connector means by which the unit is slidably attachable to a head portion of a razor handle, said dispensing container comprising storage means for mounting a plurality of said shaving units such that said blade means are covered by portions of said storage means and portions of said body member are exposed, and locating means engageable by said head

portion of said razor handle to locate said head portion of said handle in a predetermined position, said storage means being rotatably coupled to said locating means whereby said storage means may be rotated relative to said locating means so that said units mounted in said storage means may be brought in turn into a position adjacent said head portion of said handle



engaged with said locating means, said storage means for mounting said shaving units including ribs on which said shaving units are slidably disposed, whereby the exposed body portion of a shaving unit may be manipulated by an operator to slide said shaving unit longitudinally of said shaving unit from said storage means into operative engagement with said handle.

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TWO-EDGE SHAVING BLADE UNIT HAVING ANTI-CLOGGING MEANS

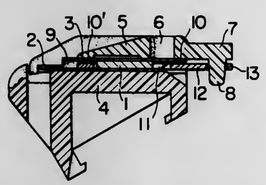
Minoru Ishida, Gifu, and Shigeru Ozeki, Seki, both of Japan, assignors to Feather Safety Razor Company, Ltd., Osaka, Japan

Filed July 27, 1976, Ser. No. 709,142

Claims priority, application Japan, July 31, 1975, 50-10702[U]

Int. Cl.² B26B *21/22, 21/40*

U.S. Cl. 30—41 **3 Claims**



1. A two-edge shaving blade unit comprising:
a platform portion,
a cap portion,
two blade elements fixed between said platform and cap portion, said blade elements being disposed parallel to each other in spaced relation to provide the leading and following cutting edges,
spacer means fixed between said platform and cap portions for retaining said blade elements in spaced relation, said spacer means comprising an elongated flat member supported between said blade elements,
means disposed between two said blade elements for ejecting the shaved hair particles and other matter deposited therebetween, said ejecting means comprising a flat member formed with an opening loosely fitting around said spacer means and being displaceable between an advanced and a retracted portion and ordinarily retained in the retracted position, and
means for manually retractably displacing said ejecting means into the advanced position.

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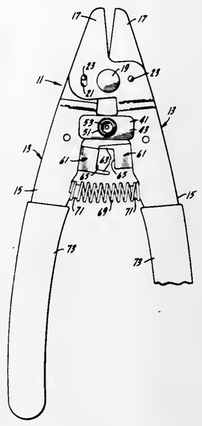
PRECISION SMALL WIRE STRIPPER

Ronald P. Hanson, Sycamore, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Filed Sept. 5, 1975, Ser. No. 610,537

Int. Cl.² H02G *1/12*

U.S. Cl. 30—90.1 **5 Claims**



1. In a hand tool for cutting and stripping the insulation from insulated electric wires, a pair of elongated members pivotally connected intermediate their ends providing handles at one end for manual manipulation and cutting blades at the other end, insulation cutting dies on each member with their axis spaced from and parallel to the pivot cooperable upon an opening and closing action of the handles to sever the insulation on a wire without cutting the wire itself, a unitary wire guide mounted on one side of the elongated members in alignment with the insulation cutting dies to guide insulation thereto and having a guide opening with its axis parallel to and spaced from the pivot, and two sliding mountings, one on each end of the guide, spaced from the pivot, one such mounting being between each end of the guide and one of the elongated members providing an arcuate floating action of the guide relative to the guide opening as the elongated members are moved during manual manipulation.

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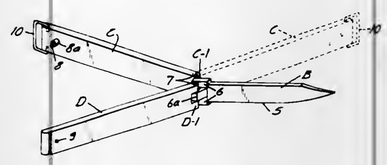
COMBINATION SHEATH AND RIGID HANDLE FOR KNIFE BLADES AND THE LIKE

Donald T. Philippar, Box 535, Sturgis, S. Dak. 57785

Filed July 1, 1976, Ser. No. 701,691

Int. Cl.² B26B *29/02*

U.S. Cl. 30—153 **4 Claims**



1. In combination with a knife blade or the like having relatively broad sides and an attachment butt with substantially parallel, broad attachment surfaces,
a combination handle and protective sheath for said knife blade comprising a pair of elongate, substantially flat members having widths somewhat greater than the maximum width of said knife blade and hingedly attached at corresponding ends to the respective surfaces of the butt of said blade and thereby spacing said elongate members apart a distance slightly greater than the thickness of said knife blade,
the attachment surfaces of said butt having outstanding hinge elements affixed thereto with the axes of said elements being disposed transversely of said butt surfaces,
the hinged attachment ends of said substantially flat members having hinge elements formed therein for complemental positioning respectively with the outstanding hinge elements of said blade butt to operatively and hingedly interconnect said butt and members for swinging of said members forwardly in opposition to the sides of said knife blade and rearwardly of said butt to opposed position jointly constituting a handle for said blade,
one of said members adjacent its unhinged end carrying a pin projecting in opposition to the other elongate member when said members are swung fully rearwardly to jointly form said handle,
and said opposing elongate member having a recess near its unhinged end for receiving and interlocking with said pin.

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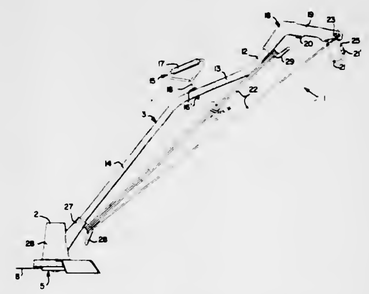
APPARATUS FOR TRIMMING VEGETATION

Lester E. Bair, Brownsville, Tex., assignor to Garden Pro, Inc., Dallas, Tex.

Filed Jan. 30, 1976, Ser. No. 653,884

Int. Cl.² A01D *55/18*; B26B *27/00*

U.S. Cl. 30—276 **7 Claims**



1. An apparatus for trimming vegetation compising:
a. drive means connected to a drive shaft and capable of rotating same at a speed of up to ten thousand (10,000) RPM;
b. an open bottom housing member mounted at its central point on said driven shaft and rotatable thereby, said member having a peripheral wall portion spaced from said driven shaft with a radial passage therethrough;
c. a relatively stiff non-metallic cutting line with suitable flexibility and a portion in a coil substantially coaxial of said driven shaft and an uncoiled portion extending initially tangentially from said coiled portion and through said radial passage and continuing radially outwardly in a cutting plane;
d. spool means coaxially supported on said driven shaft and supporting said coil of cutting line, said spool means being movable longitudinally of said driven shaft and rotatable relative to said member for adjusting the length of cutting line extending outwardly of said radial passage;
e. resilient means engaging said housing member and spool means to urge the spool means outwardly relative to said open bottom of the housing member; and
f. means on said driven shaft and said spool means engageable to limit said outward movement of said spool means and to key same to said shaft for rotation therewith, said means on the driven shaft and spool means being released in response to predetermined inward movement of said spool means relative to said housing means to permit relative rotation thereof.

4,047,300

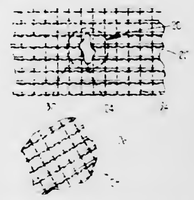
METHOD AND APPARATUS FOR REPAIRING DAMAGED MATERIALS PARTICULARLY SUITED TO REPAIRING KNIT OR POLYESTER MATERIALS

John L. Sweeney, Jr., 4300 NE. Sunset Blvd. No. B6, Renton, Wash. 98055

Filed Dec. 22, 1975, Ser. No. 642,897

Int. Cl.² B32F *1/32*

U.S. Cl. 30—358 **9 Claims**



1. An apparatus, for manual operation, for cutting materials particularly suited for cutting clothing fabric comprising:
a. a cutting die having a flat surface and a hole passing through the surface normal to the surface whereby a sharp edge is defined along the perimeter of the hole at the intersection with the flat surface;
b. a punch having a longitudinally tapered surface end, creating in transverse cross section the shape of the hole, which will contact the perimeter of the hole to permit the cutting of a hole in the material, when the material is interposed between the punch and the die, and they are brought together;
c. a body having a central cavity containing the punch with the contact surface of the punch extending from the first end of this central cavity;
d. means for retaining the contact surface of the punch at the first end of the cavity such that the surface of the contact surface of the punch extends from the cavity to permit full contact with the corresponding hole in the die;
e. a shaft longitudinally positioned in the central cavity with the first shaft end adjacent the punch and the second shaft end extending from the rear of the cavity; and
f. means for biasing the shaft relative to the body so that the punch may be forcefully driven against the die by first withdrawing the shaft from the rear of the central cavity against the force of the biasing means and then releasing the shaft such that the shaft is driven by the force of the biasing means and impacts against the punch opposite the contact surface of the die and the punch is then moved against the die.

4,047,301

DENTAL HANDPIECE

Eugen Elbofner, Biberach, Germany, assignor to Kaltenbach & Voigt, Biberach an der Riss, Germany

Filed May 7, 1976, Ser. No. 684,453

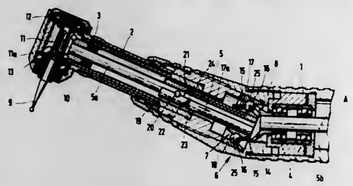
Claims priority, application Germany, May 13, 1975, 2521313

Int. Cl.² A61C *1/10*

U.S. Cl. 32—27 **10 Claims**

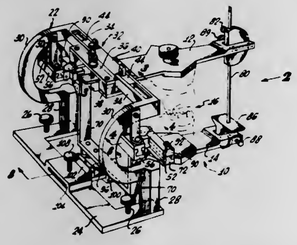
1. A dental handpiece comprising a holding sleeve (1);
a head sleeve (2) connected to said holding sleeve (1) and adapted to mount rotatably a dental tool (9), said head sleeve (2) having its lognitudinal axis inclined relative to the longitudinal axis of the holding sleeve (1);

a connecting zone providing an interconnection between said holding sleeve (1) and said head sleeve (2);
a two-drive shaft housed within the handpiece, a first part (5*b*) of the shaft (5) being arranged within the holding sleeve (1) and a second part (5*a*) of the shaft (5) being arranged within the head sleeve (2);
a transmission (7) providing a drive connection between said first and second parts (5*b*, 5*a*) of the shaft (5), said transmission (7) being housed within said connecting zone;
wherein the transmission comprises a ball-type planetary transmission (7) including an inner ring (17), an outer ring (18), balls (16) frictionally engageable between said rings; a cage engaging said balls (16); one of said parts (5*b* or 5*a*) of the drive shaft (5) is coupled drivingly with said cage, one of said rings (17 or 18) is non-rotatably mounted in



said connecting zone, and a coupling element (19) is secured to the other of said parts (5*a* or 5*b*, respectively) of the shaft (5); the other of said rings (18 or 17, respectively) is coupled with said other parts (5*a* or 5*b*, respectively) of the shaft (5) for rotation therewith, said other ring (18 or 17, respectively) having a drive transmitting connection with said coupling element (19) and being axially displaceable relative to said other part (5*a* or 5*b*, respectively) of the shaft (5) in order to adjust the frictional engagement of said balls (16) between said inner and outer rings (17 and 18) thereby to alter the value of torque transmissible by the shaft (5);
and wherein said drive transmitting connection comprises interengaging helical teeth (22, 23) provided on said coupling element (19) and on said other ring (18 or 17, respectively).

4,047,302
DENTAL ARTICULATOR
Arthur W. Cheythey, 712 S. Wilton Ave., Los Angeles, Calif. 90005
Filed Jan. 14, 1976, Ser. No. 649,135
Int. Cl.² A61C *11/00*
U.S. Cl. 32—32 6 Claims



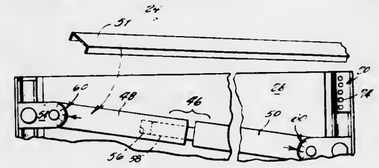
1. In a dental articulator having a lower member for mounting a lower tooth model and an upper member for mounting an upper tooth model, the improvement comprising:
mounting means for supporting said upper member in stationary relationship with respect to said mounting means;
a pair of upper articulating elements carried by said mounting means and having internal surface contours closely conforming to the surface contours of the fossae forming the upper members of a human mandibular joint;
a pair of lower articulating elements attached to said lower member in operative relationship with said upper articulating elements and having external surface contours closely conforming to the surface contours of the mandibular condyles forming the lower members of a human mandibular joint;
means for adjusting the angular orientation of said upper and lower articulating elements to conform with measured characteristics of a particular patient's mandibular joint;
means for adjusting the lateral spacing of said upper and lower articulating elements to conform with measured characteristics of a particular patient's mandibular joint; and
means for urging corresponding ones of said upper and lower articulating elements together and thereby holding them in continuous contact;
whereby said lower member can be moved relative to said upper member in close simulation of actual movements of the particular patient's lower jaw.

4,047,303
GUIDE FOR SETTING UP ARTIFICIAL TEETH
Henry Ziofsky, Rte. 55, Eldred, N.Y. 12732, and Brett Jason Sinclair, 150-11 72nd Road, Flushing, N.Y. 11367
Filed May 26, 1976, Ser. No. 690,146
Int. Cl.² A61C *3/00*
U.S. Cl. 32—40 R 7 Claims



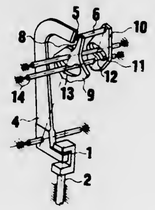
1. A dental guide for setting up teeth on a model, said guide comprising, in combination, a guide strip of transparent material having an upper edge, a lower edge, and being of flexible, non-elastic material, a vertical center line on said strip, parallel height lines along the upper edge of said strip, first markings on said strip on each side of said center line indicating at least the average width of first anterior teeth, second markings on said strip on each side of said center line indicating the range of the width of the three anterior teeth on each side, measuring scales on said strip extending from said center line toward each end of said guide strip along the lower edge of said strip, indicating means on said strip having a downward facing angle to be placed adjacent to the phrenum of a model, and means joining the ends of said guide strip to fix said guide strip about a model.

4,047,304
DRAFTING BOARD WITH ADJUSTABLE STRAIGHT-EDGE ASSEMBLY
Anthony Delre, Jr., 7570 Tropicana St., Miramar, Fla. 33023
Filed June 1, 1976, Ser. No. 691,387
Int. Cl.² B43L *5/00*
U.S. Cl. 33—80 7 Claims



1. A drafting board comprising in combination:
a pair of laterally spaced base members;
support means for pivotably mounting said base members;
a drawing surface mounted on said base members having front, rear and side edges;
a straight-edge assembly, including at least one ruling edge, carried by said drawing surface and extending laterally thereof, said at least one ruling edge being positionable to extend across said drawing surface in any of a plurality of angles relative to the front edge thereof;
means on said straight-edge assembly and on said base members cooperable to permit selective movement of said assembly across said drawing surface between the said front and rear edges thereof, said means including an extensible multi-segment rotatable shaft carried by said assembly and having wheel elements at the opposed ends thereof and track elements carried by said base members adapted to receive said wheel elements and to cooperate therewith for selective movement of said assembly.

4,047,305
LINK MECHANISM OF A MECHANICAL TRANSDUCER, ESPECIALLY OF A TOOTHED AMPLIFYING GAUGE
Eugeniusz Ratajczyk; Januariusz Godcimski, and Adam Jędrzejewski, all of Warsaw, Poland, assignors to Politechnika Warszawska, Warsaw, Poland
Filed Apr. 2, 1976, Ser. No. 673,104
Claims priority, application Poland, Apr. 8, 1975, 179417
Int. Cl.² G01B *3/22, 5/00*
U.S. Cl. 33—172 R 4 Claims



1. A link mechanism of a mechanical transducer, especially of a toothed amplifying gage, comprising an input member (2) performing a rectilinear motion and contacting in a point one arm of a double-arm lever (4), the other arm whereof contacts in a point an output lever (9), and a transmission compensator (7) in the form of an intermediate member, namely a shaft (6) rigidly mounted on a rotating arm (10) of said compensator and arranged between respective working surfaces (5, 8) of said double-arm lever and of said output lever.

4,047,306
BORE HOLE PROBE
Hubert Josef Otte, 165 Evelyn Avenue, and Gosta Roosman, 98 Merrick Street, both of Toronto, Canada
Filed June 4, 1976, Ser. No. 693,110
Int. Cl.² E21B *47/022*
U.S. Cl. 33—314 12 Claims

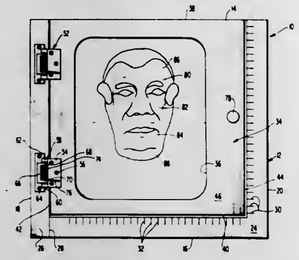


1. A bore hole probe for determining the path of a bore hole and comprising
a source of radiant energy
support means for said source of radiant energy;
radiant energy sensitive means, sensitive to exposure to said radiant energy; fibre optic thread means for forming said radiant energy into a narrow spot adapted for transmitting said radiant energy, with said source of radiant energy at one end, the other end of said fibre optic thread means being adjacent to said radiant energy sensitive means, and said radiant energy sensitive means defining a predetermined area having length and breadth, upon a portion of which said spot of radiant energy may be received, and recorded, while the remainder of said area of said sensitive means remains unaffected thereby, whereby to record the position of said spot of radiant energy on said predetermined area of sensitive material;
support means for said radiant energy sensitive means;
flexible connection means extending between said radiant energy source support means and said support means for said sensitive means, permitting relative angular movement between said spot of radiant energy and said radiant energy sensitive means and, rigid support means surrounding said fibre optic thread means within said flexible connection means.

4,047,307
SNAP ACTION FRAME FOR FACIAL IDENTIFICATION SYSTEM
William T. Quinn, III, 681 Park Ave., Freehold, N.J. 07728
Filed May 27, 1976, Ser. No. 690,812
Int. Cl.² G09B *1/30*
U.S. Cl. 35—28 1 Claim

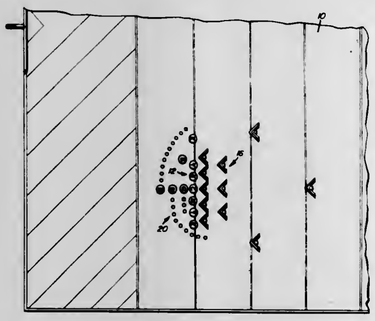
1. In a facial identification system comprising a composite of facial features interrelated to form a representation of a subject, the composite being made up from changeable individual feature component segments, a holder for said segments comprises:
a base member having top and bottom edges, side edges, and a lower surface;
an elevated ledge along one of said side edges, the ledge extending inwardly;

the base member having an upper surface opposite said lower surface;
first indicia on the upper surface adjacent the side edge remote from the elevated ledge;
second indicia on the upper surface adjacent the bottom edge;
the first and second indicia cooperatively providing coordinates for definition of the location of characteristics on said representation;
a transparent cover plate having upper and lower edges and first and second side edges;
the cover plate having top and inside surfaces;
the first side edge of the cover plate being located adjacent the elevated ledge, and the second side edge being spaced inwardly from the side edge of the base member having said first indicia whereby said indicia are exposed;



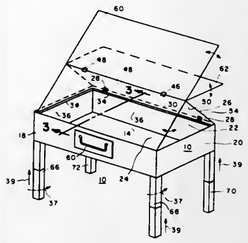
the upper edge of the cover plate being vertically aligned with the top edge of the base member, and the lower edge of the cover plate being spaced inwardly from the bottom edge of the base member whereby the second indicia are exposed; and
snap hinges on the ledge and cover plate to effect flush fitting relationship between the cover plate and base member and to clamp said representations firmly therebetween, said hinges each comprising a hinge plate on the cover plate having sleeves extended therefrom over the elevated ledge, hinge bases on the ledge with a bracket, hinge pins extending through the brackets and sleeves, and springs within the brackets and about the pins and having spring arms extended over the hinge plates.

4,047,308
COACHES FIELD ANALYSIS KIT
Anthony A. Wheeler, 18784 Bainbury St., Canyon Country, Calif. 91351
Filed Mar. 4, 1976, Ser. No. 664,005
Int. Cl.² A63B *71/02*
U.S. Cl. 35—29 R **1 Claim**



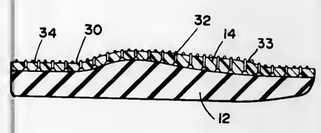
1. A kit for use by a coach on a regulation playing surface in position and play analysis for teaching players positions and plays, the kit comprising a plurality of two different elements forming a first set of elements and a second set of elements, the first set representing an offensive unit and the second set representing a defensive unit, with the elements of the second set each including a body member in the shape of a V and forming direction arrows arrangeable indicating on the playing surface directions of players, with the elements of the first set representing an offensive football unit and being circular disks provided with indicia including raised letters denoting a specific offensive football position and raised designs indicating the direction the player is headed, and the elements of the second set additionally each having a portion of V-shape formed in raised relation on the body member and arranged in conformity with the shape of the body member.

4,047,309
INFORMATION DEMONSTRATION DEVICE
Patricia Diane Royko, 14 Allen Drive, Wayne, N.J. 07470
Filed Nov. 3, 1975, Ser. No. 628,246
Int. Cl.² A47B *97/08*
U.S. Cl. 35—60 **12 Claims**



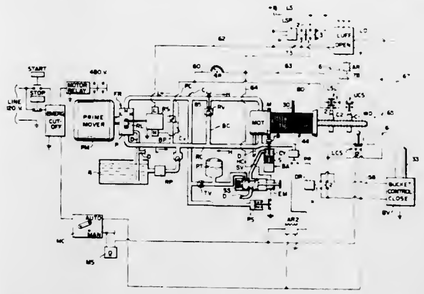
1. A portable device for demonstrating information, comprising:
a. a receptacle structure comprising a bottom and side walls;
b. a lid element pivotably mounted at a first edge, thereof on a first side wall of said receptacle structure;
c. a support element pivotably mounted at an edge thereof on an opposite second edge of said lid element;
d. said receptacle structure comprising means for engaging a second opposite edge portion of said support element;
e. plural retractable legs attached to said receptacle structure; and at least one leaf element pivotably disposed at an edge portion thereof at said second edge of said lid element.

4,047,310
FATIGUE RELIEVING FOOT APPLIANCE
Hyeng P. Sunoo, 20 Greenwood Way, Monterey, Calif. 93940
Filed Apr. 19, 1976, Ser. No. 677,946
Int. Cl.² A43B *3/12*
U.S. Cl. 36—11.5 **10 Claims**



1. A podiatric sandal for relieving foot fatigue comprising:
an outer sole;
an inner sole of resilient material supported by the outer sole substantially conforming to the contour of the plantar surface of the foot except for being mildly elevated in selected massaging areas defined by the area under the metatarsal arch and between the second and fourth metatarsal;
a plurality of rigid, rounded-head protuberances substantially uniformly distributed in said massaging areas in staggered columns extending above said inner sole for encountering said plantar surface; and
at least one strap bonded to said outer sole for mounting on the foot.

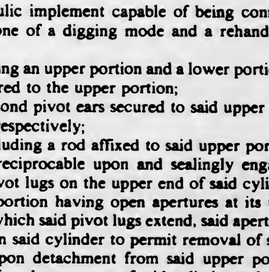
4,047,311
AUTOMATIC GRAB BUCKET WITH PRESSURE RESPONSIVE SOLENOID CONTROL
Charles S. Kelley, 253 Bradwell Road, Barrington, Ill. 60010
Continuation-in-part of Ser. No. 508,274, Sept. 23, 1974, Pat. No. 3,967,394. This application May 20, 1976, Ser. No. 688,232
Int. Cl.² E02F *5/00*; F16D *31/02*; B66D *1/48*
U.S. Cl. 37—54 **11 Claims**



1. In a grab crane having a power driven hydraulic positive displacement pump and a hoist means driven by a hydraulic positive displacement motor for raising and lowering the grab of the grab crane;
conduit means including parallel high pressure conduit and low pressure conduit interconnecting said pump and motor in series flow relationship;
means for detecting a change of grab weight on the hoist means when the lowering grab contacts submerged work material including pressure responsive means critically responsive to a substantial increase of hydraulic pressure in the low pressure conduit from that pressure that is induced therein by the effective weight thereon of the grab being lowered empty under gravity through water at a controlled rate;
means actuated by said increase in hydraulic pressure for closing said grab in timed relation to said change in hydraulic pressure; and
means actuated by said detecting means for changing the pattern of hydraulic flow in the conduits between the motor and pump.

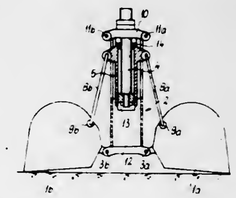
4,047,312
CORNER TOOTH ASSEMBLY
Visvaldis A. Stepe, Willow Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Sept. 8, 1976, Ser. No. 721,654
Int. Cl.² E02F *9/28*
U.S. Cl. 37—141 R **7 Claims**

1. A corner tooth assembly, adapted to be removably secured to the corner of an implement having a floor member and side wall member substantially normal thereto, comprising:
a bottom wear plate disposable exteriorly of said floor member and having a forwardly extending cutting edge thereon;
a side wear plate disposable exteriorly of said side wall member and having a forwardly extending cutting edge thereon;
a body portion of substantial cross section integrally associated with a front portion of said bottom plate and said side plate;



an earth penetrating member which extends forwardly from said body portion; and
a hook member extending rearwardly from said body portion and being of a construction sufficient for interlocking said floor member and said side wall member immediately inwardly the intersection thereof.

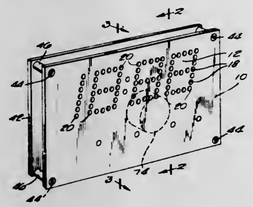
4,047,313
CONVERTIBLE GRAB BUCKET
Jean-Pierre Luc Bricon, Venissieux, France, assignor to International Harvester Company, Chicago, Ill.
Filed Feb. 9, 1976, Ser. No. 656,237
Claims priority, application France, Feb. 10, 1975, 75.04573
Int. Cl.² E02F *3/44*; B66C *3/00*
U.S. Cl. 37—187 **1 Claim**



1. A hydraulic implement capable of being connected for operation in one of a digging mode and a rehandling mode comprising:
a frame having an upper portion and a lower portion detachably secured to the upper portion;
first and second pivot ears secured to said upper and lower portions respectively;
a piston including a rod affixed to said upper portion;
a cylinder reciprocable upon and sealingly engaging said piston; pivot lugs on the upper end of said cylinder;
said lower portion having open apertures at its upper end through which said pivot lugs extend, said apertures being wider than said cylinder to permit removal of said lower portion upon detachment from said upper portion notwithstanding the presence of said cylinder and pivot lugs;
a pair of mating implement members having inner and outer connections on each member;
link means connected to said outer pivot connections;
said link means and said inner pivot connections being selectively connected to provide one of said digging mode, wherein said link means are pivotally connected to said pivot lugs and said inner pivot connections are pivotally connected to said second pivot ears, and said rehandling mode, wherein said lower portion is removed, said cylin-

der is inverted on said piston and said link means are pivotally connected to said first pivot ears and said inner pivot connections are pivotally connected to said pivot lugs.

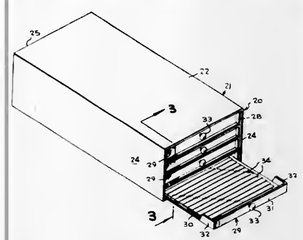
4,047,314
DISPLAY DEVICE WITH SLIDING BACK PLATES
Roger A. Slack, and Gerald W. Michel, both of Milwaukee, Wis., assignors to Everbrite Electric Signs, Inc., Milwaukee, Wis.
Filed May 3, 1976, Ser. No. 682,946
Int. Cl.² G09F 9/30, 11/29
U.S. Cl. 40—28 C **6 Claims**



1. A display device comprising an opaque face plate having at least one array of openings therein arranged to represent predetermined indicia when light is transmitted through selected openings of said array, an opaque back plate slidably mounted behind said face plate and having an array of light passages therein, some of which are elongated slots which are of substantially greater length than the corresponding dimension of openings in the face plate, means guiding said back plate for reversible stepped sliding movement in a predetermined lineal direction that corresponds with the direction in which said elongated slots extend, portions of said light passages in said back plate permitting light to be transmitted through selected openings of said face plate while said opaque back plate blocks the transmission of light through other openings and said slots being arranged so some will be between openings in said face plate while other of said slots are coincident with corresponding openings, thereby forming selected indicia, some of said face plate openings being arranged in a line extending in one direction and said elongated slots being arranged in rows each comprising slots of varying length, said rows being parallel to each other and inclined at an acute angle relative to said line, and drive means coupled to said back plate for shifting said back plate linearly, said elongated slots being so disposed relative to said face plate openings that when the back plate is shifted in its guided path there is a change in the selection of openings in the face plate through which light is permitted to pass, thereby changing said indicia.

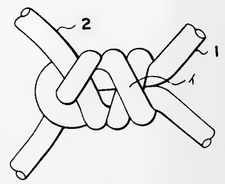
4,047,315
HOLDER FOR PHOTOS AND THE LIKE
Benjamin B. Osher, New York, N.Y., assignor to Kleer-Vu Industries, Inc., New York, N.Y.
Filed Sept. 17, 1976, Ser. No. 724,256
Int. Cl.² B42F 7/12
U.S. Cl. 40—102 **3 Claims**

1. Apparatus for holding a plurality of thin articles including photographs in a manner to be selectively displayed comprising, an elongated housing having top and bottom walls connected by generally parallel side walls and a back wall, the front end of said housing being open, a plurality of elongated superimposed stationary guide members mounted in stacked abutting relationship with each other within said housing in a position to reinforce the same, each of said guide members including upper and lower horizontally disposed portions and vertically disposed side portions, said side portions being in abutting relationship with said side walls of said housing, said guide members extending substantially the entire length of said housing, a tray slidably mounted in each of said guide members, each of said trays including a bottom piece substantially complementary to said horizontally disposed portions of said guide members, each of said trays having a front piece extending upwardly from the front edge of said bottom piece and a pair of side pieces extending rearwardly a short distance from said front piece along each side of said bottom piece, said front pieces closing the open end of said housing, means carried by each tray for withdrawing the tray from its associated guide



member, a plurality of flat tubular transparent article holders, tape means hingedly mounting a plurality of pairs of holders on said bottom piece, said pairs of holders being in generally parallel relationship with each other and with said front piece, one edge of each of said holders being positioned adjacent to said bottom piece, the holder nearest to said front piece being spaced rearwardly therefrom a distance greater than the length of said side pieces so that articles may be slid into holders, and said articles holders being arranged in generally horizontally disposed overlapping relationship with each other when said trays are in retracted position with said housing.

4,047,316
KNOTTED FISHING NET
Jiro Maruyama, Hakodate, Japan, assignor to Hakodate Seimo Sengu Co., Ltd., Japan
Filed Dec. 22, 1975, Ser. No. 642,759
Claims priority, application Japan, Dec. 27, 1974, 50-518
Int. Cl.² A01K 74/00
U.S. Cl. 43—7 **5 Claims**



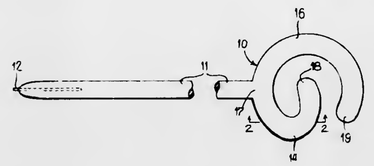
1. A knotted fishing net wherein the knot is formed of a U-shaped weft, and a warp wound about the weft and drawn out of the knot after passing inside of said shaped weft with the feed and return portions of the warp being wound in opposite directions around said shaped weft in a direction away from the free ends of said shaped weft such that said feed and return portions intersect each other on at least three points and the under-pass and over-pass of the feed portion of the warp relative to the return portion thereof are reversed at two adjacent intersections exclusive of the outermost intersection on the outlet side of the knot on which the warp is drawn outward.

4,047,317
FISH LURE
William H. Pfister, Livingston, N.J., assignor to William R. Pfister, Point Pleasant, N.J.
Filed Feb. 17, 1976, Ser. No. 658,696
Int. Cl.² A01K 97/04
U.S. Cl. 43—42.06 **4 Claims**



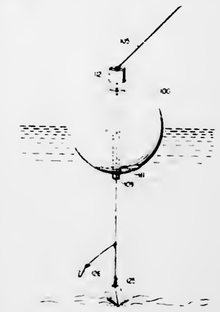
1. A fish lure containing fish attracting scent material comprising: a body portion including opposed first and second elongated shell-like members each formed with a shallow cavity, the said cavities forming an enclosure for holding the scent material; means for swingably securing the two members to each other at one end; latch means comprising a ring and a slot combination at the opposite end of each of the shell-like members for releasably securing the shell-like members, said slot consisting of an L-shaped slot having an open end formed in one of the shell-like members and an elongated closed slot formed in the other shell-like member movably retaining said ring member therein for cooperation with said L-shaped slot to lock the two lower ends of the members together, and the ring is oval shaped, and a fish hook secured at one end to the ring.

4,047,318
ATTRACTOR ELEMENT FOR FISHING LURE
Alan L. Mapp, 676-A Third St., Maxwell AFB, Montgomery, Ala. 36113
Filed Oct. 18, 1976, Ser. No. 733,204
Int. Cl.² A01K 85/00
U.S. Cl. 43—42.24 **10 Claims**



1. An attractor element for a fishing lure comprising:
a. a first pliable leg section,
b. a second pliable leg section,
c. means connecting the forward ends of said first and second leg sections to a fishing lure,
d. said first leg section extending outwardly and rearwardly from its forward end and then inwardly and terminating in a free end rearwardly of its forward end, and
e. said second leg section extending outwardly and rearwardly from its forward end and away from said first leg section and then inwardly around said free end of said first leg section with said second leg section being longer than said first leg section and terminating in a free end rearwardly of said first leg section.

4,047,319
FISHING DEVICE
William Palmer Duncan, Jersey City, N.J., assignor to Van Buren Cunningham, II, Harker Heights, Tex., a part interest
Filed July 12, 1976, Ser. No. 704,526
Int. Cl.² A01K 93/00
U.S. Cl. 43—44.87 **7 Claims**

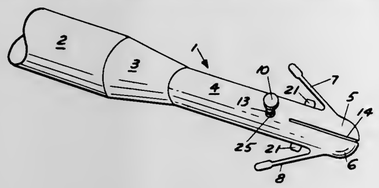


1. In a fishing device for locating the depth of a body of water and for permitting at least one fish hook affixed to a fishing line to be set at any desired height relative to the bed of said body of water, the improvement which comprises:
a. a float; and
b. a tubular assembly carried by said float, said assembly including:
1. a passageway extending throughout the length of the assembly adapted to permit insertion of the line at a top of the passageway and emergence of the line at a bottom of the passageway; and
2. a first frictional means adapted to permit a first frictional engagement of said line at a point intermediate the top and the bottom of the passageway, in a manner so as to restrict movement of the line towards the top of the passageway, but not to restrict movement of the line towards the bottom of the passageway when said first frictional means is engaged; and
3. a second frictional means adapted to permit a second frictional engagement of said line at a point proximate to the bottom of said passageway, in a manner so as to restrict all movement of the line when said second frictional means is engaged; and
4. disengagement means for disengaging the first and second frictional means, such that when the disengagement means has been actuated, said line is capable of being moved freely toward the top or the bottom of the passageway and when said disengagement means has not been actuated, said first frictional means is engaged alone, or in combination with engagement of said second frictional means.

4,047,320
BAIT DISPENSER
Marion D. Lee, Rte. 1, Box 174, Castor, La. 71016
Filed Sept. 23, 1976, Ser. No. 725,849
Int. Cl.² A01K 97/04
U.S. Cl. 43—55 **10 Claims**

1. A bait dispenser comprising:
a. a dispensing tube, one end of which may be fitted to a container carrying live bait, and the opposite end of which is closed and which is characterized by a longitudinal slot defining a pair of jaws;
b. lever means in cooperation with each of said jaws for manipulating said jaws and selectively expanding and contracting said slot; and

c. a plunger positioned adjacent said slot transverse to the longitudinal axis of said dispensing tube, slidably carried



by said dispensing tube, and extending into the interior of said dispensing tube when in depressed configuration.

4,047,321

ANIMAL TRAP

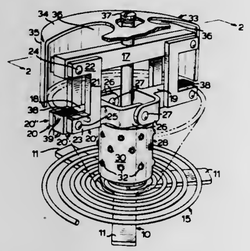
Lloyd Carl Thorning, 115 Coleman Avenue, Toronto, Ontario, Canada (M4C 1P9)

Continuation of Ser. No. 658,738, Feb. 17, 1976, abandoned. This application Nov. 15, 1976, Ser. No. 741,985

Claims priority, application United Kingdom, Mar. 13, 1975, 10588/75

Int. Cl.² A01M *23/30*

U.S. Cl. 43—78 **21 Claims**



1. An animal trap comprising a spiral spring having a fixed inner end portion and a movable outer end portion the spring having a plurality of coils and being extendible to a stressed condition thereof, a movable bait holder which is so mounted as to be within the coils of the spring when the spring is in said stressed condition thereof, a support with which said outer end portion of the spring is engageable when in said stressed condition thereof to retain the spring in said stressed condition thereof, and a linkage mechanism through which the bait holder is engageable with the support, the linkage mechanism being operable, by movement of the bait holder under the influence of an animal attempting to remove bait from the bait holder, to move the support for release of said outer end portion of the spring therefrom with resultant retraction of the spring from its stressed condition during which adjacent coils of the spring between which the neck of the animal is disposed exert a shearing action on the neck of the animal to kill the animal.

4,047,322

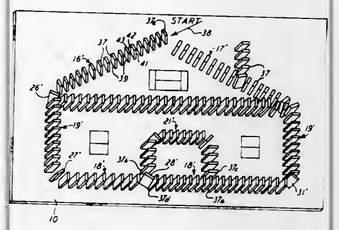
AMUSEMENT DEVICE OF PICTORIAL DISPLAY

Nelson Woodrow Keisling, Racine, Wis., assignor to James Stephen Holub and Robert James LaSalle, both of Racine, Wis., part interest to each

Filed Feb. 17, 1976, Ser. No. 658,176

Int. Cl.² A63H *33/00*

U.S. Cl. 46—1 R **2 Claims**



1. An amusement device of pictorial display, comprising a base member having markings thereon depicting an object, said markings being located on said member in rows representing the configuration of said object, said markings being spaced apart relative to each other in directions relative to the length of said rows of said markings, said markings having length and width dimensions and being oriented relative to said rows to have the length dimension disposed transverse to the length of its said row, said markings being located in said rows which intersect with each other, one of said markings at the intersection of said rows having an orientation with its said length dimension which bisects the intersection of the lengths of said intersecting rows, one of said intersecting rows of said markings being arranged as a branch which extends from said intersection with another of said intersecting rows and which re-intersects said another row at a location spaced along said another row, a plurality of elongated blocks disposed spaced apart and on end and singularly on each of said markings with the longest dimension of said blocks being upright and with said blocks being presented along said rows of and at the orientations of said markings, said blocks have a rectangular base having length and width dimensions matching said dimensions of said markings and with the said length dimension of said blocks being orientated with said length dimension of said markings to have said base of said blocks disposed transverse to said rows, said blocks being tipable in the direction along their said rows and being of an elongated height sufficient to lean against each other in the tipped position and while on said markings to thereby create a sequential falling action and ultimately prone align along said rows of said markings, the total length of said branch row being greater than the length of said another row from said intersection o the stated re-intersection, to thereby have said blocks in said length of said another row tip over before all said blocks in said branch row tip over, and said base member having indicia thereon showing which one of said blocks is to be first tipped toward the others.

4,047,323

FLYING OBJECT

Egidio Biffi, 20062 Cassano d'Adda, Via Q. Divona, 29, Milan, Italy

Filed Mar. 31, 1976, Ser. No. 672,451

Claims priority, application Italy, July 3, 1975, 25061/75

Int. Cl.² A63H *27/04*

U.S. Cl. 46—47 **6 Claims**

1. A flying object assembly comprising, in combination, a cable, means for connecting one end of said cable to the flying object, a drive handle for rotating the flying object through said cable, an automatic cable winding means within said handle connected to the other end of said cable for yieldingly urging said cable into a wound condition within said handle, said cable winding means arranged to respond to the centrifugal force of the flying object acting oppositely to the urging force exerted on said cable by said cable winding means for



unwinding of said cable from said handle to a length proportional to the centrifugal force exerted on said cable by the flying object.

4,047,324

BALLOON AND PARACHUTE TOY

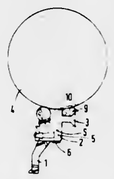
Hans Ulrich Wesenberg, D-8506, Langen-Kirchfembach-37, Germany

Filed Mar. 15, 1976, Ser. No. 666,626

Claims priority, application Germany, Nov. 26, 1975, 2555296

Int. Cl.² A63H *33/20*

U.S. Cl. 46—86 R **7 Claims**



1. A balloon and parachute toy comprising: a balloon which can be inflated by air, a missile, such as a rocket aviator, parachutist or the like, and a parachute, the balloon having a mouthpiece the longitudinal axis of which passes through the center of gravity of the missile, with the mouthpiece aperture facing the ground in the normal flight position of the missile, the missile having a trough opening which opens towards the balloon for receiving the folded parachute, a portion of the balloon facing the trough acting as a cover for automatically opening and closing the trough whereby the balloon, in its inflated condition, serves to retain the folded parachute in the recess and, upon deflation, allows the parachute to leave the recess and open, and wherein the dimensioning of parts is such that the force of recoil of the air escaping from the inflated balloon is greater than the force of gravity which acts on the missile and the attached balloon and parachute.

4,047,325

BATON TWIRLING FIGURE

Tomio Yamazaki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed June 18, 1976, Ser. No. 715,242

Claims priority, application Japan, Aug. 27, 1975, 50-118589[U]

Int. Cl.² A63H *11/10*

U.S. Cl. 46—106 **8 Claims**

1. The combination of a doll having a torso, arms, legs and a head connected together so as to simulate the human body and a support structure for holding the doll in which the improvement comprises:

said support structure including a wheeled platform, a support member extending from the platform to the torso and mechanical drive means for deriving power from at least one wheel of said platform as said platform is rolled along a surface and for conveying motion derived from such



movement of said platform into the interior of said torso of said doll,

an arm of said doll being rotatably mounted upon said torso and

motion transmitting means within said torso for transmitting motion from said mechanical drive means to said arm so as to rotate said arm as said platform is rolled along said surface.

4,047,326

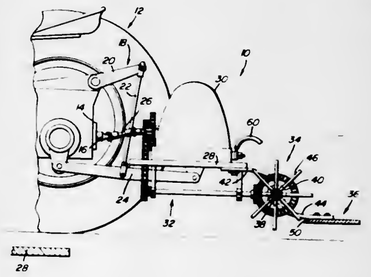
VASCULAR CONTACT ROTATING AND STATIONARY ABRADING ELECTRODE DEVICES FOR ELECTRIC WEED KILLING

Robert C. Tibbs, Cleveland Drive, Cleveland, Miss. 38732

Filed Dec. 5, 1975, Ser. No. 638,097

Int. Cl.² A01M *21/00*

U.S. Cl. 47—1.3 **5 Claims**



1. Apparatus for killing undesirable vegetation having stems projecting upwardly from the ground, comprising a mobile frame adapted to be move along the ground, abrading means mounted on the frame for engagement with the stems of said vegetation to remove external layers therefrom, electrode means mounted on the frame for prolonged sequential contact with exposed internal tissues of the vegetation abraded by said abrading means, and electrical supply means connected to the electrode means for conducting current through the abraded vegetation in contact with the electrode means, said abrading means including a rotor, a plurality of blades projecting radially from the rotor and drive means for imparting rotation to the rotor during movement of the frame in a forward direction.

4,047,327

GROUND COVERING MATERIAL

Gunter H. Tesch, Fribourg, Switzerland, assignor to Breveteam S.A., Fribourg, Switzerland

Filed Sept. 24, 1976, Ser. No. 726,228
Claims priority, application Switzerland, Sept. 26, 1975, 12557/75
Int. Cl.² A01G 7/00
U.S. Cl. 47—9 5 Claims

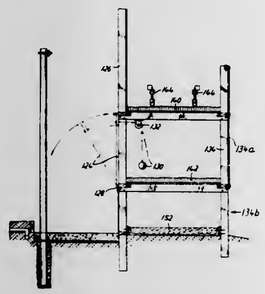
1. A vegetation suppressing, ground covering agronomic mulch sheet comprising a polymeric film having a light-absorbing effective quantity of pigmentation to provide a maximum light transmittance of about 60%; said film being slit in a pattern wherein slits having a length in the range of from about 4 mm to about 12 mm are arranged substantially uniformly in a plurality of rows, and wherein individual slits in a given row are opposite slits of identical dimension in adjacent rows; whereby there are provided a minimum slit density of at least 1,000 slits per square meter and a minimum air permeability of about 200 l/m^2s at a pressure differential of about 10 mm water across the plane of the sheet.

4,047,328

GREENHOUSE

Donald K. Kehl, and Eugene A. Crist, both of Panama City, Fla., assignors to Hygroponics, Inc., Panama City, Fla.

Division of Ser. No. 492,014, July 26, 1974, Pat. No. 3,949,522.
This application Feb. 13, 1976, Ser. No. 657,761
Int. Cl.² A01G 31/00
U.S. Cl. 47—59 17 Claims



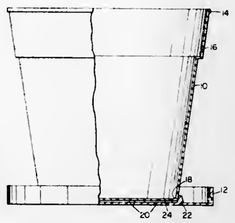
1. A greenhouse comprising
a front wall assembly
a rear wall assembly
a pair of spaced-apart leveling plates located at the outer edges of the greenhouse forming the width thereof, and an arched roof connecting said front and rear wall assemblies and being connected between said spaced-apart side leveling plates,
said side leveling plates running the length of said greenhouse and being placed on level ground,
a cover placed over said roof and extending between said side leveling plates,
attachment means connecting said covers to each of said side leveling plates, said cover being placed on said roof,
said roof comprising curved members attached together forming rafters and being secured at their outer ends in the ground at regularly spaced distances along the length of said greenhouse and purlins connected to said rafters extending lengthwise in said greenhouse,
exhaust fan means attached to the front wall of said greenhouse,
an opening provided at the rear wall of said greenhouse, said exhaust fan means operating to draw outside air into said greenhouse from said rear wall end,
baffle louver means connected at the rear wall of said greenhouse, said baffle louver means opening responsive to said exhaust fan means being in operation, said baffle louver means directing air upwardly toward the roof of the greenhouse away from plants in troughs on the greenhouse floor.
counterweight means connected to said baffle louver means,
said baffle louver means comprising door means hingedly connected at its lower end to the rear wall of said greenhouse, the top of said door means connected to said counterweight means, said door means swinging open at its upper end responsive to the operation of said exhaust fan means at said front walls of said greenhouse to direct air upwardly as it enters said greenhouse,
cooling means located outside the rear wall of said greenhouse, said cooling means cooling air prior to its entry into said greenhouse,
said cooling means comprising means for forming a water mist and means for drawing said outside air past said water mist for adiabatically cooling said air,
said cooling means comprising water pads,
means for supporting said water pads in a horizontal position,
means for wetting said water pads,
and means for drawing said outside air through said water pads prior to entry into said greenhouse for cooling said air,
said means for wetting said water pads comprising misting means for creating a mist, said mist being deposited on said water pads, said outside air being drawn past said mist and through said water pads for achieving the cooling of said air prior to its entry into the greenhouse,
said cooling means comprising separated upper and lower water pads, said water pads being horizontally supported with outside air passing therethrough prior to entry into said greenhouse.

4,047,329

DUAL PURPOSE CONTAINER

William Gilbert Holt, Raynham, Mass., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jan. 2, 1976, Ser. No. 646,131
Int. Cl.² A01G 9/02, 9/04
U.S. Cl. 47—66 6 Claims



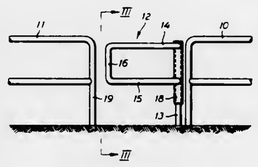
1. A dual purpose container comprising:
a container having a double tapered sidewall, the outside of said wall being textured and the inside of said wall being smooth to facilitate material slippage, said container having an open top and a closed bottom, said top having a radially outwardly projecting locking flange, said bottom having a plurality of prethinned portions, said prethinned portions removable to provide aeration to the container, said container having a plurality of concentric feet members providing essentially a full circumference concentric ring, said feet being spaced to provide narrow slot openings directly opposite said prethinned areas of said container bottom, the junctions of said double taper sidewall to each other and to the bottom being rounded with fillets to provide additional impact strength, to facilitate removal of materials and to prevent material build-up at the junctions; and
a lid having a skirt portion, the inside of said skirt portion being complementary with the locking flange to seal the top of said container, said lid having a plurality of concentrically spaced lugs on the inside thereof complementary with the periphery of the bottom of said container to provide concentric centering for the bottom of said container and drainage through said prethinned portions and said slot openings when said lid is removed and placed on the bottom of said container as a saucer.

4,047,330

BARRIER FOR MOPEDS AND BICYCLES

Inge Charlen Gustafsson, Skyttevagen 10, S-290 71 Morrum, Sweden

Filed Feb. 18, 1976, Ser. No. 659,054
Int. Cl.² E05D 15/02
U.S. Cl. 49—42 4 Claims



1. A barrier for selectively passing vehicles such as baby carriages of predetermined height or length while barring vehicles such as bicycles of differing height or greater length, comprising, in combination, two substantially U-shaped bows which are arranged substantially horizontally, one above the other, each bow having two legs, and a web fixedly interconnecting the two legs along one side and forming a substantially U-shaped rigid unit therewith, the legs being interconnected at their ends opposite the webs so that the bows are united in one piece; and the distance between the legs of one bow being greater than the distance between the legs of the other bow; a supporting pole mounting substantially U-shaped unit at the webs thereof with the substantially U-shaped unit spaced above the ground; and a second pole spaced from said supporting pole on the open side of said unit and embraced by the legs of the bows; the substantially U-shaped unit and the second pole defining therebetween an open passageway through the barrier, and compelling a vehicle seeking to pass through the passageway to pass on the inside of said second pole between the web and two legs, the distance between the two legs and web and said second pole being so selected as to permit the passage therethrough of vehicles such as baby carriages of a predetermined height or length, while preventing passage therethrough of vehicles such as bicycles of differing height or lesser length.

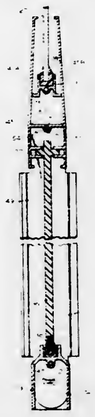
4,047,331

PET ACCESS DOOR PANEL

George N. Davlantes, 7844 Gazette Ave., Canoga Park, Calif. 91306

Filed Oct. 14, 1975, Ser. No. 622,067
Int. Cl.² E06B 7/28
U.S. Cl. 49—171 1 Claim

1. A pet access door panel for insertion in an opening with a frame having horizontal and vertical apertures in said frame and cooperating with sliding doors in said frame opening, and comprising
spaced vertical stiles;
a weather pane restrained between the stiles;
an intermediate access door rail;
a bottom access door rail;
a top panel rail, each rail extending between the panel stiles;
an access door flap for a pet;
means swingably securing the access door flap to the intermediate rail;
means releasably securing the access door flap to the bottom door rail;
means for adjusting the height of the access door panel;
vertically extending means and vertically spaced horizontal rods fixed in a said stile to protrude therefrom into the horizontal apertures in the said frame for fixing the access door panel in the framed opening;
said access door flap including
lower door edge means moveable to door opening positions on opposite sides of said bottom access door rail;
said means releasably securing said access door flap comprising



generally vertically superposed yieldable, magnetic securing means carried by said lower door edge means of said access door flap and an upper edge portion of said bottom access door rail;
said generally vertically superposed yieldable securing means cooperating to exert generally vertically oriented access door flap centering force,
tending to yieldably position said lower door edge means of said access door flap superposed along said upper edge portion of said bottom access door rail; and
said access door flap including
laterally projecting wiper means operable to compressively engage said spaced, vertical stiles,
said laterally projecting wiper means comprising reduced thickness wed portions of said access door flap.

4,047,332

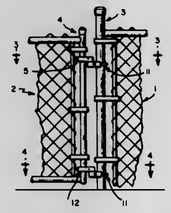
GATE HINGE COMPOSITION

Orient Benoit, Acushnet, Mass., assignor to New Bedford Wire & Iron Company, New Bedford, Mass.

Filed Nov. 20, 1975, Ser. No. 633,687
Int. Cl.² E05D 7/06
U.S. Cl. 49—236 1 Claim

1. Hinge means for mounting the gate to a fence post within an opening in the fence for gravitational closing from an open position, comprising upper and lower supports for attachment to the fence post and upper and lower hangers for attachment to the gate post, said supports and hangers being adjustably movable on the posts for clamping thereto at corresponding spacing, each support comprising an arm, a pintle pin at one end and two-part clamping means at the other end for encircling the fence post so arranged that the axis of the pintle pin

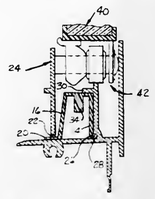
and the axis of the two-part clamping means lie on the longitudinal center line of the arm and are perpendicular thereto, said two-part clamping means comprising at said one end of the arm a transverse part having a substantially half-cylindrical surface which is symmetrical with respect to the center line of the arm, at the opposite ends of which are holes, the axes of which are parallel to the axis of the center line of the arm, a U-shaped band embodying a substantially half-circular part which, in conjunction with the substantially half-cylindrical surface of the transverse part, provides a clamping collar for clamping engagement with the fence post and at its opposite ends straight portions for engagement with said holes and means for securing the straight portions within said holes, said upper hanger comprising two parts of symmetrical configuration adapted to be bolted face-to-face and each part containing longitudinally spaced substantially half-circular openings defining half-circular surfaces of different diameter which collectively define, when the parts are bolted together, a collar for clamping engagement with the gate post and a bearing opening for pivotally receiving the pintle pin of the upper support and said lower hanger comprising two parts adapted to be bolted face-to-face, one of said parts containing longitudinally spaced



substantially half-circular openings defining half-circular surfaces corresponding in spacing and size to those of the parts of the upper hanger such that the two halves of the upper hanger and the one-half of the lower hanger are identical and the other one of the parts of the lower hanger containing a half-circular opening corresponding to said substantially half-circular opening of larger diameter in the one part and a substantially half-circular nub protruding from its face for engagement within the substantially half-circular opening of smaller diameter in the one part, and a limb extending from said other one of the parts at an angle to the center line defined by the faces of the parts beyond and laterally of the center line having at its distal end a bearing opening for pivotally receiving the pintle pin of the lower support so that when the gate is hung, a projection of the axis of the pintle pin of the lower support on a line containing the centers of the posts is closer to the axis of the fence post than is the pintle pin on the upper support and that the center lines of the upper and lower hangers coincide with the vertical plane containing the vertical axes of the posts so that the plane of the gate coincides with the plane of the fence when the gate is closed and, when in said closed position, the axis of the lower pintle pin is situated laterally of said plane.

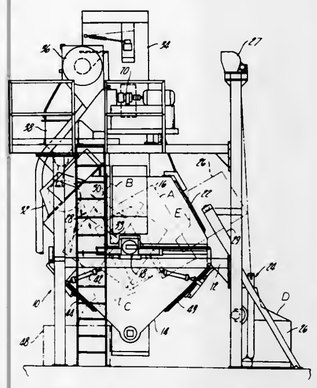
4,047,333
SNAP-IN KEEPER FOR SLIDING WINDOWS, DOORS AND THE LIKE
Harry M. Riegelman, Fullerton, Calif., assignor to Rusco Industries, Inc., Fullerton, Calif.
Filed Apr. 27, 1976, Ser. No. 680,868
Int. Cl.² E05D *13/06*
U.S. Cl. 49—450 **1 Claim**

1. A keeper for a latch means wherein a latch member is carried on a rail or stile of an assembled movable window, door or the like, wherein the latch member is movable relative to an extrusion in which the movable window, door or the like is slidable, and wherein the extrusion has opposed wall surfaces wherein one wall surface has interruptions therein, comprising:
an elongated element adapted to be inserted between the opposed wall surfaces of the extrusion and being a generally U-shaped element having a center wall and two side walls,
said center wall having a number of spaced openings therealong,
each opening being shaped to receive a portion of the latch member,
said side walls being normally non-parallel and characterized by spring action in that they can be forced towards each other and will return to their non-parallel relation when released,
the distance between the terminal edge portions of said



walls being less than the distance between the opposed wall surfaces of the extrusion,
one of said side walls having interruptions along its terminal edge adapted for interlocking relation with the interruptions in the one wall surface of the extrusion,
said terminal edge of said one wall having tabs adapted to be self-biased via the spring action of said side walls to enter crevices or openings in the one wall surface of the extrusion,
and wherein the extrusion is a sill member and the interruptions in the one wall surface thereof are constituted of weep holes, and wherein the tabs extend through said holes.

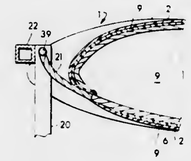
4,047,334
BLAST CLEANING MACHINE
Udo Kuehn, Ann Arbor, Mich., assignor to Ervin Industries, Inc., Ann Arbor, Mich.
Filed Nov. 8, 1976, Ser. No. 739,954
Int. Cl.² B24C *3/24*
U.S. Cl. 51—422 **4 Claims**



1. In a blast cleaning machine for shot blast cleaning parts, said machine having a main frame, a housing supported in a stationary position on said main frame, a barrel having an open end and a longitudinal axis extending through said end, said barrel being movably mounted in said housing for movement

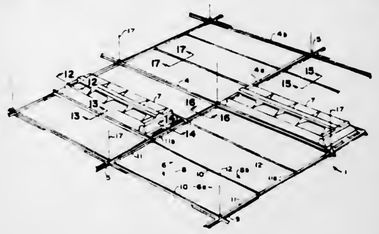
to a part tumbling and blast cleaning position in which said axis extends upwardly toward said open barrel end, means for rotating said barrel about the longitudinal axis thereof, and means in said housing for impelling a stream of shot into the open end of said barrel in said blasting position thereof, said barrel having an annular side wall assembly consisting of a plurality of connected arcuate sections having inner surfaces that cooperate to form the internal side wall surface of said barrel, each of said internal surfaces having leading and trailing portions which are substantially straight and are relatively arranged so as to form an obtuse angle therebetween, said leading portion being ahead of said trailing portion in the direction of rotation of said barrel during rotation thereof to tumble parts therein, said leading portion terminating in a surface portion which extends radially outwardly of said barrel at the leading end of said leading surface portion, said barrel having a bottom surface which is divided into relatively inclined sections, said side wall surface portions, and said bottom surface sections cooperating during rotation of said barrel about the longitudinal axis thereof in said blast cleaning position of said barrel to provide for a tumbling flow of parts in said barrel in a direction substantially diametrically thereof and through said stream of shot.

4,047,335
PNEUMATIC LOAD-SUPPORTING STRUCTURES
Robert M. Darmstadt, 22 G Meadow Green Circle, Englishtown, N.J. 07726
Filed Nov. 18, 1975, Ser. No. 633,074
Int. Cl.² E04B *1/345*
U.S. Cl. 52—2 **18 Claims**



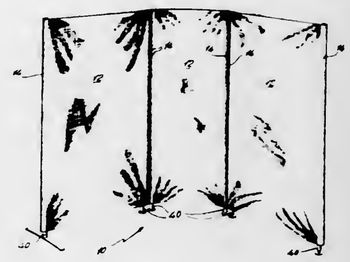
1. A pneumatic structure, comprising:
a. an inflatable envelope having opposed, spaced upper and lower membranes;
b. a plurality of vertical diaphragms connected between said first and second membranes, said diaphragms being at least semi-elliptical with top and bottom curved edges that diverge from a common point with respect to the major axis of the ellipse, said diaphragms being reinforced vertically and being operable to resolve the vertical component of forces applied to the top of the envelope;
c. a plurality of upper cables, each upper cable being connected to the top edge of a diaphragm at the junction of the diaphragm and the first membrane;
d. a plurality of lower cables, each lower cable being connected to the bottom edge of a diaphragm at the junction of the diaphragm and the second membrane;
e. said upper and lower cables of each diaphragm being connected to each other near the periphery of said envelope;
f. means for inflating said envelope; and
g. said cables and said diaphragms coacting to carry the load applied to the top of the envelope when inflated.

4,047,336
LIGHTING SYSTEM
Leo G. Stahlhut, Kirkwood, and Willard R. Garnett, Bellefontaine Neighbors, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Oct. 16, 1975, Ser. No. 622,859
Int. Cl.² E04F *19/00*
U.S. Cl. 52—28 **20 Claims**



1. A lighting system comprising:
a first main runner member;
a second main runner member, said first and said second main runner members being identical in at least one cross section, said cross section generally having an inverted U-shape, said inverted U-shape defining an open mouth chamber, said U-shape having a connecting portion, a first leg attached to said connecting portion, a second leg attached to said connecting portion, said legs having a second end and a lip, said lip having a first part extending inboard of the second end of said legs at an angle such that said first part lies in a plane other than a horizontal plane, a second part approximately parallel to said connecting portion, and an upturned third part, the relationship of the first part, the second part and the third part of said lip permitting the attachment of additional structure to said runners both along the lip and along the chamber defined by said inverted U-shape;
a luminaire mounted between said first and second runners; and
ceiling panel means extending between said first and said second runner members adjacent at least one side of said luminaire.

4,047,337
SOUND INSULATING PANELS
Torsten Bergstrom, Barseback, Sweden, assignor to Formac International AB, Arlov, Sweden
Filed Aug. 18, 1976, Ser. No. 715,522
Claims priority, application Canada, Oct. 30, 1975, 238682
Int. Cl.² A47G *5/00*; E04B *1/86*
U.S. Cl. 52—71 **5 Claims**



1. An improved sound insulating panel assembly having a

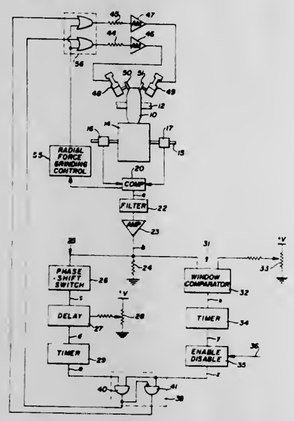
sound insulating core defining a pair of opposed major surfaces extending between a pair of opposite vertical edges, each vertical edge having a channel-like frame member extending along the height thereof, an extruded profile having a semi-cylinderical outer surface releasably supported in each respective channel-like frame member, the semi-cylinderical outer surface having a radius of curvature between 15 and 35 mm, and the profile having a height of at least 800 mm, each extruded profile having a pair of inwardly directed flanges which terminate in rearwardly extending gripping means, cooperating bent portions on the channel-like frame members engaging the gripping means, the width of the insulating core being substantially equal to the corresponding dimension of the channel-like frame members; fabric stretched over th- major surfaces of the panels, forced over the flanges of the frame members and adhesively secured thereto, the inwardly directed flanges of the profiles having shoulder portions accomodating ends of the fabric between the shoulder and adjacent surfaces of the channel-like frame members and concealing ends of the fabric from view while preventing accidental removal thereof from the panel; and meshingly-engagable, connecting-tapes mounted on the respective outer radiused surface of said profiles, said connecting-tapes being releasably-engagable with a complementary connecting-tape on a second structure for assembling the sound insulating panel and said second structure, the two connected tapes at said profile defining a sound-absorbing connection between the panel and said second structure and minimizing sound transmission therebetween, the core being secured to the frame members by fastening means, each pair of complimentary tapes respectively including releasably-engagable mushroom-like sections and meshing portions.

4,047,338

METHOD AND APPARATUS FOR REDUCING LATERAL FORCE VARIATIONS AND OVERTURNING MOMENT VARIATIONS IN PNEUMATIC TIRES

Kenneth J. Gormish, Tallmadge; Clarence Hofelt, Jr., Hudson; Silvano Anthony Lavecchia, Uniontown, and Clarence Arthur Ripley, Jr., Tallmadge, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Dec. 17, 1975, Ser. No. 641,861
Int. Cl.² B24B *49/00*
U.S. Cl. 51—106 R **4 Claims**



3. Apparatus for reducing variations in lateral force wherein said sensing and measuring means comprises:

a. two load cells equally spaced from and on opposite sides of the mid-plane of the tire for measuring load forces in the radial direction;

b. converting said force measurements to voltage level signals; and

c. means for subtracting one of said signals from the other to obtain a resulting signal representative of the magnitude and direction of the lateral force variation;

d. means for comparing the lateral force variation with a preset level to determine if said variation is unacceptable;

e. means for determining the point on the tire at which the lateral force variation is at its maximum; and

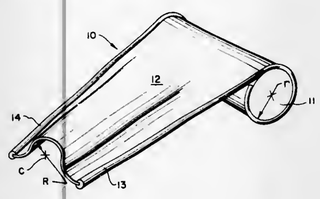
f. means for grinding alternatingly the tread shoulders of the tire if the lateral force variation exceeds said preset level, a zone of one shoulder being ground and the opposite zone of the other shoulder being ground, said zones being chosen in response to said determining means.

4,047,339

HIGH LOAD EXTENDIBLE STRUCTURE

Gordon A. Smith, Gaithersburg, and James M. Talcott, Clarksburg, both of Md., assignors to Fairchild Industries, Inc., Germantown, Md.

Filed Mar. 29, 1973, Ser. No. 345,837
Int. Cl.² E04H *12/16*
U.S. Cl. 52—108 **15 Claims**



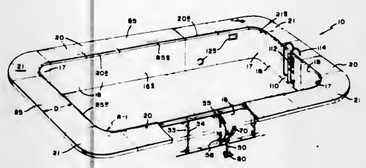
1. A method of forming an elongated thin pre-stressed metallic element comprising placing a flexible non-metallic sheet on a substantially flat metallic sheet which is to be formed into the thin pre-stressed element, and forming at least a portion of the substantially flat metallic sheet by subjecting both the portion of the substantially flat metallic sheet which is to be formed and the adjacently located portion of the flexible non-metallic sheet which is located on the substantially flat metallic sheet to pressure.

4,047,340

SWIMMING POOL MODULAR CONSTRUCTURE

Donald H. Witte, and Donald H. Weir, both of York, Pa., assignors to Fox Pool Corporation, York, Pa.

Division of Ser. No. 444,027, Dec. 20, 1974, Pat. No. 3,975,874.
This application Aug. 18, 1976, Ser. No. 715,528
Int. Cl.² E04H *3/18*
U.S. Cl. 52—169.7 **18 Claims**



1. A modular swimming pool wall panel being provided at its side extremities with flanges, each of said flanges having formed thereon upper and lower elements for locating continuous panels in a single predetermined vertical relationship, and by said upper and lower elements (with mating means for) interlocking said panel in situ with an adjacent panel to form the pool enclosure, said upper and lower elements providing a

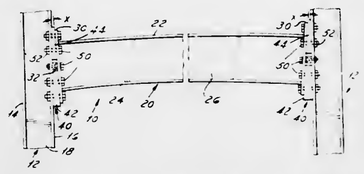
predetermined locking position thereon, respectively, for the upper and lower arms of a supporting brace.

4,047,341

FRAME STRUCTURE

James T. Bernardi, 17200 Fairfield, Detroit, Mich. 48221

Filed Oct. 29, 1976, Ser. No. 737,256
Int. Cl.² E04B *1/18*; F16B *9/02*; E04C *3/10*
U.S. Cl. 52—223 R **9 Claims**



1. A frame structure comprising a pair of spaced apart vertical columns having vertically extending mounting members, the mounting member on one of said columns facing the mounting member on the other of said columns, spacing means forming a fulcrum secured to each of said mounting members at a place thereon spaced from the ends thereof, a horizontal beam extending between the mounting members of said columns, vertically extending end plates fixedly secured to the end portions of seid beam, said end plates fixedly secured to the end portions of said beam, said end plates facing said mounting members and being spaced therefrom by and being engageable with said spacing means, moment inducing wedge means interposed in each of the spaces between the corresponding mounting members and end plates, rows of aligned openings in each of said mounting members and end plates which are horizontally and vertically spaced, and fastening means in the form of threaded bolts extending through said aligned openings in said mounting members and end plates and secured thereto by nuts, said fastening means at each end of the beam prior to the tightening of the nuts initially rotating the beam on said spacing means and thereafter after the tightening of the nuts fixedly securing the corresponding end plate of the beam to the opposing mounting member through said wedge means, each of said wedge means being arranged vertically and having an upwardly and outwardly inclined flat surface extending toward the corresponding mounting member and engageable with the opposing end plate of the beam, each wedge means having a vertically extending flat surface engageable with the opposing mounting member of the column, with said inclined flat surface and said vertical flat surface lying in planes which intersect at an acute angle, each wedge means being effective when the threaded bolts and nuts are stressed to induce as a result of the beam rotating on said spacing means an upwardly extending camber in the beam prior to the application of dead loads to the structure, said wedge means being held in the spaces between the corresponding members and end plates solely by the forces generated by said fastening means, without any physical attachment to said fastening means.

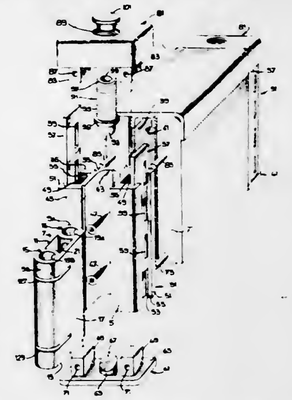
4,047,342

PANEL ASSEMBLY

Paul Boulva, 7425 Canora Rd. Ville, Mount-Royal, Quebec, Canada (H3P 2H9)

Filed May 5, 1975, Ser. No. 574,367
Int. Cl.² E04B *2/74*
U.S. Cl. 52—239 **25 Claims**

1. A space divider assembly comprising a bridge means joining together a number of structural wall panels each having vertically extending connecting means on vertical edges thereof, along adjacent vertical edges, the bridge means having projecting edges equal in number to the number of panels to be joined together, receiving means at each end of each projecting edge, the receiving means extending longitudinally inwardly of the bridge means from each end and receiving the vertically extending connecting means on the panels.

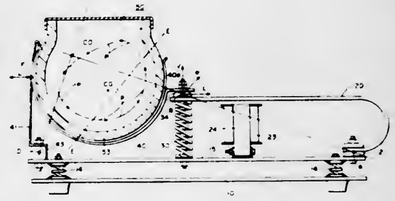


4,047,343

METHOD OF VIBRATORY POLISHING OF STONES AND THE LIKE

Edward Earl Smith, New London, Iowa, assignor to Geode Industries, Inc., New London, Iowa

Division of Ser. No. 498,070, Aug. 16, 1974, Pat. No. 3,978,623.
This application June 23, 1976, Ser. No. 698,968
Int. Cl.² B24B *1/00*
U.S. Cl. 51—313 **3 Claims**



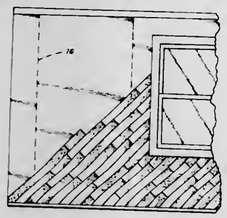
1. In the method of polishing discrete material such as stones and the like by tumbling of the same together with an abrasive medium in a vibrated container having a wall whose inner surface is arcuate relative to a substantially horizontal first axis, the improvement comprising: tumbling a mass of the material and the abrasive medium in a path about a second axis substantially parallel to the first axis and through the body of said mass, said path including a portion along said wall surface, and vibrating the container so that only part of said path portion describes an orbit having its theoretical center on a third axis parallel to the first and second axes and disposed above the center of gravity of said mass, said part of said path portion being more remote from said third axis than any other portion of said path, whereby increased alternate compaction and separation of the material in the abrasive is achieved during the tumbling process.

4,047,344

WOOD VENEER WALL COVERING

John R. Postman, Portland, Oreg., and Elwin G. Bottorff, Kalama, Wash., assignors to Pope & Talbot, Inc., Portland, Oreg.

Filed Aug. 12, 1976, Ser. No. 713,861
Int. Cl.² E04F *13/00*
U.S. Cl. 52—390 **10 Claims**



5. For a wall including vertically disposed structural members forming the plane of the wall, a wood surface covering forming the visible face of the wall, said covering comprising wood veneer strips having a width corresponding to lumber width and a thickness no greater than about the thickness of the annual growth in the wood of the strip, the relatively thin nature of the strip accommodating manual bending of the strip to accommodate surface curvature and irregularities in the plane of the wall,

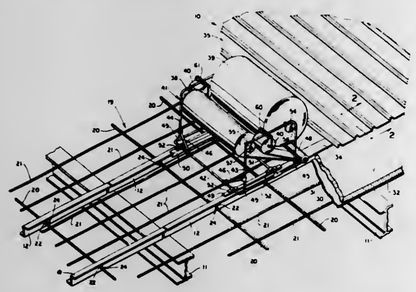
said strips being disposed with one set of faces lying against and adhesively bounded to the wall, said strips occupying side-by-side nonoverlapping rows extending diagonally on the wall with each row containing strips extending longitudinally thereof, said strips being disposed end-to-end in a row and the ends of strips in one row being staggered with respect to the ends of strips in other rows, said wall having bounding margins along the top and bottom of the wall and a row of strips where such terminates at a bounding margin including an end strip which has a cut extending diagonally thereof which appears as a horizontal cut with the strip on the wall with such cut coinciding with the bounding margin.

4,047,345

ROOF SYSTEM

Robert J. Alderman, 812 59th St., N.W., Bradenton, Fla. 33505

Continuation-in-part of Ser. No. 494,097, Aug. 2, 1974, Pat. No. 3,969,863. This application Dec. 8, 1975, Ser. No. 638,329
Int. Cl.² E04B *2/28, 2/60;* E04F *21/00*
U.S. Cl. 52—404 **12 Claims**



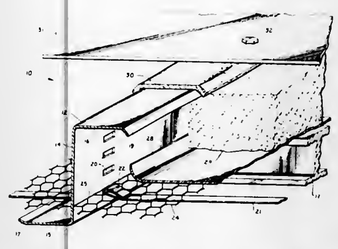
1. In a roof structure comprising a plurality of spaced rafters oriented parallel to one another, a plurality of purlins each including an upwardly extending central web, said purlins being mounted in spaced parallel relationship with respect to one another on said rafters, the improvement therein of the upwardly extending central webs of said purlins defining a plurality of openings at various heights therein with the openings of the purlins being in approximate alignment with the openings of the purlins or opposite sides thereof, and a plurality of insulation support straps oriented parallel to one another and perpendicular to said purlines and extending through aligned ones of said openings of said purlins, elongated strips of insulation material of a width approximately equal to the spacing between the central webs of said purlins positioned between the extending parallel to said purlins and resting on said support straps, and sheets of roofing material mounted on said purlins and extending over said strips of insulation material.

4,047,346

CHICKEN WIRE ROOF AND METHOD OF INSULATION

Robert J. Alderman, 812 59th St. NW., Bradenton, Fla. 33505

Continuation-in-part of Ser. No. 649,911, Jan. 16, 1976, and a continuation-in-part of Ser. No. 494,097, Aug. 2, 1974, Pat. No. 3,969,863. This application Feb. 9, 1976, Ser. No. 656,642
Int. Cl.² E04B *2/28;* E04D *3/35*
U.S. Cl. 52—407 **12 Claims**



1. In a roof structure comprising a plurality of approximately equally spaced purlins oriented parallel to one another in a common plane, each of said purlins including an upwardly extending central web and oppositely laterally extending upper and lower flanges, the improvement therein of each of said purlins defining groups of openings through its central web, said groups of openings being spaced along the length of the purlins with the openings of each group being variably spaced from the flanges of the purlins and with the openings of the purlins being in approximate alignment with the openings of the purlins on opposite sides thereof, a plurality of support straps oriented parallel to one another and extending through the openings of the central webs of said purlins, elongated strips of wire mesh positioned between and extending parallel to said purlins and resting on said support straps and spanning the space between the central webs of adjacent ones of the purlins, elongated sheets of substantially impervious material positioned between and extending parallel to said purlins and resting on said sheets of wire mesh and spanning the space between the central webs of adjacent ones of the purlins, a layer of heat insulation material extending over each sheet of material, and sheets of roofing material mounted on said purlins.

4,047,347

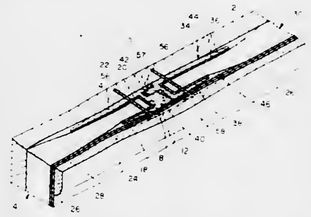
WALL OR CEILING PANEL CONSTRUCTION

Lloyd J. Scheid, 4404 Grimes Place, Encino, Calif. 91316

Continuation-in-part of Ser. No. 510,027, Sept. 27, 1974, abandoned. This application Mar. 4, 1976, Ser. No. 663,821
Int. Cl.² E04B *2/00;* E04C *2/00*
U.S. Cl. 52—436 **51 Claims**

1. A panel construction comprising the combination: a first elongate panel of gypsum core construction material having first and second opposed lateral edges; a female elongate

mounting member secured substantially coextensively along one of said first and second opposed lateral edges, said female elongate mounting member comprising a channel-like configuration with solid, continuous wall first and second opposed flanges and an integral, intermediate connecting web portion; said web portion having an intermediate groove, the confronting surfaces of said first and second flanges having a plurality of grooves therein and matingly engaging opposed surfaces of said first elongate panel in an edge reinforcing manner; a male elongate mounting member secured substantially and coextensively along the other of said first and second opposed lateral



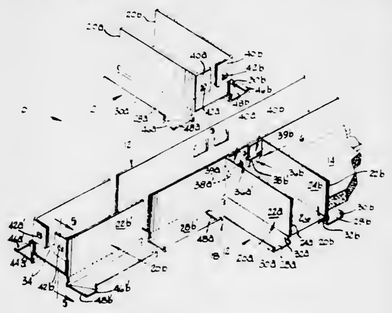
edges, said male elongate mounting member comprising a channel-like configuration with solid, continuous wall first and second opposed flanges and an integral, connecting web portion having an intermediate tongue adapted to matingly nest within the groove of said female mounting member of a secondly positioned elongate panel, the confronting surfaces of said opposed flanges of said male mounting members having a plurality of grooves therein and matingly engaging opposed surfaces of said first elongate panel in an edge reinforcing manner, said male and female elongate mounting members being adapted for rigid securement to a support surface.

4,047,348

CEILING SUPPORT GRID SYSTEM

Diarmuid Justin McSweeney, Granville, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.

Filed June 28, 1976, Ser. No. 700,289
Int. Cl.² E04B *5/52;* E04C *2/42*
U.S. Cl. 52—484 **11 Claims**



1. A ceiling support arrangement, comprising:

a. a plurality of longitudinally extending support runners, each of which includes

i. a pair of horizontally spaced apart and aligned vertical sidewalls having respective outer surfaces and confronting inner surfaces,

ii. means joining said sidewalls together, said joining means extending between the inner surfaces of the sidewalls adjacent the bottom edges thereof, and

iii. a pair of support flanges respectively connected with the bottom edges of said sidewalls and extending horizontally out from the outer surfaces thereof;

b. means for connecting one end of a first of said runners to a second runner at an intermediate point along the length of said runner, said means including:

i. a first interlocking member connected with one of the said sidewalls of said second support runner at said intermediate point, said interlocking member including an upwardly extending segment having a top edge portion which is spaced outwardly from the outer face of said one sidewall and which is located above the horizontal support flange connected with said one sidewall, and

ii. a second, vertical interlocking member connected to one end of said first runner, said second interlocking member extending inwardly from the inner surface of one of the sidewalls of said first runner and having a bottom edge portion which is spaced above the sidewall connecting means of said first runner, said bottom edge portion being adapted for vertically downward insertion into the space between the top edge portion of said first interlocking member and the sidewall to which the first interlocking member is connect; and

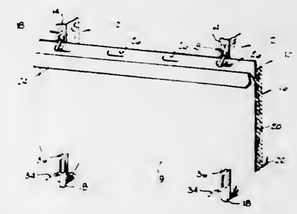
c. means separate from said first and second interlocking members and located at and connected to said one end of said first runner in a horizontal plane including said support flanges of said first runner, said last-mentioned means being interlocked with a support flange of said second runner at said intermediate point for interlocking said end of said first support runner to the second support runner at said intermediate point along the length of said second runner for preventing said first runner from moving away from said second runner in said horizontal plane and for preventing said first runner from rotating in said plane relative to said second runner.

4,047,349

SHEET MATERIAL ATTACHING DEVICE AND WALL ARRANGEMENT USING THIS DEVICE

Manuel Aguilar, Jr., Savannah, Ga., assignor to Johns-Manville Corporation, Denver, Colo.

Filed May 14, 1976, Ser. No. 686,351
Int. Cl.² E04D *1/34*
U.S. Cl. 52—551 **3 Claims**



1. A device for supporting sheet material to a vertically extending, fixed support member, said device comprising:

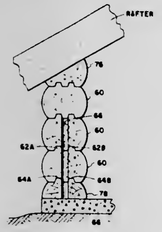
a. a longitudinal metal strip having a front longitudinally extending face and a back longitudinally extending face, said strip being adapted for connection with said support member such that said back face rests against said support member; and

b. a plurality of elongated metal support elements spaced from one another longitudinally along the front face of said strip and integrally formed therewith, each of said elements being connected at one end with said strip and extending out beyond the front face thereof, whereby an outwardly extending portion of each of said elements is adapted for insertion through an opening through said sheet material to support said sheet material in a vertical

position adjacent said fixed support member said portions being substantially straight before being inserted through association openings, said elements being constructed of bendable metal whereby, once the outwardly extending portion of said elements are inserted through corresponding openings through said sheet material, said portions can be bent in a vertically upward direction to aid in supporting said sheet material against said fixed support member;

c. each of said support elements including an upwardly extending irregularity located a predetermined distance in front of the front face of said elongated strip, said irregularity being positioned directly behind a corresponding opening is said sheet material when the outwardly extending portion of the support element is inserted through said corresponding opening, said irregularity being adapted to inhibit movement of said sheet material inwardly along said support element beyond said irregularity.

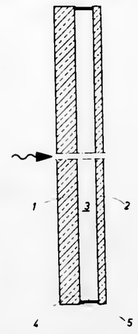
4,047,350
LOG PRODUCT AND IMPROVEMENTS IN MACHINE TO PREPARE LOGS FOR LOG HOUSES
Finis Lavell Chisum, P.O. Box 1145, Claremore, Okla. 74017
Continuation-in-part of Ser. No. 571,373, April 24, 1975, Pat. No. 3,951,187. This application Apr. 19, 1976, Ser. No. 678,238
Int. Cl.² E04C 1/10; E04B 1/10
U.S. Cl. 52—593 **1 Claim**



1. A finished log for log house construction comprising
an esentially cylindrical log cut to desired length,
upper and lower parallel flattened surfaces along the longitudinal length of said log,
two spaced and parallel tongue members extending from one of said surfaces along said longitudinal length,
two spaced and parallel groove members, reverse images of said tongue members, extending into the other surface along the longitudinal length thereof,
each end of said log having vertical outward opening grooves perpendicular to said flattened surfaces, said grooves being a first groove nearest the said end and a second groove of dimension less than the width of said first groove, and
at least one vertical hole extending through said log perpendicular to said flattened surfaces and located between said spaced tongue and grooves.

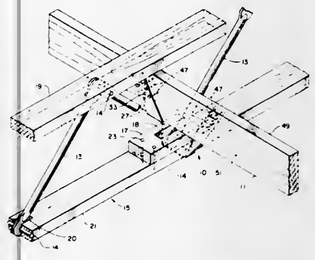
4,047,351
LIGHT TRANSMITTING PANEL
Paul Dorner, Gelsenkirchen; Hans Sountag, Gelsenkirchen-Buer, and Otto Stehl, Essen, all of Germany, assignors to BFG Glasgroup, Paris, France
Filed Sept. 16, 1975, Ser. No. 613,852
Claims priority, application Luxembourg, Sept. 16, 1974, 70915; Sept. 16, 1974, 70916; Germany, Dec. 27, 1974, 2461533; Dec. 27, 1974, 2461531; Dec. 27, 1974, 2461532; Feb. 1, 1975, 2504293; Luxembourg, Apr. 4, 1975, 72220
Int. Cl.² B32B 1/04; E04C 2/34
U.S. Cl. 52—616 **34 Claims**

1. In a light transmitting panel composed of at least two panes and spacer means holding the panes in spaced relation to define an inter-pane space between adjacent panes, the improvement wherein, for imparting improved sound damping properties to said panel, at least two said panes have respectively different masses per unit light transmitting surface area, said inter-pane space is sealed from the atmosphere, and said



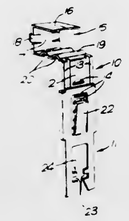
panel comprises a gaseous medium filling said space and having a composition such that the velocity of sound propagation in said gaseous medium is at least 1.2 times the velocity of sound propagation in dry air at the same pressure and temperature.

4,047,352
BRIDGING CLIP FOR TRUSS JOISTS
Lavern E. Sweet, 6561 Arthur St., Chino, Calif. 91710
Filed Aug. 16, 1976, Ser. No. 714,560
Int. Cl.² E04C 3/02
U.S. Cl. 52—693 **3 Claims**



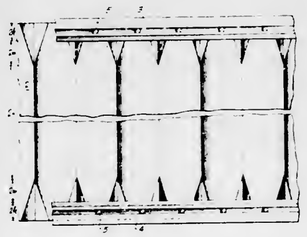
1. In a truss joist construction comprising a plurality of truss joists in generally parallel relationship, a bridging member extending generally perpendicular to the truss joists and means securing the bridging member to the truss joists, the improvement wherein the securing means comprises:
a longitudinal strap folded so as to form a generally V-configuration having centrally disposed channel which includes a bottom strap extending across the bottom of the chord of a truss joist, two adjacent portions of the strap extending perpendicularly to the bottom strap upwardly along the vertical edges of the chord, the vertical portions having oppositely angled fold lines so disposed that the vertical portions are folded outwardly along the respective angled fold lines such that the upper ends of the strap extend upwardly from the bottom strap and diverge outwardly from each other and are displaced so that the ends lie in parallel planes a distance D apart, the distance D approximating the thickness of the bridging member, the ends of the strap being secured to the bridging member whereby the bridging member is securely fastened above and perpendicularly to the chord for positioning the chord relative to other truss joist chords, transmitting loading between adjacent truss joists, and maintaining bridged truss joists in relatively parallel relationship.

4,047,353
RIDGE CAP HOLDING CLIPS
Raymond Joseph Aarons, Jindallee, Australia, assignor to Monier Colourtile Pty. Ltd., Darra, Australia
Filed May 14, 1976, Ser. No. 686,553
Int. Cl.² E04B 7/02, 7/06
U.S. Cl. 52—713 **9 Claims**



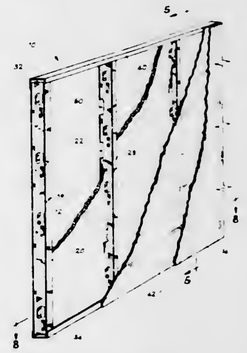
1. A clip for securing a ridge- or hip-cap of the type having cap-pieces mounted end-to-end to form a continuous capping, said clip including:
an upright lower part having anchoring means for attaching said part to a T-section member of a building structure, said anchoring means being constituted by a slot in said upright lower part having inwardly projecting lugs to define opposed notches positioned for slidably engaging a flange of the T-section member;
an upper part including a depending section for passing between edges of adjacent cap-pieces and a top section to overlie the top surfaces of both said cap-pieces; and
attachment means between said upright lower part and said depending section.

4,047,354
COMPOSITE BEAM STRUCTURE
James Gordon Sutherland, Kingston, Canada, assignor to Alcan Aluminum Corporation, Cleveland, Ohio
Filed June 15, 1976, Ser. No. 696,354
Int. Cl.² E04C 3/32, 3/07
U.S. Cl. 52—729 **16 Claims**



1. A beam, including:
a. an elongated, relatively flexible, transversely corrugated web (1,2,6);
b. two elongated, relatively rigid, structural members, (3,4,7), each member having a slot (3c,4c,7a) receiving one margin of said web;
c. said corrugated web comprising primary corrugations (1a,1b), each having a depth greater than the width of the slot and extending transversely across the middle (2n) of the web, said primary corrugations enhancing the stress resistance of the web, and relatively shallow secondary corrugations (1d,1e,1g,1h) extending transversely across each margin from the edge of the web to a juncture with the primary corrugations, said shallow corrugations having a depth which increases gradually from a minimum at the edge of the web to a maximum at said juncture, said minimum depth being smaller than the width of the slots, to facilitate movement of the margins into the slots; and
d. means (5) fastening each margin of the web in its associated slot, to lock the members and the web together in a unitary beam.

4,047,355
SHAFTWALL
William L. Knorr, Salem, Oreg., assignor to Studco, Inc., Salem, Oreg.
Filed May 3, 1976, Ser. No. 682,330
Int. Cl.² E04C 3/07
U.S. Cl. 52—738 **15 Claims**

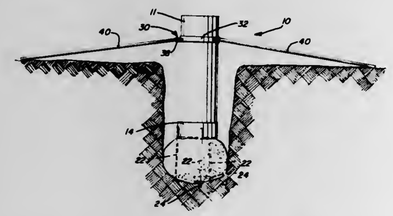


1. In a shaftwall,
a plurality of vertical studs of sheet metal,
each stud having at one side thereof an inner flange and an outer flange folded back on and spaced from the first flange to form a thin, vertical passage open at the top and one side,
the inner and outer flanges being parallel to each other and overlapping portions thereof forming a double thickness flange,
the overlapping portions of the second flange having an opening therethrough into the space between the flanges,
the openings being spaced low on the studs to admit air into the passages,
and gypsum boards secured to the other side of the studs.

4,047,356
POST FOOTING FORM HOLDER AND STABILIZER SYSTEM
Mario Louis DePirro, 511 S. Highland Ave., Lombard, Ill. 60148
Filed Dec. 22, 1975, Ser. No. 642,724
Int. Cl.² E02D 27/00
U.S. Cl. 52—749 **7 Claims**

1. A post footing form holder and stabilizer system for use in conjunction with a post form and stabilizer means for positioning and retaining the post form in its use position, comprising in combination,
a collar formed by a peripheral side wall and having an open top end and an open bottom end bounded by a bottom edge,

said open bottom end having a flange positioned along the bottom edge and extending inwardly for a distance,
said collar being dimensionally sized to accommodate the positioning of the post form therein and said flange functioning as a bottom stop for the post form once inserted within said collar,
a plurality of legs mounted on said collar and extending downwardly therefrom and terminating in a lower end,
said legs being provided with stop means mounted thereon and spaced a distance upwardly from said lower end of said legs,
stabilizer means associated with said collar and post form for stabilizing and maintaining the post form and collar in position when forming a post footing,
said stabilizer means comprising,
a clamp ring formed by a ring wall having an interrupted portion,



a tension clamp overlying and bridging said interrupted portion,
said tension clamp constructed so as to draw the opposed ends of said interrupted portion together and positionally lock in a closed position,
said ring wall further provided with a plurality of tie means mounted thereon along the outer surface thereof,
and a plurality of stabilizer rods constructed so as to attach to said tie means at one end and for attachment to an underlying support surface at the other end,
whereby said clamp ring may be circumferentially positioned about the post form while the tension clamp is positionally locked such as to firmly retain said clamp ring about the post form, while said stabilizer rods are then attached to said tie means at one end and secured to the underlying support surface at the other end thereby to firmly retain and position the clamp ring, and in turn, the post form in position.

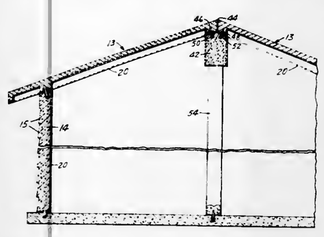
4,047,357

ROOF STRUCTURE OF CONCRETE EDGE-TO-EDGE ABUTTING PANELS AND METHOD OF INTERCONNECTING SAME

Stanley C. Mulholland, deceased, late of Rochester, Minn., by Wanda E. Mulholland, administratrix, Mr 73, Box 168, Rochester, Minn. 55901

Continuation of Ser. No. 502,345, Sept. 3, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 661,142
Int. Cl.² E04B *7/04*
U.S. Cl. 52—90 **7 Claims**

1. A roof structure comprising a plurality of concrete building panels supported, by a supporting means, in abutting edge-to-edge relationship, each said building panel having a downwardly projecting rib extending along each of two opposite side edges on the bottom surface of said panel, each said rib being integral with said bottom surface, a layer of foam covering said bottom surface and extending around each said rib so as to at least partially cover said opposite side edges of said panel, wherein the thickness of each rib is greater at said bottom surface of said panel than at the projecting end of said rib, wherein abutting edges of said panels are received in and supported by a V-shaped notch in said supporting means.



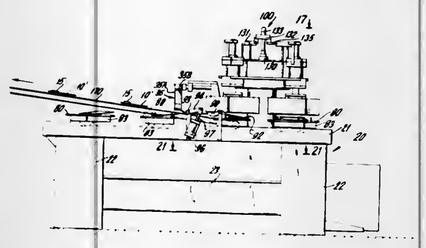
whereby said foam on said abutting edges of said plurality of panels is compressed so as to form a seal.

4,047,358

METHOD FOR FORMING ARTICLE-HOLDING DISPLAY PACKAGES

William Heffernan, Westfield; George R. Hair, Clifton, both of N.J., and John G. Nielsen, Freeport, N.Y., assignors to International Inpak Inc., Saddle Brook, N.J.

Continuation of Ser. No. 437,314, Jan. 28, 1974, abandoned, which is a division of Ser. No. 205,817, Dec. 8, 1971, Pat. No. 3,788,032. This application Sept. 7, 1976, Ser. No. 727,002
Int. Cl.² B29C *17/04*; B65B *43/08*
U.S. Cl. 53—30 R **2 Claims**



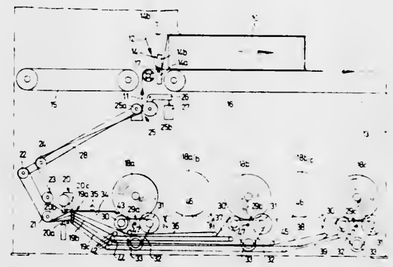
1. In a method for forming and sealing article holding pockets in plastic windows in a series of sheet-like blank members, each member having at least one window opening covered on one surface by a heat formable, heat sealable plastic sheet sealed to said one surface, wherein heat is applied to the plastic sheet and then, at a molding station, pressure is applied to the already heated plastic sheet to cause the plastic sheet to conform to the shape of a female mold and form a pocket, then an article is inserted into the pocket, the said at least one window opening of said blank is superimposed with a further blank member to enclose the article within the pocket and the blank sections are sealed to each other by the application of heat and pressure, the improvement comprising: transporting each blank from a supply station to the molding station and partially forming said pocket by heating the plastic sheets covering said at least one window opening of each blank to the molding temperature during said transporting by direct thermal contact of said plastic sheet and a heated die member under differential air pressure, drawing said thus heated plastic sheet through said window opening into a female mold to complete forming of said pocket, transferring said blank to an article insertion station and inserting an article in said pocket, superimposing said blank with a further blank section, sealing said further blank section to said heat sealable plastic sheet by the application of heat and pressure at a sealing station, and wherein a different blank is operated upon at each station.

4,047,359

DEVICE FOR PACKAGING AN OBJECT IN FOIL

Theo Gronebaum, Rietberg, Germany, assignor to Firma Heinrich Kuper, Reitberg, Germany

Filed Sept. 1, 1976, Ser. No. 719,466
Int. Cl.² B65B *57/04, 51/14*
U.S. Cl. 53—64 **24 Claims**



1. Device for packaging an object in foil wherein a pair of foils are disposed on both sides of a packaging plane and, in a central welding device, are welded to one another enclosing therebetween the object to be packaged, and wherein the foil webs travel in a given direction and, for each foil web, a foil-web parting and/or foil-web re-welding device is provided, serving to effect an exchange of foils and having functional members for parting a foil web as well as for welding a pair of juxtaposed foil-web ends together, the functional members extending transversely to the foil-web travel direction, the parting and/or re-welding device being disposed between a bearing which carries one foil roll, and a foil-web pulling device located upstream of the central welding device in the foil-web travel direction, the packaging device comprising at least another bearing carrying a foil roll disposed in spaced relationship to and behind the first-mentioned foil-roll bearing, means defining respective separate foil-web guide paths for the foil webs of each of the foil rolls, said guide path means comprising at least one conveyor device and extending from said foil-roll bearings to the vicinity of said parting and/or re-welding device, said separate guide paths having respective end regions at said vicinity of said parting and/or re-welding device, said end regions being disposed slightly spaced from one another at varying elevations.

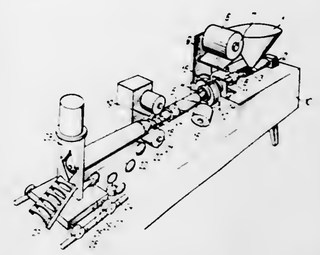
4,047,360

AUTOMATIC MACHINE FOR MAKING PACKAGES OF VISCOUS FOOD PRODUCTS BY ENCLOSING IN A CASING

Alexandr Ivanovich Minaev, Oktyabrskaya ulitsa, 89, kv. 50; Alexandr Valerievich Lebedev, Severny bulvar, 12-B, ky. 252, both of Moscow, and Artur Viktorovich Mogilev, ulitsa Pervomaiskaya, 52-A, kv. 6, Dolgoprudny Moskovskoi oblasti, all of U.S.S.R.

Filed Oct. 20, 1976, Ser. No. 734,048
Int. Cl.² B65B *9/06*; A22C *11/08*
U.S. Cl. 53—122 **2 Claims**

1. An automatic machine for making packages of viscous food products by enclosing in a casing, comprising: a hopper adapted to be charged with a product to be packaged; a positive displacement pump communicating with said hopper; a nozzle communicating with said pump, adapted to feed the product being packaged into a casing; a sleeve mounted about said nozzle and adapted to have formed thereon the longitudinally extending layer of the casing; a mechanism for supplying a flat elastic film web onto said sleeve; a mechanism for supplying another flat elastic film web to be formed into a helically wound layer of the casing, superimposed upon the longitudinally extending layer thereof, said last-mentioned mechanism including a mandrel mounted for rotation, a drive adapted to impart rotation to said mandrel, operatively connected therewith; a spool with a supply of the elastic flat film web to be formed into the helically wound layer of the casing, rigidly



secured on said mandrel at an acute angle thereto; a device for pulling the casing stuffed with the product being packaged off said nozzle, mounted directly on said nozzle.

4,047,361

WRAPPING PAPER SUPPLYING DEVICE IN COIN WRAPPING APPARATUS

Masato Ono, and Minoru Nakamura, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Filed Oct. 18, 1976, Ser. No. 733,192
Claims priority, application Japan, Oct. 17, 1975, 50-125034
Int. Cl.² B65B *11/04*
U.S. Cl. 53—212 **6 Claims**

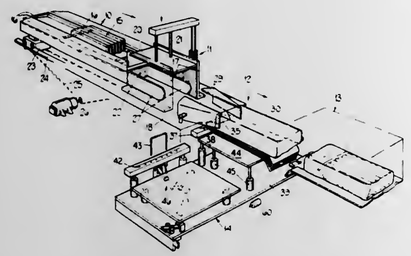


1. A wrapping paper supplying device incorporated in a coin wrapping apparatus wherein a predetermined number of coins are stacked together and wrapped by a piece of wrapping paper fed through a pair of paper feeding rollers and cut by a cutter into said piece of a length adapted for the coins, the paper thus wrapped being thereafter crimped at projecting sides edges thereof at the ends of the coin stack, the paper supplying device comprising: a cutter position setting mechanism for setting the cutter at one of the positions adapted for cutting the paper into said piece of said length appropriate for wrapping the coins of a specific denomination; roller supporting means for supporting one of the feeding rollers in a manner such that one of the rollers is movable toward or away from the other; a cutter position detecting arm which is coupled with said roller supporting means and is displaceable in accordance with the set position of said cutter; and control cam means operating cooperatively with a contact part of said detecting arm for displacing the detecting arm for a period determined by the set position of said cutter, whereby the operative period of the paper feeding rollers is varied depending on the set position of said cutter, and thereby a time-difference appropriate for the wrapping of the coins is provided in the paper feeding operation of the feeding rollers.

4,047,362
PACKAGING MACHINE FOR INSERTING ARTICLES INTO BAGS

Edward Alan Lister, Burnley, and Graham Wilson Clarke, Nelson, both of England, assignors to Brdr. Schur International A. S., Horsens, Denmark

Filed Mar. 18, 1976, Ser. No. 667,944
Claims priority, application United Kingdom, Mar. 20, 1975, 11594/75
Int. Cl.² B65B *43/36*
U.S. Cl. 53—189 20 Claims



1. A packaging machine for inserting semi-compressible articles into preformed bags of the kind having one side thereof extended at the open end of the bag so as to define a main portion and an extension portion, the machine comprising a plate for supporting a stack of said bags substantially beneath their main portions, a stationary upper gripping member for engaging the upper surfaces of said extension portion of said bags, a movable lower gripping member supporting the extension portions of said bags in opposition to said upper gripping member, means carried by the lower gripping member for temporarily retaining the bags of the stack of bags relative thereto; means for inserting articles through the open end of the upper bag of the stack; and, linkage means connecting said lower gripping member and said support plate for effecting differential vertical movement therebetween; means for raising said lower gripping member upwardly toward said upper gripping member to clamp said extension portions therebetween; and means for permitting said lower gripper member to release the extension portions, said gripping members being maintained in clamping pressure about said bag extension portions while the articles are inserted into the upper bag, said articles undergoing limited compression against the end wall of the bag after which the clamping pressure is released by movement of said lower gripping member, permitting the filled bag to move relative to the upper and lower gripping members under the influence of said article inserting means, the force applied to the bag being sufficient to overcome the restraint imposed by the temporary retaining means.

4,047,363
PACKAGING APPARATUS

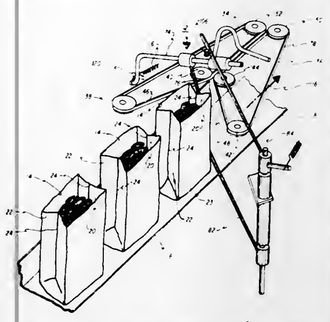
Alfonso Vigneri, Batavia, N.Y., assignor to Richard Rath Packaging Machinery, Inc., Fairport, N.Y.

Filed Nov. 5, 1976, Ser. No. 739,384
Int. Cl.² B65B *7/06, 7/18*
U.S. Cl. 53—371 10 Claims

1. For use in closing open ends of containers while they move along a path of travel with the trailing and leading sides of successive containers spaced from each other, apparatus which comprises

a finger disposed adjacent to said path of travel and rotatably mounted to oscillate along an arc between a first location between said trailing and leading sides of said successive containers and a second location spaced from an open end thereof, and

means responsive to the movement of each of said successive containers along said path of travel and actuated by said containers as said containers move along said path past the vicinity of said finger for causing said finger to oscillate from said first location to said second location and then from said second location to said first location so as to form inward folds in the leading and trailing sides of each of said containers at the open end thereof, said actuation by said containers being provided by a mechanism comprising a rotatable first bar having an end which successively pivots from a position into engagement with said containers to a position into the space between the trailing

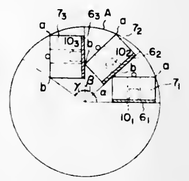


and leading sides of successive ones of said containers, a second bar rotatable with said first arm, a cam member disposed in engagement with said second bar, said cam member and said finger being rotatably mounted for conjoint movement, said second bar providing for displacement of said cam member, said cam member having a shape such that the displacement of said finger along said arc from said first position to said second position is a function of the displacement of said container along said path of travel and said container is disposed in a position with its trailing side intersecting the arc of said finger when said finger reaches said second position.

4,047,364
WRAPPING PAPER STORING DEVICE IN A COIN WRAPPING MACHINE

Yasuo Murakami; Masatoshi Ushio, and Hirokuni Matono, all of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Filed Sept. 15, 1976, Ser. No. 723,636
Claims priority, application Japan, Sept. 30, 1975, 50-133514
Int. Cl.² B26D *7/00;* B65B *41/16*
U.S. Cl. 53—389 2 Claims

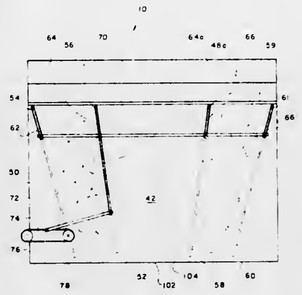


1. A wrapping paper storing device in a coin wrapping machine, comprising a rotary body rotatable about a shaft, a plurality of wrapping paper placing beds for placing thereon rolls of wrapping paper with axes perpendicular to respective placing beds, said placing beds lying in planes radially disposed relative to said shaft, wrapping paper roll supporting spindles so positioned according to the height of respective rolls of wrapping paper that, when said rotary body is rotated, the outer upper edge portions of the rolls of wrapping paper placed on said placing beds trace orbits lying in one and the same circle, placing angles of the placing beds being unequally formed in such a manner that the lower surface of each adjacently preceding placing bed is positioned as close as possible to the inner upper edge portion of the roll of wrapping paper on the succeeding placing bed.

4,047,365
AUTOMATIC LEAF SPREADER FOR A TOBACCO HARVESTER

Charles W. Suggs, 1507 Trailwood Drive, Raleigh, N.C. 27606

Filed Aug. 25, 1975, Ser. No. 607,218
Int. Cl.² A01D *45/16*
U.S. Cl. 56—27.5 6 Claims



6. A tobacco harvester having an automatic leaf spreading mechanism for generally uniformly spreading and distributing harvested tobacco leaves over substantially the entire cross sectional area of a leaf receiving structure, said tobacco harvest comprising:

a. a frame structure;

b. defoliating means mounted on said frame structure for defoliating tobacco leaves from respective tobacco stalks during the tobacco harvesting operation as said tobacco harvester moves through the field;

c. conveying means supported on said frame structure for receiving the defoliated tobacco leaves and for conveying the tobacco leaves from said defoliating means;

d. a leaf receiving structure normally operatively associated with said tobacco harvester during the harvesting operation for receiving the defoliated leaves, said leaf receiving structure during the harvesting operation having an opened top wherein the receiving structure may be filled by directing tobacco leaves into the top thereof during the harvesting operation;

e. leaf spreading means operatively interposed between said conveying means and said leaf receiving structure for uniformly spreading the harvested tobacco leaves both fore-and-aftly and laterally side to side over substantially the entire horizontal cross sectional area of said leaf receiving structure during the filling operation thereof;

f. said leaf spreading means for spreading the leaves both fore-and-aftly and laterally side to side relative to the opened top said said leaf receiving structure includes at least one movable leaf passageway having inlet and outlet openings with said inlet opening adapted to receive tobacco leaves leaving said conveying means and wherein the received tobacco leaves move through said leaf passageway and exit the outlet opening therein;

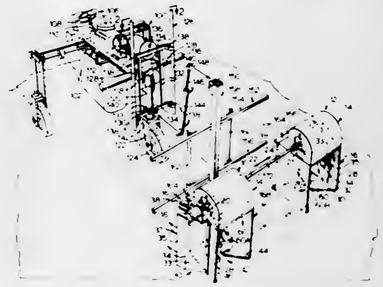
g. said fore-and-aftly and laterally side to side movement constitutes first and second directions of movement and wherein said movable passageway comprises a first pair of spaced apart sides movably mounted above the opened top of said leaf receiving area and adapted to move thereacross in a first direction, and a second pair of spaced apart sides pivotably mounted between said first pair of sides and movable independently thereof in a second direction generally perpendicular to said first direction such that during the spreading operation the area bounded by the first and second pair of sides define the leaf passageway; and

h. drive means operatively connected to said leaf spreading means for simultaneously driving said first and second pair of sides so as to give rise to a fore-and-aft and lateral side-by-side leaf spreading pattern.

4,047,366
TOBACCO TOPPING APPARATUS

John Balthes, Port Burwell; Garry Balthes, Tillsonburg, and William Palmer, Straffordville, all of Canada, assignors to Balthes Farm Equipment Manufacturing Limited, Tillsonburg, Canada

Filed May 7, 1976, Ser. No. 684,149
Int. Cl.² A01D *45/02*
U.S. Cl. 56—63 12 Claims



1. A tobacco topping apparatus, suitable for mounting on a tobacco harvester, said tobacco topping apparatus having a housing assembly in which power operated cutting means having a substantially horizontally disposed cutting blade for topping a tobacco plant is secured; said assembly having wall means defining a front opening therein opening in the direction of movement of the apparatus down a row of tobacco plants when the apparatus is used to top such row of tobacco plants and a discharge opening therein, the area of the wall means in which said discharge opening is situated being determined by the direction of rotation of the cutting blade of the cutting means a base having, base in the direction of movement of the apparatus when the apparatus is used to top the row of the tobacco plants, said guide means for serving to guide the stalk of the plant into the narrow slot and a deflector disposed adjacent the discharge opening in the wall means for deflecting the flower portions discharged through the opening and deposit them between the rows of tobacco plants; power operated blower means surmounting the assembly adjacent said front opening of said hopper assembly for directing air downwardly onto the upper leaves of the tobacco plant, when the apparatus is moved down the row to tobacco plants to initiate the deflection of the leaves downwardly to expose the flowering portion prior to the base passing over the deflected leaves whereby when said base passes over such leaves, it holds them down under said base during the cutting operation out of contact with said cutting blade; said substantially horizontally disposed cutting blade being disposed for rotation over a portion of said slot for severing the stalk of the tobacco plant below the flowering portion when the stalk is guided by the guide means toward the cutting means; means secured for rotation with the cutting blade to clear the severed flower portion out the discharge opening in the wall means for deposition between rows of tobacco plants; means secured to said

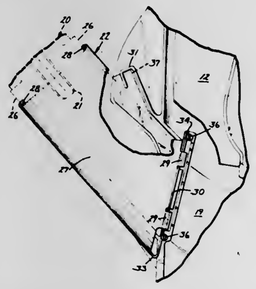
blower means for operating said blower means; means secured to said cutting means for operating said cutting means, and means secured to said means to clear the severed flower portions for operating said means to clear the severed flower portions for operating said means to clear the severed flower portions.

4,047,367

ROTARY MOWER BAGGING APPARATUS

Richard A. Thorud, Bloomington, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Aug. 2, 1974, Ser. No. 494,051
Int. Cl.² A01D *35/22*
U.S. Cl. 56—202 **13 Claims**



1. Bagging apparatus for a rotary mower having a housing substantially enclosing a blade mounted for rotation about a vertical axis, said housing having a discharge opening for discharge of grass particles cut by said blade from the interior of said housing, comprising:

a. deflector means hingedly attached to said housing and having a longitudinal axis, said deflector means defining a discharge passageway along said longitudinal axis and pivotable about a generally horizontal axis so that pivotal movement of the deflector means covers and uncovers said discharge opening;

b. yieldable means for urging said deflector downward toward the top surface of said housing;

c. a tubular chute member including a top wall and adjoining side walls which define a longitudinal passageway having an axis that is aligned with the longitudinal axis of said deflector means when said tubular chute and said deflector means are attached to each other, one end of said chute member being adapted to mate with said discharge opening, the opposite end of said chute member being adapted to receive a grass-catching bag; and

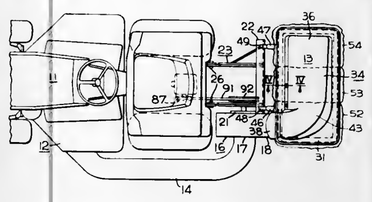
d. elongated mating channel and projection means, one each carried by said chute and said deflector, said elongated mating channel and projection means each having a longitudinal axis parallel to the aligned axes of said deflector means and said discharge passageway, whereby an operator may attach said chute member to said mower by the axial insertion of said chute member in said deflector means with said elongated channel and projection means cooperating in attachment to permit rotation of said deflector means upward by movement of the inserted chute member downward into contact with said housing.

4,047,368

ATTACHMENT FOR COLLECTING MOWER DISCHARGE IN A PLURALITY OF BAGS

James F. Peterson, Cedarburg, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 559,968, March 19, 1975, abandoned. This application July 29, 1976, Ser. No. 709,871
Int. Cl.² A01D *35/22*
U.S. Cl. 56—202 **12 Claims**



1. A grass catcher attachment for a lawn mower comprising:

a container structure adapted for mounting on said mower, said container being open at its upper end,

a plurality of flexible bags removably positioned in said container structure in lateral side-by-side relation to one another and with their upper ends open,

a cover structure releasably secured to said upper end of said container structure with an impervious top wall in vertically spaced overlying relation to said open bags and a screen in a rear of said cover structure permitting discharge of air from said grass catcher, and

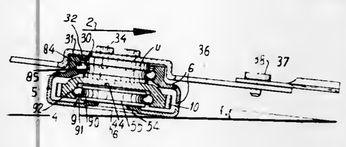
means defining an opening in said attachment adpated to receive a single mower discharge conduit directing mower discharge into the space between the upper open ends of said bags and said top wall of said cover structure whereby said plurality of bags simultaneously receive mower discharge.

4,047,369

MOWING DEVICE

Pieter Adriaan Oosterling, and Hendricus Cornelis van Stayeren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Filed Nov. 14, 1975, Ser. No. 632,017
Claims priority, application Netherlands, Dec. 18, 1974, 7416533
Int. Cl.² A01D *55/18*
U.S. Cl. 56—295 **10 Claims**



1. A rotary mower assembly comprising, in combination:

an elongate housing adapted to extend transverse to the direction of mower movement, said housing including a bottom portion and a cover portion defining an enclosure;

a gear train disposed within said enclosure defined by the housing and including a set of longitudinally spaced cutter driving gears and coupling gears drivingly interconnecting said cutter driving gears;

lower ball bearing means mounted on said bottom portion of the housing for rotatably supporting each cutter driving gear;

upper ball bearing means mounted on said cover portion of the housing for rotatably supporting each cutter driving gear; and

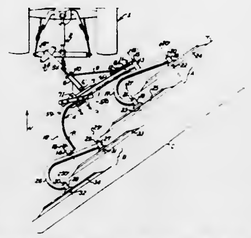
a cutter member rigidly secured to each cutter driving gear and lying above said cover portion of the housing.

4,047,370

RAKE

Norman C. Eve, R.R. No. 2, New Albany, Ind. 47150

Filed June 9, 1976, Ser. No. 694,314
Int. Cl.² A01D *77/00*
U.S. Cl. 56—377 **7 Claims**



1. A rake adapted for either lateral or medial displacement of material lying upon the ground, said rake having a predetermined direction of travel and including:

A. a frame having a substantially rigid main beam and

B. a plurality of rake wheels, each having ground engaging tines and being rotatably mounted toward each end of said main beam in operative relation with said frame, the planes of said wheels being generally parallel to each other and being angularly disposed so as to define an acute angle in relation to said direction of travel;

C. the improvement for the variable adjustment of the planes of said wheels on each end of said beam from a parallel relation to an intersecting relation relative to each other for the medial displacement of material coming into engagement with said ground engaging tines, which comprises, in combination

1. first and second elongated beam members, in which at least one of said beam members is bent along its longitudinal axis,

2. coupling means for coupling said elongated beam members together in end to end relation in a first fixed position to form the rigid main beam,

3. pivot means associated with said coupling means for pivoting said main beam members relative to each other in a horizontal plane in the intended direction of travel of said rake to a second fixed position and to change the relationship of the planes of said rake wheels at one end of said beam from a parallel to intersecting relationship, relative to the planes of said rake wheels at the other end of said beam, and,

4. locking means for locking said beam sections in either said first or in said second position.

4,047,371

SPINNING MACHINE FACILITY WITH A PLURALITY OF OPEN END SPINNING MACHINES AND AT LEAST ONE SERVICING INSTRUMENT

Fritz Stahlecker, Bad Uberkingen, Germany, assignor to Hans Stahlecker and Fritz Stahlecker, both of Germany

Continuation-in-part of Ser. No. 732,880, Oct. 15, 1976. This application Nov. 1, 1976, Ser. No. 737,265
Claims priority, application Germany, Dec. 13, 1975, 2556237
Int. Cl.² D01H *15/00, 11/00, 13/14, 1/12*
U.S. Cl. 57—34 R **11 Claims**

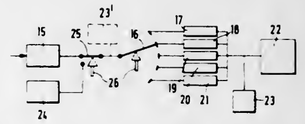
1. Servicing apparatus for a plurality of spinning machines comprising:

servicing means for servicing spinning assemblies of the spinning machines, said servicing means including function elements for carrying out servicing operations,

moving means for moving said servicing means to respective servicing positions adjacent the respective spinning assemblies to be serviced,

program control means for controlling switching sequences and switching times of drives for said function elements, said program control means including a plurality of control





programs which are distinguished from one another as to switching sequence and/or switching times, whereby different spinning machine operating conditions can be accommodated by said servicing means,

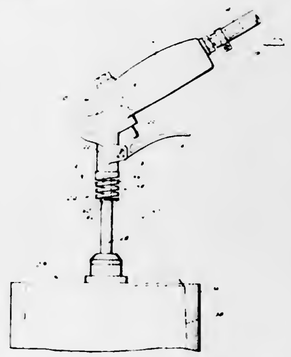
and program switch control means for switching said program control means from one control program to another.

4,047,372

PNEUMATIC THREADER FOR TWISTING APPARATUS

Aloys Horstmann, Greven, and Reinhardt Veltel, Everswinkel, both of Germany, assignors to Hamel GmbH Zwirnmaschinen, Munster, Germany

Filed Sept. 17, 1976, Ser. No. 724,460
Claims priority, application Germany, Sept. 18, 1975, 2541690
Int. Cl.² D01H *13/04, 13/12*
U.S. Cl. 57—34 R **9 Claims**



1. In combination with a tube having an open filament-receiving end, a threading apparatus comprising:

a nozzle formed with a passage and having a formation interfittable with said open end with said passage directed into said open end, said nozzle being formed at said pas-

sage with a thread-receiving slot opening toward said tube; and

means for directing a stream of gas through said passage past said slot and into said open end when same is fitted to said formation, whereby a filament in said slot can be blown by said stream into said open end and thereafter said nozzle can be disengaged from said open end with said filament sliding out of said slot, said slot extending helically in said nozzle past said formation.

4,047,373

FALSE-TWISTING METHOD AND APPARATUS FOR PRODUCING CRIMPED FILAMENT YARNS

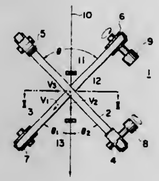
Isao Takai, Komatsu, Japan, assignor to Oda Gosen Kogyo Kabushiki Kaisha, Komatsu, Japan

Filed June 22, 1976, Ser. No. 698,778

Claims priority, application Japan, June 24, 1975, 50-76854; June 24, 1975, 50-76855; July 23, 1975, 50-89210; Nov. 25, 1975, 50-140289

Int. Cl.² D02G *1/06*; D01H *7/92*

U.S. Cl. 57—77.4 **24 Claims**





12. A false twisting apparatus of nipping type for producing crimped filament yarns, comprising:

power-driven at least one first twister member having a work surface and power-driven at least one second twister member having a work surface,

both of said first and second twister members being arranged so that their work surfaces cross each other at a predetermined angle in contact relationship to provide a crossing zone for nipping at least one filament yarn fed into this crossing zone to twist this filament yarn between the contacting work surfaces and at the same time therewith to urge this filament yarn to advance from said crossing zone, and

means for driving said first and second twister members so that the work surfaces of the first and second twister members run in different directions relative to each other at a predetermined angle.

4,047,374

FALSE TWIST TEXTURIZING SPINDLE

Jean Venot, Roanne, France, assignor to ASA S.A., Roanne, France

Filed Nov. 16, 1976, Ser. No. 742,099

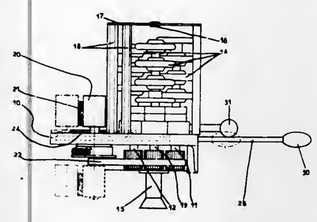
Claims priority, application France, Nov. 19, 1975, 75.36070

Int. Cl.² D02G *1/04*

U.S. Cl. 57—77.45 **7 Claims**

1. In a spindle adapted for use on a false twist texturizing machine which comprises a fixed platen disposed adjacent a tangential belt, a motor pulley mounted on an axle substantially perpendicular to the platen for rotation upon engagement with the tangential belt, three bosses mounted on the platen parallel to the motor pulley, each boss carrying at least one friction disc rotatable thereon in response to rotation of the motor pulley, the improvement comprising:

a lever pivotally attached to said platen, having said motor pulley mounted thereon, and



means for pivoting said lever to cause engagement or disengagement of said motor pulley with said tangential belt.

4,047,375

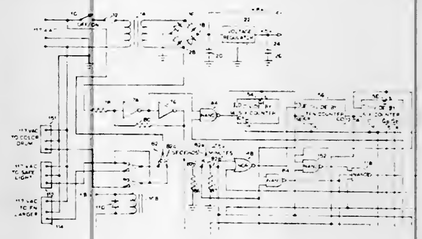
DARKROOM TIMER

Allan Wulff, 1351 Northgate Square, Reston, Va. 22090

Filed Nov. 17, 1975, Ser. No. 632,850

Int. Cl.² G04C *3/00*; G04E *1/00*

U.S. Cl. 58—21.13 **15 Claims**



1. A timer for switching power to and from an external unit, comprising:

a. actuator means;

b. digital means responsive to said actuator means for providing control signals;

c. coupling means for providing the timer with a periodic signal having a first characteristic frequency;

d. clock means responsive to said coupling means to produce a series of pulses having a second characteristic frequency related to said first characteristic frequency;

e. counter means adapted for receiving a desired selectable digital value, said counter means being responsive to said control signals from said digital means to count pulses from said clock means and produce an output when a digital value entered into said counter means has been counted out;

f. programming means for entering a desired selectable digital value into said counter means; and

g. switch means responsive to said counter means for switching power to and from an external unit as a function of the condition of said counter means.

4,047,376

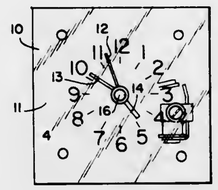
CLOCK MECHANISM

Frank Hubert Marz, Delavan, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 30, 1975, Ser. No. 627,375

Int. Cl.² G04C *3/00*; H01H *51/22*; H01F *7/08*

U.S. Cl. 58—23 D **24 Claims**



1. In an electrical automobile clock having a housing; a face plate within said housing, said face plate having a dial face normally viewable at one surface thereof and having an opening therein from said one surface to an opposite surface thereof; hour, minute, and second hands which rotate about a common concentric axis; and pulsing means for converting direct current to a series of electrical pulses having a repetition rate *f*; the improvement comprising:

a back plate within said housing oriented parallel to said face plate in proximity to said opposite surface thereof, the space between said plates forming a gear area,

an hour gear having a central axis;

a tubular hour shaft connecting the central axis of said hour gear to said hour hand through said opening in said face plate,

a minute gear, and a minute gear pinion axially affixed to said minute gear, said minute gear and said minute gear pinion having a common concentric axis;

a tubular minute shaft rotatable within said hour shaft and connecting the common concentric axis of said minute gear and pinion, concentrically with respect to said hour shaft, to said minute hand through said opening in said face plate;

a toothed second wheel, and a second wheel pinion axially affixed to said second wheel, said second wheel and said second wheel pinion having a common concentric axis;

a second shaft rotatable within said minute shaft and connecting the common concentric axis of said second wheel and pinion, concentrically with respect to said hour shaft and said minute shaft, to said second hand through said opening in said face plate;

wherein said central axis of said hour gear, said common concentric axis of said minute gear and pinion, and said common concentric axis of said second wheel and pinion are a single common axis;

a motion gear is meshing engagement with said minute gear pinion, and a motion gear pinion axially affixed to said motion gear with said motion gear pinion in meshing engagement with said hour gear, said motion gear and said motion gear pinion having a common concentric axis;

a motion gear shaft connecting said motion gear and pinion to said housing to be rotatable therewithin so that said motion gear shaft is rotatable about an axis which is parallel to and located outbound from said single axis;

an intermediate gear in meshing engagement with said second wheel pinion, and an intermediate gear pinion axially affixed to said intermediate gear with said intermediate gear pinion in meshing engagement with said minute gear, said intermediate gear and said intermediate gear pinion having a common concentric axis;

an intermediate gear shaft connecting said intermediate gear pinion to said housing to be rotatable therewithin so that said intermediate gear shaft is rotatable about an axis which is parallel to and located outbound from said single axis;

a ratchet wheel comprising

a. said second wheel,

b. a reciprocating lever, said lever having an armature coupled thereto,

d. a pawl for communicating motion to said second wheel, and

c. a pawl for preventing back motion of said wheel; and

a solenoid coupled to said pulsing means for receiving electrical pulses therefrom, and, when energized by one of said pulses, for attracting said armature,

whereby all gears in said clock, except for said intermediate gear and said motion gear and their associated pinions, are aligned along said single common axis and wherein

said hour gear is located in said gear area,

said motion gear and said motion gear pinion are located in said gear area,

said motion gear shaft is coupled to said back plate so as to be axially supported thereby while permitting rotation of said motion gear shaft about its axis,

said minute gear and said minute gear pinion are located in said gear area,

said intermediate gear pinion is located in said gear area,

said intermediate gear is located in an area outside of said gear area, separated therefrom by said back plate,

said intermediate gear shaft is connected to the axis of said intermediate gear at said outside area and is connected to the axis of said intermediate gear pinion at said gear area, said intermediate gear shaft being adapted to freely rotate about its axis within said back plate, and

said second wheel pinion, said ratchet wheel, and said solenoid being located at said outside area.

4,047,377

SLEEP-INDUCING/INTERRUPTING AUDIO SYSTEM

Holly Banks, Jr., 4046 St. Monica Drive, Baltimore, Md. 21222

Filed Feb. 24, 1976, Ser. No. 660,988

Int. Cl.² G04B *37/12*

U.S. Cl. 58—152 B **3 Claims**



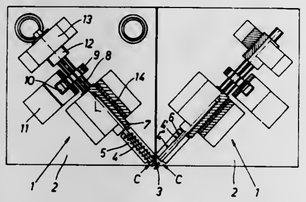
1. A sleep-inducing/interrupting audio system comprising: means for emitting a uniform audible hum-like signal for inducing sleep, means for adjusting the signal to mask ambient sounds, including means for adjusting signal tone and volume, means for sounding an alarm to interrupt sleep, including means for stopping said signal upon the sounding of the alarm, the means for sounding an alarm having connection for sounding said alarm through the speaker and including a clock having means for commencing the alarm sounding at an adjustably predetermined time, and the means for sounding the alarm further including connection for sounding the alarm through origination by a source such as a burglar alarm external to the audio system.

4,047,378

MACHINE FOR FORMING A BISMARCK CHAIN

Jouko Jaane, 32700 Lauttakyla, Finland

Filed May 27, 1976, Ser. No. 690,612
Int. Cl.² B21L 7/00
U.S. Cl. 59—20 **8 Claims**



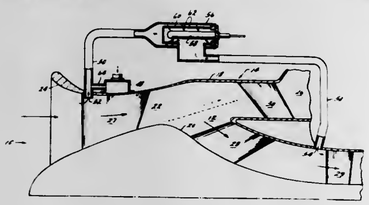
1. Machine for twisting a Bismarck chain in that the end of a helix formed of silver, gold or equivalent wire is intertwined by rotation crosswise with another helix and the helices thus affixed to each other are cut into pieces of a given length and the attachment of helical pieces is continued in the same manner, the machine comprising two twisting heads (1) each having a pin (4), around which the wire helix (3) can be formed and which has been arranged to be reciprocatingly turnable and to be simultaneously reciprocatingly fed in its axial direction, the two twisting head (1) being arranged to feed periodically in turns and simultaneously to turn two wire helices (3), the twisting heads (1) being positioned at an angle of about 90 degrees with reference to each other in two planes having a mutual vertical distance substantially equal to the inner diameter of the helix turn or slightly less; a wire cutting means (18) immediately adjacent to the ends of the feeding pins (4) (C) whereby the termination of the feed motion of the first twisting head starts the feed motion of the second twisting head, and the termination of the feed motion of the second twisting head starts operation of the wire cutting means (13, 21*a*, 21*b*), the machine further comprising a chain pulling means (30, 34) grasping the chain and pulling it upwards, and a pair of chain holding jaws (17) extending upwards from the ends of the feeding pins and forming therebetween a space corresponding to the outline configuration of the chain so that the chain can slide therethrough, the lower ends of the chain holding jaws (17) being at such a level (B) that more than two but less than three helix pieces are below that level before operation of the chain pulling means.

4,047,379

TRANSIENT AIR TEMPERATURE SENSING SYSTEM

Neil Roger Brookes, Topsfield; Martin George Ray, Marblehead; Joseph David Cohen, Danvers, and Thomas Joseph McCarey, Boxford, all of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Apr. 28, 1976, Ser. No. 680,909
Int. Cl.² F02C 7/04; G01K 1/00
U.S. Cl. 60—39.09 D **5 Claims**



1. In a gas turbine engine of the type which includes an inlet supplying air to a compressor, a combustor and turbine in serial flow relation and a particle separator disposed intermediate the inlet, and compressor and wherein a pressure drop is created across the particle separator by air flowing therethrough, there is provided apparatus for measuring the temperature of the air entering the compressor comprising:

a feed duct having an inlet, disposed intermediate the engine inlet and the particle separator and an outlet disposed intermediate the particle separator and compressor whereby airflow through the feed duct is generated by the pressure drop across the particle separator, and

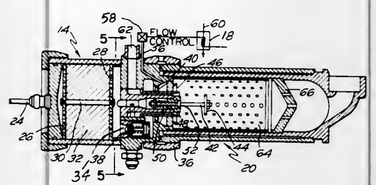
temperature sensitive probe means disposed in the feed duct for remotely transmitting temperature signals.

4,047,380

COMBUSTION SYSTEM USING DILUTE HYDROGEN PEROXIDE

Robert J. Heffernan, Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 9, 1976, Ser. No. 675,671
Int. Cl.² F02C 3/20
U.S. Cl. 60—39.46 R **8 Claims**



1. A combustion system using dilute hydrogen peroxide having a concentration less than 40 percent by weight and a fuel propellant which comprises:

a decomposition chamber for catalytically decomposing the dilute hydrogen peroxide having a concentration less than 40 percent by weight into liquid phase water and vapor phase oxygen as the decomposed components thereof;

a liquid/gas separator means for separating the liquid phase water and vapor phase oxygen of the decomposed dilute hydrogen peroxide, said separater means being mounted adjacent said decomposition chamber and being connected to said decomposition chamber;

means for feeding the components of the decomposed dilute hydrogen peroxide from said decomposition chamber into said liquid/gas separator means;

means for extracting a portion of the liquid phase water from the components of the decomposed dilute hydrogen peroxide being fed to said separater means; and

a combustion chamber for mixing the oxygen and the remaining water with the fuel and for igniting the mixture thereof, said combustion chamber being mounted adjacent said separater means and being connected to said separater means.

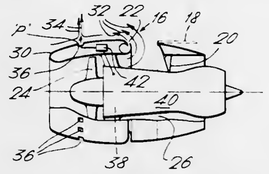
4,047,381

GAS TURBINE ENGINE POWER PLANTS FOR AIRCRAFT

Thomas Eric Smith, Ilkeston, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Sept. 21, 1976, Ser. No. 725,155
Claims priority, application United Kingdom, Oct. 11, 1975, 41751/75
Int. Cl.² F02K 3/02
U.S. Cl. 60—226 A **4 Claims**

1. A gas turbine engine power plant including a thrust reverser capable of directing a reversed flow of air along an exterior surface of a cowl of the power plant whereby to effect reverse thrust and thereby generate a mobile high pressure area on the cowl external surface, at the interface of forward flowing reversed airflow and ambient air, mobile high pressure area sensing means and mobile high pressure area stabilising



means whereby in operation, said sensing means senses the pressure change which occurs as the mobile high pressure area reaches it and actuates the mobile high pressure area stabilising means so as to stabilise the position of the mobile high pressure area with respect to a point on said cowl.

4,047,382

THRUST MANAGEMENT CONTROL PROPULSION SYSTEM

Clarence A. LeFebvre, San Jose, and Joseph M. Cabezut, Jr., Sunnyvale, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1975, Ser. No. 619,153
Int. Cl.² F02K 9/04; F16K 31/126
U.S. Cl. 60—252 **1 Claim**



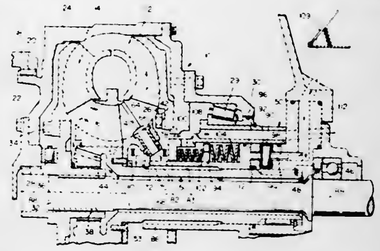
1. A control system for supplying uncured putty-like propellant into a missile combustion chamber comprising: a propellant storage chamber; means for pressurizing propellant in said chamber; said pressurizing means including a warm gas generator, an igniter for igniting said generator and a roll seal which acts on said propellant when actuated by gas from said generator; a movable injector; a metal web supporting said movable injector; said web being provided with propellant discharge openings therein; a seat provided with a rubber flow seal; said web being disposed between said propellant storage chamber and said combustion chamber for cooperation with said rubber flow seal to control the propellant flow between the injector and the seat; said injector and said seat provided with a double angle therebetween to serve as a radiation shield; an annular piston connected to said metal web and a hydraulic system to actuate said piston to move said web and injector in a forward or rearward direction.

4,047,383

TORQUE CONVERTER WITH VARIABLE STATOR

Lowell E. Johnson, East Peoria; Raymond P. Cobb, Washington; Frank W. Howard, III, Dunlap, and Dwayne D. Dietz, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 699,777, June 25, 1976, abandoned, which is a continuation of Ser. No. 595,911, July 14, 1975, abandoned. This application Nov. 11, 1976, Ser. No. 741,005
Int. Cl.² F16D 33/04
U.S. Cl. 60—354 **19 Claims**



1. An improvement in a fluid torque converter which includes a main stator communicating with a stationary member, a pump drivingly connected to an engine and a turbine output coupled to a drive shaft, the improvement comprising:

an auxiliary stator intermediate the main stator and the pump, said auxiliary stator including a plurality of holes therethrough adjacent the periphery thereof;

a plurality of vanes fixedly attached to a plurality of shafts rotatably mounted through said holes, said vanes being positioned to adjustably direct a flow of hydraulic fluid from the main stator past the vanes to the pump;

a plurality of handles, one attached at a fixed angle to an end of each of said shafts removed from the vanes thereon;

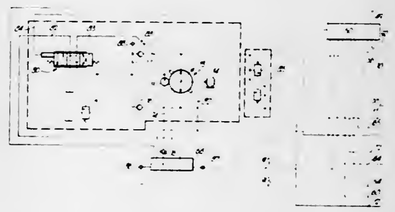
a sleeve including a plurality of slots at one end thereof, the number of slots being in one to one relation with the number of said handles, one handle being slidably held in each of said slots; and means for operator adjustment of the position of said sleeve in a direction which causes rotation of said handles.

4,047,384

PUMP JACK DEVICE

Minoru Saruwatari, Calgary, Canada, assignor to Canadian Foremost Ltd., Calgary, Canada

Filed June 23, 1976, Ser. No. 699,134
Claims priority, application Canada, Apr. 9, 1976, 249962
Int. Cl.² F15B 9/04
U.S. Cl. 60—372 **30 Claims**



1. A pump jack comprising a double acting piston an cylinder motor; means for connecting a piston rod of said motor to a polished rod in a well head; a variable displacement type

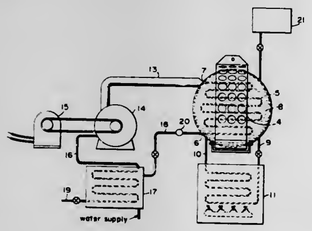
hydraulic pump having a pair of output ports; a pair of hydraulic conduits each placing one of said output ports in communication with an opposite end of said motor and forming a closed hydraulic loop with said motor and pump; drive means for said pump; and a pump control means including means indicative of desired instantaneous position and velocity of said piston for controlling the direction and volume of flow in said loop to thereby establish a total velocity profile during a complete pumping cycle and also to determine the length and position of the stroke of said piston rod.

4,047,385

SOLAR TO ELECTRICAL ENERGY CONVERTING SYSTEM

Heinz J. Brinjevec, 3990 Riberdy Road, Windsor, Ontario, Canada

Filed Sept. 21, 1976, Ser. No. 725,251
Claims priority, application Canada, Sept. 25, 1975, 236413
Int. Cl.² F01K *7/02*
U.S. Cl. 60—641 **3 Claims**



1. Apparatus and method for converting solar energy to electricity through the medium of heat comprising in combination a heating unit which collects the rays of the sun by means of convex lenses, which converge these rays into heat producing focal points which come in contact with a metal container, said container having a heating liquid whose boiling point is considerably higher than that of water, therein; and a steam producing pipe coil immersed in said heating liquid; means for breaking contact between said focal points and said container for the purpose of controlling the heat in said container; a steam turbine which is powered by said steam producing coil; a dynamo for producing electrical power which is operated by said steam turbine, a source of water which feeds said steam coil; a heat exchanger which preheats the water entering said steam coil, said heat exchanger utilizing the spent steam from said turbine for preheating the water; a furnace for heating said heating fluid to a steam producing temperature when the rays of the sun are not available; a storage tank, which communicates with said heating container, which contains a supply of heating fluid for the purpose of replenshing said fluid as required; and standard temperature and liquid flow controls for proper operation.

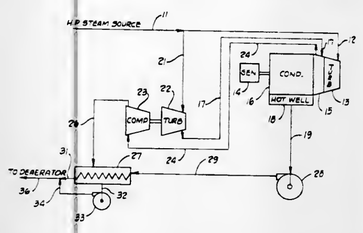
4,047,386

PROCESS FOR HEATING CONDENSATE

William A. Frondorf, Brownsville, Pa., assignor to SCM Corporation, New York, N.Y.

Filed June 10, 1976, Ser. No. 694,774
Int. Cl.² F01K *7/38*
U.S. Cl. 60—654 **4 Claims**

1. A process for heating a primary liquid condensate which results from condensing a supply of exhaust vapor from a primary turbine which comprises: compressing a minor portion of said exhaust vapor, the compressing of said minor portion being powered by a secondary turbine, the source for the secondary turbine being the same as that for the primary turbine; exchanging heat between said primary liquid condensate and the resulting compressed minor portion of exhaust vapor prior to any other heating of said primary liquid condensate; withdrawing from said heat exchanging the heated primary liquid condensate and a secondary liquid condensate resulting from condensation of said compressed vapor.

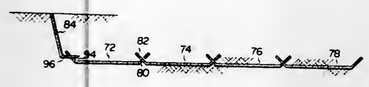


4,047,387

METHOD OF FORMING A SUBTERRANEAN WATER BARRIER AND A PLOW FOR USE THEREWITH

Yukio Tamura, Isehara; Katsu Hirosawa, and Koji Ogaki, both of Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed June 9, 1976, Ser. No. 694,174
Claims priority, application Japan, June 9, 1975, 50-76822[U]; June 12, 1975, 50-70187; June 12, 1975, 50-78694[U]; June 12, 1975, 50-78695[U]; June 12, 1975, 50-78696[U]
Int. Cl.² E02B *13/00*
U.S. Cl. 61—13 **18 Claims**



1. A method of forming a continuous flexible subterranean water barrier of congealed thermoplastic material, said barrier composed of a plurality of separately formed barriers having finite dimensions, each separate barrier in transverse section having a central portion continuous with lateral side portions wherein each side portion is inclined relative to said central portion and terminate in a lateral edge at an elevation different from the elevation of said central portion, comprising:

I. forming a first barrier as defined above at a preselected depth beneath the soil surface by the steps of:
   a. moving a plow having a cavity therein through the soil to continuously displace the soil upwardly at said depth thereby separating the soil into an upper portion supported by the plow and an exposed lower portion;
   b. concurrently introducing said thermoplastic material into the cavity of said plow to fill it up without leaving any void portion;
   c. ironing said thermoplastic material so as to spread same over uniformly in the transverse direction of said plow by passing said thermoplastic material through a restricted outlet from said plow so as to form a congealing coating of said material, said restricted outlet being defined between a rear bottom surface of said plow and the lower exposed soil portion and being located at the rear end portion of said plow; and
   d. continuously covering said coating by free flow of said supported soil simultaneously with releasing an excess pressure on said thermoplastic material within said plow which exceeds a balanced pressure created by a soil pressure at the point of tail end of said plow and a pressure of said thermoplastic material inside said plow thereby preventing an excess outflow of said material from said plow, whereby said first barrier of uniform thickness is formed; and

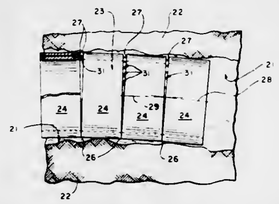
II. forming an adjoining barrier in a path parallel to the first path and at the preselected depth to engage said first barrier by repeating the steps employed in forming the first barrier and including continuously intersecting the adjacent lateral side portion of said first barrier with a new lateral side portion of said adjoining barrier, thus joining said first barrier and said adjoining barrier to provide a continuous water barrier laterally and longitudinally by separately formed barriers.

4,047,388

METHOD FOR COUPLING AXIALLY ALIGNED TUNNEL SECTIONS AND APPARATUS THEREFOR

James W. Howlett, Oakland, Calif., assignor to Howlett Machine Works, Berkeley, Calif.

Filed June 30, 1976, Ser. No. 701,344
Int. Cl.² E21D *11/08*
U.S. Cl. 61—45 R **4 Claims**



1. A method for coupling together a first structure and a second structure while positioned in close proximity to each other and while positioned in slightly misaligned relation, said method including the steps of mounting coupling means to said first structure, mounting a coupling tendon to said second structure, coupling said tendon to said coupling means and thereafter applying an axial tension force to at least one of said tendon and said coupling means while supporting said tension force by said structures, wherein the improvement in said coupling method permitting coupling of misaligned structures is comprised of the steps of:
   providing said coupling means as a member having a tapered socket with a tapered thread therein;
   providing said tendon with a tapered threaded end dimensioned to mate with said socket; and
   coupling said tendon means to said coupling means by threadably engaging said tapered threaded end of said tendon with said tapered thread in said socket until said end is cinched down in said socket.

4,047,389

PRECAST CONCRETE PILE, AND COFFERDAMS

Yue-Chyou Yang, San Francisco, Calif., assignor to T. Y. Lin International, San Francisco, Calif.

Filed Mar. 22, 1976, Ser. No. 669,341
Int. Cl.² E02D *5/10, 5/30*
U.S. Cl. 61—59 **6 Claims**

1. A precast concrete pile, comprising a rectangular main stem extending from the top to the bottom of said pile and having first and second pairs of parallel faces,
   said pile having a lower portion consisting exclusively of said main stem and
   an upper portion incorporating, integrally with said stem, a pair of generally rectangular flanges each extending out from one face of said first pair and having a first face in alignment with one face of said second pair and a second face parallel thereto and set back from the other face of said second pair, said second face being joined to said stem by a splay, said flanges being thinner than said stem, and terminating in vertical end edges,
   the upper end of said upper portion being flat, the lower end of said upper portion being splayed into said lower portion,



   a vertical grout-receiving passage going all the way through each said flange from said upper end to said lower end, each said passage being located near said end edge of a said flange, and
   a series of outlet passages at intervals leading outwardly from said grout-receiving passage to and through said end edge.

4,047,390

SEA TENT

William D. Boyce, II, 1 Boulevard de la Gare 95760, Valmondois, France

Filed Aug. 20, 1974, Ser. No. 498,925
Int. Cl.² B63C *11/00*
U.S. Cl. 61—69 R **16 Claims**



1. A submersible container apparatus for isolating from adjacent water, a selected water bottom area together with an area extending upwardly from said selected bottom area to the water surface, comprising a flexible closed wall member bounding a selected water bottom area and extending to the water surface, a flexible tubular base member secured to the lowermost portion of said wall member, said tubular base member being adapted to receive flowable fill means for holding said base member under the influence of gravity against the water bottom bordering said selected water bottom area, and a plurality of fill tube means communicating at their lower ends with the interior of said tubular base member, secured along their length to said flexible closed wall member, and having upper ends positioned substantially at the top of said closed

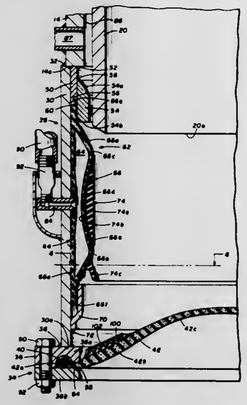
wall member, said upper ends of said fill tubes being adapted to receive said fill means for transmission through said fill tube means to said tubular base member.

4,047,391

GROUT SEAL

Windel O. Mayfield; Clarence T. Thomerson, and Tom C. Waldrop, all of Corsicana, Tex., assignors to Regal Tool & Rubber Co., Inc., Corsicana, Tex.

Filed June 24, 1976, Ser. No. 699,321
Int. Cl.² E02D *5/14, 5/52*
U.S. Cl. 61—94 **17 Claims**



1. A grout seal for a piling driven through a cylindrical platform leg into submerged strata which comprises:

a. an array of spring members having upper and lower end portions of cylindrical configuration, the lower and upper extremities of said portions, respectively, defining boundaries of inward diversion to form a central outwardly bowed portion of said array,

b. a reinforced elastomeric outer cover for said central portion of said array, and

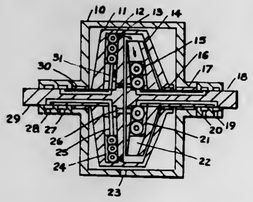
c. an elastomeric pad mounted inside said array having a cylindrical inner face for contact with said piling and an outer face conforming with said central outwardly bowed portion of said array.

4,047,392

DUAL ROTOR HEAT EXCHANGER

Michael Eskell, 7994-41 Locke Lane, Houston, Tex. 77042

Continuation-in-part of Ser. No. 219,212, Jan. 20, 1972, Pat. No. 3,791,167, and Ser. No. 386,207, Aug. 6, 1973, abandoned. This application Oct. 18, 1973, Ser. No. 407,665
Int. Cl.² F25B *9/00;* **F25D** *9/00;* **F28D** *11/02*
U.S. Cl. 62—402 **3 Claims**



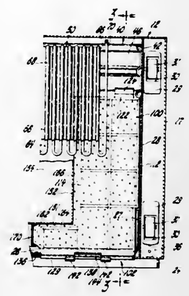
1. A heat exchanger comprising a first rotor and a second rotor, means for mounting said rotors for independent rotation, a closed, first-fluid circulation path through said rotors, circulation path comprising a first passage extending approximately radially outwardly within said first rotor a second passage extending approximately radially outwardly at least partially within said second rotor, first fluid communication means communicating between the radially outward ends of said first and second passages, and second fluid communication means comprising first and second conduits through said first and second rotors respectively, communicating between the radially inward ends of said first and second passages, a heat removal exchanger carried by one of said rotors to remove heat from said first fluid being heated by centrifugal force, and a heat addition heat exchanger carried by one of said rotors to add heat to said fluid being cooled by expansion against centrifugal force.

4,047,393

REFRIGERATOR FORCED AIR CONDENSER FILTER

Robert S. Hanson, Kettering, and Ralph R. Rigg, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 8, 1976, Ser. No. 730,977
Int. Cl.² F25D *17/06;* **F25B** *39/04*
U.S. Cl. 62—428 **3 Claims**



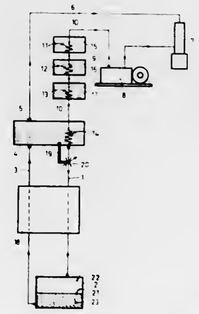
1. A household refrigerator adapted to be supported on a floor comprising an outer cabinet having a front wall and a machinery compartment in the lower portion thereof, said front wall including a front opening communicating with said machinery compartment and being defined in part by a cabinet frame member along its lower portion and a free edge of said front wall along its upper portion, said machinery compartment including a refrigeration condenser including plate means at the rearward portion of said machinery compartment and adapted for air-cooling thereof, said machinery compartment having a bottom opening adapted to be in spaced relation to said floor and defined in part at its rearward end by said plate means and at its forward end by said lower frame member, forced air circulating means for circulating a stream of air through said openings into said machinery compartment and into air-cooling relation with said condenser, removable air filtering means adapted for coextensively covering both the front and bottom openings in said machinery compartment, said removable air filtering means including a front filter batt member for closing said front opening and a bottom filter batt member for closing said bottom opening, said front and bottom filter batt members each having a support border frame extending around the peripheral edges thereof, the border frame for said bottom batt member having a rearward transverse frame portion including attaching means operative to engage said rear plate means, said attaching means configured to form a lower downwardly bowed runner adapted to contact and slide along the floor and an upper flange, said upper flange having an upwardly and rearwardly diverging flexible lead-in cam member adapted to contact the condenser, whereby said attaching means is guided by said runner and said cam member into engaging alignment with said rear plate means upon the rearward sliding movement of the bottom filter batt member of said air filtering means to close said bottom opening, the support border frame of said front and bottom filter batt members being flexibly interconnected along their adjoining transverse frame edges by a flexible hinge panel which conforms with said cabinet frame member when said bottom opening is closed by said bottom filter batt member, said front filter batt member having a normal position extending forwardly from said hinge panel in a plane offset upwardly from the plane of said bottom filter batt member and a stressed position extending upwardly from said hinge panel, the border frame for said front filter batt member having latch means selectively engageable with the free edge of said front opening when said front filter batt is in said stressed position, said front filter batt member being movable in accordance with the flexibility of said hinge panel to effect the engagement of said latch means with said free edge, whereby said front filter batt member is maintained by its stressed position in closed and covering relation with said front access opening when said air filtering means is in said machinery compartment, and whereby downwardly pressure on said front filter batt member effects a slight flexing of said hinge panel to release said latch means from said free edge so said front filter batt member may return to its normal position for removal of said air filtering means from said machinery compartment.

4,047,394

^{3}HE-^{4}HE DILUTION REFRIGERATING MACHINE

Adrianus Petrus Severijns, and Franciscus Henricus Eduard Aarts, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,007
Claims priority, application Netherlands, Apr. 24, 1975, 7504835
Int. Cl.² F25B *19/00*
U.S. Cl. 62—502 **3 Claims**



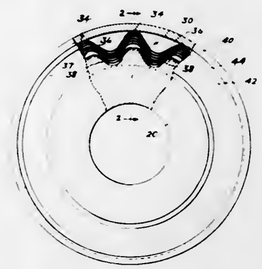
1. A ^{3}He-^{4}He dilution refrigerator operable with a supply of gaseous helium, which comprises pump means for compressing and circulating said gaseous helium, means for cooling and condensing the compressed helium, a heat exchanger for further cooling the condensed helium, a mixing chamber for receiving the cooled condensed helium for separation into a liquid concentrated ^{3}He phase and a liquid diluted ^{3}He phase, a supply duct for flowing the condensed helium from said cooling and condensing means through said heat exchanger to said mixing chamber, a separating reservoir for receiving the liquid diluted ^{3}He phase for separation into gaseous ^{3}He and liquid ^{4}He, a return duct for flowing said liquid diluted ^{3}He phase from said mixing chamber through said heat exchanger in heat-exchange relation with said supply duct to said separating reservoir, a suction duct for flowing said gaseous ^{3}He from said separating reservoir to said pump means, and a variable-flow restriction member positioned in said supply duct between said cooling and condensing means and said heat exchanger, said variable-flow restriction member being operated by the flow of condensed helium and, at a pressure difference exceeding a threshold value, allowing said flow of condensed helium to pass substantially independently of said pressure difference.

4,047,395

TORSIONALLY RESILIENT GEAR COUPLING

Wilfrid H. Bendall, Elmwood St., Old Saybrook, Conn. 06475

Filed Oct. 4, 1976, Ser. No. 729,841
Int. Cl.² F16D *3/52, 3/56, 3/66, 3/14*
U.S. Cl. 64—15 B **10 Claims**



1. A torsionally resilient gear coupling for connecting axially spaced driving and driven members, said coupling comprising an externally toothed gear connected to each of said members interconnected by a resilient annular gear bridging the space between the gears, said annular gear comprising a plurality of concentric, uniformly corrugated flexible laminas, the corrugations thereof being shaped to mesh tangentially with each other and with the teeth of the externally toothed gears; a concentric sleeve member extending axially over the periphery of the annular gear and in retentive contact therewith, said sleeve member supporting the radial component of tangential gear tooth forces transmitted to the annular gear, said annular gear being in resiliently compressed driving engagement between the internal periphery of the sleeve member and the externally toothed gears, and means enclosing the ends of the sleeve member and annular gear.

4,047,396

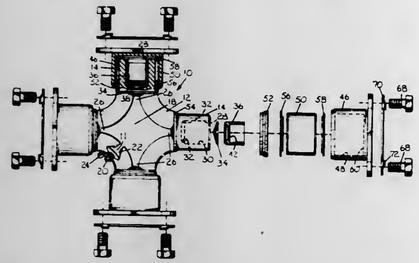
UNIVERSAL JOINT AND CROSS THEREFOR

John Christee McElwain, Rochester, Mich., and Lawrence Howard Hogan, Chagrin Falls, Ohio, assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 13, 1976, Ser. No. 686,038
Int. Cl.² F16D *3/26*
U.S. Cl. 64—17 A **10 Claims**

1. A universal joint including a cross operably connected therein, said cross comprising a body having four trunnions extending therefrom along two mutually perpendicular lines, a lubrication network in said body and said trunnions to provide lubrication to the cylindrical outer bearing surface of said trunnions, said network including a plurality of branches in communication with each other and terminating in a counterbore provided internally in each of said trunnions, each said counterbore having a cylindrical inner surface coaxial with said cylindrical outer bearing surface of said trunnions, said counterbore being open at its end opposite said branches, a flow metering member having at least one metering orifice therethrough fixedly disposed within each of said counterbores to meter lubricant flowing through each of said branches downstream into said counterbore and to the bearing means in

bearing engagement with the cylindrical outer bearing surface of said trunnions, said filtering means being a screen provided upstream of each of said metering orifices to filter particulate matter from said lubricant to avoid clogging of said metering orifice and to ensure the free flow of said lubricant through



said orifice, there being a radially extending surface at the junction of each branch and said counterbore, said metering orifice member being a substantially rigid member and is held fixedly in place within said counterbore near said radially extending shoulder by interference fit between its outer surface and said inner cylindrical surface of said counterbore.

4,047,397

CROCHET NEEDLE WITH CUTTING MEANS

Shirley P. Laliberte, 2724 E. Main St., Waterbury, Conn. 06705

Filed May 5, 1976, Ser. No. 683,464
Int. Cl.² D04B *3/02*
U.S. Cl. 66—118 **10 Claims**



1. A crochet needle comprising an elongated body portion having a generally smooth surface for manual gripping and manipulation, a hook formed integrally at one end portion and bent back upon itself so as to open generally toward said body portion for engagement with and manipulation of an elongated flexible strand of material, and a means for severing said flexible strand of material at an end portion of said needle opposite said one end portion.

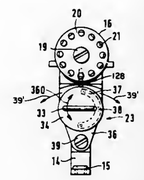
4,047,398

YARN GUIDE FINGER FOR POSITIVE YARN SUPPLY APPARATUS

Josef Fecker, Steinhofen-Bisingen, and Gustav Memminger, Freudenstadt, both of Germany, assignors to Firma Gustav Memminger Verfahrenstechnik fur die Maschenindustrie, Freudenstadt, Germany

Filed Dec. 19, 1975, Ser. No. 642,257
Claims priority, application Germany, Dec. 31, 1974, 2461938
Int. Cl.² D04B *15/48*; B65H *51/20*; D04B *15/54*
U.S. Cl. 66—132 R **21 Claims**

1. Positive yarn supply apparatus comprising
a support frame (7, 14);
a rotatable storage drum capable of rotation in a clockwise or counter-clockwise direction (1) journalled in the support (7, 14) for winding thereon yarn (24) to form a stack of yarn storage supply windings (27), the yarn being supplied tangentially to the surface of the drum (1) and being removed axially over the end thereof;
and means (23; 29, 30, 31, 32) controlling the pull-off position of the yarn (24) including an essentially elongated and symmetrical yarn guide element adjustably secured to the support frame for its selective extension into the path of the yarn so that it is contacted at either side by the yarn



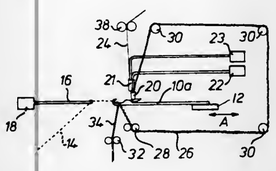
when placed in selectively different yarn guiding positions and thereby positively guides the yarn regardless of the direction of rotation of the storage drum (1).

4,047,399

KNITTING BRAIDS

Robert Walter Frost, Tilton-on-the-Hill, and Anne Winnifred Morris, Anstey, both of England, assignors to R. W. Frost Limited, Syston, England

Filed Dec. 1, 1975, Ser. No. 636,757
Claims priority, application United Kingdom, Jan. 17, 1975, 2011/75
Int. Cl.² D04B *15/88*
U.S. Cl. 66—149 R **8 Claims**



1. Method of warp knitting a narrow band comprising,
knitting a narrow band using first needles of a warp knitting machine to knit ground yarns of the narrow band and using at least one inlay guide of the warp knitting machine to incorporate a special effect thread into the narrow band and taking off the narrow band at a first take-off speed;
knitting the said special effect thread using at least one second needle of the said warp knitting machine at the same time as the special effect thread is being incorporated into the narrow band and taking off the said special effect thread at a second take-off speed higher than the first take-off speed and guiding a length of the thread to the said inlay guide.

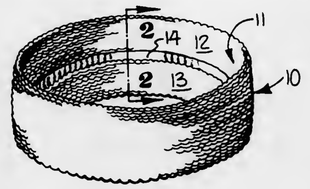
4,047,400

MOISTURE ABSORBENT BAND

James L. Thorneburg, Statesville, N.C., assignor to Thorneburg Hosiery Mill, Inc., Statesville, N.C.

Filed Sept. 13, 1976, Ser. No. 722,679
Int. Cl.² D04B *1/02, 1/18, 1/24*
U.S. Cl. 66—171 **11 Claims**

1. A moisture absorbent band including a central opening adapted to be worn with a portion of the body extending therethrough and comprising
a. a cylindrical band of double ply knit fabric of predetermined width and including successive courses of body yarn stitch loops extending circumferentially of said band and defining parallel wales of stitch loops extending perpendicularly of said courses and continuously from one ply to the other of said band,
b. a single connector tab, said connector tab comprising a single layer of knit fabric of a relatively narrow width and including successive courses of body yarn stitch loops and a greater number of wales than the number of wales contained in said double ply fabric, said single layer including an initial course integrally knit with the initial and the final



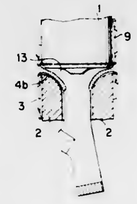
courses of said band to integrally join the corresponding adjacent edges of said double ply fabric, said single layer including a final course defining a free edge, and
c. said band including a moisture absorbent yarn in at least certain courses of said band.

4,047,401

METHOD FOR FORMING A CLOSED TOE

Siegfried Nurk, Berkheim, Germany, assignor to Gottlieb Eppinger, Denkendorf, Germany

Continuation of Ser. No. 340,950, March 14, 1973, abandoned.
This application Mar. 19, 1975, Ser. No. 559,785
Claims priority, application Germany, Mar. 16, 1972, 2212749
Int. Cl.² D04B *15/02, 9/54, 9/56*
U.S. Cl. 66—187 **9 Claims**



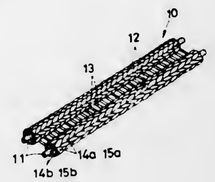
1. A process for the production of a closed toe on a circular knitting machine having two needle beds, each needle bed having at least one knitting system, comprising the steps of knitting a main fabric body portion by forming loops on needles of at least one of said beds; then knitting a closed toe portion by producing two layers of tubular fabric, one within the other, by knitting only with selected needles of said one needle bed at one of the knitting systems and only with selected needles of the other needle bed, when in a predetermined manner part of the loops of the last knitting course of the main portion are distributed to said selected needles of said one needle bed and the remaining loops of said last knitted course to said selected needles of the other needle bed; subsequently rotating the two needle beds relative to each other so that the two layers of the tubular fabric are twisted relative to each other through at least 180° whereas the stitches comprising the last course of said body portion are not held by any needle during this twisting; knitting at least one connecting course using all loops of the last courses of said two layers, and finally joining said two layers together in a ladder-proof manner.

4,047,402

REINFORCEMENT FOR SLIDE FASTENERS

Yoshio Matsuda, Nyuzen, and Yoshinori Fujisaki, Kurobe, both of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Dec. 1, 1975, Ser. No. 636,540
Claims priority, application Japan, Dec. 3, 1974, 49-147151[U]
Int. Cl.² D04B *21/00*
U.S. Cl. 66—195 **3 Claims**



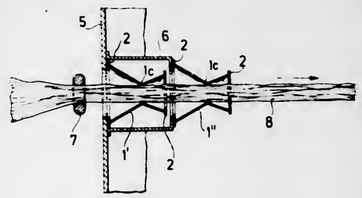
1. A reinforcement for a slide fastener comprising a plurality of cylindrical, warp-knitted members having needle loops and sinker loops interconnected therewith, said sinker loops extending in diagonally criss-crossed relation to each other and alternately over and under said needle loops to define a plurality of warp-knitted members each having a generally tubular knitted configuration, and a connecting thread laid in weftwise to interconnect said plurality of warp-knitted members transversely in parallel, spaced-apart relation to each other.

4,047,403

APPARATUS FOR THE CONTINUOUS WET TREATMENT OF TEXTILES IN ROPE FORM

Hans-Ulrich von der Eltz, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

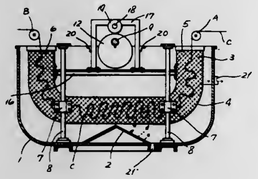
Filed Aug. 20, 1976, Ser. No. 716,242
Claims priority, application Germany, Aug. 23, 1975, 2537665
Int. Cl.² D06B *23/18*
U.S. Cl. 68—5 E **5 Claims**



1. A sealing device for the inlet and outlet of a continuous textile material in a dry or wet state, and in the form of an endless rope, into and from a pressure tight container that is under high pressure conditions, comprising at least one pressure lock including a sealing element formed of an elastic material, said sealing element having a shell configuration comprising two frustro-conical sections of different height having complementary small base portions located adjacent each other to define a narrow neck in the sealing element and larger, different diameter base portions remote from said neck on opposite ends of the sealing element with one of said larger diameter base portions freely protruding into the pressure container, said sealing element having an internal surface lined with a smooth layer, and the inner diameter of said neck of the sealing element being selected to be substantially equal to the diameter of the rope whereby the shell of the sealing element is tightly pressed from all sides by the pressure in said container

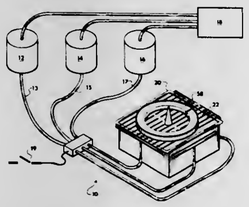
to engage the inner surface of the sealing element at said neck with the rope to form a pressure seal therebetween.

4,047,404
PRINTED FABRIC WASHING APPARATUS
Takashi Hayashi, Kyoto, Japan, assignor to Tanno Senshoku Kogyo Co., Ltd., Kyoto, Japan
Filed Nov. 17, 1976, Ser. No. 742,616
Int. Cl.² D06B *3/20*
U.S. Cl. 68—152 **1 Claim**



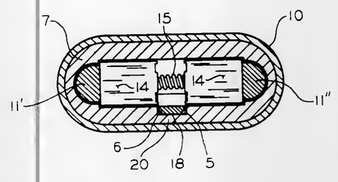
1. A printed fabric washing apparatus comprising a U-shaped tunnel-like cage of rectangular cross-section formed of a screen material, said cage having a middle linear portion and upwardly curving vertical portions positioned at opposite ends of said middle linear portion to define the U-shape, a liquid containing tank in which said cage is disposed with said middle linear portion lying below said liquid and with its upwardly curving vertical portions located at opposite ends of said tank and providing introducing and withdrawing ports for, respectively, introducing and withdrawing a printed fabric to and from said cage, a ridge-like projection mounted centrally on the bottom of said tank transversely below said linear portion of said cage, coupling rods attached to the opposed inner sides of said vertical portions of the cage and extending horizontally with the longitudinal axis of said linear portion, U-shaped suspension frames each fixed to one of said coupling rods at the middle of the respective rod, each frame having a loose pulley attached thereto, a rotatable shaft installed on posts and extending over said tank above the middle of opposite lateral walls of the tank and at right angles with the longitudinal axis of said linear portion of the cage, and eccentric wheels fixed on said rotatable shaft with each wheel carrying thereon a respective loose pulley to suspend the cage, a motor operatively associated with said rotatable shaft to rotate the shaft and eccentric wheels such that the rotation of the eccentric wheels causes said cage to move up and down within the tank.

4,047,405
APPARATUS FOR APPLYING DYE LIQUOR TO KNIT/DEKNIT TUBULAR ROLLS
Edward J. Dombrowski, Asheboro, N.C., assignor to Champagne-Dye Works, Asheboro, N.C.
Filed Oct. 13, 1976, Ser. No. 732,091
Int. Cl.² D06B *1/02, 11/00*
U.S. Cl. 68—205 R **6 Claims**



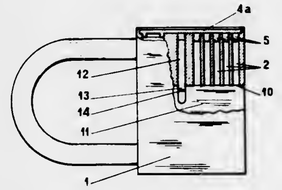
1. Apparatus for applying dye to spaced positions on the side surfaces of a roll of knit fabric which is to subsequently be deknit to form a crimped yarn comprising:
   a. a dye fixture including support means for holding at least one of said rolls in close relation thereto;
   b. a plurality of containers, each adapted to receive a supply of dye liquor therein;
   c. a supply line extending from each of said containers to said dye fixture;
   d. means for applying pressure to the interior of each of said containers to force the dye liquor out into said supply lines under pressure;
   e. said dye fixture comprising a plurality of tubular elements arranged in a horizontally planar configuration and having spaced dye outlet openings in the upper surface thereof, and means for connecting each of said tubular element to one of said supply lines for selectively receiving dye under pressure therefrom; and
   f. valve means selectively operable for opening said supply lines and causing a plurality of spurts of dye liquor to be emitted upwardly through the openings in said tubular elements.

4,047,406
ANTI-RAP MOUNTING FOR PERMUTATION LOCK ELEMENTS
Daniel J. Foote, Wauwatosa, Wis., assignor to Master Lock Company, Milwaukee, Wis.
Filed Sept. 3, 1976, Ser. No. 720,191
Int. Cl.² E05B *37/04*
U.S. Cl. 70—25 **1 Claim**



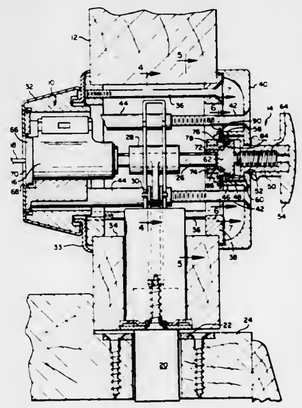
1. In a permutation lock, a body, a bolt housing lining a portion of said body, a shackle movable in the body including the lined portion of the latter and having a closed position and a projected open position, a pair of separate locking bolts mounted within a cavity in the lined portion of the body in a manner as to slide in opposite directions into locking engagement with the legs of the shackle when the latter is in its closed position, resilient means normally urging said locking bolts in opposite directions into releasable locking engagement with the shackle legs, a blocking lever separate from the locking bolts pivotally mounted within the body and having a reduced blocking finger at one end movable in a path at right angles to the axis of the locking bolts into locking position between the inner ends of said locking bolts to prevent undesired retraction thereof out of locking position relative to the shackle legs, said blocking finger being accommodated by a cavity within the lined portion of the lock body whose forward end portion communicates with an alined recess therefor only in the inner face portion of the bolt housing, the forward end portion of the last-mentioned cavity being closed by a rigid bridge in said portion of the bolt housing so that the last-mentioned cavity can snugly receive the blocking finger and positively limit its path of travel within the last-mentioned cavity and relative to the spaced inner ends of the locking bolts a distance only infinitesimally greater than the breadth of said blocking finger so that unauthorized raps imposed on a portion of the lock body cannot cause surreptitious oscillations of said blocking finger sufficient to free it from the locking bolts.

4,047,407
PADLOCK
Feliciano Aranzabal, Mondragon, Spain, assignor to Feliciano Aranzabal Y Cia, S.A., Spain
Filed Jan. 13, 1976, Ser. No. 648,753
Claims priority, application Spain, Feb. 3, 1975, 209606
Int. Cl.² E05B *67/02*
U.S. Cl. 70—52 **6 Claims**



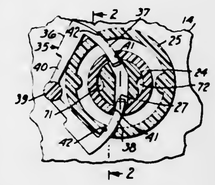
1. An improved padlock comprising:
a padlock body having a cylindrical bore passing therethrough, said bore being adapted to receive a lock plug;
said padlock body also including a plurality of tumbler receiving passages arranged in a predetermined array and extending from said bore to one side of said body, each of said passages having a predetermined cross-section;
a lid to cover said one side of said padlock body, said lid comprising a plate having a sufficient size to extend past and cover all of said passages;
a first plurality of lugs projecting from said lid in an array corresponding to said array of said passages, each said lug corresponding to a different said passage and having a cross-section approximately equal to that of said corresponding passage, the length of each lug being less than the length of its corresponding passage whereby said lugs do not extend into said cylindrical bore.

4,047,408
LOCK MECHANISM
Eddie D. Johns, 2680 SE. Spruce St., Hillsboro, Oreg. 97123; Robert E. Cummings, 45 Eagle Crest Drive, Lake Oswego, Oreg. 97034, and Edgar W. Pearl, 18620 SW. Aloha Court, Aloha, Oreg. 97005
Filed Dec. 8, 1975, Ser. No. 638,609
Int. Cl.² E05B *65/06*
U.S. Cl. 70—129 **13 Claims**



1. A lock mechanism having a forward end and a reverse end, said mechanism comprising a lock cylinder at the forward end thereof, a manually engageable knob on the reverse end of the lock mechanism for positioning on the opposite side of a door from said cylinder, and a bolt operated by rotation of said cylinder,
releasably engageable means normally intercoupling both said cylinder and said knob in operating relation to said bolt,
and means selectively operable from said forward end of said lock mechanism for positioning said releasably engageable means in non-coupling relation so that said bolt cannot be operated from said knob while maintaining said cylinder in operable relationship with said bolt.

4,047,409
KEY CONTROLLED LOCK
David W. Fuller, Rosemead, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.
Filed Sept. 9, 1976, Ser. No. 721,667
Int. Cl.² E05B *29/06*
U.S. Cl. 70—356 **8 Claims**



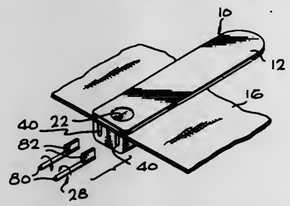
1. A key controlled lock comprising
a base structure forming a cylindrical bearing,
an actuator rockable in said bearing,
said actuator having a keyway extending at least substantially diametrically across one end portion thereof,
a flexible locking element having a pair of locking fingers normally engaging in the opposite sides of said keyway to prevent rocking of said actuator member,
means supporting said locking member eccentrically of said bearing,
said last mentioned means preventing movement of said locking member about the axis of said bearing,
a key insertable endwise in said keyway,
said key having camming means thereon effective to cam said locking fingers out of said keyway and to flex said locking element upon insertion of said key in said keyway to permit rocking of said actuator member by said key.

4,047,410
MECHANISM FOR RELEASING DEVICE ATTACHING AN ANTI-THEFT MONITOR TO MERCHANDISE
Leo R. Close, Granada Hills, Calif., assignor to Mrs. Lawrence Israel, Los Angeles, Calif.
Division of Ser. No. 563,480, March 31, 1975, Pat. No. 3,973,418. This application May 17, 1976, Ser. No. 687,014
Int. Cl.² E05B *19/14*
U.S. Cl. 70—401 **1 Claim**

1. A mechanism for releasing a device for attaching a monitor to an article of merchandise, the attaching device including a tack having a shank and a keeper for receiving the shank, the keeper enclosing a fastener having opposed elements for gripping the shank, displacement of the opposed gripping elements toward releasing positions permitting withdrawal of the shank from the keeper, the keeper further having a pair of openings for receiving key means adapted to engage and displace the fastener gripping elements to the shank-releasing position, the releasing mechanism comprising:
base means;

a pair of horizontal, parallel spindles journalled for rotation in the base means, the spindles being coupled for counter-rotation and spaced apart a distance equal to the distance between the pair of openings in the keeper, the spindles further having outer end portions comprising key means including tabs adapted to engage the fastener gripping elements and displace the gripping elements to the shank-releasing position upon rotation of the spindles;

an actuator supported by the base means and coupled to



rotate the spindles, the actuator being pivotally mounted on the base means for movement between a first position in which the tabs are oriented in a non-engaging position relative to the fastener and second position in which the tabs are oriented in a fastener-engaging position, the base means further including a stop for engagement by the actuator in the first position thereof;

means for biasing the actuator against the stop; and

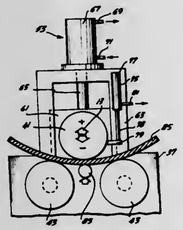
means for supporting the monitor in operative relationship to the key means.

4,047,411

NUMERICALLY CONTROLLED PYRAMID ROLL FORMING MACHINE

Gene B. Foster, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jan. 3, 1977, Ser. No. 756,360
Int. Cl.² B21D *5/14*; G01B *5/20*
U.S. Cl. 72—7 **22 Claims**



17. A method of controlling a pyramid roll forming mechanism having a position controllable upper forming roll such that parts with varying radii contours can be formed, said method comprising the steps of:

continuously producing control signals denoting the desired radii of a part as it is being contour formed;

continuously producing feedback signals related to the position of said upper forming roll and, thus, the radii of a part as it is being formed;

continuously comparing said control signals with said feedback signals to produce position error signals; and,

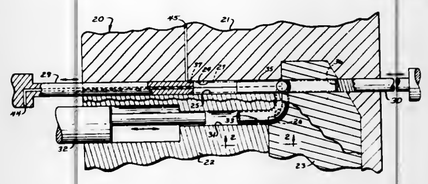
using said position error signals to control the position of said upper forming roll such that said pyramid roll forming machine contour forms said part in accordance with said control signals.

4,047,412

METHOD OF MAKING A PIPE FITTING AND PRODUCT

Marvin E. Holmgren, Elkhart, Ind., assignor to Elkhart Products Corporation, Elkhart, Ind.

Filed Nov. 15, 1976, Ser. No. 741,968
Int. Cl.² B21D *51/16*
U.S. Cl. 72—58 **5 Claims**



1. A method for producing a pipe fitting having at least three legs comprising the steps of:

providing a tube of malleable metal having one end closed and a diameter to wall thickness ratio in the range of 5-30,

substantially filling said tube with a constant volume filler material,

confining said tube in die means having relief zones on each side of said tube and intermediate the ends adapted to develop legs having a length to diameter ratio of more than 3, and

deforming said tube in a single step by exerting pressure at both ends thereof to extrude the same from both ends simultaneously while continuously maintaining said filler material at constant volume to provide at least three legs thereby wherein the variation in wall thickness throughout said fitting is less than about 10%.

4,047,413

AUTOMATIC METAL-SPINNING METHOD

Burton F. Lewis, Bear Hill Road, and Alan Y. Lewis, Walnut St., both of Hillsboro, N.H. 03244

Filed Jan. 16, 1976, Ser. No. 649,907
Int. Cl.² B21D *22/14*
U.S. Cl. 72—83 **4 Claims**

1. A method of metal spinning comprising:

a. rotating a plurality of rotating mandrels about a common center;

b. clamping work pieces upon said mandrels as a function of the position of said mandrels about said common center;

c. positioning a metal forming tool mounted on a cross arm of a respective reciprocatable rotatable shaft relative to each said mandrel;

d. moving each said shaft in a direction parallel to the axis of rotation of the respective mandrel to cause each said tool to bear against a work piece.

e. rotating each said shaft under a predetermined load pressure to cause each said tool to bear against a work piece in a direction perpendicular to the axis of rotation of the respective mandrel;

f. varying said predetermined load pressure during spinning to accomodate variations in the work to be performed; and,

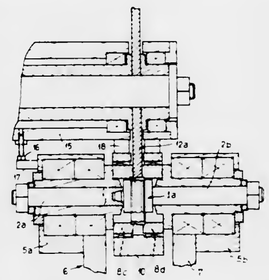
g. effecting said clamping, positioning, moving, rotating and varying as a function of the position of said mandrels about said common center.

4,047,414

BEARING RACE ROLLING DEVICE

Gerard Druge, and Roger Troccaz, both of Annecy, France, assignors to Societe Nouvelle de Roulements, Annecy, France

Filed Nov. 4, 1976, Ser. No. 739,014
Claims priority, application France, Nov. 6, 1975, 75.33940
Int. Cl.² B21H *1/12*
U.S. Cl. 72—91 **6 Claims**



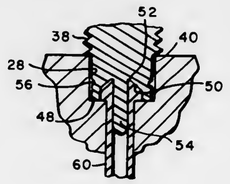
1. Device for rolling rolling-contact bearing races from a blank by means of a die and shaping wheels comprising an inner roller for obtaining the internal profile of the race in the die from which it is separated to permit a possible extrusion of the excess material of said blank, said inner roller being mounted on a shaft rotating in a fixed support in its operative position; an outer wheel having an outer working profile for shaping part of the external profile of the race against the action of the inner roller; said die being divided in the axial direction into two separable sections disposed on either side of said outer wheel in a die support, said die support being mounted for movement across said shaft and being responsive to the thrust from a member supporting said outer wheel during the rolling operation; and said sections constituting a cavity of which the profile is designed for shaping the portions of the outer profile of the race which are adjacent to those shaped by said roller, the two die sections being fitted for free rotation in said die support.

4,047,415

APPARATUS FOR SHAPING THE END OF A HOLLOW TUBE

Warren Joseph Crane, 161 Boden Lane; Russell Bancroft Collins, 17 Hillcrest Ave., and Charles Warren Crane, 161 Boden Lane, all of Natick, Mass. 01760

Filed Nov. 6, 1975, Ser. No. 629,557
Int. Cl.² B21D *19/02*
U.S. Cl. 72—125 **1 Claim**



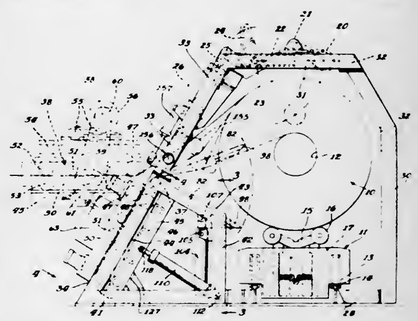
1. A tool for forming a head at one end of a hollow tube made of a deformable material, said tool comprising an anvil containing a cylindrical opening of predetermined diameter greater than the diameter of the head to be formed at the end of the tube, means for clamping the tube with the end to be formed into a head extending into said opening in concentric relation thereto, a die supported in axial alignment with the cylindrical opening in the anvil for rotation and rectilinear movement toward the cylindrical opening, a cylindrical tip at the leading end of the die, interengageable within the cylindrical opening by movement of the die toward the cylindrical opening, said cylindrical opening having a predetermined depth and having at its bottom a flat annular surface at right angles to the axis of the cylindrical opening, and said cylindrical tip having a flat end surface at right angles to the axis of the die for engagement with the flat annular surface at the bottom of the cylindrical opening and containing at said end an axially extending cylindrical pilot member of a diameter corresponding to the inside diameter of the tube for reception within the tube as the die is advanced into the cylindrical opening, and surrounding said pilot member an annular opening comprising an axially extending cylindrical portion at the end face, inwardly of the cylindrical portion a frustoconical portion and at the inner end of the frustoconical portion an annular portion, screw means mounting the die for movement toward the cylindrical opening in the anvil to force the cylindrical tip into the cylindrical opening into engagement with the end of the tube and by a combination of rotation and rectilinear movement, reform the metal of the wall while the latter is supported internally by the pilot member so as to cause the metal of the wall of the tube to conform in solid section to the annular space surrounding the pilot member.

4,047,416

UNCOILING AND STRAIGHTENING APPARATUS FOR STRIP MATERIAL

Kenneth C. Johnson, Des Plaines, Ill., assignor to F. J. Littell Machine Company, Chicago, Ill.

Filed Oct. 14, 1976, Ser. No. 732,324
Int. Cl.² B21D *1/02*
U.S. Cl. 72—183 **11 Claims**



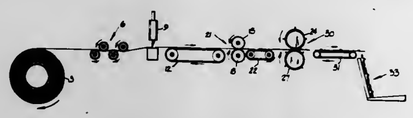
1. In uncoiling and straightening apparatus for strip material, the combination with frame structure, of means for supporting a coil of strip material in a manner permitting rotation of the coil, a straightening and feeding machine located on the unwinding side adjacent the coil, said straightening and feeding machine including a pair of pinch rolls at respective ends and a plurality of straightening rolls located between and, when operative, receiving the strip material at one end as it unwinds from the coil and ejecting the same at its other end as a processed relatively flat and straight strip of material, means provided by the frame structure for pivotally mounting the straightening and feeding machine on a horizontal axis, whereby the said machine may have movement to and from inclined and horizontal positions, and power means for moving the machine on said axis into and from said positions.

4,047,417

DEEPLY EMBOSSED SHEET PRODUCT AND METHOD AND APPARATUS FOR THE PRODUCTION THEREOF

Nathan Oser, Perrineville, and Edmund John Niedzinski, Somerville, both of N.J., assignors to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 622,930, Oct. 16, 1975, abandoned, which is a continuation of Ser. No. 521,829, Nov. 7, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,642
Int. Cl.² B21D *22/08*
U.S. Cl. 72—185 8 Claims



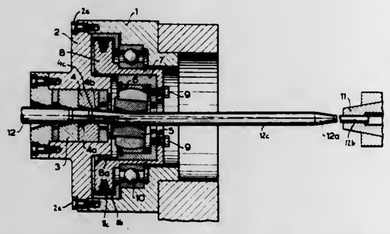
1. Apparatus for the deep embossment of single sheets of sheet material comprising a first set of rolls, each of said rolls in said first set having an embossment pattern suitable for embossment of a small scale relief pattern across the entire surface of each of said sheets, and a second set of rolls, each of the rolls in said second set having a surface pattern suitable for embossment of deep protuberances in each of said sheets in a superimposed relationship to said small scale relief pattern.

4,047,418

COMBINED DRAWING AND STRAIGHTENING MACHINE FOR METALLIC TUBES OR RODS

Ralf Fangmeier, and Alfons Goeke, both of Solingen, Germany, assignors to Kieserling & Albrecht, Solingen, Germany

Filed Sept. 24, 1973, Ser. No. 399,820
Claims priority, application Germany, Oct. 12, 1972, 2249994
Int. Cl.² B21C *1/16;* B21D *3/00*
U.S. Cl. 72—278 11 Claims



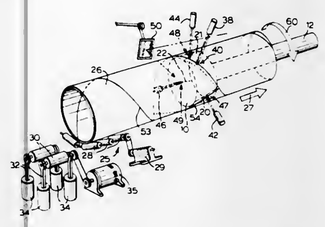
1. In a machine for simultaneous reducing and straightening of elongated tubular or rod-shaped metallic workpieces, a combination comprising a frame; a reducing die mounted in said frame and having a reducing opening for workpieces and a surface surrounding said opening, said surface having a throat portion and an outlet portion which is tapering counter to the direction of the lengthwise movement of workpieces through said die an annular straightening tool movably installed in said frame downstream of said die and having a passage for workpieces; and means for moving said straightening tool relative to said frame so that the axis of said passage orbits about the axis of said opening whereby a workpiece moving lengthwise through said die and said straightening tool is flexed in a plurality of directions in the entire region extending from said die to said straightening tool.

4,047,419

METHOD AND APPARATUS FOR EXPANDING SPIRALWELD PIPE

Paul H. Hookings, Ridgeville; Harry C. Wade, and Phillip Deijs, both of Welland, all of Canada, assignors to The Steel Company of Canada, Limited, Hamilton, Canada

Filed June 23, 1976, Ser. No. 698,964
Claims priority, application Canada, Apr. 30, 1976, 251515
Int. Cl.² B21B *17/02*
U.S. Cl. 72—370 7 Claims



1. A method of expanding a spiralweld pipe having transverse welds at intervals, comprising the steps:

supporting at a fixed location an expander head having a helically arranged recess matching the helical weld of the pipe, and at least one further recess disposed so as to be capable of alignment with a transverse weld of the pipe,

sequentially and incrementally advancing the pipe around the expander head in the direction of the pipe axis through a plurality of stationary locations at which movement is arrested, the movement of the pipe between each sequential pair of locations including both axial and rotational motion such that the helical weld tracks in registry with said recess, the arresting of pipe movement being accomplished such that whenever any part of a transverse weld comes to a halt adjacent the expander head it is in registry with the said at least one further recess, the latter step including the provision of visible indicator means adapted to show at the exterior of the pipe the location of all said recesses, thereby to facilitate the alignment of welds with the respective recesses,

and expanding said expander head against the inside of the pipe at each said stationary location.

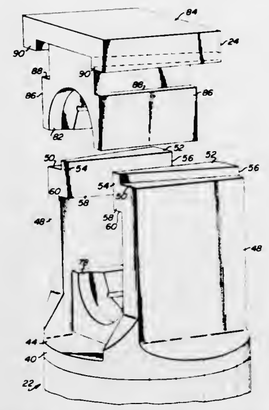
4,047,420

PRESS FOR SWAGING METAL SLEEVES

Hugh Jeremy Willis Edwards, Guisely, England, assignor to CCL Systems Limited, England

Filed Aug. 2, 1976, Ser. No. 710,489
Claims priority, application United Kingdom, Aug. 4, 1975, 32600/75
Int. Cl.² B21D *37/02*
U.S. Cl. 72—416 2 Claims

1. A press adapted for use in confined spaces for forming a workpiece, said press comprising a cylinder having a longitudinal axis with a piston therein and reciprocable along said axis, said cylinder having an end from which a pair of arms extend in a direction generally parallel to said longitudinal axis, the outer surface of each of said arms being planar with the distance between the outer surfaces of said arms measured in a direction transverse to said longitudinal axis being less than the outer diameter of said cylinder, said arms also including tapered flanges, a bridging member in the form of a cap having tapered flanges thereon, said cap being detachably secured to said arms, with the flanges of said arms mating with the flanges of said cap, a first die part mounted for said reciprocable movement with said piston and a second die part mounted on said bridging member, said die parts cooperating together to form said workpiece by movement of said first die part toward said second die part in accordance with the movement of said piston along said axis.

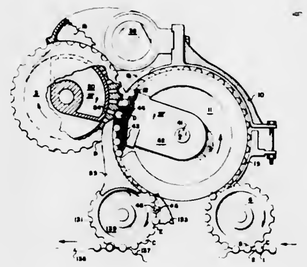


4,047,421

APPARATUS FOR CALIBRATING CIGARETTE INSPECTION DEVICE

Steven F. Spiers; Howard M. Lewis; Gerald A. Kraft, and Arthur R. Pasquine, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 4, 1976, Ser. No. 711,572
Int. Cl.² G01M *3/26*
U.S. Cl. 73—1 R 11 Claims



1. Apparatus for calibrating a device for testing cigarettes, wherein said testing device including conveyor means for moving the cigarette to be tested past a test point and means disposed at said test point for measuring the air pressure difference across the wrapping of the cigarettes to be tested, the improvement comprising:

a. deforming means disposed adjacent said conveyor means and forward of said test point, for disposing a first and a second defect into first and second test cigarettes, respectively, as carried by said conveyor means, the first and second defects being known, respectively, to provide unacceptable and acceptable pressure differences across the wrappings of the first and second test cigarettes;

b. manifestation means responsive to the outputs of said pressure means, for indicating, respectively, whether the first and second test cigarettes are acceptable; and

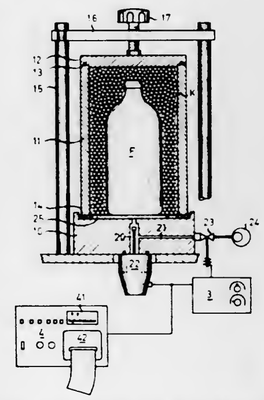
c. sensitivity means for varying the output of said pressure measuring means until said manifestation means provides indications that the first test cigarette is unacceptable and that the second test cigarette is acceptable.

4,047,422

PROCESS FOR MEASURING PERMEABILITY TO GAS OF WALLS AND/OR CLOSURE OF THREE-DIMENSIONAL ENCASING ELEMENTS

Georges H. Lyssy, Rotfluhstrasse 87, CH 8702 Zollikon, Zurich, Switzerland

Filed Apr. 16, 1976, Ser. No. 677,849
Claims priority, application Switzerland, Apr. 18, 1975, 004969/75
Int. Cl.² G01N *15/08;* G01M *3/34*
U.S. Cl. 73—38 3 Claims



1. A process for measuring the permeability to gas of the walls and/or the closure of three-dimensional encasing elements, such as packages, bottles or cans, in accordance with a manometric measuring method, said process comprising:

placing a filled or gas encasing element which is to be tested into a measuring chamber;

filling the free space between said encasing element and the inner wall of said measuring chamber with filler elements that protect the encasing element against bursting or inflation;

producing a vacuum in said measuring chamber; and

measuring the time within which a certain pressure increase within said measuring chamber occurs, such time representing a criterion for the leakage rate of the encasing element and/or its closure.

4,047,423

LEAK DETECTOR FOR ENGINE CHAMBERS

Celvie L. Eason, 621 W. 43 Place, Hialeah, Fla. 33012

Filed Sept. 20, 1976, Ser. No. 725,015
Int. Cl.² G01M *3/02*
U.S. Cl. 73—49.8 1 Claim

1. A leak detector for detecting leakage in a passageway comprising:

a sealing cap adapted to fit against and seal one end of a passageway, and including means for attaching a rod to said cap and oriented to pass through and extend out of the opposite end of the passageway;

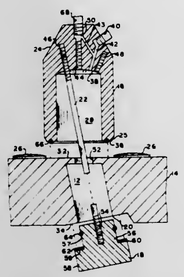
an elongated rod threaded on one end, and including attachment means at the opposite end for attachment to said sealing cap;

a pressure application and measurement enclosure assembly comprising:

a generally cylindrical-shaped chamber having regions with an open end and a closed end, and a sealing ring adapted

to fit around said open end, and sealably coupling said open end to said passageway,

said closed end region of said chamber including a plurality of threaded sockets adapted to receive said threaded end of said rod, one of said threaded sockets being concentric and extending along a line normal to said open end of said chamber, one of said sockets being at an angle of 12° with respect to a line parallel to said axis of said first-named socket, and one of said sockets being positioned at an angle of 14° with respect to a line parallel to said first-named socket,



a pressure gauge coupled to the interior of said chamber, and

pressure valve means coupled to the interior of said chamber for selectively applying gas pressure to and releasing gas pressure from the interior of said chamber;

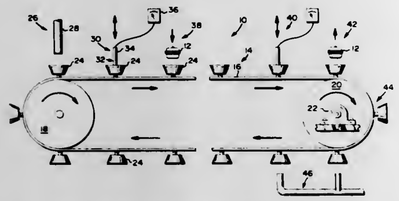
whereby said rod may be passed through said passageway and selectively inserted into one of said sockets at an appropriate angle, and then said rod tightened to effect an aligned seal between said cap and an end of a said passageway.

4,047,424

APPARATUS FOR NON-DESTRUCTIVE LEAK TESTING OF PRIMARY ELECTROCHEMICAL CELLS

Peter H. Rollason, Cayuga, and James M. Williams, Seneca Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 29, 1976, Ser. No. 727,769
Int. Cl.² G01M *3/20*; G01N *31/00*
U.S. Cl. 73—52 **4 Claims**



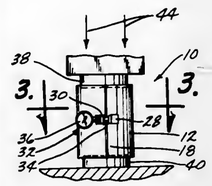
1. An apparatus for leak testing electrochemical cells comprising: conveyor means adapted to move a plurality of test receptacles along a given path; a first work station disposed at a starting point of said path comprising means for dispensing a test fluid into said test receptacles; a second work station adjacent said first work station and downstream therefrom comprising first means for checking at least one particular parameter of said test fluid; a third work station adjacent said second work station and downstream therefrom comprising means for delivering an electrochemical cell into said test receptacle containing said test fluid; a fourth work station disposed downstream from said third work station a digestion distance comprising a second means for checking said at least one particular parameter of said test fluid; means for comparing said first and second checks to determine if said cell leaked; and means for removing said cell.

4,047,425

TESTING DEVICE FOR MEASURING LATERAL PRESSURE INDUCED ON A MATERIAL BY A VERTICAL APPLIED PRESSURE

Richard L. Handy, Des Moines, and James M. Hoover, Ames, both of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Dec. 17, 1975, Ser. No. 641,545
Int. Cl.² G01N *3/08*
U.S. Cl. 73—94 **10 Claims**



1. A testing device to measure the lateral pressure induced on a material by a vertical applied pressure, said testing device comprising in combination,

a material holding receptacle which is capable of lateral expansion in response to a vertical applied force on a material contained in said receptacle, and a sensing means positioned on said receptacle to sense the amount of lateral expansion of said receptacle,

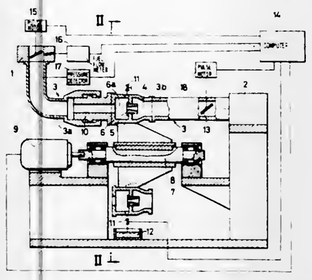
said cylindrical sleeve having a slit along its entire length parallel to the longitudinal axis of said sleeve.

4,047,426

SONIC NOZZLE APPARATUS IN A CARBURETOR FLOW TESTING MACHINE

Iwao Maruyama, Kawagoe, and Shigeo Kanai, Sayama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 30, 1976, Ser. No. 710,242
Claims priority, application Japan, Aug. 1, 1975, 50-105738
Int. Cl.² G01M *15/00*
U.S. Cl. 73—118 **9 Claims**



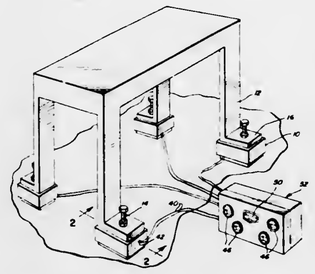
1. In a sonic nozzle apparatus in a machine for testing flow in a carburetor connected to a suction pressure source: measuring passage means connecting the carburetor to the suction pressure source, said measuring passage means comprising a first passage connected to the carburetor, a second passage connected to the suction pressure source, said first and second passages defining a spaced cutout portion therebetween, a plurality of tubular nozzle chambers, each nozzle chamber including a respective sonic nozzle therein and upstream and downstream chamber portions on opposite sides of said sonic nozzle, and means for selectively introducing one of said nozzle chambers into said cutout portion to establish communication between said first and second passages.

4,047,427

LOAD-SENSING AND ADJUSTING METHOD FOR OPERABLE MACHINES

Sheldon E. Young, Western Springs, Ill., assignor to Vibro/Dynamics Corporation, LaGrange, Ill.

Filed Jan. 26, 1976, Ser. No. 652,203
Int. Cl.² G01L *5/00*
U.S. Cl. 73—141 A **2 Claims**



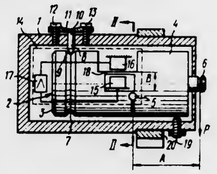
1. The method of optimizing the weight distribution, balance and performance of an operable machine which comprises mounting same on a plurality of height-adjustable, load-indicating, vibration-isolating supports and thereafter selectively adjusting the height of each such support while observing indications of load thereon so as to equalize weight distribution, then placing such machine in operation, observing variations in load indications during such operation and selectively adjusting the height of any such supports as necessary to distribute weight for optimum stability consonant with the cyclical dynamics during operation of such machine.

4,047,428

FORCE MEASURING TRANSDUCER WITH FREQUENCY OUTPUT SIGNAL

Valentin Mikhailovich Karpov, Kolomensky prospekt, 7, korpus 1, kv. 50; Vladimir Rezhevich Santo, Varshavskoe shosse, 10, kv. 137; Viktor Yakovlevich Yanovsky, Kostanaevskaya, 23, korpus 2, kv. 14; Anatoly Ivanovich Mikhailov, ulitsa Obrucheva, 28, korpus 2, kv. 154, and Mikhail Fedorovich Belyaev, prospekt Vernadskogo, 68, kv. 12, all of Moscow, U.S.S.R.

Filed Oct. 24, 1975, Ser. No. 625,514
Int. Cl.² G01L *1/10*
U.S. Cl. 73—141 A **6 Claims**



4. A force measuring transducer with a frequency output signal, comprising: a casing; an elastic body in the form of a cantilever beam responsive to bending forces and arranged in said casing in spaced relationship therewith; a base on said elastic body and secured in said casing; a working member on said elastic body attached to said base by flexible joint and subjected to the action of a force; an oscillating element constructed as a single unit with said working member and having an oscillation frequency depending upon the magnitude of said force; an electromechanical self-excited oscillator with resonator comprising said oscillating element; at least three supports to secure said base of said elastic body in said casing and to limit the transfer of oscillatory energy from the elastic body to the other elements of the transducer; one tapered end of each said support bearing up against the surface of said base; the other end of each said support being joined to said casing, said working member including said cantilever beam for changing the stresses in said oscillating element in response to the action of said force.

4,047,429

METHOD OF TESTING GLASS FIBER COATING COMPOSITIONS

Norman G. Bartrug, Allison Park, and Donald L. McDaniel, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 587,471, June 16, 1975, which is a continuation of Ser. No. 475,705, June 3, 1974, abandoned. This application Jan. 29, 1976, Ser. No. 653,322
Int. Cl.² G01N *3/08*
U.S. Cl. 73—150 R **7 Claims**

1. In the method of testing an aqueous admixture of a coating composition to be used for coating glass fibers used to reinforce elastomers, the improvement comprising:

spraying an amount of said admixture onto a surface, said surface being at a temperature greater than 120° F., the amount of said admixture forming a base film of less than about 0.7 mil thickness, the adhesion between said surface and said film being less than the cohesion within said film;

spraying a plurality of additional coats of said admixture over said base film, each of said additional coats imparting a coat thickness of less than about 0.7 mil, to form a continuous, uniform final film of greater than 4 mils thickness which is substantially water free, removing said final film from said substrate;

heating said final film with pressure to cure said film;

preparing test samples from said film; and

testing said sample for strength and percent elongation.

4,047,430

METHOD AND APPARATUS FOR LOGGING EARTH BOREHOLES USING SELF-CONTAINED LOGGING INSTRUMENT

Jorg August Angehrn, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 682,940, May 3, 1976. This application Aug. 2, 1976, Ser. No. 710,974
Int. Cl.² E21B *47/00*
U.S. Cl. 73—151 **8 Claims**

1. Apparatus for investigating the formations surrounding an earth borehole, comprising:

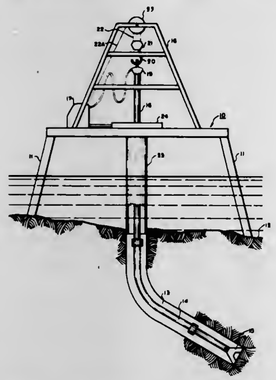
an elongated instrument adapted to traverse an earth borehole;

means within said instrument for measuring at least one characteristic of the formations surrounding said borehole and for generating first signals functionally related to said at least one characteristic;

a variable-output accelerometer within said instrument for generating second signals functionally related to the acceleration of said instrument while traversing an earth borehole;

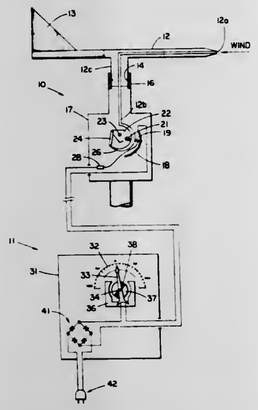
circuit means within said instrument for translating said

second signals into third signals functionally related to the depth of the instrument within an earth borehole; and



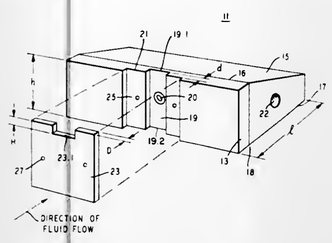
means within said instrument for recording said first and third signals.

4,047,431
WIND CHILL FACTOR INDICATOR
Ronald J. Mulvaney, 1201 W. 5th, Dubuque, Iowa 52001, and Cecil L. Moore, Dubuque, Iowa, assignors to said Ronald J. Mulvaney, by said Cecil L. Moore, a part interest
Filed Aug. 20, 1976, Ser. No. 716,075
Int. Cl.[2] G01W *1/17*
U.S. Cl. 73—170 R **5 Claims**



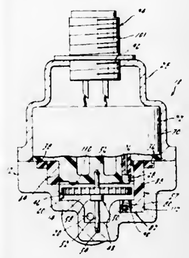
1. A wind chill factor indicator comprising a pitot-static tube mounted out-of-doors for swivel movement and having a vane adapted to face the open end of the tube into the wind, a variable resistor having a wiper arm mounted adjacent the total pressure connection end of the tube, a transducer connected between the pressure connection end of said tube and said wiper arm for converting the pressure in said tube into motion of said wiper arm, a thermistor mounted to be responsive to outdoor ambient temperature, an indicating meter having a coil adapted to induce movement of an indicating needle proportional to electrical current flow through the coil, a source of electrical power, and wiring means connecting said resistor, thermistor, meter coil and source of power, whereby the current flow through said meter coil, and hence the position of said indicating needle, is a function of both the wind velocity and temperature sensed by said tube and thermistor.

4,047,432
BLUFF BODY FLOWMETER INCLUDING SHIELD-CHANNEL ARRANGEMENT
Theodore John Fussell, Jr., Bridgewater Township, Somerset County, N.J., assignor to Neptune Eastech, Inc., Edison, N.J.
Filed Aug. 12, 1976, Ser. No. 713,887
Int. Cl.[2] G01F *1/32*
U.S. Cl. 73—194 VS **9 Claims**



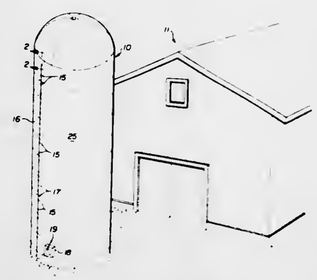
1. For use in measuring the flowrate of fluid in a conduit, a bluff body comprising
a planar base surface portion disposed substantially normal to the direction of fluid flow and effective to produce vortex shedding in said fluid, characterized in that
a fluid flow channel extends from one side of said base portion to the opposite side thereof,
a sensor is located in said channel,
a shield is disposed over said channel and said sensor, and
at least that portion of said shield which covers said channel is shorter than the length of said channel so that fluid flow through said channel is unidirectional.

4,047,433
MODULAR VORTEX FLOWMETER
Karnig H. Dabanian, Taylor, Mich., assignor to Cox Instrument Division Lynch Corporation, Detroit, Mich.
Filed May 7, 1976, Ser. No. 684,416
Int. Cl.[2] G01F *1/06, 1/32*
U.S. Cl. 73—194 C **13 Claims**
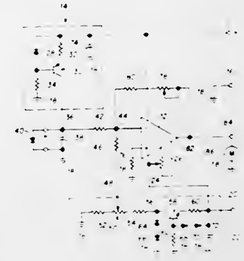


1. A vortex flowmeter comprising a body structure having a cavity formed therein, cover means fastened contiguous to said body structure for closing said cavity, inlet port means positioned generally tangentially to one portion of said cavity and outlet port means positioned adjacent another portion of said cavity for permitting the flow of fluid through said cavity from said inlet port means to said outlet port means, said body structure including a first shaft mounting means, a shaft mounted at one end thereof in said mounting means and extending centrally through said cavity, a rotor mounted on said shaft and positioned in said cavity and having a plurality of teeth formed thereon, and a modular sensing assembly positioned to sense the passage of said teeth in response to the flow of fluid in said cavity including a second shaft mounting means for mounting the other end of said shaft, said sensing assembly being mounted in said cavity and comprising a light-emitting diode, a phototransistor mounted remote from said light-emitting diode, and sensor housing means and sleeve means forming an integral unit for mounting said light-emitting diode and phototransistor in spaced relation, at least a portion of said rotor being positioned between a portion of said sensor housing means and a portion of said sleeve means for rotation therebetween, one of said phototransistor and said light-emitting diode being mounted in said portion of said sensor housing means and the other of said phototransistor and said light-emitting diode being mounted in said portion of said sleeve means, said sensor sleeve means including projecting means formed to project along an axis generally parallel to the axis of said housing means, said portion of said sleeve means extending radially from said projecting means adjacent said rotor, said sensor housing means and said sleeve means being formed as separate elements, said housing means and sleeve means being fastened, one to the other, said sensor housing means being formed as a cup shaped element having a projection therefrom, said sleeve means including fastening means fastened to said projection, said projection is formed as a cylinder, said fastening means including an annulus surrounding said cylinder.

4,047,434
BIN DEPTH MONITOR
Norman F. Marsh, Auburn, and William T. Eng, Springfield, both of Ill., assignors to Dickey-john Corporation, Auburn, Ill.
Filed Feb. 6, 1976, Ser. No. 655,904
Int. Cl.[2] G01F *23/24*
U.S. Cl. 73—304 R **14 Claims**



1. A monitor for displaying information related to the depth of material stored in a walled silo or the like, comprising a plurality of sensors in a vertical array along a silo wall, each sensor being adapted to sense the presence or absence of stored material at the sensor, electrical circuit means connected to the sensors for generating a plurality of electrical signals, one of said signals comprising a back plane voltage for a liquid crystal display, and another of said signals comprising a first voltage different from said back plane voltage and corresponding to the presence of stored material for each sensor where material is present and a second voltage the same as the back plane voltage corresponding to the absence of stored material for each sensor where material is absent, and liquid crystal display means connected to the electrical circuit means for receiving said back plane and first and second voltages for providing a display corresponding thereto and to the number of sensors at which the presence of stored material is sensed.

4,047,435
TEMPERATURE MEASURING APPARATUS
John L. Keith, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed May 20, 1976, Ser. No. 690,206
Int. Cl.[2] G01K *7/00*
U.S. Cl. 73—362 SC **1 Claim**

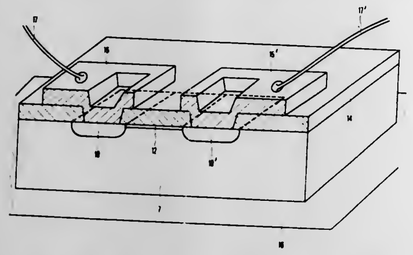


1. Temperature indicating means comprising, in combination:
power supply means including ground means and first and second power terminal means;
constant current transistor means including an emitter resistively connected to said first power terminal means, a base connected through a zener diode to said first power terminal means and a collector;
temperature sensing diode means connected between said collector and said ground means;
temperature compensated constant voltage reference means including output means for supplying a constant voltage reference over a wide range of temperatures with respect to said ground means, said constant voltage reference means including,
constant current second transistor means including an emitter resistively connected to said second power terminal means, a base connected through voltage dropping diode means to said second power terminal means and a collector connected through a series connection of a temperature compensating diode means, and a second zener diode means to said ground means, and
potentiometer means connected between said collector of said second transistor means and said ground means and having a wiper connected to the output means thereof; and
summing means connected to said temperature sensing diode means and to said output means for providing an output indication of temperature of said sensing diode means as a function of the voltage across said sensing diode means as compared to said reference voltage.

4,047,436
MEASURING DETECTOR AND A METHOD OF FABRICATION OF SAID DETECTOR
Jean Bernard, St-Martin D'Heres; Giorgio Frossati, Grenoble Gare; Georges Guernet, Grenoble; Michel Montier, Meylan; Louise Peccoud nee Toupillier, Claix, and Daniel Thoulouze, Echirolles, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Jan. 26, 1972, Ser. No. 220,747
Claims priority, application France, Jan. 28, 1971, 71.02774
Int. Cl.[2] G01K *7/00*
U.S. Cl. 73—362 SC **21 Claims**

1. A method of fabricating a thermometric measuring detector for use at very low temperatures of the type constituted by the resistance of a given volumn of a doped semi-conductor, comprising: providing a semiconductor monocrystal having

one type of conductivity, forming by ion implantation on a surface of a semiconductor monocrystal a surface region having a predetermined thickness having the same type conductivity as said monocrystal, and having a predetermined concentration of doping ions greater than the concentration of impurities in said monocrystal, forming electrical contacts at the



extremities of said region, and forming a thermally conductive metallic coating on a face of said crystal opposite said surface region bonded to said crystal to be in thermal contact with said crystal.

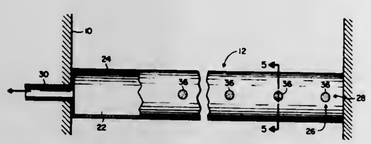
2. A method of measuring temperature comprising fabricating a detector as recited in claim 1 and subjecting said metallic coating to the temperature to be measured.

4,047,437

CONTINUOUS ROW AVERAGE SAMPLING METHOD AND APPARATUS FOR STATIONARY SOURCE GAS STREAMS

Edward F. Brooks, Lawndale, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 20, 1976, Ser. No. 716,317
Int. Cl.² G01N *1/26*
U.S. Cl. 73—421.5 A **4 Claims**



1. A gas sampling probe for continuous row average sampling of a stationary source gas stream comprising:

a tubular body to be placed in sampling position in said gas stream;

said body having a longitudinal passage bounded by a tube wall containing a longitudinal row of sampling ports opening to said passage and an outlet from said passage for connection to gas analyzing means and a vacuum source for evacuating said probe to effect inflow of gas into said probe passage through said ports, mixing of the entering gas within said passage to form composite sample gas, and flow of said composite gas to the gas analyzing means; and

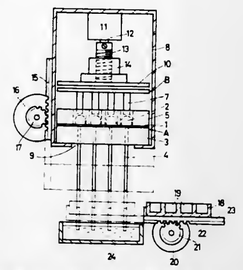
each port containing a separate porous filter through which gas flow occurs to said probe passage and whose pores are sized to produce a pressure drop across the port which is larger by a factor on the order of 10 to 20 than any pressure changes which occur along said port row and is substantially constant along said port row so as to maintain a substantially uniform sample rate along said port row.

4,047,438

LIQUID QUANTITATIVE DISPENSING APPARATUS

Teruaki Sekine, 1-1 Tsukiji 5-chome, Chuo, Tokyo, Japan

Filed Mar. 31, 1976, Ser. No. 672,170
Claims priority, application Japan, Apr. 4, 1975, 50-46509[U]
Int. Cl.² B01L *3/02*
U.S. Cl. 73—423 A **3 Claims**



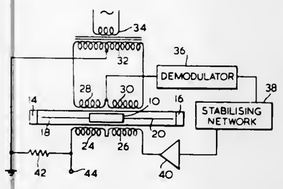
1. Liquid quantitative dispensing apparatus comprising a flexible board-like member having a plurality of cap-like projections arranged in rows lengthwise and crosswise thereon with a small space between each of said projections, a lower board positioned under the said flexible board-like member and having a plurality of aligned pipettes held therein which correspond in number with said projections, a guide board positioned on the said flexible board-like member and having bores to loosely receive said cap-like projections, the said guide board, flexible board-like member and said lower board forming together the main apparatus body, and a keep plate having push bars disposed thereunder so as to be inserted into the said bores of the said guide board to press said cap-like projections.

4,047,439

MAGNETIC LIQUID SUPPORTED LINEAR ACCELEROMETER

Michael King Russell, Lynworth House, Prestbury, Cheltenham, and Anthony William Russell, The Bittams, Crippetts Road, Leckhampton, Cheltenham, both of England

Filed Feb. 17, 1976, Ser. No. 658,866
Claims priority, application United Kingdom, Mar. 26, 1975, 12568/75
Int. Cl.² G01P *15/08*
U.S. Cl. 73—516 R **3 Claims**



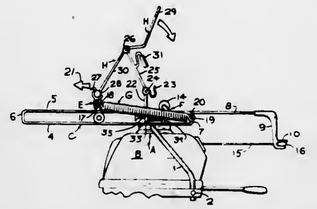
1. A linear accelerometer having a proof mass comprising a permanent bar magnet located in an elongate chamber of length in the direction of its longitudinal axis substantially greater than its width in directions perpendicular to said longitudinal axis and substantially filled with a magnetic fluid, the bar magnet being supported by the magnetic fluid with the magnetic axis of the bar magnet parullel to the longitudinal axis of the chamber, servo means responsive to movement of the bar magnet in the direction of the axis thereof for maintaining the bar magnet in a desired position and means for providing an electrical signal indicative of the force exerted on the bar magnet by the servo means.

4,047,440

STARTER FOR ROPE PULL OUTBOARD MOTORS

Manuel Carriera, 560 Ramos Ave., No. 1, Hayward, Calif. 94544

Filed July 22, 1976, Ser. No. 707,676
Int. Cl.² F02N *5/02*; F03G *1/00*
U.S. Cl. 74—6 **4 Claims**



1. A starter for a rope pull outboard motor comprising:

a. a pair of spaced apart and parallel guide tracks securable to an outboard motor equipped with a pull cord for starting the motor;

b. a rope pulling member including a trolley movable along said guide tracks, said member having means for gripping the motor pull cord;

c. spring means for moving said rope pulling member for actuating the pull cord for starting the motor;

d. a hand operated toggle mechanism for moving said member for tensioning said spring means and for holding said member in a tensioned condition; and

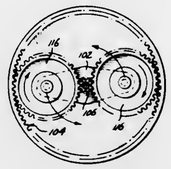
e. said toggle mechanism being manually freed from said trolley to permit said tensioned spring means to rapidly move said rope pulling member for starting the motor.

4,047,441

MECHANICAL COUNTERBALANCE ASSEMBLY

Richard Webster Kellogg, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 2, 1976, Ser. No. 654,381
Int. Cl.² F16H *37/12*
U.S. Cl. 74—52 **10 Claims**



1. A torsional counterbalance assembly for counterbalancing the weight of an object mounted for movement in a vertical direction comprising:

a first rotatable member having a rotational axis and frame means mounting said rotatable member for rotation about its axis,

spring means associated with said first rotatable member for imparting torque to said first rotatable member to rotate said first rotatable member in a first direction and to resist rotation of said first rotatable member in the opposite direction,

a second rotatable member associated with said first rotatable member and mounted for rotation relative thereto, and means associated with said second rotatable member for translating the rotational motion thereof into motion corresponding to the movement of said object,

manually actuated connection means associated with said first and second rotatable members for releasably interconnecting said first rotatable member and said second rotatable member in mutually driving relationship, so that said first rotatable member can rotate independently from said second rotatable member when released from said second rotatable member.

manually actuated locking means associated with said frame means for selectively preventing said second rotatable member from rotating, and

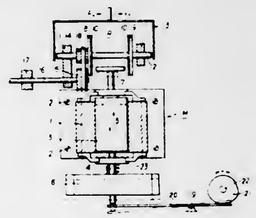
drive means associated with said first rotatable member for manually rotating said first member.

4,047,442

APPARATUS FOR ADJUSTING THE ROTATIONAL SPEED OF A DRIVE MECHANISM

Gottfried Pammer, Maria Enzersdorf, Sudstadt, and Rudolf Kvasnicka, Baden, both of Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed June 24, 1976, Ser. No. 699,458
Claims priority, application Austria, June 26, 1975, 4929/75
Int. Cl.² F16H *15/08, 15/10, 15/12*
U.S. Cl. 74—194 **6 Claims**



1. Apparatus for adjusting the rotational speed of a drive mechanism of the type incorporated in a movie projector or the like, comprising, in combination, a drive motor having a stationary mounted stator and a rotor including a shaft rotating in one direction with said rotor and stator arranged for relative movement, a rotatably mounted drive shaft, at least one friction disc mounted on said drive shaft,

a friction wheel mounted on said rotor for movement by said rotor in a radial direction with respect to said friction disc, an adjustment mechanism engageable with said motor shaft in an axial direction for moving said rotor with respect to said stationary stator for driving engagement between said friction wheel and said friction disc in either a first or second radial position with respect to said disc for adjusting the rotational speed of the drive mechanism.

4,047,443

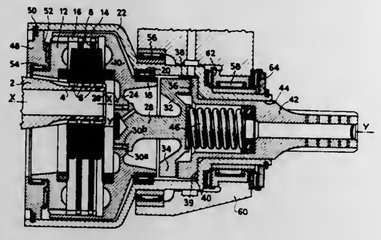
SPEED VARIATOR HAVING FRICTION ELEMENTS

Rene Leveque, Orgeval, France, assignor to Automobiles Peugeot, Paris, France

Filed Nov. 18, 1975, Ser. No. 633,024
Claims priority, application France, Nov. 18, 1974, 74.37872
Int. Cl.² F16H *15/14*
U.S. Cl. 74—199 **11 Claims**

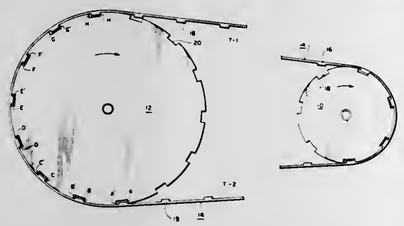
1. In a speed variator comprising a housing, a first shaft having a first axis of rotation, a second shaft which is parallel to the first shaft and mounted in the housing and has a second axis of rotation, a clamping plate axially slidably mounted in the housing and coaxial with the second shaft, a cylinder integral with the clamping plate, an assembly of friction elements consisting of a first single series of said friction elements coaxial with and connected to rotate with the first shaft and a second single series of said friction elements coaxial with the second shaft and slidably keyed in said cylinder, the first series of friction elements being interposed between and clampable between the second series of friction elements, said assembly of friction elements having a first end and a second end which

second end is opposed to said first end and adjacent the clamping plate, means for varying the distance between the two shafts transversely of the shafts, and a coupling device for coupling the clamping plate to the second shaft and rendering the clamping force exerted by the clamping plate on the friction elements proportional to the torque transmitted to the second shaft and comprising two sets of cooperative conjugate ramps respectively associated with the clamping plate and the second shaft, said clamping plate being rotatable relative to the second shaft to an extent sufficient to allow relative rotary



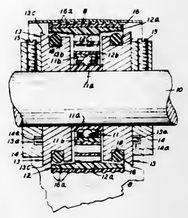
movement between and operation of said two sets of cooperative conjugate ramps, support means carried by and supported by the housing axially of the second shaft supportingly engaging said first end of said friction elements, said clamping plate engaging said friction elements at said second end of said friction elements substantially in a given transverse plane; the improvement comprising two bearing means which are space apart axially of said clamping plate and located axially on opposite sides of said given transverse plane for guiding the clamping plate in the housing.

4,047,444
SYNCHRONOUS BELT AND PULLEY DRIVE
Joseph O. Jeffrey, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Sept. 10, 1976, Ser. No. 722,237
Int. Cl.[2] F16H 7/00; F16G 1/28
U.S. Cl. 74—229 **11 Claims**



1. A synchronous belt and pulley drive comprising:
a driveR pulley;
a driveN pulley;
said pulleys being spaced from each other and each having a plurality of spaced tooth-gaps;
a belt engaging the pulleys and having spaced teeth which are accommodated by the tooth gaps of said pulleys;
the drive between said driveR pulley and said driveN pulley being substantially by friction of the belt thereon, the relationship of belt teeth and the pulley toogh gaps insuring synchronization of the drive between the pulleys and substantially eliminating slippage of the belt on the pulleys;
the pitch of the driveR pulley substantially matching the pitch of the belt under a first tension; and
the pitch of the driveN pulley substantially matching the pitch of the belt under a second and different tension.

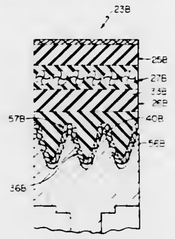
4,047,445
DEMAND DRIVEN CLUTCH
Conrad V. Anderson, Minneapolis, Minn., assignor to Pako Corportion, Minneapolis, Minn.
Filed Sept. 20, 1976, Ser. No. 724,592
Int. Cl.[2] F16H 7/22
U.S. Cl. 74—230.4 **6 Claims**



1. A demand driven clutch assembly comprising:
a pulley member including an outer rim, an inner sleeve positioned in spaced relation within the outer sleeve and a plurality of yieldable resilient vanes which normally maintain said rim and sleeve in concentric relation but are yieldable to external force to permit said rim to shift radially inwardly,
said inner sleeve being adapted to be journaled for free rotation on a rotary drive shaft, and
said outer rim extending axially outwardly beyond said inner sleeve to provide an inner friction clutch driving surface,
a pair of driving members including:
a driving collar adapted to be fixed to the drive shaft in axially spaced relation to said inner sleeve,
a driving hub clutch element interposed between said collar and said inner sleeve and having a central axial opening to receive shaft, and
a plurality of connecting elements extending between said collar and said hub in parallel relation to the axis of said central opening to provide a driving connection between said hub and said collar,
the outer circumferential surface of said hub providing a friction driving clutch surface for driving engagement within the inner clutch surface of said rim when said rim is shifted radially inwardly by an external force applied to the outside thereof.

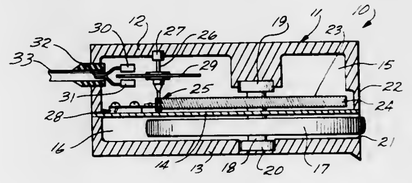
4,047,446
ENDLESS POWER TRANSMISSION BELT
Billy L. Speer, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio
Filed June 14, 1976, Ser. No. 696,108
Int. Cl.[2] F16G 5/00, 1/00
U.S. Cl. 74—234 **16 Claims**

1. An endless power transmission belt having a compression section and a plurality of longitudinally extending ribs comprising said compression section and defining the inside surface of said belt, each pair of immediately adjacent ribs having a space therebetween which when viewed in cross section has a substantially U-shaped peripheral outline, said spaces allowing wear of said ribs while assuring apexes of sheave projections



operatively engaging said belt are maintained spaced from said belt with normal wear of said ribs thereby prolonging belt life.

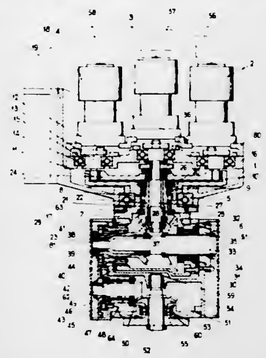
4,047,447
DUAL RATE BIAS SPRING FOR ANTIBACKLASHING GEARS
Irven H. Culver, Playa Del Rey, and Oleg Szymber, Rancho Palos Verdes, both of Calif., assignors to Belrico, Inc., San Lorenzo, P.R.
Continuation-in-part of Ser. No. 576,883, May 12, 1975, abandoned. This application Apr. 19, 1976, Ser. No. 678,316
Int. Cl.[2] F16H 55/18, 57/00
U.S. Cl. 74—409 **22 Claims**



15. A biasing mechanism for variable center distance gear trains in which a driven gear is engageable with a drive gear and is rotatable about an axis which, at least adjacent the drive gear, is not fixed in position radially of the drive gear, the mechanism comprising spring means engageable with the driven gear for biasing the driven gear substantially radially toward the drive gear into mesh therewith with a force corresponding to a desired intertooth loading force between the teeth of the drive and driven gears during conditions of substantially normal use, and stop means effectively cooperable with the driven gear for limiting movement of the driven gear in a direction radially away from the drive gear to an amount of movement less than the amount required to permit the driven gear to unmesh from the drive gear.

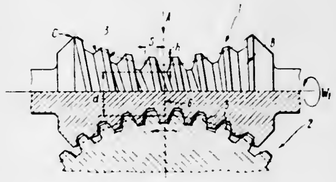
4,047,448
ROBOT HEAD
Pierre Pardo, and Francois C. Pruvot, both of Meudon la Foret, France, assignors to SOFERMO, Meudon la Foret, France
Filed May 12, 1976, Ser. No. 685,927
Claims priority, application France, May 15, 1975, 75.15127
Int. Cl.[2] F16H 1/14
U.S. Cl. 74—417 **7 Claims**

1. Robot or manipulator head comprising a control casing and at least two perpendicular shafts and corresponding external members rotatably driven from driving servo motors, one of said perpendicular shafts being rigid with one of said members supporting the other perpendicular shaft, said servo motors fixedly mounted in said control casing being drivingly connected to at least two coaxial shafts, while at least one of said perpendicular shafts is driven from one of said coaxial-



shafts through a bevel gear of which the input pinion is rigid with said one coaxial shaft and the output pinion is rigid with said one perpendicular shaft.

4,047,449
GLOBOID WORM GEARING AND METHOD OF MAKING GLOBOID WORM THEREOF
Valentin Alexeevich Popov, ulitsa Tsjurupy, 6, korpus 4, kv. 57, Moscow, U.S.S.R.
Filed Jan. 29, 1976, Ser. No. 653,454
Int. Cl.[2] F16H 55/04, 1/16, 1/20
U.S. Cl. 74—458 **4 Claims**



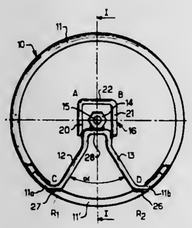
1. A globoid worm gearing comprising: a cylindrical worm-wheel having a plurality of teeth with side surfaces, a globoid worm having a thread with side surfaces and a throat, the side surfaces of the thread of said globoid worm shaped to envelop the side surfaces of the teeth of said cylindrical worm-wheel, means for meshing said worm-wheel with said globoid worm and for engaging the thread of said globoid worm with the teeth of said cylindrical worm-wheel such that said worm thread makes a linear contact throughout the entire side surface of said worm-wheel teeth wherein the contact surface of the globoid worm gearing comprises the contact surface of the cylindrical worm-wheel; the contact lines of the cylindrical worm-wheel envelop the entire side surface of the worm-wheel teeth, while the contact lines of the globoid worm gearing occupy only the medium portion of the tooth side surface, said contact lines on the worm-wheel teeth intersect on the side surface of the working wheel teeth during successive engagement of the globoid worm thread with the teeth of the cylindrical worm-wheel.

4,047,450

SAFETY STEERING-WHEELS FOR AUTOMOTIVE VEHICLES

Jean-Guy Pierre Denis Lecart, Saint-Quen-l'Aumone, and Jean Claude Amalberti, Suresnes, both of France, assignors to Chrysler France, Paris, France

Filed July 11, 1975, Ser. No. 595,080
Claims priority, application France, Sept. 16, 1974, 74.31271
Int. Cl.² B62D *1/08*
U.S. Cl. 74—552 **8 Claims**



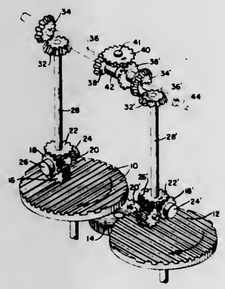
1. Safety steering-wheel including a central hub having a hub axis and a rim situated in a predetermined rim plane located in front of said central hub, the said steering-wheel including only two deformable legs fixed to said rim and inclined rearwardly therefrom toward said hub, with at least one of said legs being fixed to said hub, said legs when projected onto said rim plane being directed substantially along two radii in proximity to one another leaving a greater part of the rim which extends through more than 180° around said axis deprived of any point of attachment with a leg, at least one of said legs and said hub respectively having portions at least one of which is a fixing portion, the said steering-wheel comprising a complementary portion inclined to the axis of the hub, substantially in the shape of a gallows, having a pair of feet at least one of which is fixed near the hub to said fixing portion, and said complementary portion extending well in front of the hub, but behind the rim plane to a side of the hub axis opposite from said steering-wheel legs, said feet respectively forming substantially prolongations of the said legs when projected onto said rim plane.

4,047,451

VARIABLE SPEED DEVICE

Leonard Stanley Ackerman, 355 Lakeview Ave., Rockville Center, N.Y. 11570

Continuation-in-part of Ser. No. 623,524, Oct. 17, 1975, abandoned. This application Nov. 12, 1976, Ser. No. 741,428
Int. Cl.² F16H *37/06*
U.S. Cl. 74—665 H **7 Claims**



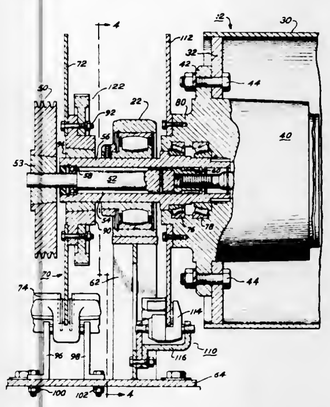
1. A variable speed transmission comprising an output shaft, a planitating gear of a differential gear train driven by two sun gears, said planitating gear being operatively secured to said output shaft to drive said output shaft, an input shaft, a pair of identical discs driven at the same speed by said input shaft, the upper surface of each of said discs having a surface consisting of rack teeth extending thereacross the rack teeth of said discs lying at 90° to each other, a carriage movable in a plane above said discs normal to the surfaces of said discs and including the axes of said discs, a pair of gear trains mounted in said carriage each including a pinion in mesh with the rack teeth of one of said discs and extending to said sun gears meshing with said planitating gear, the distance between said pinions being the same as the distance between the axes of said discs.

4,047,452

BELT CONVEYOR DRIVE MECHANISM

Robert Truman Eddy, South Bend, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed Mar. 15, 1976, Ser. No. 667,022
Int. Cl.² F16H *3/74*
U.S. Cl. 74—752 C **13 Claims**



1. A drive mechanism for a belt conveyor system having a driven pulley and a belt trained thereon, said mechanism comprising a speed reducer having a housing drivingly connected to said driven pulley, a power input shaft for said speed reducer and reaction output shaft for said speed reducer disposed coaxially around said input shaft, a disc brake member connected to said reaction output shaft for rotation therewith, a friction head for restraining the rotation of said disc brake member, and means responsive to the load on the conveyor belt for controlling the restraining effect of said head on said brake member.

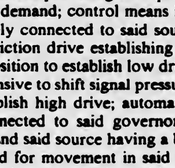
4,047,453

INDEXING ATTACHMENT FOR A DIVIDING HEAD

Henry J. Muller, Stamford, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 10, 1976, Ser. No. 665,676
Int. Cl.² B23B *29/24*
U.S. Cl. 74—813 R **2 Claims**

1. In an indexing mechanism for a dividing head, an indexing attachment for use with a six minute interval circular dividing plate, said indexing attachment increasing the indexing capabilities of said dividing head, said dividing plate having apertures disposed at spaced intervals circumferentially about a peripheral portion thereof, each of said apertures adapted to receive a retractable pin of a rotatable indexing arm of said dividing head, said attachment comprising a one minute interval disc having a stem extending from a mid-portion thereof, said stem being adaptable for placement in any one of said apertures of said dividing plate such that said disc of said attachment will be disposed between the dividing plate and said retractable pin, said disc of said attachment is rotatable about its stem in order to align any of its apertures with the retractable pin of said



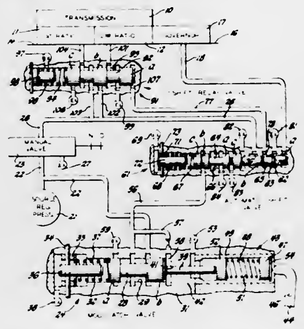
indexing arm containing a plurality of spaced apart apertures for receiving the retractable pin in place of the apertures of said dividing plate, said apertures of said disc being arranged in a spiral pattern and spaced apart in given increments to subdivide the spacing between successive apertures of one ring of apertures of said dividing plate, whereby a greater indexing capability is provided for said dividing head.

4,047,454

SHIFT SIGNAL VALVE HYSTERESIS

Ted M. McQuinn, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 19, 1975, Ser. No. 551,000
Int. Cl.² B60K *21/00*
U.S. Cl. 74—868 **7 Claims**



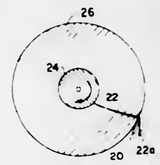
1. A multi-ratio transmission having a plurality of fluid pressure operated friction drive established means having a large fluid chamber selectively established to provide a low and a high speed ratio drive; a source of fluid at a regulated pressure; governor means connected to said transmission providing a governor signal varying with transmission speed; torque demand means providing a torque demand signal varying with torque demand; control means including relay valve means operatively connected to said source and a fluid pressure operated friction drive establishing means and normally biased to low position to establish low drive and having actuator means responsive to shift signal pressure for upshift to high position to establish high drive; automatic shift valve means operatively connected to said governor means, said torque demand means and said source having a bore and a shift valve element mounted for movement in said bore between an upshift position and a downshift position and governor and torque demand responsive means responsive to said governor signal and said torque demand signal to upshift said shift valve element from said downshift position to said upshift position at speeds increasing with increasing torque demand and to downshift said shift valve element from said upshift position to said downshift position at lower speeds, said bore of said automatic shift valve means having a large diameter bore portion and a slightly smaller diameter bore portion with a step therebetween, a shift signal port at said step connected to supply shift signal pressure to said actuator means, a source port in said large diameter bore portion and an exhaust port in said small diameter bore portion, said shift valve element having a large land fitting said large diameter bore portion, a small land fitting said small diameter bore portion and an intermediate portion slightly smaller than said small diameter bore portion to provide a highly restricted passage located and restricting flow between said signal port and said exhaust port and between said signal port and said main port to damp changes in said shift signal pressure to damp relay valve operation and for extended automatic shift valve hysteresis.

4,047,455

METHOD AND APPARATUS FOR SHARPENING END OF FILAMENT IN VEGETATION FILAMENT-TRIMMER

Charles B. Pittinger, Sr., Rte. 1, Box 68, Weatherford, Tex. 76086

Filed Apr. 14, 1976, Ser. No. 676,971
Int. Cl.² B21K *19/00*
U.S. Cl. 76—82.1 **10 Claims**



1. In the combination of a vegetation filament-trimmer having a filament with an inner end and an outer end, a drive connection with the inner end for sweeping the outer end in an intended path, and means on the filament trimmer for working the sweep of said outer end to said intended path on operation of the drive, the improvement comprising: the means for working including means for progressively shaping under centrifugal force on sucessively shorter radii the filament outer end to a predeterminable squared-off end shape, and means for holding the means for progressively shaping proximate said intended path.

4,047,456

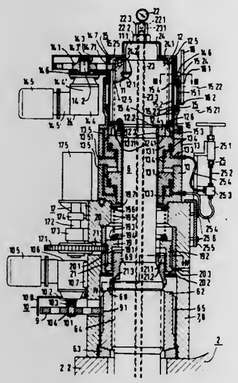
MOTOR-DRIVEN SCREWING AND TRANSPORTING TOOL FOR REACTOR PRESSURE VESSEL HEAD RETAINING FASTENINGS

Manfred Scholz, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Continuation of Ser. No. 639,922, Dec. 11, 1975, abandoned. This application Sept. 21, 1976, Ser. No. 725,285
Claims priority, application Germany, Dec. 17, 1974, 2459645
Int. Cl.² B25B *29/02*
U.S. Cl. 81—57.38 **21 Claims**

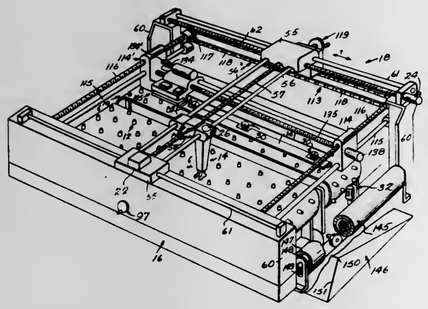
1. A device for unscrewing and screwing nuclear reactor pressure vessel head-retaining nuts and screw studs, the studs extending upwardly through stud holes in a head flange of a removable head of a reactor pressure vessel, the studs having threaded lower ends screwed into threaded holes in the pressure vessel's top and threaded portions on which the nuts are screwed above the head flange to hold down the head on the pressure vessel with the studs under pretension between the vessel's top and the nuts, the nuts having external gear teeth for their rotation and the studs having upper ends spaced above the nuts; said tool comprising a support body and means for supporting said body at controllable heights on said head

flange; and unscrewing and screwing units for said nuts and studs, mounted on said body and having axial passages for releasable insertion of the studs and nuts; each of said units for a stud and nut when inserted in the unit's passage, having a pinion releasably meshing with the nut's said gear teeth and means for reversingly driving said pinion for unscrewing and screwing movements of the nut on the stud, gripping means for releasably gripping the upper end of the stud above the nut, and means for applying upward force to said gripping means



for stretching the stud upwardly from the pressure vessel's top to free the nut from said pretension during said movements; each of said units further having means for releasably engaging said reversibly rotating the stud so its said lower end can be unscrewed and screwed in the threaded hole in the pressure vessel's top while the nut remains screwed on the stud, and means for applying a lifting force to both the nut and stud to relieve the stud's said lower end from the weight of the nut and stud while being unscrewed and screwed in the pressure vessel's threaded hole.

4,047,457
SHEET METAL CUTTING
James Henry Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.
Filed Nov. 11, 1975, Ser. No. 630,894
Int. Cl.² B26D *5/00*
U.S. Cl. 83—71 **30 Claims**



1. Automatic sheet metal cutting apparatus for cutting patterns and the like from sheets of metal fed to said apparatus in a feed direction, said apparatus comprising

a scissors cutting tool means having a pair of blades, one blade being adapted to be disposed above a horizontally arranged metal sheet to be pattern cut, and one blade being adapted to be disposed below said metal sheet,

conveying means for conveying said metal sheet into a pattern cutting position, said sheet being disposed in a horizontal plane, supporting means being associated with said conveying means for supporting said sheet so that said cutting tool means may cut through an edge thereof when pattern cutting is initiated and may pattern cut said sheet without damaging said conveying means during pattern cutting,

means for supporting said cutting tool means above said conveying means, in a position wherein said blades will be disposed above and below said sheet in a horizontal plane, and for movement in *x* and *y* horizontal directions substantially perpendicular to each other, and allowing access of said cutting tool means to at least one free edge of said sheet,

means for supporting said cutting tool means for substantially 360° angular, α, movement about a vertical axis,

x, *y*, and α motor means for automatically moving said cutting tool means in said *x*, *y*, and α directions,

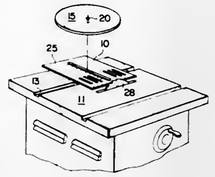
computer control means for automatically controlling the operation of said *x*, *y*, and α motors for moving said cutting tool means to cut a desired, preprogrammed pattern from said sheet,

guide means for guiding movement of said metal sheet into said pattern cutting position,

clamping means for securely holding said metal sheet stationary at said pattern cutting position during pattern cutting thereof, and

motor means associated with said cutting tool means for moving sais blades with respect to each other to shear said metal sheet during pattern cutting thereof.

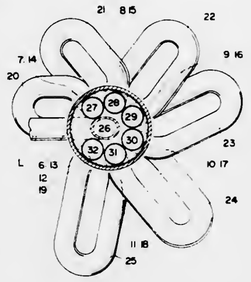
4,047,458
DISK GUIDE
Lester W. Hall, Madera, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed June 29, 1976, Ser. No. 700,822
Int. Cl.² B27B *5/02*
U.S. Cl. 83—439 **2 Claims**



1. A guide plate for mounting on the work table of a power saw, said plate fitted with means to center and rotate the work piece with regard to the cutting point of the saw, in which the guide plate is fitted with a first bar of a size to fit in the miter slot of the work table, and fitted with a slidable second bar that is formed with a cylindrical hole, said hole of a diameter to rotatably fasten the cylindrical head section of a screw which is attachable to the work piece,

said screw formed with a cylindrical shaped head section joined to a tapered pointed section which pointed section is externally formed as a tapered male screw thread, with said pointed section separated from said head section by a projecting radial flange section of a size to extend beyond the circumference of the cylindrical hole of the slidable second bar, when the head section is engaged in said hole, so that the screw may freely rotate in the cylindrical hole of the slidable bar, with the flange supporting said screw in the axial direction of the screw, and so that a work piece threadably engaged in the pointed section may rest on the said radial flange section.

4,047,459
VALVE TUNING SYSTEM FOR THE BRASS MUSICAL INSTRUMENTS
Satoshi Nakamura, 556 Oaza Hakoda, Kumagaya, Saitama, Japan
Filed Aug. 8, 1975, Ser. No. 603,177
Int. Cl.² G10D *9/04*
U.S. Cl. 84—390 **12 Claims**



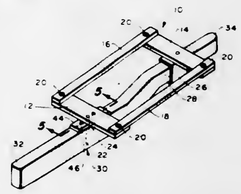
1. A valve tuning system for brass musical instruments comprising a single valve housing, a valve body movable in said housing, a basic instrument pipe and a plurality of by-pass pipes connected to the housing, a plurality of air passages formed in the valve body, tuning means which comprises a plurality of separately actuable finger keys, and means connecting said tuning means to said valve body operable to move the valve body to a plurality of switchover positions such that various combinations of the by-pass pipes and air passages may be connected in series with the basic instrument pipe.

4,047,460
DRUMSTICK
Mark A. Fiedler, and Darrell M. Hart, both of Edina, Minn., assignors to Riff Rite, Inc., Edina, Minn.
Continuation-in-part of Ser. No. 632,607, Nov. 17, 1975, abandoned. This application June 21, 1976, Ser. No. 697,705
Int. Cl.² G10D *13/00*
U.S. Cl. 84—422 S **6 Claims**



1. A drumstick comprising an elongated handle, a rounded striking tip and a reduced diameter neck connecting said tip to said handle characterized in that the drumstick includes two elongated parts secured together to form said tip, neck and handle, each part having a longitudinal groove therein so that a longitudinal bore is provided within said handle, the material forming said tip, neck and at least the portion of said handle adjacent said neck containing graphite fibers.

4,047,461
PIANO KEY BUTTON ALIGNMENT TOOL
Lew Forrest, 21414 DeLaOsa St., Woodland Hills, Calif. 91364
Filed June 18, 1976, Ser. No. 697,379
Int. Cl.² G10G *7/00*
U.S. Cl. 84—458 **5 Claims**



1. A key button alignment tool for precisely locating a key button on a piano key, said key having a finger-tip contact end, a striking end, and an opening intermediate said ends, said fingertip end having a planar side wall which is parallel to the plane of movement of said key when struck;

a key button having a narrow longitudinal slot therein, said key button to be located upon said key over said opening with said slot to be parallel to said plane of movement;

said key button alignment tool comprising:

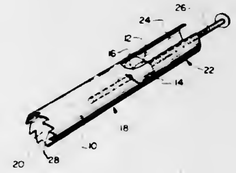
two pair of parallel members pivotally joined to form a parallelogram;

alignment means attached to one of said members, said alignment means being adapted to be placed within said slot and said opening; and

abutment means attached to a second member parallel to said one member, said abutment means being adapted to be placed against said side wall;

whereby when said alignment means is placed within said slot and said opening and said abutment means is placed against said side wall, said slot will be parallel to said side wall.

4,047,462
TOGGLE BOLT
Carl R. Hurtig, Cohasset, Mass., assignor to Encor Limited, Cohasset, Mass.
Filed Mar. 29, 1976, Ser. No. 671,411
Int. Cl.² F16B *21/02*
U.S. Cl. 85—3 R **6 Claims**



1. A toggle bolt comprising:

a generally tubular sleeve having on an end thereof a toothed cutting configuration suitable for cutting a circular opening through a wall to which the toggle bolt is to be mounted;

an internally threaded collar pivotally mounted in said sleeve at a position along the longitudinal axis of the sleeve providing a heavier portion between said collar and one end and a lighter portion between said collar and the opposite end of said sleeve;

a slot provided in the wall of said sleeve extending longitudinally between said collar and said opposite end;

a threaded bolt threadably mated with the collar and having a diameter less than the width of the slot and operative to pass through said slot into longitudinal generally coaxial alignment with said sleeve; and

an opening through the wall of said sleeve confronting said collar permitting threading of said bolt through said collar and passage through said opening into generally transverse position with respect to the longitudinal axis of said sleeve;

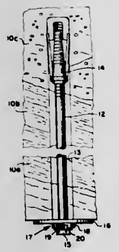
said threaded bolt being operative in a first position with the bolt extending transversely through the sleeve to provide first and second outwardly extending handles for manual rotation or reciprocation of said sleeve to cause said cutting configuration to cut a circular mounting opening through a wall, and after cutting of the mounting opening by said cutting configuration to be threaded out of said sleeve wall opening and pivoted through said slot into a second position in longitudinal generally coaxial alignment with said sleeve and operative to push said sleeve through the mounting opening in said wall.

4,047,463

TENSION INDICATOR

Chester P. Coldren, Canton, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed July 23, 1976, Ser. No. 708,446
Int. Cl.² F16B *31/02*
U.S. Cl. 85—62 **11 Claims**



1. A one-piece mechanical device for visually indicating if tension in a monitored bolt is within a predetermined range, said device comprising:

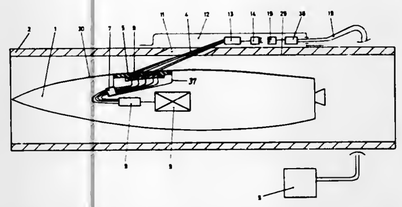
a substantially helical spring washer for insertion inbetween the head of the monitored bolt and the surface against which the bolt head exerts a force, said washer having opposed bearing surfaces and having free ends which are opposed but axially spaced apart when the washer is in an uncompressed state, said washer of a spring constant such that the washer will resiliently axially compress over a range of compressive forces exerted thereon equal to the predetermined range of tension in the monitored bolt, the axially extended outer circumferential wall of the washer being of a substantially constant thickness throughout the entire circumference thereof and being of a greater axial extension than the remainder of the washer, the free ends of the outer circumferential walls of the washer carrying indicia marks thereon which are spaced from and substantially centrally located between said opposed bearing surfaces and which will be substantially axially aligned upon the application of an axial compressive force to the washer equal to a tensile force within the given range.

4,047,464

UMBILICAL CORD BREAKER

Lars Evert Fredriksson, Vreta Kloster; Gunnar Jacobson, and Olof Bertil Olsson, both of Karlskoga, all of Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Jan. 29, 1976, Ser. No. 653,325
Claims priority, application Sweden, Feb. 19, 1975, 7501822
Int. Cl.² H01R *13/62*; F41F *3/04*
U.S. Cl. 89—1.811 **15 Claims**



1. Apparatus for breaking a plurality of continuous, flexible electrical conductors which connect a missile having an outer wall to a missile container, during launch of said missile from said container, comprising:

first means for securing one end of each of said continuous, flexible conductors in said missile container;

second means spaced from said first means for securing the other end of each of said continuous flexible conductors in said missile, so that said continuous flexible conductors extend across an open annulus separating said missile from said missile container;

an insert of electrically non-conductive material mounted in said outer wall of said missile and spaced from said container with said continuous flexible conductors extending through said annulus;

a plurality of holes, each having a diameter larger than the diameter of at least one of said continuous flexible conductors, extending through said insert through each of which holes at least one of said continuous, flexible conductors is passed from said first to said second securing means, each of said holes having an exterior outlet opening with an edge located at or below the outer surface of said outer wall, said at least one conductor being movable across said opening into contact with said edge, over which edge said at least one continuous, flexible conductor is bent as said continuous, flexible electrical conductors are tensioned between said first and second securing means when said missile moves out of said container during launch;

whereby during launch the tensile stresses in each continuous, flexible conductor are combined with the bending stress in each continuous, flexible conductor at the point where said conductor is bent over said edge, thereby producing a concentration of stress at said point sufficient to break said conductors at said point and thus to provide said missile with a smooth outer surface without conductor ends extending beyond said surface following breaking of said conductors.

4,047,465

TELESCOPED EXPLOSIVE DRIVER

William P. Wohlford, Bettendorf, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 23, 1976, Ser. No. 708,163
Int. Cl.² F41F *1/00*
U.S. Cl. 89—8 **5 Claims**

1. A telescoped explosive driver comprising:

a central gas cylinder,

an annular gas cylinder telescoped over and spaced from said central gas cylinder,

an annular propellant filled cylinder surrounding said central gas cylinder and positioned within said annular gas cylinder,

said driver having a projectile at one end and propellant detonating means at the other,



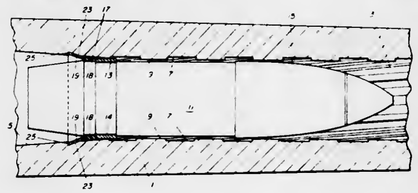
said propellant cylinder upon detonation expanding into and thereby compressing said gas cylinders and thereby ejecting said projectile upon expansion thereof.

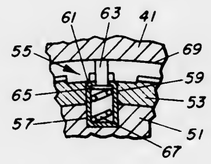
4,047,466

PROJECTILE FALL-BACK PREVENTION MEANS

Allen Berman, Dover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 29, 1976, Ser. No. 709,837
Int. Cl.² F42B *31/00*
U.S. Cl. 89—14 R **9 Claims**





1. In a breech-loading gun that is loaded by first ramming a projectile into the gun barrel to a firing position therein and then inserting a separate propelling charge behind the projectile, means for preventing unlimited fall-back of said projectile from said firing position, comprising:

at least one fixed forwardly-facing internal locking shoulder on said barrel;

at least one movable rearwardly-facing external locking shoulder on said projectile; said projectile shoulder being located forwardly of said barrel shoulder when said projectile is in said firing position; and

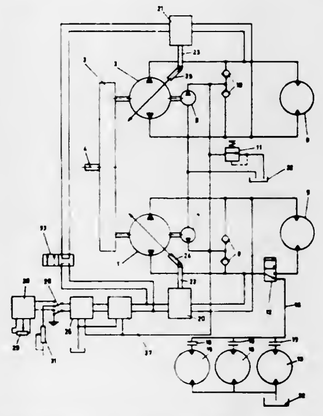
resilient means for moving said projectile shoulder into abutting relation with said barrel shoulder in the event of rearward movement of said projectile from said firing position.

4,047,467

DEVICE FOR GENERATING OIL PRESSURE FOR AN ARTILLERY PIECE OR A CORRESPONDING UNIT

Lars Olof Landin, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Dec. 5, 1975, Ser. No. 638,223
Claims priority, application Sweden, Dec. 18, 1974, 7415879
Int. Cl.² F41G *5/04*
U.S. Cl. 89—41 H **7 Claims**



1. Apparatus for producing a flow of pressurized oil for selective operation of the weapon on a self-propelled artillery piece of the type having a plurality of driven wheels and at least one hydrostatic transmission for driving said wheels during self-propulsion, said at least one hydrostatic transmission comprising a variable displacement hydraulic pump and a hydraulic motor driven by flow from said pump, comprising:

means for selectively diverting the output flow of the variable displacement pump included in said at least one hydrostatic transmission from its associated hydraulic motor, to provide a flow of pressurized oil for operating said weapon; and

means responsive to said flow of pressurized oil for controlling loading, aiming, firing and related functions of said weapon.

4,047,468

STRAND MILLING METHOD

Heribert A. Krall, Wurzburg, and Helmut Maag, Hochberg, both of Germany, assignors to Technica-Guss GmbH, Wurzburg, Germany

Filed Jan. 14, 1975, Ser. No. 540,766
Claims priority, application Germany, Jan. 15, 1974, 2401732
Int. Cl.² B23C *3/13*
U.S. Cl. 90—11 C **3 Claims**

1. A method of milling a plurality of strands each drawn intermittently from a continuous casting machine, said strands passing through a displaceable milling machine, said milling machine having a pair of feed rolls engaging the upper and lower surfaces of a first of said strands, milling tools engaging the surfaces to be milled of all of said strands, and control means for regulating the direction and speed of rotation of said feed rolls, said method comprising the steps of:

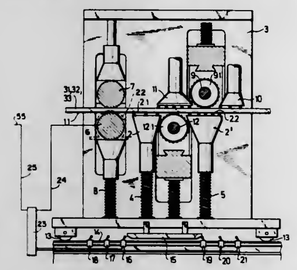
actuating said feed rolls to rotate said rolls in a forward

direction to advance said milling machine toward said casting machine for milling the surfaces of said strands;

drawing said first strand a selected distance from said casting machine, said milling machine being carried away from said casting machine by said strand due to the engagement of said feed rolls with said first strand;

ceasing drawing of said first strand, said milling machine advancing toward said casting machine for continued milling of said strands;

actuating said feed rolls to rotate said rolls in a reverse direction along said first strand to withdraw said milling



machine from said casting machine prior to drawing of a second of said plurality of strands to move said milling machine away from said casting machine a distance greater than the draw to be made of said second strand;

drawing said second strand a selected distance; and

actuating said feed rolls to rotate said rolls in a forward direction along said first strand toward said casting machine upon completion of said drawing of said second strand to advance said milling machine toward said casting machine for continued milling of said strands, whereby said selected distance of draw of said second strand is milled.

4,047,469

METHOD FOR SUPPRESSING CHATTER VIBRATIONS IN A MACHINE TOOL

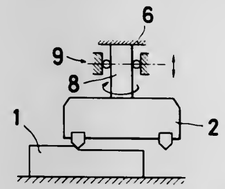
Okitsugu Sakata, Tokyo, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Nov. 5, 1975, Ser. No. 629,066

Claims priority, application Japan, Nov. 5, 1974, 49-126682

Int. Cl.² B23Q *11/00*

U.S. Cl. 90—11 C **6 Claims**



3. In a method of machining a workpiece in which a tool has a first portion secured to a support, an intermediate portion freely projecting from said support in a predetermined direction, and a terminal portion connected to said first portion by said intermediate portion, said terminal portion engages a workpiece and removes material from said workpiece during relative movement of said tool and of said workpiece, whereby vibration may be induced in said tool, the improvement which comprises:

a. holding an inert mass in contact with said intermediate portion under a force applied in a direction transverse to said predetermined direction; and

b. continuously shifting the contact of said mass with said intermediate portion in said predetermined direction during said relative movement, said applied force being sufficient to impede said vibration.

4,047,470

MACHINE FOR WORKING METAL SURFACE

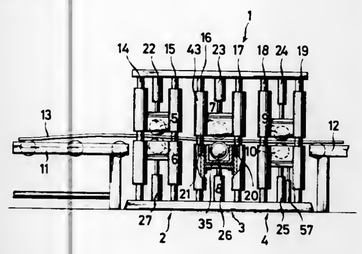
Horst Lorenz, Solingen; Rolf Eckart Koch, Witzhelden, and Reiner Kahlhofer, Wuppertal-Barmen, all of Germany, assignors to Th. Kieserling & Albrecht, Solingen, Germany

Filed Oct. 8, 1975, Ser. No. 620,776

Claims priority, application Germany, Oct. 10, 1974, 2448360

Int. Cl.² B23C *3/13*

U.S. Cl. 90—15 R **18 Claims**



1. Apparatus for working on the surface of an elongated generally flat rigid workpiece passing therethrough in a predetermined direction along a path comprising; at least one station having opposed generally cylindrical tools for engaging opposite generally flat irregular sides of a workpiece, said tools having tool axes extending generally perpendicular to said path, mounting means mounting said tools for automatic movement of said axes thereof toward and away from said path and for automatic tilting movement of said axes relative to said path with said tilting movement being generally in a plane extending generally perpendicular to said path, and said mounting means including yieldable biasing means yieldably biasing said tools toward said path, whereby said tools automatically follow the sides of the workpiece even though such sides are irregular due to curves, twists, and dimensional and shape variations in the workpiece.

4,047,471

LOCKING MEANS FOR PISTON PIN

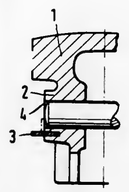
Wolfgang-Hermann Noack, Heilbronn, Germany, assignor to Karl Schmidt GmbH, Neckarsulm, Germany

Filed Feb. 9, 1976, Ser. No. 656,667

Claims priority, application Germany, Mar. 27, 1975, 2513579

Int. Cl.² F16J *1/18*

U.S. Cl. 92—187 **2 Claims**



1. In a piston having bosses with openings and a piston pin loosely mounted in the bosses and wherein the piston has a larger outside diameter than the external distance between the bosses, comprising: at least one locking pin means for each boss opening for securing the piston pin in the bosses, said locking pin means being fabricated from a bendable material and having one arm cast embedded into the external surface of the boss and extending substantially parallel to the axis of the boss opening and another arm connected to said one arm and having a length greater than the distance of the one arm to the boss opening and bent to extend before the opening of the boss to block axial movement of the piston pin.

4,047,472

APPARATUS FOR OPTICALLY MARKING PREDETERMINED POSITIONS IN A STACK OF DOCUMENTS

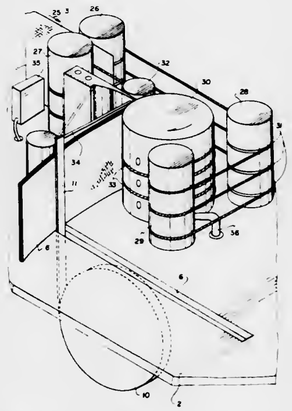
Markus Haberstroh, Munich, Germany, assignor to G.A.O. Gesellschaft fur Automation und Organisation mbH, Germany

Continuation-in-part of Ser. No. 527,763, Nov. 27, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 665,701

Claims priority, application Austria, Dec. 12, 1973, 10379/73

Int. Cl.² B31B *1/98*

U.S. Cl. 93—93 D **7 Claims**



1. In apparatus for optically marking predetermined positions in a stack of documents, such as for subdividing a stack of documents, during the stacking operation, with the aid of mechanical means which, in response to control signals, can be mechanically introduced into the stack of documents between two successive documents, the improvement comprising, in combination, a horizontally oriented stacking table arranged to support a stack of vertically oriented documents stacked on edge thereon; a vertically oriented support movable horizontally relative to said stacking table and arranged to support the stack of documents stacked on edge on said stacking table; conveyor means operable to feed vertically oriented documents successively to said stacking table for forming a stack of vertically oriented documents stacked on edge on said stacking table and supported by said support in a vertically oriented condition; at least one elongated slot formed in said stacking table and extending perpendicularly to the stack of documents; at least one rotatable disc disposed beneath said stacking table in alignment with a slot therein, the plane of rotation of each rotatable disc being perpendicular to the stack of documents; and at least one flexible narrow strip, forming a separating finger, secured to the circumference of each rotatable disc and, when the disc is in a starting position, extending tangentially away from the associated rotatable disc beneath said stacking table; each flexible narrow strip, when the associated rotatable disc is turned through a predetermined angle from its starting position extending vertically through the associated slot of the stacking table and engaging against the last document added to the stack and, responsive to rotation of the associated rotatable disc through a further angle in the same direction, slipping out through the associated slot again.

4,047,473

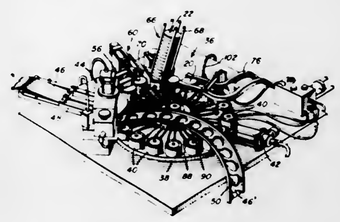
ASSEMBLY SYSTEM FOR CONTAINER FLEXIBLE END CLOSURES

Wade D. Fletcher, and E. Riley Rowe, both of Hartsville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed June 11, 1975, Ser. No. 586,011

Int. Cl.² B31B *1/90*

U.S. Cl. 93—36 B **15 Claims**



1. A method of forming a closure for mounting as a unit over the open end of a container, said method comprising the steps of forming a sealing membrane and releasably engaging an overcap over the membrane in a manner so as to releasably secure the membrane within the confines of the overcap, the forming of the sealing membrane including the steps of forming an integral outwardly projecting tab on said membrane and folding said tab laterally of the plane of said membrane.

4,047,474

APPARATUS FOR SEPARATING AND STACKING BLANKS OF A DIE CUT SHEET

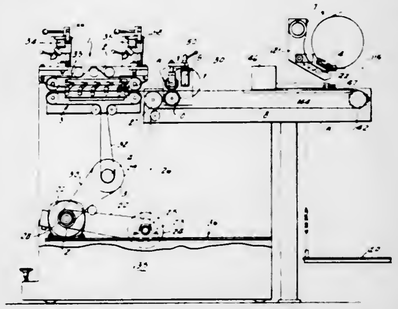
Pierre Lang, Ecublens, Switzerland, assignor to J. Bobst & Fils S.A., Switzerland

Filed Sept. 11, 1975, Ser. No. 612,572

Claims priority, application Switzerland, Oct. 2, 1974, 013249/74

Int. Cl.² B31B *1/12, 1/98*

U.S. Cl. 93—36 A **9 Claims**



1. An apparatus for separating a plurality of interconnected blanks formed in at least one row in a sheet and for stacking the separated blanks in a plurality of designated stacks, comprising an input means for receiving the sheet with each row of blanks extending parallel to the direction of movement of the sheet in the input means, separating means arranged to receive a sheet from the input means and to separate the blanks into a flow of

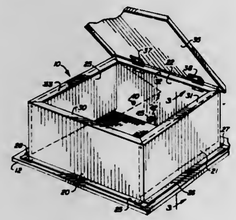
spaced blanks with the blanks of each row moving in a path one after another, and stacking means for depositing the separate blanks in designated stacks including a frame, means mounted on the frame for supporting each of the designated stacks and including means for receiving a separate designated stack for each of the blanks in a row of the sheet, suction means for each row of blanks mounted on the frame above the support means for engaging an upper surface of each of the blanks of the row and transporting each of the engaged blanks to a position above the means for receiving for its designated stack on the support means, and means for releasing the blank from the suction means to cause the depositing of each blank onto its designated stack, said means for releasing comprising a peeling member mounted for pivotable movement at each of said designated stacks, and means for simultaneously pivoting each of the peeling members from a first position withdrawn from the path of a blank being transported on the suction means and a second position extending across the path of the blank at an angle so that all of the blanks are simultaneously peeled from the suction means and deposited into their respective stacks.

4,047,475

VENTILATING DAMPER ASSEMBLY

Howard W. Cox, Tempe, Ariz., assignor to Mission Marketing Corporation of Arizona, Phoenix, Ariz.

Filed Aug. 2, 1976, Ser. No. 710,920
Int. Cl.² F04D *25/08, 25/14;* F24F *7/00, 13/00*
U.S. Cl. 98—116 **7 Claims**



1. A ventilating damper assembly including, in combination:
a ventilating ceiling duct having upper and lower open ends;
first normally-closed pressure-opened damper means for closing said duct, said damper means located to open in response to air flow from the lower to upper end of said duct and biased to normally close said duct to prevent backdrafts into said duct from the upper to lower end thereof;
abutment flange means located in said duct and extending into the space defined by said duct; and
normally-open temperature-responsive anti-draft damper means in said duct and closed against said abutment flange means in response to temperatures above a predetermined temperature to close said duct irrespective of the position of said first damper means.

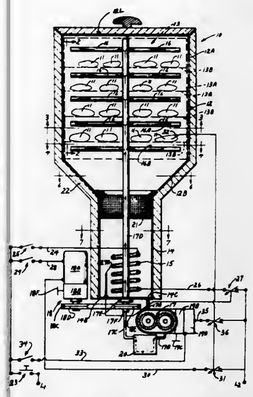
4,047,476

APPARATUS FOR COOKING FOOD ARTICLES

Beano E. Liebermann, 2805 Lime Kiln Lane, Louisville, Ky. 40222

Filed July 21, 1976, Ser. No. 707,318
Int. Cl.² A47J *27/00, 27/52*
U.S. Cl. 99—325 **10 Claims**

1. Apparatus for cooking food articles, comprising:
a. a chamber;
b. support means for locating food articles within said chamber with substantially all of their exterior surfaces being exposed;
c. sump means having an inlet fluid-connected to said chamber for containing a liquid cooking medium.
d. heater means for heating the liquid cooking medium contained in said sump means;
e. first sprayer means located within said chamber adjacent to a first side of said suppot means;
f. second sprayer means located within said chamber adjacent to a second side of said support means that is opposite from said first side and being aligned in a common plane with said first sprayer means; and
g. pump means fluid-connected to said sump means and to both of said sprayer means to admit to said chamber, through both of said sprayer means and onto the food articles supported therein, a pressurized spray of liquid



cooking medium in a pressure range between 10 and 70 p.s.i.g. that has been heated by said heater means but has not received any latent heat of vaporization therefrom so as to cause food articles supported on said support means to be clamped between the pressurized sprays respectively discharged by said first and second sprayer means and to be cooked thereby without being immersed therein,
h. said sprayer means and said support means being movable relative to one another and drive means being provided for causing relative movement therebetween with said first sprayer means and said second sprayer means continuing to remain aligned in a common plane with one another.

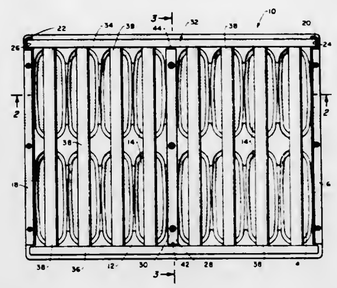
4,047,477

HOT DOG BUN BAKING PAN

Julius B. Berke, 21205 Saticoy St., Apt. 10, Canoga Park, Calif. 91304

Filed Oct. 17, 1975, Ser. No. 619,598
Int. Cl.² A21B *5/02*
U.S. Cl. 99—428 **2 Claims**

1. A hot dog bun baking pan comprising:
a substantially flat plane base including upstanding side wall members secured to said base, whereby said upstanding side walls prevent the dough during baking from moving exteriorly of said base, and, said base being divided into a plurality of dough receiving sections;
an overlying member removably connectable to said base, said member having a pair of transverse sides which are interconnected by a plurality of elongated oval shaped rods, said member adapted to be placed upon said base with one of said rods to extend centrally through each said dough receiving section, whereby with dough placed within each dough receiving section and said member placed upon said base during the baking operation the dough will conform around its respective said rod resulting in the forming of a hot dog bun with an elongated hot dog receiving recess detachable connecting means between said member and said base to secure said overlying member to said base and, positioning means attached to said base, said positioning means to connect with said member to locate said member at a particular location upon said base, said positioning means comprising a pair of spaced apart U-shaped upright guide members both located directly adjacent the periphery of said base, each
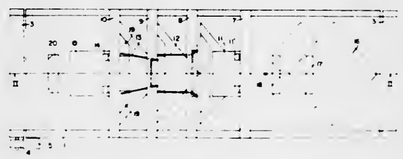


said guide member having a longitudinal groove therein with said grooves facing each other, each end of one of said transverse sides is to cooperate within a said longitudinal groove, each said elongated rods being oval shaped in cross section with the longest axis of the rod being located perpendicular to the plane of said base, whereby a deeper recess is formed within the formed hot dog bun which permits the bun to more readily hold the hot dog.

4,047,478

APPARATUS FOR THE PRODUCTION OF ROLLED FOOD PRODUCTS

Erik Trostmann, Birkerod, and Ove Albertsen, Lyngby, both of Denmark, assignors to Dansk Styreteknik A/S, Denmark

Filed June 19, 1975, Ser. No. 588,319
Claims priority, application Denmark, June 24, 1974, 3381/74
Int. Cl.² A23P *1/00;* A21C *11/00*
U.S. Cl. 99—450.1 **9 Claims**



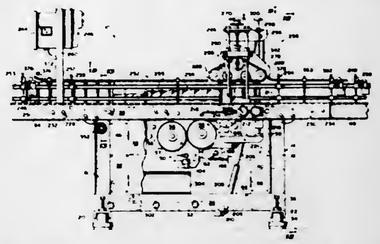
1. An apparatus for producing rolled food products comprising a support for supporting a flat wrap and a filler substance placed atop the flat wrap, means for successively folding the front portion and the opposite side portions of the wrap onto the filler substance and means for rolling the folded wrap with its filler substance towards the rear edge of said wrap, the means for successively folding the front and opposite side portions of the wrap onto the filler substance comprises means for generating a pressure differential across said portions, the pressure above said portions being less than the pressure below said portions.

4,047,479

HIGH SPEED ARTICLE CODING MACHINE

James G. McKay, deceased, late of Skokie, Ill., by Allen J. McKay, executor, Palatine, Ill., assignors to Kiwi Coders Corporation, Chicago, Ill.

Filed Apr. 28, 1975, Ser. No. 571,906
Int. Cl.² B41F *17/00*
U.S. Cl. 101—36 **29 Claims**



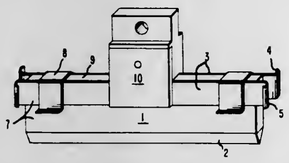
1. A high speed coding machine for applying a code imprint consecutively to individual articles moving in a line along the upper reach of conveyor means along a path of movement to an imprinting zone arranged positioned along said path, the imprinting zone having an imprinting location, said coding machine comprising:
framework means for supporting the operating components of said machine;
feed means for introducing articles individually at regularly spaced intervals traveling to the imprinting zone at a speed correlated with the speed of the conveyor means;
drive means, including a single source of power, operably connected to the operating components of said machine;
hold-down means arranged along the path of movement of said articles at the imprinting zone for applying a positive force to said articles at least during the imprinting thereof; and
a rotary inking and imprinting assembly including a train of rotary wheel members arranged aligned with their circumferential surfaces respectively in tangential engagement, support means for drivably mounting said train of wheel members, a source of liquid ink, a driven rotary ink applicator arm having a free end traversing a generally circular path through said ink source and effecting momentary contact with the circumferential surface of one of the train of wheel members to apply ink thereto for successive transfer to the other members of said train and another one of said train of wheel members carrying a plurality of printing heads and comprising an imprinting wheel, each of said heads carrying type font adapted to receive ink thereon for applying said imprint, said imprinting wheel arranged to circumscribe a rotational path of movement for the type font to place same consecutively to intercept the article at the imprinting location simultaneously with the appearance of the article thereat, the speed of circumferential rotation of the imprinting wheel being correlated with the speed of the conveyor and the number of printing heads carried by the imprinting wheel, each of said train members having a differential circumferential speed of rotation one relatve to the other whereby incrementally to change the point of contact of adjacent train members with each circumferential revolution thereof whereby uniformly to apply and spread the ink upon the circumferential surface of said respective train members and there are means coupled between said drive means and said applicator arm variably controlling the speed of rotation of said applicator arm at a rate from zero to and including the maximum rate of speed of said train of wheel members.

4,047,480

LONGITUDINALLY FLEXIBLE SQUEEGEE AND MOUNTING STRIPS THEREFOR

Eastathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 30, 1976, Ser. No. 710,103
Int. Cl.² B41F *15/44*
U.S. Cl. 101—123 **3 Claims**



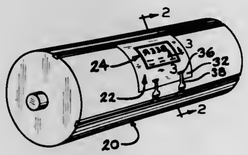
1. A squeegee comprising a flexible bladé positioned between and projecting downwardly from two flat resilient support strips of about equal length which lie in register and whose flat sides lie in parallel planes, the strips projecting beyond the ends of the blade, to form a blade/strip assembly; a plurality of short channel bars positioned astride the assembly, snugly fitting and so spaced along its top edge that at least one bar is on each side of the assembly's longitudinal center, one side of each bar being immovably attached to one support strip but not the other;
and
means for mounting the assembly.

4,047,481

APPARATUS FOR PRINTING INDICIA ON CORRUGATED BOARD AND THE LIKE

Philip G. Saunders, Toledo, Ohio, assignor to Container Graphics Corporation, Toledo, Ohio

Filed Mar. 1, 1976, Ser. No. 662,561
Int. Cl.² B41F *27/12*
U.S. Cl. 101—376 **7 Claims**



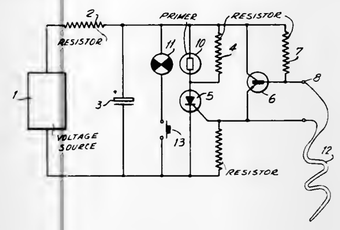
1. Apparatus for printing indicia on corrugated board comprising a printing plate cylinder having at least two mounting flanges thereon, and a printing assembly, said printing assembly consisting of a mounting sheet of dimensionally-stable, solid, calendered, rigid, polyvinyl chloride sheeting having a uniform thickness, said mounting sheet having a structurally integral lip formed on one edge thereof and engaging one of said cylinder flanges, the opposite edge of said mounting sheet having openings therein, mounting straps received in said openings and engaging another of said cylinder flanges, a printing plate comprising a layer of a resilient material with printing surfaces thereon and recesses between the printing surfaces, and a dimensionally-stable sheet affixed to said layer in a location spaced from said printing surfaces and said recesses, an adhesive layer affixing said printing plate to said mounting sheet in a predetermined position, said printing surfaces being on the side of the printing plate opposite said dimensionally-stable sheet, and a resilient and compressible pad affixed to the side of said mounting sheet opposite said printing plate, being of a size at least equal to the size of said printing plate, and also being located between said mounting sheet and said printing plate cylinder.

4,047,482

ELECTRONIC IGNITER CIRCUIT FOR DETONATING AN ELECTRIC PRIMER

Jean Kervizic, Versailles; Claude Deslandes, Saint-Mande, and Alain Berson, St-Germain en Laye, all of France, assignors to Etat Francais, Paris, France

Filed Oct. 14, 1975, Ser. No. 622,395
Claims priority, application France, Oct. 11, 1974, 7434198
Int. Cl.² F42B *23/26, 3/10, 19/12*
U.S. Cl. 102—19.2 **5 Claims**



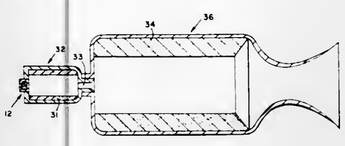
1. In an electronic igniter adapted to detonate a pyrotechnical charge by the rupture of a tripping wire comprising a direct current source, a first resistor connected to one terminal of said source, a primer, a condensor, said primer and condensor being connected in parallel to said source, and semi-conductor control means connected to the tripping wire and to said primer to detonate the latter when the tripping wire is ruptured, an improvement comprising control means for checking the functional integrity of the igniter, said control means including a voltage sensor connected in parallel to said condensor and to said primer, switch means connected in series with the voltage sensor, and an adaptation element connected to said voltage sensor as a unit assembly.

4,047,483

INITIATOR FOR USE IN LASER BEAM IGNITION OF SOLID PROPELLANTS

Nathan P. Williams, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 24, 1976, Ser. No. 670,012
Int. Cl.² F23Q *13/00*
U.S. Cl. 102—70.2 A **2 Claims**



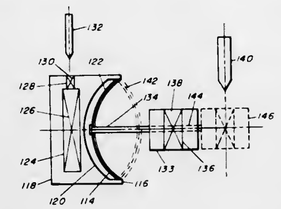
1. In a laser activated initiator for igniting solid propellants having a tubular container, a transparent window secured to said container at the rim of said container, a pyrotechnic pellet housed in said container, said pellet having a surface on which combustion is initiated, and a laser beam which shines through said transparent window onto said surface of said pyrotechnic pellet, the improvement: wherein said pellet has a flat side opposite said surface and said surface of said pellet is concave and generally conical ending in a tip with the tip being adjacent said flat side and separated therefrom by a thin web of pyrotechnic material forming a breakaway/burn section, whereby rays of said laser beam striking said surface tend to be reflected off of said surface wall toward the tip of said surface, the energy from said laser beam thus being concentrated at said tip and insuring ignition of said pellet on or near the top of said surface.

4,047,484

FUZE WITH BIMETALLIC SPRING DELAY MODULE

Lewis C. Cole, Chester, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 29, 1976, Ser. No. 700,993
Int. Cl.² F42C *15/34*
U.S. Cl. 102—76 P **2 Claims**



1. A fuze providing delay arming and impact functioning of a munition, which comprises
a bimetallic spring delay module comprising
a bimetallic spring, and
a pyrotechnic charge for heating said spring, said spring being capable of inverting from a first stable position to a second stable position by heat from the pyrotechnic charge and of reverting to said first position by cooling,
a detonator,
a firing pin driven by impact of the fuze with a solid target, and
a safing and arming means attached to said bimetallic spring for preventing contact of the firing pin with the detonator when the spring is in said first position, and for permitting contact of the firing pin with the detonator when the spring is in said second position;
whereby ignition of the pyrotechnic charge causes the bimetallic spring to be heated and to invert from said first position, wherein the fuze is in an unarmed condition, to said second position, wherein the fuze is in an armed condition permitting the firing pin to strike the detonator by impact of the fuze on a solid target and the fuze, if not activated by impact while in the armed condition, is returned to the unarmed condition by reversion of said bimetallic spring on cooling.

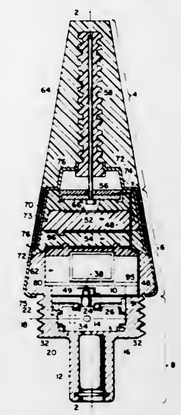
4,047,485

COMPACT ELECTRICAL FUZE

Edgar John Abt, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 24, 1975, Ser. No. 644,212
Int. Cl.² F42C *15/26*
U.S. Cl. 102—80 **5 Claims**

1. A compact electrical fuze for a projectile having a flight path axis, being subject to centrifugal and setback forces thereon, the fuze including a lead charge having a major axis, detonator means, booster charge means, and safing and arming means, said safing and arming means comprising:
a plurality of drive balls;
barrel means having an axis of rotation being normal to the flight path of the fuze and projectile, said barrel means being located between said detonator means and said booster charge means, said detonator means and said booster charge means being located nominally on the flight path axis, said barrel means containing said lead charge, said barrel means being supported by a trunion mount at each extremity thereof for rotation of said barrel means about said normal axis, said barrel means having a plurality of slots on a surface thereof for containing a first portion of each of said plurality of drive balls; and
cavity means for mounting said barrel means for rotation about said normal axis, said cavity means having a plurality of cooperating slots on an inner surface thereof for containing a second plurality of each of said plurality of drive balls in cooperation with said plurality of slots on said surface of said barrel means, said slots on said barrel means and said slots on said cavity means inner surface being mutually shaped for providing rotation of said barrel means in response to the centrifugal forces on said plurality of drive balls and said barrel means, said shaped slots being formed to allow no more than one of said plurality of drive balls to exert a rotational force on said barrel means at any given time.

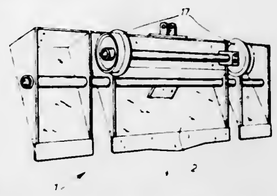


4,047,486

EXCAVATOR BLADE FOR REPLACING RAILROAD SLEEPERS

Melvin Pabsdorff, Hamar, Norway, assignor to A/S Hymas, Brumunddal, Norway

Filed July 21, 1975, Ser. No. 597,948
Int. Cl.² E01B *27/02, 29/06*
U.S. Cl. 104—9 **1 Claim**



1. A blade for use with an excavator having a mobile, power-operated, articulated arm and hydraulic means acting in conjunction with the articulated arm, the blade having particular utility in replacing sleepers secured in the foundation ballast of a railroad track, comprising:
a plate including a primary working surface and a reverse surface, said plate having a width at least equal to the width of said replacing sleepers and a depth substantially greater than the distance from the top of the track to the bottom of the foundation, said plate having a pair of re-

cesses symmetrically spaced across the width of one edge thereof, the recesses having a center distance corresponding to the gauge of the track, a width for clearance of the track and a depth at least as large as the sum of the construction height of the rail of the track and the sleeper, said one edge constituting the working edge of the plate;

wearing steel means mounted on said working edge of the plate;

first lug means mounted on said plate proximate the edge opposite said working edge and adjacent said working surface for rotatably securing said blade to said articulated arm;

second lug means aligned with said first lug means and spaced therefrom for securing said blade to the hydraulic means for swinging the blade;

said first and second lug means cooperating respectively with said articulated arm and said hydraulic means at least for actuating the blade for displacing the ballast and replacing the same ballast of said foundation during replacing of said sleepers, and

a pair of flanged wheel means mounted on the reverse surface of the plate for supporting one end of said excavator through said articulated arm and for guiding said excavator along said track.

4,047,487

TOWING MECHANISM FOR A SKI LIFT

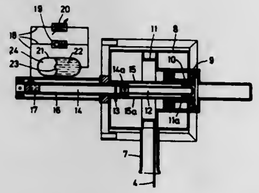
Samuel G. Wyss, Sporthaus, 3801 Kleine Scheidegg, Bern, Switzerland

Filed Aug. 10, 1976, Ser. No. 713,111

Claims priority, application Switzerland, Aug. 22, 1975, 10930/75

Int. Cl.² B61B *11/00*

U.S. Cl. 104—173 ST **3 Claims**



1. A towing mechanism for a ski lift having a hauling cable, of the type comprising a tow rope secured to a towing bar, a pay-out and take-up device enabling said tow rope to be pulled out and retracted, a suspension bar for connecting said device to said cable, and return means for counteracting pay-out traction on said tow rope, wherein said pay-out and take-up device comprises:

a housing,

a luffing drum non-displaceably mounted for rotation within said housing,

a nut rigidly secured to said rope-drum,

a screw-spindle non-rotatingly mounted for longitudinal displacement within said housing, said nut and said screw-spindle together forming a non-self-locking screw gear, and

a hydraulic-pneumatic device including a piston rigidly secured to said screw-spindle for returning said screw-spindle after longitudinal displacement thereof.

4,047,488

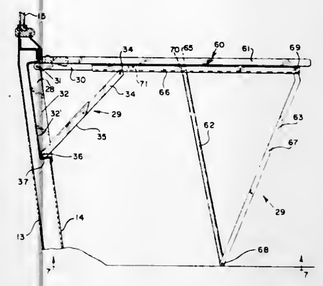
TABLE ARRANGEMENT FOR RAILWAY PASSENGER CAR COMPARTMENTS

Jack E. Gutridge, Dyer; Ronald W. Marsh, Michigan City, both of Ind., and Grant M. Newbury, Shawano, Wis., assignors to Pullman Incorporated, Chicago, Ill.

Filed Sept. 2, 1976, Ser. No. 720,021

Int. Cl.² B61D *1/02*

U.S. Cl. 105—315 **10 Claims**



1. A passenger compartment for a railway car formed by an outer side wall, longitudinally spaced and laterally extending partition walls, and a divider wall extending longitudinally and having a door opening providing access to said compartment,

a passenger seat positioned against each partition wall and extending laterally therewith, the improvement including;

a table arrangement adapted to be positioned in use position between said seats comprising;

a first table supported on said first outer side wall in a flat upright stored position,

means supporting said first table on said outer wall whereby the same may be moved to a horizontal use position,

means releasably locking said table in said use position,

a second table including means releasably connecting the same to one of said walls in an upright stored position,

said second table including a table top having connector means,

said second table being movable to a horizontal use position whereby said connector means engages said first table to connect said tables together with said first table serving as a support means for said second table top, and

said connector means including releasable latch means for releasably locking said tables in said use position.

4,047,489

INTEGRATED PROCESS FOR PREPARING AND FIRING BAGASSE AND THE LIKE FOR STEAM POWER GENERATION

Temple S. Voorheis, Atherton, and James H. White, Palo Alto, both of Calif., assignors to Coen Company, Inc., Burlingame, Calif.

Filed Jan. 7, 1976, Ser. No. 647,029

Int. Cl.² F23G *5/04*

U.S. Cl. 110—15 **7 Claims**

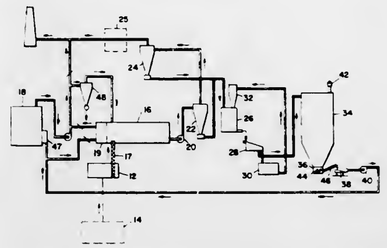
1. An integrated method for preparing and suspension firing bagasse and bagassillo as a primary fuel for heating and steam power generation in a sugar cane refinery which produces bagasse and bagassillo as a wet by-product which comprises the repetitive substantially continuous sequential steps of:

mixing the wet by-product with de-ashed hot flue gases of a bagasse fired suspension burner, thereby driving it and reducing the temperature of the drying flue gases;

separating the by-product dried thereby from the drying flue gases in a primary cyclone collector and directing the flue gases emitted from said primary cyclone collector through a secondary cyclone collector to capture substantially all suspended particulate material preventing its exhaustion into the atmosphere; thereafter

sizing the dried by-product, directing by-product fines up to a maximum pre-selected size to temporary substantially enclosed storage while regrinding and resizing oversized by-product; thereafter

metering out, spacing and pneumatically suspending the by-product fines, for providing a smooth-flowing suspended fuel-air mixture; thereafter



controllably firing the suspended mixture in a suspension type furnace burner to produce a relatively high temperature heat output and a combustion effluent characterized by substantially complete combustion; thereafter

directing the combustion effluent through a cyclone collector to extract substantially all ash from the hot flue gases of the burner; and thereafter

utilizing the resultant flue gases for subsequent drying of further wet by-product.

4,047,490

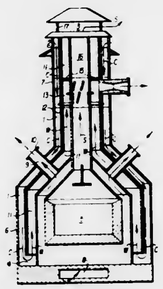
RECUPERATIVE HEATING SYSTEM

Vincent Galluzzo, 8548 Oakleigh Road, Baltimore, Md. 21234

Filed Sept. 7, 1976, Ser. No. 720,671

Int. Cl.² F23L *15/04*

U.S. Cl. 110—56 **5 Claims**



1. A recuperative heating system, comprising:

a. a heat conductive chimney flue;

b. a fuel combustion chamber exhausting hot waste gases and smoke upwardly through said flue;

c. duct means, telescopingly spaced about said flue, defining a fresh air flow path downwardly along the outer of said duct means and upwardly along the inner of said duct means into direct heat exchange relationship with the outer surface of said flue and exhausting outwardly from said inner duct means; and

d. a plurality of conduit means, each having an intermediate heat exchange section within said flue, with the inlet end of each said conduit means opening into said outer duct means and the outlet end of each said conduit means opening into said inner duct means.

4,047,491

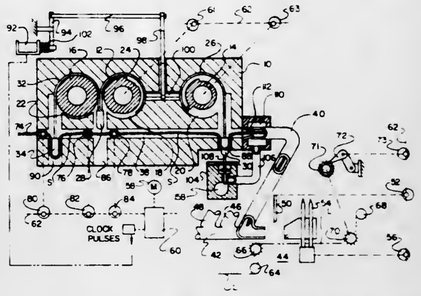
MULTI-COLOR TUFTING MACHINE

Abram N. Spanel, Princeton, N.J.; P. Frank Elland, Stamford, and David R. Jacobs, New Canaan, both of Conn., assignors to Abram N. Spanel, Princeton, N.J.

Filed June 25, 1976, Ser. No. 699,904

Int. Cl.² D05C *15/34*

U.S. Cl. 112—79 A **19 Claims**



1. Tufting apparatus including bit-applying means for applying tufts to a backing layer wherein the improvement comprises a yarn supply system having:

feeding means including yarn displacement metering means;

means for controlling said feeding means including:

an oscillatory feeding shaft;

a flexible feeding band member engageable with said oscillatory feeding shaft, said band member being extendable within a track to prevent unwanted flexing, said track extending to a yarn plunger for engaging yarn; and,

means to cause said feeding band member to engage with said oscillatory feeding shaft enabling said feeding band member to be driven when said feeding shaft oscillates; and,

pneumatic yarn transport means to transport the yarn to said bit-applying means.

4,047,492

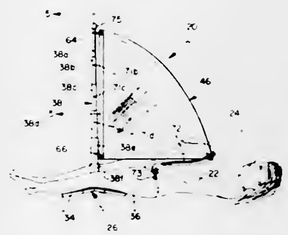
SAILING DEVICE

Marlene J. Brown, 226 Pequot Ave., Mystic, Conn. 06355

Filed Apr. 12, 1976, Ser. No. 676,053

Int. Cl.² B63B *35/00*

U.S. Cl. 114—39 **3 Claims**



1. Apparatus for propelling the body of a person floating in the water comprising:

a floatable support member having a substantially continuous planar surface over which the person's legs are posi-

tioned in the water and having a centrally located bore extending therethrough;

a mast releasably mounted on said member and extending upwardly from said planar surface between the person's legs and achieving a normally upright relationship with the surface of the water only when the person's legs are positioned upon said planar surface, said mast being collapsible and including a plurality of interconnected hollow segments, each successive segment capable of nesting within its larger neighboring segment, and resilient detent means associated with each pair of adjacent segments for maintaining said pair in an extended relationship such that said mast is movable between a fully extended position in which each adjacent pair of neighboring segments assumes an extended relationship, and a fully retracted position in which each segment is nested within its larger neighboring segment, each successive segment further having a pair of holes at diametrically opposite positions;

means mounting said mast on said support member including a stud integral and coaxial with said mast and extending from the base thereof, said stud receivable in and through the bore in said support member, and a fastener threadedly engageable with said stud;

a sail having a head, a tack, and a clew, said head and said tack releasably attached to said mast at spaced apart locations, respectively, and movable in azimuth adjacent the clew by the person about an axis defined by said mast to appropriate positions to catch the wind;

fasteners attached to said sail at said head and said tack and receivable through the pair of holes of said segments at spaced apart locations to thereby releasably attach said sail to said mast; and

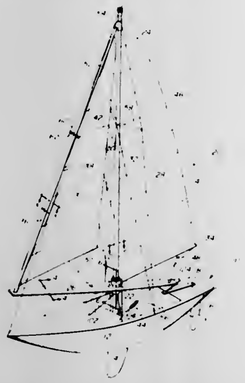
control means attached to said clew for aiding the person in moving said sail in azimuth relative to said mast.

4,047,493

AUTOMATICALLY ROTATABLE SLOOP RIG

Robert L. Menegus, 62 Major St., Clifton, N.J. 07013

Filed Dec. 3, 1976, Ser. No. 747,162
Int. Cl.² B63H *9/04*
U.S. Cl. 114—102 **7 Claims**



1. An automatically rotatable sail rig for a sloop comprising:

a stiff step structure bedded to the hull of said sloop;

an upper main bearing on said step structure having a pair of upper and lower thrust bearings separated by a radial bearing;

a lower bearing on said step structure having a radial bearing;

a single vertical, tubular mast assembly mounted at its foot within said step structure;

said mast assembly supporting a battened cloth mainsail along its luff;

a substantially horizontal carrier boom freely rotatable about the radial bearing of said upper main bearing and hence freely rotatable about the vertical axis of mast assembly; said carrier boom having its angular span of free rotation limited by means of a line attached to the fore end of said carrier boom and attached to the hull along its centerline, said attachments being designed to permit the boat to be operated without adjusting sail sheets and said limiting line when making course changes, such as going about, jibing, changing from any tack to any other tack, and circling repeatedly, by manning only the helm or tiller;

a rotatable, tubular, inclined forespar assembly mounted at its lower extremity on the fore end of said carrier boom and at its upper extremity near the head of said mast assembly;

said forespar supporting a battened cloth jibsail along its luff;

a tubular mainsail boom to accomodate the foot of said mainsail;

the fore end of said mainsail boom being secured to said upper main bearing by a load spreader;

said step structure mounting said mast, said carrier boom, said forespar and said mainsail boom;

a vang to pull a weather-varying tension on the leech of said mainsail;

said vang being made fast at its extremities to said mainsail boom and to the lower bearing of said step structure;

a main sheet between said mainsail boom and said carrier boom to control the angle of said mainsail with respect to said rotatable carrier boom;

a coordinated system of multiple jib sheets made fast to said jib battens to shape the jibsail generally and to control the angle of said jibsail with respect to said carrier boom and to said mainsail;

a forestay set from the masthead to the nose of the hull to resist the horizontal moment of tension imposed on the leech of said mainsail;

a plurality of athwartships shrouds to support said mast assembly;

said forestay and said shrouds being flexibly anchored to said hull to permit free rotation of said spars, sails, vang, sheets, and carrier boom.

4,047,494

MEANS FOR STEERING JET DRIVEN WATER CRAFT

Albert Rockwood Scott, 287 Wychwood Ave., Toronto, Ontario, Canada

Filed Dec. 29, 1975, Ser. No. 644,540
Claims priority, application United Kingdom, Dec. 30, 1974, 55963/74
Int. Cl.² B63H *11/10*
U.S. Cl. 115—12 R **1 Claim**



1. In a water craft propelled by a jet of water discharged from its' stern and having a water outlet means rotatably mounted at the stern of the discharge housing of a water pump means for controlling the deflection of the jet of water to starboard or to port of the stern of said craft, the combination comprising;

a water deflector rotatably mounted beneath said outlet and moveable therewith to direct said jet of water downwardly and forwardly of said craft;

a first gear member fixed to the lower side of said housing and intermeshing with and driving a second gear member fixed to said deflector thereby to allow said deflector to rotate about said outlet; and

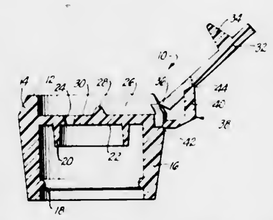
control means for rotating said outlet and said deflector together to provide a cumulative deflection forward of said craft from said deflector to allow water to discharge at an angle of at least 90° to the course of travel of said craft.

4,047,495

CHILD RESISTANT DISPENSING CLOSURES

Edward D. O'Brian, Anaheim, Calif., assignor to Polytop Corporation, Slatersville, R.I.

Filed May 3, 1976, Ser. No. 682,607
Int. Cl.² B65D *55/02*
U.S. Cl. 215—224 **4 Claims**



1. A container closure having a top with an opening extending therethrough, means for mounting said top on a container attached to said top and extending around said opening, hinge means secured to said top, a lid secured to said hinge means so as to be capable of being rotated between a closed position in which the lid overlies the top and covers the opening and an open position in which said opening is exposed in which the improvement comprises:

a recess having a bottom located in said top of said container,

a fulcrum located between said hinge means and said opening extending from the bottom of said recess upwardly into said recess,

said lid fitting within said recess when in its closed position so that said lid cannot be manually engaged to be lifted from said closed position,

overcenter toggle means connecting said lid and said top for controlling the position of said lid so that said lid is held by the action of said toggle means in either said closed or said open position, said toggle means being located adjacent to said hinge means,

said toggle means including a bell crank lever structure having ends, other hinge means pivotally connecting one of said ends of said lever structure to a side portion of said top and further hinge means pivotally connecting the other of said ends of said lever structure to said lid, said lever structure being capable of deflecting as said lid is moved between said open and said closed positions,

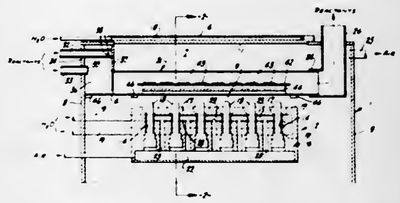
said toggle means being capable of responding to pressure applied vertically against said further hinge means when said lid is in said closed position so as to pivot said lid about said fulcrum to a sufficient extent so that said lid can be engaged to be further moved to said open position.

4,047,496

EPITAXIAL RADIATION HEATED REACTOR

Michael A. McNeilly, and Walter C. Benzing, both of Saratoga, Calif., assignors to Applied Materials, Inc., Palo Alto, Calif.

Continuation of Ser. No. 475,051, May 31, 1974, abandoned, which is a continuation of Ser. No. 195,504, Nov. 3, 1971, abandoned, which is a division of Ser. No. 866,473, Oct. 15, 1969, Pat. No. 3,623,712. This application Aug. 25, 1975, Ser. No. 607,133
The portion of the term of this patent subsequent to Nov. 30, 1988, has been disclaimed.
Int. Cl.² C23C *13/08*
U.S. Cl. 118—49.1 **19 Claims**



1. A cool wall radiation heated reactor for effecting epitaxial and like chemical vapor deposition reactions therein on heated substrates positioned therein and heated thereby, comprising

A. a radiant heat source defined by a bank of a plurality of high intensity radiant heat lamps which together produce and transmit radiant heat energy of short wave length as a generally uniform non-focused radiant energy field,

B. means defining a reaction chamber, for receiving therein the substrates to be coated, positioned adjacent said heat source,

1. at least that portion of a wall of said reaction chamber which is positioned adjacent said heat source being formed from a material which is transparent to heat energy at the wave length produced by said heat source so that such radiant energy is transmitted through said wall without appreciable absorption thereby, whereby said wall remains cool and substantially free of film deposits during operation of said reactor,

C. susceptor means to be heated directly by said field of radiant energy emitted from said heat source, said susceptor means being positioned within said reaction chamber for supporting said substrates directly thereon in direct contact therewith during operation of said reactor,

1. said susceptor means including a susceptor body formed from a material which is generally opaque to said radiant energy and which absorbs the same and is generally uniformly heated thereby,

2. said susceptor body being positioned directly in line with said energy field emitted by said heat source for direct heating thereby over its full extent,

3. said susceptor body in turn uniformly heating and maintaining the temperature of said substrate substantially constant during operation of said reactor, and

D. conduit means for introducing gaseous reactants into said reaction chamber and for withdrawing spent reaction gases therefrom.

4,047,497

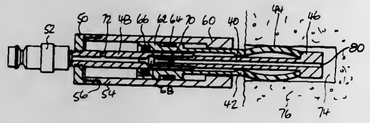
APPARATUS FOR IMPREGNATING CONSTRUCTIONAL ELEMENTS

Johannes Hermanus Grobler, 112 Valley View Road, Crest View, South Africa

Filed Jan. 26, 1976, Ser. No. 652,282
Int. Cl.² B05C *7/00*
U.S. Cl. 118—50 **1 Claim**

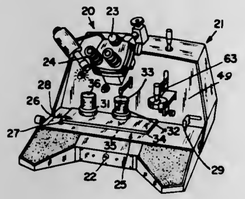
1. Apparatus for impregnating a constructional element with a fluid under pressure, the apparatus being of the type compris-

ing a conduit for conveying the fluid into a hole in the constructional element, a resiliently deformable sealing element, and a piston-and-cylinder assembly arranged to be actuated by the fluid to deform the sealing element to seal the conduit in the hole, a valve arranged to close to prevent the fluid from



flowing through the conduit, means for supplying the piston-and-cylinder assembly with fluid from a point upstream of the valve, and means arranged automatically to close the valve until the pressure of the fluid reaches a higher level than that required to actuate the piston-and-cylinder assembly.

4,047,498
APPARATUS AND METHOD FOR REPEATABLE TRANSFERS OF LIQUID DEPOSITS
Laurier A. Wood, 2 Vose Road, Westford, Mass. 01881
Filed Nov. 21, 1975, Ser. No. 634,048
Int. Cl.² B05C *1/02*
U.S. Cl. 118—243 **10 Claims**



1. Liquid transfer apparatus of the type having a source of coating, an applicator including a plunger movable within a housing and an arm supporting said applicator for movement between said source of coating and a work piece said apparatus characterized by

said source of coating including means for maintaining a layer of controlled, uniform, thickness of viscous coating, and

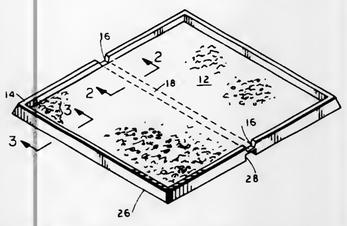
said plunger having a tip projecting beyond said housing adapted to pick up a layer of controlled thickness from said source and stamp said layer on said work piece, and having an enlarged rearward portion captive within, but axially slidable relative to said housing for stamping only with the force of gravity determined by the weight of said plunger.

4,047,499
PET WASTE DISPOSAL DEVICE
George Janecek, 1321 Scoville Ave., Berwyn, Ill. 60402
Filed Apr. 5, 1976, Ser. No. 673,701
Int. Cl.² A01K *29/00*
U.S. Cl. 119—1 **4 Claims**

1. A pet waste disposal device comprising:

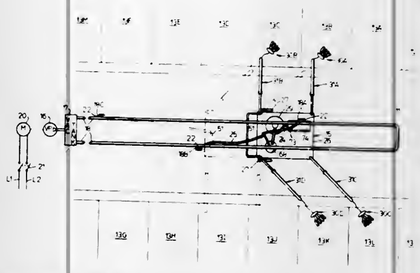
a. A substantially planar base, having a resilient intermediate portion comprising a thinner cross section than the remainder of said base, for receiving waste material from a pet standing thereon during use and foldable about said intermediate portion to form a pouring channel; and

b. A wall disposed about the periphery of said base extending above and below said base to prevent the waste material from escaping and to support the base, wherein said wall has notch means at opposite ends of said intermediate portion above and below said base to enable folding and to



provide an aperture for waste material passing along the pouring channel to exit from the device.

4,047,500
MILKING APPARATUS AND METHOD FOR OPERATING SAME
Lloyd F. Bender, and Rolyn A. Schmid, both of Hayward, Wis., assignors to Bender Machine Works, Inc., Hayward, Wis.
Filed Sept. 23, 1976, Ser. No. 725,785
Int. Cl.² A01J *9/08*
U.S. Cl. 119—14.11 **6 Claims**



1. Milking apparatus comprising:

a vacuum system including a main vacuum line installed along a plurality of milking stalls, a plurality of spaced-apart vacuum ports along said main vacuum line;

first valve means for selectively and independently opening and closing each vacuum port;

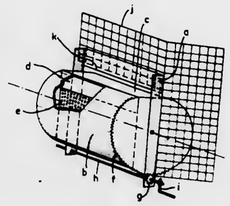
a mobile milking unit selectively movable from one position to another along said main vacuum line and said milking stalls, said unit comprising:

vacuum operated components on said milking unit including a plurality of teat claw assemblies for milking a plurality of cows simultaneously; and

a pair of flexible auxiliary vacuum lines on said milking unit, each auxiliary vacuum line having one end connected to operate all said vacuum operated components, each auxiliary vacuum line having its other end adapted for connection to a vacuum port in said main vacuum line, whereby at least one auxiliary vacuum line is always connected to said main vacuum line to permit continuation of milking as said mobile milking unit is moved from one position to another; and

second valve means in each auxiliary vacuum line operative to close an auxiliary vacuum line whenever it is disconnected from a vacuum port.

4,047,501
DEVICE FOR KEEPING LIVE CHINCHILLA
Gaëtan Guibert, 9 Rue de Montesson, 95870 Bezons, France
Filed Mar. 17, 1976, Ser. No. 667,640
Claims priority, application France, Mar. 17, 1975, 75.08266
Int. Cl.² A01K *13/00*
U.S. Cl. 119—17 **5 Claims**



1. A device for keeping chinchilla adapted to be used in combination with a cage having a horizontal floor containing a chinchilla or similar animal, comprising a cylindrical container closed at its two ends by two respective side walls, and rotatably mounted with its axis in a horizontal position, said axis being substantially located in the plane defined by one of the sides of the cage and said container closing said side of the cage, said container having a peripheral wall with a longitudinal opening provided therein for allowing the animal to enter the container, and a longitudinal inner wall parallel to the axis of the container, said inner wall being connected by one of its longitudinal edges to one of the edges of said longitudinal opening of the container, and by at least a portion of its opposite longitudinal edge to the inner wall of said container, so as to define within the container one longitudinal small compartment and one longitudinal large compartment communicating with said longitudinal opening, said inner wall having a longitudinal imperforate portion adjacent said inner wall edges connected to said one edge of the longitudinal opening of the container, and a perforated portion coplanar with said imperforate portion and extending between said imperforate portion and the opposite end of the inner wall, said device further comprising positioning means for bringing said container into various preselected angular positions about said axis thereof.

4,047,502
HEAVY DUTY STANCHION
Melvin T. Gordon, Jr., 5107 Amberhill Drive, Greensboro, N.C. 27405
Filed May 24, 1976, Ser. No. 689,201
Int. Cl.² A01K *29/00*
U.S. Cl. 119—29 **4 Claims**



1. A collapsible, floor-to-ceiling stanchion comprising:

a. at least three segments including an upper segment having a top plate attached to the upper end thereof, a lower segment having a base plate attached to the lower end thereof, and at least one intermediate pivot section;

b. said pivot section being the shorter of said segments, with the walls of said three segments being substantially coplanar;

c. means for separably assembling said three segments in longitudinally aligned relationship with each segment being axially pivotal with relation to the adjacent segments, said assembly means including at least one threaded rod extending between said pivot section and one of the other two segments, said rod being secured within an end wall of one section and the adjoining end wall of the adjacent section having a threaded receiving means therein for receiving said threaded rod in assembled relationship;

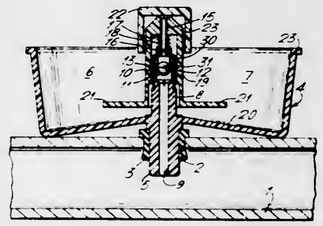
d. said top plate having a length dimension of such magnitude as to extend across two adjacent beams of said ceiling when installed;

e. a plurality of platforms and a hinge structure for pivotally securing said platforms to the side walls of at least one of said upper and lower segments, said platforms and hinge structure so constructed as to support weights of at least 20 pounds,

f. each of said segments being covered with a traction imparting surface therearound;

g. whereby, upon assembly, rotation of said pivot section changes the effective longitudinal dimension of said stanchion without the use of resilient force, and the large surface area of said top plate permits the axially applied force to be maximized to resist laterally applied forces without ceiling damage.

4,047,503
DRINKING STATIONS FOR POULTRY AND THE LIKE
Kenneth Wilmot, Clitheroe, England, assignor to Neotechnic Engineering Limited, Clitheroe, England
Filed May 4, 1976, Ser. No. 683,033
Claims priority, application United Kingdom, May 7, 1975, 19275/75
Int. Cl.² A01K *7/02*
U.S. Cl. 119—75 **10 Claims**



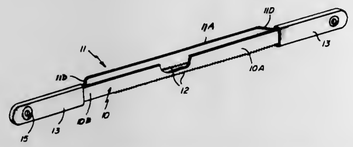
1. A drinking station for poultry or the like, the drinking station comprising a plurality of receptacles for receiving a drinking liquid, and valve means adapted to control the flow of the drinking liquid from a supply thereof into said receptacles, said valve means comprising a sleeve, a tongue extending laterally from said sleeve into one of said receptacles, and a valve-operating member projecting internally of said sleeve, said valve means being operable to supply the liquid to the receptacles in response to downward pressure on said tongue.

4,047,504

GROOMING IMPLEMENT FOR HORSES

Paul A. Borba, 626 Smith Neck Road, and Harry R. Miller, 751 Potomska Road, both of South Dartmouth, Mass. 02748

Filed July 12, 1976, Ser. No. 704,426
Int. Cl.[2] A01K *13/00*
U.S. Cl. 119—92 **10 Claims**



1. An animal grooming implement comprising relatively long and flexible blade means, and a pair of hand grips to which the blade means are connected, said blade means including first and second blades, corresponding edges of said blades including grooming teeth, means to space a central portion of one blade from the central portion of the other blade, said central portions normally straight and parallel, and means connecting one end of said first blade to said second blade so that it may slide relative thereto as the blades are curved by drawing the hand grips towards each other, said central portions remain parallel during use of the implement.

4,047,505

INSECT REPELLENT COLLAR

John Madden McAndless, Ottawa, Canada, assignor to Canada, Her Majesty the Queen in right of, as represented by the secretary of National Defence, Ottawa, Canada

Filed Aug. 2, 1976, Ser. No. 710,606
Int. Cl.[2] A01K *27/00*
U.S. Cl. 119—106 **7 Claims**



1. A collar for use in protecting exposed skin of a wearer's face and neck against biting insets which comprises:
   a. a backing strip resistant to the passage of liquid therethrough having a fastening means at the ends thereof,
   b. an absorbent layer adjacent the backing strip and being formed of an open-cell solid resin foam impregnated with a finely divided particulate absorbent material capable of absorbing liquid-repellent chemical which then slowly desorbs and evaporates, the rate of evaporation being controlled by the structure of the resin foam
   c. a porous outer covering adjacent the absorbent layer and being secured to the backing strip, and
   d. N, N-diethyl-meta-toluamide insect repellent applied to the porous outer covering adjacent the absorbent layer.

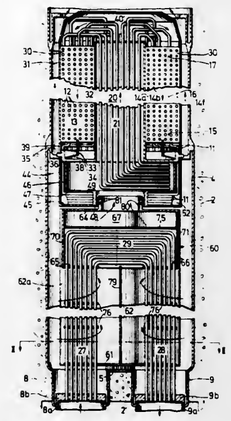
4,047,506

GAS HEATED STEAM GENERATOR

Max Weber, Wiesendangen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 3, 1975, Ser. No. 637,399
Claims priority, application Switzerland, Dec. 6, 1974, 16222/74
Int. Cl.[2] F22B *1/18*
U.S. Cl. 122—32 **14 Claims**

1. A gas heated steam generator comprising
   means defining a cylindrical chamber having a bottom and an inlet for a flow of heated gas;
   an evaporator disposed in said chamber for evaporating a flow of feed water;
   means for feeding water to said evaporator;
   a superheater connected to said evaporator within said chamber for heating the flow of evaporated feed water to steam, said superheater being mounted in communication with said bottom to deliver steam from said chamber;
   a reheater within said chamber, said reheater including a group of U-shaped tubes having a pair of vertically disposed spaced apart leg portions, said leg portions being mounted in said bottom to receive and conduct steam



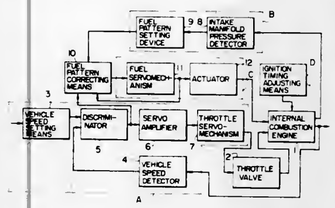
   from outside said chamber from one leg portion to the other leg portion;
   a casing surrounding said group of U-shaped tubes, said casing having a pair of oppositely disposed openings communicating with said inlet; and
   means directing the heated gas flows from said opening in two counterflows over each of said leg portions of said group of U-shaped tubes and subsequently over said superheater and said evaporator.

4,047,507

FUEL ECONOMIZING SYSTEM

Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyoto, and Nobuhito Hobo, Inuyama, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

Continuation of Ser. No. 530,974, Dec. 9, 1974, abandoned. This application Aug. 10, 1976, Ser. No. 713,208
Claims priority, application Japan, May 7, 1974, 49-50448
Int. Cl.[2] F02B *3/00*; F02M *39/00*
U.S. Cl. 123—32 Ea **10 Claims**



1. A fuel economizing system comprising:
   constant speed control means for detecting the difference between the preset speed of a vehicle and the actual speed of said vehicle and for varying the opening of a throttle valve to reduce said difference to zero;

   fuel pattern setting means for detecing the operating condition of an internal combustion engine and for setting the quantity of fuel to be required by said engine;
   fuel pattern correcting means connected to said constant speed control means is in operation and to said fuel pattern setting means, said fuel pattern correcting means being adapted to correct said quantity of fuel to reduce it when said actual speed is not less than said preset speed and the variation of the quantity of fuel is not increasing; and
   fuel feeding means connected to said fuel pattern correcting means for feeding to said engine the quantity of fuel corrected by said fuel pattern correcting means, wherein the output of said fuel pattern setting means is connected directly to said fuel feeding means when said constant speed control means is not in operation.

4,047,508

COOLING AIR DISTRIBUTION SYSTEM FOR RECIPROCATING AIRCRAFT ENGINES

George R. Schramm, Williamsport, Pa., assignor to Avco Corporation, Williamsport, Pa.

Filed Dec. 8, 1975, Ser. No. 638,978
Int. Cl.[2] F02F *1/34*
U.S. Cl. 123—41.6 **5 Claims**



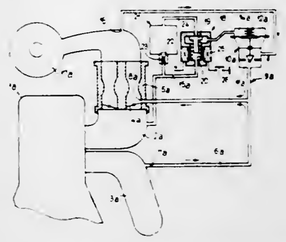
3. In a reciprocating engine, the combination of:
   at least two cylinders disposed side by side, each cylinder comprising a barrel and an enlarged head of bulging caplike contour, the barrel and the head being formed with groups of peripheral cooling fins, and
   a cooling air distributor comprising a channel portion and a divider portion, the channel portion being formed with a runner and triangularly shaped wings transverse to the runner and terminating in flaps, the flaps being positioned closely adjacent the barrels and the runner forming an open mouth and next conforming first to the triangular wings and second to the bulging caplike head in the progression from the inner region of the barrel to the outer region of the head, the barrel-zone admitting orifices of cooling air being large with respect to the flap-barrel spacing which defines barrel-zone exit orifices, whereby part of the cooling air admitted via said open mouth and the barrel-zone admitting orifices is diverted from the barrels to the heads, the runner continuing substantially beyond the termination of the triangular wings and being formed so that its side edges are disposed to provide head-zone exit orifices that are large with respect to the head-zone admitting orifices, the divider being transverse to the channel portion and being formed with a triangular portion generally conforming to the wings and with a fin which substantially penetrates into the zone between heads.

4,047,509

METHOD AND DEVICE FOR RECIRCULATING EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

Henry Arnaud, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of France

Filed Apr. 29, 1975, Ser. No. 572,873
Claims priority, application France, May 16, 1974, 74.16996
Int. Cl.[2] F02M *25/00*
U.S. Cl. 123—119 A **4 Claims**



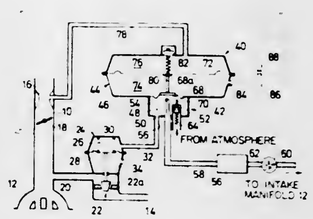
1. A method of recirculating the exhaust gases of internal combustion engines having an induction manifold, an engine power output adjustment throttle valve, and an exhaust system comprising the steps of, injecting exhaust gases from the exhaust system directly into the induction manifold, mixing atmospheric air with the exhaust gases to be injected into the induction manifold prior to said injecting step and adjusting the amount of air to be mixed with the exhaust gases prior to said mixing step to thereby control indirectly the metering of the amount of recycled exhaust gases without passing recycled exhaust gases through a gas recirculation control valve wherein said mixing step is carried out by providing an adjustable output induction air circulation in parallel with the induction manifold and wherein said injecting step is carried out by injecting the mixture of exhaust gases and atmospheric air just upstream of the throttle valve to provide atmospheric pressure at the output of the air circulation at engine idling speed.

4,047,510

EXHAUST GAS RECIRCULATION SYSTEM WITH CONTROL APPARATUS FOR EXHAUST GAS FLOW CONTROL VALVE

Yasuo Nakajima, Yokosuka; Yoshimasa Hayashi, Yokohama; Yasuo Takagi, Yokohama; Kunihiko Sugihara, Yokohama, and Syunichi Aoyama, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed June 19, 1975, Ser. No. 588,239
Claims priority, application Japan, June 27, 1974, 49-73704
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **3 Claims**



1. An exhaust gas recirculation system for use on an internal

combustion engine having an intake system and an exhaust system comprising:

a recirculation conduit to recirculate a portion of exhaust gas from the exhaust system of an internal combustion engine to an intake system having a carburetor and an intake manifold;

an exhaust gas flow control valve normally closing said recirculation conduit;

a valve actuator including a vacuum chamber and a diaphragm operatively connected to said exhaust gas flow control valve to urge said exhaust gas flow control valve toward its open position so as to open said recirculation conduit responsive to a vacuum in the vacuum chamber of said valve actuator; and

a control apparatus comprising:

a housing having a vacuum regulating chamber, said vacuum regulating chamber having an inlet port connected to the vacuum chamber of said valve actuator, an air bleed port and an outlet port connected in operation to a vacuum source;

a first flexible diaphragm means defining a wall of said vacuum regulating chamber;

a second flexible diaphragm means cooperating with said first flexible diaphragm means for defining said housing and between said first and second diaphragm means a biasing chamber, said second flexible diaphragm means forming on the opposite side of a side exposed to said biasing chamber and in said housing a venturi vacuum chamber communicating with the venturi of the carburetor;

means mechanically interconnecting said first and second flexible diaphragm means;

said first diaphragm means having a valve portion engageable with said outlet port, said first diaphragm means being movable in increase and decrease of pressure in said vacuum regulating chamber to bring said valve portion into out of closing engagement with said outlet port;

said second diaphragm means having an effective area larger than that of said first diaphragm means;

an air bleeder valve means for opening said air bleed port in response to further flexing of said first diaphragm means due to increase of vacuum in said vacuum regulating chamber after closing of said outlet port;

a vacuum conduit having an air bleeder orifice, said vacuum conduit connecting said biasing chamber with the intake manifold, and said air bleeder orifice having a restriction chosen such that a vacuum in said biasing chamber is a reduction of a vacuum in the intake manifold and is lower than a vacuum in said venturi vacuum chamber.

4,047,511

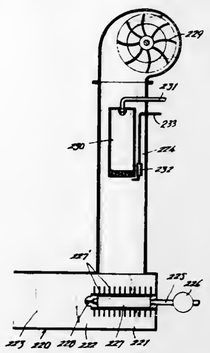
PERFECT FUEL GASIFICATION DEVICE FOR USE IN COMBINATION WITH A COMBUSTION APPARATUS OF INTERNAL COMBUSTION ENGINE

Kazumi Takagi, Fuji, Japan, assignor to Takagi Sangyo Kabushiki Kaisha, Fuji, Japan

Filed Nov. 26, 1974, Ser. No. 527,233
Claims priority, application Japan, Dec. 1, 1973, 48-139247
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 G **2 Claims**

1. A fuel gasification-increasing device for use with fuel-combustion apparatus comprising:

a hollow, cylindrical main body having upstream and downstream ends, the interior of said main body including intercommunicating fuel-intake, combustion-air supply, heating, fuel-spraying and mixing zones in series, the mixing zone being downstream of the fuel-spraying zone, said fuel-spraying zone being defined in said main body by a liquid-fuel nozzle connected to a fuel-pressurizing means, said nozzle being directed axially in said main body toward to the downstream end thereof and having means for discharging a wide, pressurized-spray of fuel as a mist into said main body toward said downstream end, said combustion-air supply means including means for heating and forcing combustion-air into said main body into said mixing zone so that the pressurized fuel mist is substantially perfectly gasified upon entering pressurized, increased-temperature combustion-air whereby the fuel-air using combustion apparatus receives gasified fuel in an optimum condition, said combustion-air supply means comprising a vertically-extending conduit communicating with said main body, blower means connected to an upper portion of said air conduit, and pre-combustion means in



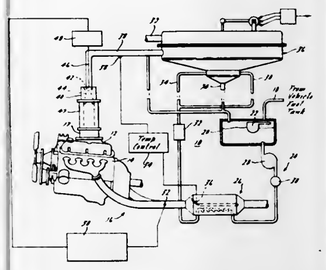
said air conduit intermediately of said blower means and the main body, said fuel-pressurizing means comprising an hydraulic pump connected to said liquid-fuel nozzle, said liquid-fuel nozzle including heating means for heating the fuel pressurized by said liquid pump prior to the fuel being directed into said mixing zone, said liquid-fuel nozzle including a plurality of heat-transferring fins disposed about said nozzle for increasing the heat-conducting area of said nozzle.

4,047,512

ELECTRIC FUEL VAPORIZER

Jerome F. Hough, Allen Park, and Douglas R. Hamburg, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 21, 1976, Ser. No. 699,003
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 E **9 Claims**



1. An electrically powered liquid fuel vaporizer system for vaporizing liquid fuel prior to its mixing with air comprising in combination:

a liquid fuel source, a plurality of electrically conductive fuel conduits arranged in side-by-side relation, each conduit having a liquid fuel receiving end and a vaporized liquid fuel outlet end, said liquid fuel receiving end communicating with said source of liquid fuel and arranged to receive a stream of said liquid fuel while excluding the atmosphere, said vaporized liquid fuel outlet end arranged for communication with a vapor storage means, while avoiding intermixing with the atmosphere, said conduits being mutually interconnected to form a thermally unitary body;

means defining a first electrical terminal in electrical contact with a first of the pair of ends of said plurality of fuel conduits;

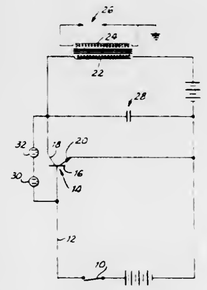
electrical circuit means for establishing a flow of electrical current through said plurality of fuel conduits between said first and second terminal means whereby the temperature of the plurality of fuel conduits may be elevated to cause substantially complete thermal vaporization of a liquid fuel flowing therethrough.

4,047,513

IGNITION SYSTEM WITH GAS DISCHARGE TUBE CIRCUIT

Guy Emery Adams, Monroe, N.Y., and Anna J. Pellegrin, Closter, N.J., assignors to Solitron Devices, Inc., Tappan, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,497
Int. Cl.² F02P *1/00*
U.S. Cl. 123—148 E **6 Claims**



1. A charging circuit for use in an electronic ignition circuit having an ignition coil controlled by a transistor, said circuit comprising:

a capacitor connected across the primary coil of the ignition coil and the collector and emitter of a switching transistor therefor; and

gas discharge tubes in a series circuit in parallel with said capacitor between a source of electrical energy and said primary coil, said tubes being between the collector and base of said transistor.

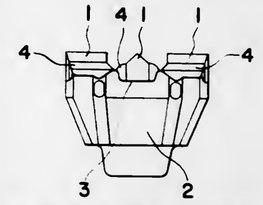
4,047,514

FURNACE TAPHOLE DRILLING BIT

Tsuyoshi Morishita; Kenji Miyake; Noboru Ishii, all of Hiroshima; Toshikazu Wakigara, Kure, and Naoji Ueda, Hiroshima, all of Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Oct. 12, 1976, Ser. No. 731,821
Int. Cl.² B28D *1/26*
U.S. Cl. 125—40 **7 Claims**

1. In a drilling bit for use in making a taphole in a furnace which comprises a bit head of ferrous material and a plurality of cutting tips radially mounted on and soldered to said bit head in spaced relation to each other, the improvement wherein each of said cutting tips is made of a metallic material selected from the group consisting of super hard alloy and stellite and each of said tips is soldered to said bit head by a soldering material containing 3 to 5% by weight of carbon, 0.5 to 3.0% by weight of silicon and the balance iron, said percent by weight being based on the total weight of the composition,



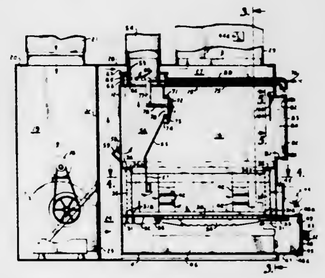
the sum of the carbon content and the silicon content in said soldering material being at least 4% by weight relative to the total weight of the composition.

4,047,515

WOOD BURNING FURNACE

Walter Lee Daniel, P.O. Box 1154, Harrison, Ark. 72601

Filed Jan. 16, 1976, Ser. No. 649,748
Int. Cl.² F24H *3/06*
U.S. Cl. 126—110 R **7 Claims**



1. A firebox for a wood burning furnace, said firebox comprising:

a plurality of walls, a floor, and a ceiling integrally joined together to provide a substantially enclosed primary combustion chamber;

a fuel support frame located within said primary combustion chamber for supporting fuel therewithin;

a plurality of air inlet openings into said primary combustion chamber at a level above said fuel support frame, said inlet openings being oriented and arranged to direct air passing therethrough generally downwardly and inwardly within said primary combustion chamber toward the fuel on said fuel support;

a blower operable to force air through said inlet openings for combustion of the fuel;

a secondary combustion chamber communicating with said primary combustion chamber to receive combustion gases;

means presenting a bypass opening communicating said primary and secondary combustion chambers with one another;

a bypass damper supported for movement to open and close said bypass opening;

actuator linkage connected with said bypass damper to open and close same, said linkage including a control member accessible from the exterior of said primary combustion chamber;

a secondary air intake to said secondary combustion chamber for supplying ambient air thereto to effect further burning of the combustion gases; and

a flue outlet from said secondary combustion chamber for directing the gases out of the firebox.

5. A furnace comprising:

a firebox presenting a substantially enclosed primary combustion chamber interiorly thereof;

ductwork extending in close proximity to said firebox for receiving air that is to be heated;

means for circulating air through said ductwork;

a plurality of air inlet openings into said primary combustion chamber for supplying air thereto;

a blower operable to force air into said primary combustion chamber through said air inlet openings;

adjustable means associated with said blower for regulating the air flow therefrom;

a switch for controlling the adjustable means of said blower, said switch being located and adapted to sense the temperature within said ductwork and being coupled with said adjustable means to effect restriction of the air flow from said blower when the temperature in the ductwork exceeds a preselected reference temperature;

a secondary combustion chamber communicating with said primary combustion chamber to receive combustion gases;

a secondary air intake to said secondary combustion chamber for supplying air thereto to effect further burning of the combustion gases, said secondary air intake communicating with an air source; and

a flue outlet from said secondary combustion chamber for directing the gases out of the firebox.

4,047,516

PIPE JOINT FOR RADIATOR ELEMENT OF THIN MATERIAL

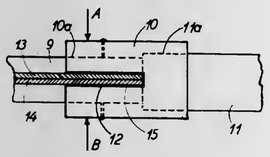
Per Wilhelm Bruel, Fuglevagsveig 5, DK-2960 Rungsted; Holger Schioler, Rode Hus, Hojbjergvej 17, DK-4171 Jystrup, and Johannes Tejlgaard Jensen, Norasvej 11, D K-2920 Charlottenlund, all of Denmark

Filed Dec. 29, 1975, Ser. No. 644,906

Claims priority, application Denmark, Jan. 17, 1975, 113/75

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **5 Claims**



1. A pipe joint for a radiator element, wherein the radiator element is a sheet of radiation absorbing material having a conduit passing therethrough in directions defined by the major surfaces of said sheet of radiation absorbing material, said conduit having a diameter essentially greater than the thickness of said sheet of radiation absorbing material and terminating at substantially right angles to an edge of said radiation absorbing material, said pipe joint comprising a block of deformable material adopted to be attached to said radiator element, said block being provided with a slot having a thickness substantially equal to the thickness of said sheet of radiation absorbing material, the bottom of said slot substantially conforming to said edge of said sheet of radiation absorbing material, said block being further provided with a first channel through said slot at substantially right angles to the bottom of said slot and having a cross-section substantially corresponding to the external dimensions of said conduit at the edge of said sheet of radiation absorbing material, said first channel passing through the bottom of said slot and terminating within the block beyond said slot, and said block being provided with a further channel through an edge of said block and communicating with said terminal end of said first channel, the surface area of the internal portions of said slot and said first channel being substantially greater than the internal surface area of said first channel.

4,047,517

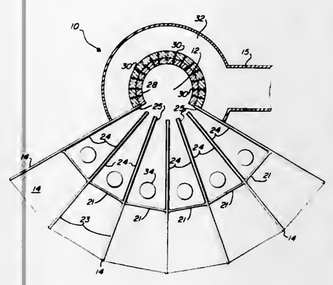
METHOD AND APPARATUS FOR RECEIVING SOLAR ENERGY

B. Thomas Arnberg, 2885 Kenyon Circle, Boulder, Colo. 80303

Filed July 6, 1976, Ser. No. 702,640

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **18 Claims**



1. A radiant energy receiver comprising:

a plurality of elongated vane structures arranged in a converging configuration from an exterior portion thereof to an interior throat portion thereof, the exterior to intermediate surfaces of the vanes being at least in part of a reflecting surface, and the intermediate to interior surfaces of the vanes being at least in part of a selective surface which absorbs radiant energy striking the selective surface at a small angle of incidence, but reflects such energy impinging at a greater angle of incidence, whereby radiant energy impinging upon the exterior portions of the vane is reflected towards the converging throat of the vanes and radiant energy in the interior portion striking the selective surface at a relatively small angle of incidence as would indicate incipient or actual reversal of direction of travel of the radiant energy relative to the vanes is absorbed while that striking the selective surface at a relatively large angle of incidence is reflected into the throat of the vanes to generate elevated temperature adjacent the throat of the vanes.

4,047,518

SOLAR HEATING CELL

John Harland Anderson, 5 Woodcrest Drive, Burnsville, Minn. 55337

Continuation-in-part of Ser. No. 449,761, March 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 390,852, Aug. 23, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,796

Int. Cl.² F24J *3/02*

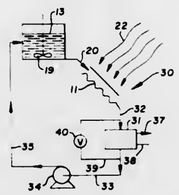
U.S. Cl. 126—271 **8 Claims**

1. Solar energy gathering system including, in combination:

a. cell means including a generally solar transmissive enclosed fluid retaining zone with length and width dimensions substantially greater than the thickness dimension, and with an inclined flat plate disposed for solar viewing and forming one wall of said enclosure and having an inlet and an outlet for the transfer of fluid energy transfer medium therethrough, surface means including said flat solar transmissive plate comprising the solar viewing wall of said cell means, an opaque solar radiation responsive plate forming a backing plate for said cell means, and with said solar viewing wall and said backing plate being arranged to support, retain and expose said fluid energy transfer medium contained therein to incident solar energy;

b. a fluid energy transfer medium arranged to flow through said cell and comprising a fluid normally in liquid state at ordinary ambient environmental conditions and being normally translucent;

c. a solar energy absorbing medium in substantially uniformly dispersed admixture with said fluid energy transfer medium and present in sufficient quantities so as to render said energy transfer medium as retained within said cell and between said solar viewing wall and said backing plate substantially opaque to incoming incident solar energy;



d. a dispersant in said fluid energy transfer medium for maintaining said solar energy absorbing medium in substantially uniform dispersion within said fluid energy transfer medium;

e. pumping means for forcibly transferring said fluid energy transfer medium through said system;

f. a heat extraction vessel for receiving fluid energy transfer medium from said cell means in liquid state and having at least one heat exchange surface for extracting thermal energy from said fluid energy transfer medium; and

g. said pumping means including means for recirculating spent fluid energy transfer medium from said heat extraction vessel to the inlet of said cell means.

4,047,519

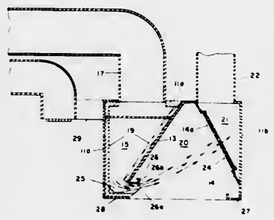
VENTILATING APPARATUS

Louis A. Nett, Box 199N Rte. No. 1, Cambridge, Wis. 53523

Continuation-in-part of Ser. No. 552,228, Feb. 24, 1975, Pat. No. 3,978,777. This application Sept. 2, 1976, Ser. No. 719,828

Int. Cl.² F24C *15/20*

U.S. Cl. 126—299 D **14 Claims**



1. Ventilating apparatus for ventilating a room which has tempered air introduced therein, exhaust apparatus comprising:

a. an exhaust hood having front, side and rear walls,

b. an interior wall which with the front wall and side walls of said exhaust hood defines an intake chamber within said exhaust hood, said interior wall and front wall converging downwardly,

c. a grease filter which with the rear wall and side walls of said exhaust hood defines an exhaust chamber within said hood,

d. said interior wall of the intake chamber and said grease filter of the exhaust chamber defining a fume collection chamber therebetween,

e. air intake means for drawing ambient air from outside the room being ventilated and forcing such air under pressure into said intake chamber,

f. a throat panel extending substantially along the length of the bottom of said interior wall,

g. a deflector panel also extending substantially along the length of the bottom of said front wall and positioned in spaced relation below said throat panel to form a longitudinally extending slot with said throat panel, the width of said slot being no more than about two inches, said deflector panel being continuously curved along its width to deflect air introduced into said intake chamber through said slot rearwardly and upwardly through said grease filter and into said exhaust chamber, and

h. exhaust means for drawing air and fumes out of said exhaust chamber and exhausting such air and fumes into the atmosphere outside the room being ventilated, said exhaust means having capacity to exhaust a minimum of 20% more air by volume than introduced into said intake chamber by said air intake means.

4,047,520

ULTRASONIC IMAGING APPARATUS OPERATING ACCORDING TO THE IMPULSE-ECHO TECHNIQUE

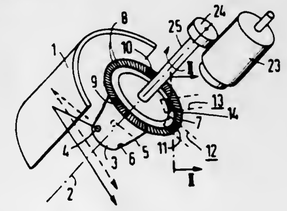
Richard Ernst Soldner, Erlangen, and Rudolf Rattmann, Herzogenaurach, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 6, 1976, Ser. No. 702,589

Claims priority, application Germany, Aug. 5, 1975, 2534974

Int. Cl.² A61B *10/00*

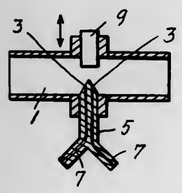
U.S. Cl. 128—2 V **14 Claims**



1. In ultrasonic imaging apparatus operating according to the impulse-echo method, and including an ultrasonic applicator for causing ultrasonic beam energy to effect ultrasonic scanning of a body region along successive scanning lines, an image registering device with a line generator for controlling the imaging of echo impulses along an image line and with an image generator for controlling image line displacement of successive image lines to form an image during displacement of the ultrasonic beam energy for scanning along successive scanning lines of the body region, said ultrasonic applicator comprising a parabolic reflector and ultrasonic transducer means operable for the transducing of ultrasonic beam energy relative to the successive scanning lines via successive points along border zones and along an intervening central zone of the parabolic reflector during rotation of the transducer means about the focal line of said reflector, and angle responsive signal generator means responsive to the angular movement of the ultrasonic transducer means and operable for controlling the image generator to produce image line displacement at a more rapid rate during transducing of ultrasonic beam energy via points at the border zones of the reflector and at a relatively slower rate during transducing of ultrasonic beam energy via points in the central zone of the reflector, wherein the improvement comprises said angle responsive signal generator means including rotary mark carrier means having a succession of angularly offset marks, and rotatable in synchronism with

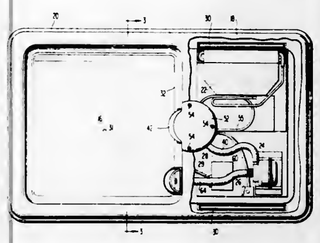
the rotation of the ultrasonic transducer means, and mark scanner means operably associated with the marks of said mark carrier means for generating mark signals in response to the scanning of the successive marks during rotation of said mark carrier means, the marks of said rotary mark carrier means having a variable spacing such that the mark scanner means scans a relatively rapid succession of marks during transducing of the ultrasonic transducer means via points in the border zones of the reflector and scans a relatively less rapid succession of marks during transducing via points in the central zone of the reflector, and said mark scanner means being operatively connected to said image generator for controlling the rate of image line displacement in accordance with the rate of scanning of said marks by said mark scanner means.

4,047,521
RATE-OF-FLOW METER, PARTICULARLY FOR DIAGNOSTIC SPIROMETRY
Carl Kramer, Am Chorusberg 8, 51 Aachen, and Hans-Joachim Gerhardt, Ruhrstrasse 12, 5023 Lovenich, both of Germany
Filed Nov. 4, 1975, Ser. No. 628,701
Int. Cl.² A61B 5/08
U.S. Cl. 128—2.08 **11 Claims**



1. A rate-of-flow meter, particularly for diagnostic spirometry, comprising:
a. wall means defining a flow tube extending along an axis for conducting a gas therethrough;
b. a measuring stud and a displacement body, each extending radially of said axis through said wall means from the exterior to the interior of said flow tube, said measuring stud and displacement body passing through said wall means at diametrically opposite sides of said flow tube such that the respective ends of said measuring stud and displacement body are in spaced confronting relationship, the space therebetween being substantially less than the interior cross-sectional width of said flow tube and the cross-sectional widths of said measuring stud and displacement body being substantially less than the interior cross-sectional width of said flow tube such that resistance to flow through said flow tube is minimized;
c. the confronting end of said displacement body terminating in at least one knife edge, and the confronting end of said measuring stud terminating in a longitudinally extending knife edge oriented in a direction substantially perpendicular to said axis;
d. at least two symmetrically disposed orifices in said measuring stud at opposite sides of said longitudinally extending edge respectively and ducts extending through said measuring stud from said orifices for transmitting the pressure differential on opposite sides of said edge of said measuring studs; and
e. means for displacing one of said displacement body and measuring stud relative to the other in a direction normal to said axis whereby the magnitude of the increase in velocity of flow between said end of said measuring stud and said end of said displacement body can be varied.

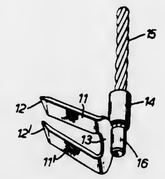
4,047,522
HYDROTHERAPEUTIC APPARATUS
Jerome R. Plugge, Rte. 50,, Skipton, Cordova, Md. 21625
Filed July 14, 1976, Ser. No. 705,252
Int. Cl.² A61H 9/00, 33/00
U.S. Cl. 128—66 **15 Claims**



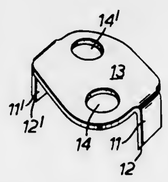
1. Hydrotherapeutic apparatus for treating the limbs such as the legs of an animal comprising in combination:
a unitary and easily transportable tub body including a tank for receiving at least one limb of said animal and a compartment for accommodating circulating and refrigeration apparatus;
said tank being of a selected size and shape to permit easy ingress and egress of said limb as well as allowing certain freedom of movement of said animal within said tank without injury to itself while preventing any overturning of said tank or other damage to said apparatus;
said tank further having a wall including a liquid input port therein for supplying a circulating liquid;
a liquid refrigerant evaporator unit and an outer casing member within which said evaporator unit is located mounted on said wall, said outer casing member having an end defining an opening adjacent said input port for receiving said circulating liquid supplied thereto and an opening in said casing member adjacent to the other end thereof for feeding circulating liquid passing said evaporator unit into said tank;
refrigeration apparatus including condenser and compressor means coupled to said evaporator unit for cooling said circulating liquid as it passes through said outer casing member from said input port to said opening in said casing;
a return port selectively located in said tank; and
liquid circulating apparatus coupled between said input port and said return port for providing a closed circuit liquid circulation system to and from said tank.

4,047,523
SURGICAL SACRAL ANCHOR IMPLANT
John Emmett Hall, Boston, Mass., assignor to Downs Surgical Limited, Mitcham, England
Filed Apr. 26, 1976, Ser. No. 680,232
Claims priority, application United Kingdom, Apr. 28, 1975, 17610/75
Int. Cl.² A61F 5/00
U.S. Cl. 128—69 **14 Claims**

1. In a surgical implant capable of securing a spinal tensioning cable to the sacrum, the improvement wherein said implant comprises two laminar and substantially coplanar prongs which are sized and shaped for insertion into a spinal disc space and are rigidly secured together at their bases by a bridge portion which extends away from the prongs in a direction that makes an angle of not more than 90° with the plane of the prongs and on the side on which the prongs lie, and means for securing to the bridge portion a spinal tensioning cable extending substantially in the said direction in which the bridge portion extends.



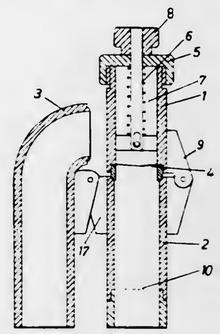
4,047,524
SURGICAL IMPLANT SPINAL STAPLE
John Emmett Hall, Boston, Mass., assignor to Downs Surgical Limited, Mitcham, England
Filed Apr. 26, 1976, Ser. No. 680,233
Claims priority, application United Kingdom, Apr. 28, 1975, 17611/75
Int. Cl.² A61F 5/00; A61B 17/18
U.S. Cl. 128—69 **6 Claims**



1. A metal spinal staple substantially U-shaped in side view and capable of securing a pair of metal tensioning cables to a vertebra via spinal screws, which comprises:
a pair of substantially parallel, perpendicularly offset laminar legs having free ends which are bevelled on the outer surfaces to terminate in a wedge shape, the parallel distance between said legs being such as to fit snugly over either side of a vertebra;
an integral, substantially solid and rectangular laminar bridge portion extending perpendicularly between the diagonally opposed bases of said legs along its length, having a width greater than the width of each leg and having curved corners between said legs; and
a pair of diagonally opposed spinal screw receiving apertures formed in said bridge portion proximate to said curved corners such that a line joining the centers of said apertures is inclined with respect to a line joining the centers of said legs in the plane of the bridge portion.

4,047,525
INHALATOR FOR AGGLOMERATABLE PULVERULENT SOLIDS
Gerhard Kulessa, Stollberg, and Elmar Mommertz, Laurensberg near Aachen, both of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany
Filed Jan. 13, 1976, Ser. No. 648,680
Claims priority, application Germany, Jan. 17, 1975, 2502251
Int. Cl.² A61M 15/00
U.S. Cl. 128—208 **19 Claims**

1. An inhalator suitable for the administration of agglomeratable pulverulent solids, said inhalator comprising:
a container having a volume of about 1 to 100 ml for pulverulent solids and sealed at one end, and means associated with the other end of said container for expelling powder of a predetermined maximum particle size from said container, said means including a porous distributor plate having a pore size of 5–100 microns;
an atomizing chamber having a volume of about 5 to 100 ml, open at one end, said one end of said atomizing chamber being removably attached to said other end of said container for receiving said powder expelled through said porous distributor plate, said atomizing chamber containing at the other end thereof a porous retention plate, the pores of said retention plate being sufficiently smaller than the pores of said porous distributor plate so as to retain said expelled pulverulent solids in said atomizing chamber; and
means for communicating said atomizing chamber with an oral cavity of a recipient.



4,047,526
AUTOLOGOUS BLOOD SYSTEM AND METHOD
Gordon S. Reynolds, Bountiful; Karl A. Pannier, Jr., and James L. Sorenson, both of Salt Lake City, all of Utah, assignors to Sorenson Research Co., Inc., Salt Lake City, Utah
Filed May 22, 1975, Ser. No. 580,087
Int. Cl.² A61M 5/00
U.S. Cl. 128—214 R **28 Claims**

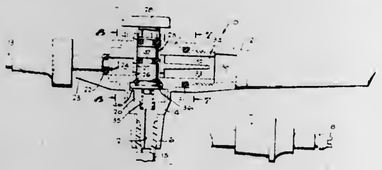


8. An autologous blood collection system comprising a closed extracorporeal blood circuit for collecting a patient's blood and delivering the collected blood to the same patient, the blood circuit comprising:
means for aspirating blood from the patient;
first means for collecting the aspirated blood, said first collecting means communicating with the aspirating means and means for continuously imposing a negative pressure in the first collecting means sufficiently to accommodate continuous aspiration of the blood;
second means for collecting the aspirated blood, said second means comprising third means for transferring the blood in the first collecting means into the second collecting means by overcoming the continuous negative pressure in the first receptacle; and

fourth means between said first means and said second means for facilitating infusion of blood into the patient from the second collecting means without interrupting the continuous evacuation of the first collecting means.

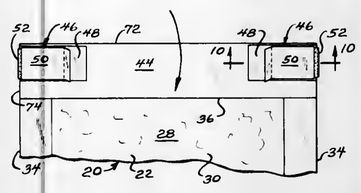
15. A method of collecting blood from a patient and infusing the same blood back into the patient, comprising the steps of:
providing a closed extracorporeal blood circuit through which blood passes;
creating suction within a blood aspiration device and selectively aspirating blood from the patient through the blood aspiration device;
depositing the blood in a first receptacle;
transferring the blood from the first to a second receptacle;
infusing the blood in the second receptacle into the patient without interrupting the suction within the blood aspiration device.

4,047,527
ORAL SYRINGE
Arthur F. Kelsen, 11701 Foster Road, Los Alamitos, Calif. 90720
Filed Nov. 21, 1975, Ser. No. 634,023
Int. Cl.² A61M *3/00*
U.S. Cl. 128—229 **1 Claim**



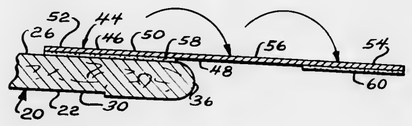
1. An oral hydrotherapeutic syringe for
delivering a fluid carrier stream to the teeth for effecting the cleaning thereof and for massaging the gums, the combination comprising:
a syringe having a central body portion;
a handle detachably connected to said body portion and provided with a mixing chamber for storing a quantity of mouthwash;
a nozzle detachably connected to said body portion for discharging said main carrier stream;
an attachment portion including an inlet chamber coupled to a source of pressurized fluid constituting said main carrier stream;
a control mechanism operably carried on said central body portion between said nozzle, said mixing chamber and said inlet chamber for selectively conducting said main carrier stream therebetween;
said control mechanism including a valve means responsive to manual depression for interconnecting said inlet chamber to said nozzle for discharge of said main carrier stream and responsive to rotation thereof in cooperation with axial rectilinear displacement of said valve means to interconnect said mixing chamber with said nozzle simultaneously with said interconnected inlet chamber for a combined discharge of said mouthwash with said main carrier stream;
said valve means includes an elongated spindle mounted for rectilinear and rotary movement on said central body portion;
at least three seals carried on said spindle is fixed spaced apart relationship so as to define a pair of annular fluid conducting chambers between adjacent seals;
a first chamber of said pair operable in response to a first depression of said valve means to interconnect said inlet chamber with said nozzle and said mixing chamber;
a second chamber of said pair operable in response to simultaneous rotation and a second further depression of said valve means to interconnect said mixing chamber with said nozzle simultaneously with said interconnection between said inlet chamber and said nozzle via said first chamber;
stop means limiting said rectilinear movement of said valve means;
said stop means includes a projection carried on one end of said spindle releasably engageable with a lip provided on said central body portion so as to prevent depression of said valve means beyond said intercommunication of said inlet chamber with said mixing chamber and said nozzle;
said stop means further includes interference of a selected one of said seals with said central body portion to arrest movement of said valve means so as to close communication between said inlet chamber with said mixing chamber and said nozzle;
spring biasing means yieldably urging said selected seal into engagement with said central body portion; and
indicia displayed on said central body portion for mixing and no-mixing; and
said valve means having a pushbutton carried on said spindle incorporating a pointer operable with said indicia to visually display the rotational position of said valve means.

4,047,528
DISPOSABLE DIAPER WITH RETAINING AND SECURING FASTENER
Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Aug. 19, 1976, Ser. No. 715,782
Int. Cl.² A61F *13/16*
U.S. Cl. 128—287 **11 Claims**



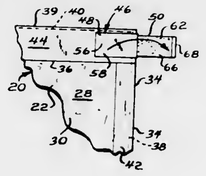
1. A disposable diaper, comprising:
an absorbent pad assembly having a pair of side edges, a pair of end edges connecting the side edges, a front surface, a backing sheet of fluid impervious material defining a back surface of the pad assembly, an absorbent pad, and a laterally extending end section adjacent one end edge of the pad assembly; and
a tape fastener comprising, a release sheet having a release back surface and being attached to the back surface of said end section adjacent a side edge of the pad assembly, a securement section having adhesive on a front surface releasably attached to the back surface of the release sheet and having a release back surface, and a retaining section having adhesive on a front surface releasably attached to the back surface of the securement section, said retaining section being peeled from the securement section and folded around the side edge of the pad assembly into a configuration with the retaining section overlying the front surface of the pad assembly and with the adhesive on the retaining section facing away from the front surface of the pad assembly, said end section of the pad assembly being folded over an adjacent portion of the pad assembly into a configuration with the adhesive on the retaining section contacting a portion of the pad assembly underlying the end section and retaining the end section in the overlying configuration, and said securement section being peeled from the release sheet to secure the diaper about an infant.

4,047,529
DISPOSABLE DIAPER WITH UNITARY TAPE FASTENER
Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Aug. 19, 1976, Ser. No. 715,783
Int. Cl.² A61F *13/16*
U.S. Cl. 128—287 **7 Claims**



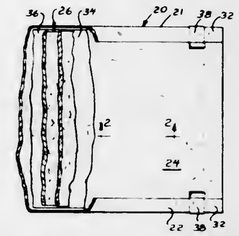
1. A disposable diaper, comprising:
an absorbent pad assembly having opposed surfaces, and at least one side edge; and
a tape fastener comprising, a tape strip having opposed front and back surfaces, first and second sections and a connecting section intermediate the first and second sections, said connecting section extending between a first fold of the tape strip located adjacent an inner end of the first section and a second fold of the tape strip located adjacent an inner end of the second section, with the back surface of the second section being folded against the back surface of the connecting section about the second fold, and with the connecting and second sections being folded over the back surface of the first section about the first fold, said first section having a release back surface and the front surface attached to a surface of the pad assembly adjacent said side edge, said second section having adhesive on the front surface and being releasably attached to the back surface of the first section.

4,047,530
DISPOSABLE DIAPER WITH FASTENER RETAINED END BARRIER
Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Aug. 19, 1976, Ser. No. 715,785
Int. Cl.² A61F *13/16*
U.S. Cl. 128—287 **5 Claims**



1. A disposable diaper, comprising:
an absorbent pad assembly having a pair of side edges, a pair of end edges connecting the side edges, a front surface, a backing sheet of fluid impervious material defining a back surface of the pad assembly, an absorbent pad, and a laterally extending end section including the backing sheet adjacent one end edge of the pad assembly, said end section being folded along a lateral fold line with a front surface of the end section facing the front surface of an underlying portion of the pad assembly adjacent said fold line; and
a tape fastener comprising, a release sheet having a release back surface and having a first end portion secured to the back surface of said end section and a second end portion secured to the back surface of the pad assembly and spaced from said end section, with said release sheet retaining the end section in its overlying configuration, said fastener having a pressure-sensitive tape strip having a first portion secured to the diaper adjacent said second portion of the release sheet, and a second securement portion releasably attached to the release surface in the first end portion of the release sheet, said securement portion of the tape strip being removed from the release sheet to secure the diaper about the infant.

4,047,531
ABSORBENT ARTICLE WITH DIFFERENTIAL PAD
Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Aug. 9, 1976, Ser. No. 713,086
Int. Cl.² A61F *13/02, 13/16*
U.S. Cl. 128—290 R **9 Claims**



1. A disposable absorbent article of a size for placement against a wearer for capturing body fluids, comprising: a backing sheet of fluid impervious material, a fluid pervious cover sheet, and an absorbent pad positioned intermediate the backing and cover sheets, said pad comprising a plurality of separate layers including a first layer having a mass of fibers substantially formed from a material selected from the group consisting of mechanical pulp, thermomechanical pulp, and semichemical pulp, and a second layer having a mass of fibers substantially formed from a material different from the selected one of the first layer and selected from the group consisting of thermomechanical pulp, semichemical pulp, and chemical pulp, with the average fibers of said first layer being more hydrophobic relative the average fibers of the second layer, and with said second layer being located intermediate the first layer and said backing sheet.

4,047,532
VACUUM FORCEP AND METHOD OF USING SAME
Jack L. Phillips, 4929 Bancroft Drive, and Timothy E. Dickinson, 9458 Showplace Drive, both of La Mesa, Calif. 92041
Filed Apr. 21, 1975, Ser. No. 570,016
Int. Cl.² A61F *9/00*; A61B *17/00*
U.S. Cl. 128—303 R **13 Claims**



1. A vacuum forcep for attachment to a controlled variable vacuum source for temporarily holding an artificial lens and inserting the lens beneath the partially withdrawn cornea of the human eye and adjacent the iris, the forcep including
an elongated essentially straight hollow stem having a longi-

tudinal axis, the exterior of the stem defining a handle for manipulation by an operating surgeon, the stem being essentially rigid;

a flexible suction head having a shank portion disposed on one end of the stem and defining a cavity communicating with the hollow stem;

the suction head having a hollow face extending from the shank portion and communicating with the cavity in the shank portion and comprising a yielding, generally radially outwardly extending substantially annular lip of outside diameter less than that of the human cornea and a radial cross-sectional area greater than that of the shank portion, the face defining an angle greater than 0° and less than 60° with the extension of the axis of the stem past the face; and

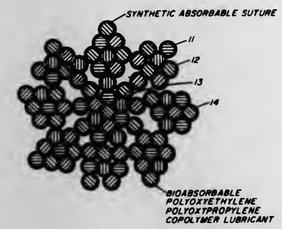
the suction head having a smoothly contoured rear surface on the side generally opposite from the face, whereby an artificial lens may be vacuum grasped by the face of the suction head, positioned with the eye beneath a partially withdrawn cornea and maintained in place until release is affected by abating vacuum in the head.

4,047,533

ABSORBABLE SURGICAL SUTURES COATED WITH POLYOXYETHYLENE-POLYOXYPROPYLENE COPOLYMER LUBRICANT

Vincent Anthony Perciaccante, Long Island City, and Henry Patrick Landi, Yorktown Heights, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 20, 1976, Ser. No. 724,804
Int. Cl.² A61L *17/00*
U.S. Cl. 128—335.5 **23 Claims**



1. An absorbable surgical suture having improved knot run-down characteristics and reduced tissue drag comprising a polyfilamentary synthetic absorbable polymer strand having thereon a thin lubricating coating of a lubricating absorbable copolymer comprising polyoxyethylene blocks and polyoxypropylene blocks to aid run-down and handleability, said bioabsorbable copolymer having a molecular weight such that it is pasty to solid at 25° C.

4,047,534

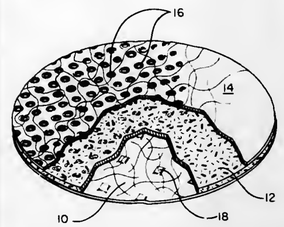
NURSING PAD

Susan N. Thomaschefsky, Menasha, and Ann Sprangers, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 3, 1977, Ser. No. 756,347
Int. Cl.² A41C *3/00*
U.S. Cl. 128—461 **7 Claims**

1. A flexible, breathable nursing pad having low stick properties, consisting essentially of, a layer having a basis weight of from about 0.2 oz/yd² to 1.5 oz/yd² of synthetic polymeric microfibers having an average fiber diameter of up to 10 microns and a tendency to cling to garments containing natural fibers and a resistance to the passage of aqueous liquids of at least 60 min. according to the Mason jar test, an absorbent middle layer comprising 30 to 50 polymeric fibers by weight and having a basis weight from about 150 g/yd² to about 250 g/yd², and

a spunbonded continuous synthetic polymeric filament layer having a basis weight of from about 0.25 oz/yd² to 1.5 oz/yd² on the other side of said absorbent layer opposite from said microfiber layer,



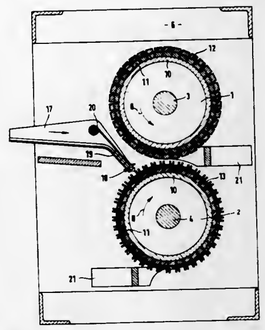
said combination being bonded by means of embossments wherein the embossing pattern on the microfiber side occupies from about 1% to 5% of the surface area and the embossing pattern on the continuous filament side occupies from about 10% to 20% of the surface area.

4,047,535

METHOD OF AND APPARATUS FOR IMPROVING SMOKING PROPERTIES OF TOBACCO PRODUCTS

Peter Wimmer, Wachtelweg 8, 4952 Barkhausen, Germany

Filed May 27, 1976, Ser. No. 690,519
Claims priority, application Germany, Mar. 29, 1976, 2613304
Int. Cl.² A24C *5/30*
U.S. Cl. 131—23 R **12 Claims**



1. A method of making perforations in tobacco products, such as cigars or cigarillos, comprising the steps of:

a. positioning said tobacco product in a channel secured on an external surface of a first cylindrical shell;

b. moving said channel by rotating said cylindrical shell about a longitudinal axis thereof;

c. contacting said tobacco product with a means for perforating said tobacco product, said perforating means being disposed on an external surface of a second cylindrical shell, said contacting performed by rotating said second shell about a longitudinal axis thereof in parallel and opposed relation to the rotation of said first cylindrical shell, whereby said perforating devices disposed on said second shell are brought into a position opposite said channel and perforations are made in the tobacco product positioned in said channel; and

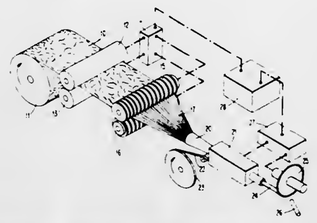
d. removing said tobacco product from said channel.

4,047,536

METHOD OF MAKING CIGARETTES AND A CIGARETTE MADE ACCORDING THERETO

Emil S. Asfour, Waugrain 21, 8704 Herrliberg, Switzerland

Filed June 16, 1975, Ser. No. 586,917
Claims priority, application Switzerland, June 19, 1974, 8366/74; May 20, 1975, 6473/75
Int. Cl.² A24B *1/02*
U.S. Cl. 131—140 C **2 Claims**



1. An improved method of making a smoking article from an endless web of reconstituted tobacco having a mass per unit length substantially equal to that of the smoking article to be made, including the steps of advancing the web along a path of travel, working the web as it travels to modify the structure thereof transversely of its length, forming the worked web as it continues to travel into a continuous rod, applying a wrapping to the rod and cutting the rod into lengths equal to that of the smoking article, the improvement being characterized in that the working is accomplished by longitudinally grooving the web while preventing any substantial transverse contraction thereof to both form therein a plurality of closely spaced narrow longitudinal corrugations and laterally stretch the material of the web to form therein closely-laterally-spaced narrow zones of lesser thickness extending longitudinally of the web wherein the fibers of the web material are loosened and exposed to provide projecting fiber ends and a plurality of discontinuous longitudinal tears without substantially impairing the longitudinal continuity of the web.

4,047,537

PROCESS FOR GROOMING HAIR WITH A HAIR GROOMING AID CONTAINING FIBRILLATABLE POLYTETRAFLUOROETHYLENE RESIN

Glen A. Shaw, Lyndhurst, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 373,585, June 25, 1973, abandoned. This application May 23, 1975, Ser. No. 580,143
Int. Cl.² A45D *7/00*
U.S. Cl. 132—7 **6 Claims**

1. A method of grooming hair comprising:

a. introducing particles of fibrillatable polytetrafluoroethylene resin into and throughout the hair, and

b. fibrillating the resin by combing, brushing or rubbing at a temperature substantially above the temperature at which the resin fibrillates, but below the temperature at which the hair would be damaged, to form a network of fibers, invisible to the naked eye, throughout the hair effective to hold it in place.

4,047,538

CHANGE DISPENSING APPARATUS

Ram N. Sahai, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 8, 1975, Ser. No. 638,728
Int. Cl.² G07D *1/00*
U.S. Cl. 133—4 R **18 Claims**

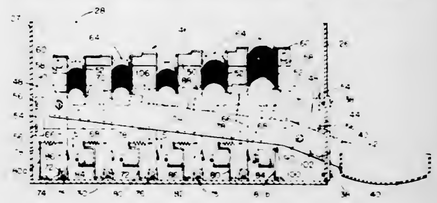
1. A change dispensing apparatus including in combination:

a. a coin channel orientated at an acute angle with a base plane and adapted to receive coins to be dispensed, said coin channel having a discharge end;

b. a coin chute adjacent the discharge end of the coin channel to support vertically orientated coins dispensed from the coin channel, said coin chute extending in a generally downward direction whereby coins will move along the chute on their edges by gravity;

c. a coin receptacle adjacent the end of the coin chute to receive coins deposited on the chute;

d. an actuator member adapted for movement to a dispensing position and located adjacent the discharge end of the coin channel, said actuator member having a coin support-



ing portion extending in a generally horizontal direction to support a coin on its edge when the actuator member is a non-dispensing position;

e. a vertically extending member mounted on said coin chute engaging and positioning the lowermost coin in the coin channel on said coin supporting portion of said actuator member;

f. and means operatively associated with said actuator member to selectively move the actuator member from a non-dispensing position to a dispensing position wherein said supporting portion moves to an inclined position to deposit the lowermost coin on the coin chute for movement to the coin receptacle.

4,047,539

METHOD FOR ESTABLISHING CORE-FLOW IN WATER-IN-OIL EMULSIONS OR DISPERSIONS

Vitold R. Kruka, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 21, 1973, Ser. No. 427,205
Int. Cl.² F17D *1/00*
U.S. Cl. 137—13 **2 Claims**

1. A method for breaking an emulsion of a viscous liquid and less viscous liquid and establishing core-flow of the viscous liquid inside an annulus of the less viscous liquid comprising subjecting the emulsion to a high shear rate by laminar conduit flow and maintaining the shear rate for a residence time of the emulsion in the conduit sufficient to cause migration of a substantial quantity of the less viscous liquid to the proximity of the conduit wall and there agglomerate to form the less viscous liquid annulus, and continuing flow in a conduit of larger diameter without substantially disrupting core-flow of the viscous liquid inside the less viscous liquid by diffusing and slowing flow from the emulsion-breaking conduit into the larger conduit by means of a diffuser having an angle ranging from about 1° to about 30°.

4,047,540

MULTI-PATH VALVE STRUCTURE HAVING EXTENDED LIFE AND BACKWASHING CAPABILITY

Myrl E. Orme, Canoga Park, and Ralph L. Vick, Granada Hills, both of Calif., assignors to The Bendix Corporation, North Hollywood, Calif.

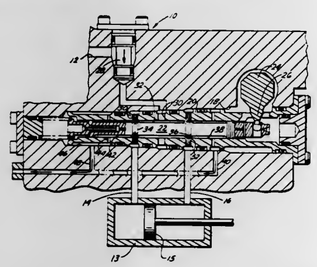
Filed Dec. 29, 1975, Ser. No. 644,393
Int. Cl.² F16K *47/08*; F15B *13/04*
U.S. Cl. 137—239 **13 Claims**

5. In a flow control valve wherein a spool valve member is

movable within a sleeve to open and close fluid passageways in said valve, a rigid structure forming part of said sleeve for dividing the flow entering and leaving said passageways into a plurality of streams comprising a stack of laminar disks having abutting faces and internal edge surfaces adjacent lands of said spool member,

said stack of disks including a first flow path across said stack, said first path including a first series of chambers connected to each other through a first series of orifices, thereby providing restricted flow in an inside to outside direction and substantial pressure drop across each of said orifices;

a second flow path across said stack, said second path including a second series of chambers connected to each



other through a second series of orifices, thereby providing restricted flow in an outside to inside direction and substantial pressure drop across each of said second series of orifices;

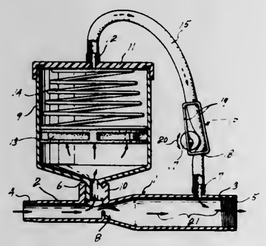
a third flow path across said stack directing a backflushing flow across said first series of orifices; and

a fourth flow path across said stack directing a backflushing flow across said second series of orifices, movement of said adjacent land a small increment from null in a first direction opening said first flow path and further movement in said first direction opening said fourth flow path, and movement of said land a small increment from null in a second direction opening said second path and further movement in said second direction opening said third flow path.

4,047,541
SHOWER HEAD LIQUID DISPENSER

Julien Mercier, 4181-45th Street, Apt. 6, Montreal, Quebec; Real Mercier, Terrebonne County, Mascouche, and Raymond Mercier, St. Anselme de Dorchester, all of Canada

Filed Apr. 15, 1976, Ser. No. 677,349
Int. Cl.[2] E03B 7/07
U.S. Cl. 137—564.5 **1 Claim**

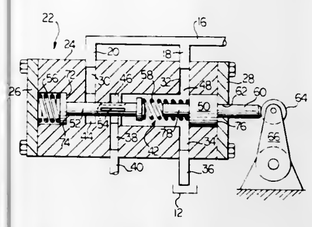


1. A shower head liquid dispenser comprising a tubular body forming a first liquid path extending from end to end of the tubular body and having an upstream portion of relatively smaller cross-section and a downstream portion of relatively larger cross-section, a liquid flow restricting internal lip projecting transversely of the tubular body into the first liquid path and located intermediate the upstream portion and the downstream portion of the tubular body, a lateral liquid outlet and a lateral liquid inlet communicating with said upstream and downstream portions, respectively, a liquid reservior having a neck at oen end removably screwed on said lateral outlet and a removable cover in fluid-tight engagement with the other end of said liquid reservoir, a flexible tube having one end in communication with the inside of said reservoir through said cover and having its other end connected to said lateral liquid inlet, said lateral outlet, reservoir, flexible tube and lateral inlet forming a second liquid path, a piston displaceable in the liquid reservoir and dividing the second liquid path into an upstream path section and a downstream path section in open communication with the lateral outlet and lateral inlet, respectively, a compression sring mounted in said reservoir between said piston and said cover and biasing said piston towards said lateral outlet and away from said cover, a pinch cock secured to said flexible tube to regulate the flow of liquid therethrough, said pinch cock including a roller and a support for the roller for adjustable pinching of the latter against said tube upon rolling of the roller along the support, so constructed and arranged that the flow of liquid along said first path produces relatively higher liquid pressure in the upstream path portion than in the downstream path portion of said tubular body which displaces the piston against the action of said spring to expel a liquid in the downstream section of the reservoir through the downstream section back into said tubular body through said lateral inlet.

4,047,542
BYPASS VALVE

Czeslaw J. May, and Donald A. Piepho, both of Aurora, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 5, 1976, Ser. No. 655,336
Int. Cl.[2] F16K 11/16
U.S. Cl. 137—627.5 **3 Claims**

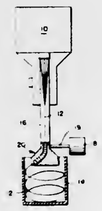


1. A control valve comprising: a valve having inlet portion means comprising first and second inlet ports for communication with first and second branch conduits communicating with a source of fluid pressure, an outlet port adapted to communicate with a tank, and a working port, each port communicating with a bore defined by the valve body; first and second valving spools reciprocally positioned within the bore, the first valving spool being movable to a first position to provide communication between the first inlet port and the outlet port, and movable to a second position to block fluid communication between the first inlet port and the outlet port; and second valving spool being movable to a first position blocking fluid communication between the second inlet port and the working port, and movable to a second position providing fluid communication between the second inlet port and the working port; and means operatively connected with the first and second valving spools for providing that movement of the first valving spool from its first to its second position moves the second valving spool from its first to its second position, and movement of the first valving spool from its second to its first position moves the second valving spool from its second to its first position, wherein the means operatively connected with the first and second valving spools comprise means for providing that the second valving spool provides communication between the second inlet port and working port subsequent to the blocking of fluid communication between the first inlet port and outlet port by the first valving spool, as the first and second valving spools are moved from the first to the second respective positions thereof, wherein the means operatively connected with the first and second valving spools comprise means for providing that the second valving spool blocks communication between the second inlet port and working port prior to the providing of communication between the first inlet port and outlet port by the first valving spool, as the first and second valving spools are moved from the second to the first respective positions thereof, wherein the means operatively connected with the first and second valving spools comprise a first helical spring disposed between the second valving spool and a portion of the valve body, and a second helical spring disposed between the first valving spool and the second valving spool, the first valving spool defining an arm extending therefrom toward the second valving spool, said means operatively connected with the first and second valving spools providing that upon initial movement of the first valving spool from its first toward its second position, the second valving spool remains in its first position relative to the valve body until said extending arm contacts the second valving spool, whereupon the first and second valving spools are moved further together against the resilience of the first helical spring.

4,047,543
GUIDE APPARATUS FOR DEFLECTING A LINEAR STRUCTURE

Burghard Burow, Radevormwald, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Mar. 25, 1976, Ser. No. 670,142
Claims priority, application Germany, Mar. 29, 1975, 2514072
Int. Cl.[2] F16L 9/14, 9/22
U.S. Cl. 138—155 **9 Claims**



1. A device for deflecting a continuously supplied filamentary structure by means of a curved guide tube, said deflection device comprising:

a casing having an entry and an exit opening,

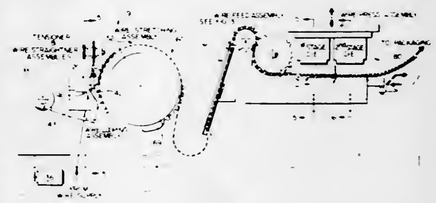
a plurality of contiguously abutting segments forming said guide tube which are disposed within said casing between its entry and exit openings, and

a bonding agent filling the space between the inner wall of said casing and the outer circumference of said segments.

4,047,544
WIRE FORMING APPARATUS

Paul Edward Seaborn, Los Gatos, and Kenneth Harold Dawson, Newark, both of Calif., assignors to The Mead Corporation, Dayton, Ohio

Filed Dec. 27, 1976, Ser. No. 754,243
Int. Cl.[2] B21F 1/04
U.S. Cl. 140—105 **5 Claims**



1. In a wire forming apparatus of the type wherein a pair of rotatable wheels are disposed alongside each other, a plurality of pins secured to each of said wheels about the periphery thereof, and mounting means for rotatably supporting said wheels in such a manner that their axes of rotation are angularly disposed to each other, wherein the improvement comprise:

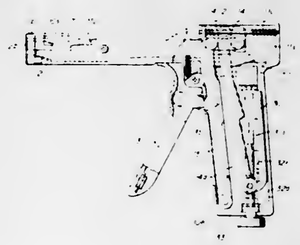
a. looping means disposed adjacent the peripheries of said wheels, said looping means being discontinuously rotatable in a single direction about a central axis, said central axis of said looping means being offset from and parallel to a plane defined by said plurality of pins secured to either of said wheels about the periphery thereof, said looping means intermittently engaging a strand of wire and imparting an undulatory configuration thereto; and

b. pushing means integrally disposed adjacent said looping means for transferring a looped strand of wire from said looping means to one of said pins on one of said wheels, said pushing means comprising at least two individual pushing members, said pushing means and said looping means being aligned and operating in cooperative relationship with one another.

4,047,545
INSTALLATION TOOL

Joseph R. Paradis, Wayland, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Continuation of Ser. No. 656,489, Feb., 1976, abandoned. This application Mar. 24, 1977, Ser. No. 780,724
Int. Cl.[2] B21F 9/02
U.S. Cl. 140—123.6 **9 Claims**



1. A tool for tensioning an item having a free end, comprising

means for gripping and drawing the free end of the item;

means for severing an end portion of said item;

first and second pivotally connected links connected to the drawing means;

means for applying force to said drawing means through said first and second links to apply tension to the end of said item; and

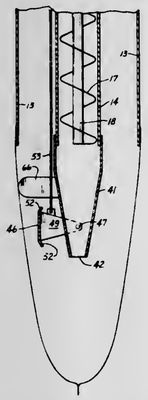
means for maintaining said links in relative alignment until the applied force reaches a prescribed level whereupon said links pivot out of alignment and operate the severing means.

4,047,546

METHOD AND APPARATUS FOR FILLING CONTAINERS

Derrick Arthur Bassendale, Ancaster, and Derrick Bartram, Mississauga, both of Canada, assignors to FMC Corporation, Philadelphia, Pa.

Division of Ser. No. 322,523, Jan. 10, 1973, Pat. No. 3,879,917. This application Feb. 14, 1975, Ser. No. 549,854
Int. Cl.² B65B *1/04*
U.S. Cl. 141—1 R 21 Claims



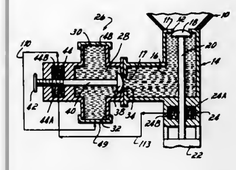
1. Improved cyclic process for the packaging of dusty powders which comprises intermittently and repeatedly feeding a predetermined quantity of said powder, and discharging said quantity from an outlet into a container for said quantity, each cycle of said process comprising said feeding and discharging steps, wherein the improvement comprises, in each cycle, feeding said predetermined quantity of powder into nozzle means, said nozzle means having an inlet and an outlet and being already filled with powder supplied thereto previous to said cycle and having said powder packed at said nozzle and bridging said outlet, and, by said feeding, forcing a stream of powder from said nozzle outlet into said container, said nozzle outlet being narrower than said nozzle inlet and being sufficiently narrow that the powder becomes packed at said outlet and bridges said outlet preventing substantial further flow therefrom at the conclusion of each of said feeding steps while said nozzle means remains filled with said powder.

4,047,547

METHOD OF FILLING, SAMPLING AND SEALING AN ASEPTIC TANK

Steve A. Rechtsteiner, 1920 Gainsborough Lane, Cincinnati, Ohio 45230; Philip E. Nelson, 911 Garden St., and John R. Heron, 1016 Lindberg Road, both of West Lafayette, Ind. 47906

Division of Ser. No. 598,049, July 22, 1975, which is a division of Ser. No. 496,654, Aug. 12, 1974, Pat. No. 3,951,184. This application Mar. 22, 1976, Ser. No. 668,950
Int. Cl.² B65B *3/04*
U.S. Cl. 141—1 4 Claims



1. A method of aseptically sealing and sampling an aseptic storage tank containing sterile product comprising the steps of:

connecting first and second aseptic valves in series with an opening in the tank,

closing the first valve to seal the valve-closure cavity of the first valve from the tank opening to which a first port of the first valve communicates when the first valve is open,

introducing liquid chemical sterilant into the valve-closure cavities of the first and second valves to sterilize and establish first and second aseptic barriers between the tank opening and the environment,

closing the second valve to seal the second valve-closure cavity from the first valve-closure cavity,

unsealing a port in said second valve,

connecting a third valve to said unsealed port of said second valve to establish alternate flow paths including a) a first flow path between said unsealed port of said second valve and said environment and b) a second flow path between said unsealed port of said second valve and a sample container,

introducing liquid chemical sterilant into said second valve-closure cavity via said first flow path to sterilize said unsealed port of said second valve and said second valve-closure cavity,

operating said third valve to establish said second flow path, and

opening said first and second valves to permit sterile product from said tank to enter said sample container via said first and second valve-closure cavities and said second flow path.

4,047,548

VAPOR RECOVERY SYSTEM WITH SAFETY VALVE

Walter D. Wagner, Chaddsford, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

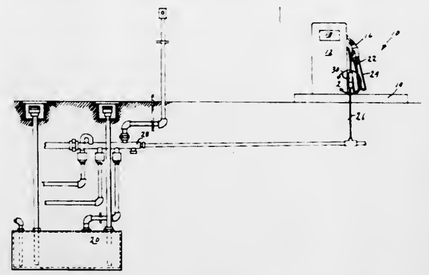
Filed Oct. 28, 1975, Ser. No. 626,418
Int. Cl.² B65B *3/04*
U.S. Cl. 141—52 2 Claims

1. A system for dispensing hydrocarbons, and having a hydrocarbon vapor recovery system to prevent hydrocarbons displaced from a storage tank in a motor vehicle from being vented into the atmosphere, and designed to minimize the danger from fire or explosion in the event of an accident and comprising:

a. an underground facility for storing hydrocarbons displaced from a storage tank in a motor vehicle when the storage tank is being filled with liquid hydrocarbons;

b. a hydrocarbon dispensing station including a dispensing nozzle having a vapor recovery passageway for transporting hydrocarbon vapors displaced from a storage tank in a motor vehicle;

c. means for transporting hydrocarbon vapors picked up by said dispensing nozzle to said hydrocarbon storage facility and including a pipe extending above ground at said hydrocarbon dispensing station and designed to transport vapors from the nozzle to said hydrocarbon vapor storage facility, and a valve means disposed in said pipe near the surface of the ground for sealing off the vapor recovery system in the event the pipe is accidentally damaged, whereby the sealing off of said pipe in the event of an accident minimizes the dangers of fire or explosion possibly caused by an open hydrocarbon storage system in the event of an accident.

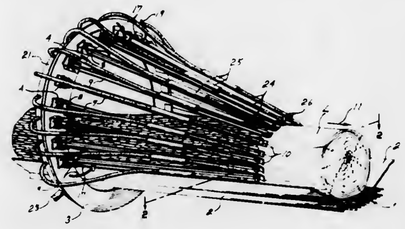


4,047,549

LOG BARKING AND CLEANING MACHINE

Clement Ratelle, St. Laurent, and Pierre Rouillard, Repentigny, both of Canada, assignors to Clement Ratelle, St. Laurent, Calif.

Filed May 11, 1976, Ser. No. 685,353
Claims priority, application Canada, Aug. 21, 1975, 233871
Int. Cl.² B08B *3/00*; B27L *1/00*
U.S. Cl. 144—208 D 10 Claims



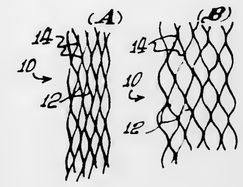
1. In a log barking and cleaning machine defining a path for endwise displacement of at least one log therethrough, the combination comprising a support structure extending transversely to the log path and adjacent the latter, arms pivoted to said support structure in planes extending longitudinally of the log path and intercepting the latter, spring means connected to said arms and inwardly biasing the latter toward operative engagement with a log conveyed endwise along the log path, a liquid jet nozzle secured to each of said arms and inwardly directed toward the log path, and a hydraulic supply system connected to said liquid jet nozzles and arranged to supply liquid under pressure to the latter.

4,047,550

PACKAGING WRAPPER

William A. Scholz, Ontario, Calif., assignor to Standun, Inc., Compton, Calif.

Filed Feb. 23, 1976, Ser. No. 660,421
Int. Cl.² B65D *65/02*
U.S. Cl. 150—52 R 1 Claim



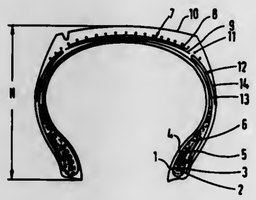
1. A packaging wrapper and article container combination comprising: a relatively rigid article container having an open side, such as a produce box; said article container being adapted to be filled with a multiplicity of relatively small articles; a stretchable net-like wrapper member conforming substantially to a hollow cap-like configuration and having a container receiving opening bounded by an edge of said member; said wrapper member comprising a multiplicity of flexible, non-absorbant, extruded monofilament plastic strands throughout, which are preformed to normally assume a generally rectilinear configuration and extend in the same edgewise direction of said member and transverse to said member edge throughout said edge; and the adjacent strands being joined to one another at relatively widely spaced junctions generally uniformly spaced along the strands with the junctions of each pair of adjacent strands located approximately midway between the junctions of each strand of said pair and its other adjacent strand; relatively small cross-sections of said strands, as compared to said relatively widely spaced junctions, defining adjacent offset circumferential rows of relatively large net openings encircling said container receiving opening and throughout said wrapper member, whereby said wrapper member is stretchable edgewise in a transverse direction of said strands to enlarge the dimensions of said member including the circumferential length of said edge in a manner which deflects said strands laterally into a sinuous configuration as permitted by said relatively large net openings wherein the strands store elastic strain energy for contracting said wrapper member in said transverse edgewise direction when the wrapper member is released; an elastic cord encircling said container opening in and secured to said edge of said wrapper member and having an unstretched circumferential length spaced less than a stretched circumferential length of said edge, said securement of said elastic cord to said edge of said wrapper member being substantially solely by said elastic cord being threaded through at least one row of said net openings adjacent said container receiving opening over and under said strands encircling said container receiving opening, whereby said elastic cord and said edge of said wrapper member are substantially independently stretchable except for said threaded securement; said wrapper member being positioned over said container open side with said independently stretchable wrapper member edge and threaded elastic cord encircling and stretchably gripping said container about its open side for retaining said multiplicity of relatively small articles in said container.

4,047,551

RADIAL TIRES PROVIDED WITH IMPROVED SIDEWALL-STIFFENING STRUCTURE

Mario Mezzanotte, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed July 14, 1976, Ser. No. 705,259
Claims priority, application Italy, Sept. 24, 1975, 27561/75
Int. Cl.² B60C 9/10, 9/18
U.S. Cl. 152—354 8 Claims



1. In a pneumatic tire for vehicle wheels comprising a radial carcass, a tread, a bead containing a bead cord and a breaker arranged between the carcass and the tread, the improvement wherein

the carcass has at least one ply of cords lying in substantially radial planes, said cords extending from one bead to the other and being turned up about the bead core contained in each bead from the inner side towards the outer side of the tire, each bead comprising a filling of high rigidity rubber arranged on the core, the lower zone of each sidewall comprising at least one strip of metal cords arranged with said cords inclined at 90° with respect to the circumferential lines of the tire, in an axially outer position with respect to the turn-up of said carcass and extending radially from the core zone to at least a height equal to 45% of the section height of the tire, and

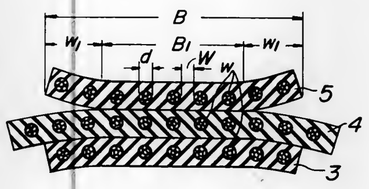
said breaker comprises at least two superimposed layers of cords of threads or wires of a material selected between textile or metallic material having a width corresponding at least to that of the tread, said breaker cords being parallel to one another in each layer and crossed with respect to those of the adjacent layer, and being inclined at an angle ranging between 10° and 35° with respect to the equatorial plane of the tire and, in a radially outer position with respect to said two layers, at least one strip of textile cords arranged in a direction parallel to the equatorial plane of the tire, having a width greater than that of said two layers, said textile cords being made of a material which reduces in length under the action of heat, characterized in that the tire also comprises, in each sidewall, a reinforcement made of a fabric of cords of threads or wires of a material selected between textile or metallic material, arranged in an axially outer position with respect to the carcass and to its turn-up in such a way that said cords, parallel to one another, are inclined, with respect to the circumferential lines of the tire, at an angle ranging between 20° and 30°, said reinforcement being so folded as to have a greater skirting extending from the bead core zone as far as the tire shoulders and a smaller skirting extending from the shoulder zone as far as one half of the section height of said tire, the folding edge of said reinforcement lying substantially adjacent to the layers of cords of threads or wires of a material selected between textile or metallic material of said breaker and underlying said strip of textile cords of the breaker itself.

4,047,552

PNEUMATIC RADIAL TIRE FOR HEAVY LOAD VEHICLES

Muneyoshi Maeda, Higashi-Murayama; Shigeo Watanabe, Kokubunji; Hidenori Takahashi, Tokorozawa, and Toshiyuki Sogi, Higashi-Yamato, all of Japan, assignors to Bridgestone Tire Company Limited, Kyobashi, Japan

Filed Aug. 6, 1976, Ser. No. 712,294
Claims priority, application Japan, Aug. 12, 1975, 50-97132
Int. Cl.² B60C 9/18
U.S. Cl. 152—361 R 5 Claims



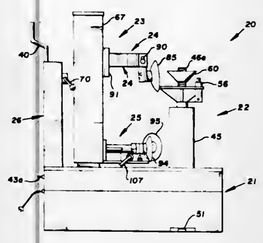
1. A pneumatic radial tire for heavy load vehicles comprising a carcass composed of ply cords lying in a radial plane of the tire or forming a very small angle with said plane and a belt for reinforcement of said carcass including tension members composed of at least two rubberized metal cords crossing with each other at a cord angle of not more than 25° with respect to the equatorial plane of the tire, characterized by coating said metal cords of said tension members with a rubber having a modulus of elasticity of 40–80 Kg/cm², and by widening a distance W between the cords in each of said tension members to 0.2–0.75 *d* based on a diameter *d* of said metal cord, and by uniformly shortening an interlaminar cord distance D between said tension members to 0.2–0.4*d* at a central region extending within 50–80% of a superposed width of said tension members, and by gradually separating said tension members with respect to each other from said central region toward both edges thereof.

4,047,553

TIRE CHANGING DEVICE

Wayne Kotila, 8317-28th Ave. North, Minneapolis, Minn. 55427

Filed May 2, 1974, Ser. No. 466,267
Int. Cl.² B60C 25/06
U.S. Cl. 157—1.24 8 Claims



3. A tire mounting and demounting unit including:

a. a longitudinally extending mounting base;

b. a tire rim mounting member arranged in generally horizontal overlying relation to said base and being rotatable with respect thereto;

c. a generally vertical carrier element arranged for longitudinal movement on said base for shifting the same with respect to said rim mounting member;

e. said carrier element including a vertically shiftable member;

f. bead breaking elements mounted on said vertically shiftable member including an upper bead breaking element vertically and rotatably positioned on said shiftable member and a lower pair of bead breaking elements which upper element and said lower pair of bead breaking elements will engage the opposite beads of a tire mounted on said tire mounting rim;

g. a mounting shaft extending from said vertically shiftable member;

h. a mounting bar arranged on said shaft;

i. said lower pair of bead breaking elements being arranged for rotation on the respective ends of said bar; and,

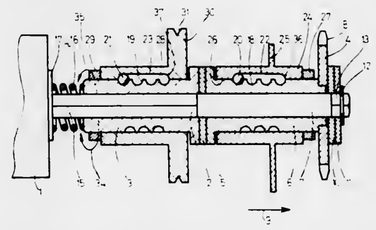
j. means for shifting said vertically shiftable member to bring said bead elements into contact with the tire for breaking the bead thereof from the rim.

4,047,554

DRIVE MECHANISM AND APPLICATION TO A BLIND WITH VERTICAL SLATS

Jean Bullat, Bonneville, France, assignor to Carpano & Pons, France

Filed Nov. 10, 1976, Ser. No. 740,714
Claims priority, application France, Nov. 17, 1975, 75.35559
Int. Cl.² E06B 9/30
U.S. Cl. 160—168 R 5 Claims



1. A drive mechanism comprising first and second rotatable driving elements kinematically connected to a common rotary actuating element respectively by a first coupling arranged to immediately couple the first driving element for a limited rotation with the actuating element when the latter is rotated and a second coupling arranged to couple the second driving element for rotation with the actuating element after a given rotation of the latter, wherein each of said couplings comprises a ramp and a facing groove transverse to the ramp, each ramp and facing groove housing a mobile piece, the ramp and groove of the first coupling being provided on the first driving element and a facing fixed surface, and the ramp and groove of the second coupling element being provided on the second driving element and the actuating element.

4,047,555

METHOD OF AND APPARATUS FOR POSITIONING CONSUMABLE ELECTRODES IN AN ELECTROSLAG REMELTING BATH

Gabriel Lamarque, Paris, France, assignor to Vereinigte Edelstahlwerke AG. (VEW), Vienna, Austria

Filed Sept. 22, 1976, Ser. No. 725,568
Claims priority, application France, Sept. 23, 1975, 75.29081
Int. Cl.² B22D 45/00
U.S. Cl. 164—52 7 Claims

1. In an arrangement for transferring a consumable electrode to and from an underlying mold section positionable along a first vertical axis, first and second vertical masts disposed in spaced relation on generally opposite sides of the first axis and individually extending along second and third axes, first and second lift means respectively mounted for reciprocation on the first and second masts, the first lift means having a fixed portion extending generally transversely across the first axis toward the second mast, the fixed portion having a recess therein aligned with the first axis for receiving an electrode to be lowered into the mold and thereafter raised after consumption via a reciprocation of the first lift means, and a first electrode-transferring arm supported for oscillation on the second lift means toward and away from the first axis and cooperable with the recess in the fixed portion of the first lift means for selectively positioning an electrode in the recess.

6. In a method of vertically transferring an elongated consumable electrode having an integral collar thereon to an underlying mold section disposed on a a first vertical axis, the steps of releasably supporting an electrode to be transferred on a first arm which is movable along a second axis spaced from



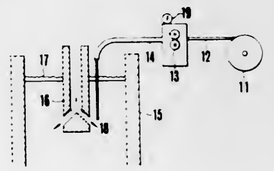
the first axis and oscillatable between the second axis and the first axis; separately supporting an electrode holder in vertically movable relation along a third vertical axis disposed on the opposite side of the first axis, the holder extending in horizontal intersecting relation to the first axis and having a recess aligned with the first axis in the path of oscillation of the first arm; moving the first arm vertically on the second axis until the collar of the engaged electrode is above the upper surface of the electrode holder; oscillating the first arm toward the first axis to position the electrode in the recess of the holder; lowering the first arm along the second axis until the collar abuts the upper surface of the holder and to disengage the electrode from the first arm; oscillating the now-empty first arm away from the first axis; and lowering the holder along the third axis to position the electrode engaged in the recess within the underlying mold section.

4,047,556

CONTINUOUS CASTING METHOD

Tatsuichi Obinata, Tokyo; Kaname Wada, Kisarazu; Shigeaki Ogibayashi, and Hironobu Mihara, both of Kimitsu, all of Japan, assignors to Nippon Steel Corporation and Hitachi Cable, Ltd., both of Tokyo, Japan

Filed Apr. 28, 1975, Ser. No. 571,973
Claims priority, application Japan, May 1, 1974, 49-48324
Int. Cl.² B22D 27/20
U.S. Cl. 164—57 11 Claims



1. A method of producing steel comprising: continuously

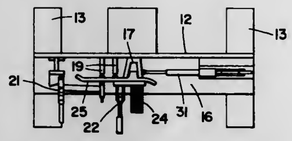
feeding an addition material in a wire form to molten steel in a mold for continuous casting at a predetermined feeding speed corresponding to a desired addition of the addition material, said addition material being composed of an addition metal in wire form and a covering metal thereon, said covering metal being a metal of low reactivity and having a thickness which dissolves at a predetermined depth in the molten steel, bringing the addition material in the wire form into contact with the molten steel, and dissolving the addition metal at a predetermined depth in the molten steel, said cover being made of a metal or alloy of low reactivity, having its side portions being overlapped with each other along its lengthwise direction, and tightly covering said addition metal.

4,047,557

ELECTROSLAG REMELTING APPARATUS FOR REBUILDING GROUSER BARS

James H. Wright, 1211 Wright Ave., Richmond, Calif. 94808

Filed June 1, 1976, Ser. No. 691,900
Int. Cl.² B22D *19/10, 27/02*
U.S. Cl. 164—252 **4 Claims**



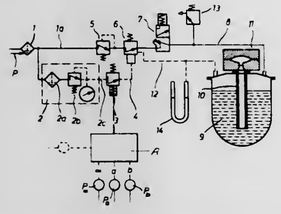
1. Apparatus for rebuilding worn grouser bars, including a support structure, a mold secured to said support structure, said mold having a cavity with the configuration of the outer surface of the original grouser bar and an outward opening, clamp means for securing a track plate to said support structure with said worn grouser bar disposed within said opening and extending into said cavity, consumable electrode welding means for filling the gap in said cavity between the surface of said grouser bar and the mold interior surface with molten electroslag metal; said mold including a base member secured to said support structure, a pair of opposed side members defining the laterally extending sides of the rebuilt grouser bar, and an end plate defining the lateral working end of said grouser bar, said side members and said end plate being secured to said base member.

4,047,558

METERING DEVICE FOR METAL CASTING MACHINES, PARTICULARLY LOW PRESSURE CASTING MACHINES

Winfried Kotthoff, Eversberg, and Wolfgang Wiedenroth, Meschede (Ruhr), both of Germany, assignors to Honsel Werke Aktiengesellschaft, Germany

Filed June 25, 1975, Ser. No. 590,276
Claims priority, application Germany, June 28, 1974, 2431108
Int. Cl.² B22D *11/16*; B22C *19/04*
U.S. Cl. 164—309 **2 Claims**



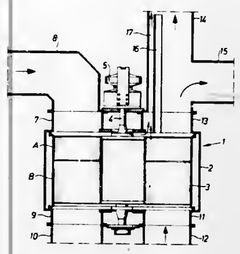
1. In a metal casting machine including a mold, a reservoir connected to the said mold, and gas pressure means connected to said reservoir for delivering molten metal from said reservoir to said mold, a pressure control device comprising a control valve, a pilot valve feeding said control valve with a predetermined gas pressure, and a conduit communicating said control valve with the pressure in said reservoir, said control valve functioning as a differential pressure valve to apply the difference in pressures across said control valve as a control for said gas pressure means.

4,047,559

REGENERATIVE AIR PREHEATER INSTALLATION

Frank Eskil William Asplund, and Axel Erik Konstantin Eggstrom, both of Jarfalla, Sweden, assignors to AB Svenska Maskinverken, Jarfalla, Sweden

Filed Nov. 12, 1975, Ser. No. 631,022
Claims priority, application Sweden, Dec. 6, 1974, 7415304
Int. Cl.² F28D *19/00*
U.S. Cl. 165—7 **2 Claims**



1. In a regenerative air preheater installation of the kind comprising a heat exchanger including a generally cylindrical rotary heat exchanging unit, connected to a driving motor and allowing fluids to flow therethrough in directions generally parallel to its rotary axis, and a stationary casing which surrounds the heat exchanging unit and is provided with axially opposite inlets and outlets for combustion air and flue gas defining two axial passageways for combustion air and flue gas, respectively, extending through the rotary heat exchanging unit, each such passageway being connected with its inlet and outlet in a duct for conveying a flow of combustion air and flue gas, respectively, through the heat exchanger, a branch duct connected to the flue gas duct to allow flue gas to be drawn off from the flue gas duct through said branch duct for subsequent use as an inert gas, the improvement comprising means to conduct away from the flue gas outlet of the heat exchanger at least a major portion of any air passing from the combustion air passageway to the flue gas passageway during the operation of the heat exchanger, said branch duct being connected to the flue gas duct at a point located downstream of the heat exchanger, as viewed in the direction of flow of flue gas through the gas duct, and means defining a passageway through which air may be conducted away from the flue gas outlet of the heat exchanger to a point in the flue gas duct located downstream of the branch duct connection.

4,047,560

REGENERATOR FLOW CONTROL

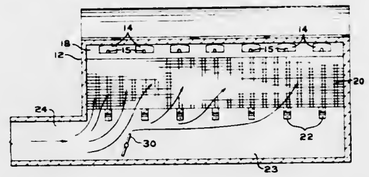
Yih-Wan Tsai, O'Hara Township, Allegheny County, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 8, 1975, Ser. No. 594,153
Int. Cl.² F28D *17/00*
U.S. Cl. 165—9.3 **6 Claims**

1. In a regenerative furnace of the type comprising a combustion chamber, a pair of regenerator chambers, a plurality of burner ports spaced along the sides of the combustion chamber providing for the alternate passage of air and exhaust gases between the combustion chamber and the regenerator chambers, and fuel feeding means associated with each burner port, and in which each regenerator chamber includes a gas-pervious bed of refractory material, a plenum communicating with one side of said bed along its length and with said burner ports, an air distributing space communicating with the opposite side of said bed along its length, and a flue communicating with said air distributing space at one end thereof, the improvement comprising:

a movably mounted baffle in the air distributing space of each regenerator chamber within the first one-third of the air distributing space from the flue end adapted to deflect air passing from said flue into an adjacent portion of said refractory bed; and

means for selectively moving each of said baffles into and out of an air flow diverting position.



5. In a regenerative furnace of the type comprising a combustion chamber, a pair of regenerator chambers, a plurality of burner ports spaced along the sides of the combustion chamber providing for the alternate passage of air and exhaust gases between the combustion chamber and the regenerator chambers, and fuel feeding means associated with each burner port, and in which each regenerator chamber includes a gas-pervious bed of refractory material, a plenum communicating with one side of said bed along its length and with said burner ports, an air distributing space communicating with the opposite side of said bed along its length, and a flue communicating with said air distributing space at one end thereof, the improvement comprising:

a baffle in each plenum extending across substantially the full cross-sectional area of the plenum so as to block the flow of exhaust gases parallel to the top of said refractory bed.

4,047,561

COOLING LIQUID DE-GASSING SYSTEM

Heinz Jaster, and Fred W. Staub, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 515,838, Oct. 18, 1974, Pat. No. 3,989,102.
This application Apr. 5, 1976, Ser. No. 673,463
Int. Cl.² H01L *23/34*
U.S. Cl. 165—32 **2 Claims**

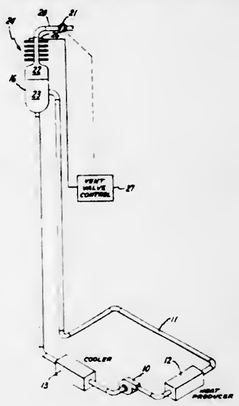
1. A forced liquid cooling system comprising

a main cooling duct loop for continuously circulating dielectric cooling liquid in a closed path past heat producing equipment to be cooled and including a pump for pumping said cooling liquid and a heat exchanger for cooling said cooling liquid,

combined continuous gas separator and liquid-gas interface pressurizer means for pressurizing at least a portion of said cooling liquid with dielectric gas and establishing selected physical conditions to obtain preferential evolution of dissolved gas from said cooling liquid, to thereby prevent the formation of bubbles,

said combined separator and pressurizer means elevated a considerable height above said main cooling duct loop to establish favorable low pressure conditions for gas evolution, and

said combined separator and pressurizer means comprising a pressurizer expansion tank for said cooling liquid having a vertical exit duct connecting to a gas storage tank, a vertically oriented condenser mounted to cool the vapor and



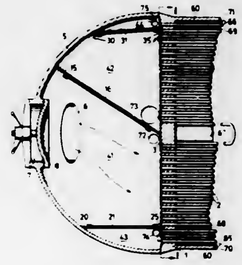
gas in said exit duct, and means for venting excess pressure in said gas storage tank.

4,047,562

HEAT EXCHANGER UTILIZING A VAPORIZED HEAT-CONTAINING MEDIUM

Max Weber, Wiesendangen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed July 10, 1975, Ser. No. 594,618
Claims priority, application Switzerland, May 16, 1975, 6380/75
Int. Cl.² F28B *1/02*
U.S. Cl. 165—111 **9 Claims**



1. A heat exchanger comprising

a horizontally disposed housing having a hood at one end;

a tube plate mounted in said housing in spaced relation to said hood to separate said housing into two sections;

at least a pair of partitions connected between said hood and said tube plate to define at least three chambers within said hood;

an inlet in said hood in communication with a middle one of said chambers to deliver a heat-containing medium thereto;

an outlet in said hood in communication with a second of said chambers to exhaust the medium therefrom in at least condensed form; and

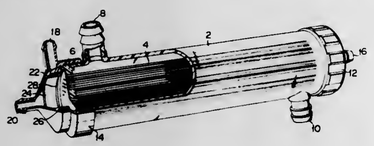
a plurality of horizontally disposed U-shaped tubes mounted on said tube plate and extending away from said chambers, said tubes being disposed in at least one plane, a first

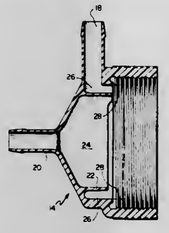
portion of said tubes communicating said one chamber with a third of said chambers, and a second portion of said tubes communicating said third chamber with said second chamber, said second portion being of less number than said first portion.

4,047,563
HEAT EXCHANGER FOR ARTIFICIAL HEART AND LUNG DEVICES

Motoji Kurata, Hatsukaichi, Japan, assignor to Japan Medical Supply Co., Ltd., Horishima, Japan

Filed Apr. 19, 1976, Ser. No. 678,373
Claims priority, application Japan, Jan. 27, 1976, 51-7192[U]
Int. Cl.² F28F *9/02, 21/06;* A61M *1/03;* A61F *7/00*
U.S. Cl. 165—158 **4 Claims**





1. A heat exchanger for use in artificial heart and lung devices, comprising a tubular shell having an inlet side and an outlet side for a heating medium; a plurality of elongated tubes arranged in parallel axially within said tubular shell; a pair of fixing plates locates at both ends of the tubular shell; a first cap secured to the inlet side of said tubular shell having an inlet port for blood; a second cap secured to the outlet side of said tubular shell having an outlet port for blood and air bubble remover means, said air bubble remover means being positioned vertically above said outlet port and downstream thereof relative to the direction of the flow of blood; and an annular baffle means secured within said second cap to divide the inside of said second cap into an inner chamber and an outer chamber, said blood outlet port communicating with said outer chamber and said air bubble remover means communicating with said inner chamber, wherein said annular baffle means accumulates the blood once in the inner chamber so as to remove air bubbles therefrom through the air bubble remover means and then allows the blood to flow into the outer chamber and subsequently to flow out through the outlet port.

4,047,564
WEIGHT AND PRESSURE OPERATED WELL TESTING APPARATUS AND ITS METHOD OF OPERATION

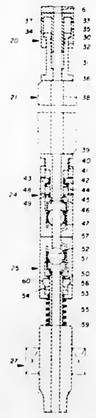
George J. Nix, London, England; Burchus Q. Barrington; David L. Farley, both of Duncan, Okla., and Norman G. Hortman, Laurel, Miss., assignors to Halliburton Company, Duncan, Okla.

Filed July 14, 1975, Ser. No. 595,648
Int. Cl.² E21B *33/03, 43/12, 45/00*
U.S. Cl. 166—72 **32 Claims**

1. An apparatus, for use in conjunction with a testing string having a central flow passage therethrough and located in a fluid filled bore of an oil well extending from the earth's surface to an underground formation, comprising:

normally closed valve means, in the lower portion of the testing string and controlling fluid communication through the central flow passage of the testing string, for selectively opening the central flow passage after the testing string has been lowered into the well bore to the underground formation;

normally open valve means, in the testing string adjacent said normally closed valve means and having a valve for controlling fluid communication through the central flow passage of the testing string subsequent to the opening of said normally closed valve means;



means in said testing string for selectively applying weight to said normally open valve means after said testing string is positioned in the oil well bore;

pressure responsive means in said normally open valve means for developing a force responsive to fluid pressure in the well bore, said force being in opposition to the weight imposed by said weight applying means; and,

valve operating means operable for closing said valve in said normally open valve means responsive to the weight imposed by said weight applying means, and for opening said valve responsive to the force developed by said pressure responsive means.

4,047,565
WELL TOOL

Charles D. Crickmer, Houston, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Mar. 29, 1976, Ser. No. 671,209
Int. Cl.² E21B *23/00*
U.S. Cl. 166—217 **15 Claims**

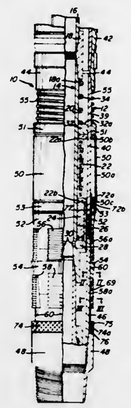
1. A well tool for suspending well equipment in a well, the well tool comprising:

an elongated hanger mandrel;

a plurality of cones axially spaced on said mandrel;

a plurality of sets of slips axially spaced around said mandrel, each set of slips including a plurality of slips circumferentially spaced around said mandrel and positioned with respect to a different one of said cones to engage said one cone upon relative axial movement between the set of slips and the cone;

a plurality of elongated slip reins circumferentially spaced around said mandrel for controlling alignment of said slips during relative axial movement between the set of slips and the cones, each slip rein being secured to a of slip from

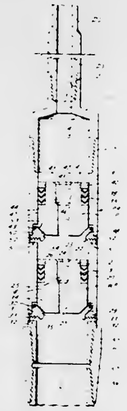


a plurality of said sets of slips and each slip rein controlling the alignment of each slip to which it is secured.

4,047,566
WELL CEMENTING METHOD AND APPARATUS

John A. Duke, 418 Pamela St., Baytown, Tex. 77520

Filed Feb. 27, 1976, Ser. No. 662,047
Int. Cl.² E21B *33/16*
U.S. Cl. 166—285 **10 Claims**



1. A method of cementing a well conduit in a well having a wellhead, comprising the steps of:

forming a well conduit to be cemented in a well at a work surface disposed above the wellhead;

mounting a hanger with the well conduit for supporting the well conduit in the well;

mounting a cementing plug container with the well conduit hanger;

connecting drill pipe with the cementing plug container to form a tubular string to support the hanger and well conduit from the work surface;

lowering the cementing plug container, hanger and well conduit by adding drill pipe to position the cementing plug container and hanger adjacent the hanger support in the well with the well conduit extending into the well;

flowing cement through the drill string, plug container, conduit hanger and conduit into the annulus between the conduit and well;

substantially clearing the conduit of cement by releasing a plug from the plug container at the hanger for movement through the well conduit;

resting the well conduit hanger on the hanger support in the well;

disconnecting the plug container from the conduit hanger to allow retrieval of the plug container after the cement has set;

releasing a wiper plug at the hanger from the plug container to clear the conduit of fluid ahead of the wiper plug to prevent contamination of the cement; and

the step of releasing the wiper plug includes blocking a flow passage in a wiper plug to release the wiper plug ahead of said cement.

7. An apparatus for cementing a well conduit supported by a drill string from a work surface in a well having a wellhead, comprising:

a plurality of drill pipe having a first inner diameter suspended from the work surface and extending to a wellhead;

a cementing plug container connected to the lower end of the drill string and positioned at the wellhead;

cement plug means having a second inner diameter with means releasably mounting the plug means with the plug container;

a well conduit hanger for setting with the well connected with the plug container and positioned at the wellhead;

a well conduit having the second inner diameter connected with the conduit hanger and positioned in the well for cementing with the well;

the plug means includes a plug having a flow passage extending through the plug for clearing cement from the conduit; and

the means for releasably mounting includes a plurality of spring biased fingers for retaining the plug means in the plug container.

4,047,567
OIL WELL CEMENTING PROCESS

Jerry D. Childs, and Roosevelt Love, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Feb. 2, 1976, Ser. No. 654,497
Int. Cl.² C04B *7/02, 7/35;* E21B *33/14*
U.S. Cl. 166—293 **3 Claims**

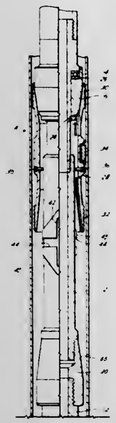
1. A process for sealing at an elevated temperature a zone penetrated by a wellbore using a high efficiency non-gelling hydraulic cement retarder composition having a high degree of predictability for controlling rheology and setting time comprising mixing an aqueous slurry of hydraulic cement with up to about 2% on a dry cement weight basis of a retarder consisting essentially of a low molecular weight sulfoalkylated lignin; wherein the concentration of retarder is calculated to control the setting time of said hydraulic cement to exceed the pumping time; wherein the sulfoalkylated lignin has a molecular weight in the range of about 2,000–10,000 and which is substantially sulfoalkylated on the benzene ring of the lignin molecule in the position ortho to the free phenolic hydroxy group and the sulfonate group is attached to the ortho position by an alkylidene radical having one to three carbon atoms; pumping said hydraulic cement mixture into said zone and maintaining said hydraulic cement mixture in said zone until a high compressive strength is attained.

4,047,568

METHOD AND APPARATUS FOR CUTTING AND RETRIEVING CASING FROM A WELL BORE

Merle W. Aulenbacher, Conroe, Tex., assignor to International Enterprises, Inc., Houston, Tex.

Filed Apr. 26, 1976, Ser. No. 680,472
Int. Cl.² E21B *23/00, 29/00, 31/02*
U.S. Cl. 166—298 **20 Claims**



1. A spearing tool for telescopic disposition with a tubular well pipe or the like comprising:

a gripping assembly comprising first gripping means selectively engageable with said pipe and disengageable therefrom respectively for preventing and allowing movement of said gripping assembly with respect to said pipe in a first longitudinal direction to support said tool in said pipe, and second gripping means longitudinally spaced from said first gripping means and selectively engageable with said pipe and disengageable therefrom respectively for preventing and allowing movement of said gripping assembly with respect to said pipe in a second longitudinal direction opposite to said first direction to spear and retrieve a portion of said pipe;

an operating assembly connected to said gripping assembly and including mandrel means, first actuating means longitudinally fixed with respect to said mandrel means for selectively engaging said first gripping means with said pipe upon relative movement of said assemblies in one direction and second actuating means longitudinally fixed with respect to said mandrel means and longitudinally spaced from said first actuating means for selectively engaging said second gripping means with said pipe upon relative movement of said assemblies in another direction opposite said one direction; and

movement limiting means cooperative between said assemblies to limit said relative movement of said assemblies, and selectively releasable to permit said relative movement of said assemblies.

16. A method of cutting and retrieving pipe and the like in a well bore with a well tool comprising an operating assembly supported on a well string, a gripping assembly connected to said operating assembly and operable thereby to engage and disengage said pipe, releasable movement limiting means cooperative between said assemblies to selectively limit and permit relative movement of said assemblies, and a cutter assembly carried by said well string, said method comprising the steps of:

a. lowering said tool into the well bore on said well string in telescopic relation with said pipe;

b. releasing said movement limiting means;

c. moving said operating assembly in one direction by means of said well string to engage said gripping assembly with said pipe thereby preventing downward movement of said tool with respect to said pipe;

d. cutting said pipe with said cutter assembly;

e. moving said operating assembly in another direction opposite said first direction by means of said well string to engage said gripping assembly with said pipe thereby preventing upward movement of said tool with respect to said pipe;

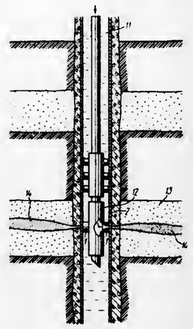
f. raising said tool and said pipe out of said well bore by means of said well string.

4,047,569

METHOD OF SUCCESSIVELY OPENING-OUT AND TREATING PRODUCTIVE FORMATIONS

Kurban Magomedovich Tagirov, ulitsa Lenina, 408a, kv. 25, and Nikolai Rubenovich Akopian, ulitsa Sochinskaya, 64, both of Stavropol, U.S.S.R.

Filed Feb. 20, 1976, Ser. No. 659,745
Int. Cl.² E21B *43/26*
U.S. Cl. 166—308 **1 Claim**



1. A method of successively opening-out and treating gas and oil bearing formations by forming hydraulic fractures therein with abrasive-laden fluid, comprising the steps of pressing jet nozzles tightly to a casing wall opposite the area where a hydraulic fracture is to be formed, the nozzles having a diameter of their through passage, which ensures that at a constant flow rate of the abrasive-laden fluid pumped through the nozzles there is maintained a pressure sufficient for hydraulic fracturing of the formation; pumping said abrasive-laden fluid at said flow rate through said nozzles at a pressure sufficient for making perforations through said casing wall, but not less than the pressure of hydraulic fracturing of the formation, until perforations are made in said casing wall of diameters substantially equal to those of said through passages of said nozzles; upon said perforations having been made, varying the flow rate of said abrasive-laden fluid pumped through said nozzles, to build up a substantially constant pressure within said formation, not less than the pressure of hydraulic fracturing of said productive formation.

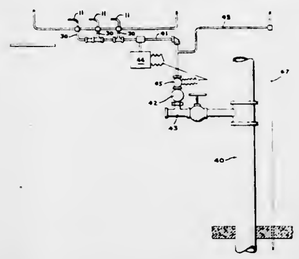
4,047,570

SPRINKLER SYSTEM FOR EXISTING BUILDINGS

Michael E. Munk, 28 Dorchester Drive, Port Chester, N.Y. 10573

Filed Mar. 8, 1976, Ser. No. 664,587
Int. Cl.² A62C *35/00*
U.S. Cl. 169—16 **7 Claims**

1. In a sprinkler system for a building having at least one room and at least one hung ceiling for said one room, at least one duct for heating, ventilating or cooling mounted in the cavity above said at least one ceiling, at least one element mounted to the wall of said one hung ceiling which is in fluid communication with the interior of said one duct and the interior of said one room, wherein the improvement comprises: at least one main branch tube mounted within said one duct so that said one duct completely surrounds said one main branch tube; means for mounting said one main branch tube in said one duct; at least one secondary branch tube having a first end in fluid communication with the interior of said one main branch tube and a second end mounted in said one element in communication with the interior of said one duct; means for connecting said first end to said one main branch tube; one sprinkler head mounted in said one element and connected to and in fluid communication with said second end of said one secon-



dary branch tube; means for supplying water to said one main branch tube and said one secondary branch tube; means for automatically controlling the operation of said one sprinkler head in response to a fire being detected in said one room; and one tertiary branch tube having a first end connected to and in fluid communication with said one main branch tube and a second end connected to and in fluid communication with said one means for supplying water and said one main branch tube; and means for connecting said first end of said one tertiary branch tube to said one main branch tube, whereby upon the start of a fire in a room, the sprinkler head is supplied with water under pressure via the main branch tube, the secondary branch tube and the tertiary branch tube.

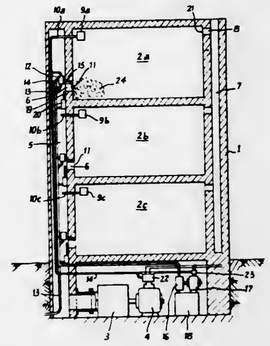
4,047,571

AUTOMATIC FIRE EXTINGUISHING SYSTEM FOR A BUILDING HAVING CENTRAL AIR CONDITIONING

Guy Chaintrier, Les Drouillards, Generac (Gironde), XVeme, and Christian Chaintrier, 8 Rue Frederic Magisson, Paris, XVeme, both of France

Filed Apr. 14, 1975, Ser. No. 568,060
Claims priority, application France, Apr. 12, 1974, 74.13075
Int. Cl.² A62C *5/02, 37/00*
U.S. Cl. 169—60 **9 Claims**

1. In a fire extinguishing system for multicompartmented buildings said system comprising: the combination of a trunkline duct system having an upstream inlet and a plurality of downstream branch duct outlets, at least one of said duct outlets being in each compartment to be protected, an air conditioning system having an outlet connected to said duct system inlet for providing an air stream in said duct system, a high expansion foam plug generator located adjacent at least one branch duct outlet for each compartment to be protected and control means associated with each of said compartments to be protected for simultaneously energizing said air condi-



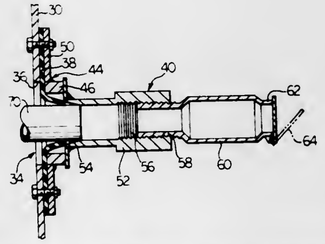
tioning system and said foam plug generator in response to the presence of a fire in said compartment.

4,047,572

VEHICLE FIRE SUPPRESSION ACCESS PORT

William Richard Stary, Peoria, and David Merrill Shaw, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 17, 1976, Ser. No. 687,122
Int. Cl.² A62C *35/12*
U.S. Cl. 169—62 **10 Claims**



1. In a fire control apparatus for use in extinguishing fires in a closed compartment, a panel defining one wall of said closed compartment, an access port communicating through said panel into said compartment, said access port comprising a distortable and slotted diaphram covering an opening in said panel, a nozzle assembly aligned with the opening and carried by the panel interior of said compartment whereby fire suppressant directed through the access port and through the nozzle assembly will act to suppress a fire in the compartment.

4,047,573

APPARATUS FOR FACILITATING THE MECHANICAL HARVESTING OF TOMATOES

Kenneth M. Aoyama, 803 Mace Blvd., Davis, Calif. 95616

Division of Ser. No. 604,422, Aug. 13, 1975, Pat. No. 3,990,217.
This application Apr. 29, 1976, Ser. No. 681,715
Int. Cl.² A01D *46/00*
U.S. Cl. 171—14 **3 Claims**

1. Apparatus for facilitating the harvesting of tomatoes comprising:

a. a fore and aft frame;

b. means for supporting said frame on the ground as said apparatus is advanced along one row of a plurality of substantially parallel rows of tomato plants, said frame

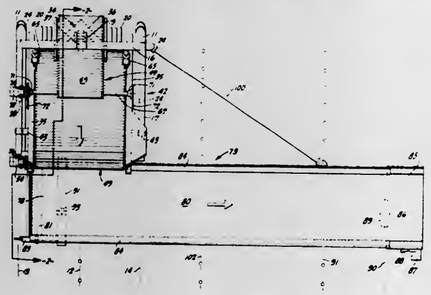
supporting means being a pair of skids straddling the plants in said one row;

c. knife means mounted on the forward end of said frame and projecting forwardly for cutting the plants in said one row ahead of said apparatus;

d. fore and aft conveyor means mounted on said frame for transporting the cut plants rearwardly toward the after end of said frame, said conveyor means including,

1. a main fore and aft power driven endless chain conveyor having an upper run mounted for movement from a forward location adjacent said knife means to receive the plants cut thereby rearwardly and upwardly toward said after end of said frame, and

2. a secondary fore and aft endless chain conveyor having a lower run movable in a rearward and upward direction and spaced above said upper run of said main conveyor a distance such as to engage the subjacent plants cut by said knife means and carried rearwardly and upwardly by said upper run of said main conveyor; and,



e. elongated transverse conveyor means removably connected at one end to said after end of said frame and extending laterally to another one of said plurality of rows for transferring the cut plants from said one row toward said other row, said transverse conveyor means including,

1. a power driven endless belt, and

2. a supporting dirigible wheel mounted adjacent the other end of said transverse conveyor means, said dirigible wheel being mounted for movement along a path separating an adjacent pair of said plurality of rows as said apparatus is advanced along said one row,

said transverse conveyor means being of a predetermined length such that as the cut plants from said one row are discharged at said other end of said transverse conveyor means the cut plants from said one row are united with the plants in said other row and in which the united plants in said other row are capable of being harvested by a mechanical harvester.

4,047,574

IMPLEMENT FOR LEVELLING LEVEES

Calvin I. Foreman, Rte. 1, Box 8, Iowa, La. 70647

Filed June 1, 1976, Ser. No. 691,248

Int. Cl.² A02B *13/02, 35/02;* **F02F** *5/08*

U.S. Cl. 172—178 **2 Claims**

1. An implement for levelling levees and the like to the general contour of the earth's terrain comprising:

a. frame means;

b. said frame means including:

1. longitudinally extending, spaced members;

2. spaced lateral members extending between and connected to said longitudinally extending members to form a frame having spaced sides, a front and rear end;

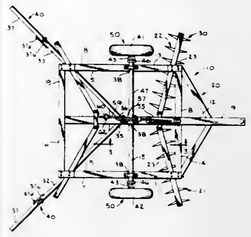
3. tow bar means projecting from said front end of said frame; and

c. a pair of ganged disc harrows supported by said frame means and depending downwardly therefrom;

d. each of said pair of ganged disc harrows extending inwardly from a side of said frame and towards the rear end of the frame to form a generally V shape with the apex of the V shape being disposed adjacent the center longitudinal axis of said frame;

e. dozer blade means supported by said frame means and depending therefrom;

f. said dozer blade means comprising a pair of dozer blades each of which extends from a side of said frame and inwardly towards the front end of the frame to form gener-



ally a V shape with the apex of the V being disposed adjacent but rearwardly of the apex of the V formed by said ganged disc harrows;

g. adjustable wheels means supporting said frame;

h. means to adjust said wheel means to raise and lower said frame relative to the terrain to thereby regulate the contact of said ganged disc harrows and dozer blade means with the earth; and

i. said dozer blades each including an end portion which is pivotally mounted thereon whereby such end portion may be moved up on top of the balance of said dozer blade to reduce the width of the dozer blade.

4,047,575

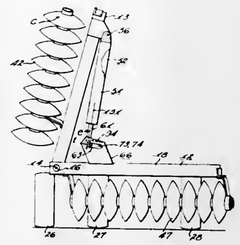
FOLDUP IMPLEMENT WITH LIFT ARRANGEMENT FOR WING THEREOF

Robert L. Wagner, La Porte, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jan. 8, 1976, Ser. No. 647,608

Int. Cl.² A01B *73/00, 63/22*

U.S. Cl. 172—311 **13 Claims**



1. A farm implement including a main section adapted for connection in draft relation to a tractor and a wing section pivotally connected to the main section at one lateral side of the latter for vertical swinging movement about a longitudinal axis between a lowered working position and a raised transport position, means for pivoting said wing section relative to said main section between said working and transport positions comprising:

a double-acting hydraulic jack disposed in transverse relation to said longitudinal axis having cylinder and rod components,

pivot means pivotally connecting one of said components to one of said sections at a point spaced from said longitudinal pivot axis, and

a lost motion pivot connection between the other of said components and the other of said sections including

a first pivot part fixedly secured to said other section at a position spaced laterally from said longitudinal pivot axis including an elongated slot with the elongated extent thereof extending generally laterally relative to said other section, said pivot part and said pivot means being disposed on laterally opposite sides of said longitudinal pivot axis when said wing section is in its lowered working position, and

a second pivot part on said other component in cooperative engagement with said slot for movement from one extremity of said slot to the other, the longitudinal axis of said jack having a substantially right-angle relationship with said elongated extent of said slot when said wing section is raised by contraction of said jack to a position wherein the center of gravity of said wing section is in vertical alignment with said longitudinal axis, said pivot connection between said sections and said lost motion pivot connection permitting said wing section to swing downwardly about said longitudinal axis to a downwardly inclined angle relative to said main section.

4,047,576

CULTIVATOR WHEEL FOR AGRICULTURAL MACHINES

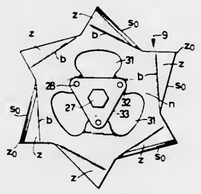
Willy Rau, Weilheim, Teck, and Christian Taus, Kirchheim, Teck, both of Germany, assignors to Maschinenfabrik Rau OHG, Weilheim, Teck, Germany

Filed Aug. 15, 1975, Ser. No. 605,186

Claims priority, application Germany, Aug. 17, 1974, 2439595; July 26, 1975, 2533625

Int. Cl.² A01B *15/16*

U.S. Cl. 172—540 **12 Claims**



1. A cultivator wheel having an axis and adapted for rotation about said axis, comprising a hub; a plurality of successive triangular tines having pointed end portions and being distributed about said hub, successive ones of said tines being bent in opposite directions out of a central radial plane of said wheel, said tines having shorter sides and longer sides, said shorter sides of said tines extending nonradially relatve to said axis, said longer sides of said tines being provided with cutting edges each extending substantially along the full length of the respective one of said longer sides and inclined to said central radial plane; said wheel being provided with openings between said cutting edges and said hub.

4,047,577

DISCHARGE CONTROLLING PLOW SWEEP

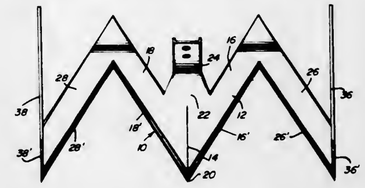
Robert C. Tibbs, II, Hospital Drive, Cleveland, Miss. 38732

Filed Sept. 22, 1976, Ser. No. 725,422

Int. Cl.² A01B *39/20*

U.S. Cl. 172—730 **8 Claims**

1. A plow sweep including a shovel body defining a central front to rear extending axis and having a pair of first and second rearwardly divergent blade arms disposed on opposite sides of said axis joined at their forward ends along said axis to define a forward apex of said sweep, said arms being transversely rearwardly and upwardly inclined and the rear portion of said apex including an integral upwardly directed mounting shank portion, the rear end of at least one of said arms terminat-



ing in an oppositely forwardly angulated blade-type wing arm, the forward edges of said arms being sharpened and said wing arm also being transversely rearwardly and upwardly inclined, the portions of said wing arm and the corresponding blade arm adjacent the juncture thereof having their rear edge portions downwardly depressed into at least generally horizontal front to rear extending positions.

4,047,578

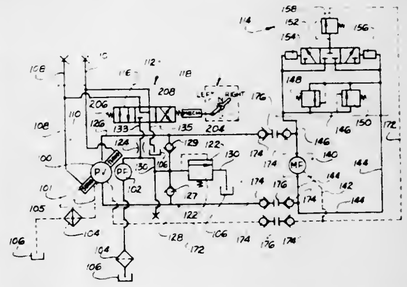
PORTABLE EARTH BORING MACHINE

William S. Appleman, Ashland, Ohio, assignor to The Richmond Manufacturing Company, Ashland, Ohio

Continuation-in-part of Ser. No. 455,388, March 27, 1974, Pat. No. 3,907,043. This application June 30, 1975, Ser. No. 591,642

Int. Cl.² E21D *9/02;* **E02D** *7/28*

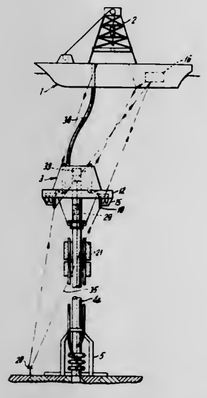
U.S. Cl. 173—152 **2 Claims**



1. An earth boring apparatus for drilling vertically extending holes and pushing casing sections therein, said apparatus comprising, in combination, vertically extending track means; main frame means mounted for movement along said track means; a fluid motor mounted on said main frame means; auger connecting shaft means driven by said fluid motor; auxiliary frame means for disposition at a location remote from said main frame means; an engine mounted on said auxiliary frame means; variable displacement pump means mounted on said auxiliary frame means and driven by said engine; conduit means forming a closed loop circuit between said pump means and said fluid motor; a servo motor for varying the displacement of said pump means; pump control valve means for controlling a control flow of pressurized fluid to said servo motor, said valve means including a "center" position isolating said fluid motor from said control flow, a "right" position for delivering said control flow to one side of said servo motor, and a "left" position for delivering said control flow to the other side of said servo motor; manually operated control means for actuating said pump control valve means, said closed loop circuit including a first circuit portion that is alternately exposed to

high and low pressure, and a second circuit portion that is alternately exposed to high and low pressure; a second pump means for charging said closed loop circuit with make-up fluid; and check valve means for selectively releasing said make-up fluid to whichever one of the circuit portions is operating at low pressure.

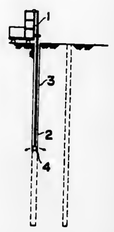
4,047,579
SEA DRILLING JIG
Helmut Wilckens, Emden, and Helmut Wetzel, Hannover, both of Germany, assignors to Rheinstahl AG, Germany
Filed Mar. 4, 1976, Ser. No. 663,915
Claims priority, application Germany, Sept. 27, 1975, 2543293
Int. Cl.² E21B *15/02*
U.S. Cl. 175—7 **8 Claims**



1. A sea drilling jig having foul weather rigging provisions, comprising a drilling tool carrier ship having at least one hull, a drill tower mounted on said hull, said hull having a hull opening from the interior of said hull downwardly into the sea below said tower, a riser head engageable in the hull opening for coupling to said hull, said riser head including a float portion with a ballast tank and having a vertically extending riser tube opening therethrough for receiving a riser tube therein, securement means for securing a riser tube so that it extends through said riser head opening and is secured to said riser head, said riser head being detachable from said carrier ship and self-propulsion means on said riser head for maneuvering said riser head with the riser tube secured thereto independently of the ship.

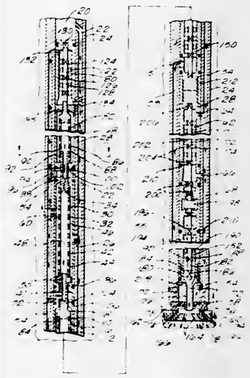
4,047,580
HIGH-VELOCITY JET DIGGING METHOD
Teruo Yahiro, and Hiroshi Yoshida, both of Tokyo, Japan, assignors to Chemical Grout Company, Ltd. and Kajima Corporation, both of Tokyo, Japan
Continuation of Ser. No. 523,647, Nov. 13, 1974, abandoned.
This application Mar. 12, 1976, Ser. No. 666,280
Claims priority, application Japan, Sept. 30, 1974, 49-111600
Int. Cl.² E21B *7/18*
U.S. Cl. 175—67 **4 Claims**

1. A method of digging in the earth comprising the steps of moving a nozzle along a subterranean longitudinal path while directing a high velocity jet of liquid from the nozzle in a direction which is transverse to said path, surrounding the jet of liquid with a gaseous jet directed substantially parallel to the jet of liquid, reducing increases in the cross section of the jet of liquid and increasing and making more uniform its effective



length by maintaining the velocity of the jet of gas at least about one-half the velocity of sound in the gas.

4,047,581
MULTISTAGE, DOWNHOLE, TURBO-POWERED INTENSIFIER FOR DRILLING PETROLEUM WELLS
John W. Erickson, Huntington Beach, Calif., assignor to Kobe, Inc., Huntington Park, Calif.
Filed Dec. 1, 1976, Ser. No. 746,408
Int. Cl.² E21B *3/08*
U.S. Cl. 175—95 **19 Claims**



1. A multiple stage, downhole, turbine-powered intensifier for drilling petroleum wells comprising:

a. a plurality of turbines aligned along a common axis;

b. a plurality of rotary pumps driven by the plurality of turbines and axially aligned therewith, the pumps and turbines forming an assembly which is long and comparatively small in maximum dimension taken radially of the axis;

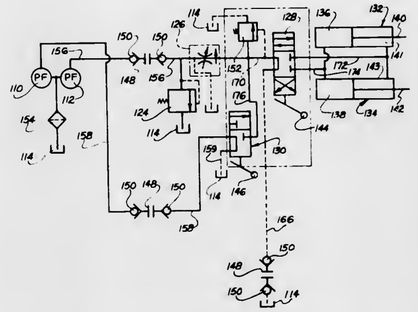
c. passage means to supply the turbines with power fluid in parallel streams with each turbine having one of the parallel streams as its input;

d. passage means to exhaust the turbines of the power fluid;

e. passage means to supply the pumps with a working fluid in series so that each pump stage increases the pressure of the working fluid; and

f. nozzle means at the base of the intensifier for receiving the working fluid from the last stage pump and directing such fluid at bore hole wells.

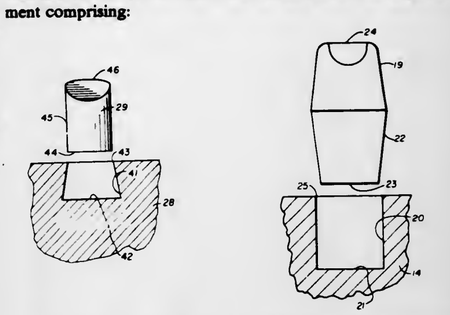
4,047,582
PORTABLE EARTH BORING MACHINE
William S. Appleman, Ashland, Ohio, assignor to The Richmond Manufacturing Company, Ashland, Ohio
Continuation-in-part of Ser. No. 455,254, March 27, 1974, abandoned. This application June 30, 1975, Ser. No. 591,641
Int. Cl.² E21D *9/02*; E02D *7/28*
U.S. Cl. 175—122 **2 Claims**



1. An earth boring apparatus for drilling vertically extending holes and pushing casing sections therein, said apparatus comprising, in combination, vertically extending track means; casing pusher means on said track means for engaging the rear end of a casing section; pushing cylinder means for moving said casing pusher means along said track means and including an extension chamber and a retraction chamber; auxiliary frame means for disposition at a location remote from said main frame means; an engine mounted on said auxiliary frame means; pump means driven by said engine for delivering pressurized fluid to said pushing cylinder means; conduit means connecting said pushing cylinder means with said pump means; control means including a directional valve means in the flow of pressurized fluid from said pump means to said pushing cylinder means, said directional valve means including a closed center position for isolating both of said chambers from said flow, an extension position for pressurizing said extension chamber and draining said retraction chamber, and a retract position for pressurizing said retraction chamber and draining said extension chamber; volumetric flow varying controller in said control means and including a low flow position for delivering a relatively low volumetric flow from said pump means to said pushing cylinder means and a high flow position for delivering a relatively high volumetric flow from said pump means to said pushing cylinder means; a first manual actuator for said control means for selectively positioning said directional valve means in said center, extension, and retraction positions; a second manual actuator for said control means for selectively positioning said volumetric flow varying valve means in said low flow and high flow positions; and variable flow control means in the flow of pressurized fluid from said pump means to said directional controller , said pump means including a first pump for delivering a first flow of pressurized fluid to said directional valve means, and a second pump for delivering a second flow of pressurized fluid to said volumetric flow varying controller.

4,047,583
EARTH BORING CUTTING ELEMENT RETENTION SYSTEM
Norman Dean Dyer, Plano, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed June 1, 1976, Ser. No. 691,732
Int. Cl.² E21C *13/00*
U.S. Cl. 175—410 **5 Claims**

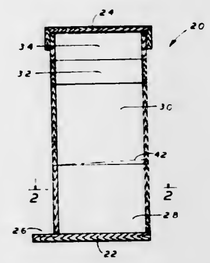
5. In a rock drill bit having an insert receiving socket for receiving a hardened insert, wherein the socket has an inner wall and bottom and the insert has an outer wall, the improvement comprising:



said socket inner wall being tapered outward toward said bottom and

said insert outer wall being cylindrical.

4,047,584
BEE-HIVE SCALE
Richard T. Daly, Coleman Court, Huntington, N.Y. 11743
Filed July 8, 1976, Ser. No. 703,543
Int. Cl.² G01G *19/00, 3/14*; G01L *5/12*
U.S. Cl. 177—1 **11 Claims**

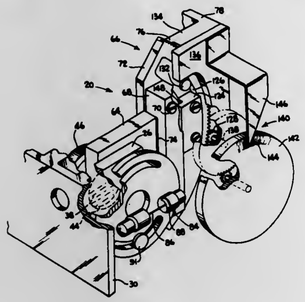


1. A portable bee-hive scale comprising; a housing and power source, a probe having a tongue extending from one end and adapted to be removably inserted at predetermined locations in a bee-hive, reaction means on the probe responsive to weight on the tongue, gauge means on the probe to read the response of the reaction means and provide a representative electrical signal, logic, memory and display means in the housing electrically connected to the gauge means to receive and process the signal therefrom, and control means to selectively operate the memory, logic and display means to indicate a desired weight.

4,047,585
SCALE OPTICAL DETECTOR WITH SPRING CONSTANT VARIATION COMPENSATOR
Daniel F. Diagos, Huntington, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed Mar. 8, 1976, Ser. No. 664,579
Int. Cl.² G01G *3/00, 23/36*
U.S. Cl. 177—210 R **14 Claims**

1. A weighing scale comprising a tare structure including load supporting means, spring means having a spring constant and adapted to provide substantially linear vertical displacement of the tare structure as a direct function of the mass of a load being weighed, and an optical detector for determining the extent of tare structure displacement, the detector including a first optical grating, means fixing the first optical grating with respect to tare structure displacement, a second optical grating, means interconnecting the second optical grating to the tare structure for unitary movement therewith the detector

further including means providing a light beam, the gratings being so positioned as to modulate the light beam to have a cyclic optical interference pattern, the interference pattern including a plurality of spaced moire fringes, movement of the second grating providing movement of the fringes, photodetector means positioned in alignment with the interference pattern and adapted to detect pattern movement, and compen-



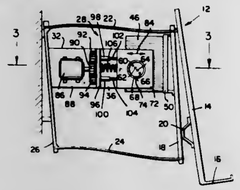
sating means including means to adjustably vary the angle of both said first and said second second gratings with respect to the direction of tare structure displacement, said compensating means adapted to compensate the interference pattern to provide pattern movement equivalent to a displacement of the second grating which is greater than the actual displacement, whereby compensation for variation in spring constants is provided.

4,047,586

ZERO LOAD ADJUSTMENT APPARATUS FOR SPRING WEIGHING SCALE

Daniel F. Dlugos, Huntington, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Mar. 23, 1976, Ser. No. 669,528
Int. Cl.² G01G *23/26*
U.S. Cl. 177—210 R **15 Claims**



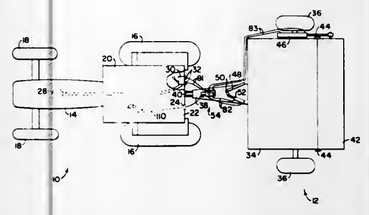
1. A zero load adjustment apparatus for a spring weighing scale having an optical detector and adapted to determine load weight as a function of the detected position of a scale tare, the detector including photodetector means for sensing the image of a modulated light beam, the adjustment apparatus comprising means mounting the photodetector means for movement in a plane transverse to the axis of the light beam and means adapted to provide controlled displacement of the photodetector means with respect to the image of the modulated light beam whereby the photodetector means may be registered with an image configuration at a tare no load position such that the photodetector means will provide a zero load signal to provide compensation for changes in the tare no load position.

4,047,587

TRACTOR-IMPLEMENT CONTROL SYSTEM

Henry Dennis Anstey, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed July 12, 1976, Ser. No. 704,287
Int. Cl.² B60K *25/00*; F16K *31/46*
U.S. Cl. 180—53 R **8 Claims**



1. In a tractor-trailing implement combination wherein the tractor includes an operator's station, a hydraulic coupling means connected to a hydraulic power source on the tractor, and a control valve for controlling the flow of hydraulic fluid between the source and the coupling means, and the implement includes a frame and at least two functional units with hydraulic actuators, an improved hydraulic control system for connecting the hydraulic actuators on the implement to the coupling means on the tractor and directing the flow of hydraulic fluid between them comprising:

an implement valve mounted on the implement frame having an inlet connected to the coupling means, at least two outlets respectively connected to the hydraulic actuators, and a control element movable to a plurality of settings so that the inlet may be selectively connected to any one of the outlets and biased to a first setting; and

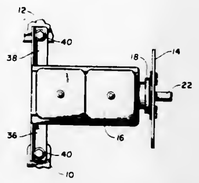
means operatively connected to the control element for moving the control element between its alternate settings and including locking means for retaining the control element in any one of the selected settings and actuating means disposed at the operator's station and connected to the locking means so that an operator on the tractor may selectively direct hydraulic power to any one of the hydraulic actuators on the implement.

4,047,588

SNOWMOBILE ENGINE MOUNT

Jaroslav Blass, Chaska, Minn., assignor to Kawasaki Motors Corporation U.S.A., Santa Ana, Calif.

Filed Dec. 22, 1975, Ser. No. 643,554
Int. Cl.² B60K *5/06*
U.S. Cl. 180—64 R **2 Claims**



1. In a snowmobile having a chassis including a generally vertical side frame, and an engine including an output shaft extending laterally therefrom through said side frame and an output end having a crankcase extension flange extending outwardly therefrom, an improved engine mounting comprising;

first mounting means at the output end of said engine including rigid inner and outer mounting members spaced radially of said output shaft and a resilient intermedite member trapped between said rigid inner and outer members; said inner mounting member comprising a base portion secured to said extension flange, a first wall portion extending outwardly from said base portion in a direction generally parallel to the axis of said output shaft and a second wall portion extending from the first wall portion normal thereto; said outer mounting member comprising a base portion secured to said side frame, a first wall portion extending from said base portion toward said engine and a second wall portion extending from said first wall portion normal thereto, said first and second wall portions of said inner and outer members restraining movement of said intermediate member in all directions, said inner, outer and intermedite mounting members being formed to completely surround said output shaft;

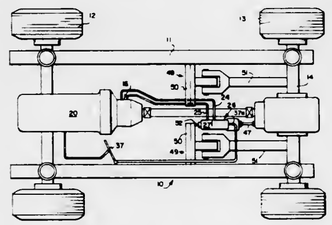
and second mounting means securing the opposite end of said engine to said chassis; said second mounting means comprising brackets extending forwardly and rearwardly from said engine, the outer ends of each of said brackets being trapped between rubber bushings.

4,047,589

METHOD AND APPARATUS FOR CLOSED LOOP ACCELERATION CONTROL FOR VEHICLES

Harvey B. Jansen, Tempe, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 18, 1976, Ser. No. 668,154
Int. Cl.² B60K *26/00*
U.S. Cl. 180—108 **13 Claims**



1. An acceleration control system for a vehicle having an engine with a throttle, a variable speed transmission, an axle with a housing, and drive wheels comprising:

a. power responsive means for adjusting the transmission to change the speed ratio thereof;

b. means controlling the application of power to said power responsive means;

c. actuating means for said power controlling means responsive to engine throttle movement, transmission output speed, and drive wheel thrust.

4,047,590

HYDRAULIC CIRCUIT FOR STEERING CONTROL IN ARTICULATE VEHICLES

Kenzo Hoashi, Yokohama, and Nobuaki Inaba, Hiratsuka, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 5, 1975, Ser. No. 638,071
Int. Cl.² B62D *5/06*
U.S. Cl. 180—139 **3 Claims**

1. A hydraulic circuit for steering control in articulate vehicles including a prime mover said circuit comprising:

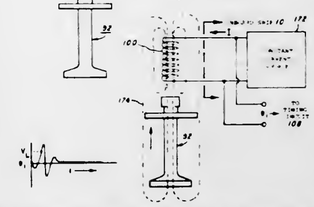
a fixed displacement pump driven by said prime mover, the output of said fixed displacement pump being directly proportional to the speed of said prime mover;

a variable displacement pump driven by said prime mover, the output of said variable displacement pump being connected to a control valve of a steering actuator;

control cylinder means including a piston rod for controlling displacement of said variable displacement pump and a spring acting on said piston rod, said control cylinder means being connected to the fixed displacement pump through a first pipe;

restricting means having one side connected to the output of said fixed displacement pump through a branch pipe from said first pipe;

a reservoir coupled to the other side of said restricting means;



wherein said control cylinder means is actuated by the force of said spring and an opposite force resulting from a differential hydraulic pressure at said restricting means and whereby the output of said variable displacement pump is held constant irrespective of the speed of said prime mover; and

linkage means interconnecting said variable displacement pump and the piston rod of said control cylinder means.

4,047,591

AIR GUN MONITORING AND SYNCHRONIZING METHOD AND APPARATUS

Phillip W. Ward, Dallas; Robert C. Donald, Jr., Richardson, and Arthur E. Leerskov, Jr., Sherman, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 3, 1975, Ser. No. 564,932
Int. Cl.² G01V *1/02, 1/38*
U.S. Cl. 181—119 **19 Claims**

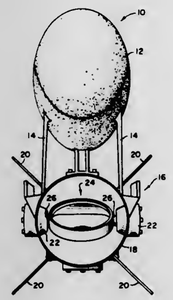
1. In a method for controlling the time of firing of an air gun actuated through subjecting a shuttle to gas pressure to thereby accelerate said shuttle and release compressed gas stored in said gun, the improvement comprising monitoring movement of said shuttle when accelerated by use of a sensor responsive to variation in a field caused by such movement which variation produces a signal indicative of such movement.

4,047,592

SELF-DRIVEN UNDERWATER NOISEMAKING DEVICE

Charles W. Sieber, Sterling, Va.; Richard K. Knutson, Rockville, and John W. Johnston, Suitland, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 20, 1976, Ser. No. 724,808
Int. Cl.² G10K 10/00; B63G 7/08
U.S. Cl. 181—142 6 Claims



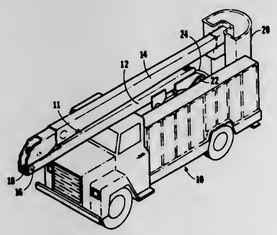
1. A towable, self-driven, underwater noisemaking device, comprising:
an underwater towable body device for connection to a tow cable from a vehicle; and
auto-rotational disc cavitation means rotating about an axis within said disc's plane and attached for rotation to said towable body device.

4,047,593

ACTUATING SYSTEM FOR TRANSPORTABLE ARTICULATED BOOMS HAVING RAISABLE PLATFORMS

Bruce Dammeyer, Fort Wayne, Ind., assignor to Teco, Inc., Fort Wayne, Ind.

Filed Aug. 11, 1975, Ser. No. 603,789
Int. Cl.² B66F 11/04
U.S. Cl. 182—2 5 Claims



1. In a vehicle, an operator controlled elevatable platform and a lift boom consisting of an upper boom and a lower boom having a mounting providing operatively selectable movement on a vertical axis, said platform being disposed at the projected end of said upper boom, means for elevating the lower boom by arcuate displacement in a vertical plane about the pivoted end thereof, and actuator means disposed between said upper and lower booms at the articulated connection therebetween and comprising a fluid motor actuator, including a cylinder having an intermediate trunnion mounting disposed at the geometric center of one of said booms, and a four bar linkage force-transmitting connection comprising a base link a driver link, a driven link and a follower link, between said fluid motor actuator and said boom and effective at full contraction of said booms relatively to each other wherein said upper boom is in surmounted parallel relation to the lower boom and wherein said fluid motor actuator is fully retracted into its associated boom, the respective bars of said four bar linkage being arranged in which the active forces on each bar of said bar linkages are limited to tension and compression and at least one of said bars is disposed wholly within the associated boom when said fluid motor actuator is fully retracted, said four bar linkage having three pivot connections with said upper and lower booms respectively and so disposed that a line connecting said trunnion mounting and the connection of said fluid motor actuator with said four bar linkage is geometrically offset relatively to the pivoted end of said upper boom and disposed to impart lift force to said upper boom commencing from full retraction of said upper and lower booms.

4,047,594

SCAFFOLD AND PLATFORM ADAPTABLE FOR ASSEMBLY AND DISASSEMBLY

Hans Jochen Eisenberg, Wettiner Str. 47a, 5600 Wuppertal 2, Germany

Filed May 17, 1976, Ser. No. 686,879
Claims priority, application Germany, Feb. 27, 1976, 2608060
Int. Cl.² E04G 1/18
U.S. Cl. 182—153 5 Claims

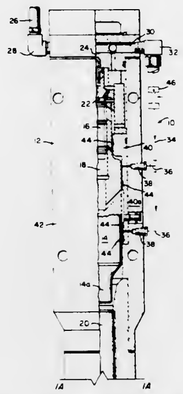
1. A scaffolding and platform adapted for assembly and disassembly and for adjusting as to height consisting essentially of
a plurality of similar rectangular platform blocks each provided with a lower frame, an upper frame, a rectangular platform carried by the upper frame and four scissors for the four corners of the platform, said scissors being arranged in pairs on the two longitudinal sides of the platform blocks,
each scissor having two legs, one leg of each scissor being articulated with one end at one of the four corner points of the lower frame whereas the other end of said one leg is slidable on one of the two longitudinal sides of the upper frame and arrested by stop means at different points of the longitudinal side of the upper frame for adjusting the height of the platform,
a number of rectangular intermediate slabs having the same plan form as the platform blocks,
said intermediate slabs being attached at the longitudinal sides of the upper frames of neighboring platform blocks,
attaching elements for inserting between the longitudinal sides of the slabs and of the upper frame,
said attaching elements being arranged at the middle section of the longitudinal sides of the upper frame of the blocks and limiting the displaceability of the slidable ends of one of said scissor legs, thus guaranteeing a minimum height of the platform blocks when slabs are inserted in the scaffolding.

4,047,595

HYDRAULIC-POWERED DEVICE

Glen O. Baker, Jr., Kent, Wash., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Sept. 22, 1975, Ser. No. 615,409
Int. Cl.² F01M 9/00
U.S. Cl. 184—6.14 6 Claims



1. An improved, hydraulic-powered device, such as an impact ram and the like, having internal components which, during operation of the device, exhibit a relative, slidable interface therebetween, the device being operative in response to power supplied by hydraulic fluid under pressure, the device further having first means for admitting pressured, powering hydraulic fluid thereinto to operate same, and having second means for discharging spent hydraulic fluid therefrom, wherein the improvement comprises:
conduit means, in fluid-flow communication with one of said first and second means, for tapping off a quantity of supplied hydraulic fluid; and
means opening internally of the device, and in fluid-flow communication with said conduit means, for introducing tapped-off hydraulic fluid internally of the device for lubricating the slidably-interfacing components.

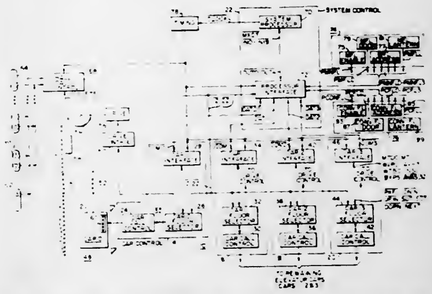
4,047,596

ELEVATOR SYSTEM

Charles L. Winkler, Worthington, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 5, 1975, Ser. No. 574,767
Int. Cl.² B66B 1/20
U.S. Cl. 187—29 R 9 Claims

1. An elevator system for a structure having a plurality of floors, comprising:
a plurality of elevator cars having doors operable between open and closed positions,
means mounting said plurality of elevator cars for movement relative to the floors,
means for registering requests for elevator service for at least certain of the floors,
car control means for each of said elevator cars, said car control means providing an inactivity signal when its associated elevator car is idle,
control means providing signals for said car control means which cause said plurality of elevator cars to answer requests for elevator service according to a predetermined strategy,
said control means including a first strategy for providing predetermined special service for a first special floor, and second strategy for providing predetermined special service for a second special floor, with said first and second strategies each including the parking of an idle elevator car at the special floor,
first and second enable means for selectively activating the first and second strategies, respectively,
first and second position selector means for selecting first and second floors to which the first and second strategies are to be applied, respectively,



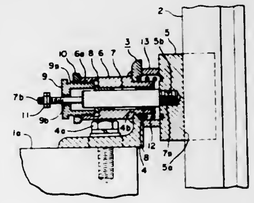
first and second door mode selector means for selecting the door positions of elevator cars parked at the first and second special floors, respectively,
and first and second service direction selector means for selecting the service directions of elevator cars parked at the first and second special floors, respectively.

4,047,597

GUIDE DEVICE FOR ELEVATOR

Masaatsu Okura; Kazutoshi Ota, and Sadayuki Otomi, all of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1976, Ser. No. 649,204
Claims priority, application Japan, Jan. 14, 1975, 50-6805
Int. Cl.² B66B 7/04
U.S. Cl. 187—95 1 Claim



1. A guide device for an elevator body, the elevator body being movable along first and second parallel guide rails, the guide device comprising:
a first sliding guide,
the first sliding guide being slidably movable along the first guide rail,
a first hollow holder,
a first shaft slidably disposed within the first hollow holder and connected to the first sliding guide,
the first shaft having a stop associated therewith so as to permit the first shaft to be slidably displaced within the first hollow holder a distance of greater than 10 mm.,
a first buffer of resilient material disposed between the first hollow holder and the first sliding guide and being connected to one but not the other,
a first compressed spring being disposed between the first hollow holder and the first sliding guide to force the first hollow holder away from the first sliding guide,

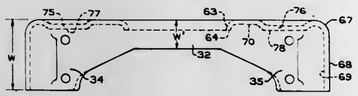
the first hollow holder being connected to the elevator body,
a second sliding guide,
the second sliding guide being slidably movable along the second guide rail,
a second hollow holder,
a second shaft slidably disposed within the second hollow holder and connected to the second sliding guide,
the second shaft having a stop associated therewith so as to permit the second shaft to be slidably displaced within the second hollow holder a distance of greater than 10 mm.,
a second buffer of resilient material disposed between the second hollow holder and the second sliding guide and being connected to one but not the other,
a second compressed spring being disposed between the second hollow holder and the second sliding guide to force the second hollow holder away from the second sliding guide,
the second hollow holder being connected to the elevator body,
whereby, when the elevator body is forced towards the second guide rail, the second buffer prevents the force of the elevator body from being transmitted in its entirety to the second sliding guide in order to permit the second sliding guide to remain in alignment with the second guide rail and whereby, when the elevator body is forced towards the second guide rail, the slidable first shaft permits the first hollow holder to be displaced away from the first slide guide by an additional distance greater than 10 mm. in order to permit the first sliding guide to remain in alignment with the first guide rail.

4,047,598

CALIPER BRAKE TORQUE PLATE

Arthur J. Thrower, Troy, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sept. 13, 1976, Ser. No. 722,982
Int. Cl.² F16D *65/00*
U.S. Cl. 188—71.1 **6 Claims**



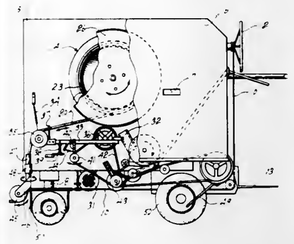
1. A torque plate for a caliper brake comprising a generally disc-shaped body having a central opening for positioning of said plate around a shaft, a mounting portion extending continuously around said opening having a first surface, a peripheral flange at an outer edge of said body having a peripheral flange surface, said flange extending along at least a portion of said outer edge and being positioned with said flange surface generally perpendicular to said first surface, said flange surface including a pair of spaced-apart rail supporting surfaces on said flange spaced from said mounting portion for mounting supporting brake members on which the caliper and friction lining carriers of said brake are slidably supported, said peripheral flange being positioned at the edge of said mounting portion at a position between said rail supporting surfacesand being continuous therebetween along said edge with said peripheral flange having a substantial width in a direction perpendicular to said first surface at said rail supporting surfaces to provide a long register for the brake supporting rails and a reduced width at said position between said rail supporting surfaces, and second surfaces raised from said first surfaces of said body at positions outward of said mounting portion in the proximity of said rail supporting surfaces.

4,047,599

ELECTRICALLY POWERED VEHICLE AND FEED CART

Victor Rousseau, 700 R.R. No. 1, St. Monique Parish, Nicolet County, Canada (J0G 1N0)

Filed May 11, 1976, Ser. No. 685,352
Int. Cl.² H02G *11/02*
U.S. Cl. 191—12.2 A **6 Claims**



1. An electrically powered vehicle comprising a chassis, an electric motor secured to the chassis, an electric plug-in cord, a reel having the electric plug-in cord operatively connected thereto and wound thereon, an electrical connection electrically joining the reel to the motor, a swivelling pulley carried by the chassis, operatively engaged by the cord, and laterally guiding the latter relative to the chassis, and a reel drive assembly rotatively biasing said reel toward operative winding of the cord thereon, said reel drive assembly including a lever pivoted to the chassis about an axis parallel to the rotation axis of the reel for movement toward and away from said reel, a friction drive wheel rotatably mounted on said lever for rotation about an axis parallel to the rotation axis of the reel, said lever being spring biased to bring said friction drive wheel in driving engagement with the periphery of said reel to rotate the latter in winding direction with respect to the electric cord, and said friction drive wheel displaceable with the support away from said driving engagement with the reel, and an idler pulley rotatively carried by said lever and operatively engaged and biased by the electric cord toward displacement of the lever away from said reel and of the rotary friction wheel away from driving engagement with the reel under predetermined tension in the electric cord.

4,047,600

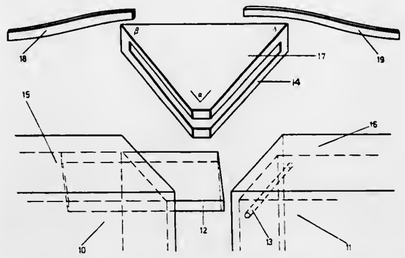
CONTINUOUS JUNCTION BETWEEN ALUMINUM CONDUCTOR RAILS

Alexander Maitland, Schaffhausen, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed July 30, 1975, Ser. No. 600,393
Claims priority, application Switzerland, Aug. 28, 1974, 11756/74
Int. Cl.² B60M *1/30*
U.S. Cl. 191—29 R **1 Claim**

1. A conductor rail junction for use in connection with a power collector shoes, comprising, in combination:
at least two aluminum or aluminum alloy rails disposed end to end and each having an abrasive resistant electrical power transfer layer adapted for contact by said power collector shoe;
each of the ends of said rails facing each other having a surface having an angle of from about 60° to about 120° with respect to the length of said rails and defining a gap;
an insert composed of a metal selected from the group consisting of steel, iron, copper, aluminum, nickel, bronze, brass, and alloys of these metals or combinations of these metals and having a shape complementary to said gap and engaging said gap, said insert having a shape in its plan view of at least a trucated isosceles triangle, whereby a substantially continuous surface is obtained even if the size of said gap undergoes any change;

supporting means operable for engaging the ends of said rails and for supporting said insert; and



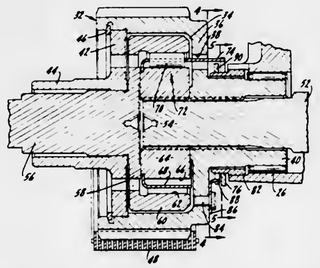
connecting means adapted to interconnect electrically said rails to each other.

4,047,601

AUTOMATIC FOUR-WHEEL DRIVE TRANSFER CASE

Mark John Fogelberg, and Donald William Kelbel, both of Muncie, Ind., assignors to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 637,923, Dec. 5, 1975, abandoned. This application June 1, 1976, Ser. No. 691,672
Int. Cl.² F16D *41/10*
U.S. Cl. 192—36 **20 Claims**



1. A torque transfer assembly comprising a housing, an input shaft supported for rotation in said housing, first and second output shafts supported for rotation in said housing, and means coupling said input shaft with said output shafts for transfer of torque thereto, said coupling means including an overrunning clutch having wedging means movable between two clutch engaging positions wherein torque is transferred to said second output shaft and a clutch disengaging position wherein torque is not transferred to said second output shaft, means biasing said wedging means toward one of said clutch engaging positions, and means operable upon initial rotation of one of said shafts for blocking said movement of said wedging means to the other of said clutch engaging positions.

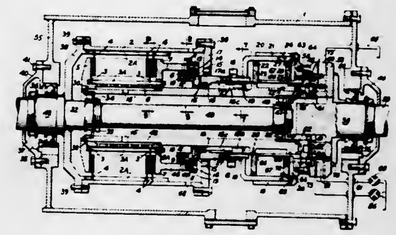
4,047,602

SYNCHRONIZING COUPLING

John H. Crankshaw, Erie, Pa., assignor to Dynetics, Inc., Pa.

Filed Dec. 11, 1975, Ser. No. 639,910
Int. Cl.² F16D *11/00*
U.S. Cl. 192—53 F **21 Claims**

1. A synchronizing clutch comprising
a drive shaft,
a driven shaft,
a driven clutch plate and
a driven gear and synchronizing means thereon
said synchronizing means being adapted to connect said drive shaft to said driven shaft,
drive clutch plates and drive gear means on said drive shaft,
said synchronizing means comprising drive pins on said drive shaft adapted to loosely engage holes in said driven clutch plate,
blocking means,
liquid supply means adapted to apply a viscous drag to said clutch plates for engaging said blocking means,
said blocking means being adapted to prevent said drive pins



from engaging said holes until said driven shaft has reached synchronized speed,
means to disengage said blocking means thereby relieving pressure on said clutch plates and moving said drive pins into said holes when said driven shaft has reached synchronized speed,
whereby said drive shaft is connected to said driven shaft with torsional looseness,
said liquid means being adapted to move said drive gear into engagement with said driven gear after said drive pins have loosely entered said holes and said drive clutch plates have been disengaged from said driven clutch plate.

4,047,603

MULTI-SPEED BICYCLE FREE WHEEL ASSEMBLY

Nobuo Ozaki, Sakai, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Feb. 5, 1976, Ser. No. 655,532
Int. Cl.² F16D *23/00*; F16H *11/08, 9/24*
U.S. Cl. 192—64 **3 Claims**



1. A multi-speed bicycle free wheel assembly comprising
a free wheel body,
a plurality of sprocket wheels which are different in diameter and are fixedly mounted in parallel to one another on said free wheel body,
a smallest sprocket wheel among said plurality of sprocket wheels being disposed outmost relative to other larger sprocket wheels,
said free wheel body including an inner ring or driven member, an outer ring or drive member, and a screw cup secured to one side of said free wheel body,

ratchet means interposed between said inner ring and said outer ring,

said screw cup having a substantially cylindrical screw cup body and an annular flange formed integral with said screw cup body,

said annular flange extending in confronting and parallel relation to said smallest sprocket wheel, and

said screw cup includes a threaded portion being designed to mate and engage a threaded portion of the driven member,

said screw cup also includes a bearing surface being designed to engage a bearing member positioned between the bearing surface of the screw cup and the drive member.

4,047,604

APPARATUS FOR CONTROLLING THE FLOW OF CONCRETE FROM A MIXER

Ralph R. Daoust, and Timothy N. Daoust, both of Anderson, Ind., assignors to Front Discharge Mixer, Inc., Anderson, Ind.

Filed Mar. 25, 1976, Ser. No. 670,552
Int. Cl.² B65G 11/12
U.S. Cl. 193—10 **10 Claims**



1. A mechanism for controlling the direction of flow of concrete from the discharge opening of a concrete mixing drum, said mechanism comprising, in combination, a support frame, a concrete collecting hopper rigidly mounted on said frame adjacent said opening of said mixing drum for receiving concrete therefrom, outlet means on said hopper for the discharge of concrete therethrough from said hopper, rigid annular bearing means mounted adjacent said outlet means and on said support frame, driven gear means having an annular bearing portion for rotatably carrying said driven gear means on said annular bearing means for rotation about a substantially upright axis, hinge means defined on said driven gear means, an elongated pivotally carried by said hinge means for rotational movement with said driven gear means about said upright axis and for movement in a substantially upright plane, said chute having an upper end positioned for receiving concrete flowing through said outlet means, a hydraulic drive motor rigidly mounted on said support frame, and a drive gear operatively driven by said hydraulic drive motor, said drive gear operatively and drivably engaging said driven gear means for rotating said driven gear means and thereby said chute about said substantially upright axis.

4,047,605

GOLF PRACTICE SWING APPARATUS

Leo Rosenvold, Wildrose, N. Dak. 58795

Continuation-in-part of Ser. No. 612,328, Sept. 11, 1975, abandoned. This application Feb. 10, 1976, Ser. No. 656,805
Int. Cl.² A63B 69/36
U.S. Cl. 194—1 R **3 Claims**

1. A golf practice swing device comprising a base support with an inclined main post extending in length upward at an acute angle from vertical and toward a position wherein a golfer operator may stand to operate said device, a first arm pivotally mounted at its upper one end to said main post to rotate on an axis perpendicular to the length of the main post to rotatably move in a plane parallel to the main post with said axis extending downwardly from said post at an angle toward the position where a golf operator may stand, a second arm pivotally mounted at its one end to the lower end of the first arm to pivot generally parallel to the same plane as the first arm pivotally rotates in, a club head fixed to the other end of the second arm, said club head having a striking face fixed laterally and perpendicularly to the plane of movement of the first arm and second arm, a club shaft having its one end attached to the club head with its other end providing a handle for the golfer to grasp, said one end of said club shaft attached to said club head so that the club shaft may extend from the club head laterally to the plane of movement of the first arm and second arm upward toward the position where the golfer operator may stand with the handle at the upper end, whereby the golfer operator may grasp the handle of the club shaft and swing the club shaft to thereby swing the club shaft and club



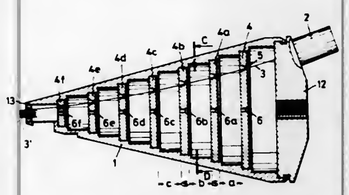
head in a manner of a normal golfer swing with the fixed connection between the club head and second arm and the pivotal connection between the first and second arm causing the club head to follow the second arm and first arm to pivot about the axis of the first arm to stay in a plane parallel to the plane of the first arm and second arm, and causing the club face to stay perpendicular to the line of travel of the first arm and second arm throughout the club swing, with the club head guided by the first arm and second arm in a path as would prevent slices or hooks to thereby give the golfer operator the feel of swinging the golf club with the club head in said path, and with the pivotal connection between the second arm and first arm adjusting the head of the club to the radius of the arc of the golfer operator during the course of the swing.

4,047,606

HEAD FOR NEEDLE PRINTER

Hubert Ott, Ulm, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Apr. 19, 1976, Ser. No. 678,357
Int. Cl.² B41J 3/04
U.S. Cl. 197—1 R **3 Claims**



1. A printing head for needle printers having a plurality of printing needles respectively driven by drivers, the head having a conical housing whose base plate carries said drivers, the needles extending to and through the apex region of the housing, the tips of the needles extending from the housing at said region being the front end of the head, the improvement comprising:

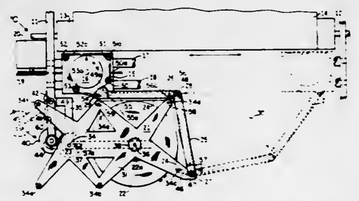
a plurality of guide plates in the housing disposed therein in spaced-apart relation to each other and spaced along the axis of the conical housing; and a plurality of bores in each of the plates for being passed through by the needles, the needles each having a curved contour and a particular diameter, the bores being composed of two cones with joined overlapping apices forming an entrance cone portion and an exit cone portion having larger height than the entrance cone portion, the narrowest portion of the bore being located where the entrance cone portion meets the exit cone portion having diameter only slightly larger than the needle passing through, each plate having a thickness at least in the region of the respective bores having value which is about eight to twelve times the diameter of the respective needle passing through, the bores in the guide plates being arranged, oriented and positioned in relation to each other, and configured as to follow the contour of the needles in that the exit cone portion of a bore in a plate of the plurality being closer to a tip of the needle passing through having a steeper cone angle than the exit cone portion of a bore in a plate of the plurality closer to the base plate and being passed through by the same needle.

4,047,607

ARTICULATED RIBBON-GUIDING STRUCTURE

Frederick P. Willcox, 565 Oenoke Ridge, New Canaan, Conn. 06840

Filed Apr. 1, 1976, Ser. No. 672,699
Int. Cl.² B41J 33/14
U.S. Cl. 197—151 **32 Claims**



1. In a printing machine of the kind having a frame, and a printing carriage movable with respect to said frame along a printing path, said printing carriage comprising printing means,

the improvement comprising:

ribbon supply means carried by said frame and relatively stationary as compared to said movable printing carriage for storing a supply of ribbon, said ribbon supply means having an output,

ribbon directing means on the movable printing carriage for directing said ribbon past the printing means, said ribbon directing means having an input on said movable printing carriage, and

ribbon guiding means having one end supported adjacent said output for receiving ribbon from said supply means and another end connected to and moved by said printing carriage for supplying the ribbon to the input of said ribbon directing means,

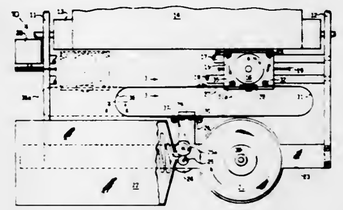
said ribbon guiding means including means that provides a substantially constant feed length between said output of the ribbon supply means and said input of the ribbon directing means irrespective of the position of said movable printing carriage along said printing path.

4,047,608

COMPLIANT RIBBON-GUIDING STRUCTURE

Frederick P. Willcox, 565 Oenoke Ridge, New Canaan, Conn. 06840

Filed Apr. 1, 1976, Ser. No. 672,710
Int. Cl.² B41J 33/06
U.S. Cl. 197—151 **33 Claims**



1. In a printing machine of the kind having a frame, and a printing carriage movable with respect to said frame along a printing path, said printing carriage comprising printing means,

the improvement comprising:

ribbon supply means carried by said frame and relatively stationary as compared to said movable printing carriage for storing a supply of pliant ribbon, said ribbon supply means having an output,

ribbon directing means on the movable printing carriage for directing said ribbon past the printing means, said ribbon directing means having an input on said movable printing carriage, and

flexible ribbon-guide-means for guiding the pliant ribbon from the ribbon supply means to the ribbon directing means,

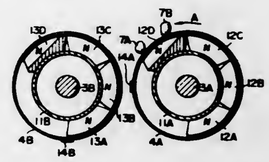
said flexible ribbon-guide-means including means uniformly flexible throughout its entire length for guiding the ribbon from said output to said input along a path of unvarying length irrespective of the position of said movable printing carriage along its printing path.

4,047,609

MAGNETIC ROLLER CONVEYOR

Iwao Nazaka, Tokyo, Japan, assignor to Bunri Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1976, Ser. No. 685,688
Claims priority, application Japan, June 2, 1975, 50-66303
Int. Cl.² B65G 17/46
U.S. Cl. 198—690 **13 Claims**



1. A magnetic roller conveyor for transporting objects, comprising a plurality of magnetic rollers arranged in a row in the transport direction of the roller conveyor, each of said magnetic rollers including:

a rotatable conveying roller,

a fixed inner barrel disposed within said rotatable conveying roller, and

magnet means on the outer periphery of said fixed inner barrel and extending over substantially half of the circum-

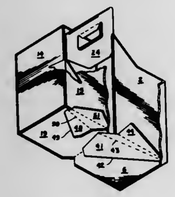
ference of said fixed inner inner barrel and extending over the vertex of said fixed inner barrel,

a last part of said magnet means which is past the vertex of said fixed inner barrel in the direction of rotation of said conveying roller comprising a dampingly magnetized portion whose magnetic force decreases, relative to the magnetic force of the remaining portion of said magnet means, gradually in said direction of rotation of said conveying roller, said last part of said magnet means being adjacent a strong magnetic force portion of the magnet means of the next successive one of said plurality of magnetic rollers which has a stronger magnetic force than that of said dampingly magnetized portion.

4,047,610
ARTICLE CARRIER

James T. Stout, Acworth, and Robert E. Plaxico, Lithonia, both of Ga., assignors to The Mead Corporation, Dayton, Ohio

Filed Nov. 8, 1976, Ser. No. 739,873
Int. Cl.² B65D *5/46, 25/04*
U.S. Cl. 206—187 **7 Claims**

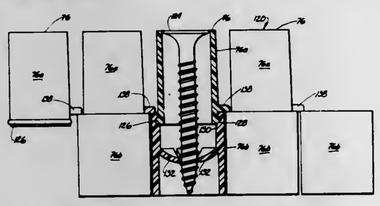


1. An article carrier comprising opposed side walls, end wall panels foldably joined to the end edges of said side walls and extending inwardly therefrom, riser panels foldably joined to said end wall panels remote from said side walls and extending medially inward of the carrier, a multiple ply handle secured to the upwardly extending portions of said riser panels, a bottom panel foldably joined to the lower edge of one of said side walls, a reinforcing panel foldably joined to said bottom panel, a web foldably joined to said reinforcing panel and disposed in overlapping relation therewith, and an attachment flap secured in flat face contacting relation with the lower part of the adjacent one of said end wall panels and foldably joined along one edge thereof to said web.

4,047,611
AIR-POWERED, SELF-FEEDING SCREW DRIVING TOOL

Harold E. Damratowski, Alda, Nebr., assignor to Triad Fastner Corporation, Alda, Nebr.

Division of Ser. No. 563,819, March 31, 1975, Pat. No. 3,971,421, which is a continuation-in-part of Ser. No. 446,023, Feb. 26, 1974, abandoned. This application Dec. 9, 1975, Ser. No. 639,164
Int. Cl.² B65D *85/24*
U.S. Cl. 206—347 **16 Claims**

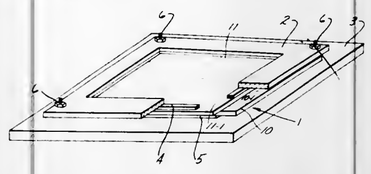


1. A belt of pods for use with an automatic fastener driving tool, each pod being adapted to contain a fastener of the type having a head and a shank, each of said pods comprising an upper portion and a lower portion joined together so as to be rotatable with respect to each other about a common pod axis such that said belt may be coiled and means enabling said belt to be twisted such that the axis of adjacent pods may be oriented non-parallel with respect to each other.

4,047,612
PACKAGING AND SUPPORTING MEANS FOR FLAT GLASS PANELS

Larry John Lohmann, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 5, 1973, Ser. No. 367,257
Int. Cl.² B65D *85/42, 81/02*
U.S. Cl. 206—454 **3 Claims**

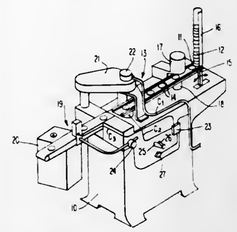


1. As an article of manufacture, a pair of frames adapted to be positioned on opposite sides of a glass display panel constituted by a pair of transverse glass plates joined by a ribbon of glass, the open center portion of each frame corresponding to the active viewing area of the display device bounded by said ribbon of glass, and means for fastening the two frames together in a compressive force relationship so as to protect the glass corners and edges of the display device each said frame having a panel engaging means, each said panel engaging means and said ribbon of glass being aligned in the direction of said compressive force, whereby said display panel is supported solely between said panel engaging means only at said ribbon of glass thereby protecting the outer edges of the display panel from cracking and/or breaking.

4,047,613
MEANS AND METHOD FOR INSPECTING IN-PROCESS AEROSOL CONTAINER CLOSURES

George W. Wright, Willingboro, N.J., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed June 28, 1976, Ser. No. 700,085
Int. Cl.² B65G *47/34*
U.S. Cl. 209—74 M **14 Claims**



1. Apparatus for inspecting top closures for aerosol containers, said closures having an outer, peripheral depressed flange for receiving a quantity of sealing compound and an inner, curled flange, comprising:

conveying means for guiding closures in single file succession along a predetermined path, said path including an inspection position;

a first rotary inspection head axially aligned with a closure in an inspection position;

drive means for said inspection head;

a light source disposed in said head for directing a beam of light toward the periphery of a closure in said inspection position;

a first sensing means responsive to light from said source and disposed in said head to receive light from said source reflected by the periphery of the closure for outputting a first defect signal;

a second rotary inspection head axially aligned with a closure in an inspection position;

drive means for said second head;

electromagnetic transducer means disposed in said second head for applying an electromagnetic field to a portion of the inner, radial flange of a closure and for sensing a manifestation of field continuity in said flange;

second sensing means associated with said electromagnetic transducing means and responsive to sensed fluctuations in field continuity for outputting a second defect signal;

gating means responsive to the periodic advancement of closures for producing a discharge enabling signal so that spurious defect signals are not produced by the sucession of one closure by the next;

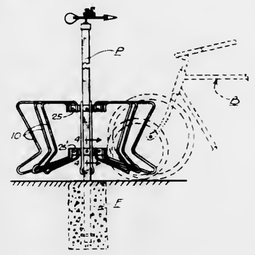
delay means for receiving said defect signals, said delay means being coupled to said gating means and to said sensing means for producing a reject signal a controllable time subsequent to the production of a defect signal; and

ejection means coupled to said delay means and responsive to said reject signal to eject a closure bearing a previously-sensed defect from said conveying means.

4,047,614
BICYCLE RACK

John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Company, Chicago, Ill.

Filed July 28, 1975, Ser. No. 599,819
Int. Cl.² A47F *7/04*
U.S. Cl. 211—20 **2 Claims**



1. A wheel retaining bicycle support, comprising

a. a pair of similar, resilient wheel-embracing members formed of tenuous material and disposed in vertical, generally parallel planes, said members being spaced apart slightly less than the thickness of wheels to be supported, whereby wheels embraced thereby will be resiliently gripped by said members,

b. said members having upper and lower extremities and being generally of sigmoid formation in vertical profile, with two vertices projecting forwardly, at least one of said vertices being flared to form a mouth portion to receive a leading portion of a wheel,

c. said upper and lower extremities having substantially parallel terminal fingers remote from said vertices and bent transversely therefrom in a common vertical plane,

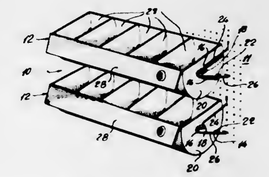
d. top and bottom mounting members permanently affixed to the respective fingers extending from the upper and lower extremities and deformed to provide means for affixing them to vertically disposed supporting means, said mounting members adapted to be selectively mounted in a plurality of angularly disposed planes relative to the plane of said support means, and

e. an intermediate connector between each mounting member and vertically disposed supporting means, said connector comprising a planar surface parallel to said supporting means and another surface extending angularly thereto for selective abutment of said mounting member with either of said surfaces to vary the angularity of said bicycle support relative to said supporting means.

4,047,615
MODULAR MERCHANDISING

Peter Browne, 27 Maughan Road, Baie D'urfe, Quebec, Canada (H9X 3E1)

Filed Nov. 5, 1975, Ser. No. 628,969
Claims priority, application United Kingdom, Aug. 8, 1975, 33237/75
Int. Cl.² A47F *5/12*
U.S. Cl. 211—88 **5 Claims**



1. An improved merchandising unit comprising a shelving unit having opposed parallel end walls and a continuous outer wall which is substantially semi-cylindrical in configuration extending between outer edges of the end walls, upper edges of the end walls and continuous outer wall defining an open portion which lies in a substantially horizontal plane when the shelving unit is in an initial position, the end walls having trunnions mounted thereon, the trunnions pivotally supporting the shelving unit from a pair of cooperating support brackets mounted on a wall situated rearwardly of the shelving unit such that a longitudinal axis of the shelving unit is substantially horizontal, the trunnions permitting the shelving unit to be normally displaced from its initial position when a user removes items from the shelving unit, whereby the open portion assumes a position extending downwardly toward the user, thereby providing easier access to the shelving unit to facilitate insertion and removal of items from the shelving unit; the trunnions being offset from a centre of gravity of the shelving unit such that when the shelving unit is displaced from its initial position by a user, the shelving unit automatically returns to the initial position upon being released by the user;

means provided on at least one end wall cooperating with the adjacent support bracket to limit the amount of the tilting of the shelving unit between the initial position and the tilted position thereby prevent accidental spillage of contents situated within the shelving unit;

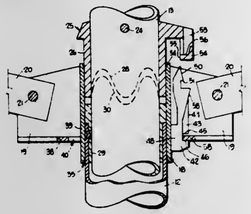
the semi-cylindrical configuration of the continuous outer wall permitting the mounting of the shelving unit with a rear portion thereof closely adjcent a vertical wall, the shelving unit being freely pivotable between its initial and tilted position without any portion thereof engaging said wall.

4,047,616

CLOTHES DRIER LATCH

Terence Dale Seabrook, 944-956 South Road, Edwardstown, Australia (5039)

Filed Mar. 10, 1976, Ser. No. 665,544
Claims priority, application Australia, Mar. 11, 1975, 867/75
Int. Cl.[2] A47F 5/00; A45B 25/08
U.S. Cl. 211—183 **6 Claims**



1. A latch useful on a clothes drier of the type wherein one member is slidable over another member, one of the members being a bush having a series of arms pivoted thereto and radiating therefrom, the arms being movable from a retracted position with the bush in a downward location to an extended operative position with the bush in a relative upward location, the latch comprising:

a latching body on one of the members and a striker plate co-operable therewith on the other member, the latching body having a boss, a retaining tongue and a latching tongue with a ramp face and the striker plate having a sliding surface and a latching surface, said ramp face upon upward movement of the bush sliding over the sliding surface, the ramp face terminating in a latching shoulder engageable with said latching surface to thereby effect an interlock between the bush and said another member when the bush is in said relative upward location, the tongues being of resilient material deformable away from the striker plate to effect interlock release and engagement,

said latching body also comprising a retaining shoulder spaced from one end surface of the retaining tongue to define a notch, said bush having a web which is engaged in said notch, said boss engaging a surface of said sliding bush when the web is engaged in the notch to thereby retain the latching body to the sliding bush.

4,047,617

LUFFING CRANE WITH OVERLOAD PROTECTION MECHANISM

Hans Tax, Munich, and Klaus Hosler, Eichenau, both of Germany, assignors to Hans Tax, Munich, Germany

Continuation of Ser. No. 635,244, Nov. 25, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 726,988
Claims priority, application Germany, Nov. 28, 1974, 2456359
Int. Cl.[2] B66C 13/48
U.S. Cl. 212—39 MS **8 Claims**

1. A crane comprising:

a. a base;

b. an elongated boom;

c. a pivot securing one end of said boom to said base for angular luffing movement of said boom about a substantially horizontal axis;

d. two power-driven winches on said base;

e. two elongated flexible tension members respectively associated with said winches,

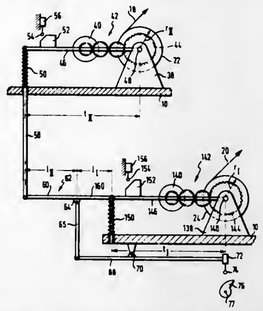
1. each tension member having one end portion attached to the associated winch, an intermediate portion trained over a longitudinal section of said boom spaced from said pivot, and another end portion depending from said section,

2. the spacing of said pivot from one of said sections and the end portion depending therefrom being different from the spacing of said pivot from the other section and depending end portion;

f. suspending means on each of said depending end portions for suspending respective loads from said tension members;

g. signal generating means for generating a mechanical stress signal in response to the stress transmitted to each winch by the associated tension member due to a suspended load;

h. weighting means for mechanically weighting each of said signals according to said spacing of the corresponding depending end portion from said pivot;



i. adding means for generating a mechanical signal indicative of the sum of the weighted signals;

j. display means connected to said boom for simultaneous movement for displaying a mechanical signal indicative of the angular position of said boom relative to said base and of a maximum permissible value of said sum in the indicated angular position; and

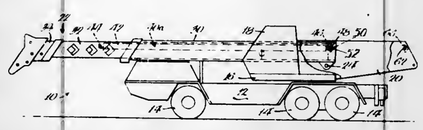
k. comparator means responsive to said adding means and to said display means for comparing said maximum permissible value with the sum indicated by said adding means and responsive to an excess of the indicated sum over said maximum permissible value for deenergizing at least one of said winches.

4,047,618

CRANE CONSTRUCTION AND METHOD OF OPERATION

Donald A. Kuester, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Sept. 18, 1975, Ser. No. 614,411
Int. Cl.[2] B66C 23/06
U.S. Cl. 212—58 R **4 Claims**



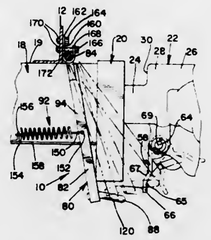
1. In a crane having a fixed boom support thereon, a multisectional boom including a base section having a rear end pivoted on said support and at least one intermediate section telescoped within said base section and normally having an overhanging portion extending beyond the forward end of the base section in a retracted working position, a fluid ram having its cylinder connected to said intermediate section and a piston rod extending therefrom, first means on said base section defining a first connection for said piston rod adjacent the rear end of said base section, and second means on said fixed boom support rearwardly of the rear end of said base section defining a second connection for said piston rod, said second connecting means having guide means for guiding said piston rod into alignment therewith so that said piston rod can be disconnected from said first connection on said base section, so that said piston rod can be extended, guided by said guide means into alignment with said second connection and connected to said second connection, whereby said cylinder can be retracted to move said intermediate section from said retracted working position to a stored position wherein said overhanging portion is telescoped into said base section and an opposite end portion is moved beyond said rear end of said base section to reduce the overall length of said crane.

4,047,619

UNCOUPLING DEVICE FOR ROTARY DUMP CARS

Osvaldo F. Chierici, Elmhurst, Ill., assignor to Holland Company, Lombard, Ill.

Filed Mar. 1, 1976, Ser. No. 662,588
Int. Cl.[2] B61G 1/08, 3/08
U.S. Cl. 213—166 **9 Claims**



1. In a railroad car having a body including a center sill projecting from one end of the car and equipped with a coupler striker and a bottom operating coupler mounted on the center sill, with the coupler being mounted for swinging movement sidewise of the car and including a pivotal lock lifter having a depending paddle for actuating the lock lifter to uncouple the coupler, with the lock lifter having a pivotal operating stroke to uncouple the coupler, and with the car having an uncoupling lever device at said end thereof, said device including an actuator pivotally mounted on the car and having a striker section underlying the center sill and positioned to be swung from under the center sill to strike the paddle to actuate the lock iifter, said center sill striker being disposed in a vertical plane and spaced outwardly of the car body end at said end of said car, longitudinally of said car, and including a handle structure operatively secured to the actuator for pivoting the actuator to strike the paddle and pivot the lock lifter about its operating stroke, and means for spring biasing the actuator to a retracted position in which said striker section thereof is disposed in a retracted position under the center sill and spaced from the paddle, the improvement wherein:

the actuator is mounted on said end of the car body for making said pivotal movement about a horizontal axis that is disposed at a level approximating that of the top of the center sill, with said horizontal axis being disposed between said car body end and the center sill striker and spaced inwardly of the car from the center sill striker longitudinally of the car and adjacent said body end,

said horizontal axis extending transversely of the car,

said handle structure comprising an operating rod portion journaled on the car in coaxial relation to said horizontal axis and a handle for pivoting said operating rod portion about said axis to pivot said actuator about said axis for striking the paddle for pivoting same about its operating stroke,

said actuator being proportioned radially of said axis to dispose said striker section thereof in substantial alignment with the plane of the center sill striker when said actuator is in its retracted position,

said actuator and said handle structure operating rod portion being free of securement to the center sill striker,

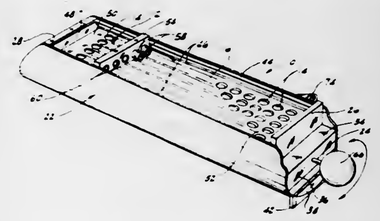
whereby both said actuator and said handle structure operate about said horizontal axis and said actuator striker section acts on the paddle with the leverage measured by the spacing of same radially of said horizontal axis, wherein the car body has a body end sill at said end thereof and said actuator and handle structure are mounted on said end sill, wherein said actuator striker includes a paddle striker, said paddle striker comprising a striker element fixed to said actuator striker section and projecting forwardly in the direction of the coupler paddle, said striker element along its forward edge being convexly curved to either side of the car in substantial conformance with the range of coupler swinging movement sidewise of the car for effecting said lock lifter pivotal operating stroke on striking same, under the operation of said handle structure, with the coupler positioned within said side swing.

4,047,620

PILL AND CAPSULE COUNTER

Warren L. Deininger, 14 Southern Drive, Decatur, Ill. 62521

Filed Oct. 10, 1975, Ser. No. 621,510
Int. Cl.[2] B65B 67/02
U.S. Cl. 214—1 C **13 Claims**



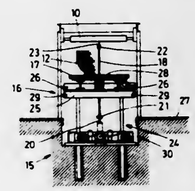
1. A counter for pills and capsules having a tray with pill and capsule receiving sides in back to back relationship, each side having a movable slide for selecting the number of recesses in said side to be filled, said tray being elongated and rotatable within a housing about a central axis to dispense the counted pills or capsules into said housing.

4,047,621

STACKING APPARATUS FOR FERROUS SHEETS

Lothar Stötzel, Buschhuttener Strasse 87, and Dieter Heider, Bottenbacher Strasse 73, both of 5910 Kreuztal-Buschhütten, Germany

Filed Mar. 18, 1976, Ser. No. 668,033
Int. Cl.[2] B65G 57/04; B65H 31/26
U.S. Cl. 214—6 DS **4 Claims**



1. Apparatus for forming a stack of ferrous sheets, comprising an endless conveyor belt having magnets for retaining ferrous sheets on the underside of the belt, the magnets being adapted to be de-energized to release the sheets to fall by

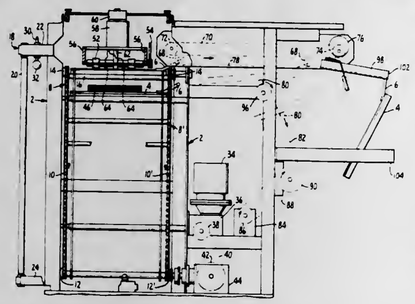
gravity, a pallet beneath the conveyor to receive the sheets in a stack, means to lower the pallet as the stack grows, vertical pins spaced to enter holes in the sheets, said pins being fixed against vertical movement when the pallet lowers, the pins having upper ends that are disposed closely adjacent the underside of the belt, and means for moving said pallet and pins laterally together as a unit to remove the formed stack from beneath the conveyor.

4,047,622

PALLET FEEDING APPARATUS

Hubert Blessing, Dallas, Tex., assignor to Levi Strauss & Co., San Francisco, Calif.

Filed July 16, 1976, Ser. No. 705,794
Int. Cl.² B65G *59/02*
U.S. Cl. 214—8.5 A **10 Claims**



1. Pallet feeding apparatus comprising

a plurality of pallets for carrying stacks of sheet material workpieces, each said pallet having a handle projecting outwardly therefrom;

vertically movable rack means for supporting said pallets in an upwardly facing orientation at vertically spaced positions;

means for removing sequentially the individual workpieces from the uppermost said pallet;

means for sensing the vertical position of the uppermost remaining workpiece of said sheet material on the uppermost said pallet and for generating a stack height control signal whenever said workpiece vertical position is below a predetermined level;

first motorized means for moving said rack means vertically upwardly in response to said stack height control signal, whereby the vertical position of the remaining uppermost sheet may be maintained generally constant;

means for sensing the absence of sheet material workpieces on said uppermost pallet in said rack and for generating a pallet removal control signal upon sensing of said absence; and

second motorized means responsive to said pallet removal control signal for gripping said handle of said uppermost pallet and for removing said handle and pallet from said rack means upon receipt of said pallet removal control signal.

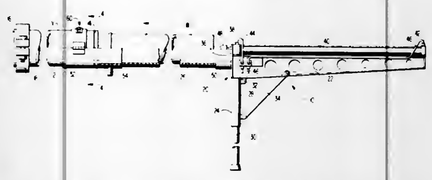
4,047,623

MODULE LOADING DEVICE

Robert Blevitt, and Miguel Eugene O'Brien, both of Santa Barbara, Calif., assignors to Ajax International Corporation, Santa Barbara, Calif.

Filed Aug. 13, 1975, Ser. No. 604,136
Int. Cl.² B66F *1/00*; B01D *31/00*
U.S. Cl. 214—17 C **12 Claims**

1. Apparatus for loading modules into a pressure vessel having at least one open end with a groove thereon adjacent said end comprising a frame, an elongated support carried by said frame for receiving a module, a pusher element carried by said frame for movement between a first position adjacent one end of said support and a second position adjacent the opposite end of said support, said element adapted to push a module along said support from the first to the second position, means for coupling the opposite end of said support to the pressure vessel at the open end thereof, said coupling means including a



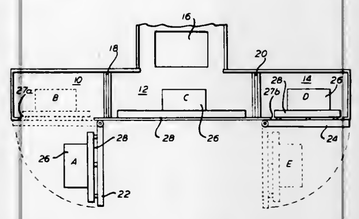
flange carried by said support and engageable in said groove to prevent relative endwise movement of said support and the pressure vessel, and means for moving said pusher element from said first position to said second position to move the module along said support and into the pressure vessel at its open end.

4,047,624

WORKPIECE HANDLING SYSTEM FOR VACUUM PROCESSING

Frederick William Dorenbos, El Cerrito, Calif., assignor to Airco, Inc., Montvale, N.J.

Filed Oct. 21, 1975, Ser. No. 624,498
Int. Cl.² C23C *13/08*
U.S. Cl. 214—17 B **13 Claims**



1. Apparatus for transporting at least one workpiece between the outside and the inside of a pressure sealable chamber, comprising:

a. a pressure sealable lock connected to the chamber having a gate aperture through which the workpiece is transportable between the inside of the chamber and the lock, and having a door aperture through which the workpiece is transportable between the lockk and the outside of the chamber;

b. a door movable between an open position and a closed position for sealing the door aperture;

c. means associated with the door for receiving, supporting and transporting the workpiece through the door aperture as the door is moved between its open and closed positions;

d. a gate movable between an open position and a closed position for sealing the gate aperture;

e. means mounted on the door for driving the workpiece and for conveying the workpiece through the gate aperture when the gate is in its open position;

f. means for receiving and supporting the workpiece inside the chamber; and

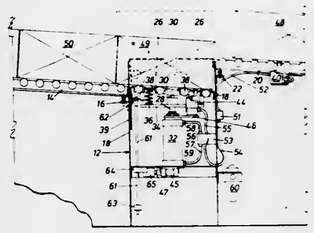
g. a pivot for supporting the door.

4,047,625

GRAVITY ROLLER CONVEYORS

Willson Barrat David Grant, Quappell, Little Frieth, Henley-on-Thames, Oxfordshire, England

Continuation-in-part of Ser. No. 472,046, May 21, 1974, abandoned. This application Nov. 21, 1975, Ser. No. 634,279
Int. Cl.² B66F *9/06*; B65G *47/00*
U.S. Cl. 214—95 R **9 Claims**



1. An elevator for raising a load from an infeed position to a discharge position which elevator comprises

a. a platform for supporting the load and adapted in use to be inclined to the horizontal about a first axis at the infeed position and inclined to the horizontal about a second axis at the discharge position, the first and second axes not being parallel,

b. means for changing the inclination of said platform during its elevation from the infeed position to the discharge position,

c. a low friction surface on said platform and provided by ball castors,

d. a pneumatic ram for elevating said platform and said load from the infeed position to the discharge position and for lowering said platform from the discharge position to the infeed position, the pneumatic ram being attached to the platform by the cooperation of a ball carried on said ram and a ball socket on the underside of said platform,

e. means preventing infeed of a load other than when the platform is in the infeed position, and

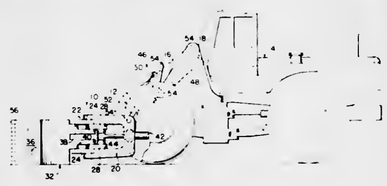
f. means preventing discharge of a load other than when the platform is in the discharge position.

4,047,626

CLAMSHELL BUCKET FOR WHEEL LOADER

Thomas C. Meisel, Jr., Phoenix, Ariz., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 24, 1975, Ser. No. 561,134
Int. Cl.² B65G *47/90*
U.S. Cl. 214—147 G **8 Claims**



1. A bucket assembly comprising:

a support frame;

a bucket comprising first and second jaws; first link means comprising a first pair of links, each pivotally connected to the support frame and first jaw;

second link means comprising a second pair of links, each pivotally connected to the support frame and second jaw;

each link being movable without direct connection to any other link;

the first and second pairs of links providing that the jaws are movable to open and closed states, said first and second pairs of links further providing that the open jaws are initially moved to an extent in a substantially open state with a generally rectilinear motion relative to the support frame and subsequently with a generally arcuate motion relative to the support frame to said closed state; and

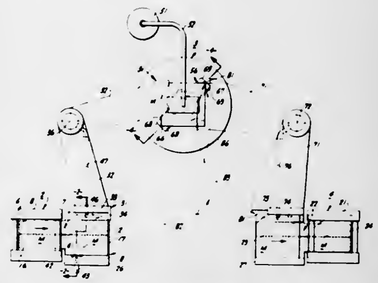
motion means pivotally mounted to the support frame and pivotally mounted to a link or a jaw for so moving the first and second jaws.

4,047,627

MASK PLATE HANDLING METHOD

Alan G. Flint, San Jose, Calif., assignor to GCA Corporation, Bedford, Mass.

Division of Ser. No. 510,284, Sept. 30, 1974, Pat. No. 3,960,277. This application Jan. 26, 1976, Ser. No. 652,514
Int. Cl.² B65G *47/91*
U.S. Cl. 214—152 **4 Claims**



1. A method of handling polygonal masks to orient the masks in sequence with their corners in a particular orientation prior to transferring said masks from an orienting station to a treating station, comprising:

A. providing a directional fluid bearing track structure at said orienting station,

B. feeding a series of polygonal masks in sequence from a supply thereof and positioning said masks in sequence upon said track structure,

C. providing stop means adjacent said track structure which includes an angular stop shoulder contoured in accordance with the corner configurations of said polygonal masks,

D. mounting said stop means along an edge of but separate from said track structure for movement relative to said track structure while said track structure remains stationary,

E. supporting said polygonal masks on a fluid cushioning emanating from said track structure and moving such masks when thus supported by said fluid cushion in sequence along said track structure with an edge thereof in generally leading relationship,

F. as each said polygonal mask moves along said track structure, urging each such mask generally laterally of said track structure while such mask is supported by said fluid cushion to move a corner thereof into close conformity with said angular stop shoulder of said stop means, and,

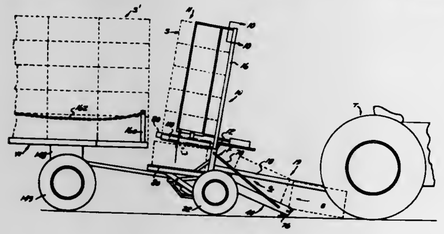
G. as each said polygonal mask in sequence is urged against said stop shoulder, grasping each such mask with transfer means and moving such mask away from said track structure to a treating station without disturbing the orientation of said corner imparted to each such mask by said stop shoulder.

4,047,628

METHOD OF LOADING AND STACKING BALES

Allan R. Havens, 491 Somerset, Beaverton, Mich. 48602

Division of Ser. No. 389,494, Aug. 20, 1973, Pat. No. 3,941,266, which is a division of Ser. No. 227,850, Feb. 22, 1972, Pat. No. 3,807,579. This application Feb. 27, 1976, Ser. No. 662,034
Int. Cl.[2] A01D *87/12*; B65G *57/32*
U.S. Cl. 214—152 4 Claims



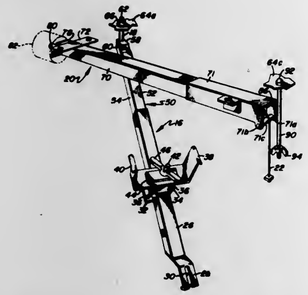
1. A method of loading and stacking bales comprising:
lifting bales off the ground and transferring them rearwardly in a longitudinal path of travel to a stacking station;
vertically stacking the bales at said stacking station;
sequentially laterally transferring the stacks of bales at the stacking station to form a row of stacks on a stack support rack;
moving the stacking support with the row of stacks rearwardly and then downwardly while maintaining the horizontal orientation of said stacks of bales substantially constant relative to said forward path of travel and then continuing to move the row of stacks downwardly while stripping the stacks of bales from the rack to transfer them to a remote location.

4,047,629

SPARE TIRE HOIST AND SUPPORT

Darrel J. Klein, R.R. 1, Box 10, Breckenridge, Minn. 56520

Continuation-in-part of Ser. No. 513,728, Oct. 10, 1974, abandoned. This application Nov. 21, 1975, Ser. No. 634,077
Int. Cl.[2] B62D *43/04*
U.S. Cl. 214—451 3 Claims



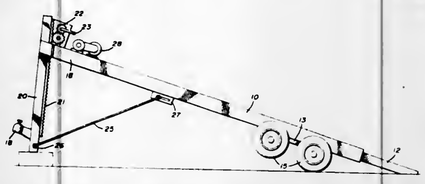
1. An apparatus for hoisting and storing a spare tire beneath the body of a vehicle comprising,
a. an elongated support bar adapted to be mounted normally in a horizontal disposed position beneath the body of the vehicle, said supporting bar having a connected end and a free end,
b. a vertically disposed threaded mounting pin rigidly connected to the vehicle at one end and attached at the other end to the connected end of the supporting bar,
c. a threaded hangar block screw threaded upon the pin whereby the hangar block can be raised or lowered upon the pin by being turned thereupon to thereby raise or lower the connected end of the elongated tire supporting bar to accomodate tires of different sizes and the screw thread connection between the pin and the hangar block functions as a vertical pivot axis at the forward end of the elongated tire support bar to allow the free end thereof to swing freely from side to side about the vertical axis of the pin at the forward end of the bar for rear or side delivery of the tire as the tire is being removed or replaced beneath the vehicle,
d. a horizontally disposed pivot operatively associated between the connected end of the bar and the threaded hangar block allowing the free end of the bar to swing upwardly and downwardly about the pivot,
e. preventor means is provided for preventing rotation of the elongated tire supporting bar and the tire mounted thereon upon its own longitudinal central axis to keep the tire from tilting as it is being placed into or removed from the storage position beneath the vehicle,
f. said preventor comprising forming the bar from an elongated polyagonal tube slidably mounted upon an elongated channel element, one end of the elongated channel element extending from the end of the tube and being operatively connected to the vehicle by means of the horizontally disposed pivot whereby the channel and tube slidably mounted thereupon are free to swing up or down about said pivot and the horizontal pivot cooperating with the channel and tube is adapted to prevent the tube and tire mounted thereupon from rotating about the central longitudinal axis of the tube,
g. a tire mounting means secured to the tube between the connected and free ends thereof for fastening a tire to the tube,
h. a tire elevating means secured to the vehicle and operably associated with the free end of the tube, said elevating means including an elongated flexible connecting member having an end adapted to be fastened to the free end of the tube,
i. a screw lift including a housing, a shaft mounted for rotation therein, a means for rotating the shaft, a pull block connected to the shaft and connected to the upper end of the elongated connecting element so that the rotation of the shaft is adapted to move and pull block toward one end or the other of the screw lift to thereby raise or lower the elongated connecting element and the free end of the tire supporting tube to thereby lower the free end of the tube or raise it together with the tire to the storage position wherein the tire assumes a substantially horizontal position beneath the vehicle.

4,047,630

TILTABLE AND EXTENSIBLE TRAILER

Wilbur E. Young, Rte. 7, New Waterford, Ohio 44445

Filed Feb. 2, 1976, Ser. No. 654,573
Int. Cl.[2] B60P *1/28*
U.S. Cl. 214—506 4 Claims



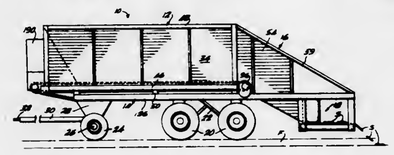
1. A tiltable trailer consisting of a main frame, wheel and axle assemblies thereunder inwardly of the ends thereof for supporting the same, a tow bar and socket at one end of said frame by which the trailer may be towed, roller guide means on said frame adjacent said tow bar and socket, a perpendicular lifting arm movably engaging said roller guide means and means for moving the lifting arm substantially vertically with respect to the trailer so as to lift said end of the trailer and bring the other end thereof downwardly, said roller guide will inch said trailer forwardly.

4,047,631

SUGARCANE PLANTING DEVICE

Angel Diz, 1206 Georgia Ave., West Palm Beach, Fla. 33401

Filed Dec. 9, 1976, Ser. No. 749,161
Int. Cl.[2] B60P *1/38*
U.S. Cl. 214—519 11 Claims



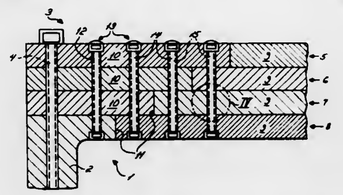
1. A sugarcane planting device for planting sugarcane seed pieces in ground furrows comprising:
a trailer having front and rear ends and providing an enlarged hopper comprised of a pair of opposed side walls, a front wall and a floor defining a main inner chamber to receive a supply of sugarcane seed pieces, a main frame supporting the hopper, a first undercarriage portion fixed to said main frame and carrying a plurality of wheels, a second, front, undercarriage portion, a front wheel assembly pivotally carried by said front undercarriage portion, and a tongue and hitch assembly carried by said front wheel assembly for attachment to a tow vehicle;
a rear end extension providing a rear end chamber portion opening at a front end into said main inner chamber and being provided with a rearwardly downwardly angled floor and a central vertical divider wall defining a pair of opposed side chutes in said chamber portion with rear openings,
means to move the sugarcane seed pieces from said main inner chamber to said rear end chamber portion wherein the seed pieces are fed by gravity forces, by reason of said rearwardly downwardly angled floor, through said side chutes and out through said rear openings,
conveyor means fixed relative to each of said rear openings to receive the seed pieces emerging therefrom and to orient said pieces to a parallel relation to one of the furrows and to discharge the pieces thereinto.

4,047,632

PRESSURE VESSEL ESPECIALLY FOR A NUCLEAR REACTOR

Franz Schilling, Kempen, Germany, assignor to Siempelkamp Giesserei KG, Krefeld, Germany

Filed Nov. 26, 1975, Ser. No. 635,637
Claims priority, application Germany, Nov. 28, 1974, 2456379
Int. Cl.[2] B65D *45/00*
U.S. Cl. 220—3 6 Claims



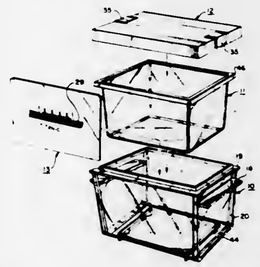
1. A pressure vessel especially for a nuclear reactor, comprising a cylindrical shell and at least one cover mounted on said shell and spanning the interior thereof, said cover comprising a plurality of generally planar superposed layers each of said layers comprising a central member and a plurality of sector shaped members surrounding said central member and bearing upon one another and upon said central member at respective joints, the joints of each layer being offset from the joints of the next-adjacent layer, said layers having mutually aligned passages forming throughgoing channels in said cover, and respective tensioning devices extending through said channels and traversing all of said layers and forming shear-resistant means between the layers of said cover, said tensioning devices bearing upon the upper and lower layers perpendicularly thereto.

4,047,633

ICE CONTAINER

Edgar F. Trombly, Grosse Pointe Farms, Mich., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Sept. 23, 1976, Ser. No. 726,076
Int. Cl.[2] B65D *13/02, 25/18*
U.S. Cl. 220—9 R 5 Claims



1. A double-walled container comprising an outer container having a bottom and integral upstanding peripheral walls terminating at a top end, an inner container having a bottom and integral upstanding peripheral walls merging into a continuous top rim extending horizontally outwardly therefrom and turning downwardly into an inclined peripheral lip portion, the underside of said rim including a downwardly projecting rib forming a channel with said lip portion; said inner container located inside said outer container with the top end of said outer container inserted in said channel, the upstanding peripheral walls and bottom of the outer container being spaced apart from the upstanding peripheral walls and bottom of the inner container with at least part of the peripheral walls of the outer container being transparent; a decorative insert positioned between the spaced apart peripheral walls to be viewed through said transparent part said outer container upstanding peripheral walls including an outwardly extending peripheral ledge located below said top end, and a cover located over the container and supported by said ledge.

4,047,634

LID HAVING A SEPARABLE PANEL

Robert McGeehin, 36 Newlaithes Gardens, Horsforth, Leeds LS18 4JU, and Edward Dodsworth, 1 Grampian Close, Shelly, near Huddersfield, both of England

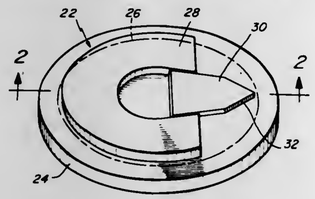
Division of Ser. No. 498,714, Aug. 19, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 660,819
Claims priority, application United Kingdom, Aug. 21, 1973, 39455/73
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—270 2 Claims

1. In a lid for a container wherein the lid is of the type having
1. a line of weakening defining a panel that can be removed

or bent to permit access to the interior of the container, and

2. a substantially rigid tab secured to the panel for causing fracture along a portion of the line of weakening by lifting one end of the tab,

the improvement for facilitating lifting of the tab and fracture along the remaining extent of the line of weakening comprising



a. a well in the panel, one end of the rigid tab protruding over the well whereby the tab end can be lifted by a finger inserted in the well, and

b. the panel including a raised horseshoe shaped portion whose outer periphery is adjacent to the line of weakening, the end of the tab to be lifted being disposed between the legs of the horseshoe, and the bight of the horseshoe forming a portion of the well perimeter.

4,047,635

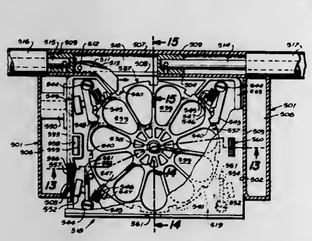
ARTICLE DISPENSING APPARATUS FOR SELECTIVELY DISPENSING ARTICLES

Arthur A. Bennett, Jr., West Covina, Calif. 91793

Continuation-in-part of Ser. No. 608,785, Aug. 28, 1975, abandoned. This application July 2, 1976, Ser. No. 702,235

Int. Cl.² B65G *1/00*

U.S. Cl. 221—5 **10 Claims**



1. An apparatus for dispensing preselected pharmaceutical doses in readily handled units such as in pill or capsule form, the apparatus comprising:

a. a housing structure;

b. a plurality of magazines arranged to be removably received in the housing structure, each magazine adapted to contain a plurality of preselected similar pharmaceutical dosages differing from the dosages in the other magazines;

c. means for activating selected magazines to cause discharge of a dosage from each selected magazine to produce a preselected multiple dosage;

d. each magazine including means providing access to the dosages contained in the magazine and lock means for each magazine to prevent unauthorized access to the dosage therein;

e. and other lock means preventing discharge of dosages when the magazine is removed from the housing structure.

4,047,636

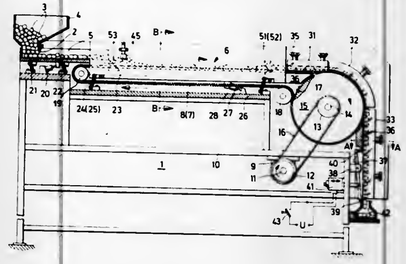
DEVICE FOR THE ARRANGEMENT, ALIGNMENT AND CORRECTLY POSITIONED FEED OF ARTICLES IN PARTICULAR HAVING ELONGATED SHAPE

Hans List, Lau-Strasse 51 (BRD), 7 Stuttgart 70, Germany

Filed Sept. 10, 1975, Ser. No. 611,977

Int. Cl.² B23Q *7/12*

U.S. Cl. 221—161 **23 Claims**



1. A device for the arrangement, alignment, and correctly positioned supply of elongated articles to receptacles, a further processing station, and the like, said device comprising a supply receptacle holding a multiplicity of said articles; a distributor means spaced from said supply receptacle for delivering a predetermined number of said articles to each of a plurality of receiving receptacles; a forward transport means for transporting articles from a supply station at said supply receptacle to said distributor means in aligned position, said forward transport means including at least two drive rollers, at least two deflecting rollers, and at least two endless spiral springs each spanned over a respective one of said drive and deflecting rollers; and return transport means for transporting from said distributor means to said supply station articles which were not correctly positioned in said forward transport means and which have fallen therefrom.

4,047,637

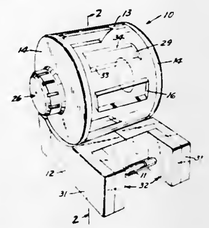
PAPER CLIP DISPENSER

Jerome A. Grunstad, West St. Paul, and Richard G. Eischens, Edina, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 3, 1976, Ser. No. 747,361

Int. Cl.² B65H *3/66*; G07F *11/24*

U.S. Cl. 221—265 **6 Claims**



2. A dispenser for magnetizable articles, comprising:

a base;

a cylindrical shell affixed to the base, the shell having an axial slot for passage of the articles;

a cylindrical article container concentric with and rotatably mounted within the shell, the container having a side wall and end walls and having a knob extending from at least one end wall for rotating the container within the shell and having at least one axial slot for passage of the articles to deliver the articles one at a time to the shell slot for dispensing therefrom upon rotation of the container; and

a pair of spaced magnets affixed to said base proximate the end points of the shell slot, the magnets providing a magnetic field in the space therebetween for intersecting the paths of the dispensed articles and suspending the articles in the space.

4,047,638

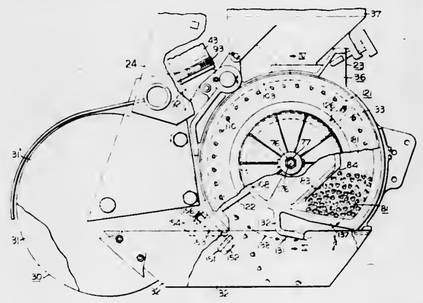
SEED DISC FOR AN AIR PLANTER

Paul H. Harrer, and LeRoy Langford, both of LaPorte, Ind., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 511,385, Oct. 2, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,332

Int. Cl.² A01C *7/04*; B65G *29/00*

U.S. Cl. 221—266 **6 Claims**



1. A seed disc for an air planter having means to rotatably drive said disc, a seed cavity and a seed drop portion, said seed disc comprising:

a relatively rigid central portion adapted for connection to said drive means whereby said disc is rotated about its axis in one direction of rotation when said planter is engaged in a planting operation, said axis being substantially horizontal and transverse to the direction of travel of said planter during the planting operation, and

a radially outer portion having

walls defining a plurality of circumferentially spaced pockets in one axial side of said disc, each of said pockets having

an axially extending surface defining a shelf at the trailing edge of said pocket operable to assist in supporting a kernel of seed in said pocket as said disc is rotated in said one direction to move said pocket in an upward arc,

a gently sloping surface from the bottom to the leading edge of said pocket facilitating movement of a kernel of seed into said pocket as said pocket communicates with said seed cavity during rotation of said disc in said one direction and facilitating dropping of said kernel of seed from said pocket when said pocket moves in a downward arc through said seed drop portion, and

a small opening between the bottom of said pocket and the other axial side of said disc, said opening being sufficiently small to prevent passage therethrough of kernels being planted and

walls defining a camming groove extending circumferentially in said one direction of rotation of said disc and radially inwardly from each pocket whereby said camming groove urges seed radially outwardly toward its associated pocket as said disc is rotated through a quantity of bulk seed.

4,047,639

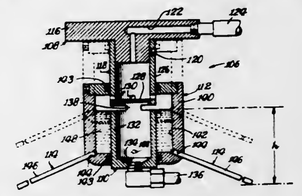
ABRASIVE SLURRY REGULATOR ASSEMBLY

David M. McNamara, Arlington Heights, and Stephen A. Boettcher, Deerfield, both of Ill., assignors to Speedfam Corporation, Des Plaines, Ill.

Division of Ser. No. 520,608, Nov. 4, 1974, Pat. No. 3,991,918. This application Aug. 23, 1976, Ser. No. 716,548

Int. Cl.² B67D *3/00*

U.S. Cl. 222—64 **5 Claims**



1. A regulator assembly for controlling the flow of an abrasive slurry, comprising

a support,

body means secured to said support and defining a cavity containing a pool of abrasive slurry therein and having a vertical elongated opening in the side thereof,

overflow means secured to the side of said body means for establishing the upper level of a pool of abrasive slurry in said cavity, said overflow means including an overflow receptacle secured to said support, with said body means being vertically slidable on said support and said overflow receptacle whereby the upper level of the pool of abrasive slurry may be selectively adjusted, and

a least one flow restrictive conduit means secured at one of said body means and communicating with said cavity at the lower end of the pool of abrasive slurry and presenting an outer end from which abrasive slurry is discharged, and one of said means being movable whereby to selectively adjust the vertical distance between the plane of the upper level in the pool of abrasive slurry and the plane of the outer end of said conduit means.

4,047,640

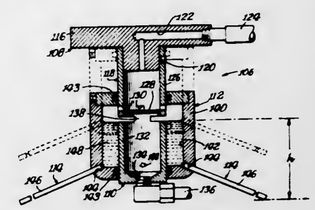
ABRASIVE SLURRY REGULATOR ASSEMBLY

David M. McNamara, Arlington Heights, and Stephen A. Boettcher, Deerfield, both of Ill., assignors to Speedfam Corporation, Des Plaines, Ill.

Division of Ser. No. 520,608, Nov. 4, 1974, Pat. No. 3,991,918. This application Aug. 23, 1976, Ser. No. 716,837

Int. Cl.² B67D *3/00*

U.S. Cl. 222—64 **4 Claims**



1. A regulator assembly for controlling the flow of an abrasive slurry, comprising

a support,

body means secured to said support and defining a cavity containing a pool of abrasive slurry therein and having a vertical elongated opening in the side thereof,

overflow means secured to the side of said body means for

establishing the upper level of a pool of abrasive slurry in said cavity, said overflow means including a sleeve member vertically slidable on said body means and having an aperture aligned with and vertically positionable along said elongated opening whereby the upper level of the pool of abrasive slurry in said cavity may be selectively adjusted, and

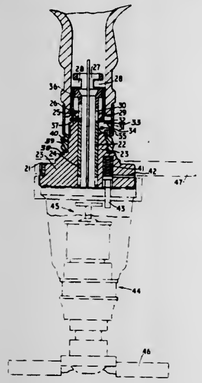
at least one flow restrictive conduit means secured at one of said body means and communicating with said cavity at the lower end of the pool of abrasive slurry and presenting an outer end from which abrasive slurry is discharged, and one of said means being movable whereby to selectively adjust the vertical distance between the plane of the upper level in the pool of abrasive slurry and the plane of the outer end of said conduit means.

4,047,641

LIQUID DISPENSING CONTAINERS WITH CUTTER FOR PREVENTING REFILLING

Francis Alfred Delaney, Formby, England, assignor to Sinanan Enterprises Limited, London, England

Filed Oct. 24, 1975, Ser. No. 625,378
Int. Cl.² B65D *47/02, 49/12*
U.S. Cl. 222—80 **8 Claims**



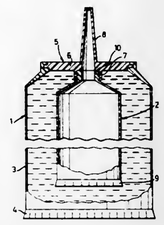
1. A bottle like container having a main body part and a neck part integral with said body part made of glass or like hard and rigid material and an extension neck piece of a softer plastics material fixedly secured in liquid-tight manner at one end to said neck part of bottle or container, said extension piece being externally screw-threaded at its other end to co-operate with a closure cap and having an inwardly directed shoulder formation between its ends and spaced from the outer end of the neck portion of the bottle, wherein said extension piece is internally screw-threaded at the end thereof remote from said bottle neck part and beyond said shoulder formation, having engaged in said internally screw-threaded portion of said extension piece a device operable to cut through the material of said shoulder formation upon rotation thereof relative to said extension piece whereby to sever said internally screw-threaded portion from the remainder of the extension piece upon rotation of said device in operated state, wherein said device includes at least one cutter member pivotally movable between a first position in which said cutter member is retracted into the body of the device and inoperative and a second position in which said cutter member projects from the body of the device for cutting engagement with said shoulder formation.

4,047,642

SPRAYING DEVICE

Billy Nils Nilson, 595 00 Mjolby, Sweden

Filed Mar. 21, 1974, Ser. No. 453,344
Claims priority, application Sweden, Mar. 22, 1973, 7304094
Int. Cl.² B65D *35/28*
U.S. Cl. 222—94 **1 Claim**



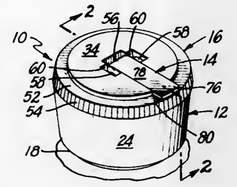
1. Spraying device comprising an outer receptacle having a flexible wall, an inner receptacle also having a flexible wall, said inner receptacle being housed in said outer receptacle, a liquid active substance being contained in said outer receptacle, said inner receptacle initially containing only air and communicating with the atmosphere via a narrow channel, said inner receptacle wall being imperforate and of a permeable material, and the permeable nature of said inner receptacle wall being the sole means for transferring the active substance to be dispensed from said outer receptacle to said inner receptacle whereby upon squeezing said outer receptacle said liquid therein is passed into said inner receptable for dispensing with the initial air charge in said inner receptacle.

4,047,643

SAFETY DISPENSING CLOSURE WITH MOVABLE RETAINER

Robert E. Hazard, North Kingstown, R.I., assignor to Polytop Corporation, Slatersville, R.I.

Filed Mar. 20, 1972, Ser. No. 235,970
Int. Cl.² B65D *55/02*
U.S. Cl. 222—153 **13 Claims**



12. A closure having a closure body including means for holding said closure body with respect to a container so that it is incapable of being removed from a container during the normal utilization of said closure and having an opening extending therethrough, said closure also having a spout rotatably mounted on said closure body so as to be capable of being rotated between a closed position in which said opening in said closure body is closed off by said spout and an open position in which a passage within said spout is in alignment with said opening, said spout extending from said closure body when in said open position and extending adjacent to said closure body when when in said closed position, said spout being mounted on said closure body so as to be incapable of being removed from said closure body during movement between said open and said closed positions during normal utilization of said closure, in which the improvement comprises:

a retainer for engaging said spout so as to hold said spout against rotation when said spout is in said closed position,

cooperating means on said retainer and said closure body for movably mounting said retainer on said closure body so that said retainer is incapable of being separated from said closure body during the normal utilization of said closure and so that said retainer is capable of being moved with respect to said spout and said closure body between locked and unlocked positions,

in said locked position said retainer being located so as to physically prevent movement of said spout from said closed position and in said unlocked position said retainer being located so as to be spaced relative to said spout so as to permit said spout to be rotated between said opened and closed positions,

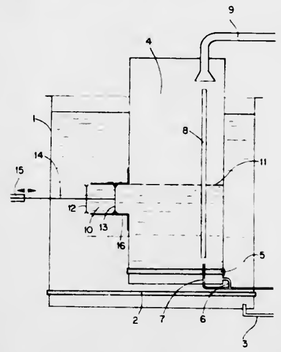
said retainer being accessible from the exterior of said closure so as to be capable of digital engagement so that it can be moved with respect to said closure body and said spout.

4,047,644

POWDER FLUIDIZER WITH FEED FOR CONSTANT POWDER LEVEL

Fernand Raymond, 38330 chemin du Manival, Saint-Ismier, France

Filed Sept. 15, 1975, Ser. No. 613,421
Claims priority, application France, Oct. 9, 1974, 74.34715
Int. Cl.² B65D *83/06*
U.S. Cl. 222—193 **7 Claims**



1. A distributor for supplying powdered solid products to apparatus utilizing such products, said distributor comprising:

a first container to which said product is supplied,

a second container from which said product is delivered to said apparatus,

means for fluidizing the powdered solid product in both containers,

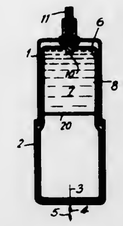
and means for maintaining the level of said product in said second container at approximately a predetermined level, said means for maintaining the level of said product comprising at least one lock-chamber connecting said first and second containers, said lock-chamber comprising an inlet to said second container, the upper portion of said inlet terminating in said second container at said desired level, together with means for opening said at least one lock chamber alternately to one of said containers and then to the other but preventing the formation at any time of an open passage from one container through said lock chamber to said other container.

4,047,645

AEROSOL DEVICE WITH TELESCOPING CONTAINER PARTS

Joseph L. Caliendo, 578 Driggs Ave., Brooklyn, N.Y. 11211

Filed June 8, 1976, Ser. No. 693,867
Int. Cl.² B65D *35/28*
U.S. Cl. 222—386.5 **7 Claims**



1. An aerosol device, comprising

airtight container means;

an airtight flexible membrane in the container means containing fluid material under pressure and compressed gas gastightly separated from the fluid material;

pressure means for manually increasing the pressure on the fluid material in the container means, the container means and pressure means comprising a pair of containers constituting an upper container and a lower container telescopically slidably mounted one within another, the upper container being mounted in the lower container, the lower container having a larger diameter for movement in axial directions, wherein dispensing pressure is maintained by gradually telescoping the upper and lower containers towards each other; and

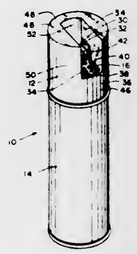
spray valve means in the container means for spraying the fluid material out of the container means under manual control.

4,047,646

CHILD-SAFE AEROSOL ACTUATOR

Mei-Kuo Lo, and Erwin Sheppard, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed July 21, 1975, Ser. No. 597,856
Int. Cl.² B65D *83/14, 55/02*
U.S. Cl. 222—402.13 **27 Claims**



1. A device for use with pressurized dispensers and adapted to prevent valve actuation by finger pressure of human fingers of less than predetermined dimensions while allowing actuation by fingers of greater than said predetermined dimensions, comprising an actuator member having an exposed surface, said surface having effective and ineffective areas, said effective area nondepressible by a finger of less than said predetermined dimensions, and said ineffective areas having substantially sharp finger-repelling means thereon which would cause

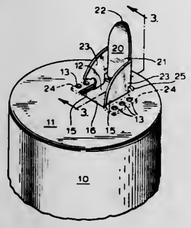
substantial discomfort to the human finger when applying valve-actuating pressure thereto, whereby the finger pressure required for valve actuation is effectively applied only to said effective area.

4,047,647

DISPENSER FOR GRANULAR MATERIAL

Richard C. Lewis, 464 Green Bay Road, Winnetka, Ill. 60093

Continuation-in-part of Ser. No. 389,165, Aug. 17, 1973, Pat. No. 3,908,873. This application Sept. 26, 1975, Ser. No. 617,024
The portion of the term of this patent subsequent to Sept. 30, 1992, has been disclaimed.
Int. Cl.² B67D *3/00*
U.S. Cl. 222—480 **10 Claims**



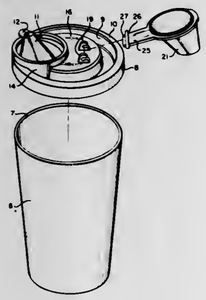
1. A dispenser for pouring or sifting granular material having an apertured wall and including a trapezoidal pouring aperture and a plurality of sifting apertures; a spout having a first closure panel of generally trapezoidal shape adapted when in a first position of pivotal adjustment to overlie and seal off said pouring aperture; a pair of spout sidewalls extending from opposite sides of said closure panel and inwardly of said pouring aperture; and second closure means carried by at least one of said sidewalls within said dispenser adapted to seal off said sifting apertures when said first closure panel is in a second position of pivotal adjustment, said pouring aperture discharging through said spout when said closure panel is in said second position and said sifting apertures are unsealed when said closure panel is in said first position.

4,047,648

SPOUT WITH SNAP ACTING COVER AND DRAIN HOLE

Jack V. Croyle, Woonsocket, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed May 7, 1976, Ser. No. 684,342
Int. Cl.² B65D *25/42*
U.S. Cl. 222—498 **1 Claim**



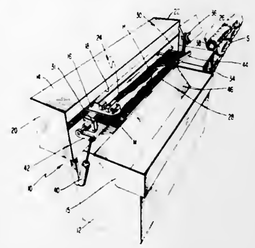
1. A container for dispensing liquids comprising a container portion having a bottom wall and continuous upstanding peripheral walls terminating at an upper edge, a seal engaging said upper edge in a liquid-tight manner, a pouring spout extending upward from said seal, a cap movable to a position over the pouring spout to seal the pouring spout, said cap having an integral elongated strap with a trunion on the end thereof, a pair of spaced lugs integral with the seal and spaced from the pouring spout a sufficient distance to permit the trunion to pivot in the lugs in moving said cap to a sealing position over the pouring spout said strap and trunion including means that extend beyond said trunion, said means being engagable with the seal upon rotation of said cap to a position removed from its sealing position over said pouring spout thereby maintaining said cap in the non-sealing position.

4,047,649

APPARATUS FOR HANDLING HOSIERY

Clifton Gregory, Hickory, N.C., assignor to Marvel Specialty Company, Hickory, N.C.

Filed Feb. 10, 1976, Ser. No. 656,901
Int. Cl.² A41H *43/00*
U.S. Cl. 223—43 **14 Claims**



1. An apparatus for separating, straightening, and stacking hose from a string, comprising:
a platform for supporting the separated hose;
means for separating hose and advancing the separated hose along a surface of said platform to a predetermined, fixed location on said platform, means for producing frictional resistance between said platform and hose during pulling serving to straighten said hose;
receiving means located below said platform for collecting and stacking hose; and
means for transferring hose from said platform to said receiving means.

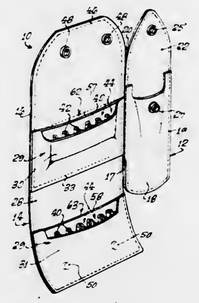
4,047,650

SPORTSMAN'S MULTIPURPOSE UTILITY POUCH

John M. Domingos, 3108 Vassar St., Bakersfield, Calif. 93306

Filed Mar. 29, 1976, Ser. No. 671,027
Int. Cl.² F41B *13/04*; F42B *39/08*
U.S. Cl. 224—2 B **3 Claims**

1. A sportman's multipurpose utility pouch adapted to be transported on the user's belt, comprising a unitary backing panel having formed thereon the combination of a knife sheath section and an ammunition section disposed immediately adjacent thereto, a sheath panel fastened to said backing panel to define a knife pocket, a portion of said backing panel above said knife sheath panel defining a safety flap disposed thereabove and being foldable into selective engagement with said sheath panel to secure a hunting knife or the like nested therein, said ammunition section comprising a series of longitudinally spaced pockets, each said pocket being formed by means of a number of contiguous intermediate panels being secured to one another along three peripheral edges thereof and to said backing panel thereby defining with said backing panel adjoined upwardly opening enclosures; means provided in one of said adjacent enclosures sandwiched between adjacent ones of said intermediate panels for securing ammunition in discreet spaced relation causing said ammunition to be securely nested between said adjacent panels except that a small portion thereof extends beyond said means to thereby permit handling of said ammunition, said backing panel extending beyond said pockets to thereby provide a closure flap, said backing panel being foldable between said pockets to thereby



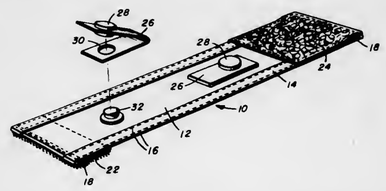
bring said pockets into protective face to face juxtaposition; and said backing panel having fastening means disposed thereon and located such that when said pockets are folded into juxtaposition said flap may be folded over said pockets and fastened to protect the contents of said pockets.

4,047,651

WATCH BAND

Richard Arnold McMullen, 2752 Choctaw Drive, Melbourne, Fla. 32935

Filed Oct. 25, 1973, Ser. No. 409,404
Int. Cl.² G04B *37/14*
U.S. Cl. 224—4 D **3 Claims**



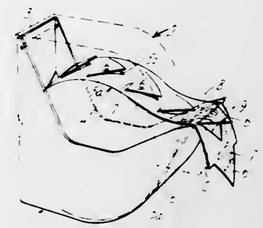
1. A fabric watch band comprising an elongated fabric strap having upper and lower sides, opposed longitudinal edges and first and second end portions, said first and second portions of the strap being reversely bent on the strap to the opposite sides thereof to form finished end edges, a pair of complementary pressure attachable components positioned to the opposite sides of said strap in overlying and concealing relation to the reversely bent end portions, and stitching securing each component and underlying reversely bent end portion to the strap, said pressure attachable components being formed of a fabric-like material incorporating releasably engageable hook-like elements on one component and loop-like elements on the second component and watch mounting means fixed to one side of the strap, said watch mounting means comprising a pair of loops, each loop comprising a length of material having the opposed ends positioned in generally overlying relation to each other, and means fixing the loop ends to the strap, said means fixing the loop ends to the strap comprising a pair of complementary fastener components, one fastener component being fixed to the strap and the second fastener component being fixed to one end of the loop, the second end of the loop having an aperture therethrough freely positionable in overlying relation to the strap about the strap mounted fastener component whereby the two fastener components can be interlocked with the apertured end of the loop trapped therebetween for a combined removable mounting of the loop on the strap and a closing of the loop for the retention of a watch.

4,047,652

TICKET DISPENSING ASSEMBLY FOR DISPENSING TICKETS FROM A FLEXIBLE STRIP

Ake Ehrlund, Alvkvarnsvagen 177, Spanga, Sweden

Division of Ser. No. 520,865, Nov. 4, 1974, which is a division of Ser. No. 326,457, Jan. 24, 1973, Pat. No. 3,885,724. This application July 7, 1976, Ser. No. 703,313
Claims priority, application Sweden, Jan. 26, 1972, 846/72
The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.
Int. Cl.² B26F *3/02*
U.S. Cl. 225—54 **7 Claims**



1. A ticket dispensing assembly for dispensing tickets from a flexible strip comprising:
a container comprising
a casing and
a cover pivotally connected with said casing and
a roll of flexible strip material positioned in said container with the end of said strip protruding from said container and from which ticket pieces are intended to be torn off, said strip roll comprising
a strip of flexible material from which single pieces of one and the same predetermined length are intended to be torn off and having a pair of marginal edges and a feeding direction away from said roll,
said strip having a series of longitudinally spaced apart penetrated lines,
each of said lines shaped and adapted to form an individual tongue shaped flap,
each of said lines starting from a point adjacent to but spaced inwardly of said strip from one of said marginal edges extending in said feeding direction of said strip toward the centerline thereof, and on the other side of said centerline extending back opposite said feeding direction of said strip to a point adjacent to but spaced inwardly from the other marginal edge of said strip,
said flaps equally spaced longitudinally along said strip with the longitudinal spacing between corresponding portions of adjacent flaps equal to said predetermined length,
the points at the ends of each of said penetrated lines lying on a straight line which is substantially perpendicular to the longitudinal direction of the strip and with each flap firmly connected to the remainder of said strip along said straight line between said points,
the end of each of said flaps remote from said firmly connected portion having a width smaller than that of said firmly connected portion and with the smaller end of each flap directed forwards in said feeding direction of said strip and dimensioned to be gripped for pulling the strip and tearing a single end piece from said strip, and
marginal strip portions at both sides of each flap between

the end points of said penetrated line and the adjacent marginal edges of said strip and connecting all of said pieces of predetermined length in said strip,

first guidance means being combined with said cover, and

second guidance means and tear-off means being combined with said casing,

said second guidance means including a separation tongue located at the strip exit point,

said tear-off means being located on both sides of said second guidance means and extending from the base of said separation tongue laterally outwardly beyond the marginal edges of said strip, and

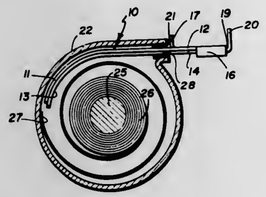
said separation tongue having a shape corresponding to the shape of the bottom part of said flaps in order to, during passage of the strip in response to a pull on the end of said strip protruding from said assembly, first guide the strip along a predetermined path between said first and second guidance means and then guide the flap over said separation tongue along one path and the remainder of the strip along another path, said last-mentioned path leading to the tear-off means for tearing off the end ticket at said marginal portions of said strip and leaving the next adjacent flap protruding from the assembly.

4,047,653

FILM RETRIEVER

Michael T. Starr, 16 Old Faith Road, Shrewsbury, Mass. 01545

Filed Feb. 23, 1976, Ser. No. 660,691
Int. Cl.² G03B *1/56*
U.S. Cl. 226—92 **2 Claims**



1. A device for retrieving the film leader from the inside of a film cartridge, comprising:

a. an outside jaw end,

b. an inside jaw end, each jaw end having a curved cylindrical surface with a radius approximately equal to that of the cartridge, each jaw end being attached to a generally flat base, and each jaw end and base being formed of a thin sheet of resilient material,

c. an inserting means adapted to allow the insertion of the jaw ends into the film cartridge,

d. a separating means adapted to cause separation of the jaw ends from time to time while they are in the cartridge, and

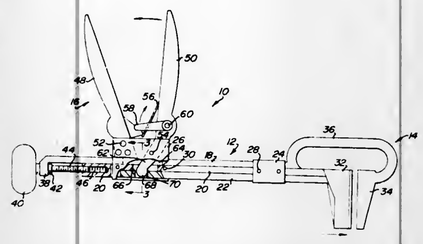
e. a closing means adapted to bias the jaw ends toward one another from time to time while they are in the cartridge, the bases of the jaws being secured parallel to and are linearly slideable with respect to one another to form the separating and closing means, the combined thickness of the bases being substantially less than the smallest dimension of a tangentially-opening entrance in the cartridge, so that the device can pass through the entrance to form the inserting means and the bases can slide with respect to one another while in the entrance, a portion of one of the bases wrapping around a portion of the other base to hold the bases in parallel and to allow linear relative movement.

4,047,654

SURGICAL STAPLER

Alfredo Alvarado, 9114 Dale Road, Philadelphia, Pa. 19115

Filed June 23, 1976, Ser. No. 699,027
Int. Cl.² B25C *5/02*
U.S. Cl. 227—19 **11 Claims**



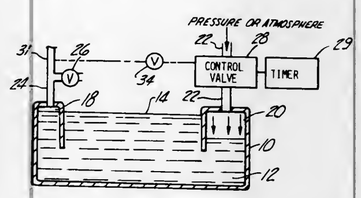
1. A surgical stapler for intralumenal anastomosis comprising a staple head and an anvil; means supporting said staple head and said anvil for movement toward and away from each other; said staple head and said anvil each having an ovoid-shaped cross-section and being adapted to simultaneously set a plurality of staples in at least one row forming a closed loop.

4,047,655

LIQUID LEVEL CONTROL MEANS AND METHOD

Gerald P. McCafferty, Churchville, Pa., assignor to The Budd Company, Troy, Mich.

Filed Nov. 28, 1975, Ser. No. 636,285
Int. Cl.² B23K *3/06*
U.S. Cl. 228—259 **3 Claims**



3. A method of soldering plurality of workpieces and for switching automatically and repetitively the level of solder in a container comprising the steps of:

sequentially positioning one at a time said workpieces over said solder a predetermined distance therefrom;

placing first control means with an open end into said solder to provide a first enclosed pressure chamber;

applying pressure to said first chamber to force the solder level therein to lower, the solder level in said second chamber to rise and the solder level in said container to rise to contact said workpiece;

detecting the solder level within said second chamber to discontinue the application of additional pressure to said first chamber while maintaining its pressure when the solder level therein reaches the level to apply solder to a particular workpiece disposed over said solder;

maintaining the solder level within said container at its raised level during the soldering of said particular workpiece, and

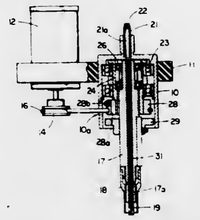
releasing the pressure within said first chamber after soldering said workpiece for a predetermined time to cause the solder level therein to rise, the level of the solder in said second chamber to lower and the solder level in said container to lower away from said particular workpiece to discontinue soldering of said particular workpiece.

4,047,656

ORBITAL MOTION WELDING HEAD

Paul W. McCombs, Connersville, Ind., assignor to Mac Machine & Metal Works Inc., Connersville, Ind.

Filed Mar. 3, 1976, Ser. No. 663,239
Int. Cl.² B23K *9/12, 9/28*
U.S. Cl. 228—27 **2 Claims**



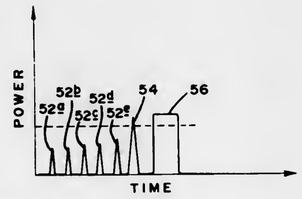
1. A welding head adapted to be moved so as to traverse a work surface to be welded, said head comprising a central support member and a tubular body carried thereby, a cylindrical spindle supported for free axial rotation within said tubular body about an axis parallel to the central longitudinal axis of said tubular body, the central bore of said spindle being offset with relation to the central bore of said tubular body, a tubular welding gun body extending centrally through said spindle bore and supported by said spindle for free axial rotation with relation thereto about an axis parallel to said central longitudinal axis of the tubular body, power means for axially rotating said spindle, and means for restraining said welding gun body against axial rotation with said spindle, whereby the tip of said welding gun body traces a generally circular path defined by the eccentricity of said spindle bore as said spindle is rotated by said power means, said circular path movement being independent of the work surface traversing movement of the welding head.

4,047,657

METHOD AND APPARATUS FOR JOINING METAL WORKPIECES USING HIGH FREQUENCY VIBRATORY ENERGY

Bruce L. Mims, Sherman, Conn., assignor to Branson Ultrasonics Corporation, New Canaan, Conn.

Filed Nov. 1, 1976, Ser. No. 737,526
Int. Cl.² B23K *21/02*
U.S. Cl. 228—103 **16 Claims**



1. The process of welding workpieces having metal surfaces by high frequency vibratory energy comprising:

superposing two workpieces to be welded upon one another;

applying a static force to the workpieces in a direction and of a magnitude to hold the contacting to be welded metal faces of the workpieces in intimate contact at the intended welding zone;

introducing through a vibrating element contacting one of the to be welded workpieces at the weld zone short bursts of vibratory energy having a predetermined frequency in the range from one to one hundred kilohertz;

monitoring the power commensurate with the vibratory energy transferred from the element to the workpieces and determining when a burst reaches a predetermined power amplitude, and

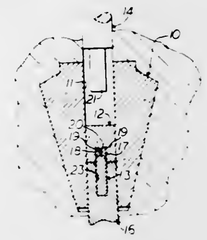
responsive to the occurrence of said power reaching the predetermined amplitude introducing said vibratory energy for a predetermined weld cycle.

4,047,658

METHOD OF FORMING A PRODUCT OF TWO DIFFERENT METALS

Harry D. Frueauff, Jr., P.O. Box 2213, Tallahassee, Fla. 32304

Filed June 10, 1976, Ser. No. 694,839
Int. Cl.² H02R *43/02*; B23K *21/00*
U.S. Cl. 228—115 **8 Claims**



1. The method of forming a product of two different metals in a closed die having a male punch element and a female punch element wherein a first metal member is connected to a second metal member of a smaller size comprising the steps of:

a. providing a recess in one end of said first metal member of a size to receive one end of said second metal member,

b. preplating at least one of said metal members with another metal selected from the group consisting of indium and tin,

c. placing said first metal member and said second metal member in said closed die with said one end of said second metal member projecting into said recess in said first metal member with the other end of said first metal member being adjacent said male punch element and the other end of said second metal member extending into said female punch element, and

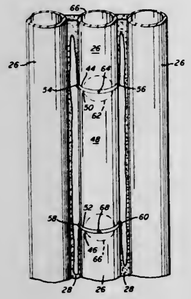
d. applying high pressure to the outermost end of at least one of said metal members through at least one of said punch elements to impart relative movement of said metal members toward each other while in said closed die to form a recess in said other end of said first metal member by said male punch element and simultaneously cause flow of the metals together at the point of contact of said metal members with displacement of one metal in the other at said point of contact whereby surface impurities are removed from the interface of the connected portions of said metal members and a metal to metal joint is provided therebetween.

4,047,659

METHOD FOR REPLACING WORN TUBES IN A GAS HOOD

Drago M. Vucic, Lorain, Ohio, assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 646,302, Jan. 2, 1976. This application Oct. 20, 1976, Ser. No. 734,067
Int. Cl.² B23K *28/02*
U.S. Cl. 228—119 **11 Claims**



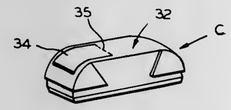
1. A method of repairing cooling tubes contained within a gas hood for a steelmaking vessel, said method comprising:
cutting out the portion of tube which has been identified as in need of repair;
squaring off the two ends of the tubing between which cutting a length of replacement tubing to fit the space between the two ends;
inserting the replacement tubing in place between the two ends;
temporarily securing the replacement tubing in place;
radially drilling a circular hole proximate each end of the replacement tubing;
permanently securing, in a water-tight relationship, the replacement tube at each end to the two ends of existing tubing;
placing an equally-sized plug cut from circular tubing into the circular hole cut proximate each end of the replacement tubing; and
sealing the plugs to the holes cut in the tubing to form a water-tight relationship between the two.

4,047,660

COMPOSITE PACKAGE

Richard L. Bell, Gleasmore; John D. Desmond, and Joseph J. Hart, both of Philadelphia, all of Pa., assignors to Container Corporation of America, Chicago, Ill.

Filed Dec. 22, 1975, Ser. No. 642,741
Int. Cl.² B65D *5/70, 5/72, 17/24*
U.S. Cl. 206—620 **5 Claims**



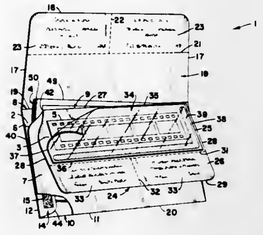
1. In a two-piece, composite pagkage, the combination of:
a. a body member formed of foldable paperboard and including a bottom wall and opposed pairs of side and end walls upstanding therefrom to form a boxlike structure open at the top;
b. a cap member including a dispensing opening and a cover for said opening and defining a cover structure open at the bottom;
c. said cap member including a depending skirt portion received within the upper portion of said body member;
d. said body member including flap means foldably connected to an upper edge of at least one of said walls and extending over a portion of said cap member to retain said cap member on said body member;
e. said flap means including a removable tab detachably joined thereto and overlying said cap member dispensing opening.

4,047,661

PRINT ENVELOPE

Bernard Klein, Kearney, Mo., assignor to Tension Envelope Corporation, Kansas City, Mo.

Filed Mar. 17, 1976, Ser. No. 667,506
Int. Cl.² B65D *27/08*
U.S. Cl. 229—70 **11 Claims**



1. A multi-pocket envelope comprising:
a. substantially rectangular front and back panels interconnected along side and bottom edges thereof forming a first content receiving pocket, said first pocket having an insert opening between the remaining edges of said panels;
b. a closure flap having a free edge and being connected with said front panel remaining edge along a first fold line;
c. a center flap having side edges and a free edge and being connected with said back panel remaining edge along a second fold line about which the center flap is folded into overlying relation with at least a portion of the back panel;
d. a patch member having upper and lower edges and first and second opposing side edges, a portion of said patch member lower edge and a portion of at least one patch member side edge being connected to said center flap forming a second content receiving pocket, said second pocket having an insert opening along at least the patch member upper edge; and
e. said closure flap being folded into overlying relation with said patch member.

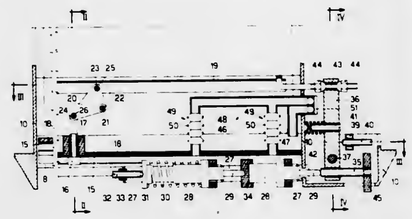
4,047,662

TERMINAL UNIT FOR THE OUTLET OF CONDITIONED AIR IN A CENTRALIZED CONDITIONING SYSTEM

Angelo Serratto, Corso Indipendenza, 5, Milan, Italy

Filed Dec. 11, 1975, Ser. No. 639,981
Claims priority, application Italy, Dec. 11, 1974, 30453/74
Int. Cl.² F24F *13/06*
U.S. Cl. 236—49 **13 Claims**

1. A terminal unit for the outlet of conditioned air in a centralized conditioning system, comprising a diffuser of conditioned air through outlet ports connected with a conditioning station and means for controlling conditioned air flow operated by a thermostatic device, wherein said conditioned air flow controlling means is positioned within the diffuser and is arranged to vary the outlet ports thereof, further comprising a device for conveying conditioned air directly to the thermo-



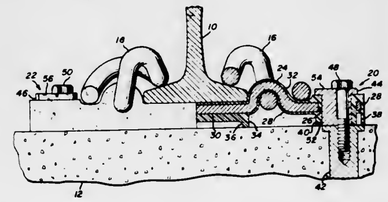
static device and means for actuating the conveyer device at a predetermined pressure of conditioned air.

4,047,663

RAIL PLATE HAVING SPRING CLIPS AND LATERAL POSITIONING MEANS

Clarke Reynolds, 535 Hillary Drive, Tiburon, Calif. 94920, and Richard J. Quigley, 25538 Adobe Lane, Los Altos Hills, Calif. 94022

Filed Nov. 21, 1975, Ser. No. 634,166
Int. Cl.² E01B *9/48, 9/62, 9/68*
U.S. Cl. 238—304 **8 Claims**



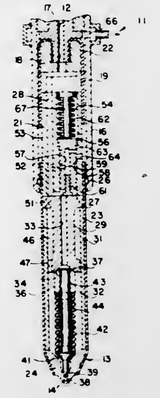
1. A fastener for supporting a rail on a support structure comprising:
a rail plate having an upper surface for supporting the rail;
clip means connected to said rail plate for resiliently clamping the rail to said rail plate, said clip means being shaped and located to allow said rail to rise above said rail plate under the application of an upwardly directed force applied to said rail;
a layer of elastomer material mounted between said rail plate and the support structure; and
a pair of post means connected to the support structure, each post means being in vertically slidable engagement with said rail plate for laterally restraining said rail plate with respect to said support structure, and having a collar in nonclamping vertical engagement with said rail plate for allowing said rail plate to freely float upon said first layer of elastomer material in the uncompressed state when said rail plate is unloaded and defines a no-load level and for precluding said rail plate from rising above said no-load level while permitting the rail plate to move downwardly under the application of a downwardly directed force applied to said rail.

4,047,664

ACCUMULATOR TYPE INJECTION VALVE INCLUDING A DUMP VALVE FOR FAST RESPONSE

Stanley J. Kranc, Morton; Alan W. Wells, Edelstein, and David E. Hackett, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 22, 1976, Ser. No. 669,363
Int. Cl.² B05B *1/28*
U.S. Cl. 239—120 **8 Claims**



1. An accumulator type fuel injection valve comprising
a cylindrical body forming an elongated chamber,
an inwardly opening outlet valve means arranged at one end of the chamber for selectively and intermittently communicating the chamber with an injection orifice in response to fluid pressure in the chamber,
inlet valve means arranged in another portion of the chamber, the inlet valve means selectively and intermittently communicating the chamber with an inlet passage while the outlet valve means is closed, and
a dump valve for increasing responsiveness of the outlet valve means, the dump valve including a dump valve means communicating the chamber with a drain and an interacting spring means, the dump valve means tending toward a closed condition in response to fluid pressure in the chamber, the dump valve means tending to be opened by the spring means, and the spring means having a resilience selected to open the dump valve means when pressure in the chamber drops below a predetermined level.

4,047,665

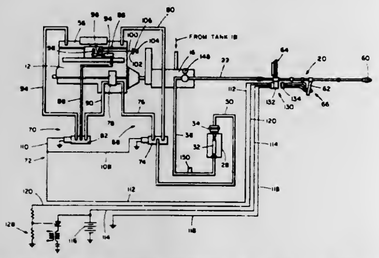
SPRAY CONTROL SYSTEM

William N. Moynihan, 9646 S. Springfield, Evergreen Park, Ill. 60642

Filed Nov. 14, 1975, Ser. No. 631,822
Int. Cl.² B05B *9/00;* F04B *49/02*
U.S. Cl. 239—124 **10 Claims**

1. In a high pressure, liquid spraying system including an internal combustion engine, a pump driven by the engine, a source of liquid connected to the pump and a spray nozzle assembly connected by a high pressure conduit to the output of the pump, the improvement comprising spray control means for controlling the pressure of liquid in and the flow of liquid to the spray nozzle assembly, for causing dumping of unneeded pressurized liquid at a location adjacent the pump and for cushioning the discharge of dumped liquid, said control means being electrically operated and including dump valve means adjacent the pump for dumping pressurized liquid, an enclosure surrounding said dump valve means and having openings therethrough, said enclosure serving to cushion the dumping of pressurized liquid from said dump valve means and said

openings permitting easy flow of dumped liquid from said enclosure into the ambient environment, and hand manipulat-



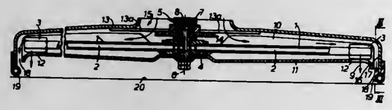
able electric switch means mounted on the nozzle assembly for operating said dump valve means.

4,047,666

JET OR SPRAY PRODUCING APPARATUS

Bernard Eaton Hart, Rosebank, Stoford, Salisbury, Wiltshire, England

Filed Oct. 20, 1975, Ser. No. 624,063
Claims priority, application United Kingdom, June 18, 1975, 26034/75
Int. Cl.² B05B *3/06*
U.S. Cl. 239—251 **14 Claims**



1. Apparatus for producing a rotating jet surface-treating fluid to be directed against a surface perpendicular to the axis of rotation of the jet, said apparatus comprising:

a nozzle directed along a first axis and adapted to produce a jet of surface-treating fluid along said axis;

means for connecting said nozzle to a supply of surface-treating fluid under pressure;

means mounting said nozzle for rotation about a second axis spaced from said nozzle axis, said second axis being perpendicular to the surface and said nozzle axis being inclined to said second axis so that fluid leaving said nozzle will exert a force on said nozzle which will rotate said nozzle about said second axis;

casing means defining a chamber generally coaxial with said second axis and in which said nozzle will rotate, said casing means defining an opening through which said rotating jet from said nozzle will emerge and comprising first and second cover members extending radially of said second axis and axially delimiting said chamber, said second cover member being positioned between said surface and said first cover member when said jet is directed against said surface, and a peripheral member peripherally delimiting said chamber;

skirt means extending axially from said casing means to peripherally enclose a space into which said jet will emerge from said opening, said space being axially delimited by said second cover member and said surface;

said casing means defining axial aperture means in the region of said second axis and peripheral aperture means in the region of said periphery of said chamber, one of said aperture means communicating with said space and the other of said aperture means communicating with the exterior of said apparatus;

rotary fluid impeller means in said chamber for driving a pressure-changing fluid through said chamber from said axial aperture means to said peripheral aperture means for changing the pressure in said space relative to the pressure on the exterior of said apparatus; and

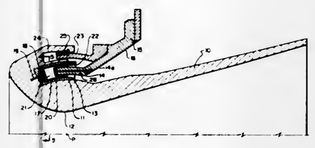
means mounting said rotary fluid impeller means for rotation by and with said nozzle.

4,047,667

SUPPORT SYSTEM FOR ROCKET THRUST NOZZLES

Edward E. McCullough, Brigham City; Stewart H. Greenwood, North Ogden; Hoyt Sherard, Jr., Pleasant View, all of Utah; Richard D. McDonald, Garland, Tex.; Ronald G. Hirschi, North Ogden, Utah, and Alfred R. Randall, Brigham City, Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed July 10, 1975, Ser. No. 594,925
Int. Cl.² B64C *15/04*
U.S. Cl. 239—265.35 **1 Claim**



1. In a rocket having a case with an aft aperture therein and a movable thrust nozzle in the aperture, a system for mounting the thrust nozzle to the rocket case comprising:

a plurality of cups surrounding the nozzle and fixed to one of said members (i.e. the nozzle and case) in a common plane perpendicular to the axis thereof;

a plurality of plugs fixed to the other said member, so that each plug fits loosely into a corresponding one of the cups, the plugs and cups being arranged so that they tend to be forced together by pressure of propulsive gases of the rocket;

a fluid containing bladder in each cup, separating each cup from its corresponding plug — each bladder being partially filled with fluid so that it forms a convolution, folding upon itself around the corresponding plug;

means for permitting fluid content of each bladder to be varied in quantity comprising a tube connected at one to a source of hydraulic fluid, capable of supplying fluid under pressure to the bladder and of withdrawing fluid from the bladder, and connected at the other end to a duct in the plug that extends therethrough to the interior of the bladder; and

means for providing a gastight seal between the nozzle and the rocket case.

4,047,668

WATER HYDRANT DIFFUSER

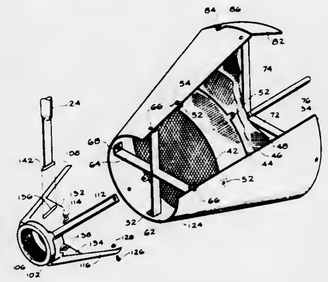
Harry R. DeWeese, 1785 Genevieve, San Bernardino, Calif. 92405, and Gary L. Smith, 357 Terrace, San Bernardino, Calif. 92410

Filed Mar. 2, 1976, Ser. No. 663,057
Int. Cl.² G01F *1/36;* B05B *1/26*
U.S. Cl. 239—500 **4 Claims**

1. A water hydrant diffuser comprising:

a plurality of diffuser elements mounted in an enclosed housing in generally parallel planes;

a coupling section having a free end and a mating end, said free end having threaded female coupling means for securing said coupling section to a water hydrant outlet and said mating end being secured to one end of said housing, said housing being formed of a truncated cone having a small diameter base and an enlarged diameter base with said small diameter base being connected to said coupling section, said enlarged diameter base end containing a handle for carrying said diffuser, said handle being secured to a pair of housing shape retention cross bars secured to said truncated cone; and



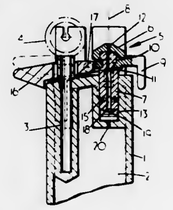
aperture means for inserting a fluid flow measuring device in said diffuser intermediate said coupling member free end and said diffuser elements.

4,047,669

GAS NOZZLES FOR GAS USING APPLIANCES

Ferenc Gutai, Shipping Campden, England, assignor to Dynacast International Limited, Alcester, England

Filed May 12, 1976, Ser. No. 685,494
Claims priority, application United Kingdom, May 15, 1975, 20535/75
Int. Cl.² F23Q *1/02*
U.S. Cl. 239—540 **6 Claims**



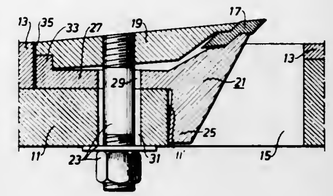
1. A gas-using appliance comprising a gas container having an exterior tubular socket, the bottom of which is connected by a passage to the interior of the gas container and the top of which is open and a gas nozzle device, said gas nozzle device comprising an elongated piston member slidable in the tubular socket having one end projecting from the top of the socket and presenting a surface of contact, a cap member mounted on the projecting end of the piston member and presenting a surface of contact abutting against the surface of contact presented by the piston member, said cap and piston members being relatively rotatable and each having a passage one end of which is located in the surface of contact of the respective member and the other end of which is located at the other end of the respective member, the ends of the two passages on the respective surface of contact being eccentric with respect to the axis of relative rotation of the members by amounts such that the locus of at least one point on the periphery of the end of the passage in one member in different relative angular positions of the two members is an orbit, a portion of said orbit being within the periphery of the end of the passage in the other member, seal means located at the bottom of the socket, means for rotating the cap member and the piston member relatively to one another and means for reciprocating the piston member in the socket into and out of contact with the sealing means whereby to close and open said other end of the passage in the piston member.

4,047,670

KNIFE DEVICE FOR A CHOPPER

Nils David Svensson, Hammaro, Sweden, assignor to Aktiebolaget Iggesunds Bruk, Sweden

Continuation of Ser. No. 561,507, March 24, 1975, abandoned.
This application May 26, 1976, Ser. No. 690,230
Int. Cl.² B02C *18/18*
U.S. Cl. 241—92 **4 Claims**



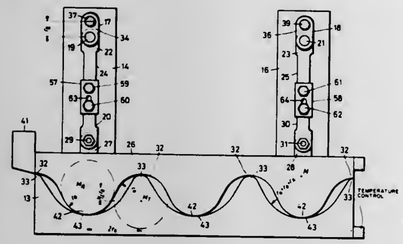
1. An apparatus for chopping material comprising a rotatable chopper disk having at least one radially disposed opening extending therethrough, a first knife holding means mounted on said disk and having a chip guiding surface located within said radial opening, said first knife holding means having a first knife engaging portion including at least two angularly disposed knife engaging surfaces, a second knife holding means mounted on said first knife holding means and having an outer wall disposed generally along the radial face of said disk, said second knife holding means having a second knife engaging portion including at least two angularly disposed knife engaging surfaces, a knife mounted between said first and second knife holding means adjacent said opening, said knife having at least one cutting edge disposed outwardly from a radial face of said disk and defined by the intersection of first and second knife edge surfaces, said knife having first and second contact surfaces, each of said contact surfaces having first and second angularly disposed surface portions for cooperative engagement with said first and second knife engaging surfaces of said first and second knife holding means, respectively, said first angularly disposed surface portion of said first contact surface extending outwardly beyond said chip guiding surface of said first knife holding means and intersecting said first knife edge surface so that the plane of said first knife edge surface is located outwardly of the plane of said chip guiding surface, said first angularly disposed surface portion of said second contact surface extending outwardly beyond said outer wall of said second knife holding means and intersecting said second knife edge surface so that the plane of said second knife edge surface is located outwardly of the plane of said outer wall of said second knife holding means, and means for securing said knife between said first and second knife holding means, whereby the location of said first and second knife edge surfaces relative to the planes of said chip guiding surface of said first knife holding means and said outer wall of said second knife holding means, respectively, substantially prevents material from penetrating between said knife and said first and second knife holding means.

4,047,671

CONTINUOUSLY OPERABLE APPARATUS FOR THE PREPARATION AND/OR PROCESSING OF SYNTHETIC PLASTICS OR RUBBER MOULDING COMPOUNDS

Jurgen Bertram, Celle; Wilhelm Brand, Hannover, and Hans-Joachim Schaeffer, Latzen, all of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, Germany

Filed June 1, 1976, Ser. No. 691,582
Claims priority, application Germany, May 30, 1975, 2523932; Mar. 25, 1976, 2612610; Mar. 25, 1976, 2612611; Mar. 25, 1976, 2612612
Int. Cl.² B02C *11/08*
U.S. Cl. 241—66 22 Claims



1. In continuously operable apparatus for the processing of powdered moulding compounds, the improvement comprising a housing in the form of a channel and a mixing and kneading member engaged in the channel and having a surface which co-operates with the bottom wall of the channel, in which said bottom wall and said surface of the mixing and kneading member are undulatingly profiled in a manner such that the profiles extend transversely or obliquely with respect to the longitudinal axis of said channel and said member, and drive means, including at least one crank drive, coupled between the housing and said member to cause said member and said housing, while retaining their respective orientations to move relatively to one another to cause the peaks of the undulations on one of the profiled surface and the profiled bottom wall to perform a circular movement in associated valleys in the other of the profiled surface and the profiled bottom wall, whereby the moulding compounds are sheared in said valleys and longitudinally conveyed from valley to valley to a discharge end of the apparatus.

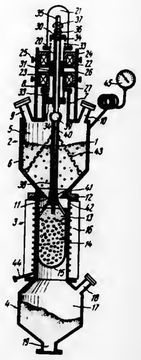
4,047,672

APPARATUS FOR DISINTEGRATION OF MATERIALS

Vladimir Vladimirovich Volkov, ulitsa Zolotodlinskaya, 34, kv. 2; Gennady Ivanovich Bagryantsev, ulitsa Zhemchuzhnaya, 12, kv. 24; Igor Grigorievich Larionov, morskoi prospekt, 21, kv. 15; Alexandr Filippovich Neermolov, Vesenny proezd, 6, kv. 45, and Valery Georgievich Leontievsky, Tsvetnoi proezd, 19, kv. 36, all of Novosibirsk, U.S.S.R.

Continuation of Ser. No. 585,515, June 10, 1975, abandoned. This application Sept. 23, 1976, Ser. No. 725,925
Int. Cl.² B02C *17/14*
U.S. Cl. 241—175 5 Claims

1. An apparatus for disintegration of solid materials, comprising: an airtight shell with three intercommunicating compartments, of which the top one serves as a material charging chamber and has an inlet pipe for material to be charged, the middle compartment accommodates a chamber with grinding solids, while the bottom compartment serves as a chamber for discharge of disintegrated products; a vibrator mounted on the shell and provided with a rod inserted into the material charging chamber so that the rod is mechanically disengaged from



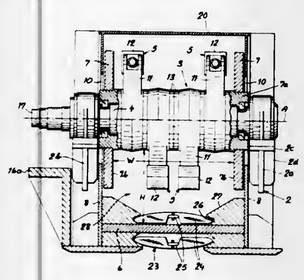
the shell and is rigidly connected to the grinding-solid chamber to impart oscillating motion to the grinding-solid chamber.

4,047,673

SINGLE-ROLL CRUSHER

Herbert Aulmann, Mullenbach; Ernst Braun, and Gert Braun, both of Essen-Heisingen, all of Germany, assignors to Aulmann & Beckschulte, Bergneustadt, Germany

Filed Apr. 9, 1976, Ser. No. 675,502
Claims priority, application Germany, Apr. 12, 1975, 2516146
Int. Cl.² B02C *13/09*
U.S. Cl. 241—186 R 10 Claims



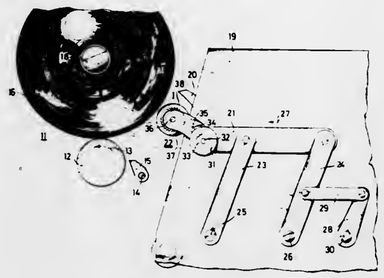
1. A single-roll crusher, especially for coal and similar minerals, comprising a housing, a bifurcated support pivotally mounted on said housing, a crusher roll journaled on said support and provided with a plurality of hammers, an anvil plate disposed below said crusher roll and cooperating with said hammers to comminute mineral pieces passing through a throad between said roll and said anvil plate, and a pair of rotating disks mounted on the extremities of said roll and flanking said hammers, said roll having a shaft journaled on said support and forming the axis for said disks, said disks resisting upward forces on said roll and imparting thereto a moment of inertia positionally stabilizing same.

4,047,674

DEVICE FOR ADJUSTING A RETROGRADE ROTARY MOTION IN A COIL

Heinz Kamp, Rickelrath, Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Aug. 19, 1976, Ser. No. 715,709
Claims priority, application Germany, Aug. 20, 1975, 2536991
Int. Cl.² B65H *54/22, 54/40, 67/08*
U.S. Cl. 242—18 DD 6 Claims



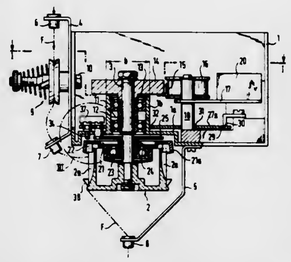
1. In winding equipment for textile coils, a device for effecting retrograde rotary motion in a coil being frictionally driven at a given rotary speed by a winding cylinder, comprising reduction gearing, and means for inserting said reduction gearing between the winding cylinder and the coil whereby both the rotary direction of the coil is reversed and the rotary speed thereof in the reverse direction is reduced.

4,047,675

THREAD STORING AND FEEDING DEVICE

Kurt Arne Gunnar Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Feb. 3, 1976, Ser. No. 654,954
Claims priority, application Germany, Feb. 4, 1975, 2504635
Int. Cl.² B65H *51/20*
U.S. Cl. 242—47.01 17 Claims



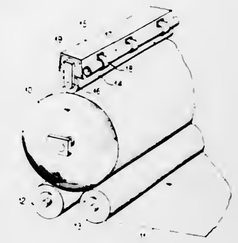
1. In a thread storing and feeding device, particularly for feeding thread in a sewing machine, comprising a housing, a storage drum mounted thereon, to which drum the thread can be tangentially fed to form a thread supply thereon and from which the thread can be withdrawn overend, a sliding disc movable in the axial direction of the storage drum for moving the thread supply over the drum, and a switching device which can be actuated by the axial movement of the sliding disc for controlling a winding drive which causes thread to be wound on the drum, the improvement wherein the sliding disc is supported on a pivot lever, of which the end directed away from the sliding disc is tiltably supported on the housing by a pivot which is located at a distance from the storage drum axle at least approximately equal to the drum radius so that the sliding disk is movable approximately rectilinearly in the axial direction with respect to the drum.

4,047,676

WINDER VIBRATION DAMPENER

Carl B. Dahl, Rockton, Ill., and Jere W. Crouse, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Dec. 17, 1974, Ser. No. 533,480
Int. Cl.² B65H *17/12*
U.S. Cl. 242—66 5 Claims



1. A winder for winding a continuous traveling web on a core, comprising in combination:
- supporting roll means for supporting a rotating roll being wound; a supporting beam having bearings,
- an elongate rider roll rotatably mounted on said supporting beam in said bearings above the roll being wound and in rotational contact with the roll;
- a vibration absorber secured to said supporting beam and extending parallel to the roll and absorbing energy along the length of the roll generated by radial bouncing movements of the wound roll transmitted to the rider roll and to the supporting beam through said bearings supporting the rider roll on the supporting beam;
- said vibration absorber having an axially extending hollow outer cylinder secured to the supporting beam an inner beam member floatingly carried within said outer cylinder;
- an inflatable tube surrounding the inner beam member and located between the cylinder and inner beam member;
- and an inflation means for controllably inflating the tube against the interior of said outer cylinder.

4,047,677

TRANSMIT AND RECEIVE TERMINAL FOR SINGLE TUBE PNEUMATIC CARRIER SYSTEM

Ernest Hochradel, 61 Edison Terrace, Sparta, N.J. 07871, and Werner Hauer, 381 Passaic Ave., Nutley, N.J. 07110

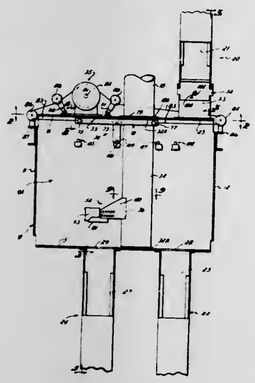
Filed Sept. 13, 1976, Ser. No. 722,497
Int. Cl.² B65G *51/32*
U.S. Cl. 243—19 13 Claims

8. A terminal for a pneumatic tube system connectable to a carrier-conveying tube through which carriers move in opposite direction in transit to and from the terminal, comprising:
- a send hopper into which multiple carriers can be inserted for temporary storage prior to sequential transmission from said terminal via said carrier-conveying tube, said carriers being released in a vertical disposition from said send hopper through a carrier exit in a vertically downward direction under the force of gravity,
- a vertically disposed transfer tube open at its upper and lower ends for receiving and temporarily storing a carrier, said transfer tube having a selectively releasable detent for supporting a carrier in said transfer tube,
- a first received-carrier hopper for temporarily storing a plurality of received carriers sequentially transmitted to said terminal via said carrier-conveying tube, said first received-carrier hopper receiving and storing vertically

disposed carriers which are delivered to an entrance end thereof in a vertically downward direction,

a transfer tube mount and drive assembly for reciprocating said transfer tube in a horizontal path between

a. a first position in which said upper end of said transfer tube underlies said exit of said send hopper to receive in said transfer tube for support by said detent a downwardly moving carrier released from said send hopper,



b. a second position in which said transfer tube is aligned with said carrier-conveying tube for delivery of a carrier to said carrier-conveying tube for transmission from said terminal, and for receiving a carrier from said carrier-conveying tube transmitted to said terminal, and

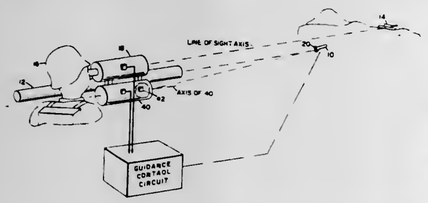
c. a third position in which said lower end of said transfer tube overlies said entrance end of said first received-carrier hopper for downward gravity-induced delivery of a received carrier thereto upon release of said transfer tube detent.

4,047,678

MODULATED, DUAL FREQUENCY, OPTICAL TRACKING LINK FOR A COMMAND GUIDANCE MISSILE SYSTEM

Walter E. Miller, Jr.; Jimmy R. Duke, and Robert L. Sittton, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 7, 1969, Ser. No. 870,554
Int. Cl.² F41G 7/00
U.S. Cl. 244—3.16 **9 Claims**



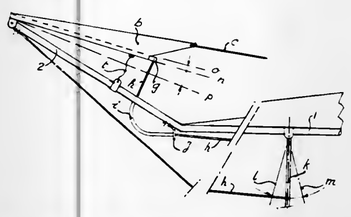
1. A dual frequency, optical tracking link within a missile tracking system, comprising: a photoemissive beacon within a missile housing to be tracked for transmitting an optical coded signal; said beacon including square wave generating means for producing a plurality of distinct and separate electrical square wave output frequencies, light emitting means, and coupling means for connecting said square wave frequencies to said light emitting means; optically sensitive tracking means, including photosensitive detectors responsive to said coded signal for providing an electrical signal output indicative of said coded signal, a preamplifier responsive to said detector for amplifying said electrical signal output, and means for reducing said plurality of frequencies for providing attitude control signals to said missile.

4,047,679

TRIANGULAR-WING GLIDER

Paul Marcel Edmond Decroix, Puteaux, France, assignor to Societe d'Equipements Divers Pour la Population Civile et l'Aviation Sedpa, France

Filed Jan. 7, 1976, Ser. No. 647,160
Claims priority, application France, Jan. 7, 1975, 75.00290
Int. Cl.² B64C 31/02
U.S. Cl. 244—16 **3 Claims**



1. Light triangular wing glider having a center of gravity and a vertical longitudinal middle plane, said glider comprising a principal wing having a frame and being in the form of a forward pointing triangle, a pilot's suspension harness under said principal wing, an auxiliary flexible wing positioned in front of said principal wing; said auxiliary flexible wing consisting essentially of a piece of cloth-like material essentially symmetrical with respect to said vertical longitudinal middle plane, a central rigid rod fastened to said piece of cloth-like material along its line of symmetry, and guys secured to side edges of said piece of cloth-like material for tensioning the cloth-like material, said glider including further means for maintaining said auxiliary wing in an average plane approximately parallel to the plane of said principal wing; and means for varying the position of the average plane of said auxiliary wing with respect to the plane of attack of the principal wing whereby the angle of attack of the whole glider can be modified and the glider can be pulled out of a dive.

4,047,680

SWINGTAIL FOR SPACECRAFT AND FOR FAST AIRCRAFT

Herbert M. Kaniut, Orrerweg 33/35, 5000 Cologne 71, Germany

Continuation-in-part of Ser. No. 508,319, Dec. 4, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 643,611
Claims priority, application Germany, Aug. 16, 1974, 2439479
Int. Cl.² B64C 5/10
U.S. Cl. 244—87 **11 Claims**

1. In aircraft being capable for repeated space missions as space shuttles and for supersonic flights in the atmosphere (FIG. 8; FIG. 9 and FIG. 10), and having increased safety landing capabilities with improved manoeuvrability at low flight speeds the improvement comprising:

a fuselage (1) with fixed vertical tail(s) (9) positioned on its aft end,

a pair of wings (2) swept outwardly and rearwardly with respect to the sides of said fuselage equiped with ailerons (16) and landing flaps (18*a;* 18*b*),

propulsion means mounted on said aircraft,

a horizontal tail (10*a;* 10*b*) consisting of two halves and having a variable geometry with swinging movements (48) of said tail halves in outside arcs rearward and forward again,

a. the said horizontal tail halves being swung to a forward position (10*a*) for high-speed flight and particularly for the entering operation into the atmosphere and for the supersonic flight in the atmosphere,

b. the said horizontal tail halves being swung to a rearward position (10*b*) for low-speed flight and particularly for the landing or takeoff operation,

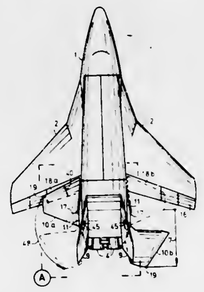
c. each half of said horizontal tail having a trapezoidal shape,

d. each half of said horizontal tail having at one corner of the base-line of said trapezoidal shape a protruding elongation of its main spar (12) which by means of a curved connection piece changes over into a substantially vertical beam (13) incorporating the substantially vertical swing axis (45) around which said half of said horizontal tail swings (48) in a substantially horizontal plane rearwards or forwards,

e. each said vertical beam (13) being at its bottom end movable connected with the fuselage structure,

f. each said vertical beam (13) being at its upper end movable connected (22) with a retaining frame (24) which is movable in longitudinal direction of said fuselage rearwards or forwards,

g. each half of said horizontal tail having control means for said rearward and forward swing movements



h. each half of said horizontal tail being coupled said said landing flap (18*a;* 18*b*) for common control movements,

i. each half of said horizontal tail having in two cross-sections positioned substantially perpendicular to each other two different air foil profiles of which one profile is advantageous for supersonic flight speeds being at both edges sharp and the second profile is advantageous for subsonic flight speeds being at one edge round (which acts as the leading edge) and at the other edge sharp (which acts as the trailing edge),

j. the said forward swung horizontal tail halves (10*a*) being placed in planes lying above the planes of said wings (FIG. 1 to FIG. 3; FIG. 4; FIG. 7 to FIG. 9) and being so much moved forward that the leading edges of said horizontal tail halves are positioned in front of the trailing edges of said wings (40) whereby the sharp leading edges of said horizontal tail halves are heat protected by the wing planes during the entering operation of said spacecraft into the atmosphere, and whereby the supersonic impact wave resistance of the swept wings and horizontal tail halves is reduced during the supersonic flight in the atmosphere,

k. the said forward swung horizontal tail halves (10*a*) having negative profile cambers and negatively inclined chords (32) (FIG. 7) with respect to the chords of said wings (FIG. 2; FIG. 7 and FIG. 9),

l. the said horizontal tail halves getting continuously increasing positive angles of incidence in relation to the local streamline direction during said rearward swing movements to produce additional lift during low-speed flight, which positive angles of incidence are continuously turned back during said forward swing movements of said horizontal tail halves,

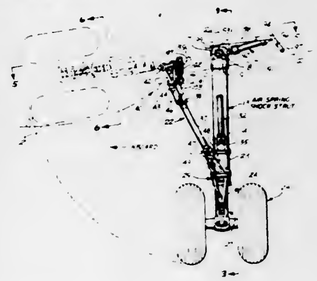
m. the said fuselage (1) carrying adaptor fairings (11) on both rear side walls adjacent to the two said horizontal tail halves.

4,047,681

APPARATUS FOR SHORTENING THE STRUT OF A PIVOTALLY RETRACTABLE AIRCRAFT LANDING GEAR DURING GEAR RETRACTION

Erwin H. Hartel, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 22, 1975, Ser. No. 643,030
Int. Cl.² B64C 25/12
U.S. Cl. 244—102 SS **7 Claims**



1. A retractable aircraft landing gear assembly comprising:

a short strut including telescopically coacting first and second members, said strut having one end pivotally mounted to a strut support on an aircraft for rotative retraction of the strut between a generally downwardly extending ground support position, and an out-of-the-way retracted position;

rotatable means mounted for rotation on said first member about an axis of rotation generally parallel to the longitudinal dimension of said strut and at a location spaced from the pivotally mounted end of said strut;

an elongate, collapsible brace means having opposed ends separately, pivotally connected to said rotatable means and to a brace support on such aircraft, respectively, said brace means coacting with said strut to assume an uncollapsed strut bracing configuration when said strut is in said downwardly extending position and to assume a collapsed nonbracing configuration when said strut has been moved to its retracted position, said brace support being located to one side of the plane of rotation of said strut so that said brace means has a skewed orientation with respect to said plane of rotation and so that when said strut is moved from said downwardly extending position to said retracted position said brace means effects rotation of said rotatable means; and

linkage means connected between said rotatable means and said second member for mechanically converting said rotation of said rotatable means into inward telescoping of said members to shorten said strut during its retraction.

4,047,682

FAN COWL TRANSLATION LOCK

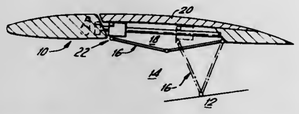
Frank Denison Brownhill, Chaddesden, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Oct. 13, 1976, Ser. No. 732,072

Claims priority, application United Kingdom, Oct. 28, 1975, 44400/75

Int. Cl.² B64C *15/06*

U.S. Cl. 244—110 B **5 Claims**



1. A gas turbine engine cowl structure comprising:
a first cowl part;
a second cowl part, said second cowl part being translatable axially of and relative to said first cowl part to open or close a gap;
a latch operable to engage said second cowl part to prevent relative translation of said first cowl part and said second cowl part to open the gap; and
latch operation delaying means comprising a movable latch abutment member which in one position abuts said latch to prevent said latch from engaging said second cowl part, said abutment member being mounted on a rotary member, said rotary member comprising a tube having a slot in one side thereof with one end of the slot formed into a cam surface, cam surface engaging means for engaging said slot and for causing rotation of said tube when engaging the cam surface of said slot, said cam surface engaging means engaging said cam surface immediately prior to termination of relative translation of said first cowl part and said second cowl part when closing the gap to cause rotation of said tube with said abutment member clearing said latch whereby said latch can move into engagement with said second cowl part.

4,047,683

PIPE HANGER

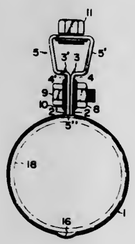
Kazuaki Takeuchi, Hita, Japan, assignor to Chuo Hatsujo Kogyo Co., Ltd., Hita, Japan

Filed Apr. 22, 1976, Ser. No. 679,291

Claims priority, application Japan, Sept. 30, 1975, 50-134617[U]

Int. Cl.² E21F *17/02*

U.S. Cl. 248—62 **7 Claims**



1. A pipe hanger comprising a pipe holder made from a strip of sheet material formed into a loop, said strip having two end portions forming lugs extending generally radially relative to said loop, said lugs having terminating end sections forming hooks, a fitting means from which said pipe holder is suspended, said fitting means having a mounting portion formed as a closed loop element adapted to be rotatably secured to a ceiling and an inserting portion inserted into the space between said lugs, said inserting portion being in the form of projections extending generally radially from said loop element, said fitting means having apertures in which said hooks are accommodated, said pipe holder being initially temporarily mounted on said fitting means by engagement of said hooks in said apertures, and fastening means for securing said pipe holder to said fitting means, whereby said pipe holder is initially temporarily secured to said fitting means by engagement of said hooks in said apertures and subsequently completely secured by said fastening means.

4,047,684

ADJUSTABLE TILTER DEVICE USED FOR HOLDING OBJECTS SUCH AS MUSICAL INSTRUMENTS

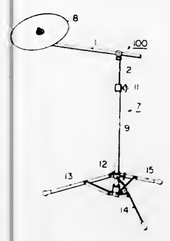
Haruhiko Kobayashi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed June 3, 1976, Ser. No. 692,490

Claims priority, application Japan, June 13, 1975, 50-80386[U]

Int. Cl.² B61L *25/00*; F16C *11/06*

U.S. Cl. 248—122 **7 Claims**



1. Adjustable tilter device used for holding objects such as musical instruments comprising, in combination:
a hollow elongated standard having an open upper end;
a stem freely slidably insertable into said standard from said open upper end;
a stationary tilter block coupled to the upper end of said standard and having a third through hole formed therein;
a movable tilter block having a first through hole for receiving said stem and formed in axial alignment with said hollow elongated standard in such an arrangement that said stem is insertable into said standard through said first through hole;
means for establishing a separable meshing engagement between said two blocks and including first serrations formed on the matching surface of said stationary tilter block and second serrations formed on the matching surface of said movable tilter block for making meshing engagement with said first serrations;
a first cylindrical extension formed on said matching surface of said movable tilter block and accommodated snugly within said third through hole in said stationary tilter block and having a fourth through hole opening in the free end thereof;
a set screw into said fourth threaded hole formed in said cylindrical extension from the side of said stationary tilter block;
means for detachably securing said stem to said movable tilter block; and
thereby, when said establishing means is rendered ineffective, said movable tilter block is swingable about a given center axis relative to said stationary tilter block in order to enable adjustment of the tilting direction of said stem with respect to said standard.

4,047,685

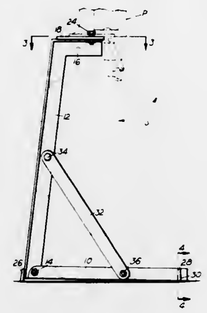
PORTABLE STAND FOR RELOADING PRESSES

Gilbert L. Wika, 333 Cedar Lane, Longview, Wash. 98632

Filed July 9, 1976, Ser. No. 703,754

Int. Cl.² A47G *29/00*

U.S. Cl. 248—158 **3 Claims**



1. A stand for supporting a reloading press, comprising:
a. an elongated base beam having front and rear ends,
b. an elongated pedestal beam,
c. a bolt pivotally interconnecting the lower end of the pedestal beam and the rear end of the base beam,
d. a diagonal brace beam extending between the base and pedestal beams intermediate their ends,
e. bolts removably securing the opposite ends of the brace beam to the base and pedestal beams with the latter beams forming an included angle of about 83°,
f. a mounting platform on the upper end of the pedestal beam adapted to mount a reloading press on a vertical axis intercepting the base beam between the front and rear ends of the latter, the upper end portion of the pedestal beam being offset angularly forward to support said mounting platform, the angle between the pedestal beam and its offset upper end portion being about 97°,
g. a transverse bar at the lower end of the pedestal beam forming a rear lateral stabilizing foot, and
h. a transverse bar at the front end of the base beam forming a front lateral stabilizing foot, the base beam being provided with a notch in its lower edge adjacent its front end and the transverse front foot bar being provided with a notch in its upper edge at its longitudinal center, said notches being dimensioned to interfit the foot bar and base beam at right angles.

4,047,686

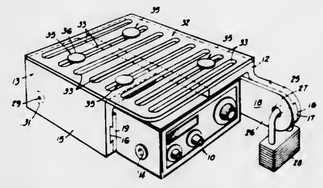
MOUNTING BRACKET FOR RADIOS IN VEHICLES

David Edward Porter, 2342 Nesbitt Drive NE., Atlanta, Ga. 30319

Filed Jan. 3, 1977, Ser. No. 756,091

Int. Cl.² A47B *96/06*

U.S. Cl. 248—203 **7 Claims**



1. An anti-theft mounting for radios in vehicles comprising a top mounting plate, a pair of spaced opposing angle brackets underlying said mounting plate and having depending side webs, adjustable fastener means securing said angle brackets to said mounting plate for lateral adjustment toward and away from each other and adapted to secure the mounting plate to the bottom of an instrument panel in a vehicle, a pair of bar members adapted for securement to opposite sides of a radio and having interlocking projections on their outer sides, said depending side webs having coacting interlocking recesses receiving said projections, concealed locking means for said bar members on said angle brackets preventing fore and aft displacement of the bar members relative to the angle brackets, said interlocking projections and recesses preventing vertical displacement of the bar members relative to said angle brackets, and forward lockable extensions on one angle bracket and bar member adapted for engagement with a primary locking means.

4,047,687

VERTICALLY ADJUSTABLE SUPPORT

Kathleen Harding Turner, 930 Delaine, Corpus Christi, Tex. 78411

Filed June 7, 1976, Ser. No. 693,891

Int. Cl.² A61G *12/00*; A47B *73/00*

U.S. Cl. 248—318 **9 Claims**



1. A longitudinally adjustable support assembly providing a plurality of support positions for a supported article, comprising
first and second elongate longitudinally adjustable members;
means on the second member for suspending the same from a support;
means for latching the first and second members together in a plurality of positions including
a plurality of longitudinally spaced pins on the first member,
a plurality of longitudinally spaced J-slots provided on the second member for supporting the pin and the first member, and
means allowing movement of the pin between the plurality of J-slot; and
means for supporting an article from the assembly comprising the plurality of pins.

4,047,688

PAGE KEEPER

Betty C. Knox, 4915 E. Mtn. View Drive, San Diego, Calif. 92116, and Sally W. Schneider, 10047 Diversion Drive, Spring Valley, Calif. 92077

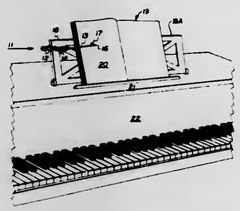
Filed Jan. 12, 1976, Ser. No. 648,126

Int. Cl.² A47B *97/04*

U.S. Cl. 248—451 **2 Claims**

1. A device for restraining pages of bound material placed on a reading aid comprising, a spring clip for attachment to said reading aid, a spring wire fixedly attached to said clip and having a first portion extending outwardly at a right angle therefrom to at least one coil of said wire for biasing said wire toward said reading aid, a second portion extending from said at least one coil so as to project over a part of said reading aid

to a substantially right-angled curve and a third portion extending laterally from said terminus of said second portion toward said reading aid, said third portion terminating in a



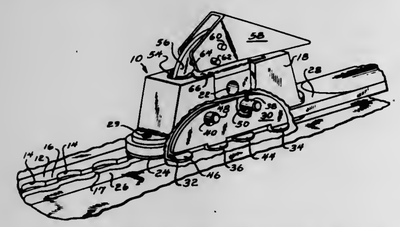
sphere, said clip comprising a pair of jaws which are pivotally coupled together, said first portion of said wire being attached to one of said jaws in the area of said coupling, the interior surfaces of said jaws having non-abrasive coatings.

4,047,689

LOAD DISTRIBUTING TRACK FITTING

Bernard Elden Greadahl, Litchfield, Conn., assignor to UOP Inc., Des Plaines, Ill.

Filed July 19, 1976, Ser. No. 706,641
Int. Cl.² B60N *1/00*; B61D *45/00*
U.S. Cl. 248—503.1 **7 Claims**



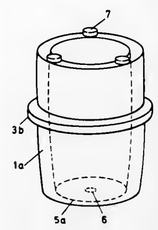
1. A track fitting for use with a slotted floor track of the type used in aircraft wherein said track has a bottom portion, vertical side portions, and top portions carried by each of said side portions and defining the side edges of a longitudinal slot which overlies the bottom and is spaced therefrom, so as to define an open channel, said top portions on each side of said slot being formed so as to define a plurality of alternately spaced retaining lip portions and concave relieved portions, said track fitting comprising an elongated housing having a length at least as great as the axial distance between four of said spaced retaining lip portions, aperture means in an upper portion of said housing for anchoring a load to said fitting, a plurality of lobe members mounted within said housing, said lobe members being shaped so as to be capable of being dropped vertically through a plurality of said concave relieved portions in said track and then moved axially with said housing along the track to bring said lobe members under the retaining lip portions, a pair of spring loaded shear pins mounted in said housing, said shear pins being capable of being moved downwardly into two of said plurality of concave relieved portions in said track when said lobes underlie said retaining lip portions to contact the edges of said concave relieved portions and restrict horizontal movement of said fitting in said track while said lobe members contact the underside of said retaining lip portions to restrict upward movement, a pair of horizontal, transverse pivot members mounted in said housing at spaced locations along the length thereof, the first of said pivot members providing the support for first pivoted support plate means which carry the lobe members which are adapted to engage the first and third of any four consecutively axially spaced lip portions in said track and the second of said pivot members providing the support for second pivoted support plate means which carry the lobe members which are adapted to engage the second and fourth of said four consecutively axially spaced lip portions in said track.

4,047,690

MOLD FOR CONCRETE TEST CUBE

Wilhelm Winter, and Artur Held, both of Frankfurt am Main, Germany, assignors to FORM-PLAST GmbH, Frankfurt-Kalbach, Germany

Filed Mar. 31, 1975, Ser. No. 563,375
Claims priority, application Germany, Apr. 3, 1974, 117467
Int. Cl.² B28B *7/08, 7/12*
U.S. Cl. 249—66 A **6 Claims**



1. A mold for concrete test cubes, comprising:
a vertically extending wall defining a tubular enclosure,
a flange-like first impact projection extending angularly from the enclosure on the outside thereof and located spaced from the bottom of the enclosure, said flange-like projection constituting the only substantial projection beyond the enclosure between the top and bottom thereof, the first projection forming an impact surface when said enclosure is tilted from a vertical to a substantially horizontal position; at least three vertically extending second impact projections formed on the top end of the enclosure, said second projections being relatively small and effective to permit a multidirectional planar smoothing of substantially the whole upper surface of the concrete test cube prior to solidification;
and a bottom panel secured to the bottom of the enclosure and having an opening provided therein; said panel and said enclosure being formed of plastic or plastic-like material as an integrally connected single piece construction.

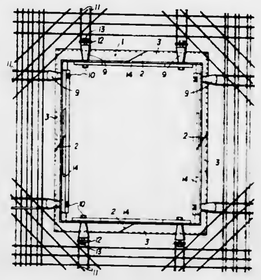
4,047,691

FIXTURE FOR USE IN THE FORMATION OF A DISCHARGE OPENING OF A FODDER SILO

Johann Wolf, Scharnstein, Austria, assignor to Johann Wolf Gesellschaft m.b.H. KG., Scharnstein, Austria

Filed Jan. 26, 1976, Ser. No. 652,573
Claims priority, application Austria, Feb. 3, 1975, 775/75
Int. Cl.² E06B *1/04*
U.S. Cl. 249—97 **2 Claims**

1. A fixture for use in the formation of a discharge opening of a fodder silo of reinforced concrete during the placing of said concrete, which comprises
a form frame which consists of a plurlity of parts which are adapted to be taken apart, said form frame being adapted to define said discharge opening during the placing of said concrete,
anchors detachably connected to said form frame and adapted to carry reinforcements for reinforcing said concrete,
said form frame being adapted to be disconnected from said anchors when said concrete has been placed,
said anchors being adapted, when said concrete has been placed and said frame has been disconnected from said anchors, to carry mounting means for mounting a door for closing said discharge opening,
each of said anchors comprising a tapped bushing having first and second ends and tapped bore portions extending from said ends,
said first end engaging said form frame and said second end being connected to said reinforcement,



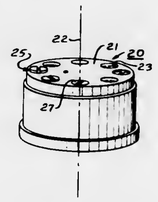
said form frame being divided along a plurality of oblique planar interfaces,
plates which bridge said interfaces, and
screws that pass through said plates and form frame and detachably screw-threadedly engage in said first ends of said anchors. said tapped bore portions are portions of a continuous bore through each of said anchors.

4,047,692

APPARATUS FOR MOLDING DYNAMICALLY BALANCED FANS

Richard E. Swin, Sr., 5302 Howard, Western Springs, Ill. 60558

Filed Sept. 24, 1975, Ser. No. 616,387
Int. Cl.² B28B *7/02, 7/16*
U.S. Cl. 249—142 **8 Claims**



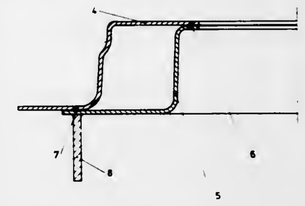
1. In a mold for molding dynamically balanced plastic air movement devices comprising mold halves having complementary surfaces forming a mold cavity in the configuration of an air movement device, the improvement comprising
an insert supported in one of said mold halves for forming a portion of an air movement device, said insert having a plurality of adjustable plugs each movable into and out from the mold cavity for forming a balancing pad on said air movement device at a predetermined position to effect the dynamic balance of said air movement device.

4,047,693

SUPPORTING RING FOR USE IN THE CASTING OF CONCRETE PIPES

Beat Melchior Karlsen Holme, Brondersley, Denmark, assignor to Pedershaab Maskinfabrik A/S, Brondersley, Denmark

Filed Jan. 12, 1976, Ser. No. 648,539
Claims priority, application Denmark, Feb. 21, 1975, 676/75
Int. Cl.² B28B *21/76*
U.S. Cl. 249—187 R **1 Claim**



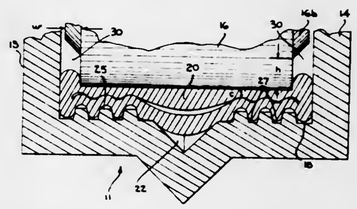
1. A supporting ring for casting machines for concrete pipes for use in moulding the socket end of the pipe and as a base for the green pipe during the removal of the casting mould and during the initial hardening of the concrete and transport of the green pipe, said supporting ring being formed by an annular body having a hollow portion of generally rectangular cross-section and comprising two rings of approximately Z-shaped cross-section, one Z-shaped ring being formed by a lower flange which projects laterally outwardly from the hollow portion for the moulding of the end face of the socket, a substantially plane top spaced from the lower flange for moulding of the end face of the pipe body inside the socket and wall means connecting the lower flange and the plane top, and the other Z-shaped ring having corresponding and generally parallel components including a bottom flange and a top flange welded to the lower flange and the plane top, respectively, said Z-shaped rings being produced from sheet metal.

4,047,694

CLAMP FOR REGULATING FLOW THROUGH PLASTIC-TUBING

Marvin Adelberg, 16821 Oak View Drive, Encino, Calif. 91436

Continuation-in-part of Ser. No. 644,166, Dec. 24, 1975, Pat. No. 4,013,263. This application Jan. 31, 1977, Ser. No. 764,406
Int. Cl.² F16K *7/06*
U.S. Cl. 251—6 **5 Claims**



1. In a clamp for regulating fluid flow through plastic tubing having a body portion with a longitudinal clamping surface, a variable cross-section longitudinal channel being formed in or along said surface, a roller wheel mounted in said body for longitudinal motion parallel to said clamping surface, and a plurality of distributed raised portions separated from each other by discrete valley portions formed in said clamping surface for locally gripping the tubing wall at given locations thereby restraining the tubing so as to reduce creep thereof, the

tubing being clamped between the roller wheel and said surface, the improvement comprising:

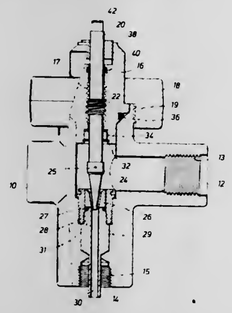
undercut stepped shoulder portions formed in the opposite edges of said wheel defining recesses in the wheel edges, the width of each of said recesses being of the order of twice the compressed wall thickness of the tubing, the height of each of said recesses being at least twice the width thereof, whereby the side portions of the tubing are permitted to migrate into said recesses without forming a flow lumen in said side portions when the tubing is being clamped.

4,047,695

ADJUSTABLE CHOKE

John T. Cleveland; Walter L. Chappell, and John D. Watts, all of Houston, Tex., assignors to Chappell Industries, Inc., Houston, Tex.

Filed Mar. 28, 1975, Ser. No. 563,190
Int. Cl.² F16K *47/04*
U.S. Cl. 251—122 **1 Claim**



1. An adjustable choke for metering a flow of fluid, comprising: a choke body having an inlet port to permit passage of fluid into said body and a discharge section through which fluid can depart said body; a valve seat having an inwardly tapering right conically shaped surface disposed within said choke body downstream of the inlet port, said seat having a discharge opening, the tapering surface of said seat having a length at least 0.25 times the diameter of said discharge opening; an axially movable plug extending through said seat and having a right conically shaped tapered outer surface parallel to said seat surface to define a tapered annular orifice in combination with said seat, said plug having a truncated downstream end with a diameter of from 0.2 to 0.6 times the diameter of the discharge opening of said seat; a flow tube below said seat providing a uniform discharge bore for a fluid discharged from said seat and having an inside diameter equal to that of said discharge opening of said seat; and means for adjustably moving said plug between a plurality of open positions and for maintaining the plug in any one of such positions after it has been moved thereto to variably adjust the area of the tapered annular orifice between said seat and said plug.

4,047,696

BUTTERFLY VALVE

George Ludwig, Troy, Mich., assignor to Tom McGuane Industries, Inc., Orchard Lake, Mich.

Filed Mar. 17, 1976, Ser. No. 667,637
Int. Cl.² F16K *1/22*
U.S. Cl. 251—308 **7 Claims**

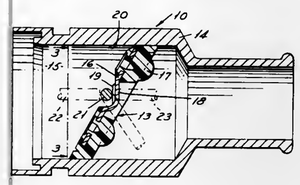
1. In a butterfly valve, the combination comprising

a housing having an opening therethrough,

at least a portion of said opening defining a cylindrical passage,

a pivot pin extending generally diametrally through said body across said passage,

and a valve plate having a diametrically extending central portion which extends radially of the passage and perpendicular to the axis of said passage when the valve plate is in inclined position with respect to the axis of said passage



and the periphery of the valve plate is in sealing engagement with the interior surface of said passage,

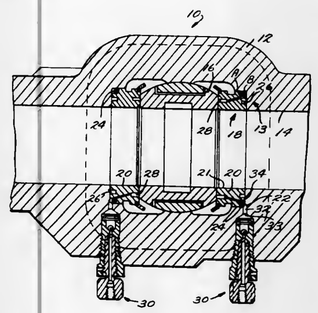
said last-mentioned portion being planar such that said valve plate can be positioned centrally of the passage with the flat portion engaging the pin before fastening said plate to said pin.

4,047,697

VALVE SEAT-TO-SEAT CONNECTION FOR EASY INSTALLATION AND REMOVAL OF SEAT

John K. McGee, Houston, Tex., assignor to Gray Tool Company, Houston, Tex.

Filed Mar. 26, 1975, Ser. No. 562,182
Int. Cl.² F16K *3/00*
U.S. Cl. 251—328 **11 Claims**



1. A valve assembly comprising

a. a valve body, said body having a bore therein, and having a section thereof of a predetermined inside diameter for receipt of a valve seat body member,

b. a valve seat body member having a bore therethrough, mounted in said valve body so that said bores are aligned and having a first section thereof having an outside diameter slightly less than but generally corresponding to said inside diameter of said valve body section, and having a second section thereof having an outside diameter less than the outside diameter of said first section, and

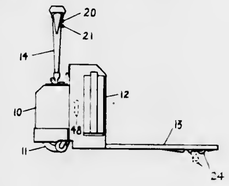
c. means for mounting said valve seat body member in said valve seat body so that said valve seat body member is readily detachably mounted in said valve body while also being tightly sealable therewith, said means including (i) a resilient metallic ring disposed around said second section of said valve seat body member and in engaging relationship with said valve body and said valve seat body member, said metallic ring having an outside diameter slightly greater than the inside diameter of said section of said valve body in which said valve seat body member is mounted, and having an inside diameter slightly greater than the outside diameter of said second section of said valve seat body member, so that said ring will retain said valve seat body member within said valve body while still allowing ready detachment thereof, and (ii) means for selectively supplying a material under pressure to said ring to force said ring into tighter engagement with said valve seat body member and said valve body so that said valve seat body member is not readily detachable from said valve body and so that fluid leakage between said valve body and said valve seat body member is prevented.

4,047,698

PALLET TRUCK AUTOMATIC LIFT

Arthur S. Ellis, Fort Erie, Canada, assignor to Blue Giant Equipment Corporation, Buffalo, N.Y.

Filed Sept. 27, 1976, Ser. No. 726,571
Int. Cl.² B66F *3/24*
U.S. Cl. 254—2 R **10 Claims**



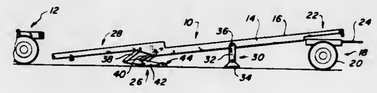
1. In a lift truck, a frame structure and a lift structure mounted thereon for vertical movement to raise and lower pallets and the like, means for effecting up and down movement of said lift structure, a pair of manually operable controls for selectively activating said means for up or down movements of said lift structure, an auxiliary electric circuit operable when both of said controls are in released position to activate said means for up movement of said lift structure when the same is in a lowered position, and a switch in said auxiliary circuit adapted to be opened by upward movement of said lift structure to a predetermined point at which the lift structure is safely out of contact with the floor upon which the truck is operating.

4,047,699

APPARATUS FOR LOWERING A TRAILER TO THE GROUND

Gerald F. Wisdom, 337 Delaware, Sterling, Colo. 80751

Division of Ser. No. 471,241, May 20, 1974, Pat. No. 3,894,747.
This application May 8, 1975, Ser. No. 575,716
Int. Cl.² B62D *53/06*
U.S. Cl. 254—86 H **1 Claim**



1. A lift mechanism for elevating a platform or the like comprising in combination:

at least two pair of laterally spaced link members, said pairs being spaced in a longitudinal direction with each link in the pairs having one end operatively connectable to said platform,

elongated main arm members, said pairs of link members being connected to said main arm members at spaced locations along the length of the main arm members,

abutment means connected to one end of said main arm members adapted to abut a reference surface away from which the platform is to be lifted, and

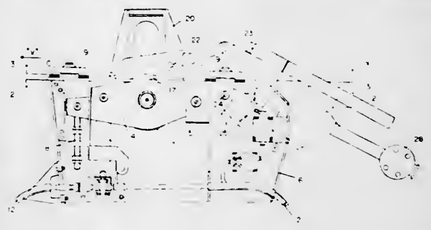
power lift means operatively connectable at one end to said platform and at the other end to an intermediate location on said main arm members, said intermediate location being spaced from the locations where the link members are connected to said main arm members so as to effect extension and retraction of said abutment means relative to said platform.

4,047,700

APPARATUS FOR MAKING TANKS FROM PLATES

Hans Koller, Lausen, Switzerland, assignor to BUSS A.G., Basel, Switzerland

Filed May 17, 1976, Ser. No. 682,376
Int. Cl.² B66F *7/12*
U.S. Cl. 254—89 H **9 Claims**



1. A cylindrically jacketed apparatus for constructing a tank which is formed from separate plates which are vertically disposed and joined together comprising:

a bottom part of a cylindrical jacket having a bottom ring attached thereto and being formed with an upper helically shaped edge;

a cover part of said cylindrical jacket comprising a cover with a cover ring attached thereto;

said cover part having a lower helically shaped edge corresponding to said upper edge;

a plurality of frames fastened to said bottom part;

lifting units for said frames arranged on said bottom part;

the lifting units for said frames arranged on said bottom part;

said lifting units moving the cover part so as to lift and displace the cover part relative to said bottom part;

freely rotatable rollers provided on said frames for said lifting means, and arranged so rollers can be lifted and lowered under the action of said lifting units;

lifting slides supported on said lifting units;

said slides being inserted between said cover part and said bottom part;

a roller surface on said slides extending in the opposite direction to the inclination of the helical line along said helically shaped edge;

said lifting units including a lifting cylinder, a plunger connected to the cylinder and a lifting beam;

each of said rollers being arranged and supported on said lifting beam;

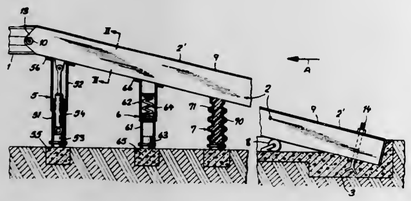
and said beam being pivoted at one end on the respective frame and having a free end which is connected to the plunger of said lifting cylinder.

4,047,701

END ASSEMBLY FOR ROADWAY GUARD RAIL

Ernest Glaesener, Differdange, Luxembourg, assignor to Arbed Acieries Reunies de Burbach-Eich-Dudelange S.A., Luxembourg, Luxembourg

Filed Oct. 29, 1975, Ser. No. 626,872
Claims priority, application Luxembourg, Oct. 31, 1974, 229
Int. Cl.² B66F *3/08*
U.S. Cl. 256—13.1 **5 Claims**



1. In combination with an elongated guardrail spaced above and extending generally parallel to the ground, an end assembly comprising:

an elongated beam at least 25 meters long and having one end secured to an end of said elongated guardrail at the height thereof above the ground, and another end lying substantially at the level of the ground such that said beam is inclined over its length to the ground from said one end to said other end, said beam being formed as a hollow profile of sheet steel of a thickness of up to 6 mm and being plastically yieldable upon receiving impact by a vehicle to absorb kinetic energy of said imapct by flexure of said beam;

a wedge-shaped socket inset in the ground and receiving said other end of said beam, said socket being formed with an inclined surface along which said other end of said beam is limitedly slidable, and means retaining said other end of said beam against said surface;

a plurality of upright posts spaced apart at distances of 2 to 8 meters from one another disposed directly beneath and coplanar with said beam, each of said posts having an upper end secured to said beam, a lower end fixed to the ground, and means between said ends compressible upon deformation of said beam in a vertical direction by a vehicle riding up on same to absorb at least a portion of the kinetic energy of said vehicle, said posts contracting vertically only upon the application of a compressive force thereto enabling said beam to yield vertically in response to a vehicle riding up upon said beam.

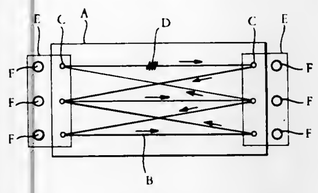
4,047,702

DEVICE FOR ABSORBING IMPACT ENERGY

Enrico Cernia, Rome, and Walter Conti, San Donato Milanese (Milan), both of Italy, assignors to Saam Progetti S.P.A., Italy

Filed Feb. 12, 1976, Ser. No. 657,694
Claims priority, application Italy, Feb. 12, 1975, 20192/75
Int. Cl.² E01F *15/00*
U.S. Cl. 256—13.1 **3 Claims**

1. A device for absorbing impact energy, comprising a water filled seal tight box, a plate secured to each end of said box having spaced holes therethrough, yarn of undrawn nylon 6 contained in said box and having a moisture content higher than two percent which is maintained at that level by the water in said box and which is wound in the form of a skein across said box by having said yarn pass through said holes in said plates, and wherein said yarn absorbs energy upon impact, and



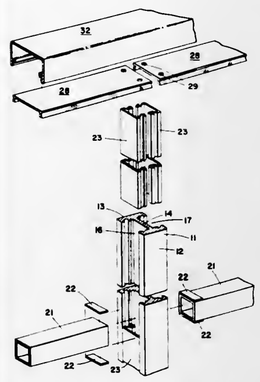
spaced guard rail structures between which and to which said box, plate and impact absorbing yarn are secured.

4,047,703

LINE RAIL CONSTRUCTION

Robert H. Murdock, Kensington, Calif., assignor to NEF Systems, Richmond, Calif.

Filed June 14, 1976, Ser. No. 695,827
Int. Cl.² E04H *17/00*
U.S. Cl. 256—68 **7 Claims**



1. A railing construction, comprising a plurality of line posts, each of said posts including a pair of channels disposed longitudinally therein, at least one railing bar secured with its ends disposed in opposed channels of adjacent line posts, a plurality of post inserts disposed within said channels for supporting and spacing said railing bars, means for securing said post inserts within said channels in the lateral direction, means for securing said post inserts and said railing bars in said channels in the longitudinal direction, and a plurality of resilient pads, each secured to the upper or lower surface of the portion of said railing bars extending into said channels of said line posts.

4,047,704

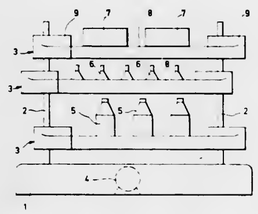
SHAKING MACHINE COMPRISING AT LEAST SUPPORTS FOR THE TREATED MATTER

Alexander Hawryleako, Bottmingen, Switzerland, assignor to Infors AG, Switzerland

Filed Nov. 26, 1975, Ser. No. 635,315
Claims priority, application Germany, Jan. 1, 1975, 2503631
Int. Cl.² B01F *11/00*; B08B *3/12*; B01F *9/00, 13/00*
U.S. Cl. 259—1 R **3 Claims**

1. In a shaking machine of the type having a frame, a drive mechanism and at least two supports, for the matter to be treated, which are mounted one above the other and guided and connected to the drive mechanism in a manner such that,

in operation, all points of the support can execute horizontal circular movements at mutually equal velocities along paths having mutually equal radii, the improvement comprising, in combination, at least one respective balance body connected to each support and mounted for rotation relative thereto in a manner such that, during operation of the machine, the center of gravity of each balance body executes a horizontal circular movement which is dephased, relative to the movement of the center of gravity of the associated support, by a constant phase angle; said balance bodies having dispositions and dimensions such that the inertia forces occurring during operation of the



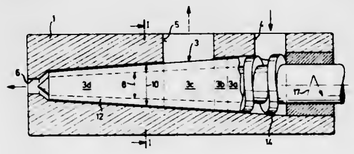
machine, and the torque produced thereby, substantially compensate each other; and means for rotating each said balance body comprising two gears, having equal numbers of teeth, rotatably mounted in each support, a respective transmission element interconnecting the two gears of each support, and a vertically oriented drive shaft rotatably mounted in said frame and driven by said drive mechanism; one gear on each support being non-rotatably and eccentrically supported on said drive shaft; the other gear on each support being non-rotatably connected to the balance body acting at the center of gravity of the associated support.

4,047,705

EXTRUDER WITH DUAL TAPERED SCREWS

Wilhelm Hanslik, Linz, Austria, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Sept. 24, 1975, Ser. No. 616,375
Claims priority, application Germany, Sept. 28, 1974, 2446420
Int. Cl.² B01F *7/08*; B29B *1/10*
U.S. Cl. 259—192 **4 Claims**



1. An extruder comprising:

a housing having an inlet end and an outlet end and formed with a pair of elongated screw chambers conically converging from said inlet end to said outlet end, the axes of said chambers converging from said inlet end to said outlet end; and

a pair of similar elongated screws extending axially between said ends in the respective chambers,

said screws having screw threads of opposite hand meshing radially with a depth of mesh substantially equal to the thread depth,

said threads having crests converging from said inlet end to said outlet end and having outer diameters progressively decreasing along the length of each screw from said inlet end toward said outlet end,

the root diameter of each screw progressively decreasing from said inlet end toward said outlet end,

each thread having a thread depth progressively decreasing from said inlet end toward said outlet end,

the outer diameter of each thread constituting the major diameter thereof at any specific location along said length,

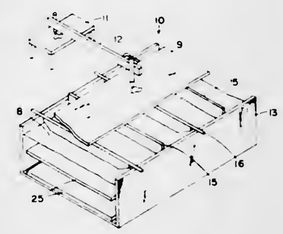
the depth of mesh and the major diameter of each screw at each such location forming a ratio between substantially 15:100 and 25:100 and which is substantially constant between said ends.

4,047,706

TORCH CUTTING SYSTEM WITH AUTOMATED WORK SUPPORT MECHANISM

Harlan C. Tronvold, Minneapolis, Minn., assignor to Paper, Calmenson & Co., St. Paul, Minn.

Filed Oct. 18, 1976, Ser. No. 733,288
Int. Cl.² B23K *37/04*
U.S. Cl. 266—49 **8 Claims**



1. An apparatus for removing slag from a torch cutting operation comprising:

a torch for cutting a sheet of metal into a predetermined shape;

a water tank suitable for filling with water;

a plurality of support members for supporting the sheet of metal above said tank;

a porous conveyor located in said tank, said conveyor having openings of sufficient size to allow slag to fall therethrough but sufficiently small to prevent the article cut from the sheet of metal from falling therethrough, said conveyor operable for transporting the article to a finishing area and for transporting slag to a collection area located in said tank, and means for propelling said conveyor.

4,047,707

PROCESS AND CONVERTER FOR REFINING LIQUID METALS

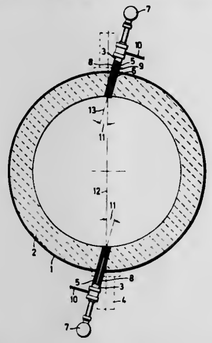
Helmut Knuppel; Karl Brotzmann, and Hans Georg Fassbinder, all of Salzgitter-Rosenberg, Germany, assignors to Eisenwerk-Gesellschaft Maximilianshutte mbH, Salzgitter-Rosenberg, Germany

Continuation of Ser. No. 501,008, Aug. 27, 1974, abandoned, which is a division of Ser. No. 402,695, Oct. 2, 1973, Pat. No. 3,920,448. This application June 9, 1976, Ser. No. 694,413
Claims priority, application Canada, Oct. 3, 1972, 153166/72
Int. Cl.² C21C *5/48*
U.S. Cl. 266—222 **3 Claims**

1. In a refractory, masonry lined tiltable refining vessel with a pivot and a nearly circular horizontal cross section wherein oxygen surrounded by fluid hydrocarbons is introduced into a bath of molten metal to be refined in said vessel through tuyeres each of which includes an inner pipe for the oxygen and an outer pipe concentric with the inner pipe, the space between said pipes being for the introduction of said hydrocarbons, the improvement which comprises:

mounting two of said tuyeres in the refractory masonary in said vessel opposite to one another and below the pivot of said vessel;

each of said tuyeres being located in the side wall of said vessel and being disposed horizontally when the vessel is in the refining position and being inclined with respect to a vessel diameter straight line connecting the orifice of



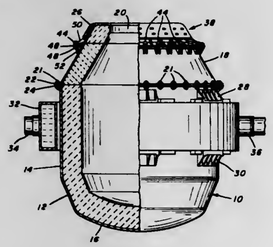
each of said two tuyeres so that the angle subtended by each tuyere, with respect to said straight line connecting the orifice of each tuyere to the orifice of the opposing tuyere does not exceed 20°.

4,047,708

DETACHABLE LIP RING FOR STEELMAKING CONVERTER

Edward J. Lee, Hobart, and Frank Vavra, Ross, both of Ind., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 4, 1976, Ser. No. 729,568
Int. Cl.² C21C *5/46*
U.S. Cl. 266—243 **6 Claims**



1. In a converter for the pneumatic refining of metals including a generally cylindrical refractory-lined shell having an annular opening at one end of the shell axis and entending transversely thereof and an annular refractory-lined lip ring assembly detachably mounted on said shell in surrounding relation to said opening and wherein the interface between said shell lining and said lip ring lining is substantially normal to said shell axis, the improvement comprising means for mounting said lip ring assembly upon said shell including:

a. a first annular flange fixedly attached to the exterior surface of said shell about said annular opening and being formed as a conical frustrum defining an angle with respect to the interface between said shell and lip ring linings;

b. a second annular flange fixedly attached to the exterior surface of said lip ring assembly adjacent the bottom thereof, said second flange being formed as a conical frustrum and having a bearing surface for engaging said first annular flange in mating facing relation; and

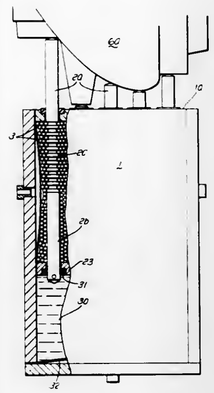
c. a plurality of circumferentially spaced, detachable bolts penetrating said flanges in angularly disposed relation to said shell and lip ring interface and operative to place said mating flange surfaces in tight contiguous relation.

4,047,709

CLAMPING DEVICE FOR WORK PIECES OF IRREGULAR SHAPE

Bertil Sven Johan Thyberg, and Karl Arne Stig Elmgren, both of Huskvarna, Sweden, assignors to AB Westin & Backlund, Stockholm, Sweden

Filed Sept. 20, 1976, Ser. No. 725,035
Claims priority, application Sweden, Sept. 25, 1975, 7510731
Int. Cl.² B23Q *3/08*
U.S. Cl. 269—22 **16 Claims**



1. Apparatus for supporting or clamping bodies or irregular shape, (e.g. cast or forged blanks or other workpieces) comprising one or more clamping jaws, each in the form of a box with a multiplicity of individual axially moveable plungers extending from at least one side wall of said box, which box is partially filled with a solid medium which acts to support the plungers in different axial positions determined by contact with the irregular surface of said body, characterised in that the box is mainly closed and the solid medium comprises a multiplicity of hard balls, in that the plungers are biassed towards extended positions through apertures in at least the work face of said box, in that each plunger has arranged along at least part of its length ball-receiving cavities; and in that the force for locking the plungers is provided by the application of a pressure to the balls separate from that exerted by inward movement of the plungers in use, this pressure being transmitted via the balls and their receiving cavities to said plungers.

4,047,710

FRAMING FORM AND CLAMP

John Wilson, 708 S. Higgins, Missoula, Mont. 59801

Filed Dec. 7, 1976, Ser. No. 748,366
Int. Cl. B25b *1/20*
U.S. Cl. 269—42 **16 Claims**

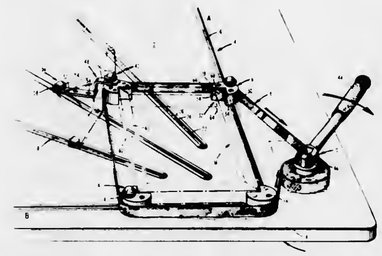
1. A framing form and clamp, comprising:

a base;

a plurality of guideways in said base;

framing means slidably mounted to said guideways;

bracket means having a first end slidably mounted to at least one of said guideways and a second end connected to one of said framing means for positioning said one of said framing means between said guideways; and



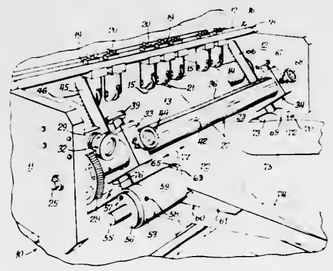
means for tightly securing said framing means around frame molding strips to clamp and form a frame.

4,047,711

ADJUSTABLE MOUNTING FOR PAPER PLOW

Clyde G. Gregoire, Bensenville; James A. Hartman, Brookfield, and Milton J. Gregoire, Lombard, all of Ill., assignors to Gregg Engineering Corporation, Lyons, Ill.

Filed Mar. 31, 1976, Ser. No. 672,397
Int. Cl.² B65H *45/22*
U.S. Cl. 270—86 **9 Claims**



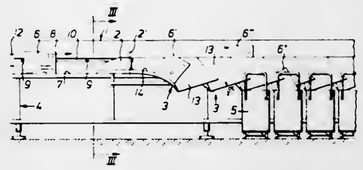
8. A plow for paper webs comprising a relatively thin piece of material having a generally rectangularly shaped flat portion defining oppositely disposed narrow ends and an arcuate circular portion upturned from one of said narrow ends of said rectangularly shaped flat portion and the flat and circular portions jointly forming a smooth undersurface, said arcuate circular portion having an extent at least one-quarter of the arc of an entire circle about an axial center of said arcuate circular portion, a bracket affixed to said flat portion and extending upwardly in the same direction as the upturned arcuate portion, said bracket having a pivot center located on the axial center of the arcuate circular portion of the plow, a shaft having its axis on the axial center of the arcuate circular portion of said plow, said bracket adapted for journal mounting on its pivot center about said shaft, and means adjustably positioning said plow about said pivot center.

4,047,712

CONVEYOR-DISTRIBUTOR APPARATUS FOR FLAT ITEMS

Gisbert Burkhardt, Reichenau, and Dieter Hofmann, Constance, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed May 27, 1976, Ser. No. 690,596
Claims priority, application Germany, May 30, 1975, 2523835
Int. Cl.² B65H *29/60*
U.S. Cl. 271—64 **6 Claims**



1. In a conveyor-distributor apparatus for handling flat rectangular items, including a conveyor channel defining a substantially horizontal feed path for the items; a support face defining the conveyor channel floor on which the lower edge of the substantially upright oriented items are guided; means for advancing the items in the conveyor channel; a plurality of consecutive deflector switches arranged along the conveying path of the conveyor channel, each deflector switch having an operative position in which the item passing therethrough is deflected from the conveyor channel and an inoperative position in which the item passing therethrough is unaffected and continues to proceed in the conveyor channel; a guiding device connected to each deflector switch for changing the orientation of the deflected items from their position they assumed in the conveyor channel to a flat-lying, stacking position; the improvement wherein each guiding device is constituted by a slide comprising

a. a curved deflecting surface having a first surface portion adjoining the associated deflector switch; said first surface portion being in alignment with the plane of the items as they emerge from the deflector switch subsequent to their deflection thereby; said deflecting surface further having a second surface portion bounded by a lower terminal edge; said second surface portion being inclined to the horizontal at an acute angle having an apex oriented towards the location of another upstream-positioned slide as viewed in the conveying direction of said conveyor channel; and

b. a curved supporting surface intersecting said curved deflecting surface substantially at a right angle, said curved supporting surface having a first surface portion adjoining said support face of said conveyor channel and a second surface portion substantially following the drop curve of the items on the slide for effecting a continuous contact with said lower edge of said items as they move down on the slide and are reoriented thereby.

4,047,713

SHEET JOGGER

Donald L. Snellman; John C. Kuspert, both of Seattle, and Arthur G. Saunders, Maples Valley, all of Wash., assignors to Norfin, Inc., Seattle, Wash.

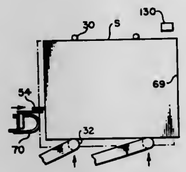
Division of Ser. No. 387,541, Aug. 10, 1973, Pat. No. 4,009,071.
This application Jan. 12, 1976, Ser. No. 648,206
Int. Cl.² B65H *31/38*
U.S. Cl. 271—221 **4 Claims**

1. In combination with a sheet receiver including a vertical column of sheet receiving compartments, jogging means including side jogging means mounted adjacent one side of the receiver and movable with respect to a side jogging position in simultaneous contact with the side edges of stacked sheets in said compartments for establishing coplanar alignment thereof,

and side backup means mounted adjacent the opposite side of the receiver and engageable with the opposite side edges of the stacked sheets in said compartments for establishing coplanar edge alignment thereof simultaneously with operation of said side jogging means, the improvement comprising:

end jogging means mounted adjacent one end of the receiver and movable between a retracted position spaced from the end edges of the stacked sheets in said compartments and an advanced jogging position in simultaneous contact with the end edges of the stacked sheets in said compartments for establishing coplanar alignment thereof;

backup means mounted adjacent the opposite end of the receiver and engageable with the opposite end edges of the



stacked sheets in said compartments for establishing coplanar alignment thereof simultaneously with operation of said end jogging means; and

sheet stop means mounted by the receiver adjacent said end jogging means at a location intervening between said retracted position and said advanced jogging position for engaging the end edges of sheets entering said compartments from the opposite end of the receiver toward the one end thereof, and positioning the sheets upon such entry thereof into said compartments with their end edges spaced from said advanced position a sufficient distance that said end jogging means may thereafter contact the sheet end edges and move the sheets against said backup means into coplanar end edge alignment.

4,047,714

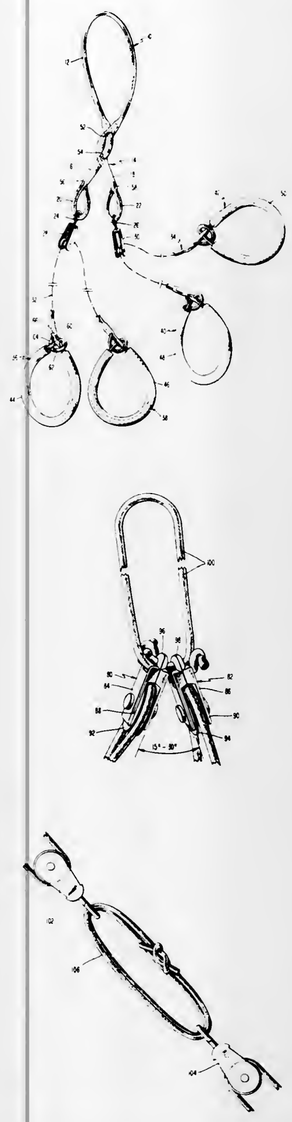
PUSH PULL TYPE EXERCISING DEVICE

Truman W. Powell, P.O. Box 535, Zephrhills, Fla. 33599

Filed Apr. 15, 1976, Ser. No. 677,166
Int. Cl.² A63B *21/00*
U.S. Cl. 272—116 **8 Claims**

3. In an exercising apparatus of the type having a pair of flexible lines each terminating at each end in a loop for engagement by the hands or feet of a user, a support assembly for attachment to a fixed support, and a pair of pulleys connected to said support assembly, said flexible lines passing over said pulleys whereby said flexible lines may be tensioned by the user and reciprocated over said pulleys in thhe performance of exercises, the improvement wherein said support assembly comprises loop means including a single, unbroken length of flexible line one end of which passing through each of said pulleys in one direction and being knotted adjacent one of said pulleys and the other end passing through each of said pulleys in the opposite direction and being knotted adjacent the other of said pulleys, said loop means supporting and drawing said pulleys together, by the cooperative action of said knots, when said line is placed in tension.

4. In an exercising apparatus of the type having a pair of flexible lines each terminating at each end in a loop for engagement by the hands or feet of a user, a support assembly for attachment to a fixed support, and a pair of pulleys connected to said support assembly, said flexible lines passing over said pulleys whereby said flexible lines may be tensioned by the user and reciprocated over said pulleys in the performance of exercises, the improvement wherein said support assembly comprises a single length of flexible line passing twice through each of said pulleys to form a support loop, the ends of said single length of line being knotted together to form a double loop whereby each loop has substantially the same dimension when the pulleys are pulled apart from each other for exercise by two persons and whereby one loop has a much larger dimension than the other when the pulleys are placed together for exercise by one person, tension in the larger loop causing the smaller loop to tightly hold the pulleys together when the larger loop is attached to a fixed support.



5. In an exercising apparatus of the type having a pair of flexible lines each terminating at each end in a loop for engagement by the hands or feet of a user, a support assembly for attachment to a fixed support, and a pair of pulleys connected to said support assembly, said flexible lines passing over said pulleys whereby said flexible lines may be tensioned by the

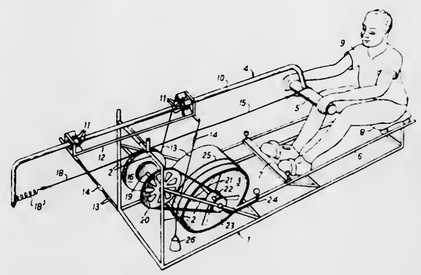
user and reciprocated over said pulleys in the performance of exercises, the improvement wherein said support assembly comprises a length of flexible line two intermediate portions of which are connected together to form a closed loop and a pair of depending legs, each of said pair of pulleys being connected to an end of a respective one of said legs.

4,047,715

FRICTION TYPE ERGOMETER APPARATUS

Einar Tandberg Gjessing, Hans Nielsen Hauges vei 22 F, 1500 Moss, Norway

Filed June 6, 1975, Ser. No. 584,503
Claims priority, application Norway, June 7, 1974, 742081
Int. Cl.² A63B *21/00*
U.S. Cl. 272—132 **6 Claims**



4. Ergometer apparatus comprising:

a flywheel;

a reciprocating actuating means reciprocated by muscle power of a user in a forward direction and a return direction;

a force transmission means operatively coupling said actuating means during movement in its forward direction, the direction in which the flywheel rotates, to said flywheel for rotating said flywheel only in the forward direction; and

brake means for applying a constant braking force to the rotation of said flywheel;

said transmission means including a rotatable wheel coupled to said flywheel by a free wheel gear, said rotatable wheel having a peripheral engagement surface in engagement with said actuating means, said peripheral engagement surface extending in several adjacent turns, said turns successively receiving the actuating means during reciprocation of said reciprocating actuating means, said turns being arranged at varying radial distances from the rotational axis of said rotatable wheel, such distances being selected in accordance with a desired speed pattern, representative of a series of desired speeds, for each forward stroke of said reciprocating actuating means so that when said actuating means is moved in accordance with such desired speed pattern then said rotatable wheel rotates with an approximately uniform rotational movement, and said free wheel gear permitting movement of said actuating means in its return direction without affecting the rotation of said flywheel.

4,047,716

PEG GAME WITH SPINNER-TYPE TIMER

John Plech, Jr., 4407 Broadale Ave., Cleveland, Ohio 44109

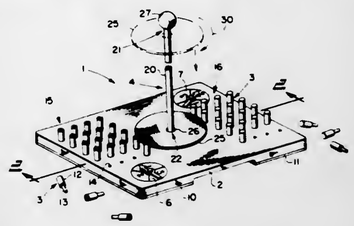
Filed Apr. 21, 1976, Ser. No. 678,934
Int. Cl.² A63F *9/00*
U.S. Cl. 273—1 R **8 Claims**

1. A game, comprising

a board,

a plurality of play members positionable on said board, said play members being removable from and positionable on said board by a player during a play,

timer means for timing a duration for each play, said timer means including an elongate, relatively rigid rod-like member having a generally rounded cross section and opposite ends, and movable, relatively rigid disc-like means movably positioned with respect to said rod-like member for moving in a direction from one to the other of said ends in response to gravitational force, said disc-like means having a substantially centrally located opening



through which said rod-like member extends, whereby upon rotation of said disc-like means the centrifugally created frictional forces with said rod-like member tend to oppose such gravitational forces to reduce the speed at which said disc-like means moves in said direction and thereby to time such duration, and said opening being of a sufficiently larger size than such rounded cross section, whereby when said disc-like means is not rotating it is relatively freely movable on said rod-like member, and

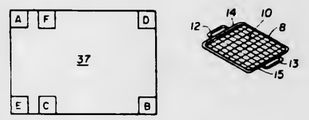
means for coupling said timer means to said board.

4,047,717

VOLLEY TENNIS GAME

Gloria J. DeAngelis, Elmhurst, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 18, 1975, Ser. No. 605,545
Int. Cl.² A63B *71/02, 59/00, 63/00*
U.S. Cl. 273—95 H **12 Claims**



1. A volley tennis game, for a plurality of players in two teams, comprising

a ball of substantially volley ball size;

a pair of portable basket members each held by a corresponding player of a corresponding one of the teams;

a plurality of ball striking members held by the remaining players of the teams, each ball striking member comprising a frame having a net of cord-like members supported therein in matrix configuration, said ball striking members being utilized to strike the ball in attempting to hit the ball into the basket member of the other team; and

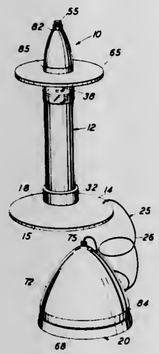
a court for positioning the players, said court being substantially rectangular and having four squares each in a corresponding corner of the rectangle and each positioning a player and restricting the player's position to the confines of the square and an additional two squares at opposite sides of the rectangular court and intermediate the corners of the corresponding sides each positioning a basket member holding player and each restricting the player's position to the confines of the square.

4,047,718

TOY GAMING DEVICE

Angelo Montano, 847 E. 232 St., Apt. 3A, Bronx, N.Y. 10466

Filed Sept. 27, 1976, Ser. No. 726,644
Int. Cl.² A63B *67/10*
U.S. Cl. 273—98 **10 Claims**



1. A toy comprising:
a. elongated handle means having a front end with a base mounted at the rear end thereof and being suitable for holding in the hand,
b. lighting means including a lamp mounted within said handle means and including a switch having a portion thereof extending outwardly above said front end of said handle such that when said switch is depressed said lamp is adapted to be energized and light is emitted therefrom,
c. translucent means for visibly displaying the light emitted from said lamp through said handle means so as to visually inform the user of the toy when said switch is depressed,
d. a hood having an axially extending cavity at one end thereof adapted to receive therein said front end of said handle means in telescopic relationship to each other for activating said switch, and
e. flexible means having one end secured to said handle means and the other end thereof secured to said hood so as to suspend said hood from said handle means to swing said hood through an arc for seating upon said front end when said handle means is manipulated to the proper position such that said lighting means is activated.

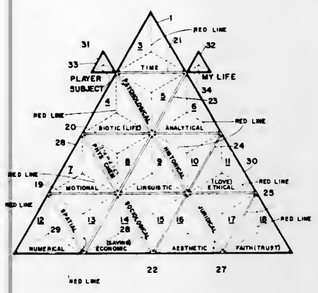
4,047,719

BOARD GAME APPARATUS

Miriam D. Sajkovic, South Hadley, Mass., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Continuation-in-part of Ser. No. 553,490, Feb. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 433,156, Jan. 14, 1974, abandoned. This application May 24, 1976, Ser. No. 689,485
Int. Cl.² A63F *3/00*
U.S. Cl. 273—130 R **4 Claims**

1. Game apparatus, comprising
a game board having an equilateral triangular configuration divided into sixteen equal equilateral minor triangular areas formed by three groups of spaced parallel lines, each group of lines being parallel to a corresponding side of the game board, each of the minor triangles having three angle bisecting lines intersecting therewithin to form an inner pole, the apices of each minor triangle forming three poles thereof representing *x*, *y* and *z* spatial coordinates and the inner pole representing the time coordinate whereby a viewer of the inner pole of a minor triangle sees a four coordinate system symbolizing the game apparatus, said game board having a peak minor triangle marked TIME, and the other minor triangles of the game board in descending order from left to right being respectively marked BIOTIC, PSYCHOLOGICAL, ANALYTICAL, MOTIONAL, PHYSICOCHEMICAL, LINGUISTIC, HISTORICAL, ETHICAL, NUMERICAL, SPATIAL, ECONOMIC, SOCIOLOGICAL, AESTHETIC, JURIDICAL and FAITH.

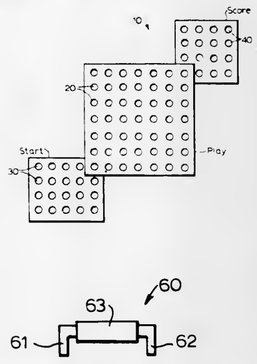


4,047,720

GAME INCLUDING NOVEL BOARD AND PLAY PIECES

Jon S. Galdal, 140 Highland Ave., Edison, N.J. 08817

Filed July 8, 1976, Ser. No. 698,061
Int. Cl.² A63F *3/00*
U.S. Cl. 273—130 R **4 Claims**



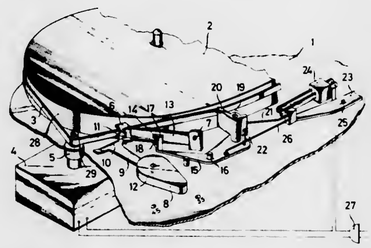
1. Game apparatus comprising
a game board having means for receiving play pieces,
said board including: means defining a starting area on said board, means defining a play area distinct from said starting area on said game board, and means defining a scoring area on said game board distinct from said starting and play areas, and
a set of play pieces for each player, each set of play pieces including pieces having different blocking values, due to their mechanical configuration, with respect to pieces of another set,
said play pieces being generally U-shaped and having different lengths and different heights.

4,047,721

DRIVE DEVICE WITH BELT AND STEPPED SPEED PULLEY

Hans Hermann, St. Georgen, Germany, assignor to Dual Gebruder Steidinger, St. Georgen, Black Forest, Germany

Filed Apr. 16, 1976, Ser. No. 677,736
Claims priority, application Germany, Apr. 19, 1975, 2517395
Int. Cl.² G11B *3/60*; F16H *7/08*
U.S. Cl. 274—9 A **4 Claims**



1. A record player drive, comprising
a turntable,
a belt pulley concentrically disposed relative to and connected with said turntable,
a motor having a motor shaft containing sections of different diameters,
a drive belt connecting said belt pulley with said motor shaft,
a guide fork means for shifting said drive belt on said sections of different diameter of said motor shaft,
an operating element means for adjustment into different setting positions each corresponding to a specific turntable drive rotational speed and for being held in said positions thereof, respectively,
means for blocking the shifting movement of said guide fork means, said blocking means is operatively independent from said operating element means,
elastic coupling means disposed between said guide fork means and said operating element means for exerting a shifting force on said guide fork means when said operating element means is adjusted to one of said positions corresponding to one drive rotational speed when said guide fork means is blocked in another position corresponding to another drive rotational speed,
switching means for opening and closing of a motor electric circuit,
said blocking means being operatively coupled with said switching means for opening and closing of the motor electric circuit, such that with opened electric circuit the blocking is operative and with closed electric circuit the blocking is inoperative.

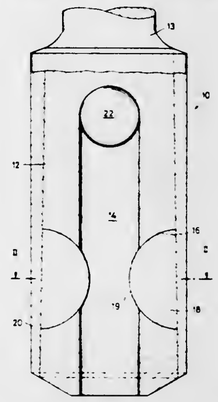
4,047,722

HAMMER DRILLING DEVICES

Mogens B. Nielsen, Glostrup; Niels Halfdan Boa, Greve Strand, and Jimmy Jensen, Glostrup, all of Denmark, assignors to H. Reinholdt A/S, Farum, Denmark

Filed Aug. 19, 1975, Ser. No. 605,817
Claims priority, application Germany, Aug. 19, 1974, 2440082; Oct. 29, 1974, 2451265
Int. Cl.² B23B *31/06, 51/08, 51/12*
U.S. Cl. 279—19.5 **15 Claims**

1. A rotational drilling device comprising in combination two releasably connected parts, one of said two parts being a drill with a substantially cylindrical shaft and the other of said two parts being a tool receiving means with a substantially cylindrical bore in which said shaft is received for limited axial movement, said tool receiving means being adapted for connection to rotatable and percussive drive means and having means for imparting rotative and percussive movement to said drill, one of said two parts comprising in relation to said shaft at least one radially extending element which is fixably secured and the other of said two parts comprising in relation to said shaft at least one substantially axially extending elongated recess, said recess having first and second closed axial ends opposite to each other, said recess having a radial depth which corresponds to the radial extension of said element, said recess having a transition surface starting at the radially deepest area of the recess and extending substantially concentrically in relation to the axis of said part provided with said recess, said transition surface starting at a position spaced from said first and second ends of the recess, said transition surface intersecting the longitudinal edge of the recess which is kept free from the transfer of the rotational force by said element, and a guiding surface open at one end and closed in axial direction at its opposite end and connected by said transition surface with said recess, said guiding surface having the same radial depth as said recess and being off-set in circumferential direction in relation to said recess.

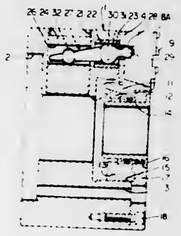


4,047,723

COUNTERBALANCED CHUCK

James R. Buck, Prairieville Township, Berry County, Mich., assignor to Buck Tool Company, Kalamazoo, Mich.

Filed Jan. 23, 1976, Ser. No. 651,949
Int. Cl.² B23B *31/16, 31/14*
U.S. Cl. 279—121 **8 Claims**



1. In a jaw chuck having a plurality of radially movable jaws and guide slots positioned radially in a chuck body receiving and guiding said jaws, actuating means connected to said jaws effecting radial movement thereof for gripping a workpiece, and means counterbalancing at least a portion of the centrigual force generated in said jaws upon rotation of said chuck, com-

prising the improvement wherein said counterbalancing means is independent of said actuating means and includes;

weight openings in said chuck body positioned parallel to and spaced from said slots and so spaced in a direction parallel with the rotational axis of said chuck;

a counterbalance weight movably guided within each said weight opening;

a lever opening in said chuck body parallel to the rotational axis of said chuck and connecting each of said weight openings to a corresponding one of said slots; and

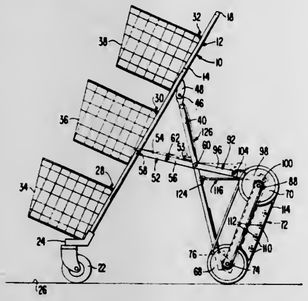
a lever aligned generally parallel with the rotational axis of said chuck and positioned for pivoting within said lever opening, said lever being independent of said actuating means and having one end thereof pivotally connected to one of said jaws and the other end thereof pivotally connected to one of said counterbalance weights, said lever including an intermediate pivot portion pivotally supported by said chuck body, said pivot portion having a rounded exterior surface disposed in pivotal bearing engagement with said chuck body and defining the sole pivotal support between said lever and said chuck body, whereby upon rotation of said chuck the moment generated by centrifugal force acting upon said jaws will be at least partially counterbalanced by a corresponding centrifugal force generated by such rotation of said counterbalance weights.

4,047,724

COLLAPSIBLE UTILITY CART

Robert H. Shaffer, 316 Escuela - No. 10, Mountain View, Calif. 94040

Filed Mar. 15, 1976, Ser. No. 666,555
Int. Cl.² B62B *1/08*
U.S. Cl. 280—5.22 **12 Claims**



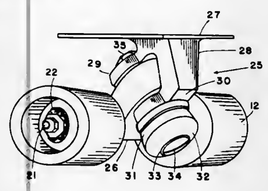
1. A utility cart comprising: an elongated frame having a normally upper end and a normally lower end; rod means pivotally mounted on the frame intermediate the ends of the frame for mounting the same in an inclined position with reference to a support surface therebelow when said rod means is in an operative position, said rod means having a normally lower extremity and being movable relative to said frame from said operative position to a collapsed position adjacent thereto; a first pair of surface-engaging wheels mounted on the normally lower end of said frame; a pair of elongated stair-climbing assemblies for said rod means, said assemblies including a second pair of surface-engaging wheels adjacent to the lower extremity of said rod means, said assemblies being pivotally mounted on the lower extremity of said rod means and movable relative thereto from respective operative positions extending upwardly and away from said rod means to collapsed positions extending adjacent to and along said rod means; means holding said rod means and said assemblies in respective operative positions; and means on said frame for removably mounting at least one basket thereon.

4,047,725

TRUCK ASSEMBLY FOR A SKATE-LIKE DEVICE

Donald E. Pinchock, Blairsville, Pa., assignor to Metcom Products Company, Blairsville, Pa.

Filed Jan. 16, 1976, Ser. No. 649,909
Int. Cl.² A63C *17/02*
U.S. Cl. 280—11.28 **11 Claims**



1. A truck assembly for a skate-like device comprising:

A. a truck support including a mounting plate and a mounting bracket extending angularly outward therefrom;

B. a truck adapted to accomodate axled wheels and pivotally mounted to the mounting bracket so as to define a fixed axis of rotation at an acute angle to the mounting plate, said truck having a central aperture therethrough;

C. means positioned along the axis of rotation and resiliently engaging said truck to resist rotation of the truck, said means including an annular insert positioned within the aperture of the truck and keyed thereto, said insert having at least one recessed cam surface, an annular cam follower extending into the insert and mating with the cam surface and a resilient pad positioned adjacent the cam follower whereby rotation of the truck and insert causes the follower to move along the cam surface in a direction along the axis of rotation and out of the insert, said movement being resisted by the pad; and

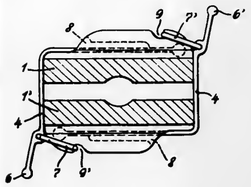
D. an adjustment pin extending along the axis of rotation and through the bracket, the truck and the resisting means to increase or decrease the resilient engagement of the resisting means.

4,047,726

DEVICE FOR BUNDLING SKIS TOGETHER IN PAIRS

Walter Kokeisl, Zurlindenstrasse 21, 5000 Aarau, Switzerland

Filed Feb. 26, 1976, Ser. No. 661,519
Claims priority, application Switzerland, Feb. 27, 1975, 2467/75
Int. Cl.² A63C *11/02*
U.S. Cl. 280—11.37 A **12 Claims**



1. A device for tying together a pair of skis assembled back-to-back, comprising:

at least one flat casing including a base mounted on an upper ski surface and a holder secured to said base, said casing forming a transverse channel terminating in a slot set back from an edge of said base;

a strap held under elastic tension in said channel and terminating in a tab emerging from said slot; and

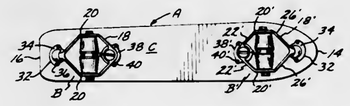
a ring carried by said tab, said tab and ring normally overlying a portion of said base without projecting beyond said edge, said casing being provided on its side opposite said slot with a hook engageable by the ring of an identical device.

4,047,727

SKATEBOARD ROLLER WHEEL ASSEMBLY

Mark Holladay, 29 Sixth Street, and Daryl Mattew Hall, 55-10th Court, both of, Hermosa Beach, Calif. 90254

Filed Sept. 17, 1976, Ser. No. 724,370
Int. Cl.² B62B *3/00*
U.S. Cl. 280—87.04 A **7 Claims**



1. In combination with an elongate skateboard that has a platform that has a top surface on which a user stands and a bottom surface, a pair of longitudinally spaced roller wheel assemblies secured to said bottom surface, each of said roller wheel assemblies including:

a. a hollow rigid frame that includes a pair of transversely spaced side pieces that have forward and rearward ends, a pair of first legs that extend forwardly and inwardly from said first ends to develop at their forward extremities into an eye, a pair of second legs that extend rearwardly and inwardly from said second ends to develop at their rearward extremities into a ball, and said side pieces at substantially the centers thereof having transversely aligned bores defined therein;

b. first means secured to said bottom surface that resiliently engage said eye and force said frame to tilt transversely when said platform is tilted transversely by said user in guiding said skateboard in a curved path;

c. second means secured to said bottom surface that pivotally engage said ball;

d. a transverse shaft supported in said bores, said shaft including threaded end portions that project outwardly from said side pieces;

e. a pair of nuts that engage said end portions and removably hold said shaft in a fixed position in said frame;

f. a first ball bearing assembly mounted on substantially the center of said shaft and a pair of second ball bearing assemblies mounted on said shaft on opposite sides of said first ball bearing assembly and independently rotatable relative to the latter;

g. a first generally cylindrical roller wheel formed from a resilient polymerized resin rotatably supported on said shaft by said first ball bearing assembly; and

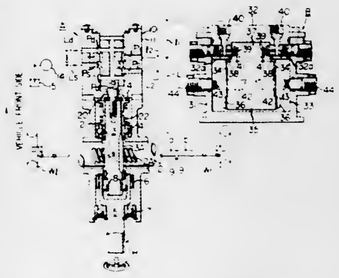
h. a pair of second generally frusto-conical roller wheels formed from a resilient polymerized resin rotatably supported on said shaft by said second ball bearing assemblies, said skateboard when guided in a straight path by said user having the major portion of the weight of said user supported on said first roller wheel and a minimum surface of said roller wheels in contact with a supporting surface on which said skateboard is used but said frame in cooperation with said first means and shaft forcing one of said second roller wheels into additional frictional rotatable contact with said supporting surface when said platform is transversely tilted by said user in guiding said skateboard in a curved path.

4,047,728

CORRECTION DEVICE IN A POWER STEERING APPARATUS FOR VEHICLES

Noriyuki Takahashi, Tokyo, and Kimio Miura, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 4, 1976, Ser. No. 693,264
Claims priority, application Japan, July 1, 1975, 50-81617
Int. Cl.² B62D *5/08*
U.S. Cl. 180—141 **3 Claims**



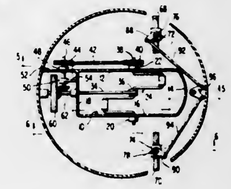
1. A correction device in a power steering apparatus for vehicles with a flow passage connecting a pair of working oil chambers partitioned by a working piston within a steering power cylinder to a source of oil pressure such as a hydraulic pump, said flow passage including a control valve for selectively controlling and supplying pressure oil from said oil pressure source into said pair of working oil chambers in response to rotative operation of a steering handle, the improvement comprising: a weight that may be oscillated in a lateral direction of the vehicle and is received in a closed oil chamber within a casing suitably mounted on the vehicle, a pair of left and right nozzle members with extreme nozzles thereof arranged opposite each other and disposed in said casing and leaving a desired clearance in opposite end surfaces of a pressure restriction plate formed integral with said weight, said nozzle members being internally brought into communication with said pair of working oil chambers respectively, within said power cylinder, stoppers disposed at tip surfaces of said nozzle members, said stoppers controlling the lateral oscillation of said pressure restriction plate to form a desired clearance between each of said opposite end surfaces and each of said nozzles.

4,047,729

DIRIGIBLE VEHICLE

Harry Tabb Smith, Box 437, Yorktown Road, Tabb, Va. 23602

Filed May 16, 1975, Ser. No. 578,349
Int. Cl.² B62K *5/02, 5/08*
U.S. Cl. 280—267 **8 Claims**



1. A vehicle comprising a frame; at least three ground engaging wheels on said frame, vertical axes through the center of each of said wheels being substantially equally spaced from each other whereby said wheels form the corners of an equilat-

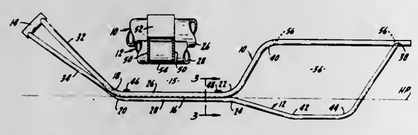
eral triangle; one of said wheels having a fixed horizontal axis of rotation with respect to said frame; driving means on said frame connected to said fixed axis wheel and linkage means for steering the others of said wheels about vertical axes of steering rotation through the center of each of said wheels to positions at which the horizontal axes of rotation of all wheels are parallel to each other, and to positions at which the horizontal axes of rotation of all wheels intersect at a common point at the center of said triangle, said dirigible wheels rotating in one direction when all of the wheels are in said parallel axis position and in the opposite direction when said wheels are in said intersecting axis position, and said fixed axis wheel rotating in the same direction in both said axis positions whereby said vehicle traverses straight line, arcuate and circular paths during operation.

4,047,730

MOTORCYCLE FRAME

David M. Panoz, 2669 E. 75th Street, P. O. Box 165, Chicago, Ill. 60617

Filed Nov. 6, 1975, Ser. No. 629,488
Int. Cl.² B62K *11/10*
U.S. Cl. 280—281 LP 11 Claims



1. A motorcycle frame comprising:

a pair of frame sections, each comprising an upper and a lower frame tube, said frame sections being situated generally symmetrically about a longitudinal vertical plane located between the frame sections, the tubes of each section being juxtaposed to one another substantially in a parallel run relation at a medial portion of the frame to define the bottom of a passenger compartment, said parallel runs being laterally opposite one another and within a horizontal plane,

a steering post generally centered within said vertical plane and rigidly connected to one end of the frame tubes for retaining a motorcycle front wheel fork,

steering post support portions of said tubes interconnecting the steering post with said parallel runs, said steering post support portions extending rearwardly from the steering post and flaring laterally outwardly and downwardly therefrom,

the upper and lower frame tubes being elongated generally cylindrical members,

the upper frame tube of each frame section having a larger diameter than its respective lower frame tube of the same frame section,

the upper and lower frame tubes of each frame section vertically diverging rearwardly of the parallel runs and converging back together to define an engine compartment located behind the passenger compartment and mostly above the horizontal plane, said tubes being rigidly connected at the point of convergence, and

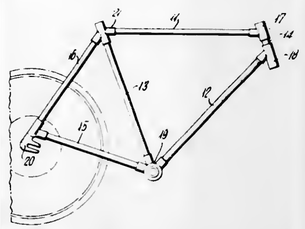
at least one frame cross member laterally spanning the motorcycle frame rearwardly of the steering post support portions and fastened to at least one tube of each frame section.

4,047,731

BICYCLE FRAME

Richard L. VanAuken, Bridgewater, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Sept. 10, 1976, Ser. No. 721,979
Int. Cl.² B62K *3/04*
U.S. Cl. 280—281 B 6 Claims



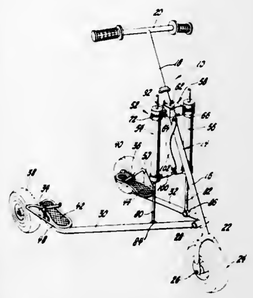
1. A bicycle frame comprising a plurality of tubular elements interconnected to form a generally diamond shaped structure including a head tube, a seat tube, a down tube, a top tube, two seat stays and two chain stays, said head tube, seat tube, down tube having a metal core and a fiber-reinforced plastic skin on the surface thereof at least half of the fibers of which are oriented at an angle of $\pm 45°$ with respect to the longitudinal axis of the tube, and said top tube having a metal core and a fiber-reinforced skin bonded to the surface thereof, said fibers in said top tube being oriented at an angle of about 0° to $\pm 10°$ with respect to the longitudinal axis of the core, and said seat stays and chain stays having a tubular metal core and a fiber-reinforced skin bonded to the surface thereof, said fibers being oriented at an angle of about 0° with respect to the longitudinal axis of the tubular core.

4,047,732

CAMBERING VEHICLE WITH HYDRAULIC STABILIZER AND EQUALIZER

Jerry K. Williams, Sterling Heights, and Franklin D. Landmesser, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1976, Ser. No. 744,968
Int. Cl.² B60G *19/06*
U.S. Cl. 280—287 2 Claims



1. A cambering vehicle comprising a main steering frame, right and left trailing arms extending rearwardly from said main frame, forward pivot connection means pivotally connecting one end of each of said arms to said main steering frame so that said trailing arms may swing on said forward pivot connection means, an equalizer and stabilizer system interconnecting said trailing arms and said main steering frame

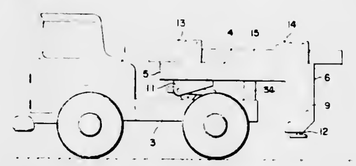
to normally support said main steering frame at a predetermined rake angle with respect to a support surface and to provide for the equal and opposite movement of said trailing arms under predetermined vehicle operating conditions, front contact means steerably mounted to said main steering frame, manual steering means connected to said front contact means, and a rear contact means for each of said trailing arms mounted at the rearward portions thereof, foot rest means on each of said trailing arms to receive the feet of a vehicle operator so that an operator can stand on the vehicle and naturally camber the vehicle while the vehicle is moving, said equalizer and stabilizer system comprising left and right hydraulic cylinders, connector means connecting each of said cylinders to said main frame, a piston and piston rod assembly operatively mounted in each of said cylinders, said piston rods extending generally downwardly from said respective cylinders, pivot means connecting each said piston rod to a respective trailing arm, a hydraulic control for said cylinders comprising hydraulic fluid passage means interconnecting said cylinders so that said trailing arms are forced by the hydraulic fluid in said system to move in equal and opposite directions when said vehicle is cambered, and valve means hydraulically connected in said fluid passage means to condition said system for a hydraulic lock condition and to thereby hold said trailing arms and said main steering frame stationary for vehicle parking, and further to selectively hydraulically interconnect said cylinders so that said trailing arms can be moved to a folded position with respect to said main frame and subsequently be hydraulically locked for vehicle stowage.

4,047,733

FIFTH WHEEL CARRIER HOIST

Alvin G. Parkes, Wingate, Pa., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 12, 1976, Ser. No. 657,365
Int. Cl.² B60P *3/06*; B62D *53/04*
U.S. Cl. 280—402 1 Claim



1. A fifth wheel carrier hoist for a towing vehicle for towing heavy vehicles, said towing vehicle having a chassis frame, said carrier hoist comprising

a hoist frame comprising a substantially planar member having front and rear opposite ends and top and bottom substantially planar surfaces and a pair of extending members comprising a pair of spaced substantially parallel members extending from the bottom surface at the rear end of the planar member substantially perpendicular to said bottom surface, each of the pair of extending members having holes formed therethrough for accommodating pin means adapted to be removably inserted via selected holes thereof supporting a boom via each of said extending members;

mounting means pivotally mounting the planar member of the hoist frame to the chassis frame at the bottom surface at the front end of said planar member is a manner whereby the extending members extend beyond and to an area beneath said chassis frame;

jack means affixed to the planar member of the hoist frame at the bottom surface at the rear end thereof substantially equidistantly from the extending members and extending perpendicularly from said bottom surface for pivotally moving the hoist frame about the mounting means thereof;

a variable length boom; and

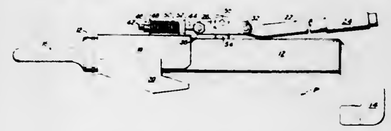
a pair of boom securing means extending substantially perpendicularly from the top surface of the planar member in the areas of the front and rear ends of said planar member for selectively releasably securing the boom at one of the boom securing means or both of said boom securing means, each of the pair of boom securing means comprising a pair of spaced substantially parallel plates straddling the boom and having holes formed therethrough, and pin means adapted to be removably inserted via selected holes of the pair of spaced plates thereby restraining said boom between said plates.

4,047,734

TOW BAR ASSEMBLY

Ray P. Miles, Macedonia, Ohio, assignor to Copperloy Corporation, Cleveland, Ohio

Filed Feb. 23, 1976, Ser. No. 660,584
Int. Cl.² B60D *1/14*
U.S. Cl. 280—486 1 Claim



1. A tow bar assembly adapted to engage a flat member disposed on the forward portion of a vehicle to be towed and the back portion of a towing vehicle comprising a horizontal longitudinal bar member having eye hook means at its front end adapted to engage said back portion of said towing vehicle and first open jaw hook means at the opposite end thereof adapted to engage the rear portion of said flat member; sliding lock means adapted to travel along said bar member provided with second open jaw hook means adapted to engage the front portion of said flat member, said first and second jaw hook means disposed below said horizontal bar member, pad eye member disposed on said lock means, rod means slidably engaged in and extending through said eye member having a forwardly disposed adjustable screw member; compression spring means encircling said rod means biased between said eye member and said adjustable screw member; lever means having an end thereof pivotally disposed on lug means on said bar member; link means pivotally connected between the rear of said rod means and said lever means, said link means pivotally connected to said lever means adjacent said pivotal lever end; whereby when said eye hook means is engaged to said back portion of said towing vehicle, said first and second open jaw hook means can initially engage said flat member of said towed vehicle, and whereby said lever means can compress said spring means thereby moving said first jaw hook means firmly against said flat member, and upon adjustment of said adjustable screw member to provide flexible locking engagement of said first and second jaw hook means with said flat member.

4,047,735

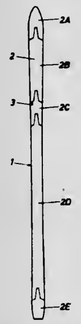
SKI HAVING A PATTERNED TOP COVERING

Rudolf Ferch, Salzburg, Austria, assignor to Fischer Gesellschaft m.b.H., Ried im Innkreis, Austria

Filed June 8, 1976, Ser. No. 693,794
Claims priority, application Austria, June 12, 1975, 4522/75
Int. Cl.² A63C *11/14*
U.S. Cl. 280—610 1 Claim

1. In combination with a snow ski having a lower running surface and a smooth upper surface, the improvement comprising a patterned top covering comprised of plural elongated sheets of plastic material having a thickness of about 0.3 to 1.5 millimeters, said plural sheets being colored throughout in different colors and arranged in succession longitudinally of

said ski, adjacent sheets having mating edges such that said sheets are disposed in direct juxtaposition with each other



throughout the length of the ski, and means for adhering said sheets to said upper surface of said ski.

4,047,736

VEHICLE SUSPENSION

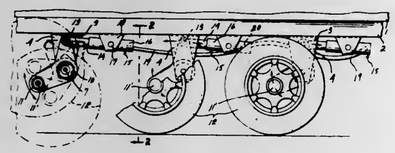
Léonel Prive, 683 Sacre-Coeur Street, Alma, Lac St. Jean County, Quebec, Canada

Claims priority, application United Kingdom, Dec. 24, 1974, 55,825

Filed Dec. 22, 1975, Ser. No. 643,210

Int. Cl.² B60G *11/26*

U.S. Cl. 280—683 **1 Claim**



1. A vehicle suspension for supporting an elongated vehicle chassis having a longitudinal axis on at least two pairs of ground-engaging wheels, each having a wheel axle, the wheels of each pair located on both sides of the vehicle, the wheel axles of said pairs disposed side by side transversely of the longitudinal axis of the vehicle, comprising a suspension system for each wheel axle, each of said suspension systems comprising a first support member secured to, and extending, underneath said vehicle chassis, an L-shaped crank arm having two legs making an acute angle therebetween pivoted to said first support member at the junction of said two legs about a first horizontal pivot axis, said wheel axle carried by the other end of one leg of said crank arm, the other leg of said crank arm upstanding from said first pivot axis, a second support member secured to, and extending, underneath said vehicle chassis, a hydraulic cylinder and piston unit having its cylinder pivotally carried by said second support member about a second pivot axis and having a piston rod pivotally connected to the outer end of said other leg of said crank arm about a third pivot axis, said first, second and third pivot axes being parallel to the wheel axle, the straight line connecting the second and third pivot axes making a small angle with the plane of the vehicle chassis, flexible conduit means interconnecting the head ends of the cylinders of all the cylinder and piston units on one side of the vehicle chassis, separate flexible conduit means connecting the head ends of the cylinders of all the cylinder and piston units on the other side of the vehicle chassis and independent of the flexible conduit means on the first-named side of the vehicle chassis, all the wheel axles on one side of the vehicle chassis being independent of the wheel axles on the other side of the vehicle chassis, upward movement of a wheel axle on one side of the vehicle chassis causing retracting movement of the cylinder rod of the associated cylinder and piston unit and transfer of the hydraulic fluid from said last-named unit to the head end of the cylinders of all the other units on the same side of the vehicle chassis and consequent movement of the piston rods of said other units and consequent lowering of the wheel axles associated with said other units, any upward impact exerted by the wheels being transmitted to the vehicle chassis longitudinally of the latter by the force transmitted through the cylinder piston unit along its longitudinal axis.

4,047,737

SEAT BELT SYSTEM FOR MOTOR CARS

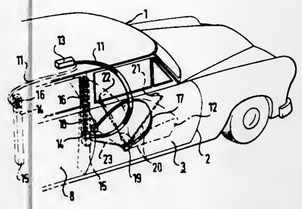
Alfred Grossbach, Lindenstrasse 42, Tamm/Wttbg, Germany

Filed July 16, 1975, Ser. No. 596,293

Claims priority, application Germany, July 19, 1974, 2434748; July 4, 1975, 2529811

Int. Cl.² B60R *21/10*

U.S. Cl. 280—745 **9 Claims**



1. In a seat belt system particularly for motor vehicles having doors which open and close by movement thereof forwardly and rearwardly of said vehicle, said vehicle comprising a vehicle body including a side wall, said vehicle body having a front, a back and a center spaced between said front and back, at least one sliding door mounted on said side wall of said vehicle body and movable from a closed position flush with the side wall of said vehicle body to an intermediate position parallel with and spaced from the closed position and then to an open position spaced in the longitudinal direction of the vehicle from the intermediate position, and means for mounting said door to said vehicle, each of said sliding doors having an inner side with the inner side having a front end and a rear end, the improvement comprising at least one safety belt having a first end mounted to a center portion of said vehicle body and a second end mounted to the inner side of said sliding door, with said at least one safety belt extending freely in an unrestrained condition continuously from said first end to said second end, means mounting said first end of said at least one safety belt to the center portion of said frame, and means for mounting said second end of said at least one safety belt to the inner side of said sliding door, said means for mounting said second end being actuated by sliding movement of said door to move said second end of said at least one belt to a first belt position to dispose said safety belt in orientation permitting ingress and egress of a passenger into and out of said vehicle when said door is in said open position, and to a second belt position to dispose said belt to actively restrain a passenger in said vehicle when said door is moved to said closed position, said at least one safety belt consisting of a shoulder safety belt, and a pelvis safety belt having a first end connected to a center portion of said vehicle body and a second end connected to said inner side of said sliding door, means for mounting said second end of said pelvis safety belt to the inner side of said sliding door, and means for mounting said first end of said shoulder safety belt to the center of the vehicle body also mounting said first end of said pelvis safety belt to the center of the vehicle body, said means for mounting said second end of said pelvis safety belt comprising a pivotal lever pivotal about an axis lying at an angle to the vertical plane of said sliding door, said pivotal lever having a first angular extension extending from one end thereof, and a second angular extension extending from the other end thereof, said pivotal lever being pivotal about said first angular extension while said second angular extension fixedly mounts thereon said second end of said pelvis safety belt.

4,047,738

RECORD SHEETS SENSITIZED WITH REDUCED CHARGE MONTMORILLONITE PIGMENT

Peter A. H. Isaac, Summit, and T. Dixon Oulton, Watchung, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 648,253, Jan. 12, 1976. This application Apr. 5, 1976, Ser. No. 673,595

The portion of the term of this patent subsequent to Nov. 23, 1993, has been disclaimed.

Int. Cl.² B41L *1/36*; B41M *3/12*

U.S. Cl. 282—27.5 **15 Claims**

1. Record material for forming a colored image having increased resistance to fading upon contact with a solution of an electron-donating colorless or substantially colorless dye precursor compound, comprising a support member having distributed throughout a recording area thereof finely divided particles of mixed layer smectite, the lattice of which is partially dioctahedral montmorillonite and partially trioctahedral such as saponite or hectorite, and wherein the proportion of trioctahedral is small, said mixed layer smectite having been subjected to ion-exchange treatment with lithium ions followed by heat treatment to collapse irreversibly the dioctahedral montmorillonite structure.

4,047,739

FITTING AND METHODS FOR MAKING THE SAME

W. Sidney Aitken, 10040 Benares Place, Sun Valley, Calif. 91352

Continuation-in-part of Ser. No. 388,071, Aug. 13, 1973, abandoned. This application May 12, 1975, Ser. No. 576,278

Int. Cl.² F16L *13/02*

U.S. Cl. 285—21 **27 Claims**

1. A fitting comprising a body having a flow passage therethrough; a socket member on said body having an opening, a central axis, a peripheral socket abutment wall, and a peripheral socket sidewall in said opening; a ring-like hub member in said opening, said hub member having a peripheral hub abutment wall, a peripheral ring groove face, and a hub sidewall; a peripheral ring groove bottom surface on one of said members facing inwardly toward said central axis and adjacent to the said ring groove face; said members being made of a thermoplastic material, which material is fusible to like material by motion fusion, said abutment walls extending non-parallel to the axis, and being joined together solely by fusion of the surface materials of the abutment walls, all radial dimensions of the socket member from the socket sidewall to and including the opening end of the socket member being greater than any radial dimension of the hub member, there being no radial overlap of the hub member by any part of the socket member at said end of the socket member; and a resilient sealing ring in the ring groove formed by the ring groove face and ring groove bottom surface.

27. The method of assembling a ring-shaped hub member of a fitting in a circular opening in a socket member comprising pressing an abutting wall of each member against the other with a resilient ring placed in a ring groove that is contiguous to both abutting walls, said ring groove having an edge adjacent to both of said abutting walls which forms a peripheral reservoir, and generating heat by means of motion fusion, whereby to fuse the members together at said abutting walls and to discharge slag from the joinder into said reservoir, the wall thickness of the hub member at the point of fusion being greater than the wall thickness of the socket member, whereby distortion of the socket member as a consequence of the heat is minimized.

4,047,740

INTERNALLY INSULATED BELLOWS ASSEMBLY

D. Craig Young, and Abraham L. Zadoks, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 1, 1976, Ser. No. 691,747

Int. Cl.² F16L *51/02, 59/14*

U.S. Cl. 285—47 **4 Claims**

1. An internally insulated bellows assembly for providing a flexible transistion in a high temperature fluid pressure system, comprising:

an annular bellows having first and second end portions;

cylindrical shield means concentrically spaced entirely within the bellows for forming an annular cavity therebetween, the shield having first and second ends adjacent the first and second ends of the bellows;

a first mounting portion connected to adjacent first ends of the bellows and shield and defining a closed first end of the cavity;

a second mounting portion connected to a second end of the bellows:

an insulating ring member engaging and interconnecting adjacent second ends of the bellows and shield and defining a closed second end of the cavity; and

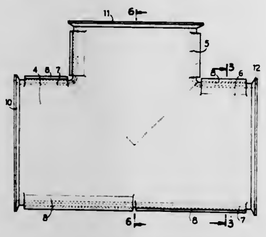
insulating material disposed within the cavity.

4,047,741

COMPOSITE REINFORCED PIPE UNION

Jean-Pierre Felix Pertriaux, Paris, France, assignor to Pont-A-Mousson S.A., Nancy, France

Continuation of Ser. No. 463,024, April 22, 1974, abandoned. This application Dec. 2, 1975, Ser. No. 636,870
Claims priority, application France, June 22, 1973, 73.23019
Int. Cl.² F16L *9/14*
U.S. Cl. 285—55 **11 Claims**



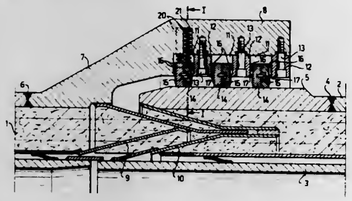
1. A reinforced composite pipe union comprising in permanent combination : a body defined by a body wall of substantially constant thickness and comprising web means of glass fibres embedded in a thermosetting plastics material in the thermoset condition, said body comprising at least two tubular end pipe portions for respectively receiving ends of at least two pipes to be united by the union, the end pipe portions meeting at an angle in an intermediate part of the union and each having a continuously generally substantially cylindrical outer and inner shape, two assembled metal half-shells constituting a case containing said body with which case said body is co-extensive throughout the outer surface of said body, a film of an adhesive material interposed between said body and said case for adhering said body to said case, and means at ends of said end pipe portions for the fixing of said ends of said pipes to the union, said body being in one inseparable piece and defining an inner surface which is continuous and impervious to the fluid to be conveyed by said union and said pipes so as to be capable of conveying said fluid.

4,047,742

PIPE CONNECTION FOR COMPENSATION OF THERMAL MOTION

Dirk Haferkamp; Alija Hodzic, both of Mannheim; Eike Paetz, Ladwigshafen, and Heiarich Stach, Ilvesheim, all of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Mannheim, Germany

Filed Oct. 17, 1975, Ser. No. 623,345
Claims priority, application Germany, Oct. 17, 1974, 2449430
Int. Cl.² F16L *55/00*
U.S. Cl. 285—187 **5 Claims**



1. A joint for high temperature and high pressure conduits comprising:

a first hollow ring holding member comprising a pressure housing extending from a first conduit member and surrounding a second hollow bushing like member comprising a gas conduit housing extending from a second conduit member and defining a space between said first and second hollow members;

at least one annular groove in said first hollow member opening toward said space;

at least one ring disposed in each groove and extending into said space in sealing relationship to said first and second hollow members, said ring including a plurality of segments separate from and contiguous with each other;

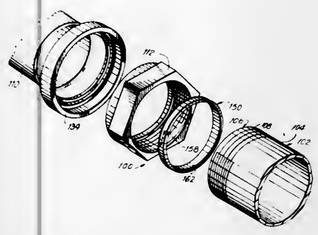
a plurality of separate helical springs disposed radially from said annular groove in said first hollow member coupled with each ring and biasing each ring segment radially inward in sealing relationship to said second hollow member; whereby said segmented rings compensate for axial and radial motion of said members due to temperature variations therein.

4,047,743

LIGHT WALLED CONDUIT

Burton L. Weintraub, Old Bethpage, and Salvatore Buda, Maspeth, both of N.Y., assignors to Berger Industries, Inc., Maspeth, N.Y.

Continuation-in-part of Ser. No. 464,121, April 25, 1974, abandoned, which is a continuation of Ser. No. 246,384, April 21, 1972, abandoned. This application Apr. 3, 1975, Ser. No. 564,823
Int. Cl.² F16L *17/06*
U.S. Cl. 285—340 **5 Claims**



4. A light walled circular metallic conduit comprising a first conduit member and a second conduit member, said first and second conduit members being identical, said first conduit member including a first end, an end of said second conduit member being snugly received within said first end of said first conduit member in a telescopic relation, means mechanically connecting said two ends, said connecting means including a male threaded element fixed on one of said members and a nut rotatable and axially slideable on the other member, said nut having a radially inwardly extending flange the free edge of which is near but spaced from the outer surface of the one member to provide an annular gap, an annular member between the end of the one conduit member and the flange, said annular member being squeezed between the flange and the end of the one conduit member when the nut is tightened on the threaded element, and an elastomeric skirt functionally unitary with the nut, said skirt including a retroverted lip of diminishing thickness extending into and filling said gap to form a water-tight seal thereat.

4,047,744

LOCKABLE GAS TANK CAP DEVICE

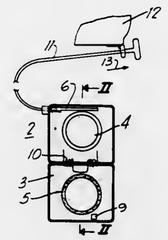
Richard C. McNeary, Forrest City, Ark., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 3, 1976, Ser. No. 682,480
Int. Cl.² B65D *55/14, 43/16*
U.S. Cl. 292—171 **2 Claims**

1. A lockable gas tank device for releasably locking the open end of a gasoline tank of a vehicle, said gas tank cap device comprising

a cover hingedly affixed to a vehicle in the area of the open end of the gasoline tank thereof in a manner whereby it covers said open end in a closed position and is free from said open end in an open position, said cover having a pair of first and second spaced parallel edges and a third edge perpendicular to and joining the first and second edges;

a loop-type projection extending from the inside of the cover adjacent the third edge and spaced from the first and second edges, said projection being at least twice the distance from the first edge that it is from the second edge;



a spring-biased pin biased by a spring and slidably mounted on the vehicle in proximity with the cover for locking the cover in closed position under the force of the spring, the pin being closely adjacent and parallel to the third edge of the cover and extending across the cover from the first edge of the cover into the projection in closed position; and

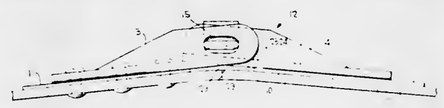
cable means affixed to the pin and extending into the vehicle for moving the pin out of the projection against the force of the spring to release the cover for movement to its open position.

4,047,745

RELEASABLE LATCH ASSEMBLY

Joseph H. Krenz, Warsaw, Ind., assignor to Sun Metal Products, Inc., Warsaw, Ind.

Filed Sept. 22, 1976, Ser. No. 725,469
Int. Cl.² E05C *19/18*
U.S. Cl. 292—302 **10 Claims**



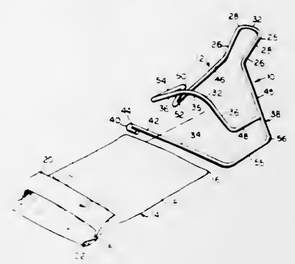
1. A latch assembly for releasably connecting adjacent parts together in an angular relationship, comprising a pair of latch elements each of which includes a base plate and at least one flange expending perpendicularly thereto, said flanges having openings elongated along lines respectively sloping toward planes containing said base plates and toward free ends of said flanges, said flanges overlapping at said free ends with said openings in axial alignment, said lines of said openings being coincident when said base plates are disposed at an angle to one another, and a releasable pin member extending through said aligned openings, said pin member having a cross-sectional width extending along said coincident lines, whereby forces tending to separate said latch elements along said coincident lines are strongly resisted by said pin member.

4,047,746

ANIMAL WASTE REMOVING DEVICE

Stanley P. Radowski, 8410 Escanaba Ave., Chicago, Ill. 60617

Filed Jan. 5, 1977, Ser. No. 756,830
Int. Cl.² A46F *13/08*
U.S. Cl. 294—55 **3 Claims**



1. An animal waste removing device, comprising:

a. a frame, and

b. a bag having an open end and a closed end with a body portion therebetween and adapted to be removably supported by said frame with said open end adapted to receive therein the animal waste,

c. said frame including:

1. a handle at one end thereof including a pair of handle elements joined together at one end thereof,

2. an upper support rail extending transversely to said handle and having a concave configuration with one side of the open end of said bag draped thereon in supported position,

3. a lower support rail extending in substantially a horizontal plane in spaced relationship to said upper rail and transversely to said handle for supporting the other side of said open end of said bag with said body portion extending rearwardly thereof towards said handle,

4. coupling means for connecting said upper support rail and said lower support rail to said handle elements, such that said handle is positioned to have said open end of said bag in position to receive the waste therein,

5. said coupling means includes a pair of downwardly extending arms connected respectively at one end thereof to said handle elements, and a first leg and a second leg, each said leg connected at one end thereof to said arms, and at the other end thereof to each end of said upper support rail,

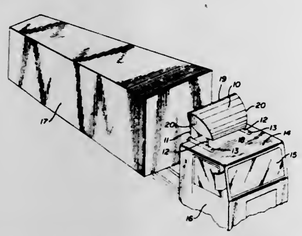
6. said second leg includes a substantially vertically extending leg portion and a substantially horizontally extending coupling member connected to said upper support rail at one end thereof such that said bag is adapted to be removed between the space defined between said coupling member and said lower suppport rail,

7. a lower connecting element extending rearwardly from one end of said lower rail and connected to one of said arms to maintain said frame in a planar surface with said bag mounted thereon, said arms converge outwardly from said handle elements to provide the spacing for defining the open end of said bag, and

8. said first leg and said lower connecting element extend forwardly from one of said arms and are in substantially vertically spaced relationship to each other, and

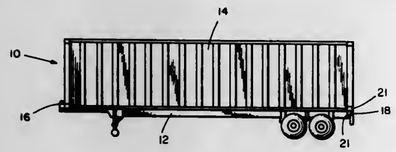
d. means for retaining said bag in releasably fixed position to said lower rail, said means includes a finger at one end thereof extending in parallel spaced relationship to said lower rail to define a groove therebetween adapted to receive therein one end of said open end of said bag.

4,047,747
AIR DRAG REDUCER FOR MOTOR FREIGHT VEHICLES
Charles James Beers, Bradenton, Fla., assignor to LDV Industries, Inc., Bradenton, Fla.
Filed Dec. 11, 1975, Ser. No. 639,882
Int. Cl.[2] B60J 9/04
U.S. Cl. 296—1 S 1 Claim



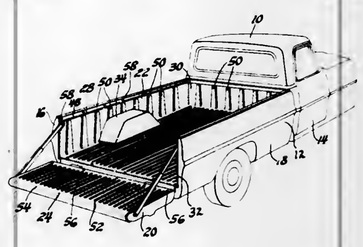
1. Apparatus for reducing air drag on highway trucks and truck tractor-semitrailer combination vehicles which have closed van type bodies, said apparatus comprising: a rigid airfoil with a smooth slightly convex upper front surface and a very convex lower rear surface, straight leading and trailing edges, with the leading edge being shorter than the trailing edge, said trailing edge being as a minimum three-fourths as long as the closed van type body is wide, said airfoil having smoothly rounded tips; an assemblage of struts and plates which secure the airfoil adjustably above the cab roof of the vehicle, holding the airfoil so that its leading and trailing edges are perpendicular to the centerline of the vehicles cab, the plates being attached to the cab roof and the struts defining a gap between the airfoil and the cab roof, these struts being adjustable in their lengths so that this gap dimension and shape may be changed.

4,047,748
CHASSIS LOCK FOR CONTAINER TRAILER
Robert L. Whaley, and James L. Day, both of Cincinnati, Ohio, assignors to Pullman Incorporated, Chicago, Ill.
Filed June 1, 1976, Ser. No. 691,679
Int. Cl.[2] B62D 27/00
U.S. Cl. 296—35 A 13 Claims



1. A chassis lock for locking a trailer chassis to a container body having a locking cavity therein comprising:
a handle,
wall means having a striker angle slot defined therein,
a sleeve fixed to said handle and extending through the striker angle slot,
a striker angle plate secured to the sleeve and shaped so as to fit into the striker angle slot in at least a first and a second rotatably separated positions,
a shaft extension carried at one end within the sleeve end and extending at its other end into the cavity in the container body,
a slip joint connecting the sleeve to the shaft extension, and
a locking plate of an elongated shape carried by the shaft extension and received within the cavity in the container body such that the container body is secured to the chassis by the locking plate when the sleeve is rotated from the first position wherein the striker angle plate fits into the striker angle slot to the second position.

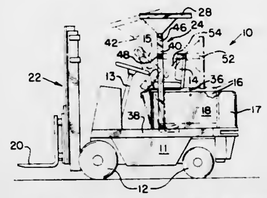
4,047,749
CARGO BOX LINER FOR PICK-UP TRUCKS
Robert H. Lambitz, and Robert J. Zeffero, both of Fenton, Mich., assignors to Zefflamb Industries, Inc., Fenton, Mich.
Filed June 23, 1976, Ser. No. 699,309
Int. Cl.[2] B62D 33/00
U.S. Cl. 296—39 R 8 Claims



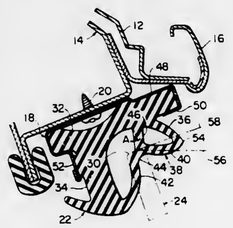
1. In combination with a pick-up truck having a cargo box, said box having sidewalls, hollow flanges extending inwardly from the sidewalls and a bottom wall, a cargo box liner comprising:
a molded, plastic, unitary liner body having walls of a substantially uniform thickness including a bottom wall, a forward wall integrally connected to the bottom wall, a pair of spaced sidewalls on opposite sides of the bottom wall, a pair of flexible corners each formed with a radius several times the liner thickness, each corner forming a connection between the bottom wall and the corresponding sidewall, the liner sidewalls forming a rearward opening for receiving an object to a position between the liner sidewalls,
integral, outwardly extending flange means connected to the top of the liner sidewalls and seated on the hollow cargo box flanges in a position in which a major portion of the height of each liner sidewall is spaced inwardly from its respective cargo box sidewall so as to be movable with respect to such cargo box sidewall,
each liner sidewall having a plurality of elongated, parallel, vertical ribs, each rib having an upper end supported adjacent the hollow flange of the cargo box and a lower end terminating adjacent the liner corner at the bottom of the sidewall, the ribs being formed such that the lower end of each rib is movable in response to a downward motion applied to the upper end of the rib whereby the corner at the bottom of the sidewall assumes a position permitting the vertical distance between the liner flange means and the liner bottom wall to accomodate the distance between the top of the cargo box flanges and the cargo box bottom wall.

4,047,750
OVERHEAD GUARD-BATTERY BALLAST
Frank Richard Samide, Chardon, Ohio, assignor to Towmotor Corporation, Mentor, Ohio
Filed July 19, 1976, Ser. No. 706,345
Int. Cl.[2] B62D 21/00
U.S. Cl. 296—107 8 Claims

1. An overhead guard assembly for industrial vehicles having a frame and a weighted member carried by said frame, the overhead guard assembly comprising:
upstanding support means pivotally secured to said frame, said support means being mounted so as to allow rotation of said support means about a transverse pivot axis between a first position wherein said support means extend vertically and upwardly of said pivot axis, and a second position wherein said support means extend forwardly and upwardly of said pivot axis;
rigid base means rigidly connected to and extending rearwardly from and perpendicularly to the lower portion of said support means, said base means being disposed beneath and under the influence of said weighted member when the support means is disposed in said first position and said base means extending upwardly and rearwardly of the transverse pivot axis when said weighted member is lifted from said frame and the support means is disposed in said second position; and,
a guard surface secured to the upper end of said support means.

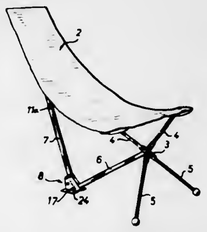


4,047,751
ROOF RAIL WEATHERSTRIP FOR MOTOR VEHICLE
Shyouichi Koike, Seki, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan
Filed Aug. 13, 1975, Ser. No. 604,446
Claims priority, application Japan, Aug. 14, 1974, 49-977110[U]; Dec. 12, 1974, 49-150873[U]; Mar. 7, 1975, 50-30951[U]
Int. Cl.[2] B60J 1/17
U.S. Cl. 296—146 7 Claims



1. A weatherstrip in a motor vehicle body structure including a roof rail defining an upper side of a window opening and a vehicle door having a window pane movable between raised and lowered position relative to the window opening, comprising:
an elongated hollow resiliently deformable member having
a. a mounting portion secured to the roof rail;
b. an inner side portion extending substantially downwardly from the mounting portion;
c. an arm portion projecting outwardly at an angle from the mounting portion;
d. a web portion extending between the inner side portion and the arm portion;
the mounting portion, inner side portion, arm portion and web portion defining the hollow of the elongated hollow resiliently deformable member;
e. a brace portion disposed in the hollow of the elongated hollow resiliently deformable member;
the transverse thickness of the inner side portion being greater than the transverse thickness of the arm portion or web portion to concentrate the flexure action in the arm portion and web portion;
the web portion having a downwardly bowed outboard lip portion and inboard lip portion;
the brace portion having an upper end connected to the mounting portion and a lower end connected to the web portion, the upper end of the brace portion being disposed outwardly of the plane of the window opening, the lower end of the brace portion being disposed inwardly of the upper end with respect to the plane of the window opening such that upon flexure of the web portion by the window pane in raised position, the brace portion swings toward the inner side portion with the upper end thereof as its hinge to flex the downwardly bowed outboard lip portion into contact with the window pane thereby to bias the window pane into contact with the inboard lip portion.

4,047,752
DECK CHAIR
Eduard Rohr, im Birch, 5506 Mageawil, Switzerland
Filed Apr. 28, 1976, Ser. No. 681,147
Claims priority, application Switzerland, May 13, 1975, 6091/75
Int. Cl.[2] A47C 4/00
U.S. Cl. 297—19 8 Claims



1. A folding deck chair of the kind which when in use rests on a ground surface at essentially three locations, comprising, in combination:
a web of flexible sheet material for providing a combined back and seat surface, having a loop in its normally upper and back end portion for insertion of a cross rod therein for supporting of the upper end of the web and having corner pockets in its normally front and lower end portion for receiving front supports, and
a foldable frame comprising
a spider connector,
a connecting rod rigidly connected to said spider connector,
a rear ground-engaging foot rigidly connected to said connecting rod and thereby spaced from said spider connector, said foot having, for mounting a rear support rod, a horizontal pivot and a portion spaced from said pivot provided with catch features,
a telescopically adjustable rear support rod pivotably connected to said foot by means of a slip joint cooperating with said pivot of said foot and having catch features cooperating with the catch features of said foot and with said slip joint for setting the inclination of said rear support rod at one of a plurality of selectable settings, said respective catch features being of a configuration allowing their release from each other by a pull on said support rod away from said foot actuating said slip joint, the pivotable connection of said rear support rod to said foot being such that said rear support rod can be folded in the folded state of the deck chair, approximately parallel to said connecting rod, the

length of said rear support rod, in its telescopically shortest state, corresponding approximately to that of said connecting rod,

a cross rod detachably insertable in the upper end of said rear support rod in a manner fixed against rotation about the axis of said rear support rod for insertion into said loop of said web for support of said web,

two front support legs disengageably insertable in said spider connector for supporting said connector and thereby the front of the deck chair above the ground, and

two front strut bars disengageably insertable in said spider connector in respective positions normally extending obliquely upwards from said connector and each having an arm bent at an angle set in its normally upper end for penetrating into one of said corner pockets of said web for support thereof and for availability of its more horizontal part for service as a handle to assist a seated person in getting up,

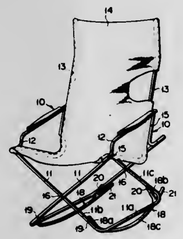
said spider connector being of such a configuration that in the unfolded and assembled state of the deck chair the connector, front support legs and strut bars form an off-plane X-shape.

4,047,753

FOLDABLE CHAIR WITH ROCKING MEANS

Soekichi Uchida, Aichi, Japan, assignor to Uchida Sharyo Co., Ltd., Nagoya, Japan

Filed Nov. 6, 1975, Ser. No. 629,564
Int. Cl.² A47C *3/02*
U.S. Cl. 297—32 **8 Claims**



1. In a foldable chair of the type including a pair of frameworks, each comprised of pipes and provided with an angular U-shaped leg having front and rear leg sections and a bottom leg section therebetween, pivot pins connecting said U-shaped legs together to permit relative pivotal movement therebetween about said pivot pins for permitting said U-shaped legs to be put into an X-like configuration and to also permit the frameworks to be folded, a flexible seat member stretched on said frameworks, and two rocking means attached to said U-shaped legs, respectively, for rocking the chair,

the improvements wherein:

each of said rocking means includes a pipe type rocker member which comprises front and rear portions pivotally connected by pivot pins to the front and rear leg sections of the corresponding U-shaped leg, respectively, and an arcuate portion between said front and rear portions, said rocker members being swingable inwardly of the chair relative to said U-shaped legs between upward and downward positions, said rocking means including means engageable with at least inside portions of the bottom leg sections of the U-shaped legs when they are in said downward position so as to be stopped and retained in said downward position;

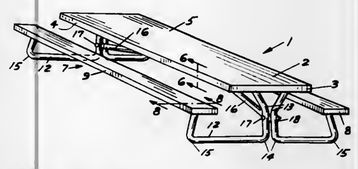
said rocker members being pivotally swingable from an upward housed position where said arcuate portion is remote from said bottom leg sections and said chair rests on said bottom leg sections in a non-rocking condition, to a fully swung downward position where said rocker members are engaged with at least inside portions of the bottom leg sections of the U-shaped legs and are stopped and retained in said fully swung downward position with the arcuate portions of said rocker members protruding downwardly from the bottom leg sections, respectively, so that said chair rests on said arcuate portions and is in a rocking condition.

4,047,754

TABLE

Jimmy D. Cathey, 1105 Baythorne Drive, Shreveport, La. 71107

Filed Aug. 11, 1975, Ser. No. 603,617
Int. Cl.² A47B *37/04*
U.S. Cl. 297—157 **8 Claims**



1. A table comprising:

a. A horizontally disposed first metal frame covered with a first metal sheeting;

b. A pair of horizontally disposed second metal frames, each covered with a second metal sheeting, said second metal frames being disposed on either side of, below, and essentially parallel to said first metal frame;

c. Two sets of metal legs, each of said sets being disposed at the opposite ends of and beneath said first metal frame and said second metal frames, each of said metal legs having a first intermediate portion disposed perpendicular to said first metal frame and a second intermediate portion disposed parallel to said first metal frame, one end portion of each of said metal legs being bent from the outer end of said first intermediate portion at an angle of from about 55 degrees to about 65° with respect to the vertical and attached to said first metal frame and the opposite end portion of said metal legs being bent inwardly from the outer end of said second intermediate portion toward said one end portion at an angle of about 10° with respect to the vertical and attached to said second metal frames, respectively; and

d. a pair of braces, one end of each of which is carried by one of said sets of legs and the opposite end of which is carried by said first metal frame.

4,047,755

RESTRAINING MEANS FOR AN INFANT CAR SEAT

Quentin H. McDonald, Scarsdale, N.Y., and Richard L. Panicci, Hanover, Mass., assignors to Quentin H. McDonald, Scarsdale, N.Y.

Filed Mar. 22, 1976, Ser. No. 668,969
Int. Cl.² B60R *21/10*
U.S. Cl. 297—216 **15 Claims**

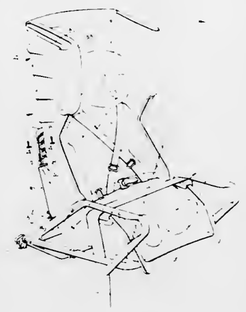
1. In combination,

a frame;

a hoop pivotally mounted on said frame;

a seat pivotally mounted on said frame; and

at least one apertured bracket mounted on said seat, said bracket having a plurality of spaced apart positioning slots for selectively receiving said hoop therein, each said slot including at least two portions angularly disposed relative to each other to define a corner and means in one of said portions for releaseably holding said hoop at one end of said one portion.

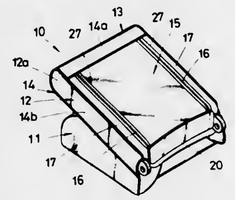


4,047,756

CHAIR CONSTRUCTION AND METHOD OF ASSEMBLING THE SAME

David Marshall Ney, St. Ives, Australia, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Oct. 1, 1975, Ser. No. 618,627
Claims priority, application Japan, Oct. 18, 1974, 49-120632; Oct. 18, 1974, 49-120633
Int. Cl.² A47C *27/00*
U.S. Cl. 297—219 **3 Claims**



1. In a chair construction having a seat with a top, a bottom, a front end, a rear end and a pair of opposing sides; and a back rest with a front, a rear, a top end, a bottom end and a pair of opposing sides, the improvement which comprises a covering of sheet material extending over the front, top end and opposing sides of said back rest, said covering having elongated marginal strip areas of sheet material extending partially over the rear of said back rest and defining an opening accommodating the fitting of said covering upon the back rest; a flap of sheet material extending in adjoining relation to said strip areas and over the rear of said back rest to cover said opening, and at least one slide fastener connected to adjoining edge portions of said strip areas and flap to secure same together closing said opening, said strip areas, flap and slide fastener defining a pair of tail pieces extending beyond the rear of the back rest and foldable against the bottom end thereof, each tail piece bearing a terminal end of said slide fastener; and a piece of sheet material secured against the bottom end of the back rest in overlying relation to said tail pieces.

4,047,757

SEATING STRUCTURES WITH FLEXIBLE BACKS

Loren W. Eames, 4233 N. Peck Road, El Monte, Calif. 91723; Joseph A. Berg, 22325 De Kalb Drive, Woodland Hills, Calif. 91364, and Thomas W. McAllister, 19301 Caladero St., Tarzana, Calif. 91356

Filed May 3, 1976, Ser. No. 682,583
Int. Cl.² A47C *7/40*
U.S. Cl. 297—230 **18 Claims**



1. A seating device comprisingly:

a seat back body which has sufficient stiffness to support the back of a user but is rearwardly flexible to conform to movements of the user's back;

said body having a lower mounting portion extending upwardly at the center of the user's back, and having two upper portions both carried movably by said lower mounting portion and extending upwardly and laterally outwardly therefrom in opposite directions respectively to support the back of a user at opposite sides of the spine;

said two upper portions of said body having a combined overall width substantially greater than the maximum width of said lower mounting portion between two opposite side edges thereof;

said body containing an upwardly opening slit which extends downwardly into the body from an upper end thereof, at a laterally central location and between said two upper portions of the body, and which terminates downwardly at a lower end of the slit above said lower mounting portion of the body;

said body having two flexible connector portions joining said two upper portions of the body respectively with said lower mounting portion thereof and extending between said lower end of said slit and the upper extremities of said opposite side edges of said lower mounting portion;

said device being constructed at the location of said slit to avoid support of a user's back along the spine, from the upper end of said slit downwardly to approximately said lower end of the slit, and to thereby allow the spine to project rearwardly farther than do laterally adjacent portions of the user's back which are supported by said two upper portions of said body.

4,047,758

ADJUSTABLE DENTAL RECLINER

Kenneth Jack Whitehill, 481 Forest Ave., Palo Alto, Calif. 94301

Filed Feb. 23, 1976, Ser. No. 660,228
Int. Cl.² A47C *3/00*
U.S. Cl. 297—284 **30 Claims**

1. An apparatus for supporting an occupant in a generally reclining position, comprising:

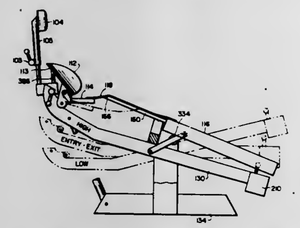
a generally elongated carriage having a head end and a foot end;

a shoulder support mounted to pivot about a first horizontal axis disposed above said carriage and generally perpendicular to the longitudinal dimension thereof near the head end thereof for supporting at least the occupant's shoulders;

an upper body support mounted to said shoulder support to

pivot about a second horizontal axis parallel to and generally above said first horizontal axis for supporting at least the occupant's upper body the relative relationship of said first and second axes allowing an occupant to readily sit up from a supine position;

a headrest assembly lockably pivotally mounted to the head end of the carriage for supporting the occupant's head;



a lower body support mounted to the foot end of the carriage for supporting at least the occupant's legs;

a middle body support positioned between the upper body support and the lower body support for supporting the middle body of the occupant, said middle body support accommodating the contour of the lower back region and hip region of the occupant, and

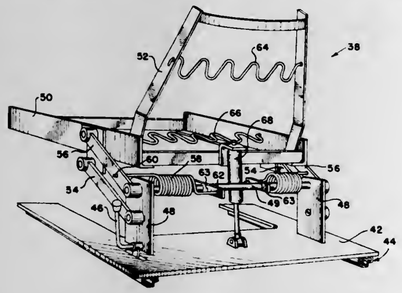
base means for supporting the carriage.

4,047,759

COMPACT SEAT SUSPENSION FOR LIFT TRUCK

Daniel P. Kocciuski, Chardon, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed July 9, 1976, Ser. No. 703,996
Int. Cl.² A47C *3/22, 3/30*
U.S. Cl. 297—346 **13 Claims**



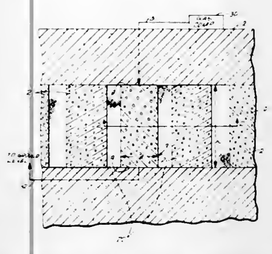
1. In a lift truck vehicle having a mast assembly, a carriage for lifting loads, and an operator's station, a seat assembly comprising; a seat, a base component mounted on a seat supporting surface, a pair of spaced apart upright components affixed to and extending normally from said base component, lower seat components, at least one pair of parallel disposed link components connected between said lower seat components and said upright components, said link components being located outboard of said seat so as to allow said seat to move in close proximity to said seat supporting surface, shaft means extending between and connected to said pair of upright components, and spring means connected to said shaft means to apply force to one of said at least one pair of link components for urging said lower seat components away from said base component.

4,047,760

IN SITU RECOVERY OF SHALE OIL

Richard D. Ridley, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Nov. 28, 1975, Ser. No. 636,227
Int. Cl.² E21B *43/24, 43/26;* E21C *41/10*
U.S. Cl. 299—2 **20 Claims**



1. An in situ oil shale retort in a subterranean oil shale formation comprising:

a cavity in the subterranean oil shale formation having sides and containing a zone of fragmented oil shale formation having a void fraction in the range of from about 10 to 25 percent of the volume of the zone of fragmented oil shale formation, the cavity having an approximately rectangular horizontal cross section and a height in the range of from about two to five times the horizontal dimension of the longest side of the cavity;

means for introducing gas at the top of the cavity for advancing a retorting zone downwardly through the zone of fragmented oil shale formation in the cavity, wherein kerogen in fragmented oil shale formation in the retorting zone is converted to liquid and gaseous products; and

means for recovering liquid and gaseous products from the bottom of the cavity.

14. A method for retorting oil shale in situ comprising the steps of:

forming an in situ retort having sides in a subterranean oil shale formation, said in situ retort having a height in the range of from about two to five times the horizontal dimension of the longest side of the retort and containing a zone of fragmented oil shale formation having an average void fraction in the range of from about 10 to 20 percent of the volume of the zone;

introducing a gas in one end of the in situ retort for advancing a retorting zone through the fragmented oil shale wherein kerogen in fragmented oil shale formation in the retorting zone is converted to liquid and gaseous products; and

recovering the liquid and gaseous products at the other end of the in situ retort.

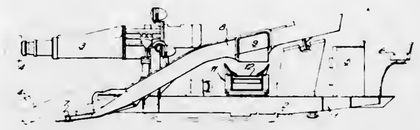
4,047,761

MINING MACHINE

Edward Gordon Coupe, Newark, England, assignor to Dosco Overseas Engineering Limited, England

Filed Sept. 5, 1975, Ser. No. 610,673
Int. Cl.² E21C *35/20*
U.S. Cl. 299—64 **12 Claims**

1. A mining machine particularly constructed for use in cutting a roadway at an end of a working face, said mining machine having a front and back and comprising a cutting head; mounting means for said cutting head including means for moving said cutting head forwardly against a working face to be cut; means for conveying mined material towards the back of the machine; a discharge conveyor extending in a direction transverse to the front-back longitudinal direction of said mining machine; said discharge conveyor having at least one discharge end and mounting means mounting the discharge conveyor on the mining machine for relative movement of said discharge end and said cutting head in the front-back longitudinal direction whereby the cutting head may be advanced towards the working face while the discharge end of the discharge conveyor is maintained in the same location to



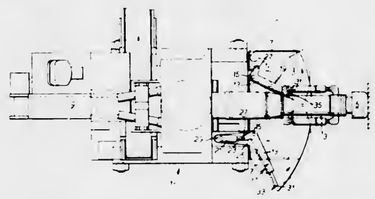
unload material at the same selected point, and means for extending the discharge conveyor in the transverse direction whereby mined material may be unloaded at selected points disposed at different transverse distances from one side of said machine.

4,047,762

GATHERING ARMS FOR A MINING MACHINE

Kenneth Bamford, East Markham, near Newark, and John Roger Clowes, Mansfield, both of England, assignors to Dosco Overseas Engineering Limited, England

Filed Mar. 24, 1976, Ser. No. 669,835
Claims priority, application United Kingdom, Apr. 14, 1975, 15225/75
Int. Cl.² E21C *35/20*
U.S. Cl. 299—64 **8 Claims**



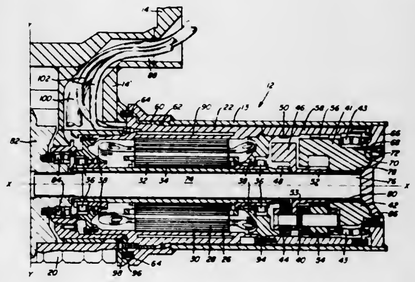
1. A mining machine comprising a cutting head, a forwardly extending apron located beneath said cutting head, a discharge conveyor associated with said apron, and at least one gathering arm having a first end for pivotal connection to the machine, a first hydraulically operated device pivotally connected to the arm for sweeping said arm through a substantial arc between a first position and a second position, and a second hydraulically operated device supported on said arm for extending and retracting said arm so that it can be extended for sweeping from said first position to said second position and can be retracted again prior to sweeping back from said second position to said first position and a hydraulic control system for controlling the sweeping and extension of said gathering arm, the system including a pump, a main control valve, a first detent valve movable between a first position, for extending said arm and for sweeping said arm from a first to a second position, and a second position for retracting said arm and for sweeping said arm back to its said first position under the control of a second detent valve, said first detent valve, when in its first position, supplying fluid to said second arm extending and retracting device to move it to an extended position, a first sequence valve operative, on movement of said device to its extended position, to permit passage of fluid to said first device to move it from said first position to said second position, a second sequence valve operative, on movement of said first device, to said second position to permit passage of fluid to said second detent valve controlling the position of said first position to its second position, whereupon fluid will be directed to said second arm extending and retracting device to move the latter from its extended position back to its retracted position, a third sequence valve subsequently allowing passage of fluid to the first said device to return it from its second position to its first position, and a fourth sequence valve which will subsequently permit passage of fluid to said second detent valve to move it from its second position back to its first position thereby causing said first detent valve to move back to its first position for a subsequent control cycle.

4,047,763

MINING MACHINE WITH CUTTER DRUM HAVING INTERNAL DRIVE MOTORS

James L. Gilliland, Emlenton, and Frank B. Kendrick, Franklin, both of Pa., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Apr. 27, 1976, Ser. No. 680,652
Int. Cl.² E21C *27/24*
U.S. Cl. 299—76 **11 Claims**



1. A mining machine comprising: a mobile support; a boom carried by said support and having an elongated extent with one end of said elongated extent forming the central portion of an elongated forward end of said boom extending transversely of said elongated extent along an axis; said forward end including elongated support portions extending outwardly from longitudinally spaced portions of said central portion coaxially along said axis; rotary means supported by said central portion for coaxial rotation about said axis; cutting means driven through an orbital path by said rotary means to cut clearance for at least said central portion; an elongated drum cutter means supported by said support portions, respectively, for coaxial rotation about said axis to cut clearance for the remainder of said forward end; elongated energizable drive means supported entirely within said forward end and extending coaxially along said axis; said drive means having substantially its entire axial extent extending outwardly of said central portion; elongated rotatable shaft means extending coaxially along said axis through the axial extent of said drive means and having a rotary driving connection to said rotary means; and said drive means having rotatable driving connections adjacent the axially outer end thereof to said cutter drum means and said shaft means for driving said cutter drum means and said cutting means, respectively.

4,047,764

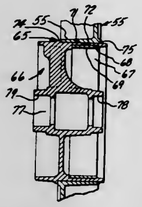
COMPOSITE MOTORCYCLE WHEEL CONSTRUCTION

Thomas J. Lester, Aurora, Ohio, assignor to The Lester Tire Company, Bedford Heights, Ohio

Continuation-in-part of Ser. No. 555,052, March 3, 1975, abandoned. This application Jan. 14, 1976, Ser. No. 648,954
Int. Cl.² B60B *1/08*
U.S. Cl. 301—6 V **6 Claims**

1. A lightweight composite wheel and hub construction comprising a wheel unit casting of lightweight metal including aluminum, magnesium and alloys thereof; said wheel unit casting including concentric rim and tubular portions inte-

grally connected together by angularly spaced-apart spokes; said tubular portion having a bore therethrough coaxial with said rim portion; and a hub unit casting of lightweight metal including aluminum, magnesium, and alloys thereof; said hub unit casting having a central bearing receiving bore and a coaxial cylindrical exterior surface which is an interference fit with said bore of said tubular portion to compressively preload said spokes, to frictionally retain said units together against



relative rotation and relative axial movement, and to locate and retain said bearing receiving bore coaxially of said rim portion; said cylindrical surface projecting axially beyond one annular end of said tubular portion; said units being welded together around said one annular end and said axially projecting cylindrical surface to prevent relative movement thereof despite application of torque and axial loads exceeding the frictional resistance of said interference fit.

4,047,765

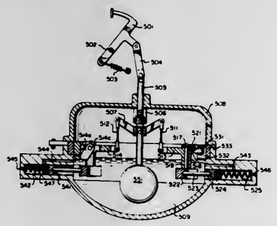
HYDRAULIC POWER TRANSMISSION AND BRAKING SYSTEM FOR VEHICLES

Bernhard Ulrich, Jr., Corpus Christi, Tex., assignor to Tex-Trans, Inc., Corpus Christi, Tex.

Division of Ser. No. 485,632, July 3, 1974, Pat. No. 3,966,365, which is a division of Ser. No. 305,513, Nov. 10, 1972, Pat. No. 3,827,239. This application Mar. 29, 1976, Ser. No. 671,389

Int. Cl.² B60T *8/18*

U.S. Cl. 303—24 F **12 Claims**



1. Brake control apparatus for automatically apportioning braking of the wheels of a vehicle in accordance with the load on respective wheels, comprising:

a brake pedal controllable by a vehicle operator;

a plurality of brake control cylinder assemblies, each brake control cylinder assembly corresponding to a wheel of said vehicle and being actuable to produce braking of the corresponding wheel;

mechanical means linking said brake pedal to each of said brake control cylinder assemblies for actuating said brake control cylinder assemblies equally in response to said brake pedal;

a pendulum;

means mounting said pendulum for displacement along the length and width of said vehicle from a predefined normal position and mechanical means connecting said pendulum to said actuating means, said connecting means including means responsive to lengthwise displacement of said pendulum for producing differences in actuation between brake cylinder assemblies corresponding to wheels at different locations along the length of the vehicle, and means responsive to widthwise displacement of said pendulum for providing differences in actuation between brake cylinder assemblies corresponding to wheels at different locations along the width of the vehicle for increasing the actuation of at least one of said brake cylinder assemblies while decreasing the actuation of at least another of said brake cylinder assemblies.

4,047,766

DIGITAL PHASE-LOCKED LOOP FOR SPEED MEASUREMENT, IN PARTICULAR FOR USE IN ANTISKID CONTROL SYSTEMS

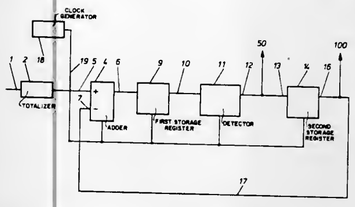
Hans-Wilhelm Bleckmann, Frankfurt, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed May 3, 1976, Ser. No. 682,818

Claims priority, application Germany, May 3, 1975, 2519867

Int. Cl.² B60T *8/08*

U.S. Cl. 303—97 **13 Claims**



1. A digital phase-locked loop for speed measurement, in particular for use in antiskid control systems, for the conversion of the frequency of an input pulse sequence which is proportional to the speed of a rotatable member into a digital numerical value suitable for use in a digital arithmetic unit including:

input means for providing a certain numerical value which will always be the same and which is allocated to any input pulse sequence;

at least one adder means having at least three inputs thereto and at least one output, one of said inputs of said adder being connected to said input means;

first storage register means having one input connected to and receiving the output of said first adder means, having at least another input for receiving clock pulses;

means for generating clock pulses;

detector means having a selected predetermined upper limit and a predetermined lower limit having one input connected to the output of said first storage register means, said detector means having another input connected to said means for generating clock pulses and generating at regular intervals a positive digital output numerical value when the content of said first storage register is above said predetermined upper limit and generating a negative digital output numerical value when the contents of said first storage register are below said predetermined lower limit;

second storage register means having one input connected to said detector means and having at least one other input receiving clock pulses from said means for generating clock pulses;

means for connecting the output of said detector means to said arithmetic unit also to said one input of said second storage register while maintaining the correct sign, whereby the content of said second storage register is the digital numerical value corresponding to the frequency of an input pulse sequence;

means connecting said second storage register to said means for generating said clock pulse and for connecting the output of said second storage register to both said arithmetic unit and another input to said adder means whereby said digital numerical value in said second storage register is always subtracted from the content of said first storage register upon the occurrence of each clock pulse generated by said means for generating said clock pulse.

4,047,767

SLIDE ASSEMBLY

Robert K. Foust, 301 Mary Kay Lane, Connersville, Ind. 47331

Filed Mar. 15, 1976, Ser. No. 666,961

Int. Cl.² F16C *29/02*

U.S. Cl. 308—3.6 **10 Claims**



1. A slide assembly which comprises:

a first rail and a second rail, each of said rails including a channel having first and second sides formed by mutually facing first and second surfaces, each of said rails further comprising a retainer flange extending generally from the first side to the second side, the retainer flange being spaced apart from the second surface and forming an acute angle with a plane parallel to the first surface; and

an elongated, free-sliding member having a generally Z-shaped cross section, the free-sliding member comprising a flat, elongated body having two longitudinal edges and further comprising a first and a second leg, each leg extending from opposite longitudinal edges of the body, the first leg forming an acute angle with a first surface of the body and the second leg forming an acute angle with a second surface of the body, the first leg being received within and bearing against the channel of said first rail, the retainer flange on said first rail being positioned near the second surface of the body, the second leg being received within said bearing against the channel of said second rail, the retainer flange on said second rail being positioned near the first surface of the body.

4,047,768

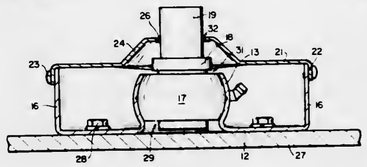
PROTECTED BEARING MOUNT ASSEMBLY

Earl S. Cain, Portola Valley; Jerome A. Carlson, Woodside, and George E. Goodrich, San Carlos, all of Calif., assignors to Tribotech, Redwood City, Calif.

Filed Mar. 25, 1976, Ser. No. 670,441

Int. Cl.² F16C *11/06*

U.S. Cl. 308—72 **8 Claims**



1. A protected bearing mount assembly including a bearing mounting flange extending from one surface of a plate with the outer edges of the plate being formed to extend in the same direction as the flange and surrounding the flange, a bearing mounted in said bearing mounting flange and a cover secured to the outer extending edges of said plate to enclose the bearing mounting flange and one end of the bearing between said cover and said plate.

4,047,769

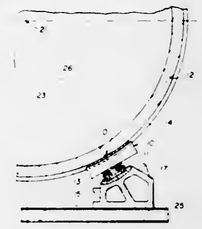
APPARATUS FOR SUPPORTING A ROTARY BODY OF LARGE DIAMETER

Alain Chielens, Marcq-en-Baroeul, France, assignor to Fives-Cail Babcock, Paris, France

Filed Feb. 17, 1976, Ser. No. 658,362

Int. Cl.² F16C *41/02, 1/24*

U.S. Cl. 308—121 **6 Claims**



1. Apparatus for supporting a body of large diameter for rotation about an axis, the body having a pair of circular flanges defining therebetween an annular raceway coaxial with the axis of rotation, circular channels being formed at the intersections between the raceway and flanges, comprising

a. a stationary support frame,

b. a support block glidingly contacting the annular raceway,

1. the spacing between the flanges being such as to provide some axial play between the flanges and the support block,

c. means for feeding a lubricant to the interspace between the flanges and the support block, the lubricant feeding means including

1. a transverse groove extending in the direction of the axis and recessed in the gliding surface of the support block,

2. a source of lubricant in communication with the groove for feeding lubricant thereto, and

3. passages in communication with the gliding surface and having openings adjacent respective lateral edges of the support block for placing the groove in communication with the circular channels, the openings being at least partially covered by the raceway so that the openings are substantially of the same size when the support block is centered between the flanges and that they increase in size as the support block is displaced laterally in the direction of the respective opening, and

d. a swivel joint mounting the support block on the support frame.

4,047,770

HUB BEARING UNIT ASSEMBLY

Abraham Korenhof, Driebergen, and Hendrikus Jan Kapaan, Ijselstein, both of Netherlands, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

Filed Sept. 22, 1975, Ser. No. 615,500

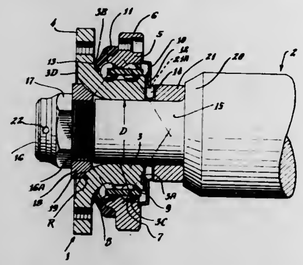
Claims priority, application Netherlands, Sept. 30, 1974, 7412873

Int. Cl.² F16C *33/00*

U.S. Cl. 308—191 **14 Claims**

1. In a hub bearing unit assembly having an inner and outer race ring, each having unified therewith a fastening flange, rows of rolling elements located between said races, said roll-

ing elements being separated from one another by means of a cage, said inner and outer race having seals coupled thereto, said seals acting to retain a lubricant contained between the rolling elements, and a driving shaft, the improvement comprising the end part head section of said inner race opposite its



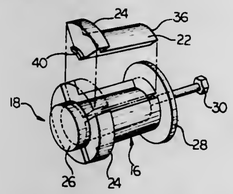
respective flange section and situated outside the inner side of said race ring having formed thereon coupling means, adapted to be coupled to said driving shaft and, by means of which coupling means said inner race is connected to said shaft so as to transmit power to said inner race, the inner side of said inner race facing said shaft in a nonpower transmissible manner.

4,047,771

BUSHING REMOVAL ADAPTER

Kennith E. Vaughn, Creve Coeur, and Hugh V. Piper, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 23, 1976, Ser. No. 660,302
Int. Cl.² F16C *43/00*
U.S. Cl. 308—237 R **5 Claims**



1. An adapter for use in the servicing of press-fit bushings, comprising:
a sleeve having an annular, radially outwardly directed flange and comprised of a plurality of separate segments;
a plug received within said sleeve to prevent radially inward movement of said segments; and
means for holding said plug within said sleeve.

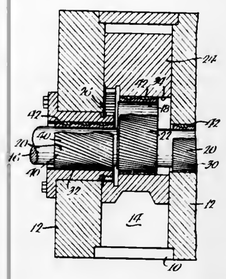
4,047,772

BEARING CONSTRUCTIONS

Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 1, 1976, Ser. No. 691,911
Int. Cl.² F16C *27/00*
U.S. Cl. 308—237 R **6 Claims**

1. In a mechanism including a shaft, a relatively rotatable member having an opening receiving the shaft, a cylindrical bearing carried by the member and journalling the shaft, and means for loading said member generally radially of the shaft;



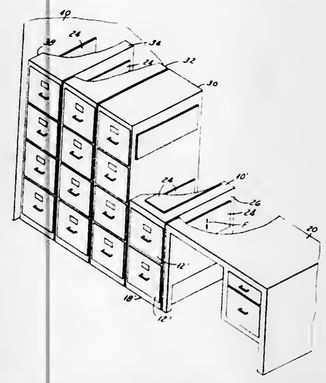
the improvement wherein said opening is elongated in a direction transverse to the direction of loading.

4,047,773

FILE CABINET SECUREMENT STRUCTURE

Joseph G. Semany, 10947 Rossiter, Detroit, Mich. 48224

Continuation of Ser. No. 449,729, March 11, 1974, abandoned. This application June 2, 1975, Ser. No. 583,237
Int. Cl.² F16B *47/00*; A47B *87/00*
U.S. Cl. 312—111 **5 Claims**



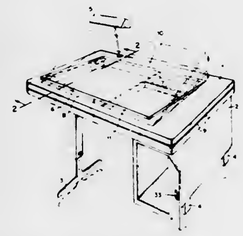
1. The combination of a support, a file cabinet with a plurality of drawers therein, each drawer being extendable in a first direction, and magnetic securement means interposed between and magnetically secured to opposing surfaces of said support and said file cabinet, said magnetic securement means being secured to said support and to said cabinet solely by magnetic attraction and without any mechanical fasteners therebetween so as to normally prevent relative motion in any direction between said opposing surfaces, said magentic securement means including a plurality of thin, flexible magnetic pads of generally uniform thickness, said pads containing finely divided magnetic particles united by a flexible finder, said file cabinet having a first position when the drawers are closed with the center of gravity located within said file cabinet having a second position when at least one of the drawers is extended in said first direction to an open position where the center of gravity is in a different position resulting in a tipping force producing a first moment about an edge at the bottom of the file cabinet tending to tip the file cabinet, said magnetic pads when said file cabinet is at said second position providing a counter force producing a second moment at said edge at the bottom of the file cabinet at least equal to said first moment and in an opposite direction thereby preventing said file cabinet from tipping.

4,047,774

STUDENT WORK TABLE

Michael Haaning, Oerlinghausen, Germany, assignor to Haaning-Kunststoffe Robert Haaning, Paderborn-Monkeloh, Germany

Filed Sept. 26, 1975, Ser. No. 617,071
Claims priority, application Germany, Sept. 26, 1974, 2445890
Int. Cl.² A47B *27/00*
U.S. Cl. 312—231 **5 Claims**



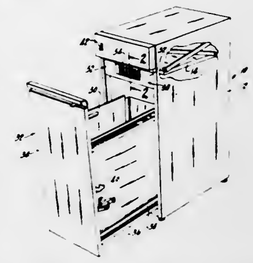
1. An adjustable table, comprising:
a table frame having a recessed storage compartment;
a work surface movably mounted on said table frame in overlying
relation to said storage compartment;
means for alternately raising either of two opposite edge portions of said work surface, including
at least two vertically movable lifting members mounted on said table frame for urging said opposite edge portions of said work surface upward, and
a slidable member movable in opposite directions for alternately engaging said lifting members to urge the so engaged lifting member upward to thereby raise the corresponding one of said opposite work surface edge portions;
means for retaining the other of said work surface edge portions in a lowered position when said one work surface edge portion is raised, including
a pair of substantially parallel, trough-like guides locatd in said table frame, said other work surface edge portion being guided in its corresponding trough-like guide when said one work surface edge portion is raised,
a plurality of locking pins fixed to said table frame, and
a plurality of pockets mounted on said work surface adjacent said opposite edge portions, the pockets adjacent said other edge portion engaging corresponding locking pins when said one work surface edge portion is raised to thereby retain said opposite edge portion in its trough-like guide;
a plurality of hinge eyes mounted to said work surface adjacent said opposite edge portions;
at least one pair of movable hinge pins mounted on said table frame adjacent said opposite work surface edge portions for engagement with said slidable member; and
means normally biasing said movable hinge pins into engagement with said hinge eyes to prevent said opposite edge portions of said work surface from being rasied;
wherein, when said slidable member is moved in one of its opposite directions to engage a lifting member, said slidable member concurrently engages one of said pins to urge said one hinge pin out of engagement with its associated hinge eye to thereby permit said lifting member to raise said one work surface edge portion.

4,047,775

DEODORIZER FOR TRASH COMPACTORS

David W. Wolbrink, Hartford, Wis., assignor to Broan Manufacturing Co., Inc., Hartford, Wis.

Filed Sept. 16, 1975, Ser. No. 613,922
Int. Cl.² B30B *15/00*
U.S. Cl. 312—211 **2 Claims**



1. A trash compactor comprising: an enclosure including a means for positioning a compacting mechanism in the upper portion thereof, said enclosure having a front panel with an opening in the lower portion containing a drawer moveable between an open position and a closed position with respect to said enclosure; a receptacle mounted on said drawer and having an open upper end at which the trash is exposed for emitting offensive odors to the air within the enclosure, said compacting mechanism entering the open end of said receptacle for compacting the trash; and an odor control means having a tray-like holder mounted on said positioning means above the receptacle and across the opening in the front panel of the enclosure, said holder containing an odor treatment material continuously applying an odor treatment substance to the air for treating the air within said enclosure for modifying the odor laden air to reduce its offensiveness, said holder having generally parallel front and back walls and a bottom wall and being open at the top, said front wall having an entry through which the odor treatment material is insertable in the holder, said rear wall having a plurality of openings of a size sufficient to permit an unimpeded flow of air therethrough, said openings forming, with said entry in the front wall of said holder, an air passage through said holder and across said odor treatment material for forming a heavily treated stratum of air along the top of receptacle expellable from said enclosure by movement of the drawer between the open and closed positions.

4,047,776

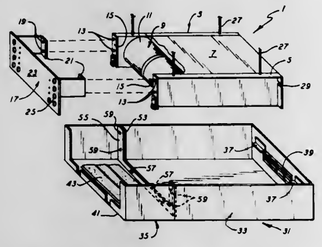
CABINET CONSTRUCTION

Edward F. Krick, Phoenix, and David E. MacLeod, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 24, 1975, Ser. No. 644,272
Int. Cl.² A47F *5/08*; F25D *23/12*
U.S. Cl. 312—245 **7 Claims**

1. A cabinet construction for housing a fan-coil unit, said cabinet construction comprising:
a first cabinet section dimensioned to house a first portion of the fan-coil unit, said first cabinet section having structure for engaging cooperating structure on the fan-coil unit to releasably hold said section on the fan-coil unit and a locating surface,
a second cabinet section attached to the first cabinet section and dimensioned to house a second portion of the fan-coil unit
latching means connected to the fan-coil unit for cooperating with said locating surface to position said cabinet sections to maintain said structure on said first cabinet section in engagement with said cooperating structure, and
connector means for connecting said first and second cabinet

sections to said latching means to cooperate with said structure on said first cabinet section to secure said cabinet



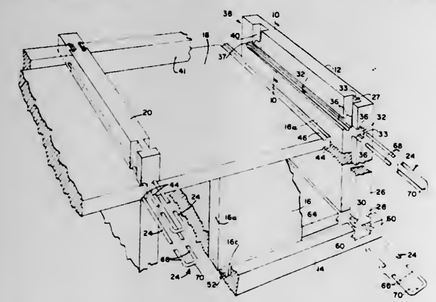
sections to the fan-coil unit and to thereby prevent the inadvertant removal of said cabinet sections from the fan-coil unit.

4,047,777

KNOCKDOWN PUT-TOGETHER ARTICLE OF FURNITURE

Raymond Pfeifer, 5530 S. Lake Shore Drive, Chicago, Ill. 60616, and Roger Ringger, 7480 SW. Fifth St., Plantation, Fla. 33566

Filed Nov. 10, 1975, Ser. No. 630,434
Int. Cl.² E04C *1/10*
U.S. Cl. 312—263 **6 Claims**



1. A knockdown, put-together article of furniture comprising a pair of spaced side members and a top, each of said spaced side members having a horizontally extending groove adjacent the upper end thereof and on each of the opposite sides of each said side members, said grooves extending substantially from the front to the rear of the side members, said top having an inwardly or downwardly facing channel adjacent the side edges thereof to receive the upper end of said side member, each said channel having spaced opposite sides, said top inwardly facing channels each having a longitudinal groove on each of the spaced opposite sides which grooves extend substantially from the front to the rear of the top and align and cooperate with the grooves in the side member when the upper end of a said side member is positioned within said channel to form at least four cooperating and aligned grooves, a U-shaped non-threaded integrally formed interlocking member having spaced generally parallel sides of a length to extend substantially the length of the cooperating grooves and a connecting end portion with said spaced parallel sides of said interlocking member slidably insertable into said cooperating grooves to simultaneously engage said four cooperating grooves to interlock the top to said side members and with said connecting end portions engaging the end of said side member to limit the insertion of said U-shaped interlocking member each of the side members having a horizontally extending, inwardly facing channel and inwardly facing grooves in said channel, a bottom having its opposite ends secured in said horizontal channel, said bottom having cooperating grooves which are aligned with the grooves in the side channel and a U-shaped interlocking member insertable into said cooperating grooves to lock said bottom to said sides.

4,047,778

APPARATUS FOR CONVERTING CRT CATHODES

Julius A. Csaki, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 16, 1975, Ser. No. 623,148
Int. Cl.² H01J *9/385*
U.S. Cl. 316—18 **7 Claims**



1. Apparatus for converting a cathode of a cathode ray tube (CRT) during the manufacture of the CRT, the apparatus comprising:
power supply means for applying a conversion voltage to a CRT filament associated with the CRT cathode to be converted;
vacuum pump means for establishing a vacuum condition within the CRT;
vacuum sensing means for detecting the vacuum level within the CRT during conversion; and
logic means coupled to said power supply means and vacuum sensing means, said logic means being responsive to said vacuum sensing means for causing said conversion voltage to steadily increase from a first predetermined voltage level to a second predetermined voltage level so long as the vacuum level within the CRT is greater than a first predetermined vacuum level, said logic means being responsive to said vacuum sensing means for causing said conversion voltage to steadily decrease from the most recently achieved voltage level toward said first predetermined voltage level if the vacuum level within the CRT falls below a second predetermined vacuum level that is lower than said first predetermined vacuum level, said logic means being responsive to said vacuum sensing means for preventing any increase or decrease in the most recently achieved conversion voltage so long as the vacuum level within the CRT is between said first and second predetermined vacuum levels.

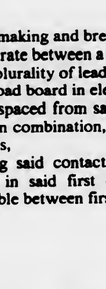
4,047,779

ANTENNA COUPLINGS

John H. Klancnik, Des Plaines, Ill., assignor to Afco Products Incorporated, Des Plaines, Ill.

Filed Oct. 16, 1975, Ser. No. 623,015
Int. Cl.² H01R *41/00*
U.S. Cl. 339—9 A **24 Claims**

12. A coupling for a vehicle-mounted antenna for coupling the antenna to a base mount attached to a part of the vehicle while permitting detachment of the antenna and comprising:
a shell member having an internal recess;
a stud member having a first portion disposed in said recess and a second portion extending axially thereof;
said members being relatively moveable and respectively having means carried thereby enabling the coupling to be attached to the base mount and enabling the antenna to be attached to the coupling;
one of said members having a radially extending lock pin fixed thereto separably joining the members;
a rotatable release member surrounding the other two members and having a circumferential groove in which the pin normally resides,
said release member also having a plurality of openings spaced about the groove for receiving the pin, each opening including a stop means preventing the separation of



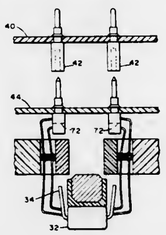
the stud and shell members when the pin is aligned therein;
said release member having an axial slot therein which, when the pin is aligned therewith, is permissive of the shell and stud members being separated along with the antenna carried by one of the separated members, whereby knowledge of the location of the slot allows quick separation but lack of knowledge requires hunting for the slot; and
spring means biasing the release member normally to a position where the groove is aligned with the pin.

4,047,780

TEST CONTACTOR SYSTEM FOR SEMICONDUCTOR DEVICE HANDLING APPARATUS

Nicholas J. Cedrone, 10 Hawthorne Road, Wellesley Hills, Mass. 02181

Filed Apr. 7, 1976, Ser. No. 674,498
Int. Cl.² H05K *1/14*
U.S. Cl. 339—17 CF **9 Claims**



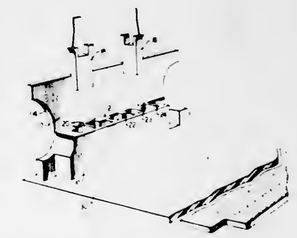
1. Means for reliably making and breaking electrical connection at a high repetition rate between a succession of electronic devices, each having a plurality of leads extending generally in a first direction, and a load board in electrical connection with a like plurality of pins spaced from said leads along said first direction, comprising, in combination,
a plurality of contacts,
means for supporting said contacts so that each contact extends generally in said first direction, said support means being movable between first and second limit positions spaced from one another along a third direction transverse to said first direction, and each of said contacts being positioned on said support means to make electrical connection between one of said leads and one of said pins when said support means is in said first limit position and to break electrical connection with both said one of said leads and said one of said pins when said support means is in said second limit position, said limit position spacing being sufficiently large that said contacts in said second limit position avoid connection with said leads while allowing a wide degree of variation in the location of said leads measured in said third direction, and
means for driving said means in a precisely controlled, symmetrical movement between said first and second limit positions,
said driving means and said support means being structured so that their surfaces adjacent said load board are unlimited in a plane substantially perpendicular to said first direction and they extend in said first direction for a distance comparable to that of said contacts to minimize the spacing between said device and said load board.

4,047,781

PRINTED WIRING BOARD HANDLE HAVING VIEWABLE OPTION CONNECTORS

Ernest Gerard DeNigris, Colts Neck, and Ralph John Palette, Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 30, 1976, Ser. No. 701,425
Int. Cl.² H05K *1/14, 1/18*
U.S. Cl. 339—17 R **11 Claims**



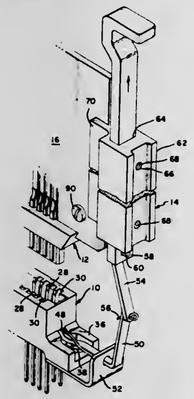
1. A handle for attachment along a side edge of a printed wiring circuit board, said handle comprising:
outer and inner surfaces, separated by a central portion, said central portion including upper and lower surfaces,
a plurality of electrical contacts disposed within said central portion, and extending through said lower surface for attachment to said side edge of said circuit board, each of said electrical contacts arranged for mating relationship with one contact of a multicontact connector, and said electrical contacts arranged into groups,
a plurality of windows in said outer surface of said handle, each said group uniquely associated with one of said groups of contacts,
said contacts being arranged into subgroups within each said group in a manner allowing a single multicontact connector to become connected optionally and exclusively to any selected one of said subgroups, one contact within each group being common to at least two subgroups, each said window being positioned with respect to said associated group of contacts in a manner which allows a visual determination to be made through said window as to which one of said subgroups of contacts of said associated group of contacts a multiconnector is connected.

4,047,782

ROTARY CAM LOW INSERTION FORCE CONNECTOR WITH TOP ACTUATION

Marvin Leo Yeager, Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 23, 1976, Ser. No. 698,979
Int. Cl.[2] H01R 13/62; H05K 1/07
U.S. Cl. 339—75 MP 3 Claims



1. A remotely actuated, rotary cam operated, low insertion force, edge board connector assembly for electrically and mechanically engaging a printed circuit board, said assembly comprising:

a printed circuit board header having a housing with at least one elongated printed circuit board receiving groove along one side edge thereof, at least one mounting tab extending from said one side adjacent said groove, a mounting tongue extending from an opposite side of said housing, a plurality of contact receiving passages extending through said housing on opposite sides of said tongue and said groove,

a like plurality of contacts each received in a respective one of said passages with a first end supported by said tongue and a second end adopted to engage against contact pads of a printed circuit board received in said groove, and latch means engaging said housing to hold said contacts in position, and

mounting means securing said printed circuit board to each said at least one mounting tab;

a low insertion force edge board connector having an elongated housing with an elongated recess for receiving said printed circuit board header therein,

a plurality of contacts disposed in said housing in parallel spaced relationship on opposite sides of said elongated recess,

a contact actuator member positioned in said recess to act against said contacts to move them between first and second positions in which they respectively engage and disengage said contacts of said printed circuit board header received therebetween, and

rotary cam means adapted to drive said contact actuator member between said first and said second positions;

printed circuit board guide means in fixed relationship to said connector and adapted to guide said board during insertion into and withdrawal from said connector,

said guide means including a pair of channel-shaped guide housing members each in fixed relation to a respective end of said connector housing, each said guide housing member extending normal to the elongated axis of said connector housing aligned with and opening in the direction of said recess, and

a passageway through one of said guide housing members; and

remote cam actuating means movably mounted in said passageway, and including an axially moving actuator rod, and

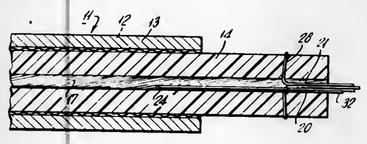
linkage means connecting one end of said actuator rod to the rotary cam of said connector whereby said rotary cam can be actuated from a position remote from said connector.

4,047,783

ELECTRICAL TERMINAL CONNECTOR

Robert E. Camp, Poughkeepsie, N.Y., and Earl W. McPeak, Jr., Powhatan, Va., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,086
Int. Cl.[2] H01R 11/20
U.S. Cl. 339—97 R 7 Claims



1. An electrical connector for making a terminal connection with a resistive type conductor having a layer of insulation thereover, comprising

a pair of solid copper wires,

one of said wires being doubled back and inserted longitudinally into said resistive type conductor,

said doubled end of said one wire forming rounded external surfaces and being inserted sufficiently into the core of said resistive type conductor to maximise the electrical contact therewith,

the other of said wires being wrapped around the outside of said layer of insulation and piercing through at diametrically spaced locations to extend radially into the core of said resistive type conductor,

said other wire extending parallel to said doubled one wire in the core of said resistive type conductor to maximise its electrical contact while said wrap around maximises mechanical contact,

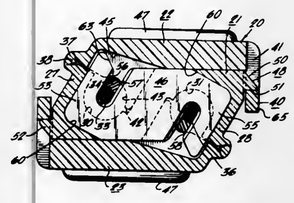
both of said wires having the free ends thereof extending far enough out from the end of said resistive type conductor to accomodate bonding together for good electrical and mechanical contact.

4,047,784

TAP SPLICE CONNECTOR

Robert D. Trank, Pompano Beach, Fla., assignor to Hollingsworth Solderless Terminal Company, Phoenixville, Pa.

Filed Dec. 28, 1976, Ser. No. 755,037
Int. Cl.[2] H01R 9/08
U.S. Cl. 339—98 2 Claims



1. A connector for insulated electrical wires comprising:

a. a body portion having an S-shaped cross section forming a wire-receiving channel at each interior bend of the S;

b. a cover hinged at each end of the S;

c. latch means for securing each cover in closed position; and

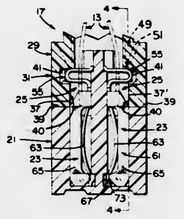
d. a metal contact plate in the body portion extending into each channel.

4,047,785

ELECTRICAL CONNECTOR, ASSEMBLY, AND CONTACT

Max Leroy Jayne, North Warren, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 12, 1975, Ser. No. 640,257
Int. Cl.[2] H01R 13/38
U.S. Cl. 339—99 R 33 Claims



1. A connector for electrically interconnecting at least one electrical wire having an insulative covering thereon and at least one electrically conductive male pin, said connector comprising:

an electrically insulative housing including at least one open portion therein and first and second openings each having access to said open portion, said fist opening adapted for receiving said electrical wire, said second opening adapted for receiving said male pin when said male pin is inserted within said housing;

at least one electrical contact positioned substantially within said open portion of said housing and having a slotted first end portion for positively retaining and electrically engaging said electrical wire when said wire is received within said first opening of said housing and a second opposing end portion comprising first and second extending arm members each including a substantially bowed portion, said first extending arm member adapted for positively engaging a wall of said open portion within said housing, said second extending arm member adapted for slidably engaging and making electrical contact with said male pin when said male pin is inserted within said housing; and

separable cover means for being positioned on said housing to substantially cover said electrical wire within said connector, said cover means comprising at least two cover members each having a base portion for slidably engaging said housing and an extending portion, said extending portions defining an opening for receiving said electrical wire when said cover members are positioned on said housing.

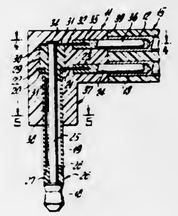
4,047,786

ELECTRICAL CONNECTOR

James J. Gletzen, Smithtown, N.Y., assignor to Dynamic Instrument Corporation, Hauppauge, N.Y.

Filed Dec. 3, 1975, Ser. No. 637,273
Int. Cl.[2] H01R 17/18
U.S. Cl. 339—154 A 3 Claims

1. An electrical connector for applying energy to an electrical device comprising a receptacle and cooperating adaptor plug, said receptacle including a body of insulating material, a pair of spaced openings in one surface of said body, electrical connecting means disposed within said openings and an electric cable connected within said body to said electrical connecting means and extending from said body for connection to a power source and said adaptor plug including a body of material, a pair of pins extending from one surface of the last said body for mating with the electrical connecting means in said receptacle, a cylindrical dual contactor plug extending from another surface of said body and means within the last said body connecting each of said pins to one of the contactors of the last said plug, the surfaces of the body of said adapter plug being disposed at about 90° one relative to the other and said cylindrical dual contactor plug comprising an outer sleeve forming one contactor, a centrally disposed rod insulated from



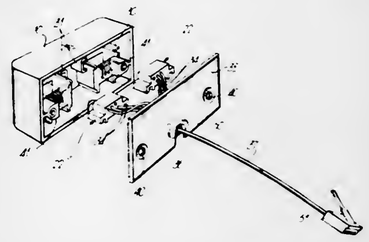
said sleeve and carrying the other contactor, the inner end of said sleeve having a lug portion extending at 90° thereto and a tubular insulating member having a diameter at least equal to the diameter of said sleeve and a section of reduced diameter disposed within said sleeve, a second lug having a circular portion overlying the outer end of said insulator and a portion extending therefrom, said rod extending through said insulator and second lug and swaged to secure it in position and said pins being coplanar with and electrically coupled to said extending lug portions.

4,047,787

EXTENSION CORDS FOR PLUG-IN TELEPHONES

Beverly William Gumb; Gerd Kuhfus, and Frederick Thomas Cogan, all of London, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jan. 21, 1977, Ser. No. 761,067
Int. Cl.[2] H01R 13/54, 25/04
U.S. Cl. 339—154 A 4 Claims



1. An extension cord for plug-in telephones, comprising:

a line cord;

a plug on one end of said line cord, said plug adapted for insertion in a telephone outlet;

a multi-outlet member on the other end of said cord, said multi-outlet member comprising a main part of hollow box-like form having a front, top and bottom, and ends, at least two apertures in said front, each aperture having a predetermined profile for reception of a plug therein, a jack aligned with each aperture on the inside of said front, each jack having a lower part integral with said front and comprising two spaced apart side walls extending normal to said front and a bridge member at the rear of said side walls and extending between said side walls and integral

therewith, and an upper part positioned on said lower part and including two spaced apart parallel channels in an undersurface thereof, said channels slidable on said side walls of said lower part;

a retaining member on each end on the inside thereof and two further retaining members extending from the inside of said front, said retaining members extending over said side walls of said lower parts to retain said top parts of said jacks on said lower parts; and

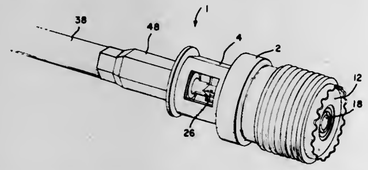
a back cover attached to the main part, a slot in said back, said line cord passing through said slot into the multi-outlet member, the conductors in said line cord connected to conductors in said jacks, said jacks connected in parallel.

4,047,788

PORT HOLE COAXIAL CONNECTOR

Edgar Wilmot Forney, Jr., Harrisburg, and Richard Shure Hogendobler, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 24, 1976, Ser. No. 689,020
Int. Cl.² H01R *17/18*
U.S. Cl. 339—177 R **1 Claim**



1. In a coaxial connector, wherein a center conductor and outer shielding are crimped simultaneously, and a portion of the connector is provided with port holes exposing a central electrical contact for crimping on the center conductor, the improvement comprising:

a medial portion of the connector being larger in cross section than a rearward portion and smaller in cross section than a forward portion of said connector, the forward portion having a dielectric insert and an electrical contact, the medial portion being substantially hollow and providing a shoulder against which the insert is seated, a hollow barrel portion of said contact supported by said insert and projecting in cantilever configuration into free space within said medial portion, said rearward portion having electrical shielding of a coaxial cable received thereover, a ferrule received over said electrical shielding and stopped against said medial portion, a center conductor of said coaxial cable supported in said rearward portion by an insulation layer of said coaxial cable, said conductor projecting into said medial portion and received in said barrel portion, said medial portion provided with opposed port holes exposing said center conductor, said insulation layer and said barrel portion, and said medial portion provided with two flat surfaces alternately spaced with said port holes around the periphery of said medial portion, said flat surfaces providing for nesting of the connector between walls of a crimping die which is enterable within one said port hole.

4,047,789

ELECTRICAL DISTRIBUTOR BLOCKS

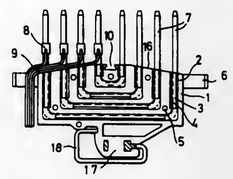
Gottfried Glaesel, Minusio, Switzerland, assignor to Hego Electric GmbH, Glarus, Switzerland

Filed Feb. 23, 1976, Ser. No. 660,547
Int. Cl.² H01R *9/16*
U.S. Cl. 339—198 H **9 Claims**

1. An electrical distributor block comprising

a. a body of electrically insulating material having two parallel major side faces and narrow further faces extending between the said major side faces;

b. a plurality of generally U-shaped channels in at least one of the major side faces, all the channels being open at both ends through a single one of the narrow faces, at least one said channel being of L-shaped cross-section transverse to its length for receiving selectively a said pin disposed with its greatest cross-sectional dimension either perpendicular or parallel to the major side faces;



c. a generally U-shaped metal terminal pin located in at least one said channel and projecting from both ends thereof;

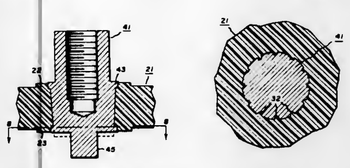
d. a rib associated with each channel provided on and projecting from the major side face of the body opposite that containing the channel, said rib corresponding in shape and position to and of no greater lateral dimensions that the associated channel, whereby when two identical blocks are placed side by side the ribs of a first said block will enter the channels of the adjacent block thereby to retain said pin in said channel.

4,047,790

INSULATIVE HEADER ASSEMBLY WITH FEED THROUGH TERMINALS

John W. Cariso, Columbia, S.C., assignor to General Electric Company, Hudson Falls, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,094
Int. Cl.² H01R *9/16*; H01G *9/10, 1/153*
U.S. Cl. 339—220 C **24 Claims**



1. In combination, a header assembly comprising:

a disc-like header made of insulating material and having a slightly tapered opening projecting transversely therethrough, the narrow end of said tapered opening having a depression formed therein and defining a shoulder, said depression including a peripheral row of axial spline means;

a one-piece metal feed through terminal pressed into said opening, said terminal having a tapered portion which is fitted into said tapered opening tightly enough to form a seal therewith, said terminal extending at least into said depression;

said terminal being formed of a material which is softer than the material of said header so that when pressed into said opening said terminal conforms to irregularities in said opening to enhance the seal; and

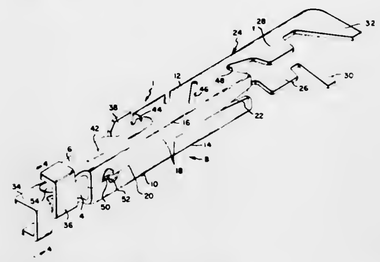
at least a portion of the part of said terminal that is within said depression being flared so that said portion overlaps said shoulder and conforms with said spline means.

4,047,791

LOW INSERTION FORCE RECEPTACLE AND CAMMED HOUSING

Clyde Thomas Carter, Shermansdale, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 530,262, Dec. 6, 1974, abandoned, which is a division of Ser. No. 367,072, June 4, 1973, Pat. No. 3,865,457. This application Feb. 17, 1976, Ser. No. 658,158
Int. Cl.² H01R *13/12*
U.S. Cl. 339—260 **4 Claims**



1. An electrical terminal, comprising:

a body portion and a wire engaging portion and a pair of projecting and normally spaced apart resilient spring arms having U-shaped ends,

said spring arms having gripping surfaces thereon,

said U-shaped ends being resiliently biased into mutual tandem alignment whereby said gripping surfaces are separated to freely receive therebetween a male terminal inserted into each of said U-shaped ends,

said spring arms being resiliently deflected outwardly away from each other when said U-shaped ends are biased into mutual tandem alignment,

said U-shaped ends being capable of resilient deflection out of tandem alignment to allow said spring arms to deflect toward each other whereby to engage the gripping surfaces thereof on a male terminal, and

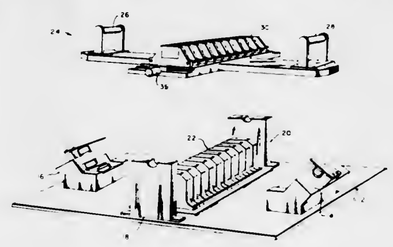
said body portion includes a plurality of cutout portions defining sections of the body portion having different degrees of resilient deflection as a reaction to resilient deflection of said spring arms toward each other.

4,047,792

TORQUE WHILE TURN-AROUND SCAN MIRROR ASSEMBLY

C. Harold Dale, Jr., Malibu; Spencer D. Howe; Robert L. Bonebreak, both of Los Angeles, and Charles J. Starkus, Culver City, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 31, 1975, Ser. No. 645,491
Int. Cl.² G02B *27/17*
U.S. Cl. 350—6 **8 Claims**



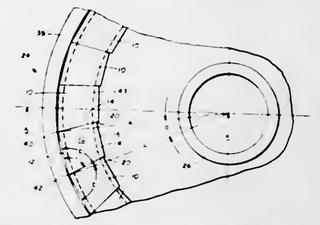
1. A scan assembly comprising a housing, a scan member mounted by means of flexural pivots to said housing, a torquer device mounted between said scan member and said housing for providing in response to an applied electrical control signal, energy to said member so as to cause it to rotate on said flexural pivots, at least two spring means each of which are disposed for contacting said scan member near the end of its travel in one respective direction, for absorbing energy therefrom and for reapplying a portion of said energy to drive said member in the opposite direction, said spring means each include at least one leaf spring mounted so as to be in substantial engagement with said scan member during at least a portion of the turn-around period at the end of each scanning cycle, and wherein the improvement comprises circuit means for sensing the contact of said scan member with said spring means and for applying a control signal to said torquer so as to impart during the turn-around period of said scan member the energy required to maintain a substantially constant scan rate for said member with said control signal comprising first and second segments of opposite polarity and poled so as to drive said torquer device to add energy to the scan mirror assembly during the deflection and return travel portions of the movement of said leaf springs and said circuit means including means for comparing the scan angle sequence of said member to that of a reference signal pulse train and for controlling the duration of said control signal so as to substantially maintain a scan angle sequence which is determined by said reference signal pulse train.

4,047,793

POLYGON SCANNER WITH AN ANNULAR LIP

John M. Lang, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 9, 1976, Ser. No. 675,101
Int. Cl.² G02B *27/17*
U.S. Cl. 350—7 **9 Claims**



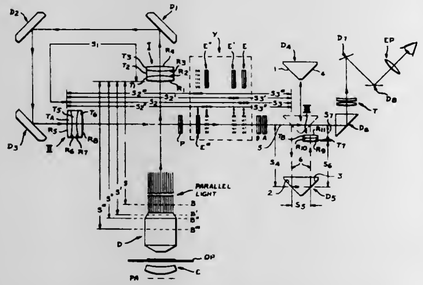
1. A scanning polygon comprising an upper plate and a lower plate, each having an inner surface; a plurality of identical blocks located between said plates and each having an upper surface engaging said upper plate, a lower surface engaging said lower plate and first, second and third side edges joining said upper and lower surfaces; said first and second side edges intersecting said third side edge to form respective corners therewith; said third edge being a highly reflective facet; an annular lip extending from the inner surface of at least one of said plates towards the other of said plates; the height of said lip beyond said inner surface being substantially less than the thickness of said facet edge; said blocks being arranged in such a manner that said first edge of one block abuts said second edge of the block adjacent thereto, and said corners of each block engages said lip whereby said facet edges of each block form chords along the lip to form a polygon; the angle of the corner formed by said first edge and said facet being substantially 90°; and the angle of the corner formed by said second edge and said facet being substantially $90° - (360°/N)$ where N is the number of facets forming the polygon.

4,047,794

OPTICAL RELAY FOR A MICROSCOPE AND A BACK APERTURE VIEWER THEREFOR

Ernest D. Park, Clarence, and Joseph C. Dianetti, East Aurora, both of N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 656,763, Feb. 9, 1976. This application Nov. 1, 1976, Ser. No. 737,743
Int. Cl.² G02B *21/06*
U.S. Cl. 350—54 **2 Claims**



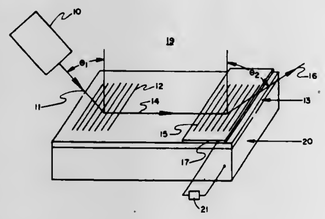
1. In a microscope having an observation system including in optical alignment along an axis, an objective, a telescope lens and an eyepiece, said objective having a back focal plane and said eyepiece having an image plane, a relay lens system to relay said back focal plane to an optically equivalent location in a station positioned between said objective and said telescope lens and an optical element at said station selectively positionable in said location for rendering said optical element operable in a manner equivalent to being positioned in said back focal plane, the improvement comprising a viewer selectively positionable on said axis between said station and said eyepiece for observing said optical element, an additional lens, said viewer including first means to deflect said axis to an alternate path passing through said additional lens, said lens being adapted to focus an image of said optical element in said eyepiece image plane, second means to deflect said alternate path after said lens along said axis and focusing means to move said additional lens axially along said alternate path.

4,047,795

OPTICAL INTEGRATED CIRCUIT LASER BEAM SCANNER

Richard Swart Hughes, China Lake, and Howard A. Wilcox, Santa Barbara, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 22, 1974, Ser. No. 526,299
Int. Cl.² G02B *5/14*; G02F *1/29*
U.S. Cl. 350—96 C **17 Claims**



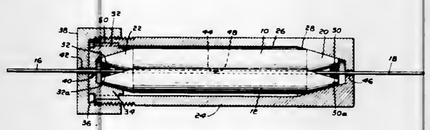
1. A variable optic coupler, comprising:
an optical path formed of a material which responds to a high electric field by manifesting the electro-optic effect, for propagating a laser beam;
means for coupling said laser beam into and out of said optical path at predetermined coupling angles, wherein said coupling means has at least one optical grating coupler overlying at least a portion of said optical path;
means for electro-optically changing the refractive index of said portion of the optical path which underlies said optical grating coupler;
so arranged and constructed that the laser beam coupling angle at said optical grating coupler changes in response to changes in the refractive index of said portion of the optical path which underlies said optical grating coupler.

4,047,796

PRECISION OPTICAL FIBER CONNECTOR

Charles Kuen Kao, and Lozure Gene Wolfgang, both of Roanoke, Va., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 15, 1975, Ser. No. 613,390
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96 C **4 Claims**



1. An optical fiber coupling device comprising:
a tubular housing;
a plurality of like-sized cylindrical rods supported longitudinally within said housing and having adjacent circumferential surfaces providing an interstitial space between said rods to receive abutting ends of a pair of longitudinal optical fibers, said rods being conically tapered at opposite ends providing a smaller diameter at said rod ends, said housing having a cylindrical bore with an opening at one end and a tapered wall within the other end having a conical taper corresponding to said rods to engage said rod ends, said one end of said housing having an outer threaded peripheral surface, said other end having a central aperture to receive an optical fiber therethrough;
means for expanding said interstitial space to permit insertion of said fibers; and
means for compressing said rods about said fibers to axially align and secure said fibers within said interstitial space said compressing means including a compression ring having corresponding tapered inner walls engaging the ends of said rods at said opening, and a threaded cap adjustably secured on said threaded end of said housing over said compression ring to urge said ring against said rods and said rods around said fibers.

4,047,797

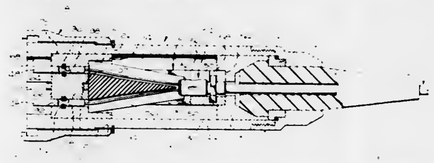
FIBER OPTIC CONNECTOR

Bruce K. Arnold, El Toro, and Elias A. Moreno, Huntington Beach, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 9, 1976, Ser. No. 694,305
Int. Cl.² G02B *5/16*
U.S. Cl. 350—96 C **14 Claims**

1. A connector for one or more single optical fibers of a fiber optic cable having a strength member therein comprising:
a support member having a forward section and a rear section;
means on said forward section for releasably mounting a contact terminated to a single optical fiber;

means for making fixed attachment to the strength member of a fiber optic cable; and



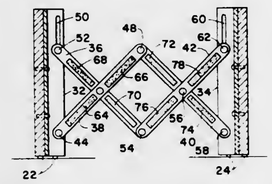
means for removably mounting said attachment means on said rear section in a predetermined position relative to said forward section.

4,047,798

EMERGENCY SIGNALLING DEVICE

James M. Bennett, 68 Cooke St. No. 41, Plainville, Conn. 06062

Filed June 1, 1976, Ser. No. 691,326
Int. Cl.² B60Q *1/26*; G02B *5/00*
U.S. Cl. 350—97 **1 Claim**



1. A compact emergency signalling device comprising a pair of parallelly disposed longitudinal end elements, magnetic securing mens for magnetically fastening said pair of said end elements to a magnetically susceptible surface, linkage means enabling said pair of said end elements to be spacedly maintained a variable distance apart from each other, handle means for manually positioning said pair of said end elements said variable distance apart from each other, light reflection means located on said linkage means for heightening the visibility of said pair of said end elements and said linkage means, wherein each of said pair of said end elements has an L-shaped cross-section, a pair of U-shaped longitudinal tracks, one of said pair of said tracks fixedly secured to one leg of said L-shaped cross-section of said each of said pair of said end elements, the other legs of said L-shaped cross-section of said each of said pair of said end elements directed inwardly towards each other, said one leg of said each of said pair of said end elements disposed in juxtaposed parallel relationship.

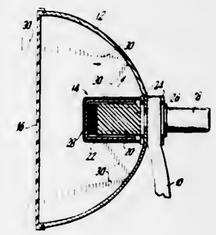
4,047,799

MULTI-COLOR HAND SIGNAL

Howard Cross, Hartsdale, N.Y., assignor to Frances Cross, Hartsdale, N.Y.

Filed Sept. 29, 1976, Ser. No. 727,665
Int. Cl.² G02B *5/12*
U.S. Cl. 350—97 **10 Claims**

1. A hand-held indicator for use in selectively providing a signal of one of two preselected colors, said indicator comprising a support, concave reflector means secured to said support, first and second members of said two colors, and means operatively connected to said support and to at least one of said first and second members for selectively positioning one of said first and second members in the vicinity of the focal point of said



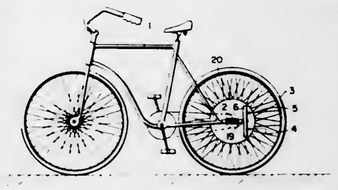
reflector means from which the selected one of said color members is reflected by said reflector means.

4,047,800

BICYCLE REFLECTOR DEVICE

Paul J. DiBease, Ocean City, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed May 13, 1976, Ser. No. 686,157
Int. Cl.² G02B *5/12*
U.S. Cl. 350—99 **3 Claims**



1. A bicycle reflector device for a bicycle having a rear axle and a rear wheel rotatably mounted on the rear axle, said bicycle reflector device comprising
a wheel disc coaxially mounted on the rear wheel and having a diameter smaller than that of the rear wheel, said wheel disc rotating with the rear axle;
a reflector disc having a light reflective surface, said disc having a rim; and
mounting means mounting the reflector disc on the rear axle of a bicycle in a manner whereby said disc is positioned substantially vertically and substantially perpendicularly to the plane of the rear wheel with the rim of the disc in abutment with said wheel whereby rotation of the rear wheel causes rotation of the wheel disc and rotates the reflector disc about its axis.

4,047,801

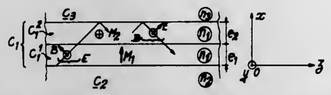
OPTICAL WAVE GUIDE HAVING DISTRIBUTED GYROTROPY

Didier Challeton, 18, avenue de l'Europe, 38120 St Egreve; Philippe Coeure, 11, place Jean Moulin, 38000 Grenoble; Jean Pierre Jadot, 6, impasse des Lecheres, 38240 Meylan, and Jean Claude Peuzin, Lotissement des 4 Seigneurs, 38320 Eybens, all of France

Filed Mar. 24, 1976, Ser. No. 669,887
Claims priority, application France, Apr. 2, 1975, 75.10296
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96 WG **13 Claims**

1. An optical wave guide comprising a layer C_1 of magnetizable material having a substantially constant optical index of refraction equal to n_1 throughout said layer and a predetermined thickness disposed between two parallel media each having an optical index of refraction of lower value than the

index n_1, the said predetermined thickness C_1 corresponding to the distance between said media, wherein the layer C_1 exhibits distributed gyrotropy as herein defined and comprises a plural-



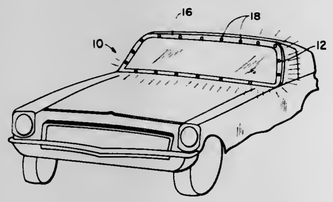
ity of adjacent regions constituting sublayers which are parallel to each other and has two parallel flat surfaces which separate the layer C_1 from the two media having optical indices of lower value than the index n_1.

4,047,802

REFLECTING DEVICE

Eli Pieters, Brooklyn, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed July 8, 1976, Ser. No. 703,355
Int. Cl.² G02B *5/12*
U.S. Cl. 350—97 **3 Claims**



1. A reflecting device for use with a vehicle with a windshield having a peripheral frame composed of a magnetizable material, said device comprising:

a rubber-like support member configured to define and attached to a border surrounding the windshield completely;

said support member being substantially planar on both surfaces thereof;

b. a retroreflective means disposed on one surface of the said support member; and

c. a plurality of magnets of the said support member and imbedded in the surface of the support member opposite to the surface on which said light retroreflective means is disposed;

said plurality of magnets being imbedded in recesses spaced apart along the surface of said support member;

said magnets being so disposed so as to be flush with the surface of said support member opposite the retroreflective means.

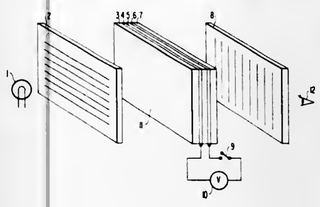
4,047,803

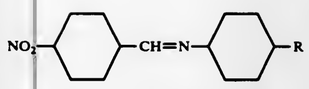
NEMATIC LIQUID CRYSTAL COMPOSITIONS

Masachika Yaguchi, Yokohama; Toshio Jinnai, Kamakura; Shirotsuka, Mikio, Kamakura, and Kazuo Totani, Kamakura, all of Japan, assignors to Dai Nippon Toryo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 463,228, April 23, 1974, Pat. No. 3,988,054. This application July 8, 1976, Ser. No. 703,335
Claims priority, application Japan, Apr. 24, 1973, 48-46543; June 30, 1973, 48-73325
Int. Cl.² G02F *1/13*; C09K *3/34*; C07C *119/10*
U.S. Cl. 350—160 LC **2 Claims**

1. A nematic liquid crystal material having positive dielectric anisotropy consisting of a compound represented by the formula





wherein R is n-alkyl group of 7 to 15 carbon atoms.

4,047,804

ANTI-REFLECTION COATINGS FOR PHOTOGRAPHIC BASES

Robert K. Stephens, Windham, N.H., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 428,400, Dec. 26, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,236
Int. Cl.² B32B *7/02, 27/00*
U.S. Cl. 350—164 **22 Claims**



1. A transparent element comprising a polymeric film base having an index of refraction of at least 1.6, said polymeric film base carrying on one surface thereof a quarter-wave anti-reflection coating having an index of refraction at least about 0.20 less than said polymeric film base and an optical thickness of about 0.08 to about 0.2 micron, said anti-reflection coating comprising a fluorinated polymer and a polydimethyl siloxane in a quantity approximately 0.2 to 4 percent by weight of said anti-reflection coating, said polydimethyl siloxane having a viscosity of about 10,000 to 100,000 centistokes.

4,047,805

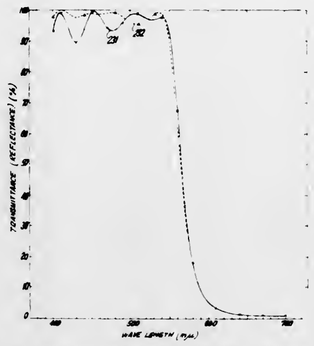
RIPPLE-FREE DICHROIC MIRRORS

Nobuyuki Sekimura, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 440,029, Feb. 6, 1974, abandoned. This application July 23, 1975, Ser. No. 598,219
Claims priority, application Japan, Feb. 14, 1973, 48-18139
Int. Cl.² G02B *5/28, 27/14*
U.S. Cl. 350—166 **18 Claims**

1. A dichroic mirror, in which ripple is eliminated, consisting of a substrate and 10-layer films coated over said substrate, said substrate having an index of refraction of 1.52, and said 10-layer films being composed of alterating layers of a high index material having an index of refraction of 2.20 and a low index material having an index refraction of 1.38, and the layer contacting with said substrate is a high index material, said high index layers each having a basic design optical thickness of $\frac{1}{2}\lambda_o$, and said low index layers each having a basic design optical thickness of $\frac{1}{4}\lambda_o$, wherein λ_o is a design wave length in air, whereby the first, the second and the outermost layers counting from the substrate have optical thickness slightly

deviated from the corresponding basic optical thickness, the optical thickness of said first layer is (2.85/4) λ_o, the optical



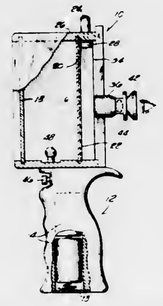
thickness of said second layer is (0.8/4) λ_o, and the optical thickness of said outermost layers if (1.6/4) λ_o.

4,047,806

HAND HELD MICROFICHE VIEWER

Jean-Pierre Puel, Paris, France, assignor to Realist, Inc., Menomonee Falls, Wis.

Filed June 11, 1976, Ser. No. 695,074
Int. Cl.² G02B *27/02*
U.S. Cl. 350—236 **4 Claims**



1. A microfiche reader comprising a housing having a rectangular lenticular light gathering panel at the rear of the housing to gather ambient light and transmit it to the interior of the housing, the long dimension of the panel being vertical,

the front of said housing having a vertically elongated aperture therein,

a rectangular light diffusing glass panel mounted in the interior of the housing in the proximity of the front of the housing adjacent the aperture and parallel to the light gathering panel,

a slot in each side of the housing immediately ahead of the light diffusing glass and dimensioned to receive and guide a microfiche card for movement transversely to the housing and of said aperture so as to position any desired column of images on the card in alignment with said aperture while confining the card around the perimeter of the aperture to hold the card flat,

a lensboard movably mounted on the front panel,

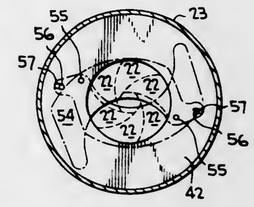
a viewing lens mounted on the lensboard in alignment with said aperture and positionable in alignment with any desired row of a microfiche card positioned in said slots.

4,047,807

DIAPHRAGM DEVICE

Yukio Okano, Minamikawachi; Nobuyuki Kita, Osaka, and Kyozo Uesugi, Izumi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Dec. 24, 1975, Ser. No. 644,320
Claims priority, application Japan, Dec. 26, 1974, 49-148439; Dec. 26, 1974, 49-148440
Int. Cl.² G03B *9/02*
U.S. Cl. 350—266 **18 Claims**



1. A diaphragm device, comprising:

base plate means having a central opening of substantially circular shape;

first diaphragm blades each mounted on said base plate means in partially overlapping relation to form a diaphragm aperture defined by inner peripheral edges thereof each having a curved identical profile, said first blades each being mounted for pivotal movement through a predetermined angle to define said aperture of a predetermined size;

a pair of second diaphragm blades disposed opposite one another relative to the center of the opening in said base plate means, said second blades being mounted on said base plate means in partially overlapping relation to said first blades, and said second blades each being mounted for pivotal movement through an angle greater than said predetermined angle so that the inner peripheries of said second blades may shield part of the aperture defined by said inner peripheries of said first blades to thereby reduce said predetermined size of said aperture, said inner peripheries of said second blades each having a curved identical profile;

means engaging each of said blades for pivoting them to vary the size of the diaphragm aperture, said means which engage said second blades causing them, when it is desired to reduce said predetermined size of said aperture, to pivot further than said first blades are caused to thereby pivot so as to define a part of said aperture, whereby said peripheral edges of said second blades defines with a portion of said peripheral edges of said first blades an elongated aperture by reason of the opposed relation of said second blades and their greater angular movement.

4,047,808

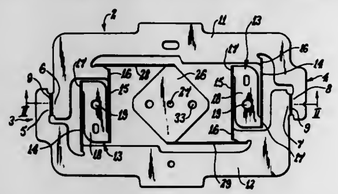
ADJUSTABLE SLIT MECHANISM

Ivan Robert Bartlett, East Burwood, Australia, assignor to Varian Techtron Proprietary Limited, North Springvale, Australia

Filed Aug. 5, 1976, Ser. No. 711,349
Claims priority, application Australia, Aug. 13, 1975, 2769/75
Int. Cl.² G01J *3/04*; G05D *25/00*
U.S. Cl. 350—271 **12 Claims**

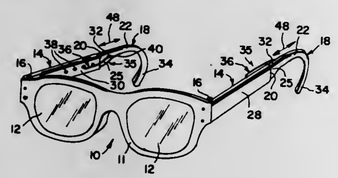
1. An optical slit device comprising a generally planar plate structure, said plate structure being elongate along a longitudinal axis and having first and second jaw assemblies, said first jaw assembly being disposed near one end of said plate structure and said second jaw assembly being disposed near the other end of said plate structure along said longitudinal axis, each of said jaw assemblies including two jaw sections arranged to define a slit between opposed edges of respective

parts of the plate structure from which said jaw sections are formed, and flexible hinge means interconnecting the two jaw sections of each jaw assembly so as to permit relative movement between said jaw sections such that the width of said slit can be changed; each hinge means including an elongate arm structure oriented generally transverse to said longitudinal axis



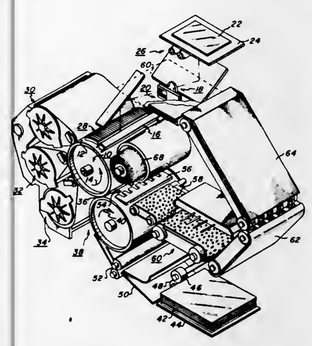
of said plate structure, said arm structure having a generally planar surface that is substantially perpendicular to said jaw sections; said plate structure further comprising two bridging portions, each of said bridging portions connecting a jaw section of one of said jaw assemblies with a jaw section of the other of said jaw assemblies.

4,047,809
SPECTACLES HAVING ADJUSTABLE TEMPLES
Joyce L. Zaccatti, 9411 Lee Highway 713, Fairfax, Va. 22030
Filed May 24, 1976, Ser. No. 689,566
Int. Cl.² G02C *5/20*
U.S. Cl. 351—118 **3 Claims**



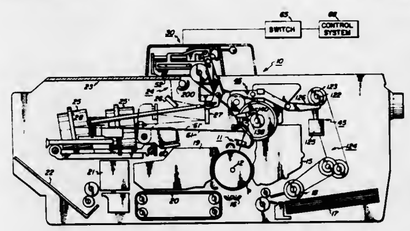
1. Spectacles comprising:
A. a frame;
B. temples each of which has one end pivotally connected to said frame and an oppositely disposed free end with an inwardly extending temple wall extending intermediate said ends;
C. extension means cooperatively associated with each free end of said temples, said extension means comprising a pair of extension members;
D. guiding means to permit slidable movement of said extension members relative to its temple during adjustment to its various positions, said guiding means providing each extension member and a respective temple to be interfitted one within the other and being slidable and longitudinally adjustable relative to its temple;
E. said guiding means is constituted by a channel in said temples, and said extension member is retractable inwardly and outwardly of and interfitting with the companion channel in the temple;
F. locking means for releasably securing said extension members in longitudinally adjusted positions relative to their companion temple, said locking means include a locking member for bridging between and interconnecting the extension member and temple;
G. said locking means includes a plurality of apertures in spaced apart relation to each other positioned on said inwardly extending temple wall; and
H. said locking member includes:
1. an inwardly extending arm at one end thereof,
2. means for firmly securing to the extension member said arm,
3. a flexible body portion integrally formed with said arm and extending parallel to said extension member,
4. an inwardly projecting tab integrally formed with said body portion and adapted to extend in the respective apertures of the temple, so that a positive force is required to disengage and retract said tab from within the respective aperture to overcome the tension against the temple to permit longitudinal adjustment of the extension member, such that in the normal wearing position of the spectacles by the wearer sufficient pressure is maintained to retain said tab within its aperture,
5. said locking members being positioned inwardly of each temple so that they are not visible when the spectacles are worn, and
6. said tab being dimensioned so as to retain said body portion in laterally spaced apart relationship to said inwardly extending temple wall so as to facilitate grasping said body portion to release said tab from a particular one of said apertures such that longitudinal adjustment of said extension member relative to a respective one of said temples may be obtained.

4,047,810
DUAL MODE COPYING MACHINE
Paul F. Morgan, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 9, 1975, Ser. No. 620,979
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **23 Claims**



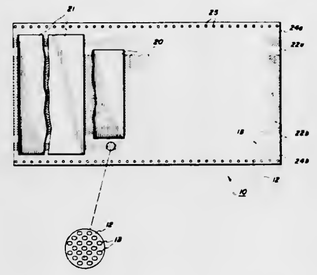
1. An apparatus for recording a latent image of an original document on a photosensitive member, including:
a deformable transparent member;
means for projecting a light image of the original document through said transparent member onto the photosensitive member to record the latent image thereon;
means for deforming restorably said transparent member to form a pattern of spaced deformations therein which phase shifts the light image passing therethrough with respect to the light image passing through the non-deformed portions thereof so as to modulate the light image transmitted to the photosensitive member; and
means for actuating selectably said deforming means.

4,047,811
AVAILABLE LIGHT MARGINAL ILLUMINATION SYSTEM
Robert F. Allis, Rochester, and Vincent A. Capaccio, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 27, 1976, Ser. No. 690,474
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 **20 Claims**



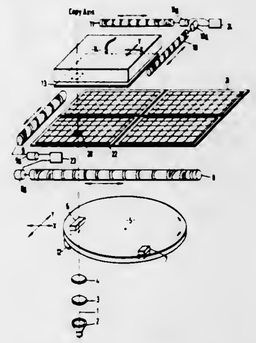
1. In a reproducing apparatus including means for forming an image on a sheet of final support material, said image forming means including means for viewing an object and for projecting an image thereof onto a photosensitive surface selectively at a first copy image magnification or at a second copy image magnification which is reduced as compared to said first copy image magnification, said viewing means including means for illuminating said object; said photosensitive surface being arranged for movement in a given direction; and further including means responsive to the selection of said second projected image magnification for illuminating at least one unused side margin region of said photosensitive surface, said side margin region being of greatest extent substantially in said given direction; the improvement wherein said means for illuminating said side margin region comprises:
means selectively operable in response to said second magnification selection for intercepting a portion of the illumination derived from said illumination means and for applying said portion of said illumination to said side margin.

4,047,812
DOCUMENT BELT WITH IMPERFORATE BANDS
James W. Hogan, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Jan. 15, 1976, Ser. No. 649,174
Int. Cl.² G03B *27/62*
U.S. Cl. 355—76 **4 Claims**



1. In a vacuum belt document transport system wherein documents are transported by and copied on a vacuum belt closely overlying a platen imaging station, including means for moving said documents in a predetermined movement direction on said vacuum belt, wherein said vacuum belt has a multiplicity of fine apertures extending substantially uniformly thereover to hold said documents against said belt substantially uniformly by vacuum forces exerted through said apertures, wherein said vacuum belt is wider than said documents transverse said movement direction, wherein said documents include at least two different standard documents of two different preselected standard edge-to-edge dimensions extending transverse said movement direction, and wherein said belt provides an image background around said documents to reduce edge show-around in the copying of said documents, the improvement wherein said vacuum belt has at least three narrow unapertured areas extending linearly in said movement direction of said belt, said unapertured areas being parallel imperforate bands spaced apart from one another by distances between the centers of said bands transverse said movement direction equal to said two standard dimensions of said two standard documents to provide an unapertured image background area of said belt for both edges of both said standard documents, with both said edges of said standard documents lying within said unapertured bands of said belt in said imaging station, and wherein the dimensions of said unapertured bands transverse said movement direction are only a minor portion of said standard dimension of said standard document and minor areas of said vacuum belt, and wherein substantially the entire major area of the vacuum belt between all three of said unapertured bands is fully apertured to provide said vacuum holding of said documents to said belt.

4,047,813
AUTO EDITORS
Harry Arthur Hele Spence-Bate, 115 Cheam Place, Morley, Australia (6062)
Filed July 28, 1975, Ser. No. 599,586
Claims priority, application Australia, July 29, 1974, 8365/74; Nov. 21, 1974, 9705/74
Int. Cl.² G03B *27/04*
U.S. Cl. 355—95 **5 Claims**



1. A microfiche or microfilm editing device comprising a light source, a means of focussing light from the source along a copy axis through a first microfiche or microfilm held in a frame, a first x actuator connected to the frame arranged to move the frame in an x direction and a first y actuator connected to the frame arranged to move the frame in a y direction, means for driving the first actuators according to a set program, holding means for a second microfiche, said holding means arranged to hold the second microfiche in close relationship to the first microfiche or microfilm, a second *x* actuator and second *y* actuator connected to the holding means and arranged to move the holding means in *x* and *y* directions respectively, means for driving the second actuators according to another set program.

4,047,814

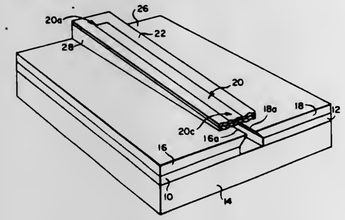
METHOD AND APPARATUS FOR SEGREGATING PARTICULATE MATTER

Vernon C. Westcott, Lincoln, Mass., assignor to Trans-Sonics, Incorporated, Burlington, Mass.

Continuation of Ser. No. 446,547, Feb. 27, 1974, abandoned, which is a continuation of Ser. No. 176,419, Aug. 25, 1971, abandoned. This application Nov. 11, 1975, Ser. No. 631,171

Int. Cl.² G01N *1/00, 33/28*

U.S. Cl. 356—38 **47 Claims**



1. A method of classifying hyperfine particles in a fluid medium according to their size, comprising the steps of:

A. positioning a substrate within a force field having a component of relatively high intensity extending orthogonal to a flow-supporting surface of said substrate and attracting toward said surface particles adjacent said surface;

B. flowing a particle-containing fluid medium along an extended path on said substrate surface of interaction with said field whereby the field precipitates particles onto said substrate according to their size, the larger particles first.

4,047,815

MEASUREMENT OF STANDARD VISUAL RANGE

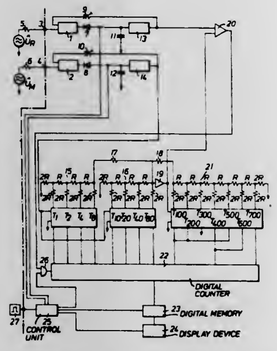
Herbert Sedlacek, Hamburg, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Oct. 8, 1975, Ser. No. 620,911

Claims priority, application Germany, Oct. 10, 1974, 2448274

Int. Cl.² G01N *21/00*

U.S. Cl. 356—104 **6 Claims**



1. In apparatus for use in a system producing pulses of light and introducing the light into a scattering volume where the light is scattered, which apparatus serves to determine the standard visual range in an atmosphere corresponding to the scattering volume, and includes electro-optical measured signal producing means connected for monitoring the light scattered in the scattering volume and producing a measured signal representative of the amount of scattering, means for producing a reference signal, and comparator means having two inputs and an output, the improvement wherein said apparatus further comprises:

means connecting one input of said comparator means to one of said signal producing means;

variable-gain amplifier means connected between the other of said signal producing means and the other input of said comparator means for applying to said other comparator means input a signal whose value is a function of the signal produced by said other signal producing means and the gain of said amplifier means;

gain adjusting means connected to said amplifier means and arranged to be controlled by digital signals for adjusting the gain of said amplifier means in response to such digital signals;

digital counter means connected between the output of said comparator means and said gain adjusting means for performing a counting operation under control of the signal at the output of said comparator means and for supplying to said gain adjusting means signals representing its digital state and constituting the digital signals controlling said gain adjusting means; and

indicator means connected to said counter means for providing a visible indication of the count state of said counter means.

4,047,816

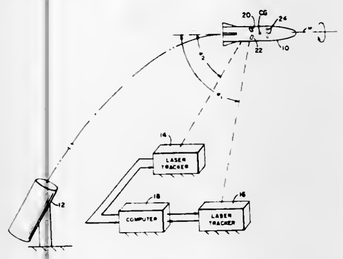
ATTITUDE DETERMINATION USING TWO TRANSMITTER/RECEIVER STATIONS AND SKEWED REFLECTORS

Kynric M. Pell, Laramie, Wyo., and David B. Brown, Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 18, 1976, Ser. No. 697,308

Int. Cl.² G01B *11/26*

U.S. Cl. 356—152 **6 Claims**



1. In a tracking system for determining the spatial attitude of an object having a longitudinal axis of rotation and wherein optical energy is directed from a tracking station toward the object and reflected back to the tracking station from the object, the improvement of first and second optical reflectors disposed on the surface of said object, said reflectors being disposed respectively along first and second axes skewed to each other for retroreflecting impinging optical energy within the respective planes formed by the normal to the surface of the object at each reflector and said first and second reflector axes respectively.

4,047,817

PHOTOGRAPHIC COLOR DENSITOMETER CHECK PLATE

Hirobumi Enomoto, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 18, 1974, Ser. No. 507,113

Claims priority, application Japan, Sept. 18, 1973, 48-108903[U]

Int. Cl.² G01J *3/46*

U.S. Cl. 356—175 **4 Claims**



1. A photographic color densitometer check plate comprising a support having thereon a plurality of light absorbing filters, each of which has a light transmission limit wavelength at a different spectral wavelength and which comletely and sharply absorbs light of a wavelength shorter than the wavelength of the light transmission limit wavelength said light transmission limit wavelength being defined as the mid-point of the wavelength corresponding to 5% and 72% of the curves of the transmission factor of the filters, said filters having light transmission limit wavelengths which are equally spaced over the wavelength region of the densitometer check plate.

4,047,818

FILTER REGULATOR FOR MICROSPECTROPHOTOMETER

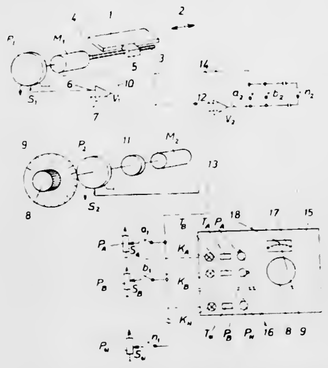
Alfred Steinbatz, Vienna, Austria, assignor to C. Reichert Optische Werke, AG, Vienna, Austria

Filed Oct. 28, 1975, Ser. No. 626,440

Claims priority, application Austria, Oct. 14, 1974, 8221/74

Int. Cl.² G01J *3/48*

U.S. Cl. 356—189 **2 Claims**



1. In a device for setting a graduated interference filter of a microspectrophotometer having an electrically operable adjustment means controlled by a graduated control knob (8) for setting the filter to a chosen wavelength, the improvement comprising a first drive motor (M_1) operably connected to the filter, a first follower control circuit including a first differential amplifier (V_1) having an output connected to the drive motor, an input (6) of the first differential amplifier being connected to a signal generator (P_1) responsive to movement of the interference filter and another input (7) connected to a nominal signal generator (P_2) responsive to movement of the control knob, a second drive motor (M_2) selectively connectable to said control knob (8), a second follower control circuit including a second differential amplifier (V_2), one input of the second amplifier (V_2) being connected to said nominal signal generator (P_2), another input of the second amplifier (V_2) being selectively connectable to one of a plurality of adjustable signal generators (P_A, P_B . . . P_N), an output of said second amplifier being operably connected to said second drive motor (M_2) whereby one of a plurality of predetermined settings of said filter can be chosen by activating one of said adjustable signal generators and other settings of said filter can be chosen by manually moving control knob (8).

4,047,819

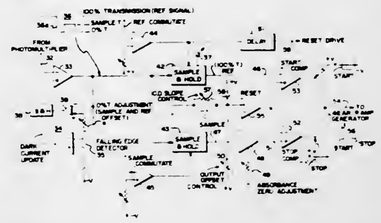
APPARATUS FOR MEASURING OPTICAL DENSITY WITH STRAY LIGHT COMPENSATION

Paul R. Goldberg, Palo Alto, Calif., assignor to SmithKline Instruments, Inc., Sunnyvale, Calif.

Filed Apr. 10, 1975, Ser. No. 566,928

Int. Cl.² G01N *21/22*; G01J *3/42, 1/42*

U.S. Cl. 356—205 **8 Claims**



1. Apparatus for measuring the optical density of a sample comprising: electro-optical means for measuring the light attenuating properties of said sample and producing a signal indicative of said attenuation, including a radiation source and detector to detect radiation transmitted through said sample and produce a sample signal; reference means for producing a reference signal including means for detecting radiation from said source; a resistive-capacitive circuit providing an exponential discharge voltage; means for adjusting the dc level of said sample signal relative to said exponential discharge voltage; means for comparing said reference and sample signal with the exponential discharge voltage of said resistive-capacitive circuit for producing start and stop signals respectively, the time interval between said start and stop signal being indicative of the optical density of said sample.

4,047,820

CONSTANT TEMPERATURE, MULTIPLE SAMPLE, ROTARY CHANGER

Charles Soodak, Silver Spring; David L. Lessner, Baltimore, and James H. Macemon, Glen Burnie, all of Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 19, 1976, Ser. No. 687,883

Int. Cl.² G01N *21/16*

U.S. Cl. 356—244 **10 Claims**

1. In a constant temperature sample changer for multiple samples contained in sample containers:

a hollow stationary axle;

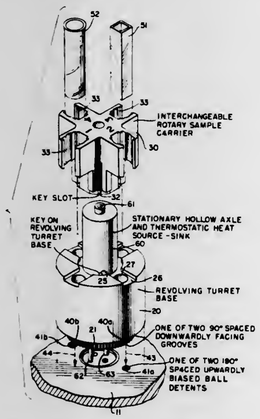
a revolving turret base mounted on said stationary hollow axle for rotation thereon;

means to index said revolving turret base to any of a sequence of angular orientations;

a readily removable interchangeable sample carrier mounted on said stationary hollow axle for rotation thereon adjacent said turret base;

means to unambiguously key said interchangeable sample carrier to said revolving turret base, whereby, when said revolving turret base is indexed, said interchangeable rotary sample carrier is correspondingly indexed;

said interchangeable sample carrier having receivers of shape adapted to receive said sample containers, said receivers being located angularly about said interchangeable sample carrier at positions correspondingly to said sequence of angular orientations;



said interchangeable sample carrier and said stationary hollow axle being made of a material having high heat conductivity;

means to maintain said stationary hollow axle at a constant temperature, whereby, by means of heat conduction, said containers of samples are thermostated to the temperature of said stationary hollow axle.

4,047,821

BREAK-RESISTANT TELESCOPING TOOL

Jack B. Hoke; Richard Graham, both of Centralia, and Richard H. Hoffman, Moberly, all of Mo., assignors to A. B. Chance Company, Centralia, Mo.

Continuation of Ser. No. 558,433, March 14, 1975, abandoned. This application Oct. 13, 1976, Ser. No. 732,056
Int. Cl.[2] F16B *7/10*
U.S. Cl. 403—109 **3 Claims**



1. In an extensible telescoping tool:

a plurality of elongated, tubular, axially reciprocable, telescopically interfitted sections formed of a fiberglass reinforced synthetic resin material,

each of said sections being configured and arranged relative to each adjacent section to assure a smooth, sliding fit therebetween;

means secured to each nestable section for substantially precluding airflow therethrough upon axial, nesting retraction thereof into the adjacent, surrounding section, and for diverting said airflow externally of the nestable section for passage thereof between the latter and said surrounding section,

the interfitting of said sections, and the configuration and location of said air precluding and diverting means, serving to cushion and slow the travel of said sections during said nesting retraction thereof for preventing damage to said sections in the event that the latter are allowed to retract in a free-falling manner;

means for releasably securing said sections in an axially and rotationally locked, extended position relative to each other to stabilize said sections against normally experienced tensile, compressive and torsional loads,

said securing means including an elongated, shiftable, generally transversely oriented button having a shank portion and situated within each of said nestable sections, and means biasing the respective buttons outwardly relative to the corresponding sections, there being a button-receiving aperture in each of said surrounding sections which extends through the sidewall and fiberglass reinforcement thereof for receiving a corresponding button, with the shank of the latter engaging the opening-defining walls of said section,

each of said buttons having the shank portion thereof formed of a shear resistant, deformable synthetic resin material having a $\frac{1}{8}$ inch notched Izod impact strength of from about 10 to 20 ft. lb./in.,

said deformable shank portions, and the corresponding surrounding sections and fiberglass reinforcement thereof, being cooperable for absorbing potentially destructive shocks developed when the tool is in an extended position and is dropped on its end,

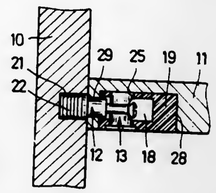
said shock absorbing occurring by virtue of the deformation of said buttons when said tool is dropped, with consequent impact loads being transmitted through said sections, fiberglass reinforcement, and buttons for absorbing said shocks without shearing of said buttons or cracking of said surrounding sections.

4,047,822

FITTING FOR AN ARTICLE OF FURNITURE

Oskar Lehmann, 4933 Blomberg, Donop 85, Germany

Filed Nov. 19, 1975, Ser. No. 633,176
Claims priority, application Austria, Nov. 29, 1974, 9569/74
Int. Cl.[2] F16B *21/02*
U.S. Cl. 403—187 **3 Claims**



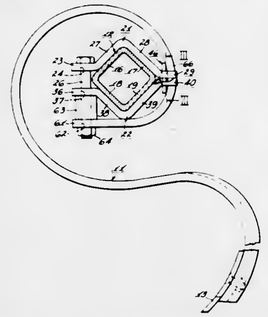
1. A fitting for detachably interconnecting two walls of an item of furniture at an angle to one another, comprising a bearing body locatable in a recess in a first of said walls, said bearing body having two bores formed therein extending at an angle to one another, said bores communicating one with the other, a torsion bolt rotatably journalled in the first of said bores and carrying, on one of its end faces, tool receiving means, said torsion bolt having an external surface, said external surface being channelled to form a first groove, and a tightening bolt locatable in the second of said bores in said bearing body, said tightening bolt comprising a securing portion engageable in the second of said walls, a guide portion engaging at least partially in said second bore and a head portion, said head portion co-operating with the surface and at least a part of the perimeter of said grooves in said torsion bolt, whereby said co-operation draws said head of said tightening bolt into said bearing body causing said two walls to be connected and causing said tightening bolt to be locked in position relative to said bearing body, said torsion bolt being provided with a projection extending laterally from the end region of said torsion bolt provided with said tool receiving means, said bearing body being provided with at least one upstanding projecting portion around the periphery of said bore receiving said torsion bolt whereby said projection on said torsion bolt co-operates with said at least one upstanding projecting portion formed on said bearing body to limit rotation of said torsion bolt in said bore.

4,047,823

CLAMPING ARRANGEMENT FOR A FLEXIBLE EARTH-WORKING TINE

John W. Mydels, LaPorte, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 7, 1976, Ser. No. 721,104
Int. Cl.[2] F16B *7/04;* A01B *15/00*
U.S. Cl. 403—188 **14 Claims**



1. Clamping arrangement for releasably connecting a flexible earth-working tine to a transverse tool bar of quadrangular cross section with a first pair of sloping side walls converging upwardly and a second pair of sloping side walls converging downwardly, said clamping arrangement comprising:

a first clamping part having

a first segment at its front end presenting a vertical opening,

a second segment extending upwardly and rearwardly from said first segment in thrust transmitting engagement with one of said first pair of side walls,

a third segment extending downwardly and rearwardly from said second segment in thrust transmitting engagement with the other of said first pair of side walls, and

a rear segment having a pair of transversely spaced fingers defining a rearwardly opening notch;

a second clamping part having

a first portion at its front end presenting a vertical opening in alignment with said vertical opening in said first clamping member,

a second portion extending downwardly and rearwardly from said first portion in thrust transmitting engagement with one of said second pair of said walls,

a third portion extending upwardly and rearwardly from said second portion in thrust transmitting engagement with the other of said second pair of side walls, and

a rear portion having a pair of transversely spaced fingers defining a rearwardly opening notch in vertically aligned relation with said notch on said rear segment of said first clamping part;

a keeper element having a downwardly facing surface in thrust transmitting engagement with the top side of said rear segment of said first clamping part and an upwardly facing surface in thrust transmitting engagement with the bottom side of said rear portion of said second clamping part;

a mounting end of said tine presenting a vertical opening in alignment with said vertical openings in said clamping parts;

a curved sector on said tine extending from said mounting end rearwardly beneath said second clamping part thence upwardly through said notches and between said pairs of fingers thence forwardly in upwardly spaced relation over the top of said first clamping part thence downwardly in forwardly spaced relation in front of said clamping parts; and,

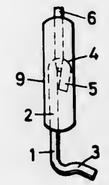
releasable fastening means rigidly securing said mounting end of said tine to said clamping parts including a tension element extending through said openings.

4,047,824

HOOK AND CORD CONNECTION

Manfred Brokmann, Silcherstr. 5; Kurt Sanders, Friedrichstr. 29; Dieter Sanders, Haneschweg 2, and Hermann Westhoff, Augustenburgerstr. 85a, all of Osnabrueck, Germany

Filed Mar. 31, 1976, Ser. No. 672,240
Claims priority, application Germany, Apr. 18, 1975, 2517188
Int. Cl.[2] A47C *23/22*
U.S. Cl. 403—209 **1 Claim**



1. A connection between a metal wire hook and a cord of synthetic fiber material, comprising

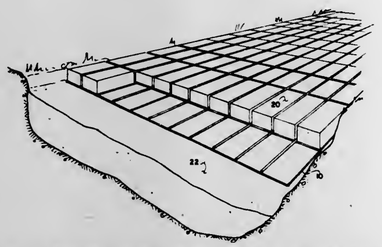
a metal wire having a plastically deformed bent U-shaped portion with a free end, said bent portion spanning an angle exceeding 180° and having a pair of converging shanks which define a clearance space therebetween;

a cord having an unsqueezed cross-sectional area, said cord extending through said clearance space with its free end folded over, the portion of said cord being squeezed so that its cross-sectional area is reduced;

said bent portion of said metal wire is U-shaped and said pair of shanks converge, the maximum width of said clearance space in the bent portion being substantially less than the diameter of said unsqueezed cross-sectional area of said cord;

at least said bent portion of said metal wire and said squeezed portion and free end of said cord are cast into a sheathing of thermoplastic material and impregnated thereby.

4,047,825
ROLLABLE WALK GUIDE
Robert O. Lundahl, Brethren, Mich., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed June 14, 1976, Ser. No. 695,593
Int. Cl.² E01C *5/08, 11/16*
U.S. Cl. 404—70 **2 Claims**



1. A rectangular open continuous grid of wire elements which is initially formed as a roll, with the grid shaped of uniformly spaced parallel longitudinal members joined to uniformly spaced parallel lateral members that bound uniform rectangular openings, each opening of the general size of the outline of a brick, together with

pointed projections perpendicularly mounted at intervals to the members, and projecting from one side of the grid, said projections serving as means to anchor the grid to a flat base upon which it is laid.

4,047,826
DRILL HAVING INDEXABLE REPLACEABLE INSERT TIP
John T. Bennett, 137 Ridgewood Circle, Downingtown, Pa. 19335
Filed May 17, 1976, Ser. No. 686,935
Int. Cl.² B23B *27/10*
U.S. Cl. 408—59 **5 Claims**



1. A drill for forming holes in metal with a high degree of precision, comprising:

a shank portion and an elongate, cylindrical body portion, having a passage extending axially therethrough, said body portion further having an axial slot in one end thereof, said slot having a bottom surface which extends perpendicularly to the axis of the body;

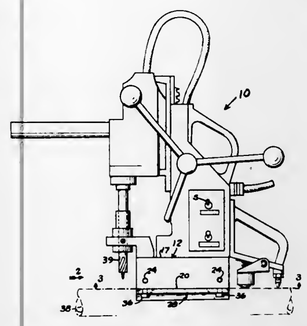
a threaded screw extending across said slot and across the longitudinal axis of the body for drawing the sides of the slot together;

a replaceable insert disposed in said slot and being indexable about said fastening means, said insert having a pair of parallel planar opposed faces, a pair of opposed ends, at least one of said ends having two angularly displaced cutting lips each lying at a lip relief angle to one of said faces, said insert further having a pair of opposed side edges extending between said opposed ends, said side edges being configured to provide non-interfering clearance with the walls of a hole formed by said cutting lips;

said passage having a diameter greater than the thickness of the insert and extending into said slot for conducting coolant along both sides of the insert to at least the center thereof; and

seating means comprising a separable, planar anvil having lateral edges and a first, substantially straight edge adapted to seat in the bottom of said slot; a locating tang projecting from said straight edge for engaging said axial passage, and a generally V-shaped indented edge opposite said flat edge forming a recess for receiving one of said opposed ends of said insert, the lateral edges of said anvil protruding from either side of said drill body to substantially equal the width of said insert to comprise wear pads for stabilizing the drill.

4,047,827
ACCESSORY SUPPORT PLATES FOR A MAGNET BASE DRILL
Everett D. Hougen, G-5072 Corunna Road, Flint, Mich. 48504
Filed Nov. 26, 1976, Ser. No. 745,393
Int. Cl.² B23B *39/00*
U.S. Cl. 408—76 **12 Claims**



1. In combination, a portable drill unit having an electromagnetic base for magnetically adhering the drill to a magnetic support, said base having a bottom wall and a pair of opposite side walls, a pair of plates formed of magnetic material, means for mounting said plates on the side walls of said base for vertical adjustment thereon, said plates having lower edge portions and being adjustable on said base so that said lower edge portions project downwardly below said bottom wall of said base, and means for rendering at least the central portion of said bottom wall and said plates magnetic when the electromagnet is energized, whereby, when said base is mounted on a convex magnetic support surface, said plates can be extended downwardly to a position wherein the lower edge portions thereof engage portions of said support surface at locations spaced laterally outwardly on opposite sides from the central portion of said base to thereby magnetically adhere the drill on said support in a stable position when the electromagnet is energized.

4,047,828
CORE DRILL
Joseph E. Makely, 889 Colony Way, Worthington, OhioIO 43085
Filed Mar. 31, 1976, Ser. No. 672,475
Int. Cl.² B23B *27/20;* B28D *5/02*
U.S. Cl. 408—145 **4 Claims**

1. A core drill comprising:

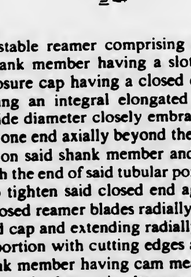
a. a rigid hollow tube;

1. having one end terminating in a bonded abrasive aggregate;

2. having the other end threaded on the interior to correspond to the external threads on a hollow rotatable member; and

3. having within its interior intermediate the ends a circular shoulder;

b. a hollow cylindrical collet shaped at one end to rest upon said shoulder of (a) and having means at the other end to fit within said rotatable member, said collet cooperating with said shoulder to thereby clamp a drill; and



c. a rod-like drill terminating at one end in an abrasive aggregate and positioned at the other end in said collet.

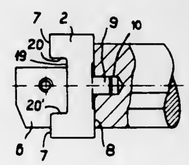
4,047,829
ADJUSTABLE FLOATING REAMER
Milton Lloyd Benjamin, and Wilbur Nelson Miles, both of Chagrin Falls, Ohio, assignors to Erickson Tool Company, Solon, Ohio
Filed May 19, 1976, Ser. No. 687,667
Int. Cl.² B23B *29/034*
U.S. Cl. 408—169 **4 Claims**



1. An adjustable reamer comprising an elongated slender cylindrical shank member having a slot diametrically across one end; a closure cap having a closed end adjacent said one end and having an integral elongated thin tubular portion having an inside diameter closely embracing said shank member from said one end axially beyond the bottom of said slot; a nut rotatable on said shank member and having threaded engagement with the end of said tubular portion remote from said closed end to tighten said closed end against said one end; a pair of juxtaposed reamer blades radially slidable in said slot as closed by said cap and extending radially through openings in said tubular portion with cutting edges at their outer extremities; said shank member having cam means engaged with said blades to move the latter simultaneously radially inward or outward in opposite directions to adjust the distance between said cutting edges; said tubular portion supporting said shank member against spreading apart of said slot by torque load imposed on said blades at said cutting edges.

3. An adjustable reamer comprising an elongated cylindrical shank member having a slot diametrically across on end; a closure cap having a closed end adjacent said one end and having an elongated tubular portion closely embracing said shank member; a nut rotatable on said shank member and having threaded engagement with the end of said tubular portion remote from said closed end to tighten said closed end against said one end; a pair of juxtaposed reamer blades radially slidable in said slot as closed by said cap and extending radially through openings in said tubular portion with cutting edges at their outer extremities; said shank member having cam means engaged with said blades to move the latter simultaneously radially inward or outward in opposite directions to adjust the distance between said cutting edges; said cam means including an elongated actuator axially reciprocable in a bore in said shank member and having one end in camming engagement with said blades and having the other end axially beyond said nut; and screw means rotatable on said shank member and operatively connected with said other end of said actuator to move the latter axially in either direction; said actuator having radial clearance with said shank member bore and a pivotal connection at said other end to permit bodily radial floating movement of said blades when said blades enter a drilled hole in a workpiece which is eccentric with respect to the longitudinal axis of said shank member.

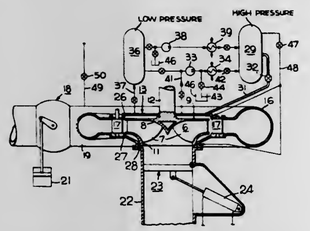
4,047,830
DRILLING TOOL
Heinrich Kruger, Essen, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed May 12, 1976, Ser. No. 685,919
Claims priority, application Germany, May 26, 1975, 2523201
Int. Cl.² B23B *31/10, 51/00, 27/14*
U.S. Cl. 408—239 A **13 Claims**



1. In a drilling tool, particularly for working metals, including a tool holder having a receiving slot which is open on three sides formed in its end surface, an interchangeable blade type drill bit inserted in said slot, and means for fastening said drill bit in said slot, the improvement comprising a bar-shaped adapter symmetrically disposed in said receiving slot between said drill bit and the bottom surface of said receiving slot, said adapter extending laterally beyond the periphery of said tool holder for a distance equal to or slightly less than the lateral expanse of said drill bit, said adpater having a first end surface which abuts said bottom surface of said receiving slot and a second opposite end surface which contacts and provides an abutment for at least the portions of the adjacent end surface of said blade shaped drill bit which extend beyond the periphery of said tool holder, said adjacent end surface of said drill bit being opposite the end surface thereof containing the cutting tip of the drill bit; a recess formed in the center of said second end surface of said adapter; and a mating protrusion formed on said adjacent end surface of said drill bit for centering said drill bit.

4,047,831
METHOD FOR REDUCING HYDRAULIC TURBINE SEAL TEMPERATURE WHILE TURBINE RUNNER IS ROTATING IN AIR

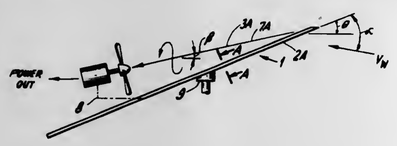
Howard A. Mayo, Jr., and Ignacy Swiecicki, both of York, Pa., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.
Continuation of Ser. No. 631,487, Nov. 13, 1975, abandoned.
This application Feb. 14, 1977, Ser. No. 768,758
Int. Cl.² F04D 29/08, 29/58; F01D 25/08
U.S. Cl. 415—1 3 Claims



1. In a hydraulic turbine including a stationary portion defining a runner chamber with a runner supported therein and rotated by water flowing through a water intake valve acting on the runner, crown and band seals located between said runner and the stationary portion of said machine, said seals during normal operation being cooled by contact of said water, and wicket gates on the upstream side of said runner capable when in the closed position to substantially interrupt the flow of water into said chamber, said runner chamber being less than airtight, the method of rotating said runner and gas to reduce runner drag comprising the steps of:
a. closing said intake valve;
b. admitting a relatively large volume of high pressure gas to said runner chamber through a first passageway sufficient to depress the water from said chamber;
c. interrupting the flow of said relatively large volume of high pressure gas to said runner chamber; and
d. admitting a relatively small volume of high pressure gas to said runner chamber through a second passageway directly through the crown and band seals to cool said seals and replenish the leakage gas to maintain the desired gas pressure in said chamber.

4,047,832
FLUID FLOW ENERGY CONVERSION SYSTEMS

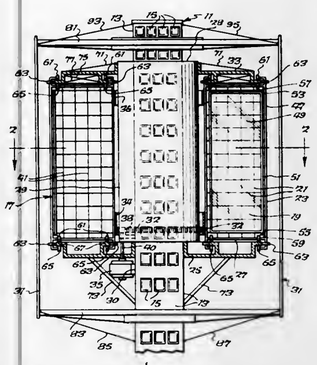
Pasquale M. Sforza, Huntington, N.Y., assignor to Polytechnic Institute of New York, Brooklyn, N.Y.
Filed Apr. 3, 1975, Ser. No. 564,681
Int. Cl.² F03D 1/04
U.S. Cl. 415—1 33 Claims



1. An energy conversion system for converting the energy of natural fluid flow as in winds or waterways, to useful output power comprising vortex generating means having a planar plate-like region adapted to intercept said natural fluid flow and to generate an edge separation vortex having a substantial axial velocity component, and turbine means positioned in the developed region of said vortex for extracting energy from said vortex.

4,047,833
HORIZONTAL WINDMILL

Bert J. Decker, 136 Capen Blvd., Buffalo, N.Y. 14226
Filed Apr. 23, 1975, Ser. No. 570,558
Int. Cl.² B27C 9/00
U.S. Cl. 415—2 15 Claims

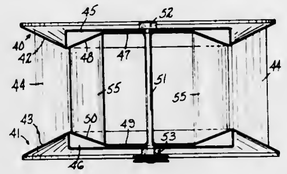


1. A horizontal windmill comprising a plurality of vanes, a substantially cylindrical internal baffle member fixedly mounted on and surrounding a vertical tower-shaped office building at a distance at least 10 meters above ground level, means for mounting and positioning the vanes about the substantially cylindrical baffle member for horizontal partial rotational movements thereof about vertical axes so as to place them in wind-resisting positions at substantially all times when moving with the wind and in feathered positions at substantially all times when moving against it, so as to promote horizontal revolution of the windmill when the wind blows, and a substantially vertical movable baffle which is straight sided, located outside the path of movements of the vanes and self-aligning so as to be maintained parallel to the direction of the wind, for increasing the wind speed, in conjunction with the substantially cylindrical internal baffle, as the wind is directed against the wind-resisting vanes, the location of which substantially vertical, straight sided baffle is such that the minimum free area through which the wind can flow between said baffle and the substantially cylindrical internal baffle, calculated without the vanes in place, is about 10 to 50% of the maximum of such free area and the rotating vanes are limited in travel by stop members which allow only about a 90° movement of the vanes between a radial position and a tangent position.

4,047,834
HORIZONTAL MULTIDIRECTIONAL TURBINE WINDMILL

George S. Magoveny, and Eric J. Forgo, both of North Haven, Conn., assignors to Windsunwatt, Inc., New Haven, Conn.
Continuation-in-part of Ser. No. 482,355, June 24, 1974, Pat. No. 3,938,907. This application Dec. 18, 1975, Ser. No. 642,240
Int. Cl.² F03D 7/06
U.S. Cl. 415—3 5 Claims

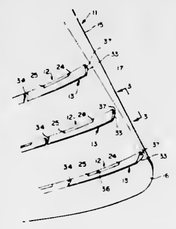
1. A horizontal multidirectional windmill comprising a fixed housing and a rotor, the housing comprising upper and lower annular frusto-conic members and a plurality of vertically disposed vanes extending between said members and lying at an angle from radial, each adjacent pair of vanes and the surfaces of the frusto-conic members therebetween forming a laterally and vertically inwardly tapering funnel to direct air inwardly with a tangential component, and the rotor comprising upper and lower horizontally disposed central disc portions, the upper disc portion being bounded peripherally by an outwardly and downwardly extending upper frusto-conic member and the lower disc portion being bounded peripherally by an outwardly and upwardly extending, lower frusto-conic member, a vertical axle to which said disc portions are secured, and a plurality of buckets mounted between said last named frusto-conic portions and extending inwardly from the



periphery thereof, the outer peripheries of said last named upper and lower frusto-conic members being disposed adjacent to the inner peripheries of the respective upper and lower fursto-conic members defining said tapered funnels.

4,047,835
HIGH EFFICIENCY PROPELLER

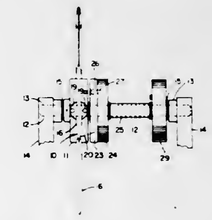
Arthur Charles Hornung, 3143 8th St., Boulder, Colo. 80302
Filed Aug. 2, 1976, Ser. No. 710,910
Int. Cl.² B63H 1/28
U.S. Cl. 416—23 5 Claims



1. A high efficiency propeller which provides added surface contact with a propellant medium, namely water or air, which is prevented from slipping off of the ends of the propeller, thereby increasing the efficiency of the propelling force of a propeller, the device comprising, in combination:
conventional propeller blades;
a series of flanges integrally formed with the outside surface of the propeller blades, consisting of an inside surface integrally conjoined with the rear surface of said propeller blades, an outside surface, opposed side surfaces, and opposed end surfaces, with a series of flanges spaced apart in line laterally across the width of said rear surface and between said side surfaces respectively and longitudinally in line on said rear surface between said outside surface and the hub of a propeller, with further a round through hole provided in each flange running axially between said end surfaces and disposed approximately centrally therethrough; and
a series of foldable fins constructed of the same material as said propeller blades and consisting of a flat bottom surface rounded on one of its ends and blunt on the opposite end, semi-curved side surfaces, and a narrow top surface interconnecting on each end the opposed end surfaces with said top surface being tapered downwardly as it extends from the leading edge of a propeller blade to the trailing edge of a propeller blade, with each of said foldable fins further provided with a round through hole extending axially between said end surfaces and disposed near said rounded edge, and with each of said foldable fins being further provided with a rectangular groove disposed centrally along its bottom surface and provided with dimensions to fit over said flanges so that said round through hole in said foldable fins axially line up with said round through hole in said flanges with said foldable fins and
said flanges connected thereby in a pivotal manner by means of a pin.

4,047,836
PHASE CHANGE MEANS FOR A POWER DRIVEN DEVICE, SUCH AS A FAN

John A. Germer, Doylestown, Pa., assignor to The Budd Company, Troy, Mich.
Filed May 3, 1976, Ser. No. 682,943
Int. Cl.² F04D 29/36
U.S. Cl. 416—39 3 Claims



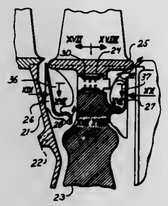
1. A fan for moving air to provide variable cooling comprising,
a fan hub and a pitch control hub disposed to be rotated about the same axis and at the same speed,
a plurality of fan blades mounted to said fan hub to permit pivotal movement of said fan blades to vary the pitch thereof,
at least one linkage connected between one of said fan blades and said pitch control hub,
a first pulley belt mounted on a first pair of pulley wheels,
a drive shaft connected to a first one of said first pair of pulley wheels to drive said fan hub,
a second pulley belt mounted on a second pair of pulley wheels,
said second pulley belt including slack portions normally held under tension,
said pitch control hub being attached to a first one of said second pair of pulley wheels to drive said pitch control hub,
means for driving said first and second pulley belts through second ones of said pulley wheels,
a sleeve member slideably mounted on said drive shaft for fixedly holding said first one of said second pair of pulley wheels and said pitch control hub to permit varying the phase relationship between said pitch control hub and said fan hub,
transducer means responsive to temperature changes connected to move the slack portions of said second pulley belt to cause said sleeve member with said first one of said pulley wheels and said pitch control hub to be moved,
whereby a change in the angular positions of said at least one linkage changes the pitch of said plurality of fan blades.

4,047,837

TURBINE WHEEL HAVING INTERNALLY COOLED RIM AND RATED BREAKING POINTS

Alfred Hueber, and Roland Buchs, both of Munich, Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Munich, Germany

Filed Nov. 14, 1974, Ser. No. 523,787
Claims priority, application Germany, Nov. 16, 1973, 2357326
Int. Cl.[2] F01D 5/18; F02D 5/08
U.S. Cl. 416—95 5 Claims



1. A turbine wheel comprising:
a disc including a central portion and a rim portion around the periphery of said central portion, and blades spaced apart around the periphery of said rim portion,
b. a plurality of through holes in said disc spaced apart circumferentially, said holes providing communication for cooling air flow between the opposite sides of the turbine wheel,
c. cooling air flow guide means on each side of the disc, said guide means defining a high pressure chamber on one side of said disc and a low pressure chamber on the opposite side of said disc, both of said chambers communicating with said through holes, and said guide means defining an entry passage through which cooling air can flow into said high pressure chamber and an exit passage through which cooling air can flow out of said low pressure chamber, said entry passage being located radially inwardly of said exit passage, and
d. a generally tubular baffle in each of said through-holes, said baffle being spaced from the wall of said through-hole along at least a portion of the length of the baffle, said baffle being open at its end facing said high pressure chamber to receive cooling air therefrom, means for preventing flow of air to the other end of the baffle, and a plurality of holes in the wall of the baffle for directing cooling air radially against the wall of the through-hole, said baffles being flared at their opposite ends to maintain a spacing between the remainder of each baffle and its respective through hole wall, and said means for preventing flow of air being a bent tab arranged at the closed end of each baffle, said tab preventing axial movement of said baffle within its respective through hole,
e. in combination with a stator at one side of the turbine wheel, said stator having a series of passageways through which cooling air flows toward the through holes in the turbine wheel.

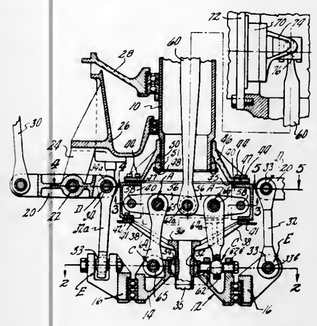
4,047,838

BLADE PITCH CONTROL MECHANISM FOR HELICOPTERS

Donald L. Ferris, and Robert L. Faiz, both of Newtown, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 22, 1976, Ser. No. 669,411
Int. Cl.[2] B64C 27/10
U.S. Cl. 416—115 9 Claims

1. In a helicopter, an upstanding rotor having a drive shaft, a rotor hub mounted at the upper end of said shaft, an axial passage extended through said shaft and into said hub, a variable pitch blade rotatable by said shaft having a spindle extended into said passage, a pitch control horn mounted on the end of said spindle within said passage, and means for controlling the pitch of said blade including a swashplate having rotatable and non-rotatable elements, a member rotatable by said drive shaft adjacent the lower end of the latter, a first pitch



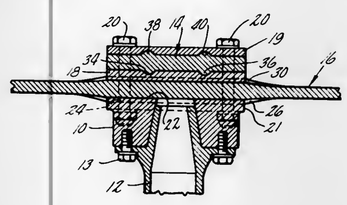
control link having a torque transmitting bearing in said rotatable member, a second link extended through said passage connecting said first link to said blade horn, and a third link having means connecting it to said first link and to said rotatable swashplate element for transmitting the rotary movement of said first link to said rotatable element.

4,047,839

TORQUE REACTING MEANS FOR THE HUBS OF CROSS BEAM ROTORS

Donald Leroy Ferris, Newtown, and William Lawrence Nochren, Huntington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 28, 1976, Ser. No. 691,251
Int. Cl.[2] B64C 27/48, 27/38
U.S. Cl. 416—134 A 11 Claims



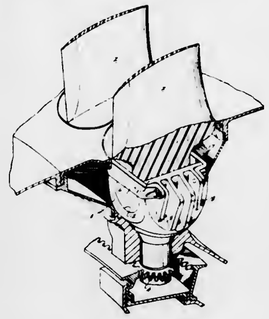
1. A cross beam rotor for helicopters comprising a rotor hub lower element, a composite lower blade spar, a composite upper blade spar, a blade-to-blade filler piece, and a rotor hub upper element, said upper and lower blade spars, said filler piece and said rotor hub upper and lower elements having aligned passages therein, tension fasteners extended through said passages, said passages in said blade spar and said filler piece having a diameter greater than the diameter of said fasteners, and means on the confronting faces of said rotor hub elements, said filler piece and said spars for reacting hub to spar torque.

4,047,840

IMPACT ABSORBING BLADE MOUNTS FOR VARIABLE PITCH BLADES

Richard Ravenhall; Charles T. Salemme, and Arthur P. Adamson, all of Cincinnati, Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 29, 1975, Ser. No. 581,751
Int. Cl.[2] F04D 29/36; F01D 5/32
U.S. Cl. 416—135 21 Claims



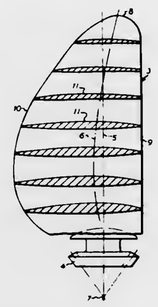
1. A blade mount for a variable pitch blade including a blade root, said blade mount comprising:
a. a jaw having opposing sides defining a cross-sectional shape corresponding to that of the blade root, said jaw being open on at least one end for slideably receiving said blade root, and providing for the pivoting of the blade about an axis for absorbing impact energy, and
b. a tie bar interconnecting said jaw opposing sides to resist the expansion of said jaw during centrifugal loading.

4,047,841

PROPELLER BLADING FOR A SELF-ADJUSTING PROPELLER FOR BOATS

Arvid Laurin, Skaldinge, Sweden, assignor to AB Jarnforadling, Hallefors nas, Sweden

Filed Nov. 4, 1975, Ser. No. 628,734
Claims priority, application Sweden, Nov. 15, 1974, 7414374
Int. Cl.[2] B63H 1/26
U.S. Cl. 416—140 5 Claims



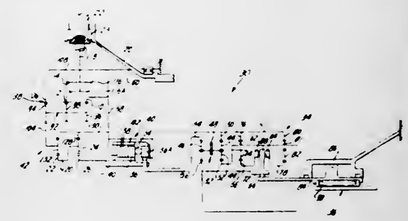
1. A self-adjusting sailing ship propeller system comprising:
a drive shaft rotatable in opposite directions;
a propeller body mounted on said drive shaft and rotatable therewith;
a plurality of propeller blades rotatably mounted on said propeller body;
each said propeller blade being freely rotatable about an axis of rotation to a neutral position when said drive shaft is stationary, and to respective forward or reverse pitch drive positions when said drive shaft is rotated in the forward or reverse directions, respectively;
means within said propeller body to limit said forward or reverse pitch drive positions of said propeller blades;
each said propeller blade having a configuration such that a center line of pressure thereof, formed by connecting points of greatest blade thickness taken in cross-sectional planes perpendicular to said axis of rotation, forms an arc which intersects said axis of rotation at a distance from the tip of said blade such that an outer portion of said propeller blade forms means for providing a moment acting on said propeller blade, upon the driving of said drive shaft, which is approximately equal to and which counteracts a directed moment causing said propeller blade to assume said neutral position when said drive shaft is stationary.

4,047,842

VARIABLE PITCH MECHANISM FOR FAN BLADES

Salvatore Avena, Newark, and Joseph W. Minarick, Oakland, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Apr. 19, 1976, Ser. No. 678,156
Int. Cl.[2] B64C 11/32
U.S. Cl. 416—152 3 Claims



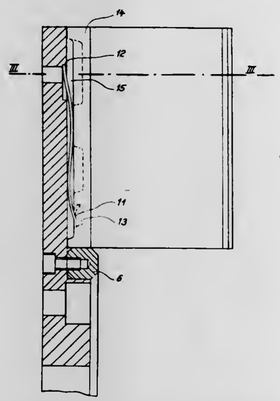
1. A pitch varying mechanism for a variable pitch fan in which a plurality of fan blades are supported in a rotor for rotative movement about their longitudinal axes and in which a drive shaft is provided for rotatively driving the rotor so that the fan blades are carried in a rotative path, the mechanism comprises, in combination:
a. gear train means for providing output rotation in two directions;
b. bi-directional clutch means rotatively connected to the drive shaft, a fixed structure and the gear train to provide the latter with rotational output alternately in one direction and the other;
c. energizing means for selectively actuating the bi-directional clutch means to effect output rotation of the gear train means in a predetermined direction;
d. a cageless planetary gear train comprising a plurality of ring gears meshing with a plurality of planets arranged concentrically of the drive shaft axis and radially outwardly of the bi-directional clutch means and the gear train means and connected to each of the fan blades to rotate the latter and change their pitch; and
e. a bi-directional, no-back, clutch-brake connected to the gear train to transmit output rotation of the gear train means to the cageless planetary gear train to effect pitch-change of the fan blades and prevent transmission of the torque load on the fan blades to the gear train means during steady state operation when no blade pitch-change is being effected.

4,047,843

CENTRIFUGAL IMPELLER FOR SANDBLASTING INSTALLATIONS

Johannes Zeidler, Reinbek, and Bernd Von Borcke, Bad Oldesloe, both of Germany, assignors to Alfred Gutmann Gesellschaft fur Maschinenbau, Hamburg, Germany

Filed June 11, 1976, Ser. No. 695,063
Claims priority, application Germany, Feb. 16, 1976, 2606063
Int. Cl.[2] F04D *29/24*
U.S. Cl. 416—185 **4 Claims**



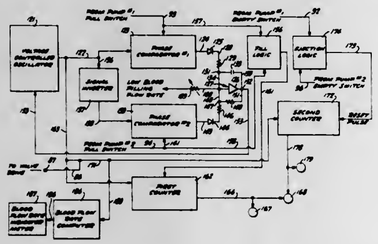
1. A centrifugal impeller for sandblasting installations, comprising a rotatively driven centrifugal impeller wheel having a radially outwardly directed side surface, a plurality of radially oriented projecting blades mounted on said side surface of the impeller wheel by associated dovetail joints, and spring members operatively positioned between said side surface and said blades locking said blades in their mounted positions, said centrifugal impeller wheel and each projecting blade defining between them a recess in the region of each dovetail joint for accommodating a spring member in its operative position, each spring member being enclosed entirely in its recess between its associated projecting blade and the impeller wheel.

4,047,844

BLOOD PUMPING SYSTEM

Thomas C. Robinson, Berkeley, Calif., assignor to Searle Cardio-Pulmonary Systems Inc., Emeryville, Calif.

Filed Dec. 8, 1975, Ser. No. 638,615
Int. Cl.[2] F04B *41/06*
U.S. Cl. 417—3 **6 Claims**



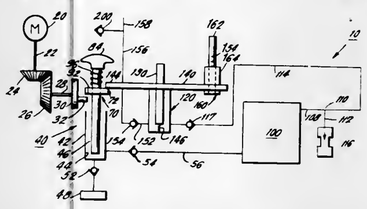
1. A blood pumping system comprising a pair of pumps each having a pumping chamber defined by a flexible enclosure expandable to a full condition and compressible to an empty condition;
means defining blood inlets to both said chambers;
means defining blood outlets from both said chambers;
inlet valves for controlling flow through said inlets;
outlet valves for controlling flow through said outlets;
first actuators for said inlet valves;
second actuators for said outlet valves;
third actuators movable in one direction for compressing said enclosures to said empty condition and movable in the reverse direction to permit said enclosures to expand to full condition;
electric controllers for said first, second and third actuators;
means responsive to movement of said third actuator to its extreme positions to provide position signals;
means for regulating the rate of operation of said controllers including a variable oscillator supplying a sequence of timed signals to repeatedly and sequentially open said inlet valves, close said outlet valves and permit said pumping chamber to expand to full condition then close said inlet valves, open said outlet valves and move said third actuators in said one direction;
a signal comparator;
means for supplying said oscillator signals to said comparator;
means for supplying said position signal to said comparator; and
means controlled by said comparator in response to differences in the time of receipt of said position signals and said oscillator signals for varying the frequency of said oscillator.

4,047,845

CYCLIC PUMP

Paul H. Reeve, River Vale, N.J., assignor to Auto Research Corporation, Rochelle Park, N.J.

Filed Dec. 22, 1975, Ser. No. 643,376
Int. Cl.[2] F04B *3/00, 5/00*
U.S. Cl. 417—251 **19 Claims**



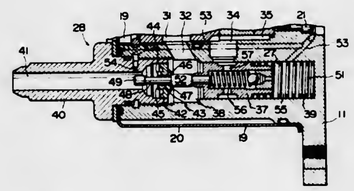
1. A cyclic pump for incompressible fluids, comprising:
a first piston pump, comprising: a first cylinder, a first piston having an end in said first cylinder and movable through said first cylinder and defining in said first cylinder beyond said end of said first piston a first pump chamber; a first inlet to and a first outlet from said first pump chamber;
a second piston pump, comprising: a second cylinder, a second piston having an end in said second cylinder and movable through said second cylinder and defining in said second cylinder beyond said end of said second piston a second pump chamber; a second inlet to and a second outlet from said second pump chamber; a conduit directly connected between said first outlet and said second inlet, whereby said first pump chamber pumps to and fills said second pump chamber under pressure;
cam means for operating said first and said second piston pumps;
first cam follower means on said first piston pump and positioned to be moved by movement of said cam means; said first cam follower means being so positioned on and so connected with said first piston pump as to cause a predetermined change in volume of said first pump chamber when said first cam follower means is moved by said cam means in one direction;
second cam follower means on said second piston pump and positioned to be moved by movement of said cam means in said one direction; said second cam follower means being so positioned on and so connected with said second piston pump as to cause a change in volume of said second pump chamber of the type opposite to said predetermined change in volume, which said second cam follower is moved by movement of said cam means in said one direction.

4,047,846

POWER-STEERING PUMP

Seiji Komamura, and Hiroyuki Hashizume, both of Gifu, Japan, assignors to Kayabakogyokabushikikaisha, Tokyo, Japan

Filed May 18, 1976, Ser. No. 687,556
Claims priority, application Japan, May 19, 1975, 50-66972[U]
Int. Cl.[2] F04B *49/08*
U.S. Cl. 417—300 **8 Claims**



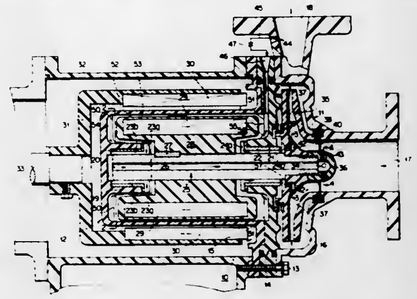
1. A power steering system adapted to be driven by an engine of a motor vehicle, comprising
a reservoir for hydraulic fluid;
a power steering mechanism;
a pump communicating with said reservoir for supplying hydraulic fluid under pressure to said mechanism;
means forming a hydraulic circuit having a supply branch which connects said pump with said mechanism;
a flow-control valve interposed in said supply branch for controlling the rate of fluid flow to said mechanism, said valve having a fluid outlet port, a chamber upstream of said port and provided with an inlet and with an outlet which communicates with said port, an annular member mounted intermediate said outlet and said port and having an axial bore communicating with said chamber and said port and an axial end face facing away from said chamber and formed with an orifice groove provided with an inner end which communicates with said bore and also with an outer end open to said port, and a valve member slidable in said chamber and having a rod-shaped extension projecting with clearance through said bore and provided adjacent said axial end face with an enlarged-diameter portion dimensioned to substantially block said bore so that, when said valve member slides in a direction in which said portion approaches said axial end face, said portion and said orifice groove together form a variablearea orifice the area of which becomes increasingly smaller as said portion approaches said axial end face whereby the flow of fluid out of said clearance and through said orifice is concomitantly progressively throttled.

4,047,847

MAGNETICALLY DRIVEN CENTRIFUGAL PUMP

Kunihiro Oikawa, Hatoyama, Japan, assignor to Iwaki Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1976, Ser. No. 669,827
Claims priority, application Japan, Mar. 26, 1975, 50-36324
Int. Cl.[2] F04B *35/04, 39/02*
U.S. Cl. 417—370 **15 Claims**



1. A magnetically driven centrifugal pump comprising a housing having a space provided therein, a split plate for dividing said space of said housing into a rotor chamber and an impeller chamber, an inlet and outlet connected to said impeller chamber, first and second bearing members fixed respectively to the inner wall of said rotor chamber and to said split plate, a shaft rotatably supported by said first and second bearing members respectively at its rearward end and intermediate portions and having its forward end portion projected into said impeller chamber, an internal rotor fixed to said shaft within said rotor chamber and having a plurality of first magnets, an external rotor disposed outside said housing and having a plurality of second magnets magnetically connected to said first magnets, a driving means for rotating said external rotor, an impeller fixed to said shaft within said impeller chamber, fluid intake passage means for guiding into said rotor chamber a fluid pumped by said impeller, resticting means for reducing the pressure of the fluid passing through said passage means, and cooling passage means for permitting the fluid sent from said rotor chamber to pass through said first and second bearing members thereby cooling said bearing members, the inner wall of said rotor chamber which is faced to the rearward face of said internal rotor being provided with first guide vanes extending toward said shaft, said first guide vanes defining first guide passages therebetween, said first guide passages being opened to the rotor chamber at their lengthwise sides and having such a configuration as to cause fluid rotating jointly with the internal rotor to positively flow through said first guide passages toward the shaft.

4,047,848

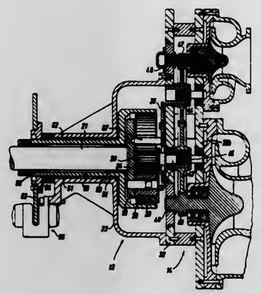
CENTRIFUGAL COMPRESSORS

Eric John Poole, Wendover, England, assignor to Compair Industrial Limited, England

Filed Jan. 21, 1975, Ser. No. 542,814
Claims priority, application United Kingdom, Jan. 31, 1974, 4604/74
Int. Cl.[2] F04B *35/04*
U.S. Cl. 417—374 **4 Claims**

1. In combination with an electrical motor means operating as a 2 pole or 4 pole in the range of 50 Hz to 60 Hz for driving a two-stage centrifugal compressor with said stages having parallel impeller shafts and a centrifugal impeller mounted on each shaft; a gear train for driving the impeller shafts which gear train includes gears mounted on each of the impeller shafts parallel to each other and intermeshing rotatably dis-

posed input gears in mesh with the gears on the impeller shafts, either of said input gears being adapted to receive drive from said motor means, the ratio of the number of teeth of the input gears being such that the relative shaft speeds of the input gears



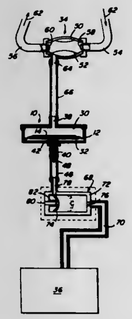
are $5n : 6N$ where n is 1 or 2 and N is 1 or 2 whereby the input gears will rotate at the same speeds whether a 2 pole or 4 pole 50 Hz or 2 pole or 4 pole 60 Hz motor means is being used so that the rotational speeds of the impeller shafts will be the same.

4,047,849

PNEUMATIC PULSATOR PUMPING SYSTEM WITH PULSATOR FLUID VENTING VALVE

Warren C. Clay, Lynn, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Jan. 9, 1976, Ser. No. 647,680
Int. Cl.² F04B *9/08, 35/02*
U.S. Cl. 417—384 **2 Claims**



1. A blood circulatory assist device comprising:

flexible bladder enclosed in a rigid housing and defining inlet means and outlet means for intermittently admitting and releasing blood to and from bladder;

means forming a pneumatic system, including as a part thereof the space between said bladder and said housing;

pneumatic pulse generator means for rhythmically pressurizing and pressure relieving said pneumatic system to rhythmically compress and release said flexible bladder;

means dividing said pneumatic system interposed between said pneumatic generator and said circulatory assist device for transmitting pneumatic forces from one division of said pneumatic system to the other; and

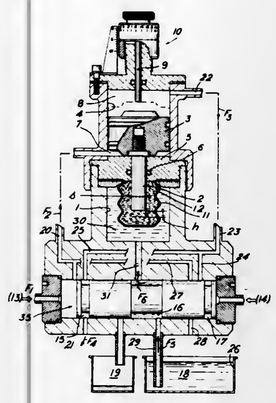
release valve means in said pneumatic system for venting said pneumatic system between said dividing means and said pneumatic generator in response to pressure relief by said pneumatic generator.

4,047,850

PROPORTIONING PUMP WITH PNEUMATIC DISTRIBUTOR

Guy Berthelot, Ivry, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 21, 1973, Ser. No. 362,514
Claims priority, application France, June 2, 1972, 72.19984
Int. Cl.² F04B *9/08, 35/02*
U.S. Cl. 417—383 **2 Claims**



1. A proportioning pump with pneumatic distributor, wherein said pump essentially comprises a measuring enclosure, a plunger having a constant cross-sectional area and capable of moving within said enclosure, a second enclosure which is contiguous with said measuring enclosure, a pneumatic jack having opposite faces rigidly fixed to said plunger and capable of sliding within said second enclosure in which said jack defines a first and a second chamber, a stop rod which serves to establish the range of sliding motion of said jack, and a linear distributor which communicates at each end with one of two sources of driving fluid, said distributor being provided with three grooves and being moveable from one end position to another end position which, in one end position of the distributor, said grooves put said measuring enclosure into communication with a storage tank for the withdrawal of liquid to be supplied in measured quantities and put one of said faces of said jack which is directed towards said measuring enclosure into communication with one of said sources of driving fluid and which, in the other end position of the distributor, said grooves put said measuring enclosure into communication with a collecting tank for receiving measured quantities of liquid and put the other face of said jack into communication with the other of said sources of driving fluid.

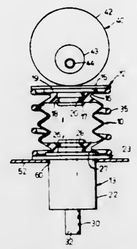
4,047,851

BELLOWS TYPE EXPANSIBLE CHAMBER PUMP HAVING SEPARATE BIASING MEANS

Lloyd F. Bender, Hayward, Wis., assignor to Bender Machine Works, Inc., Hayward, Wis.

Filed Sept. 27, 1976, Ser. No. 726,834
Int. Cl.² F04B *43/00;* **A61M** *1/03*
U.S. Cl. 417—412 **6 Claims**

1. A bellows type expansible chamber pump comprising a resilient, corrugated bellows having opposite ends and having a generally flat seating surface at each of its opposite ends and also having an annular engaging member adjacent each of its ends, a first pump end section having a generally flat surface adapted to abut firmly against one of said flat surfaces of said bellows ends, said first pump end section also having a radially extending flange extending radially beyond said bellows, said first pump end section also having an annular engaging member forming a quickly releasable tight snap fit with one of said annular engaging members of said bellows, a second pump end section having a radially extending flange which extends radially beyond said bellows and also having a generally flat surface which is adapted to abut firmly against the other flat



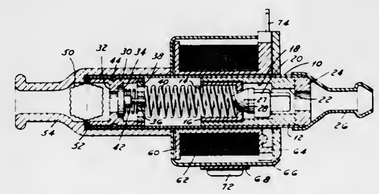
surface of said bellows, said second end section also having annular engaging means which forms a quickly releasable snap fit with said other annular engaging means of said bellows, a coil spring surrounding said bellows and abutting against and between said radially extending flanges of said end sections urging them apart in a pump extended direction.

4,047,852

IN-LINE PUMP CONSTRUCTION

Alton J. O'Connor, and Thomas L. Schrinel, both of Cass City, Mich., assignors to Walbro Corporation, Cass City, Mich.

Filed Aug. 16, 1976, Ser. No. 714,388
Int. Cl.² F04B *17/04*
U.S. Cl. 417—415 **6 Claims**



1. A fuel pump adapted for mounting in a fuel line which comprises:

a. a tube forming a body,

b. a solenoid coil assembly mounted concentrically around one end of said body,

c. a tubular armature slidable in said body in the area surrounded by said coil, said armature having a stepped bore, one end of said stepped bore serving as a guide for a flow check valve, the other end of said bore serving as a valve seat retainer,

d. a cup-shaped valve seat having a valve opening in the bottom thereof and positioned in said other end of said stepped bore,

e. a slidable flow check valve member guide in said bore having a valve portion to cooperate with said valve opening in said valve seat,

f. a second valve housing at the other of said body having a valve seat and valve recess,

g. a valve in said valve recess to cooperate with said seat,

h. spring means interposed between said cup-shaped valve seat and said second valve housing to serve as a retainer for said cup-shaped valve seat and a resilient bias for said armature, and

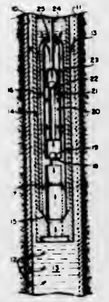
i. means to retain said second valve housing in said body against said spring means.

4,047,853

HYDRAULIC UNLOADING AND CIRCULATING DEVICE

Leonard Huckaby, P.O. Box 152, Wayne, Okla. 73095

Filed Nov. 15, 1976, Ser. No. 741,944
Int. Cl.² F04B *39/12, 21/00*
U.S. Cl. 417—434 **4 Claims**



1. A hydraulic unloading and circulating device adapted to be inserted in a threaded joint of a well tool connected to sucker rods and including a pumping tube surrounding said tool and supported on the end of a pipe string through which said sucker rods extend, for passing fluid between the exterior of the tool and interior of the pumping tube to the interior of the tool so as to be placed in communication with the well annulus and thereby relieve the difference of hydrostatic pressure between fluid in the well annulus and fluid in the interior of the pumping tube and pipe string, said device comprising, in combination:

a. a housing having lower threads for threaded connection to the lower threads of said joint;

b. a mandrel having a lower end portion telescopically received in the upper portion of said housing, the upper end of said mandrel being coupled to the upper threads of said joint, said mandrel having a straight through central passage including a lateral port eclipsed by said housing when said mandrel is telescoped within said housing to a first given position, and exposed above said housing when said mandrel is pulled upwardly from said housing to a second telescoped position;

c. a sleeve in the lower portion of said housing having cut-out wall portions defining vertical guide channels of given circumferential width, the lower end of said mandrel being received in said sleeve and having radially extending lugs of given circumferential extent receivable in said channels so that upward and downward telescoping movement of said mandrel between said first and second telescoped positions is guided by said guide channels, the lower ends of said sleeve between said channels being spaced above the lower end of said mandrel when in said first telescoped position so that rotation of said mandrel through a given number of degrees positions said lugs beneath said lower ends of the sleeve to thereby lock the mandrel against pulling movement when in its rotated position; and

d. a torque spring connected between said mandrel and said housing to exert a circumferentially directed biasing force on said mandrel in a rotational direction to position said lugs beneath said lower ends of the sleeve,

whereby intentional rotation of the sucker rods from the surface of the well through said given number of degrees in a rotational direction opposite to the bias of said torque spring

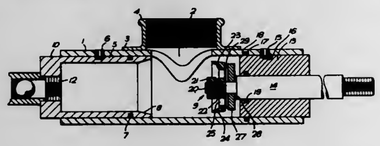
positions through the upper threaded coupling of the mandrel said lugs in said channels, and subsequent upward pulling on said sucker rods from the surface of said well move said mandrel to said second telescoped position thereby exposing said port and placing fluid in said pump tube and pipe string in communication with fluid in the annulus of the well to thereby equalize the hydrostatic pressure of the fluid, subsequent urging of said mandrel to its first telescoped position eclipsing said port and permitting rotation of the mandrel by said spring to its rotated position to lock the mandrel against telescoping movement relative to said housing.

4,047,854

METERING PISTON PUMP WITH PISTON-CARRIED DISTRIBUTOR FOR VISCOUS FLUID

Laurence Richard Penn, 18 Church Mount, Guilsborough, Northampton, England

Filed Aug. 7, 1975, Ser. No. 602,547
Claims priority, application United Kingdom, May 27, 1975, 23106/75
Int. Cl.² F04B 7/04, 39/10, 15/02
U.S. Cl. 417—489 **1 Claim**



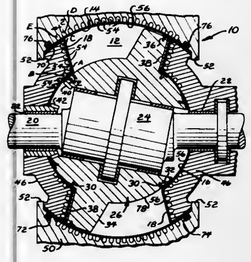
1. A material dispensing and metering piston pump comprising, in combination:
   1. a cylinder having an axis and defining a chamber receiving the material to be dispensed and metered, the cylinder defining
      a. an inlet for the material,
      b. an outlet for the material axially spaced from the inlet, and
      c. a coaxial cylindrical metering portion extending in the cylinder chamber from the outlet towards the inlet,
   2. a non-return valve in the outlet, and
   3. a piston mounted for axial reciprocation in the cylinder chamber between a first terminal position in the metering portion adjacent the outlet and a second terminal position adjacent the inlet, the piston comprising
      a. a piston rod and
      b. a piston head mounted on the piston rod, the piston head including a first member having a peripheral skirt projecting in an axial direction towards the outlet and having a diameter corresponding to that of the metering portion for sealing engagement between the peripheral skirt and the metering portion, the first piston head member defining at least one axially extending aperture therethrough and being mounted for free axial movement on the piston rod between a first axial position and a second axial position, and a second member having a diameter smaller than that of the metering portion and being fixedly mounted on the piston rod adjacent the second axial position, the sealing engagement between the peripheral skirt and the metering portion holding the first piston head member in the first axial position spaced from the second piston head member upon axial movement of the piston away from the outlet and out of the metering portion, whereby the material in the chamber may flow between the piston head members and through the aperture, means on the piston rod for supporting the first piston head member on the piston rod during the axial movement of the piston away from the outlet, and axial movement of the piston towards the outlet and the metering portion causing the peripheral skirt to engage the metering portion and thus to move the first piston head member axially into the second position whereby the second piston head member seals the aperture and prevents flow of the material therethrough into the metering portion, one of the piston head members having a circular ridge defining a knife edge and the other piston head member having a corresponding circular recess for sealing engagement between the knife edge ridge and recess when the first piston head member is in the second axial position.

4,047,855

ROTARY MECHANISM WITH IMPROVED COOLING

Alexander Goloff, East Peoria; Noble G. Barker, Pekin, and Paul J. Staebler, Dunlap, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 12, 1975, Ser. No. 640,084
Int. Cl.² F04C 29/04
U.S. Cl. 418—53 **1 Claim**



1. In a slant axis rotary mechanism including a housing defining a chamber having a radially outer spherical wall and a radially inner spherical wall interconnected by opposed, generally radially extending side walls, a shaft journalled within said housing and having an angularly offset portion within said chamber, and a rotor within said chamber and journalled on said angularly offset portion, an improved cooling system including a plurality of coolant receiving grooves in said walls, and a thin cover plate for said walls and thus said grooves and being supported against collapse by the wall portions between said grooves; said side walls being formed by side wall members separate from said outer spherical wall, gas seal means sealing the interfaces of said side wall members and said outer spherical wall, there being at least one said groove between said gas seal means and said chamber along said interface.

4,047,856

ROTARY STEAM ENGINE

Ralph M. Hoffman, 15950 N. Hillcrest Court, Eden Prairie, Minn. 55343

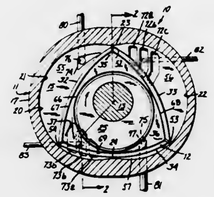
Filed Mar. 18, 1976, Ser. No. 668,150
Int. Cl.² F01C 1/02, 21/12
U.S. Cl. 418—61 A **11 Claims**

1. In a rotating machine including a housing having opposite end walls spaced apart along a first axis by a peripheral wall shaped to define an epitrochoidal cavity symmetrical about said first axis and configured as two lobes intersecting at lobe junctures which define a minor axis of the section of said housing normal to said first axis, one of said lobes lying in first and second quadrants about said first axis and the other lying in third and fourth quadrants thereabout,

a rotor symmetrical about a further axis and movable in said cavity, said rotor having opposite side wall surfaces adjacent, and in slightly spaced relation, to said end walls of said housing, and interconnected by a plurality of peripheral flank surfaces which intersect at apices to determine lines of sealing contact with said peripheral wall of said housing,

means, including a crankshaft on which said rotor rotates on said further axis eccentrically with respect to said first axis, for limiting motion of said rotor in said cavity to planetating movement about said first axis in the direction from said fourth quadrant to said first quadrant, so that said apices sweep through said lobes,

spaced seal means, including inward valving seal means and outward chamber isolating seal means, carried by at least one side wall surface of said rotor to move in the interstice between said side wall surface and the adjacent end wall of the housing, so that said rotor and said housing jointly define a plenum space inward of said valving seal means



and a plurality of distinct working chambers, outward of said isolating seal means, which move about said first axis and successively increase and decrease in volume with said movement of said rotor,

and means for conducting a fluid into said housing at a site inward of said valving seal means, the improvement which comprises:

bridging passage means in the inner surface of at least one of said end walls, sized to conduct pressure fluid from said plenum space to said working chambers during first predetermined portions of said movement;

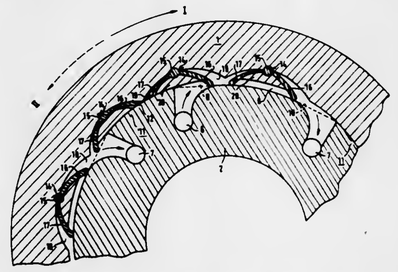
and further passage means in said inner surface of said one of said end walls for affording egress of pressure fluid from said working chambers during second predetermined portions of said movement.

4,047,857

ROTARY PISTON ENGINE

Arno Fischer, Pfistermuhle, 8121 Rottenbuch, Upper Bavaria, Germany

Filed Nov. 4, 1975, Ser. No. 628,632
Claims priority, application Germany, Nov. 4, 1974, 2452288
Int. Cl.² F04C 5/00, 1/00
U.S. Cl. 418—153 **12 Claims**



1. A rotary piston engine including a stator and a rotor located concentrically thereto, and sealing elements positioned in the rotor and sealingly engaging a race of the stator, the stator including separating portions in contact with the rotor and having feed and discharge ports arranged between working chambers, said sealing elements comprising:

a stationary cylindrical bearing portion pressed into said rotor;

at least one curved blade connected to said bearing portion and extending forwardly in the direction of rotation of said engine to engage said stator race; and

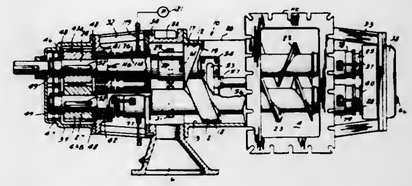
said curved blade adapted to pivot into a curved recess provided in said rotor to accommodate said blade.

4,047,858

STUFFING BOX FOR HIGH DENSITY SCREW PUMP AND PUMP INCORPORATING SAME

Albert A. Zalis, Warren, Mass., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Mar. 10, 1976, Ser. No. 665,387
Int. Cl.² F01C 1/16
U.S. Cl. 418—201 **9 Claims**



1. Apparatus for rotary screw pumping comprising

A. a casing having defined therein parallel, overlapping bores, an intake chamber communicating with one end region of said bores, and a laterally opening output aperture at the opposite end region of said bores,

B. a pair of oppositely rotating rotors extending axially of said bores and extending across said intake chamber, said rotors having continuous helical intermeshing pumping flights within said bores and said intake chamber, said rotors further having shaft means projecting through said casing from respective opposite end portions of said rotors,

C. a plurality of bearing means, each one journaling a different one of said shaft means, said bearing means each being supported in outwardly spaced relationship to said casing by bearing support means,

D. a plurality of stuffing box assemblies, each said assembly embracing a different one of said shaft means, each assembly being located between said casing and an axially adjacent one of said bearing means relative to each shaft means, each said assembly being adapted to make sealing engagement with said casing and with said shaft, and

E. stuffing box floating mounting means mounting each said stuffing box assembly in axially fixed but radially limitedly movable relationship to said casing,

F. each stuffing box assembly comprising a housing having a cylindrical channel extending therethrough defined therein, and through which said shaft means extends, packing means in said channel between said channel and said shaft means, and gland means including adjustable pressurizing means for compressing said packing means between said channel and said shaft means,

G. an annular flange radially outwardly projecting from said housing in spaced relationship to one end of each of said channels and a demountable brace means associated therewith and radially outwardly projecting at each said one end, each said flange and said associated brace means defining in combination with said housing a circumferentially extending radially outwardly opening groove, and

H. a pair of O-ring sealing means, each including an O-ring and a groove receiving same, said sealing means being

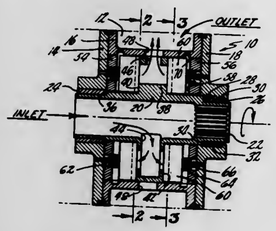
located on generally opposed sides of each of said channels, one of said sealing means being associated with each of said brace means, the other such sealing means being associated with each of said flanges.

4,047,859

AXIAL VANE PUMP WITH NON-ROTATING VANES

Jack Gunnar Sundberg, Meriden, Conn., assignor to Chandler Evans Inc, West Hartford, Conn.

Filed Aug. 16, 1976, Ser. No. 714,598
Int. Cl.² F04C *15/00, 1/00*
U.S. Cl. 418—232 **1 Claim**



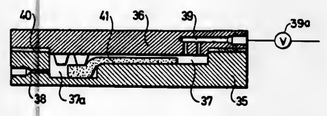
1. A vane pump comprising:
a housing;
a cam member mounted in the housing for rotation about an axis, the cam member having an annular axial side which defines an undulated cam surface with at least one inlet arc and at least one discharge arc;
an array of vanes, each having a radially extending contact surface, fixedly mounted in the housing for axial movement parallel to the axis of rotation toward and away from the cam surface, the contact surfaces of the vanes being adapted to respectively engage the cam surface such that rotation of the cam member produces axial movement of the vanes toward and away from the cam member;
inlet passage means for directing fluid entering the pump into the volume defined between two adjacent vanes when one of the adjacent vanes is traversing an inlet arc;
discharge passage means for receiving fluid expelled from the volume between two adjacent vanes when one of the adjacent vanes is traversing a discharge arc;
a spring loaded piston mounted in the housing behind each vane to urge the vane into engagement with the cam surface, the side of the piston remote from the vane being subjected to inlet pressure and the side of the piston adjacent the vane being subjected to the pressure behind the vane; and
means to direct discharge pressure behind each vane, the spring loading on the pistons being such that a discharge pressure achieved at a low pump speed is sufficient to force the pistons away from the vanes, whereby constant flexing of the springs is not encountered during normal operation.

4,047,860

PRESS MOLD FOR PRODUCING MICROCELLULAR SHAPED PIECES OF DIMENSIONAL ACCURACY, PARTICULARLY SHOE SOLES

Boris Nisonovich Dinzburg; Jury Alexandrovich Smetkin; Vladimir Iosifovich Alexeenko; Vsevolod Andreevich Mikhailov, all of Moscow, U.S.S.R.; Ivan Lorant, Budapest, Hungary; Gyozo Seltenreich, Dunakeszi, Hungary; Jeno Keszei, Budapest, Hungary; Gyorgy Marton, Budapest, Hungary; Albert Balazsfai, Budapest, Hungary; Jeno Donath, Budapest, Hungary, and Erno Bolcskei, Budapest, Hungary, assignors to Bor-, Cipo-, Szormeipari Kutato Intezet, Budapest, Hungary and Vseojuzny Nauchno-Issledovatelsky Institut Plenochnykh Materialov I Iskusstvennoi Kozhi, Moscow, U.S.S.R.

Division of Ser. No. 332,089, Feb. 13, 1973, Pat. No. 3,897,190, which is a division of Ser. No. 96,738, Dec. 10, 1970, abandoned.
This application Feb. 26, 1975, Ser. No. 553,152
Claims priority, application Hungary, Dec. 30, 1969, BO 1210
Int. Cl.² B29D *27/00; B29F 1/00*
U.S. Cl. 425—4 R **1 Claim**



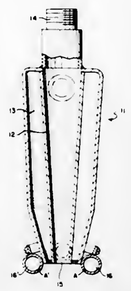
1. A press tool for vulcanizing plastic material, comprising a die, a cover plate forming with said die a molding chamber, said die having a flat bottom surface and said cover plate having a flat upper surface parallel to said bottom surface of said die, said die and cover plate having upright edges extending between said upper and lower surfaces, means for introducing a hot liquid through a said edge of said die into a lower portion of said chamber, and means to remove gas from an upper portion of the chamber through a said edge of said cover plate.

4,047,861

EXTRUSION DIE WITH FIBRILLATING AIR NOZZLE

Alexander Balaz, Barrington, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Continuation of Ser. No. 478,758, June 12, 1974, abandoned.
This application Sept. 22, 1975, Ser. No. 615,310
Int. Cl.² A23P *1/00; D01D 5/26*
U.S. Cl. 425—7 **4 Claims**



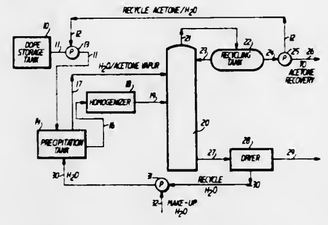
1. A die utilized for simultaneously forming and cooling fibers in a hot food extrudate comprising:
a. an outer heating means engaged about an inner housing and completely surrounding said inner housing;
b. said inner housing having an inlet in the upper portion of said housing and an elongated outlet in the lower portion of said housing, said lower outlet having one opening;
c. a first gas injection means affixed to said outer heating means located adjacent one elongated sided of said outlet, said first gas injection means comprises an air pipe having a plurality of three or more orifices, said air pipe being connected to a pressurized air source to project air through said orifices upon the hot extrudate flowing through said outlet;
d. a second gas injection means affixed to said outer heating means located adjacent the other elongated side of said outlet and parallel to said first gas injection means, said second gas injection means comprising an air pipe having a plurality of three or more orifices, said air pipe being connected to a pressurized air source to project air through said orifices upon the hot extrudate flowing through said outlet, said first and said second gas injection means being capable of forcing air into the hot extrudate to fibrillate it before it substantially cools and maintain it in a fiber state while cooling.

4,047,862

CELLULOSE ESTER FIBRILLAR STRUCTURE

Charles Herbert Keith, Charlotte, N.C., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 409,197, Oct. 24, 1975, abandoned.
This application Dec. 8, 1975, Ser. No. 638,242
Int. Cl.² B29C *23/00*
U.S. Cl. 425—8 **5 Claims**



1. An apparatus for the production of an opaque, voidy fibrillar structure which comprises a precipitation tank containing a precipitation bath; a substantially cylindrical disk positioned within said tank and submerged in said bath; means for rotating said disk in said bath at a peripheral speed of at least 500 meters per minute; a stationary annular wall spaced from said disc's peripheral surface by 1/16 to ¼ inch; one or more orifices positioned about the periphery of said disk; means for pumping additional precipitation bath into said precipitation bath and past the periphery of said disk at a flow rate of at least 0.5 liter per minute per extrusion orifice; means for removing the precipitated fibrillar structure from said bath; and means for homogenizing said fibrillar structure.

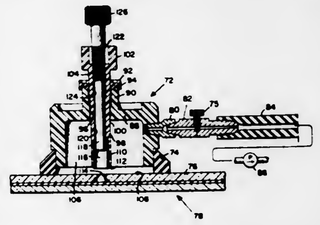
4,047,863

APPARATUS FOR REPAIR OF SHATTERPROOF GLASS

Douglas McCluskey, Greenlane, and Harley E. Kelchner, Hatfield, both of Pa., assignors to Glass Medic, Inc., Hatfield, Pa.

Continuation of Ser. No. 668,469, March 19, 1976, abandoned.
This application Jan. 18, 1977, Ser. No. 760,339
Int. Cl.² B29C *11/00*
U.S. Cl. 425—13 **26 Claims**

26. Apparatus for the repair of the conical cracks in shatterproof glass comprising:
means for cooperating with an area on said glass surrounding a conical crack therein, to provide an enclosure bounded in part by said area; and
means for evacuating said enclosure;
wherein said means to provide an enclosure comprises means forming a wall and means for causing said wall to be spaced from said area when said enclosure is bounded in part by said area, said wall having an opening with threads and said apparatus also including a sleeve threaded into said opening and movable toward and away from said area by the action of said threads, annular sealing means on one end of said sleeve adapted to contact the surface of a piece of shatterproof glass to be repaired and



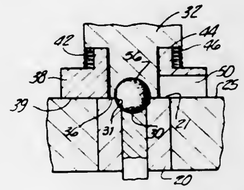
thereby isolate a small portion of said area from the remainder thereof, and control means manipulable from the exterior of said enclosure for rotating said sleeve in order to move the same toward and away from said area, said sleeve having a channel in its interior communicating with said one end thereof, and means operatively associated with said channel to force a repair liquid into said conical crack.

4,047,864

APPARATUS FOR PRODUCING SPHERICAL ARTICLES

Raymond P. DeSantis, Royal Oak, Mich., assignor to Wolverine Aluminum Corporation, Lincoln Park, Mich.

Filed Oct. 6, 1975, Ser. No. 619,855
Int. Cl.² B30B *11/02*
U.S. Cl. 425—78 **6 Claims**



1. An apparatus for compacting powder material into a spherical solid article, said apparatus comprising a punch and die assembly comprising a die plate, a bore in said die plate, a unitary single piece punch disposed reciprocably in said bore, a concave compacting face on an end of said punch, a progressively enlarged end portion in said bore, said enlarged end portion forming with said compacting face in said punch a first half-mold cavity, a unitary single piece counterpunch overlapping the end portion of said bore and having a flat annular end face engageable with a surface of said die plate surrounding said end portion of said bore and preventing said counterpunch from penetrating into said bore, a second concave half-mold cavity disposed in said counterpunch within said annular end face, said second half-mold cavity being alignable with said bore, supporting and guiding means for said counterpunch disposed above said die plate and having a face in sliding engagement with said die plate, means for reciprocating said punch to a position whereby the face of said punch forms with the enlarged end portion of said bore said first half-mold cavity for compacting said powder material in a molding cavity, means for displacing said punch to a position ejecting said

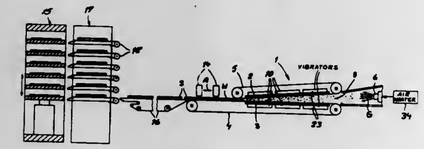
article from said bore upon retraction of said counterpunch a distance away from said die plate, and a slot in said supporting and guiding means for clearing said article when ejected from said bore.

4,047,865

APPARATUS MAKING PRESSED BOARD

Heinrich Axer, Nettetal, and Gerd Roth, Kevelaer, both of Germany, assignors to G. Siempelkamp & Co., Krefeld, Germany

Continuation-in-part of Ser. No. 532,375, Dec. 13, 1974, which is a division of Ser. No. 383,730, July 30, 1973, Pat. No. 3,904,336. This application Oct. 20, 1975, Ser. No. 624,780
Claims priority, application Germany, Aug. 1, 1972, 2237755; Nov. 14, 1972, 2255712
Int. Cl.² B29J *5/04*
U.S. Cl. 425—80 **6 Claims**



1. In an apparatus for making pressed board from thermosetting resinous material and filter, in combination:
   a a pair of perforated, endless conveyor bands with generally horizontal, relatively inclined confronting surfaces forming a converging throat between them;
   nozzle means adjacent said conveyor bands for continuously blowing a substantially horizontal stream of thermosetting resinous material and filler entrained by a carrier fluid into said throat from the broad end thereof;
   heating means at said throat for thermally presetting said resinous material during compaction of the mixture between said conveyor bands into a continuous, coherent and self-supporting web;
   cutter means downstream of said throat for transversely dividing said web into a series of individually manipulable sections;
   a press with a multiplicity of heating stages at different levels synchronized with said cutter means for further compacting said sections with final setting of said resinous material; and
   transport means for delivering said sections from said cutter means to the several levels of said press in timed relationship with the operation thereof.

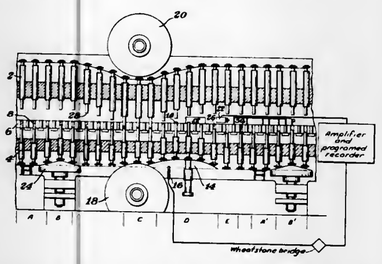
4,047,866

AUTOMATIC SELF-LUBRICATING ROTARY TABLET PRESS

Dhiren N. Shah, Indianapolis, Ind., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 22, 1976, Ser. No. 743,899
Int. Cl.² B30B *11/08*
U.S. Cl. 425—107 **4 Claims**

1. In a rotary tablet press having a revolving head with multiple upper punches, lower punches, and dies that ride on a cam path having stations for filling the dies with tabletting material, adjusting the amount of die fill, compressing the tabletting material to form a tablet, and ejecting the tablet, wherein the improvement comprises a force detector for measuring the force required to eject the tablet from a given die cavity, said force detector being connected to a lubricator for applying controlled amounts of lubricant to said die cavity and punch faces, said lubricator being activated as the force required to eject the tablet from the die cavity reaches a predetermined value as measured by the force detector.

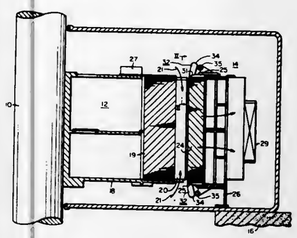


4,047,867

CASTING ASSEMBLY FOR STATOR COILS

Michael R. Zona, McKeesport; Charles R. Ruffing, Edgewood, and Paul S. Johrde, Franklin, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 4, 1976, Ser. No. 683,117
Int. Cl.² B29C *1/04, 5/00*
U.S. Cl. 425—117 **3 Claims**



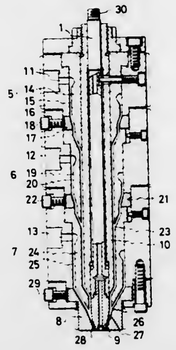
1. In a core member of a dynamoelectric machine having a winding supported by said core, said winding including a plurality of coil end turn terminal portions which project from said core, a selected plurality of said coil end turn terminal portions being disposed in side-by-side relation with respect to one another for connection in electrical series relation one to another by electrical connecting means, the combination with said winding of a casting assembly for encapsulating said end turn terminal portions and electrical connecting means, said casting assembly comprising:
   a removable pad of conformable material secured to said selected end turn terminal portions, said pad having radially extending side portions which circumscribe and extend transversely to said selected coil terminal portions to provide a barrier to the axial flow of a fluid relative to said selected terminal portions;
   a sleeve disposed around said selected end turn terminal portions in a spaced relation therewith and in an abutting relation with said pad, said sleeve having a continuous, circumferentially extending side portion bounded by first and second open end portions, said sleeve providing a barrier to the radial flow of a fluid relative to said end turn terminal portion, said first open end portion of said sleeve being disposed in abutting engagement with said pad, and said side portion being radially spaced from said end turn terminal portions;
   means compressing said removable pad against said end turn terminal portions to substantially fill a void which may exist between said coil end turn terminal portion and said pad;
   means forcing said sleeve against said pad to establish a compressive union at the interface of said first open end portion of said sleeve and said conformable pad; and,
   a compound disposed in the volume defined by the union of said sleeve and said pad, said compound when cured providing electrical insulation and thermal conduction for said end turn terminal portions and said electrical connecting means.

4,047,868

MULTILAYER PARISON EXTRUSION MOLDING MACHINE FOR BLOW MOLDING

Kazuo Kudo, and Takashi Mizutani, both of Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 610,169, Sept. 4, 1975, abandoned. This application Mar. 9, 1977, Ser. No. 775,735
Claims priority, application Japan, Aug. 12, 1975, 50-97841
Int. Cl.² B29D *23/04*
U.S. Cl. 425—133.1 **3 Claims**



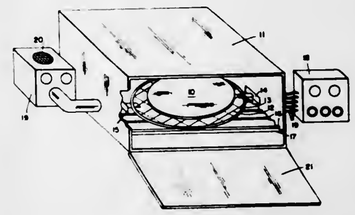
1. A multilayer parison extrusion molding machine for blow molding wherein one main extruder and one or more subextruders are mounted radially around one diehead at an angle of 25° to 90° relative to each other, said diehead comprises a core holder having a core pin at the lowermost end thereof, a cylindrical mandrel enclosing said core holder therein, a die portion including an extrusion die and adjusting means for adjusting the relative positions of said core pin and said extrusion die, said die portion constructed to surround said core holder so as to form a resin extrusion outlet opening, and at least two head portions provided on said die portion, each of said head portions form a resin layer and wherein each of said portions comprises:
   a. a sleeve surrounding said mandrel, the external surface of said sleeve being arranged to allow change of the flowing direction of resin and the internal surface thereof being arranged to surround the mandrel;
   b. a housing which surrounds said sleeve with a space therebetween to define a resin passage for forming a resin layer, and includes an internal surface parallel to the external surface of said sleeve, and a resin inlet opening connected to said resin passage and to one of said extruders;
   c. a pressure ring mounted on said housing downstream from said resin inlet opening for controlling the thickness and pressure of the molten resin layer formed by said resin passage, at least one surface of said pressure ring being arranged parallel to the external surface of said sleeve and shaped to change the flow direction of the resin layer, another surface of said pressure ring being arranged parallel to the external surface of said mandrel and spaced from the external surface of said sleeve, the pressure ring surface directions in cooperation with the internal surface of the housing being adapted to change the resin flowing direction two times; and
   d. means operatively associated with said pressure ring for adjusting said pressure ring to vary the size of said resin passage; and
   e. the resin passages of adjacent ones of said head portions arranged to merge at a respective junction so that the individual resin layers formed in each of said head portions flow together at the respective junction and subsequent downstream junctions so as to form a multilayer parison which is extruded from said resin extrusion outlet opening.

4,047,869

APPARATUS FOR FORMING PLASTIC ARTICLES

R. F. Mulvany, Jr., 521-C Marine View, Belmont, Calif. 94002

Division of Ser. No. 335,401, Feb. 23, 1973, abandoned. This application Apr. 29, 1976, Ser. No. 681,659
Int. Cl.² B29C *17/04*
U.S. Cl. 425—143 **5 Claims**



1. A device for forming plastic articles comprising:
   a pair of opposed platens adapted to compress a heated sheet of thermoplastic material therebetween, said pair of opposed platens having corresponding apertures through the centers thereof to expose the center of said heated sheet of thermoplastic material, the compression between said opposed platens generally allowing for controlled planar movement of the thermoplastic material radially inwardly towards the center thereof;
   an extension member passable through the apertures through the pair of opposed platens to draw the heated sheet of thermoplastic material inwardly between the platens toward the center of the sheet and extend the material transversely through one of the apertures into an elongated conical shaped piece;
   means for monitoring the movement of the thermoplastic material radially inwardly toward the center of said sheet;
   means for controlling the compression of the heated sheet of thermoplastic material by the pair of opposed platens responsive to said monitoring means to control slippage of said sheet of thermoplastic material relative to said pair of opposed platens;
   an involute female mold adapted to receive the elongated conical shaped piece of thermoplastic material therein; and
   means for pressurizing the interior of the elongated conical shaped piece of thermoplastic material to expand and press the thermoplastic material against the interior surface of the involute female mold.

4,047,870

AUTOMATIC PODIATRIC CONTROL MOLDER

Fulvio Smaldone, 313 E. North Ave., Northlake, Ill. 60164

Filed June 1, 1976, Ser. No. 691,510
Int. Cl.² B29C *3/06*
U.S. Cl. 425—151 **3 Claims**

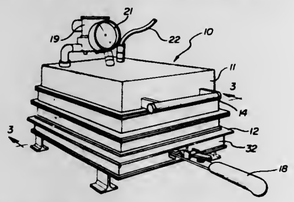
1. A molding press for molding a thermoplastic sheet material to a desired contour, said press comprising a base and a

rigid generally hollow housing overlying said base and movable vertically with respect thereto, said housing having an opening facing said base and a flexible sheet-like diaphragm covering said opening to from a fluid-tight chamber;

means for pressurizing said housing with a fluid to cause said flexible diaphragm to apply molding force to a sheet of softened thermoplastic material covering a mold positioned on said base to cause said sheet to assume the contours of said mold;

said press including mechanical interlock means for interlocking said housing with said base and electrical control means for controlling the application of fluid pressure to said housing, said mechanical and electrical means being interrelated to prevent application of fluid pressure except when said housing and said base are interlocked,

said mechanical interlock means comprising one or more vertical cleats attached to said housing and arranged to project into said base when said press is closed,



a horizontal plate carried in said base and rotatable about a vertical axis, and

one or more horizontal lock blades outwardly extending from said lock plate, each of said blades being adapted to interlock with a corresponding one of said cleats on rotation of said lock plate to prevent separation of said housing from said base;

said electrical control means comprising an electrical circuit including in series:

a power source,

an electrically actuated pneumatic control valve for regulating the application of pneumatic pressure to said chamber, and

at least one electrical switch actuated by said mechanical means,

whereby pneumatic pressure cannot be applied to said housing except when said housing and said base are interlocked.

4,047,871

DIE CLOSING UNIT FOR INJECTION MOLDING MACHINE

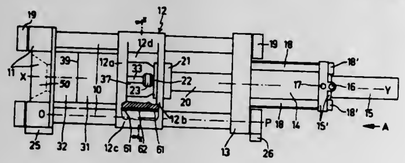
Karl Hehl, Arthur-Hehl-Strasse 32, 7298 Lossburg 1, Germany

Filed Sept. 4, 1975, Ser. No. 610,280

Claims priority, application Germany, Sept. 11, 1974, 2443509; Sept. 11, 1974, 2443510

Int. Cl.² B29F *1/06*

U.S. Cl. 425—450.1 **20 Claims**



1. A push-type die closing unit for an injection molding machine, serving to open and close the die halves of an injection molding die in a reciprocating motion along the longitudinal center axis of the unit, the die closing unit comprising in combination:

a stationary die carrier plate to which the stationary half of the injection molding die is attachable and which extends transversely to the unit center axis;

a stationary head plae likewise extending transversely to the unit center axis, on the other side of the emplacement of the injection molding die and at a distance therefrom;

a movable die carrier member to which the movable half of the injection molding die is attachable and which is arranged axially between the stationary die carrier plate and the staionary head plate;

means for guiding the movable die carrier member and attached die half in relation to the stationary die carrier plate and head plate for opening and closing movements along the unit center axis between a forward closed position and a rearward open position; and

a hydraulic linear actuator mounted axially behind the stationary head plate, said actuator including: a power cylinder enclosing a power piston having valve means for selectively hydraulically bypassing the power piston, an auxiliary cylinder extending coaxially to the rear of the power cylinder and enclosing an auxiliary piston, a piston rod carrying both said power piston and said auxiliary piston and extending in the unit center axis, the forward extremity of the piston rod being connected to the movable die carrier member for the transmission thereto of opening and closing forces, including elevated closing pressures; and wherein

the movable die carrier member defines, in the area immediately surrounding the unit center axis between the movable die half and the piston rod, a central space for the accommodation, at least in part, of an ejector device or other accessory device; and

the piston rod has a hollow forward portion accommodating therein an accessory drive in the form of an accessory hydraulic linear actuator to which said accessory device is connectable.

4,047,872

DEVICE ON PRESSING PISTON

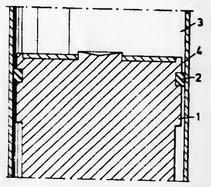
Hugo Karlsson, Kopmansgatan 17, S-820 60 Delsbo, Sweden

Filed Mar. 7, 1975, Ser. No. 556,343

Claims priority, application Sweden, Mar. 8, 1974, 7403094

Int. Cl.² B29C *1/00*

U.S. Cl. 425—469 **2 Claims**



1. A device for compressing a wax-type material which comprises a chamber containing a piston movably disposed therein, at least a portion of the lateral surface of said piston containing a plurality of projecting members which extend from said lateral surface into sliding engagement with the wall of said chamber, said projecting member defining a plurality of channels therebetween for venting of gases produced during the compressing operation, wherein said piston is provided with a head portion containing a skirt having a continuous surface and said continuous surface of said skirt being provided with said projecting members, and said projecting members are arranged in a plurality of substantially parallel rows, with the projecting members in adjacent rows being staggered with respect to each other.

4,047,873

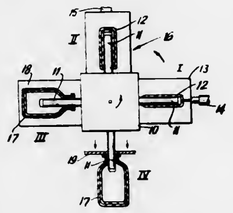
APPARATUS FOR MAKING MULTILAYERED BLOW MOLDED ARTICLES

John Jerome Farrell, Greenbrook, N.J., assignor to Consupak, Inc., Morristown, N.J.

Filed Dec. 15, 1975, Ser. No. 640,490

Int. Cl.² B29D *23/03*

U.S. Cl. 425—523 **20 Claims**



1. An apparatus for making a multi-layered hollow article comprising, a core rod, means operative to form a first parison on said core rod, a mold having a cavity larger than the formed parison and into which said core rod extends with said parison thereon, vacuum means operable to stretch the first parison radially and axially from the core rod so as to provide a cavity between the core rod and the first parison, and means operative to form a second parison in said cavity between the core rod and first parison so as to form a layered parison, the first parison being the outer layer and the second parison being the inner layer, and means operative to blow mold said layered parison to form the hollow article.

4,047,874

APPARATUS FOR THE PREPARATION OF PARISONS

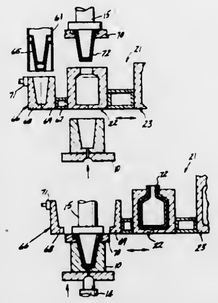
Emery I. Valyi, 5200 Sycamore Ave., New York, N.Y. 10471

Division of Ser. No. 473,580, May 28, 1974, Pat. No. 3,966,378.

This application Dec. 17, 1975, Ser. No. 641,639

Int. Cl.² B29D *23/03*

U.S. Cl. 425—523 **10 Claims**



1. An apparatus for the preparation of parisons comprised of more than one layer of moldable organic plastic material which comprises: a dispenser containing a quantity of parison liners; a core having an axis and being in spaced relation to said dispenser, and further being operable to receive a parison liner from said dispenser; a parison die in axial alignment with said core and engageable therewith, said parison die being operable to inject plastic around said core and liner; and means for conveying a parison liner from said dispenser into axial alignment with said core and said parison die, wherein said core is moved along its axis to receive said parison liner from said means then to engage said parison die by directionally uninterrupted relative axial movement, and means to blow mold the composite liner and injection molded layer.

4,047,875

INHIBITION OF CORROSION IN FUELS WITH MG/SI/MN COMBINATIONS

Walter R. May; Michael J. Zetlmeisl, and Kenneth W. Koch, all of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Nov. 24, 1975, Ser. No. 634,530

Int. Cl.² C10L *9/00*

U.S. Cl. 431—3 **6 Claims**

1. An additive composition comprising magnesium, silicon and manganese, in combination, wherein the (Mn/Mg+Si) ratio is from 0.01 to 100 and where the ratio of Mg to Si varies from 0.01 to 100.

4,047,876

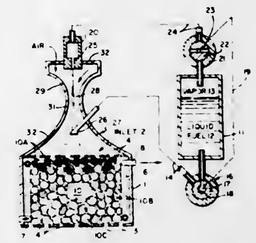
CATALYTIC FUEL COMBUSTION APPARATUS AND METHOD

Richard E. Rice, Arlington, Mass., assignor to Comstock & Wescott, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 561,591, March 24, 1975. This application Aug. 1, 1975, Ser. No. 601,228

Int. Cl.² F23D *19/00*

U.S. Cl. 431—7 **53 Claims**



1. Catalytic fuel combustion apparatus comprising:

a combustion chamber forming a fuel inlet and an outlet and a combustion path therebetween, and

a fuel- and air-permeable mass of catalyst in the chamber the mass including a relatively high catalytic concentration at the inlet and a relatively lower catalytic concentration is toward the outlet, wherein the mass of high concentration capable of spontaneous self-ignition in the presence of a lower alcohol selected from the group consisting of methanol, ethanol and isopropanol, the apparatus comprising means containing at least one of said lower alcohols and a pressurizer, and including means to form and direct droplets of said alcohol on said high catalyst concentration.

4,047,877

COMBUSTION METHOD AND APPARATUS

Paul Flanagan, Princeton, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed July 26, 1976, Ser. No. 708,557

Int. Cl.² F02C *3/16*

U.S. Cl. 431—8 **32 Claims**

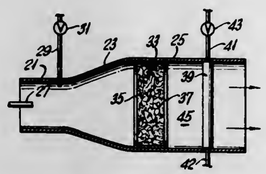
1. Combustion apparatus, comprising:

a catalyst body for combusting carbonaceous fuel passing therethrough;

feed means for supplying a mixture of combustion air and carbonaceous fuel to said catalyst body for flow therethrough to provide a catalyst effluent traversing a downstream zone adjacent to and downstream of said catalyst body;

thermal burner means disposed for directing jets of burning

gaseous fuel into said downstream zone from a multiplicity of points distributed within or alongside said downstream zone to obtain combustion of said gaseous fuel in said jets substantially throughout a cross section of said downstream zone; and



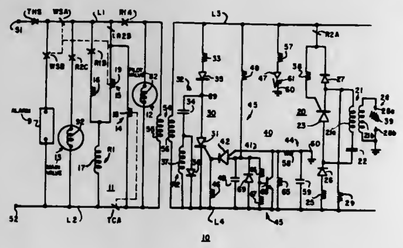
burner supply means for supplying gaseous fuel when desired to said burner means for obtaining said combustion in said jets substantially throughout a cross section of said downstream zone.

4,047,878

ELECTRONIC CONTROL ARRANGEMENT FOR DETECTING A LEAK CONDITION FOR A VALVE

Russell Byron Matthews, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Oct. 14, 1975, Ser. No. 621,653
Int. Cl.² F23N *5/24*
U.S. Cl. 431—22 **14 Claims**



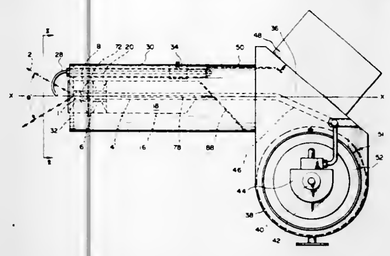
1. In an automatic fuel ignition system including pilot valve means operable when energized during an ignition interval to supply fuel to a pilot fuel outlet for ignition to establish a flame at said pilot outlet, and main valve means operable when energized to supply fuel to a main fuel outlet for ignition by said flame, a control arrangement comprising flame sensing means for sensing the presence of a flame at either one of said fuel outlets, control means operable in the absence of a flame at said pilot fuel outlet during a first duration following the start of the ignition interval to be responsive to said flame sensing means to energize said main valve means when a flame is established at said pilot fuel outlet, said control means maintaining said main valve means deenergized whenever a flame is established at said pilot fuel outlet during said first duration, and delay means operable whenever a flame is provided at said pilot fuel outlet during said first duration to deenergize and reenergize said pilot valve means to thereby interrupt the supply of fuel to said pilot fuel outlet for a predetermined duration, said control means being operable in the event the flame becomes extinguished as the result of operation of said delay means to respond to said flame sensing means to effect energization of said main valve means when a flame is thereafter reestablished at said pilot fuel outlet before the end of said ignition interval.

4,047,879

OIL BURNER ASSEMBLY

Earl R. Mitchell; Thomas D. Brown, and Beverley C. Post, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed June 3, 1976, Ser. No. 692,461
Claims priority, application Canada, June 27, 1975, 230344
Int. Cl.² F23C *5/06*
U.S. Cl. 431—183 **4 Claims**



1. An oil burner assembly, comprising:
a. an atomizing nozzle for spraying oil droplets substantially as a symmetrical hollow cone having an included angle for the outside edge of the oil spray, when the oil is sprayed in still air, in the range 60° to 80°,
b. an oil supply tube connected to an oil inlet end of the atomizing nozzle, and having a longitudinal axis extending along the axis of symmetry of the hollow cone of oil droplets,
c. an air swirler around the atomizing nozzle and extending rearwardly from the spraying end thereof, the air swirler comprising a plurality of similar blades equally spaced around the atomizing nozzle and extending therearound at a helix angle in the range 50° to 65° to the axis of symmetry of the hollow cone of oil droplets with the edges of the blades adjacent the spraying end of the atomizing nozzle inclined in the direction of the hollow cone of oil droplets at an angle in the range 20° to 55° to the axis of symmetry of the hollow cone of oil droplets,
d. an air supply tube for supplying air to the air swirler and extending rearwardly therefrom and coaxial with the oil supply tube, the air supply tube enclosing an air space around the oil supply tube, and
e. an air pre-swirler on the oil supply tube, and spaced therealong from the air swirler, and comprising a plurality of blades which have a similar helix angle and direction of helix to the blades of the air swirler and which extend across an air outlet from the air space in the air supply tube, whereby, in operation,
f. a substantially uniformly distributed air flow is produced to a flame burning the oil droplets,
g. a substantially stable recirculation vortex within the flame is produced, and
h. a region of rapid oil droplet and air mixing is established.

4,047,880

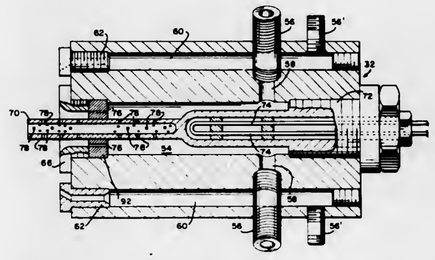
FLUIDS DISTRIBUTOR FOR ENERGIZED-FLUID SYSTEMS

Antonio Caldarelli, 281 W. Clinton St., Dover, N.J. 07801

Division of Ser. No. 470,001, May 15, 1974, abandoned. This application Sept. 3, 1975, Ser. No. 610,047
Int. Cl.² F23D *11/44*; F02K *9/02*
U.S. Cl. 431—208 **6 Claims**

1. For use in energized-fluid systems, a distributor for receiving and discharging volatile fluids, comprising:
a body having an elongate axis;
said body further having a plurality of axially-extending passageways formed therein for conducting discrete fluids therethrough;

means carried by said body for admitting only one fluid to each passageway of said plurality of passageways;
an axially-extending bore formed in said body and opening out onto an end of said body;
an ignition device confined within said bore;
conduits communicating at least one pair of said passageways with said bore, for conducting discrete fluids from said pair of passageways into said bore for contact with said ignition device;
means disposed in at least one of said axially-extending passageways for heating fluid admitted thereinto;
said fluid-heating means comprising a tube axially supported within said one axially-extending passageway in spaced-apart relationship to inner surfaces of said one passageway;
said tube having a pair of axially-extending tube-bores formed therein, with a wall separating said tube-bores one from the other thereof;



a heating element confined within one of said axially-extending tube-bores;
the other of said tube-bores having a multiplicity of apertures formed therein normal to the axis of said other tube-bore for admitting fluid therethrough into said other tube-bore, to effect a vaporization of such fluid upstream of, and prior to address of such fluid to, said ignition device;
said other tube-bore opening externally of said body, to discharge vaporized fluid therefrom;
an annulus enveloping a portion of said tube and in engagement with said inner surfaces of said one passageway;
said annulus having a plurality of axially-extending channels formed therein opening intermediate said tube and said inner surfaces of said one passageway, and opening externally of said body, also to effect a vaporization of such fluid upstream of, and prior to address of such fluid to, said ignition device; and
means in said body for cooling said body.

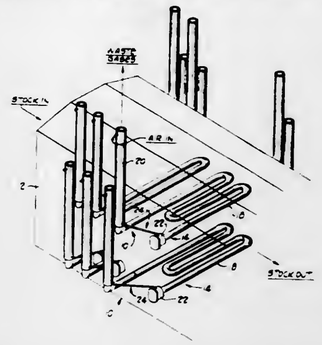
4,047,881

HEAT RECUPERATOR AND SHROUD FOR RADIANT TUBE BURNER

Paul R. Eschenauer, Cleveland Heights, and George Main, Garfield Heights, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed May 11, 1976, Ser. No. 685,287
Int. Cl.² F23D *11/44*
U.S. Cl. 431—215 **7 Claims**

1. A recuperator and shroud assembly for converting a radiant tube burner assembly that is comprised of a burner and a connected radiant tube from indirect air control to direct air control and for providing heat recuperation, comprising: a shroud attachable in surrounding relationhip about the burner, in a manner that encloses an air inlet to the burner, said shroud having an inlet aperture and connected conduit for directing a flow of air under pressure in a direction transversely of, and at a location offset laterally from, the path of fuel flow from the burner and the central longitudinal axis of the adjacent radiant tube portion; a heat recuperator connected to a discharge portion of the radiant tube to receive a flow of hot gas therefrom, said heat recuperator having spaced inner and outer coaxial tubular members, one end of the inner member communicating with the discharge portion of the radiant tube and the other end serving as an exhaust opening, the outer member



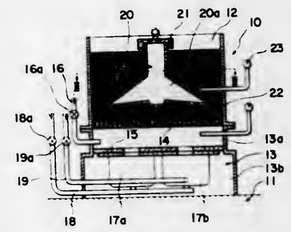
being sealed at opposite ends about the inner member, one of the ends being sealed in sliding relationship and the other in fixed relationship, an inlet through the outer member adjacent one end, and an outlet adjacent the other end; and means connecting the shroud conduit to said last mentioned outlet.

4,047,882

BURNING METHOD OF CERAMIC SHELL MOLD FOR PRECISION CASTING

Yasuji Morita, Kobe, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Mar. 22, 1976, Ser. No. 669,454
Claims priority, application Japan, Mar. 26, 1975, 50-37127
Int. Cl.² F27D *3/16*; F27B *15/00*
U.S. Cl. 432—9 **3 Claims**



1. A method of burning a ceramic shell mold for use in precision casting, which ceramic shell mold has a shaped cavity, defined therein, and at least one opening leading into said shaped mold cavity, said burning method being carried out by the use of a heating kiln of a type comprising heating and combustion compartments divided by a ceramic filter, said heating compartment being positioned immediately above said combustion compartment and accommodating therein a mass of sand, and a source of heating medium of elevated temperature, said burning method comprising the steps of:
positioning said ceramic shell mold from top into the mass of sand within the heating compartment while said mass of sand is fluidized by the application of compressed air flowing upwardly through the ceramic filter at a pressure within the range of 1.0 to 2.5 kg/cm², said ceramic shell mold being positioned such that the opening leading into the mold cavity projects outwardly from the top level of said mass of sand within said heating compartment;
interrupting the supply of the compressed air; and

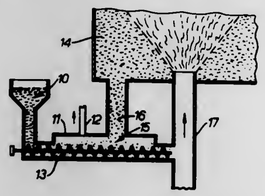
supplying the heating medium composed of a blast of hot gas from the combustion compartment into the heating compartment through said ceramic filter to heat said mass of sand and, in turn, said ceramic shell mold at a predetermined curing temperature for a predetermined time, said gas pressure being such as to avoid fluidization of the sand particles during this curing time.

4,047,883

THERMAL TREATMENT OF MATERIALS BY HOT PARTICULATES

Percy Lloyd Waters, North Ryde, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed July 23, 1975, Ser. No. 598,210
Claims priority, application Australia, July 24, 1974, 8310/74
Int. Cl.[2] F27B *15/00*; F23G *7/00*
U.S. Cl. 432—14 **19 Claims**



1. A method of heat treating a material which comprises the steps of:

a. removing hot solid particles from the bed of a particle bed combustor;

b. mixing the removed hot bed particles and said material in a mixing chamber; and

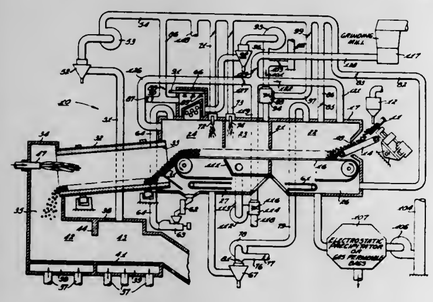
c. conveying at least part of the product of the admixture to the combustor.

4,047,884

MEANS AND METHOD FOR PROCESSING CEMENT RAW MATERIALS CONTAINING FUEL OF HIGH VOLATILE CONTENT

Glenn A. Heian, Franklin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 5, 1976, Ser. No. 674,062
Int. Cl.[2] F27D *7/04*; C04B *7/04*; C01B *17/96*
U.S. Cl. 432—21 **9 Claims**



1. In a method of processing raw cement material containing fuel of high volatile content in which the material is progressed through a drying zone and at least one preheat zone each of different temperatures and for a specific function wherein the temperature in the preheat zone is between 1200° F and 2400° F; comprising the steps of:

A. collecting the noncombusted volatiles from a collector in the windbox below the material bed in preheat zone;

B. combusting the collected volatiles of Step A in a combustion chamber; and,

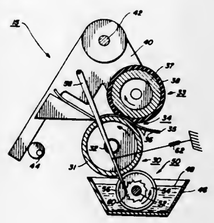
C. passing the combusted volatiles as heat back to said preheat zones wherein preheating and calcining of the material being processed is effected.

4,047,885

ROTATING WICK OIL DISPENSING SYSTEM

Dewey H. Hasman, Jr., Palmyra, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 26, 1976, Ser. No. 690,212
Int. Cl.[2] F27B *9/28*
U.S. Cl. 432—60 **8 Claims**



1. Roll fuser apparatus comprising:

a heated roll structure;

a pressure roll structure cooperating with said heated roll structure to form a nip through which substrates carrying toner images thereon move;

means for effecting pressure engagement of said roll structures to form said nip during fusing of said toner images and for effecting disengagement thereof when images are not being fused;

means for applying release agent material to at least one of said roll structures for minimizing the offsetting of toner thereto, said means for applying release agent material comprising an endless surface only a portion of which contacts said at least one roll structure at any given time; and

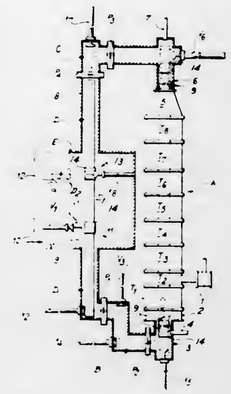
means for effecting incremental movement of said release agent applying means whereby different portions of said endless surface are sequentially and periodically moved into contact with said at least one roll structure, said incremental movement effecting means being operably connected to said pressure engagement effecting means whereby movement of said release agent applying means is effected in response to actuation of said means for effecting pressure engagement and disengagement of said roll structures.

4,047,886

FURNACE FOR THE CONTINUOUS SINTERING OF PELLETS OF CERAMIC NUCLEAR FUEL MATERIAL

Jacques Heyraud, Aix-en-Provence, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 24, 1975, Ser. No. 634,629
Int. Cl.[2] F27B *9/02*
U.S. Cl. 432—128 **3 Claims**



1. A furnace for the continuous sintering of pellets of ceramic nuclear fuel material in a neutral or reducing atmosphere, comprising a tubular enclosure having a longitudinal axis and equipped with heating means located at intervals along said enclosure, a hearth for the longitudinal displacement of pellet containers, means for injecting gas at both ends of the furnace, means for sucking gas in an intermediate zone between the preheating and sintering zones and for condensing a binder for the pellets, and means for displacing said containers along said hearth from a lock-chamber for the introduction of containers which is placed at one end of the furnace to a lock-chamber for the extraction of containers at the other end of the furnace, wherein the two lock-chambers are connected to each other in leak-tight manner by means of a conveyor belt which passes through a glove box, there being juxtaposed within said glove box a station for loading containers with sub-containers which contain the pellets to be sintered and a station for unloading said sub-containers which contain the sintered pellets.

4,047,887
WHITENING OF POLYESTER FIBERS

Klaus Kackstadter, and Hans Theidel, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 22, 1975, Ser. No. 570,408
Claims priority, application Germany, Apr. 27, 1974, 2420473
Int. Cl.² D06P *5/20*
U.S. Cl. 8—1 W **5 Claims**

1. In the process for whitening polyester materials or mixed fibres of polyester and cellulose with a dispersion of a fluorescent coumarin or styryl whitening agent by the pad-thermosol process, the improvement comprising using said fluorescent whitening agent in a liquor also containing 1 to 4 g/l of a water-soluble inorganic salt from the group of alkali metal tetraborate, alkali metal silicate, alkali metal aluminum sulphate, alkali metal polyphosphate or alkali metal sulphate.

5. A composition of matter comprising a dispersion containing 60–250 g/kg. of fluorescent coumarin or styryl whitening agent and 150–200 g/kg of a water soluble inorganic salt of the formula

$$Me_2B_4O_7,\ Me_2SiO_3,\ Me_2Si_2O_5,\ MeAl(SO_4)_2,$$
$$Me_{m+2}P_mO_{3m+1},\ Me_nP_nO_{3n}\ \text{or}\ Me_2SO_4$$

in which
m is 2–10⁶;
n is 3–8; and
Me is sodium or potassium.

4,047,888
HAIR DYE COMPOSITION CONTAINING A CATIONIC RESIN

Christos Papantoniou, Epinay-sur-Seine, France, assignor to L'Oreal, Paris, France

Filed May 27, 1976, Ser. No. 690,783
Claims priority, application Luxembourg, May 28, 1975, 72592
Int. Cl.² A61K *7/13*
U.S. Cl. 8—10.2 **10 Claims**

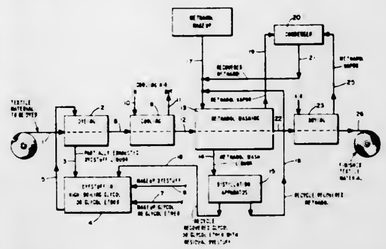
1. A hair dye composition comprising a hair dye support in the form of a cream or gel, at least one oxidation dye in an amount between 0.006 and 6 percent by weight relative to the total weight of said composition and at least one graft cationic copolymer of:
a. 3–95 weight percent N-vinylpyrrolidone,
b. 3–95 weight percent dimethylaminoethyl methacrylate and
c. 2–50 weight percent polyethylene glycol,
said graft cationic copolymer being present in an amount between 0.5 and 5 percent by weight based on the total weight of said composition and having a molecular weight between 10,000 and 100,000.

4,047,889
PROCESS FOR THE RAPID, CONTINUOUS AND WATERLESS DYEING OF TEXTILE AND PLASTIC MATERIALS

Julius Hermes, Martinsville, Va., assignor to Martin Processing, Inc., Martinsville, Va.

Filed Jan. 9, 1976, Ser. No. 647,775
Int. Cl.² C09B *67/00*; D06P *1/64*
U.S. Cl. 8—93 **6 Claims**

1. A process comprising dyeing a textile or plastic material with a dyestuff dissolved or suspended or dispersed in a high boiling organic liquid which is free or substantially free of water and at a relatively high temperature, followed by cooling the dyed textile or plastic material and washing same with a low boiling organic liquid which is free or substantially free of water, followed by drying the washed and dyed textile or plastic material, and carrying out the dyeing, the washing, and the drying steps in cyclic manner and in an essentially closed system with the partially exhausted dyestuff liquor from the dyeing step being recycled for the treatment of further textile or plastic material to be dyed, with the separation and recovery of used low boiling wash liquid with recovered low boiling wash liquid being recycled to the washing step and residual high boiling liquid containing residual dyestuff being recycled

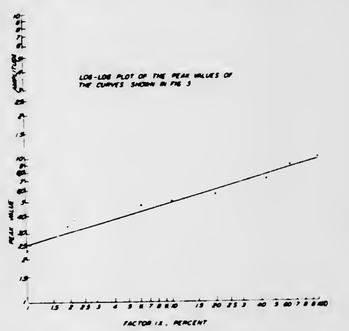


to the dyeing step, and with low boiling wash liquid vaporized from the textile material in the drying step being recovered and returned to the low boiling liquid washing step; said high boiling organic liquid being a lower alkylene glycol or a lower alkyl ether of a lower alkylene glycol.

4,047,890
METHOD AND APPARATUS FOR DETERMINING DEFICIENCIES IN ENZYMATIC REACTORS PARTICULARLY CLOTTING FACTOR LEVELS IN BLOOD PLASMAS

James W. Eichelberger, Plainfield, N.J.; Frederick M. Keat, Warrington, and Michael Sokol, Abington, both of Pa., assignors to Bio/Data Corporation, Willow Grove, Pa.

Continuation-in-part of Ser. No. 411,994, Nov. 1, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,464
Int. Cl.² G01N *33/16*; G06F *15/42*
U.S. Cl. 23—230 B **12 Claims**



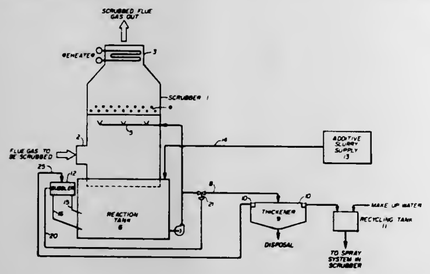
1. A method of determining clotting factor levels (other than fibrinogen) in blood plasma, comprising the steps of:
generating an electric signal proportional to the optical density of an unknown blood plasma undergoing clotting over a period of time;
electronically differentiating said optical density-time signal to generate a first differential signal;
electronically determining the peak value of said first differential signal; and, to determine clotting factor level activity of the unknown plasma;
electronically comparing said peak value to a predetermined standard logarithmic function based on standard plasmas having known factor activity levels, said standard logarithmic function relating the peak values of the first differential of the optical density-time signal of said standard plasmas to corresponding known factor activity levels.

4,047,891

DENSITY CONTROL SYSTEM

Adolph August Schuetz, East Hampton, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 21, 1976, Ser. No. 671,199
Int. Cl.² C01B 17/58; B01J 10/00; G01N 9/26, 9/36
U.S. Cl. 23—230 A 5 Claims



1. A method of manifesting the percent undissolved solids in a mixture of finely divided undissolved solids and liquid with dissolved solids, including,

establishing a collection of a mixture of finely divided undissolved solids and a first liquid with dissolved solids,

injecting a second liquid with only dissolved solids equivalent to the dissolved solids of the mixture at two different elevations in the collected mixture,

sensing the differential between the pressures required to inject the second liquid at the two different elevations,

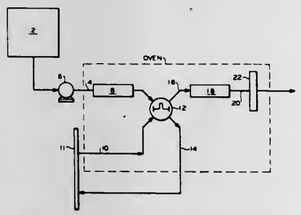
and manifesting the differential pressures as the density of the mixture and percent undissolved solids in the mixture.

4,047,892

LIQUID CHROMATOGRAPHIC ANALYSIS FOR STYRENE-BUTADIENE MONOMERS

Edward N. Fuller, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 1, 1976, Ser. No. 701,727
Int. Cl.² G01N 31/08
U.S. Cl. 23—232 C 5 Claims



1. A process for the liquid chromatographic analysis of a mixture of styrene, 1,3-butadiene and cyclohexane which comprises:

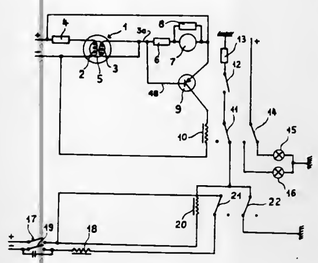
introducing a sample of said mixture into a chromatographic column having a partitioning material therein which selectively retards passage therethrough of the components of said mixture, drying a carrier fluid by passing same through a drying chamber and thereafter introducing the thus-dried carrier fluid into said column at a predetermined flow rate to carry said mixture through said column to effect separation of said mixture into said styrene, said 1,3-butadiene and said cyclohexane, and thereafter separately determining the quantity of styrene, 1,3-butadiene and cyclohexane.

4,047,893

APPARATUS FOR MEASURING THE ALCOHOL CONTENT IN HUMAN BREATH

Bob Kok, and Erhardt Krause, both of Hamburg, Germany, assignors to C.S.S. Container Storage Service Establishment, Hamburg, Germany

Filed July 22, 1974, Ser. No. 490,294
Claims priority, application Germany, July 24, 1973, 2337988
Int. Cl.² G01N 27/16
U.S. Cl. 23—254 E 1 Claim



1. A portable hand-held apparatus for determining the alcohol content in the breath of a human subject, comprising, in combination, a gas chamber having an inlet into which the human subject can breathe and having at least one outlet; a low-voltage battery having first and second battery output terminals; first and second D.C. supply lines connected to said first and second battery output terminals; a gas cell mounted in said gas chamber and comprised of a porous semiconductor shell, a heating conductor embedded in said shell and connected to at least one of said supply lines, a probe embedded in said shell at a predetermined distance from said heating conductor, and a probe lead-in conductor connected to said probe, the resistance of said gas cell decreasing with increasing alcohol content of the gas present in said gas chamber; a milliammeter connected between said probe lead-in conductor and said first supply line for measuring and indicating the valve of the alcohol content in said gas; at least one transistor circuit each comprising a transistor and a relay, said transistor having a base connected to said probe lead-in conductor, an emitter connected to said first supply line, and a collector, said relay having a relay coil connected to said collector and said second supply line, at least one pair of relay contacts and at least one switch arm operated by said relay coil; at least one control circuit comprising a control lamp, one pair of said relay contacts being opened and closed by the corresponding relay switch arm and connected to cause said control lamp to light up when the current in the probe lead-in conductor exceeds a value corresponding to a predetermined alcohol content; and an adjustment resistor connected between said probe lead-in conductor and said first supply line and operative for adjusting the value of the probe lead-in conductor current at which said control lamp lights up, whereby a traffic officer or the like operating at night, in the rain, or in other low-visibility conditions, is informed by the control lamp that he should bother to take a precise alcohol content reading and is enabled by the milliammeter to thereafter actually take the reading.

4,047,894

REMOVING CARBON DIOXIDE FROM THE AIR

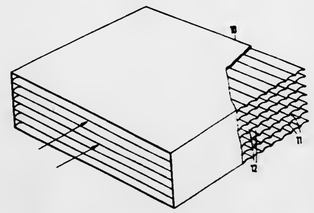
Dieter Kühl, Bubenreuth, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 17, 1974, Ser. No. 470,905
Claims priority, application Germany, May 22, 1973, 2326070
Int. Cl.² B01J 1/00; C01B 31/20; H01M 8/06
U.S. Cl. 23—284 4 Claims

1. Apparatus for removing carbon dioxide from air comprising:

a. a housing opened on two opposing sides, said opposing sides forming an inlet and outlet for the air from which carbon dioxide is to be removed; and

b. a plurality of corrugated porous sintered plates of polyvinyl chloride impregnated with a carbon dioxide absorbing liquid supported within said housing in parallel spaced relationship to each other with the peaks and valleys of the corrugations also in parallel relationship to define a



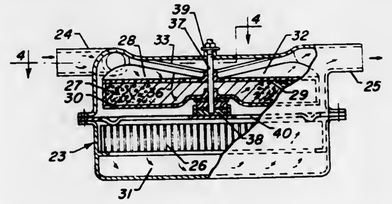
plurality of spaces, one between each two adjacent plates which spaces are open between said inlet and outlet, the corrugations extending transverse to the direction of flow of air from said inlet to said outlet, whereby the air is conducted through said spaces from said inlet to said outlet between the plates at right angles to the corrugations to result in a longer reaction time and larger surface area to give better material transfer between the air and absorption liquid without appreciable pressure loss.

4,047,895

APPARATUS FOR THE PURIFICATION OF ENGINE EXHAUST GASES WITHOUT OXIDATION OF ENTRAINED SO_2

Peter Urban, Northbrook, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 30, 1975, Ser. No. 627,161
Int. Cl.² B01J 8/04; F01N 3/15, 3/16, 5/04
U.S. Cl. 23—288 F 4 Claims



1. A catalytic converter for purifying engine exhaust gases while preventing sulfur dioxide from contacting a catalyst to preclude the formation of sulfuric acid and which comprises in combination,

a. a confined housing with exhaust gas inlet means thereto and a purified gas outlet therefrom;

b. a gas permeable catalyst retaining section fixedly positioned within said housing;

c. a shaft supported by said housing an additional gas permeable section for retaining a SO_2 adsorbent material therein that is rotatably supported upon said shaft within said housing to be maintained adjacent said catalyst section in a manner to permit gas flow between said sections and to provide movement of said adsorbent material between an upstream adsorption zone and downstream desorption zone;

d. gas flow diverter means positioned in said converter to direct the incoming stream through the SO_2 adsorption zone and through a portion of said SO_2 adsorbent material so as to pass a substantially SO_2-free stream to said catalyst section and, in addition, to direct a treated stream from said catalyst section through said downstream description zone to remove SO_2 from another portion of the adsorbent material and from the converter, and

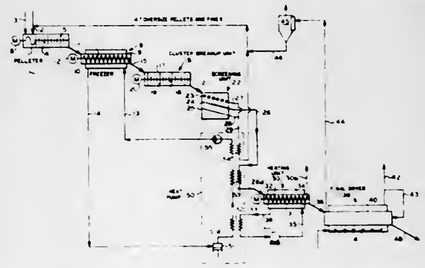
e. rotatable vane means in interconnection with said rotatable section for rotating said rotatable section, said vane means being positioned within the exhuast gas stream flow path through the housing whereby the adsorbent material in said rotatable section will continuously move therewith between the SO_2 adsorption and desorption zones in the housing.

4,047,896

CARBON BLACK PELLET TREATMENT

John W. Vanderveen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 8, 1976, Ser. No. 693,995
Int. Cl.² C09C 1/58
U.S. Cl. 23—314 8 Claims



1. A process for producing carbon black pellets of uniform pellet size which comprises:

A. forming wet carbon black pellets by wet-pelleting carbon black with an aqueous pelleting agent,

B. freezing the resulting wet carbon black pellets so as to form a frozen carbon black pellet material,

C. breaking apart clumps and clusters of carbon black pellets contained within said frozen carbon black pellet material by subjecting said frozen carbon black pellet material to mechanical action,

D. sizing the resulting frozen carbon black pellets so as to obtain frozen carbon black pellets of essentially uniform size, and thereafter

E. drying the resulting sized carbon black pellets so as to form as a product of the process dry carbon black pellets of essentially uniform pellet size.

4,047,897

SINTERED ALLOY FOR CUTTING TOOLS

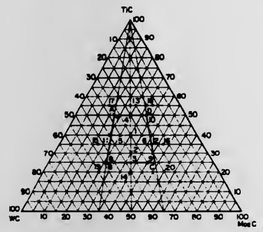
Hiroshi Tanaka, and Osamu Kato, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Oct. 13, 1976, Ser. No. 731,959
Claims priority, application Japan, Oct. 14, 1975, 50-123561
Int. Cl.² C22C 29/00
U.S. Cl. 428—539.5 1 Claim

1. A sintered alloy for cutting tools consisting essentially of 60 to 92% by weight of a carbide comprising Mo_2C, WC and TiC in the proportions shown by the tetragonal region A, B, C and D in the ternary composition diagram of FIG. 1, the proportion of the sum of WC and Mo_2C with a WC/Mo_2C weight ratio of 35:65 to 65:35 being 50 to 75% by weight, and the proportion of TiC being 25 to 50% by weight;

3 to 20% by weight of a nitride selected from the group consisting of TiN, TaN or a mixture of TiN and TaN; and

5 to 20% by weight of Ni, Co or a mixture of Ni and Co as a binder metal; and wherein the carbide and nitride are in



the form of a solid solution phase nitride with a grain size of not more than 1.3 μ and a binder metal phase.

4,047,898

UPGRADING OF SOLID FUELS

Edward L. Cole, Fishkill; Howard V. Hess, Glenham, and James Wong, Jr., Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Continuation of Ser. No. 583,387, June 3, 1975, abandoned. This application Oct. 28, 1976, Ser. No. 736,626

Int. Cl.² C10L *9/10*

U.S. Cl. 44—1 G **8 Claims**

1. In a process for the hydrothermal treatment of a low rank solid fuel in the presence of added hydrogen the improved method of reducing hydrogen consumption which comprises forming a mixture of particulate low rank solid fuel and water, heating the mixture in an inert atmosphere to a temperature between about 300° and 700° F. at a pressure sufficient to maintain the water liquid in the heating zone, venting the heating zone to release the generated gases and then subjecting the mixture to hydrothermal treatment at a temperature between about 300° and 700° F. and a pressure sufficient to maintain the water liquid in the hydrothermal zone in the presence of added hydrogen.

4. The process of claim 1 in which the solid fuel is lignite.

4,047,899

METHOD FOR PREPARING A LACTONE REACTION PRODUCT

Justin Christopher Powell, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 446,844, Feb. 28, 1974, Pat. No. 3,997,569, which is a continuation-in-part of Ser. No. 304,675, Nov. 8, 1972, abandoned. This application June 28, 1976, Ser. No. 700,360

Int. Cl.² C10L *1/22*

U.S. Cl. 44—63 **23 Claims**

11. A motor fuel composition comprising a mixture of hydrocarbons in the gasoline boiling range containing a deposit inhibiting amount of a high molecular weight alkenyl-substituted lactone reaction product prepared by the steps comprising admixing an alkenylsuccinic acid, said alkenyl radical having an average molecular weight ranging from about 300 to 3,000, with a protonating agent or electron pair acceptor selected from the group consisting of sulfuric acid, perchloric acid, p-toluene sulfonic acid, boron triflouride etherate and sulfonic acid ion exchange resins to form a substantially anhydrous reaction mixture and reaction said mixture under substantially anhydrous reaction conditions at an elevated temperature up to about 100° C until infrared spectra at about 5.66 and 5.74 micrometers indicates a substantial conversion of said alkenylsuccinic acid to said lactone reaction product.

4,047,900

MOTOR FUEL COMPOSITION

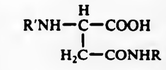
Peter Dorn, Lagrangeville, and Walter D. Foucher, Jr., Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Apr. 14, 1976, Ser. No. 676,773

Int. Cl.² C10L *1/22*

U.S. Cl. 44—68 **6 Claims**

1. A motor fuel composition comprising a mixture of hydrocarbons in a gasoline boiling range containing from about 0.001 to 5.0 weight percent of a substituted asparagine having the formula:



in which R and R' each represent a secondary or a tertiary alkyl or alkylene radical having from about 7 to 20 carbon atoms and from about 0.02 to 3.5 grams per gallon of manganese as a cyclopentadienyl manganese tricarbonyl.

4,047,901

FEEDER FOR COAL-GASIFICATION REACTOR

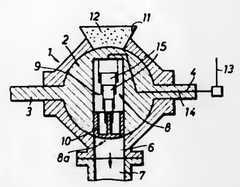
Gerhard Baron, Hofheim; Herbert Bierbach, Frankfurt am Main; Carl Hafke, Frankfurt am Main, and Karlheinz Zolzer, Frankfurt am Main, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 13, 1976, Ser. No. 714,550

Claims priority, application Germany, Sept. 17, 1975, 2541356

Int. Cl.² C10J *3/30*

U.S. Cl. 48—86 R **4 Claims**



1. Device for feeding granular and dust coal to a coal-gasifying reactor operating under a pressure of 5 to 150 bars comprising stationary housing means connected to the coal inlet of the reactor in which a lock member is rotatably mounted and movable between a coal-receiving position and coal-discharging position, said lock member having at least one chamber which is open only at one end and containing displacing means which extends approximately to the entrance of the chamber, said displacing means consisting of a plurality of telescopic tubes which form a stem that extends and retracts and carries a sealing head within the chamber, thereby substantially preventing an ingress of product gas into the chamber when in the discharge position.

4,047,902

METAL-PLATED ABRASIVE PRODUCT AND METHOD OF MANUFACTURING THE PRODUCT

Richard K. Wiand, 1773 Washington, Birmingham, Mich. 48009

Continuation-in-part of Ser. No. 564,077, April 1, 1975, abandoned. This application June 24, 1976, Ser. No. 699,591

Int. Cl.² B24D *11/04*

U.S. Cl. 51—295 **10 Claims**

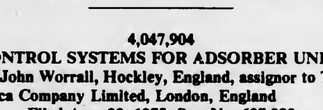
1. A method of manufacturing an abrasive product comprising,

providing a conductive member with a surface thereon for attachment of abrasive particles,

masking off predetermined desired surface portions on the backing member to thereby leave exposed spaced apart portions on the backing,

a significant plurality of said abrasive grit particles positioned on each said exposed portions,

bonding generally non-ferromagnetic abrasive grit particles to the exposed portions subsequent to the masking, said



bonding being effected by a deposited metal plating technique of either the electrolytic, electroless, or vacuum deposition type and,

said grit particles and said metal plating being applied to the product generally simultaneously in a generally static plating technique.

4,047,903

PROCESS FOR THE PRODUCTION OF ABRASIVES

Wolfgang Hesse, Wiesbaden; Jurgen Ritz, Mainz-Mombach, and Eckart Teschner, Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 399,683, July 24, 1973, abandoned. This application Sept. 5, 1975, Ser. No. 610,679

Claims priority, application Germany, Sept. 26, 1972, 2247103

Int. Cl.² B05D *3/06*

U.S. Cl. 51—298 R **3 Claims**

1. A process for preparing a waterproof abrasive which comprises forming a waterproof abrasive by coating a fibrous substrate with a plurality of successive layers including at least one base layer of a binder resin hardenable by irradiation, at least one intermediate layer of abrasive grains and at least one top layer of binding resin hardenable by irradiation and thereafter curing the resin layers by electron irradiation; at least one of said resin layers being selected from the group consisting of

A. the reaction product of a polycarboxylic acid (A1) with an esterified epoxy resin (A2), prepared by reaction of an epoxy resin with a member selected from the goup consisting of

a. acrylic acid,

b. methacrylic acid,

c. a mixture of (a) and (b) and

B. the reaction product of (A2) first reacted with diketenes and then reacted with a chelate forming compound.

4,047,904

CONTROL SYSTEMS FOR ADSORBER UNITS

Michael John Worrall, Hockley, England, assignor to The British Ceca Company Limited, London, England

Filed Aug. 22, 1975, Ser. No. 607,080

Claims priority, application United Kingdom, Sept. 12, 1974, 39869/74

Int. Cl.² B01D *57/00*

U.S. Cl. 55—18 **7 Claims**

1. A vapor adsorber system consisting essentially of an inlet for air containing vapor to be adsorbed, a plurality of vapor adsorber units connected to said inlet, which are arranged to be utilized and regenerated in a sequence and which each include a respective exhaust outlet leading to atmosphere,

a respective sample line connected to each adsorber exhaust unit,

a sample exhaust line,

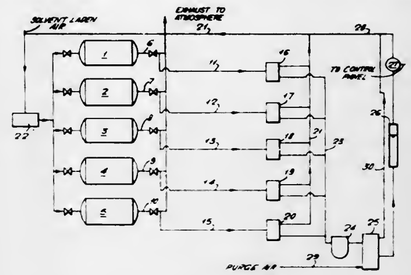
an analyzer line,

a plurality of first two way valves arranged respectively to connect selectively each said sample line to said sample exhaust line or direct to said analyzer line,

an analyzer means for detecting concentrations of vapor to be adsorbed in the ppm range,

a source of purge gas for said analyzer, valve means arranged to connect selectively said analyzer either to said analyzer line or to said source of purge gas, and

control means operative upon said two way valves to connect the sample line associated with one adsorber unit in use to said analyzer whilst connecting the sample lines associated with the other adsorber units to said sample exhaust line and operative in response to detection by said



analyzer of a concentration of vapor to be adsorbed above a predetermined level, to cause a further adsorber unit to be brought into use and said one adsorber unit regenerated, and to cause said analyzer to be connected to said source of purge gas for a predetermined time, said connection of said one sample line to said analyzer being such that only gases and vapors emitted from the said one adsorber are passed to the analyzer.

4,047,905

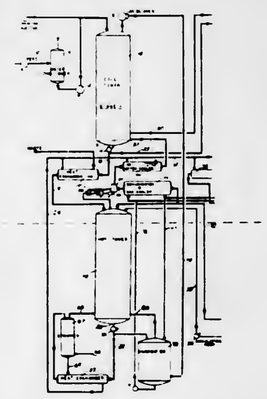
METHOD FOR ENRICHMENT BY DUAL TEMPERATURE EXCHANGE

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, White Plains, N.Y.

Division of Ser. No. 587,362, Sept. 26, 1966, abandoned, which is a continuation of Ser. No. 822,975, June 25, 1959, abandoned, which is a division of Ser. No. 188,925, Sept. 29, 1950, Pat. No. 2,895,803. This application Jan. 5, 1971, Ser. No. 104,154

Int. Cl.² B01D *19/00*; C01B *5/02*

U.S. Cl. 55—37 **6 Claims**



1. An improved gas and liquid treating method wherein

a. a liquid stream containing first fluid and a gas stream containing second fluid are contacted with each other in a contact zone at a first temperature, and

b. the said liquid stream passing from the contact zone contains, and is thereafter stripped of second fluid dissolved therein,

said method being improved by

c. delivering to a separate stripping zone maintained at a temperature higher than said first temperature the liquid stream passing from said contact zone,

d. at said stripping zone stripping from said liquid stream second fluid dissolved therein by passing stripping fluid in gaseous phase in countercurrent flow to said liquid stream,

e. discharging from said stripping zone a gas effluent containing said stripped second fluid,

f. discharging from said stripping zone a liquid effluent containing first fluid from which second fluid has been stripped,

g. passing said liquid effluent in countercurrent indirect contact heat exchange with the liquid stream referred to in step (c) to aid in maintaining higher than said first temperature the temperature of said stripping zone, and

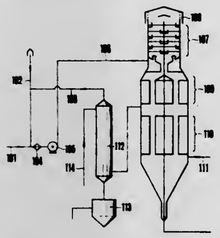
h. delivering to said contact zone, for participation in the contacting therein, second fluid discharged from said stripping zone.

4,047,906

METHOD FOR THE PURIFICATION OF WASTE GAS CONTAINING GASEOUS POLLUTANTS

Heiichiro Murakami, and Tsuneo Okamoto, both of Iwaki, Japan, assignors to Taiyo Kaken Company, Ltd., Tokyo, Japan

Filed Feb. 20, 1976, Ser. No. 659,901
Claims priority, application Japan, Feb. 27, 1975, 50-24262
Int. Cl.² B01D *53/12*
U.S. Cl. 55—79 **19 Claims**



1. A method for the continuous purification of a waste gas containing gaseous pollutants, comprising the steps of:

providing a tower having an absorbing section containing a plurality of vertically spaced trays, said trays being of two types, alternately arranged, a first type of said trays having at least one weir provided on its surface disposed to divide its surface area into a central zone I and a distal zone II, said central zone I having 80–95% of the total surface area of said first type tray, both of said zones being provided with a plurality of apertures, the total area of the apparatus of said central zone I equaling 4–20 times the total area of apertures in said distal zone II, the second type of tray being provided with at least one weir disposed to divide the tray into a central zone II and a distal zone I, said central zone II having 5–20% of the total surface area of said second type tray, both zones of second type tray being provided with a plurality of apertures, the total aperture area of said distal zone I equaling 4–20 times that of the total aperture area of said central zone II, the weir provided on said first type of tray and the weir provided on said second type of tray being equal in height;

continually introducing the gas to be purified into a lower section of the tower beneath said adsorption section;

continuously feeding activated carbon spheres onto the top tray of said tower, said carbon spheres and said gas coming into countercurrent contact, said carbon spheres forming a fluidized bed in zone I of each tray and descending through zone II to the next lower tray; and

continuously removing purified gas from the top of said tower.

10. A method for the continuous purification of a waste gas containing gaseous pollutants, comprising the steps of:

providing a tower having an adsorbing section containing a plurality of vertically spaced trays, each of said trays being divided by at least one weir into first and second zones, each zone having a plurality of apertures, each first zone having 80–95% of the total surface area of the tray and a total aperture area 4–20 times the total aperture area in said second zone,

continually introducing the gas to be purified into a lower section of the tower beneath said adsorption section;

continuously feeding activated carbon spheres onto the top tray of said tower, said carbon spheres and said gas coming into countercurrent contact, said carbon forming a fluidized bed in said first zone of each tray and descending through said second zone to the next lower tray; and

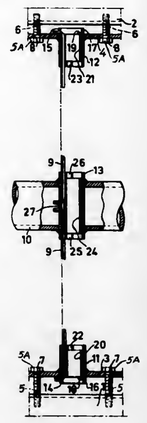
continuously removing purified gas from the top of said tower.

4,047,907

DUST SEPARATOR APPARATUS

Filip Knutsson, and Lars Bergström, both of Vaxjo, Sweden, assignors to AB Svenska Flaktfabriken, Nacka, Sweden

Filed Nov. 26, 1975, Ser. No. 635,272
Claims priority, application Germany, Dec. 4, 1974, 2457255
Int. Cl.² B03C *3/41*
U.S. Cl. 55—147 **14 Claims**



1. In a discharge electrode assembly comprising a holder, a discharge electrode, and securing means for securing an end of said electrode to said holder, the improvement wherein

said discharge electrode has a dove-tail shaped end which has flared angled edges which are angled about a longitudinal axis therein to form a dihedral angle in cross section, and

said securing means comprises a bifuracated shoe, for receiving and holding said dove-tail end of said electrode,

said shoe comprising a web and a pair of spaced-apart legs, said legs extending generally in the same direction from opposite ends of said web, one side edge of said web and one side edge of said legs being affixed to said support member,

the transitions between each of said legs and said web forming opposed internal channels for receiving and retaining the flared angled edges of said dove-tail end, said channels extending at substantially the same angle as the corresponding ones of said flared edges,

whereby said electrode can be installed by slipping said flared angled edges between said legs and into a position between said channels and then urging said electrode longitudinally to establish mating contact between said flared angled edges and said channels.

4,047,908

GAS SEPARATION MEMBRANE

Edward F. Steigelmann, and Robert D. Hughes, both of Park Forest, Ill., assignors to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 365,203, May 30, 1973, Pat. No. 3,865,890, which is a continuation-in-part of Ser. No. 335,012, Feb. 23, 1973, abandoned. This application Aug. 14, 1974, Ser. No. 497,481
Int. Cl.² B01D *53/22*
U.S. Cl. 55—158 **10 Claims**

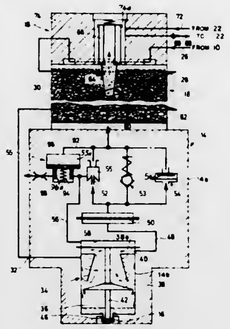
1. A hydrophilic, semi-permeable, water-insoluble, film membrane comprising a grafted copolymer consisting essentially of nylon having polyvinyl alcohol grafted thereto, said membrane having therein a metal component which in the presence of water will provide cations that are capable of forming a complex with aliphatically-unsaturated hydrocarbons.

4,047,909

VALVE SYSTEM PARTICULARLY FOR APPARATUS FOR PRODUCING DRY COMPRESSED AIR

Hans-Joachim Hofmann, Geradstetten, Germany, assignor to Durr-Dental KG., Germany

Filed Apr. 18, 1975, Ser. No. 569,449
Claims priority, application Germany, Apr. 20, 1974, 2419177
Int. Cl.² B01D *35/00*
U.S. Cl. 55—184 **19 Claims**



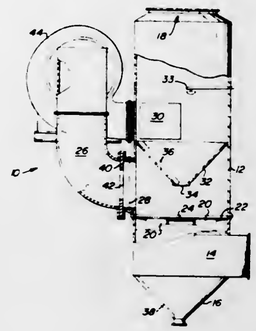
14. In a system for producing dry compressed gas, comprising means for supplying compressed gas, means for storing dry compressed gas, liquid separator means, filter means including adsorption filter means and having an inlet, and first passage means connecting said separator means and filter means sequentially between said supply means and said storing means for communication therewith; the improvement comprising a pneumatic valve control system in combination with said separator means, said separator means and valve control system comprising housing means providing a cavity, a flexible diaphragm dividing said cavity into an upper chamber and a lower chamber having an inlet and an outlet, said first passage means including means connecting said inlet of said lower chamber with said supply means, baffle means disposed in said lower chamber between said inlet and outlet for separating liquid from said gas, said liquid collecting in said lower chamber, a tap opening in the bottom of said lower chamber, valve means associated with said tap opening and movable between an open position for opening said tap opening and a closed position for closing said tap opening, means connecting said valve means with said diaphragm for movement by said diaphragm between open and closed position, a suction ejection nozzle having a suction chamber in which a reduced pressure is produced by flow of gas through said nozzle, said first passage means further including means connecting said suction ejection nozzle between said outlet of said lower chamber and said inlet of said filter means in communication therewith so that said gas flowing through said suction ejection nozzle in flowing from said separator means to said filter means produces a reduced pressure in said suction chamber, second passage means connecting said suction chamber of said ejection nozzle with said upper chamber in communication therewith to provide a pressure differential on said diaphragm to deflect said diaphragm when there is a flow of said gas at a predetermined rate through said nozzle and thereby move said valve means to closed position, said valve means being biased to open position when said diaphragm is not thus deflected, whereby said valve means is maintained in closed position by said diaphragm to close said tap opening when said gas is supplied by said supply means and flows through said separator means, valve control system and filter means to said storing means, and is moved to open position, when said gas is not so supplied, to open said tap opening to drain said collected liquid from said lower chamber and to permit back flow of said gas from said storing means through said filter means to regenerate said adsorption filter means.

4,047,910

APPARATUS FOR COLLECTING FINE PARTICLES

Harry Krockta, E. Northport, N.Y., assignor to The Ducon Company, Inc., Mineola, N.Y.

Filed May 21, 1976, Ser. No. 688,801
Int. Cl.² B01D *47/10*
U.S. Cl. 55—235 **2 Claims**



1. Apparatus for collecting fine particles from a gas stream including an upright elongated generally cylindrical scrubber having a means for introducing a scrubbing liquid, a tangential gas inlet for dust laden gas in the bottom portion of said scrubber, radially extending baffle means at an elevation in said scrubber above the elevation of said gas inlet, said baffle means including a plurality of inclined vanes forming passageways for imparting rotary motion to gas introduced through said gas inlet, a duct having its entrance and exit communicating with said scrubber, said duct entrance being above the elevation of said vanes, said duct exit being at an elevation above the elevation of said duct entrance, dynamic separation and impelling means in said duct including a rapidly rotating means an orifice plate in said duct for reducing the cross-sectional area of said duct by a substantial amount to create turbulence and improved contact between said scrubbing liquid and said particles in said duct upstream of said impelling means, said duct

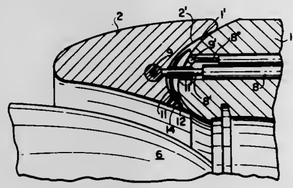
being of uniform cross section between said plate and said impelling means, and said scrubber having a clean gas outlet above the elevation of said duct exit.

4,047,911

AIR INTAKE WITH DEFLECTING DEVICE AGAINST FOREIGN OBJECTS IMPINGING IN THE INITIAL DIRECTION OF AIR FLOW AT ENGINE NACELLES

Hubert Krojer, Kippenhausen, Germany, assignor to Dornier GmbH, Germany

Continuation of Ser. No. 440,576, Feb. 7, 1974, abandoned. This application Dec. 30, 1974, Ser. No. 537,447
Claims priority, application Germany, Apr. 12, 1973, 2318380
Int. Cl.[2] B01D *46/00*
U.S. Cl. 55—306 5 Claims



1. In an air intake for an aircraft engine, particularly a propjet engine, which intake is annular at the forward part thereof and has a central, non-rotatable body with a convex surface mounted in said intake,

the improvement which comprises displaceable annular inlet lip means, having a concave inner surface, on said intake,

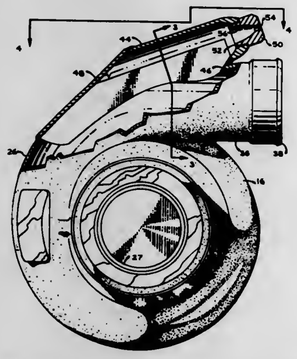
said lip means being diplaceable to sealing contact against said central body and against the direction of air onflow, whereby a first air inflow channel is closed to air and a second air inflow channel behind said lip means is opened to air, said latter channel having an opening pointing away from the direction of air onflow.

4,047,912

TURBOCHARGER AND AIR CLEANER DEVICE

R. Donald Markland, Menlo Park, Calif., assignor to Consolidated Freightways, Inc., San Francisco, Calif.

Filed June 11, 1976, Ser. No. 695,070
Int. Cl.[2] B01D *45/00*
U.S. Cl. 55—406 5 Claims



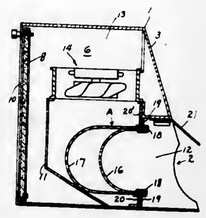
1. An air cleaner and turbocharger device comprising a turbocharger housing including an inlet and enclosing a rotary impeller, said housing being a volute-shaped diffuser into which air is compressed by the impeller, said diffuser having a tangential gas discharge port, means forming a collection spout extending outwardly from the periphery of the diffuser and the gas discharge port for trapping and collecting foreign matter carried in a stream of air rotating within the diffuser, and a nozzle mounted in the discharge end of the spout, said nozzle being formed with an opening sized larger than said foreign matter for expelling the collected foreign matter from the spout, said opening being sized substantially less than the diameter of the collection spout for restricting air leakage through the nozzle for minimizing pressure loss within the diffuser and thereby maintaining boost pressure in the discharge port of the diffuser.

4,047,913

DUST COLLECTOR FOR DENTAL TECHNICIAN

Sosuke Okumura, Musashimurayama, Japan, assignor to Yutaka Denki Saisakusho, Tokyo, Japan

Filed June 17, 1976, Ser. No. 697,257
Claims priority, application Japan, Jan. 8, 1975, 50-107505
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—418 10 Claims



1. A dust collector for use by a dental technician, the collector comprising: a housing having a dust inlet at one side thereof and an air outlet at another side thereof; a porous outlet filter positioned adjacent said air outlet; partition wall means in said housing to divide the interior thereof into a suction portion which communicates with said dust inlet and an exhaust portion which communicates with said air outlet via said outlet filter; an electric fan assembly mounted between said suction portion and said exhaust portion to cause air flow from said suction portion to said exhaust portion; a first concave grating of given length in said suction portion facing said dust inlet; at least one second concave grating having a length greater than said given length in said suction portion behind said first grating, top and bottom edge portions of said first and second gratings being in superimposed relationship; means clampingly receiving said superimposed edge portions of said gratings, and cooperating means on said clamping means in said suction portion for positioning said gratings in said suction portion across said dust inlet.

4,047,914

INTERNALLY SUPPORTED MULTI-STAGE SLEEVE FILTER

Elwood F. Hansen, Allendale; Arnold Goldberg, Fair Lawn; Henry Zenzie, Princeton, and Kermit Giroward, Scotch Plains, all of N.J., assignors to Drico Industrial Corporation, Wallington, N.J.

Filed Sept. 27, 1976, Ser. No. 727,204
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—488 9 Claims

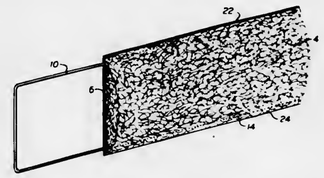
1. A self-supporting, self-gasketing, multi-stage, variable density fiber glass sleeve filter of rectangular configuration comprising:

a. a rigid, rectangular, internal reusable wire frame;

b. a composite, low velocity, fluid entry filter member on one side of said frame having a first fluid permeable, puffed glass fiber outer filter layer and a second fluid permeable, puffed glass fiber inner filter layer contiguous with said first filter layer and positioned inwardly thereof;

c. said first fluid permeable filter layer defining the fluid entry surface of the filter and having a thickness and density less than the thickness and density of said second fluid permeable filter layer;

d. a fluid egress member disposed on the other side of said frame comprising a flat, fibrous surfacing mat having a thickness less than the thickness of either of the layers of said entry filter;



e. said entry filter member and said egress filter member each extending transversely beyond the longitudinal edges of said frame and being joined to one another by stitching exteriorly of said frame along longitudinal edge portions on opposed sides thereof so as to form an open ended sleeve that can be slid on and off of said reusable frame; and

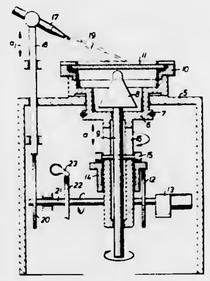
f. said sleeve being dimensional such that when it is slid onto said frame, the fluid entry layer is tensioned across said wire frame and assumes an outwardly curved configuration with respect to said fluid egress member, said fluid egress member lying flat and tensioned across said frame.

4,047,915

METHOD OF MANUFACTURING GLASS VACUUM ENVELOPES

Klaus Schaffernicht, Herrlingen; Josef Hentrich, Ulm; Herbert Klein, Ulm, and Karl-Heinz Kuckenburg, Ulm, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed June 23, 1976, Ser. No. 698,818
Claims priority, application Germany, June 26, 1975, 2528421
Int. Cl.[2] C03B *23/02*
U.S. Cl. 65—106 15 Claims



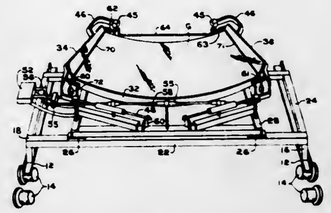
1. A method of manufacturing vacuum casings or vacuum casing parts made of glass for electronic valves, particularly cathode ray tubes, in which a substantially plane glass plate is heated beyond the softening point and is deformed by means of an appropriately moulded stamp, characterised in that said glass plate is clamped at the circumference at least at several points; that the free part of said glass plate is heated; that when said glass plate begins to soften, said stamp is pressed against said glass plate perpendicular to the plane of extension of said glass plate; that said stamp is moved on in the pressing direction relative to said clamping points with further supply of heat at the same time, wherein the glass of said plate substantially abuts the end surface and the side surfaces of said stamp while at the same time the thickness of said glass becomes thinner; and that after at least partial cooling of the moulded glass body has taken place, and after removal of said stamp and release of the clamping points, at least the edge which has been formed by clamping is removed.

4,047,916

METHOD AND APPARATUS FOR BENDING GLASS SHEETS TO DOUBLE V-BENDS

Thomas J. Reese, Sarver; James R. Mortimer, Natrona Heights; Melvin W. Tobin, New Kensington, and Stephen J. D. Jursa, Saxonburg, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 21, 1976, Ser. No. 725,054
Int. Cl.[2] C03B *23/02*
U.S. Cl. 65—106 8 Claims



1. A sectionalized bending mold of the outline type for supporting glass sheets during sag bending the glass to a double V-type of bend including two lines of sharp bending comprising a mold support structure, an outline mold of concave elevation having an upward facing shaping surface of outline configuration formed by the upper shaped edge surfaces of a plurality of shaping rail sections including a pair of longitudinally extending, laterally spaced shaping rail portions forming a central mold section supported on said mold support structure, a pair of bearing housings supported by said mold support structure in laterally spaced relation to define a transversely extending line between said bearing housings, an end mold section pivotably mounted for rotation about each said pair of said bearing housings between a flat glass loading position and a closed mold position in which the upper shaped edge surfaces of said end mold sections form continuations of the upper edge surface of the longitudinal extremities of said shaping rail portions of said center section, said shaping rail portions of said section terminating in longitudinal extremities lying in a common plane to provide a common plane of support for a flat glass sheet, each longitudinal extremity of each elongated shaping rail portion of the central mold section being aligned with a corresponding longitudinal extremity of the other shaping rail portion of said central mold section along a transverse line, a contact electrode supported on and insulated from said mold support structure and located laterally outside each longitudinal extremity of each said longitudinally extending shaping rail portion and having a surface for slideably supporting a ribbon slightly above said transverse line and aligned therewith, and means carried by the mold support structure in insulated relation to said mold and mold support structure adapted for electrical connection to a source of electrical potential at one end and to said electrodes at the other end, a removable, flexible electroconductive ribbon movably supported on the said surface of each said laterally spaced pairs of electrodes and bridging the space between said laterally spaced electrodes of each said pair of electrodes, and weight means attached to said ribbon laterally outside each said electrode to

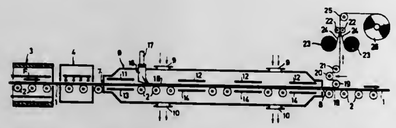
support said ribbon in sliding relation to said surfaces of said electrodes and to prevent sagging of said ribbon between said electrodes, whereby said ribbon is maintained out of contact with said glass during sag bending.

4. A method of bending glass sheets to a sharp bend of double-V configuration including sharply bent end portions adjacent each of the longitudinal extremities thereof, said method comprising mounting a pair of glass sheets in superimposed aligned relation to one another over a sectionalized bending mold having a center mold section comprising longitudinally extending rail portions and end mold sections pivotably mounted with respect to said center mold section so that said glass sheets are supported on said longitudinal extremities of the center mold section and on the outer longitudinal extremities of said end mold sections, mounting a flexible, electroconductive ribbon in closely spaced relation over the glass sheets along a line aligned with each line of sharp bending desired for the glass sheet after bending, tensioning the flexible electroconductive ribbons so that they are maintained along lines transverse to said mold and spaced a short distance above the upper surface of the upper glass sheet along the lines desired for sharp bending, slidably supporting the flexible, electroconductive ribbons on contact electrodes supported on and insulated from said mold support structure, each electrode being located beyond an end of the lines of sharp bending and having a surface for slidably supporting one of said ribbons disposed slightly above the upper surface of the upper sheet of said pair, heating the glass sheets to their deformation temperature, and applying electrical current to said flexible, electroconductive ribbons by way of said electrodes to increase the heating along the lines of sharp bending when the overall temperature of the glass approaches its deformation temperature so that said glass sheets sag sharply along said transversely extending lines of sharp bending to conform to the shaping surface of said mold and the end mold sections pivot to form a continuous shaping surface conforming in elevation and outline to the shape desired for the glass sheet sagged onto said mold.

4,047,917
APPARATUS FOR THE MANUFACTURE OF PLASTICS FILM BY CASTING ON A FLOATING GLASS RIBBON

Pierre Rene Heymes, Paris, France, and Rudolf Pelzer, Herzogenrath, Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Division of Ser. No. 541,099, Jan. 15, 1975, Pat. No. 3,990,876. This application Sept. 20, 1976, Ser. No. 725,120
Int. Cl.[2] C03B 13/14, 18/02
U.S. Cl. 65—146 7 Claims

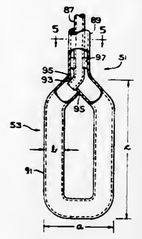


1. Apparatus for making sheets of transparent plastics material having high optical quality, which comprises fabrication means for making a ribbon of glass by the float glass process, means for continuously transporting the glass ribbon in a horizontal direction from the fabrication means, means for cooling the ribbon after the ribbon leaves the fabrication means, a coating head for depositing a liquid composition capable of solidifying to form a solid plastics sheet on the upper surface of the cooled transported ribbon, and means for removing the plastics sheet as a continuous strip.

4,047,918
WATER COOLED GLASS STIRRER

Robert B. Helthoff, Wichita Falls, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 2, 1976, Ser. No. 711,017
Int. Cl.[2] C03B 5/18
U.S. Cl. 65—179 7 Claims



1. In a horizontal glassmaking furnace for melting, refining and conditioning glass for discharge to a flat glass forming process comprising a melter and a refiner joined through a waist having substantially less width than either the melter or refiner and including a plurality of glass stirring means positioned in the furnace waist for homogenizing molten glass passing through the waist prior to being conditioned for discharge, the improvement which comprises

a transverse row of at least four mixing paddles, each rotatably mounted for rotation about its axis, wherein

each mixing paddle includes an axial section comprising two coaxial iron or steel pipes, an inner pipe and an outer pipe, having an annular space between them and a mixing end section comprising an open bent loop having at the upper ends thereof inlet and outlet openings, said bent loop extending below said coaxial inner and outer pipes and said bent loop being connected to the ends of coaxial pipes for providing flow of coolant substantially throughout the length of the annular space; of the inner pipe and of the bent loop,

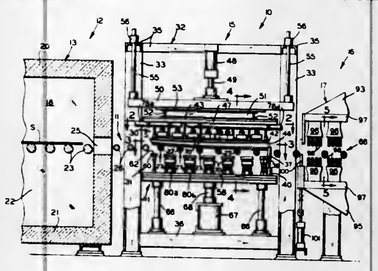
means for rotating said mixing paddles, and

means for supplying coolant to said paddles during their rotation.

4,047,919
APPARATUS FOR PRESS BENDING RELATIVELY THIN GLASS SHEETS

Waldemar W. Oelke, Rossford, and Floyd T. Hagedorn, Oregon, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed June 23, 1975, Ser. No. 589,020
Int. Cl.[2] C03B 23/02
U.S. Cl. 65—273 6 Claims



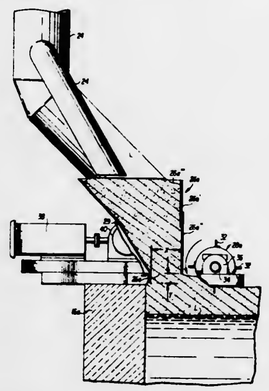
1. Apparatus for bending and heat treating relatively thin

glass sheets comprising: means including a furnace for heating a flat sheet of glass to substantially the softening point thereof, means including spaced conveyor rolls for supporting and conveying said heated sheet in a horizontal plane and moving the same in a generally horizontal path from said furnace toward and between opposed lower and upper horizontally disposed press members located exteriorly of said furnace and having complemental shaping surfaces, said lower press member having a shaping rail constituting the shaping surface thereof and formed of a plurality of spaced apart segments permitting passage of said shaping rail past said conveyor rolls upon vertical movement relative thereto, a plurality of heating elements detachably mounted on said lower press member for applying supplemental heat to said sheet while the latter is being advanced horizontally between said press members whereby the sheet is substantially continuously heated while conveyed from said furnace to a desired bending position between said press members, means on said lower press member interrupting advancement of said sheet in a desired position between said press members, and means for moving said lower press member toward the other for lifting said sheet from said conveyor rolls and pressing said sheet into shape between said complemental shaping surfaces, said heating elements movable along with said lower press member to maintain a constant spacing between said heating elements and said sheet upon vertical movement of said lower press member, said heating elements being arranged in spaced rows extending generally parallel to the axes of said conveyor rolls and offset therefrom to provide clearance for said rolls upon vertical movement of said lower press member.

4,047,920
APPARATUS FOR CHARGING AN ELECTRIC GLASS FURNACE AND METHOD OF COMPLETELY DISTRIBUTING GLASS BATCH OVER THE SURFACE OF MOLTEN GLASS IN AN ELECTRIC GLASS FURNACE

Thomas M. Armstrong, Chattanooga, Tenn., assignor to Chattanooga Glass Company, Chattancoga, Tenn.

Filed Aug. 5, 1976, Ser. No. 711,867
Int. Cl.[2] C03B 3/00, 13/00
U.S. Cl. 65—335 9 Claims



1. An apparatus for charging an electric glass furnace having opposing end walls and opposing sidewalls, said apparatus comprising:

stationary means for discharging a gravitating bed of glass batch onto the surface of molten glass in the furnace along one end wall thereof in a zone extending substantially from one sidewall to the other, and

two pushers parallel and adjacent to but spaced from the said stationary means for pushing succeeding portions of the batch resting on the molten glass along the surface of said molten glass toward the opposing end wall, said pushers being substantially axially aligned but axially spaced from each other and from said sidewalls.

4,047,921
TREATING MICRO-NUTRIENT DEFICIENCIES IN PLANTS

Volker Mues, Wuppertal, and Johannes Niggemann, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 18, 1976, Ser. No. 668,151
Claims priority, application Germany, Mar. 22, 1975, 2512816; Nov. 13, 1975, 2550935
Int. Cl.[2] C05F 11/00
U.S. Cl. 71—11 8 Claims

1. A method of supplying plants with micro-nutrients, which comprises applying to the plants or a plant habitat, an effective amount of a prussiate of the formula

$$M_a[Fe(CN)_5X]_b$$

in which

M is an alkali metal ion, alkaline earth metal ion, heavy metal ion, ammonium ion or hydrogen,

X is a group which can occupy the sixth coordination position on the iron, or a suitable organic radical,

a is 2, 3, 4 or 5, and

b is 1, 2 or 3.

4,047,922
SLOW RELEASE COMPOSITION COMPRISING SLACK WAX-UREA ADDUCT

Walter Van Neste, St. Amandsberg, Belgium, assignor to S.A. Texaco Belgium N.V., Brussels, Belgium

Filed Mar. 8, 1976, Ser. No. 664,447
Int. Cl.[2] C05C 9/00
U.S. Cl. 71—28 4 Claims

1. A slow release fertilizer composition adapted for use on dry, desert-type soils comprising a solvent-dewaxes slack wax-urea adduct having a wax-to-urea ratio of about 1 to 5 containing from 92.5 to 60 percent by weight of urea, balance wax, said adduct containing no more than about 0.1 weight percent of solvent, said wax having a melting point such as to melt under solar radiation to slowly release said urea and form a biodegradable protective layer against wind erosion and water loss from said soils.

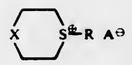
4,047,923
HETEROCYCLIC SULFONIUM SALT CONTAINING PLANT-GROWTH REGULANT COMPOSITIONS

Klaus Naumann, Cologne; Klaus Lurssen, Grosskoenigsdorf, and Klaus Sasse, Schildgen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 476,760, June 5, 1974. This application June 18, 1975, Ser. No. 588,083
Claims priority, application Germany, June 19, 1973, 2331185
Int. Cl.[2] A01N 5/00
U.S. Cl. 71—76 9 Claims

1. Plant-growth regulant composition containing from 0.1 to 95% of a heterocyclic sulfonium salt of the formula

(I)



in which

R is methyl;

A^- is one equivalent of an anion of a chlorine or methyl sulfate; and

X is the group $N^+R'R''A^-$ in which

A⁻ is identified as above; and
R' and R", which may be identical or different, are each methyl; and at least one plant-growth regulatingly acceptable inert carrier.

4,047,924
REGULATING PLANT GROWTH
Keith Peter Parry, Maidenhead, and Edwin Francis George, Eversley, near Basingstoke, both of England, assignors to Imperial Chemical Industries Limited, London, England
Filed Nov. 21, 1975, Ser. No. 634,181
Claims priority, application United Kingdom, Nov. 28, 1974, 51571/74
Int. Cl.² A01N 9/22
U.S. Cl. 71—76 5 Claims

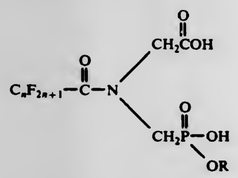
1. A method of regulating the growth of, or killing, plants, which method consists essentially of applying to said plants an indole compound which is 7 - chloro - or bromo - indole, said compound being applied in an amount sufficient at least to stunt, or kill, said plants.

4,047,925
ALKANE DIOLS AS CHEMICAL PINCHING AGENTS
Sol J. Barer, Clark, N.J., assignor to Celanese Corporation, New York, N.Y.
Filed Oct. 14, 1975, Ser. No. 621,893
Int. Cl.² A01N 9/24
U.S. Cl. 71—78 9 Claims

1. A method for the inhibition of suckering in growing plants susceptible thereto comprising the application of an amount of a composition comprising an active agent consisting essentially of an alkane diol having 2 to 6 carbon atoms inhibitory to the growth of meristematic tissue.

4,047,926
TREATMENT OF SUGARCANE WITH N-(PERFLUOROACYL)-N-PHOSPHONOMETHYL GLYCINE
Melvin L. Rueppel, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.
Continuation-in-part of Ser. No. 580,252, May 23, 1975, Pat. No. 3,970,695. This application May 3, 1976, Ser. No. 682,297
Int. Cl.² A01N 9/36
U.S. Cl. 71—86 4 Claims

1. A process for modifying the ripening of sugar cane plants so as to increase its yield of sucrose which comprises contacting the sugar cane with an effective amount of a compound of the formula



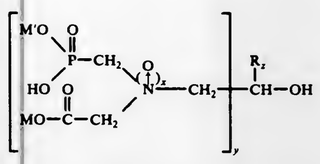
wherein R is a member of the group consisting of H and



and *n* is an integer of from 1 to 4.

4,047,927
N-(2-HYDROXYALKYL) DERIVATIVES OF N-PHOSPHONOMETHYLGLYCINE AND THE HERBICIDAL USE THEREOF
Van R. Gaertner, Ballwin, and Philip C. Hamm, Glendale, both of Mo., assignors to Monsanto Company, Saint Louis, Mo.
Filed Aug. 13, 1976, Ser. No. 714,054
Int. Cl.² A01N 9/36
U.S. Cl. 71—86 7 Claims

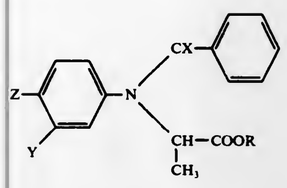
1. A herbicidal method which comprises contacting a plant with a herbicidally effective amount of a compound of the formula



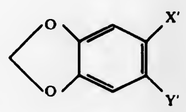
wherein *x* is selected from zero and one, *y* is selected from one and two, *z* is selected from zero and one, the sum of *y* + *z* is two, R is selected from hydrogen, methyl, ethyl, hydroxymethyl and lower alkoxymethyl, M is selected from hydrogen, lower alkyl and alkali metal, and M' is selected from hydrogen, lower alkyl, phenyl and alkali metal.

4,047,928
WILD OAT HERBICIDE MIXTURE
Richard P. M. Bond, Sittingbourne; Robert J. Pryce, Faversham; Clive A. Raven, Sittingbourne, and Michael A. J. Venis, Faversham, all of England, assignors to Shell Oil Company, Houston, Tex.
Filed June 21, 1976, Ser. No. 698,612
Claims priority, application United Kingdom, June 30, 1975, 27483/75
Int. Cl.² A01N 9/02
U.S. Cl. 71—88 12 Claims

1. A herbicidal composition comprising as active ingredient an N,N-disubstituted alanine derivative having the following general formula:



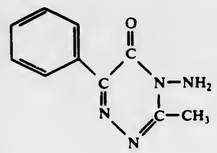
wherein Y and Z each represent, fluorine or chlorine, X is oxygen or sulfur; and R is hydrogen or an alkyl group containing up to 6 carbon atoms; and as a synergist therefor, a methylenedioxybenzene derivative having the following general formula:



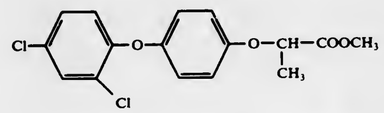
wherein X' is a polyglycol ether group containing up to 20 carbon atoms and 2 to 6 oxygen-ether linkages and Y' is hydrogen or an alkyl group containing up to 6 carbon atoms, said alanine derivative and methylenedioxybenzene derivative being present at a weight ratio of the alanine derivative to the methylenedioxybenzene derivative of from 10:1 to 1:10.

4,047,929
SYNERGISTIC HERBICIDAL COMPOSITIONS
Robert R. Schmidt, Cologne; Ludwig Eue, Leverkusen, and Wilfried Draber, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed July 21, 1976, Ser. No. 707,456
Claims priority, application Germany, Aug. 21, 1975, 2537290
Int. Cl.² A01N 9/22
U.S. Cl. 71—93 10 Claims

1. A herbicidal composition containing as active ingredients, in herbicidally effective amounts, (1) 3-methyl-4-amino-6-phenyl-1,2,4-triazin-5-one of the formula



and (2) a 4-phenoxy-phenoxy-alkanecarboxylic acid of the formula

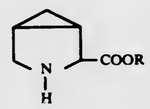


wherein the weight ratio of compound (1) to compound (2) is from about 1:1 to about 2:1.

4,047,930
METHOD OF STERILIZING MALE ANTHERS
Michael W. Kerr, Borden, England, assignor to Shell Oil Company, Houston, Tex.
Filed Sept. 7, 1976, Ser. No. 721,001
Claims priority, application United Kingdom, Sept. 16, 1975, 38011/75
Int. Cl.² A01N 9/22
U.S. Cl. 71—95 4 Claims

1. A method of sterilizing male anthers in plants which comprises treating the plants with an amount effective to sterilize said anthers of a heterocyclic compound having the following general formula:

(I)



wherein R represents a hydrogen atom, an alkali metal, an alkaline earth metal, ammonium, alkylammonium the alkyl groups or groups of which preferably each contain up to 6 carbon atoms, or an alkyl group of up to 4 carbon atoms.

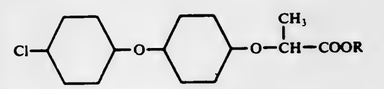
4,047,931
PROCESS FOR THE CONTROL OF PLANT METABOLISM
Otto Rohr, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Division of Ser. No. 462,146, April 29, 1974, Pat. No. 3,944,411, which is a division of Ser. No. 239,328, March 29, 1972, Pat. No. 3,821,285. This application Dec. 8, 1975, Ser. No. 638,409
Claims priority, application Switzerland, Apr. 1, 1971, 4775/71
Int. Cl.² A01N 9/24
U.S. Cl. 71—107 1 Claim

1. A process for the promotion of fruit abscission which comprises applying to the fruit-bearing plant or to the fruit itself an effective, non-phytotoxic amount of 3-acetoxybenzoic acid -(2'-iodoethyl)-ester.

4,047,932
HERBICIDAL AGENTS
Konrad Albrecht, Fischbach, Taunus; Peter Langeluddeke, Diedenbergen, Taunus; Hans Schumacher, Weilbach, Taunus, and Friedhelm Schwerdtle, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Filed June 4, 1975, Ser. No. 583,514
Claims priority, application Germany, June 6, 1974, 2427270
Int. Cl.² A01N 9/20
U.S. Cl. 71—108 5 Claims

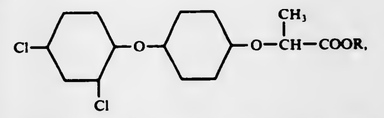
1. A herbicidal preparation comprising, as the active ingredient, a herbicidally effective amount of a mixture of 1.5 to 5 parts by weight of a compound selected from the group of compounds of the formulas

A



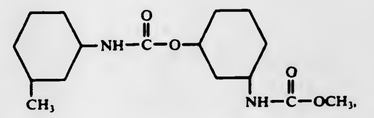
and

B



wherein R is hydrogen or alkyl having 1 to 6 carbon atoms, and 1 part by weight of 3-methoxy-carbonylaminophenyl-N-(3'-methylphenyl)-carbamate of the formula

C

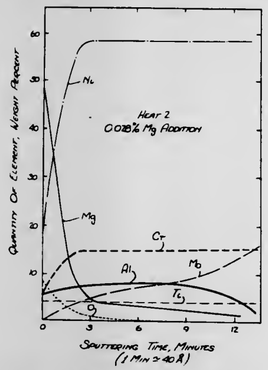


in combination with formulation auxiliaries.

4,047,933
POROSITY REDUCTION IN INERT-GAS ATOMIZED POWDERS
Jay Michael Larson, Warwick; Ian Sidney Rex Clark, Greenwood Lake, both of N.Y., and Robert Cameron Gibson, Ringwood, N.J., assignors to The International Nickel Company, Inc., New York, N.Y.
Filed June 3, 1976, Ser. No. 692,312
Int. Cl.² B22D 23/08
U.S. Cl. 75—.5 C 14 Claims

1. A process for substantially reducing gas entrapment in an

inert gas atomized metal powder comprising: melting a metal alloy, activating said metal alloy by addition of from about 0.001 to about 0.1% by weight of an activating agent, selected



from the group consisting of magnesium, calcium, lithium, silicon, and rare earths and atomizing said metal alloy containing said activating agent by contact with a high velocity inert gas.

4,047,934

BENEFICIATION OF THE NON-FERROUS METAL VALUES OF OXIDE-CONTAINING MATERIALS

Leslie John Pollard, Lower Templestowe, and Donald Fergusson Stewart, Doncaster, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed May 4, 1976, Ser. No. 683,242
Claims priority, application Australia, May 7, 1975, 1512/75
Int. Cl.[2] C21B *3/04*; C22B *7/00, 9/14*
U.S. Cl. 75—29 **10 Claims**

1. In a process of removing iron from an oxide containing material comprising iron oxide in the presence of a non-ferrous metal oxide wherein the iron oxide in the oxide containing material is selectively reduced to iron while leaving non-ferrous metal oxide substantially unreduced, the improvement whereby segregation of the iron thus obtained is enhanced, said improvement comprising heating said oxide-containing material with a solid carbonaceous material in a bath of molten salt to a temperature in the range from 750° to 1300° C, wherein said salt comprises at least one chloride selected from the group consisting of alkali metal chlorides and alkaline earth metal chlorides.

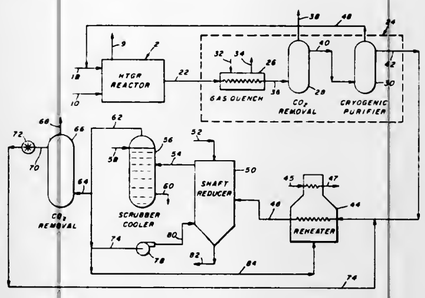
4,047,935

PROCESS FOR DIRECT-REDUCTION OF IRON-ORE EMPLOYING NUCLEAR REACTOR-POWDERED CATALYTIC REFORMER

Thomas F. Barnhart, O'Hara Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 11, 1974, Ser. No. 531,829
Int. Cl.[2] C21B *13/00*; C07C *1/02*
U.S. Cl. 75—34 **14 Claims**

1. A process for the direct-reduction of iron ore, said process comprising:
   a. passing iron-ore pellets or lump iron ore into the top of the shaft reducer;
   b. producing a reducing gas for introduction into the lower half of said shaft reducer in counter current flow to the pellets, said reducing gas being produced from a fluid, selected from the group consisting of gaseous and light hydrocarbon liquids, which is passed to a catalytic reformer operated at a pressure of from about 200 to about 700 psig, said catalytic reformer being heated by indirect exchange through a reactant coolant loop connected to a high-temperature gas-cooled nuclear reactor operated at a pressure of about 200 to 700 psig and a corecoolant temperature of less than about 1650° F and having a reactant selected from the group consisting of H_2O, CO_2, and mixtures thereof, passed into said reformer in an amount sufficient to (i) react with the fluid to produce a product gas containing hydrogen and carbon monoxide in a sum of from about 50 to about 97 percent, and from about 5.5 to about 34 percent by volume (dry basis) of unreacted hydrocarbon and (ii) inhibit carbon deposition on the catalyst, collecting said gas produced from said reformer, removing a sufficient amount of unreacted hydrocarbon, carbon dioxide and H_2O to render the gas acceptable for direct-reduction, said unreacted hydrocarbon being re-



moved to a level of less than about 5 percent by volume (dry basis), said removal resulting in cooling said gas;
   c. then passing at least a portion of said gas through a reheated to heat said gas to a temperature between about 1400° to about 1800° F;
   d. passing said reheated gas into the lower portion of said shaft reducer to reduce the oxygen content of said iron-ore pellets or said lump iron ore to produce iron pellets or sponge iron;
   e. passing a cooling gas into said shaft near the bottom thereof to cool said reduced iron pellets or sponge iron prior to discharge from said shaft reducer; and
   f. discharging said iron pellets or sponge iron from said shaft reducer.

4,047,936

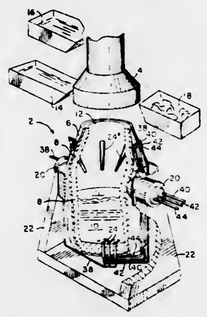
PROCESS FOR REFINING HOT METAL TO STEEL

Yi-Chung Chang, Murrysville, Pa., assignor to Berry Metal Company, Harmony, Pa.

Division of Ser. No. 347,743, April 4, 1973, Pat. No. 3,912,243. This application July 25, 1975, Ser. No. 599,197
Int. Cl.[2] C21C *5/32, 5/30*
U.S. Cl. 75—52 **4 Claims**

1. The process of making steel in a bottom-blow converter which is provided in the top thereof with a burner lance supplying oxygen for heat of combustion in the top at the converter whereby the converter may be charged with pig iron and scrap, the steps of the process comprising:
   1. charging of scrap through the top of the converter,
   2. bottom blowing of oxygen with a shield gas over said scrap thereby oxidizing impurities in the vessel generating a combustible gaseous product,
   3. simultaneously top blowing with said burner lance of oxygen into said converter for burning with said combustible gases for producing heating of said scrap to molten metal,
   4. charging said molten metal with pig iron supplied to said converter,
   5. continuing the bottom and top blowing of oxygen with the said blowing decarbonizing said molten bath,

   6. charging of lime and other fluxes into said converter, said bottom blowing of said oxygen and top blowing combining with said combustible gases for producing heat at the top of the molten bath, and
   7. discharging steel and slag from said converter.



4,047,937

METHOD FOR CONTROLLING THE OPERATION OF A STEEL REFINING CONVERTER

William A. Kolb, Forest Hills Borough, and Pete Vignovich, Bethel Park Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 312,173, Dec. 4, 1972, Pat. No. 3,895,785, which is a continuation-in-part of Ser. No. 277,017, Aug. 1, 1972, abandoned. This application May 5, 1975, Ser. No. 574,838
Int. Cl.[2] C21C *7/00*
U.S. Cl. 75—59 **5 Claims**

1. The method of operating a tiltable steel refining converter of the type having at least one tuyere therein positioned below the molten metal level in the converter, said tuyere consisting of a center jet positioned within an annulus jet, comprising the steps of
   a. tilting said converter onto its side,
   b. blowing first and second purging gases at a predetermined pressure through the center and annulus jets of said tuyere respectively,
   c. placing a charge within said converter,
   d. increasing the pressure of the purging gases being blown through said center jets,
   e. tilting said converter to an upright position,
   f. blowing oxygen and a fuel through said center and annulus jets respectively while continuing to blow said first and second purging gases through said jets,
   g. shutting off said first and second purging gases from the jets of said tuyere once the flow of oxygen and fuel has been established until the refining of said charge is completed,
   h. blowing said first and second purging gases through said center and annulus jets while continuing to blow oxygen and fuel through said center and annulus jets respectively,
   i. shutting off the oxygen and the fuel from the jets of said tuyere once the flow of said first and second purging gases has been established,
   j. tilting said converter to an approximately horizontal position,
   k. reducing the pressure of the purging gases being blown through said tuyere, and
   l. removing the refined steel from said converter.

4,047,938

PROCESS FOR REFINING MOLTEN METAL

Andrew Geza Szekely, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 536,954, Dec. 23, 1974, Pat. No. 3,980,742, which is a continuation-in-part of Ser. No. 323,785, Jan. 15, 1973, Pat. No. 3,870,511, which is a division of Ser. No. 211,950, Dec. 27, 1971, Pat. No. 3,743,263. This application June 18, 1976, Ser. No. 697,466
The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.
Int. Cl.[2] C22B *45/00*
U.S. Cl. 75—67 A **12 Claims**



1. A process for refining a molten metal selected from the group consisting of magnesium, copper, zinc, tin and lead comprising the steps of:
   a. feeding the molten metal into a refining zone;
   b. maintaining a protective atmosphere above the surface of said molten metal at a greater than atmospheric pressure, thereby preventing contact of the melt with air or atmospheric moisture;
   c. providing a gas injection device submerged in said molten metal comprising (i) a shaft fixedly attached to a vaned rotor at its lower end, (ii) a stationary sleeve surrounding said shaft, and (iii) a passageway for conveying and discharging refining gas into the molten metal running the length of said gas injection device;
   d. introducing a refining gas into the upper end of said passageway under sufficient pressure to be injected into the melt;
   e. preheating the refining gas by contact thereof with the hot walls of the passageway, whereby the gas is expanded, before being sub-divided into gas bubbles, to the point where thermal growth of said bubbles in the melt is substantially prevented;
   f. directing the preheated refining gas to the vanes of said rotor of said gas injection device;
   g. sub-dividing the refining gas into discrete gas bubbles by rotating said vaned rotor at a speed sufficient to create a circulation pattern in the molten metal such that the gas bubbles are transported substantially radially outward with a downward component relative to their points of entry into the melt thereby coming into intimate contact with substantially the entire mass of molten metal in said refining zone, resulting in the removal of dissolved gases and substantially all non-metallic impurities from said melt;

h. withdrawing the spent inert gas and the dissolved gases released by the metal while collecting other non-metallic impurities in a slag layer on the surface of the molten metal; and

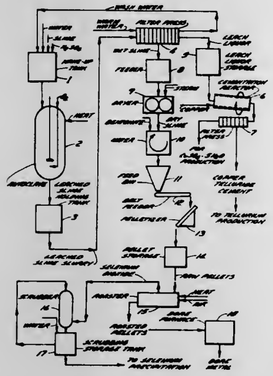
i. withdrawing the refined molten metal from said refining zone.

4,047,939

SLIMES TREATMENT PROCESS

Bernard H. Morrison, Mississauga, Canada, assignor to Noranda Mines Limited, Toronto, Canada

Filed June 13, 1975, Ser. No. 586,819
Int. Cl.² C22B *11/00*
U.S. Cl. 75—99 **11 Claims**



1. A method of treating slimes from the electrolytic refining of copper comprising:

a. leaching said slimes with dilute sulphuric acid under an oxygen partial pressure of up to 50 psi and at an elevated temperature between about 180° and 320° F until copper and tellurium in said slimes are substantially dissolved, thereby forming a leach slurry;

b. effecting a liquid-solid separation on said leach slurry to separate leach liquor from the solid leach slimes;

c. treating said leach liquor with metallic copper to cement the tellurium as copper telluride and form a remaining solution suitable for the production of copper sulphate; and

d. separating the cemented copper telluride solids from said solution.

4,047,940

SEPARATION AND RECOVERY OF COPPER METAL FROM AMMONIACAL SOLUTIONS

Alkis S. Rappas, Arlington, and J. Paul Pemsler, Lexington, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

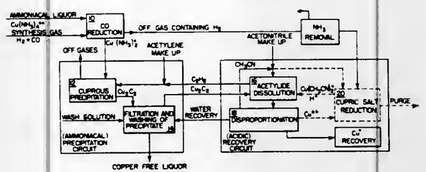
Filed June 14, 1976, Ser. No. 695,389
Int. Cl.² C22B *15/12*
U.S. Cl. 75—108 **32 Claims**

1. A process for producing copper metal from a solution containing Cu^+ ions comprising the steps of:

a. precipitating the Cu^+ ions from the solution as a cuprous acetylide;

b. separating the cuprous acetylide precipitate from the solution;

c. reacting the cuprous acetylide with an acid and a nitrile to form a soluble cuprous-nitrile complex;



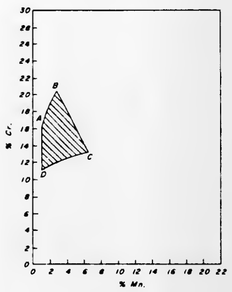
d. removing the nirile from the complex and disproportionating the Cu^+ ion to produce copper metal and Cu^{++} ions.

4,047,941

DUPLEX FERRITIC-MARTENSITIC STAINLESS STEEL

Roger N. Wright, Elnora, N.Y., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 508,376, Sept. 23, 1974, abandoned. This application Mar. 29, 1976, Ser. No. 671,901
Int. Cl.² C22C *38/38*
U.S. Cl. 75—126 B **5 Claims**



1. A ferritic-martensitic duplex stainless steel consisting essentially of, by weight, from 11.0 to 20.5% chromium, between 2.0 and 6.5% manganese, from 0.005 to 0.1% carbon, balance essentially iron; said steel being additionally characterized by chromium and manganese contents within Area ABCD of the FIGURE; said steel being further characterized by a chromium equivalency of from 5.0 to 11.0, in accordance with the following equation:

$$\text{Chromium Equivalency} = \%Cr + 5(\%Si) + 4(\%Mo) + 12(\%Al) - 40(\%C + \%N) - 2(\%Mn) - 3(\%Ni) - \%Cu;$$

silicon, molybdenum, aluminum, nitrogen, nickel and copper being residuals, said steel having at least 5% ferrite and at least 20% martensite, said steel having an as-annealed tensile strength between 80 and 175 ksi and an as-annealed ductility between 18 and 25% elongation in 1 inch.

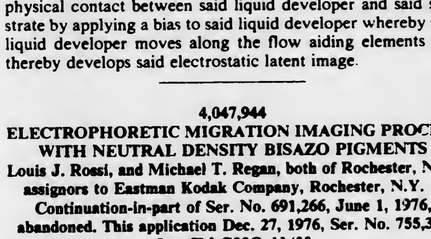
4,047,942

THERMITE SMELTING OF FERROMOLYBDENUM

George W. Clark, Stonham Aspal, and Douglas H. Dainty, Bury St. Edmunds, both of England, assignors to AMAX Inc., Greenwich, Conn.

Filed Sept. 29, 1976, Ser. No. 727,879
Int. Cl.² C22B *5/04*
U.S. Cl. 75—133.5 **10 Claims**

1. A process for producing ferromolybdenum by a thermite smelting reaction which comprises the steps of forming a substantially uniform particulated mixture of molybdenum oxide, an iron bearing material, a reductant present in an amount substantially equal to the stoichiometric quantity required for reaction with the oxygen associated with said molybdenum oxide and said iron bearing material, and a slag fluxing agent, introducing a first portion of said mixture into a refractory crucible, igniting said first portion to effect an exothermic thermite reaction between said reductant and said molybdenum oxide and iron bearing material, progressively introducing a second portion of said mixture into said crucible to sustain said reaction forming a molten mass of said ferromolybdenum alloy having a first layer of slag floating on the upper surface thereof, interrupting the introduction of said



mixture for a period of time to permit the migration of molten droplets of said ferromolybdenum alloy from said first slag layer into said molten mass, cooling said molten mass to effect a solidification thereof forming a first ferromolybdenum alloy button, progressively introducing a third portion of said mixture into said crucible on the molten slag layer to reinitiate and sustain said thermite reaction forming a second molten mass of ferromolybdenum alloy having a second slag layer thereon, cooling the reaction mass to effect a solidification of said second molten mass to form a second ferromolybdenum alloy button and second slag layer thereon, and thereafer extracting the solidified said reaction masses and separating said first and said second ferromolybdenum alloy button from said slag.

4,047,943

METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGES WITH CONDUCTIVE LIQUID DEVELOPER

Chin H. Lu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 364,216, May 25, 1973, Pat. No. 3,907,694. This application Feb. 24, 1975, Ser. No. 552,590
Int. Cl.² G03G *13/10*
U.S. Cl. 96—1 LY **11 Claims**

1. A method for the development of latent electrostatic images on a substrate comprising positioning close, but spaced from the electrostatic latent image on said substrate, a non-volatile, non-hydroscopic, conductive liquid developer comprising about 5-25 weight percent of a coloring agent, about 1-10 weight percent of a dispersing agent, but 5-30 weight percent of a resin binder and the balance triethylene glycol monobutyl ether; and applying said non-volatile conductive liquid developer to said substrate from flow aiding elements in physical contact between said liquid developer and said substrate by applying a bias to said liquid developer whereby said liquid developer moves along the flow aiding elements and thereby develops said electrostatic latent image.

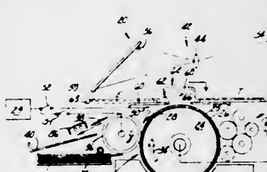
4,047,944

ELECTROPHORETIC MIGRATION IMAGING PROCESS WITH NEUTRAL DENSITY BISAZO PIGMENTS

Louis J. Rossi, and Michael T. Regan, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 691,266, June 1, 1976, abandoned. This application Dec. 27, 1976, Ser. No. 755,368
Int. Cl.² G03Q *13/22*
U.S. Cl. 96—1.2 **7 Claims**

1. In an electrophoretic migration imaging process which comprises subjecting an electrically photosensitive colorant material positioned between at least two electrodes to an applied field and exposing said material to an image pattern of radiation to which the material is photosensitive, thereby obtaining image formation on at least one of said electrodes, the improvement which comprises using as at least a portion of said material a bisazo naphthalenediol pigment having the formula:



wherein:

R^1 is $-OCH_3$, $-OC_2H_5$ or $-OCH_2CONH_2$;

R^2 is H or $-NO_2$; and

R^3 is H or $-SO_2NH_2$

4,047,945

XEROXPRINTING MASTER AND PROCESS

Gustav R. Pfister, Webster, and David J. Williams, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 18, 1975, Ser. No. 550,258
Int. Cl.² G03G *5/04*
U.S. Cl. 96—1 R **5 Claims**

1. An electrophotographic imaging member consisting essentially of a conductive substrate, a non-persistent photoconductive insulating layer operatively associated with said conductive substrate, a persistent photoconductive insulating layer comprising an acid sensitized charge transfer complex contiguous with the non-persistent photoconductive insulating layer and an unpigmented dielectric film overcoating the free surface of the persistent photoconductive insulating layer.

4,047,946

DUPLICATING PROCESS UTILIZING ION MODULATING MEANS AS THE IMAGE GENERATING SOURCE

George Thomas Croft, Northfield, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Division of Ser. No. 492,005, July 26, 1974, Pat. No. 3,957,365. This application Feb. 2, 1976, Ser. No. 654,611
Int. Cl.² G03G *13/22*
U.S. Cl. 96—1 R **5 Claims**

1. In a process for making reproductions of a graphic original on plain paper through the use of a foraminated image storing device in cooperation with an image generating medium, the steps comprising:

imparting a charge distribution system on the surface of said image storing device corresponding to the intelligence on

said graphic original, said charge distribution system causing said device to selectively transmit charged particles therethrough, directing charged particles against said image device;

collecting the charged particles transmitted through said device onto said image generating medium to form a charge pattern corresponding to the intelligence on said graphic original, said image generating medium being in the form of a metal cylinder, overcoated with a first compliant layer and a second dielectric layer, said second layer having a thickness of 0.4 to 0.6 mils and a resistivity of at least 10^{14} ohm-centimeters;

converting said charge pattern into a transferrable material image;

feeding said plain paper into pressure contact with said image generating medium to transfer said material image thereto.

4,047,947

PROCESS FOR PREPARATION OF TRANSPARENCIES BY SELECTIVE DECOMPOSITION OF AN ORGANOSELENIUM COMPOUND IN A POLYMERIC MATRIX

Joseph Y. C. Chu, Fairport, and Wolfgang H. H. Gunther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 23, 1974, Ser. No. 517,120

The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.

Int. Cl.[2] G03G *5/12, 13/24;* **G03C** *1/00*

U.S. Cl. 96—1.3 **15 Claims**

1. A process for preparation of transparencies comprising:

a. forming a photoconductive solid phase dispersion of particles of selenium in an insulating polymer matrix by subjecting an insulating film consisting essentially of an organo-selenium compound and an insulating polymer to sufficient electromagnetic and/or thermal energy to effect decomposition of the organo-selenium compound whereby particles of selenium are deposited within the insulating film in substantial conformance with the distribution of the electromagnetic and/or thermal energy throughout the film, the organo-selenium compounds of this film being represented by the formula

$$R - (Se)_n - R_1$$

wherein:

R and R_1 are independently selected from the group consisting of benzyl, alkyl substituted benzyl, alkoxy substituted benzyl, acyl substituted benzyl, amino substituted benzyl, amido substituted benzyl, arylalkyl substituted benzyl, aryl substituted benzyl, alkoxy alkyl substituted benzyl, aryloxy alkyl substituted benzyl, amino alkyl substituted benzyl, hydroxy alkyl substituted benzyl, alkyl amino substituted benzyl, aryl amino substituted benzyl, alkyl carbonyl substituted benzyl, alkyl thio substituted benzyl, alkyl seleno substituted benzyl, carboxamido substituted benzyl, halogen substituted benzyl, carboxyl substituted benzyl, cyano substituted benzyl, and nitro substituted benzyl; and

n is 1 to 4.

b. forming a latent electrostatic image on the surface of said insulating film;

c. developing the latent image by bringing said latent image in contact with oppositely charged developer materials; and

d. affixing of the developer materials to the insulating polymeric film.

4,047,948

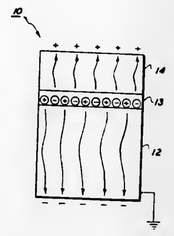
COMPOSITE LAYERED IMAGING MEMBER FOR ELECTROPHOTOGRAPHY

Anthony M. Horgan, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

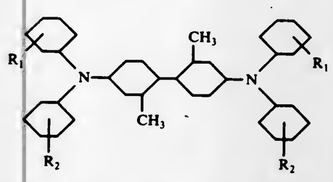
Filed Nov. 1, 1976, Ser. No. 737,448

Int. Cl.[2] G03G *5/00, 5/04*

U.S. Cl. 96—1.5 R **36 Claims**



1. An imaging member comprising a first layer of electrically active charge-transport material contained on a supporting substrate, a photoconductive layer overlying said active layer, and a second layer of electrically active charge transport material overlying said photoconductive layer, said photoconductive layer exhibiting the capability of photo-generation of charge carriers and injection of said charge carriers, one of said electrically active layers comprising electrically inactive resinous material having dispersed therein from about 10 to about 75 percent by weight of:



wherein R_1 is selected from the group consisting of hydrogen, (ortho) CH_3, (meta) CH_3 and (para) CH_3, and R_2 is selected from the group consisting of (ortho) CH_3, (meta) CH_3 and (para) CH_3, and capable of supporting the injection of photogenerated holes from said photoconductive layer and transporting said holes through said electrically active layer and the other electrically active layer capable of supporting the injection of photogenerated electrons from said photoconductive layer and transporting said electrons through said electrically active layer.

4,047,949

COMPOSITE LAYERED IMAGING MEMBER FOR ELECTROPHOTOGRAPHY

Anthony M. Horgan, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

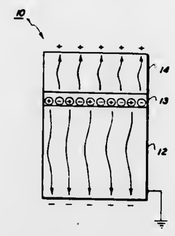
Filed Nov. 1, 1976, Ser. No. 737,292

Int. Cl.[2] G03G *5/00, 5/04*

U.S. Cl. 96—1.5 R **32 Claims**

1. An imaging member comprising a first layer of electrically active charge-transport material contained on a supporting substrate, a photoconductive layer overlying said active layer, and a second layer of electrically active charge transport material overlying said photoconductive layer, said photoconductive layer exhibiting the capability of photo-generation of charge carriers and injection of said charge carriers, one of said electrically active layers comprising electrically inactive resinous material having dispersed therein from about 10 to about

75 percent by weight of a material selected from the group consisting of N,N'-diphenyl-N,N'-bis(2-methylphenyl)-[1,1'-biphenyl]-4,4'-diamine; N,N'-bis(3-methylphenyl)-[1,1'-biphenyl]-4,4'-diamine; N,N'-diphenyl-N,N'-bis(4-methylphenyl)-[1,1'-biphenyl]-4,4'-diamine; N,N'-diphenyl-N,N'-bis(2-chlorophenyl)-[1,1'-biphenyl]-4,4'-diamine; N,N'-diphenyl-N,N'-bis(3-chlorophenyl)-[1,1'-biphenyl]-4,4'-diamine and



N,N'-diphenyl-N,N'-bis(4-chlorophenyl)-[1,1'-biphenyl]-4,4'-diamine, and capable of supporting the injection of photogenerated holes from said photoconductive layer and transporting said holes through said electrically active layer and the other electrically active layer capable of supporting the injection of photogenerated electrons from said photoconductive layer and transporting said electrons through said electrically active layer.

4,047,950

METHOD FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE ON AN ELECTROPHOTOGRAPHIC FILM

Frank C. Gross, Wilbraham, Mass., assignor to A. B. Dick/-Scott, Holyoke, Mass.

Division of Ser. No. 459,195, April 8, 1974, Pat. No. 3,916,828, which is a continuation-in-part of Ser. No. 349,452, April 9, 1973, Pat. No. 3,972,610. This application Aug. 18, 1975, Ser. No. 605,392

Int. Cl.[2] B05B *5/02*

U.S. Cl. 96—1 SD **3 Claims**

1. Method of developing an electrostatic latent image on a portion of an electrophotographic film, comprising the steps of:

A. positioning the film against a mask bordering an opening in a developing chamber with the mask bordering the portion of the film being developed and forming a seal against fluid flow;

B. drawing toner liquid through the chamber and into contact with the portion of the film with a vacuum source which creates a sub-atmospheric pressure within the chamber to prevent leakage of the toner liquid from the mask beyond the portion of the film being developed; and

C. after step B, drawing drying air through the chamber with a vacuum source which creates a sub-atmospheric pressure within the chamber to prevent toner liquid from leaking past the mask beyond the portion of the film during drying.

4,047,951

MARKER MAKING METHODS FOR CUTTING FABRIC PATTERNS

Shannon L. Cooper, Chicago, Ill., and Frank C. Adams, Cape Girardeau, Mo., assignors to Hart Schaffner & Marx, Chicago, Ill.

Continuation-in-part of Ser. No. 488,475, July 15, 1974, abandoned. This application Dec. 1, 1975, Ser. No. 636,711

Int. Cl.[2] G03C *5/04*

U.S. Cl. 96—27 R **15 Claims**

1. A method of cutting pieces of fabric for use in the manufacture of clothing, including the steps of:

reproducing a full size image of a clothing pattern on a light sensitive film by photographic contact printing of said pattern and said film and then developing said exposed film to provide a film replica of said pattern having an image corresponding to that of said pattern with said image being at least partially surrounded by a border,

positioning a plurality of said film replicas on a light sensitive marker sheet with said images arranged on said marker sheet so as to provide the most efficient utilization of the fabric to be cut using said marker sheet,

exposing said film replicas and said light sensitive marker sheet to a source of light,

developing said exposed light sensitive marker sheet to provide a marker sheet having a plurality of closely spaced marker images thereon, and

placing said marker sheet on a lay of fabric and cutting said lay of fabric into pieces of fabric by cutting along the outlines of the marker images on said marker sheet.

4,047,952

IMAGEWISE SOLUBLE SILVER SALT INTENSIFICATION OF DIFFUSION TRANSFER SILVER IMAGES

Maurice Edgar Pfaff, Le Perreux, France, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 28, 1976, Ser. No. 680,932

Claims priority, application France, May 2, 1975, 75.13773

Int. Cl.[2] G03C *5/54, 7/00, 1/48, 1/40*

U.S. Cl. 96—29 R **24 Claims**



1. A photographic diffusion transfer process for producing an image in a photographic element, said element comprising

1. a support bearing at least one negative silver halide emulsion layer and a physical development associated with said negative silver halide emulsion layer,

said process comprising

a. image-wise exposing said negative emulsion layer and

b. developing said negative emulsion layer with a chemical developer in the presence of a silver halide solvent and an alkaline activator which contains therein a soluble, reducible silver salt, said development performed such that the silver halide solvent and alkaline activator first contacts said negative emulsion layer and then contacts said physical development layer, whereby

physical development of a positive silver image corresponding to the unexposed areas of said negative emulsion layer is produced in said physical development layer.

4,047,953

COLOR DIFFUSION TRANSFER EMPLOYING SILVER SALT TRANSFER REVERSAL AND 4-THIOHYDANTOINE

Maurice Edgar Pfaff, Le Perreux, France, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 28, 1976, Ser. No. 680,950
Claims priority, application France, May 2, 1975, 75.13774
Int. Cl.² G03C *5/54, 7/00, 1/48, 1/40*
U.S. Cl. 96—29 D **15 Claims**

13. In a photographic diffusion transfer process for producing a dye or dye precursor image in a photographic element and transferring said image to an image receiving layer, said element including a support bearing at least one element comprising

1. a negative silver halide emulsion layer having associated therewith a ballasted scavenger for oxidized chemical developing agent and
2. a physical development layer comprising cadmium sulfide nuclei and an initially immobile dye-providing substance which provides diffusible dye or dye precursor,

said process including

a. image-wise exposing said negative emulsion layer
b. developing said negative emulsion layer with a chemical developing agent in the presence of an alkaline processing medium and a silver halide solvent, whereby unexposed silver halide in said negative emulsion is solubilized and diffuses into said physical development layer,
c. physically developing said solubilized silver halide in said physical development layer in the presence of a chemical developing agent to obtain oxidized chemical developer which interacts with said initially immobile dye providing substance thereby producing a diffusible dye or dye precursor image, and
d. transferring said diffusible dye or dye precursor image to said image receiving layer,

the improvement which comprises carrying out step (b) of said process in the presence of a 4-thiohydantoine.

4,047,954

SULFINYL-SULFONYL ALKANE SILVER HALIDE SOLVENTS

Richard B. Greenwald, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 564,164, April 1, 1975, abandoned. This application July 19, 1976, Ser. No. 706,461
Int. Cl.² G03C *5/54, 5/38, 1/48, 1/06*
U.S. Cl. 96—29 R **29 Claims**

14. A diffusion transfer photographic process comprising the steps of:

1. reacting exposed silver halide of an imagewise exposed photosensitive silver halide emulsion layer carried on a support with a silver halide developing agent in aqueous alkaline solution;
2. reacting unreduced silver halide of said photosensitive emulsion with as a silver halide solvent an open-chain alkane possessing an intralinear sulfonyl group and an intralinear sulfinyl group wherein said sulfonyl and sulfinyl groups are separated by a single carbon atom substituted with two hydrogen atoms or with one hydrogen atom and one lower alkyl group to form a complex silver salt that is soluble in said alkaline solution;
3. transferring said complex silver salt to a superposed image-receiving layer; and
4. reducing said transferred complex silver salt to provide a silver image.

4,047,955

(DIALKYLAMINO)ALKYLOXOSULFONIUM ALKANESULFONYLMETHYLIDE SILVER HALIDE SOLVENT

Richard B. Greenwald, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 564,165, April 1, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,888
Int. Cl.² G03C *5/54, 5/38, 1/48, 1/06*
U.S. Cl. 96—29 R **28 Claims**

14. A diffusion transfer photographic process comprising the steps of:

1. reacting exposed silver halide of an imagewise exposed photosensitive silver halide emulsion layer carried on a support with a silver halide developing agent in aqueous alkaline solution;
2. reacting unreduced silver halide of said photosensitive emulsion with as a silver halide solvent, a (dialkylamino)alkyloxosulfonium alkanesulfonylmethylide capable of reacting with silver halide to form a complex silver salt that is soluble in said alkaline solution;
3. transferring said complex silver salt to a superposed image-receiving layer; and
4. reducing said transferred complex silver salt to provide a silver image.

4,047,956

LOW COATING WEIGHT SILVER HALIDE ELEMENT AND PROCESS

Ralph Kingsley Blake, deceased, late of Westfield, N.J., by June Arlene Blake, executrix, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 17, 1975, Ser. No. 632,728
Int. Cl.² G03C *5/32, 1/76, 1/06*
U.S. Cl. 96—60 R **15 Claims**

1. A process of forming a composite image in a photosensitive element that comprises a support, a photosensitive silver halide emulsion layer on said support, and a contiguous colorant-containing layer in which the colorant is selected from the group consisting of an oxidatively bleachable dye, fogged silver halide, colloidal silver, colloidal mercury, colloidal palladium, colloidal copper, a copper film, and a lead film; which process comprises:

1. imagewise exposing said photosensitive silver halide emulsion layer to actinic radiation, and developing the resultant latent image, and
2. immersing said photosensitive element in an oxidizing bleach bath which diffuses through the unexposed areas so as to chemically bleach those areas of the colorant-containing layer which are under the nonimage areas of the silver halide emulsion layer, leaving an image in those areas of the colorant-containing layer which are directly under the image formed in the silver halide emulsion layer, whereby the image in the silver halide emulsion layer is retained, and at the same time is intensified by the image in the colorant-containing layer.

4,047,957

PROCESS OF HARDENING PROTEIN-CONTAINING PHOTOGRAPHIC LAYERS WITH A MIXTURE OF A CARBOXYL GROUP-ACTIVATING, LOW MOLECULAR WEIGHT COMPOUND AND A CARBOXYL GROUP-ACTIVATING POLYMER

Walter Frans De Winter, 's-Gravenwezel, and Daniel Maurice Timmerman, Mortsel, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Feb. 6, 1976, Ser. No. 655,878
Claims priority, application United Kingdom, Feb. 10, 1975, 5653/75
Int. Cl.² G03C *1/76, 1/30*
U.S. Cl. 96—67 **11 Claims**

10. A silver halide photographic material containing at least one protein-containing layer and a superposed contacting layer comprising a mixture of a low molecular weight, fast-acting, carboxyl group-activating hardening agent with a larger amount of a film-forming, hydrophilic, polymeric, fast-acting hardening agent carrying at least one carboxyl group-activating carbodiimide substituent, said low molecular weight hardening agent being selected from the group consisting of carbamoylpyridinium salts, carbamoyloxypyridinium salts, isoxazolium salts, dihydroquinoline compounds, and carbodiimides.

4,047,958

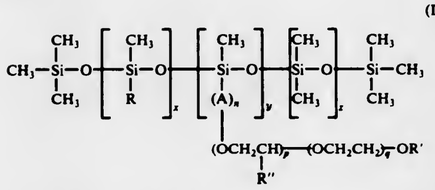
PHOTOGRAPHIC SENSITIVE MATERIALS

Masakazu Yoneyama; Toshimasa Usami; Shiyoichi Ino; Yoshiteru Sata, all of Minami-ashigara, and Nobuo Yamamoto, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 7, 1976, Ser. No. 674,538
Claims priority, application Japan, Apr. 7, 1975, 50-42065
Int. Cl.² G03C *1/34*
U.S. Cl. 96—87 R **21 Claims**

1. A photographic sensitive material comprising a support having thereon at least one silver halide photographic emulsion layer, wherein at least one surface layer of the photographic sensitive material contains an alkylpolysiloxane having in the side chain thereof a polyoxyethylene chain, said alkylpolysiloxane being represented by the following general formula (I):

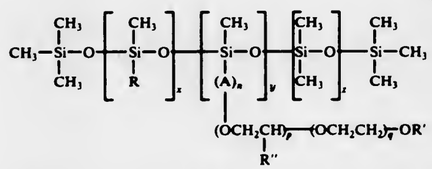
(I)



in which R represents an aliphatic group or aryl group, R′ represents a hydrogen atom, an aliphatic or an aryl group, R″ represents an alkyl group or alkoxyalkyl group, A represents a divalent residue of an aliphatic hydrocarbon, *n* represents 0 or an integer of 1 to 12, *p* represents a value of 0 to 50, *q* represents a value of 2 to 50, *x* represents a value of 0 to 100, *y* represents a value of 1 to 50, *z* represents a value of 0 to 100 and $x + y + z$ represents a value of 5 to 250.

3. A method of preventing fog which comprises incorporating in at least one surface layer of a photographic sensitive material, said photographic sensitive having thereon at least one silver halide photographic emulsion layer, a compound represented by general formula (I):

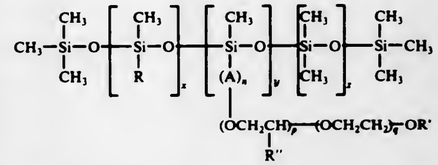
(I)



in which R represents an aliphatic group or aryl group, R′ represents a hydrogen atom, an aliphatic group or an aryl group, R″ represents an alkyl group or alkoxyalkyl group, A represents a divalent residue of an aliphatic hydrocarbon, *n* represents 0 or integer of 1 to 12, *p* represents a value of 0 to 50, represents a value of 2 to 50, *x* represents a value of 0 to 100, *y* represents a value of 1 to 50, *z* represents a value of 0 to 100 and $x + y + z$ represents a value of 5 to 250.

5. A method of preventing abnormal coloration which comprises incorporating in at least one surface layer of a photographic sensitive material, said photographic sensitive material having thereon at least one silver halide photographic emulsion layer, a compound represented by general formula (I):

(I)



in which R represents an aliphatic group or aryl group, R′ represents a hydrogen atom, an aliphatic group or an aryl group, R″ represents an alkyl group or alkoxyalkyl group, A represents a divalent residue of an aliphatic hydrocarbon, *n* represents 0 or integer of 1 to 12, *p* represents a value of 0 to 50, *q* represents a value of 2 to 50, *x* represents a value of 0 to 100, *y* represents value of 1 to 50, *z* represents a value of 0 to 100 and $x + y + z$ represents a value of 5 to 250.

4,047,959

NONIONIC WATER EMULSIONS OF TRIS(2,3-DIBROMOPROPYL)PHOSPHATE

George Paul Guzzardo, Norristown, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 9, 1976, Ser. No. 656,564
Int. Cl.² C09D *5/18, 5/20*
U.S. Cl. 106—2 **9 Claims**

1. The textile flame retardant emulsion consisting essentially of:

tris(2,3-dibromopropyl) phosphate — about 40 to 50%, one or more ketones selected from the group consisting of C_5 to C_7 aliphatic and alicyclic ketones - about 6 to 12%, and about 3 to 6% of one or more nonionic surfactants having a hydrophile-lipophile balance of 10 to 14 selected from the group consisting of:

a. sorbitan fatty acid esters and ethoxylated sorbitan fatty acid esters in which the ethylene oxide content ranges from about 4 to 20 moles and the fatty acids range from about C_{12} to C_{15},
b. polyoxyethylene glycol tallate in which the ethylene oxide content ranges from about 4 to 20 moles, and
c. ethoxylated condensate of ethylene glycol and propylene oxide in which the ethylene oxide content ranges from about 4 to 20 moles and the molecular weight ranges from about 1100 to 15,000.

and water to make 100%, all percentages being by weight.

8. The process of rendering textiles flame retardant and oil-water repellent with a hydrostatic pressure rating of at least 24 cm. by treating textiles with the composition consisting essentially of tris (2,3-dibromopropyl) phosphate emulsion of claim 1 in about 40–70 percent, anionic, cationic and nonionic fluorochemical oil and water repellent in about 10–20 percent, ammonium dihydrogen phosphate in about 2.5–4.0 percent, and water to make up 100 percent, all percentages being by weight, and thereafter, drying to textiles to leave about 10 to 30 percent tris (2,3 -dibromopropyl) phosphate and about 1 to 5 percent anionic, cationic or nonionic fluorochemical oil and water repellent on the textiles, all percentages based on the dry weight of the textiles.

4,047,960

REFRACTORY PARTIALLY CRYSTALLINE MATERIALS WITH GOOD VISIBLE TRANSPARENCY

Richard F. Reade, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed June 18, 1976, Ser. No. 697,315
Int. Cl.[2] C03C 3/22; C03B 32/00
U.S. Cl. 106—39.8 3 Claims

1. A method for making a transparent partially crystalline article containing at least about 20%, but less than about 50%, by volume crystals dispersed within a residual glassy matrix wherein the predomininant crystal phase consists essentially of aluminum niobate, aluminum tantalate, or an aluminum-tantalate solid solution having a crystal size of about 300–500A in diameter, which crystalline article retains its transparency after extended exposures to temperatures up to about 1150° C., comprising the steps of:

a. melting a batch for a glass consisting essentially, in weight percent on the oxide basis, of about 10–20% Al_2O_3, 59–72% SiO_2, 5–8% TiO_2, and 5–20% Nb_2O_5 and/or Ta_2O_5 0 to about 2% K_2O and/or 0 to about 6% Cs_2O;

b. simultaneously cooling said melt to at least within the transformation range and shaping a glass article of a desired configuration therefrom;

c. heating said glass article to a temperature of at least about 1000° C., but not more than about 1150° C., for a period of time sufficient to cause the crystallization of aluminum niobate, aluminum tantalate, and/or an aluminum niobate-tantalate solid solution having a crystal size of about 300–500A to occur in situ to produce a transparent partially crystalline article; and then

d. cooling said crystallized article to room temperature.

3. A transparent partially crystalline article made in accordance with claim 1.

4,047,961

CEMENT COMPOSITION

William Eugene Alderete, Irving; John Parke Boyer, Dallas; Kenneth Earl Daugherty, Lewisville, and David Lee Johnson, Garland, all of Tex., assignors to General Portland, Inc., Dallas, Tex.

Filed June 10, 1975, Ser. No. 585,659
Int. Cl.[2] C04B 7/14
U.S. Cl. 106—89 13 Claims

1. An efficacious cement consisting essentially of the grind obtained from the mixture of 1 up to 25 parts by weight of air-cooled iron blast furnace slag, and

from over 75 up to 99 parts by weight of conventional Type I Portland clinker, and

from 2 to about 10 parts by weight of set control additive.

4,047,962

CONSTRUCTION COMPOSITION

William Leo Copeland, Shreveport, La., assignor to Copeland Concrete Products, Inc., Monroe, La.

Continuation-in-part of Ser. No. 238,659, March 27, 1972, Pat. No. 3,827,895. This application May 28, 1974, Ser. No. 474,100
The portion of the term of this patent subsequent to Aug. 6, 1991, has been disclaimed.
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—90 10 Claims

1. A composition, which upon mixing with water and subsequent setting forms a material of construction, consisting essentially of:

a. gypsum in a volume percentage of from about 15% to about 40%;

b. an expanded material in a volume percentage of from about 9% to about 29%;

c. cement in a volume percentage of from about 15% to about 40%; and

d. polypropylene or fiberglass or sisal fibers in a volume percentage of from about 1% to about 2%.

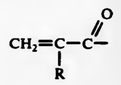
4,047,963

PHOTOPOLYMER COMPOSITIONS

David A. Simpson, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed June 17, 1976, Ser. No. 697,072
Int. Cl.[2] G03C 1/68
U.S. Cl. 96—115 R 22 Claims

1. A photopolymer composition comprising (1) a water-soluble, thermoplastic ethylene oxide copolymer containing 50–96% ethylene oxide, having a reduced specific viscosity of 0.4 to 50 at 1% concentration in water at 25° C., (2) from about 0.5 to about 25% by weight based on the ethylene oxide copolymer of an ethylenically unsaturated monomer having its unsaturation in the form of at least two



groups, wherein R is hydrogen or a C_1–C_3 alkyl group, and (3) from about 0.1 to about 10% by weighht based on the ethylene oxide copolymer of a photoinitiator thermally stable at temperatures up to about 150° C.

19. The process of making a printing relief which comprises admixing the components of the composition of claim 1, thermoforming the resulting mixture in the form of a sheet, laminating the sheet to a support to form a photopolymer element, exposing to actinic light selected areas of said element until substantial crosslinking takes place in the exposed areas without significant crosslinking in the unexposed areas, and removing the unexposed areas of photopolymer composition by washing the photopolymer element with water.

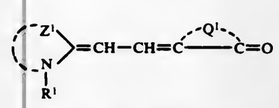
4,047,964

SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSION

Masanao Hinata; Haruo Takei; Akira Sato, and Akira Ogawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

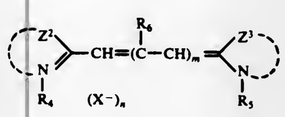
Filed Oct. 23, 1975, Ser. No. 625,356
Claims priority, application Japan, Oct. 23, 1974, 49-122679
Int. Cl.[2] G03C 1/08, 1/14
U.S. Cl. 96—126 31 Claims

1. A spectrally sensitized silver halide photographic emulsion containing a supersensitizing amount of a dye combination comprising at least one dye represented by the following general formula (I):



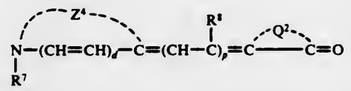
(I)

wherein Z^1 represents the atoms necessary to complete a benzisoxazole ring; Q^1 represents the atoms necessary to complete a 2-thio-oxazolidine-2,4-dione ring, a rhodanine ring or a 2-thiohydantoin ring; and R^1 represents an aliphatic group, in combination with at least one cyanine or merocyanine dye which contains no benzisoxazole ring, said cyanine dye which contains no benzisoxazole ring being a dye represented by the following general formula (II):



(II)

wherein Z^2 and Z^3 each represents the stoms necessary to complete an imidazole ring, an oxazole ring, a thiazole ring, a selenazole ring, a thiazoline ring, a quinoline ring or an indolenine ring; R^4 and R^5 each represents an aliphatic group; R^6 represents a hydrogen atom, an alkyl group, an aralkyl group or an aryl group; *m* represents 0 or 1; X represents an acid anion; and *n* represents 1 or 2; said merocyanine dye which contains no benzisoxazole ring being a dye represented by the following general formula (III):



(III)

wherein Z^4 represents the atoms necessary to complete an oxazole ring, a thiazole ring, a selenazole ring, a thiazoline ring, an imidazole ring, a 2-quinoline ring, a 4-quinoline ring, a pyridine ring, a pyrroline ring, or a tetrazole ring; Q^2 represents the atoms necessary to complete a 2-thio-oxazolidine-2,4-dione ring, a rhodanine ring or a 2-thiohydantoin ring; R^7 represents an aliphatic group; R^8 represents a hydrogen atom, an alkyl group or an aryl group; and *p* and *d* each represents 0 or 1.

4,047,965

NON-FRANGIBLE ALUMINA-SILICA FIBERS

Karl A. Karst, St. Paul, and Harold G. Sowman, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 4, 1976, Ser. No. 683,183
Int. Cl.[2] C04B 35/80
U.S. Cl. 106—65 23 Claims

1. Transparent, smooth, fracture resistant, discrete, refractory oxide fibers uniformly round in cross section and of homogenous chemical composition comprising 96 to 100 weight percent of a mixture or chemical combination of 67 to 77 parts by weight alumina and 23 to 33 parts by weight silica, and fibers having a predominant polycrystalline phase of mullite, transitional alumina, or a mixture of both.

4,047,966

METHOD OF ENHANCING THE REFRACTORINESS OF HIGH PURITY FUSED SILICA

Peter P. Bihuniak, Corning, and Donald L. Gulle, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,460
Int. Cl.[2] C04B 35/14
U.S. Cl. 106—69 13 Claims

1. In an improved method of producing a high purity fused silica product, wherein a liquid flowable form of a silica slurry or sol is dried to form solid silica bodies which are then thermally vitrified, the improvement, whereby the refractoriness of the fused silica is enhanced, which comprises doping the silica containing liquid with 10 to 1000 parts per million by weight, as based on the fused silica, of aluminum and/or titanium oxide calculated on the metal basis.

4,047,967

CONCRETE COMPOSITION

Kamran Majidzadeh, Worthington, and Hani R. Guirguis, Upper Arlington, both of Ohio, assignors to Dampocrete Incorporated, Amesbury, Mass.

Continuation-in-part of Ser. No. 648,482, Jan. 12, 1976, abandoned, which is a continuation of Ser. No. 502,221, Aug. 30, 1974, abandoned. This application Feb. 16, 1977, Ser. No. 769,327
Int. Cl.[2] C04B 7/35
U.S. Cl. 106—90 45 Claims

1. A curable composition suitable for forming concrete having a high damping capacity which comprises sand, gravel, cement, vegetable gum particles coated with a water dispersible curable resin and a curing agent for said resin, said coated vegetable gum particles being present in a concentration of between about 2 and 15 weight percent based upon the total weight of the concrete composition and water in a concentration to yield a water-cement ratio of between about 0.37 and 0.45, the relative concentration of resin and curing agent being controlled to cause substantially complete curing of the resin within about the same time necessary to cause substantially complete curing of the cement composition.

4,047,968

METHOD FOR THE PRODUCTION OF SYNTHETIC WOLLASTONITE MATERIALS

Heinrich zurStrassen, Schonberg, Taunus, and Eberhard Rauschenfels, Weisbaden-Sonnenberg, both of Germany, assignors to Dyckerhoff Zementwerke AG, Weisbaden-Amoneburg, Germany

Division of Ser. No. 241,823, April 6, 1972. This application Aug. 19, 1974, Ser. No. 498,641
Claims priority, application Germany, Apr. 7, 1971, 2116968
Int. Cl.[2] C08L 95/00; C04B 35/16
U.S. Cl. 106—281 R 9 Claims

1. The method of producing steam hardened calcium silicate building materials, comprising

steam hardening a synthetic wollastonite material,

said wollastonite having been produced prior to its said steam hardening by a process which includes the steps of quenching in water the slag melt obtained during the thermal production of phosphorous from crude phosphate, and then burning the quenched melt in the substantial absence of phosphate slime in a rotary kiln at a temperature of about 1100° C in an oxidizing atmosphere for a period of time sufficient to produce a clear change in color.

4,047,969

IRON BLUE NACREOUS COATED PIGMENTS

Louis Armanini, Pleasantville, and Cordell E. Johnson, Peekskill, both of N.Y., assignors to The Mearl Corporation, Ossining, N.Y.

Filed Oct. 5, 1976, Ser. No. 729,787
Int. Cl.[2] C09C 1/00
U.S. Cl. 106—291 10 Claims

1. A method for directly adhering Iron Blue to a mica or metal oxide coated mica substrate which comprises mixing said substrate with a soluble ferrocyanide and a soluble ferric compound in an aqueous medium such that there is at least 30% excess ferric ions based on the amount of ferric ion necessary to form Iron Blue, adjusting the pH to 3.5 to 5.5, recovering the resulting Iron Blue coated substrate and drying the recovered Iron Blue coated substrate at a temperature below the decomposition temperature of the Iron Blue.

4,047,970

PRODUCTION OF CALCINED CERAMIC PIGMENTS

Harry Augustus Morriss, Wombourne, and John Peter Hugh Williamson, Chester, both of England, assignors to Keeling and Walker, Limited, Stoke-on-Trent, England

Continuation-in-part of Ser. No. 544,452, Jan. 27, 1975, abandoned. This application Aug. 5, 1976, Ser. No. 711,935
Int. Cl.[2] C09C 1/00
U.S. Cl. 106—299 22 Claims

1. In the process for the production of a zircon based stain by reacting a zirconia containing material with a color determining agent the improvement comprising the steps of:

1. plasma dissociating a zircon sand to obtain a plasma-dissociated zircon sand having zirconia rich phase, a silica rich phase and no more than 30% unreacted zircon sand;

2. comminuting said plasma dissociated zircon sand without

prior leaching to obtain a comminuted plasma dissociated zircon sand containing at least 90% by weight of its original silica content before comminution; and

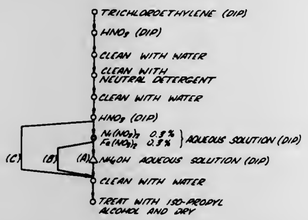
3. reacting said comminuted plasma dissociated zircon sand with a color determing agent.

4,047,971

METHOD FOR TREATING A GLASS SURFACE

Hiroaki Yanagida, Kashiwa, and Tsuneo Ohashi, Katsuta, both of Japan, assignors to Fujitok Co., Ltd., Tokyo, Japan

Filed Apr. 8, 1976, Ser. No. 674,879
Claims priority, application Japan, May 2, 1975, 50-53528
Int. Cl.² B08B *3/00*; C03C *17/22*, *21/00*
U.S. Cl. 134—2 **6 Claims**



1. A method for treating a solid alkali glass surface to prevent whitening thereof comprising the steps of:

pre-cleaning said glass surface;

bringing said pre-cleaned glass surface to contact with an aqueous solution containing one or more metal nitrates selected from the group consisting of nitrates of iron, nickel, chromium and cobalt in amounts effective to prevent whitening of said glass surface; and

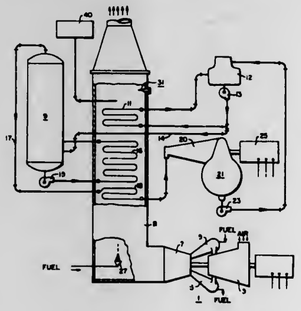
immediately thereafter post-cleaning said metal nitrate treated glass surface.

4,047,972

METHOD FOR THERMALLY DE-SOOTING HEAT TRANSFER SURFACES

James P. Stumbar, Middletown Township, Allegheny County; Daniel E. Carl, Media, and Suh Y. Lee, Monroeville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 23, 1976, Ser. No. 726,038
Int. Cl.² C03C *23/00*; B08B *7/00*
U.S. Cl. 134—2 **6 Claims**



1. A method for removing carbonaceous deposits which form on the outside of heat exchanger tubes disposed to extract heat from hot exhaust gases from a fossil fuel energy system, said method of removing carbonaceous deposits comprising the steps of:

shutting down the system;

draining water from the heat exchanger tubes;

blanketing the inside of the heat exchanger tubes with an inert gas;

starting up the energy system and stabilizing its operation at a minimum temperature;

maintaining a predetermined CO level of the effluent hot exhaust gases leaving the heat exchangers;

increasing the inlet temperature of the influent hot exhaust gases entering the heat exchanger until the CO level of the effluent gases leaving the heat exchanger is within a predetermined range, maintaining the temperature of the influent hot exhaust gases at a level which results in a CO level in the effluent hot exhaust gases leaving the heat exchanger not to exceed a predetermined limit;

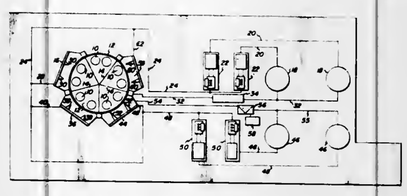
said predetermined limit of CO being sufficient to oxidize and remove the carbonaceous deposits from the outer surface of the heat exchanger without igniting the carbonaceous deposits and thereby preventing a run-away reaction which would damage the heat exchanger.

4,047,973

RECOVERY OF SELENIUM AND SELENIUM ALLOYS BY HYDRAULIC LATHING

John K. Williams, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 27, 1976, Ser. No. 736,056
Int. Cl.² B08B *3/02*, *11/00*
U.S. Cl. 134—10 **7 Claims**



1. A method of recovering selenium or a selenium alloy from the surface of an endless, flexible, xerographic belt comprising a ductile metal substrate having on its outer surface a thin layer of an organic resinous material which is overcoated with a relatively thicker layer of selenium or a selenium alloy which method comprises the consecutive steps of:

a. mounting the belt on a rigid mandrel having a ribbed outer surface;

b. subjecting the surface of the belt to one or more jets of high pressure water, said jets being expelled from one or more nozzles at a pressure of from about 8,000 to 11,000 pounds per square inch to strip the selenium or selenium alloy from the belt without substatially affecting the layer of organic resinous material to thereby form a water slurry of selenium or selenium alloy; and

c. recovering the water slurry and removing the water to obtain substantially pure selenium or selenium alloy.

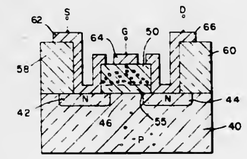
4. The method of claim 1 wherein the xerographic belt is cleaned by subjecting it to a 60–80 p.s.i. water spray before stripping the selenium or selenium alloy.

4,047,974

PROCESS FOR FABRICATING NON-VOLATILE FIELD EFFECT SEMICONDUCTOR MEMORY STRUCTURE UTILIZING IMPLANTED IONS TO INDUCE TRAPPING STATES

Ellyahou Harari, Irvine, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 30, 1975, Ser. No. 645,150
Int. Cl.² H01L *21/265*, *21/324*, *29/78*
U.S. Cl. 148—1.5 **5 Claims**



1. A process for fabricating a non-volatile field effect memory cell comprising the steps of:

a. forming active field effect transistor regions, including a source region, a gate region, and a drain region, on a silicon semi-insulating substrate;

b. forming a first layer of silicon dioxide on top of said gate region;

c. implanting ions into said silicon dioxide layer near the silicon interface whereby said implanted ions provide charge trapping sites for non-volatile memory operation;

d. annealing said structure in a nonoxidizing ambient at a predetermined elevated temperature sufficient to diffuse any of said ions that have reached into said substrate but not affecting significantly the distribution of ions implanted into said fist silicon dioxide layer;

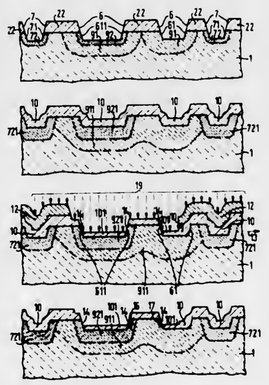
e. thermally growing a second layer of silicon dioxide under said first layer of silicon dioxide.

4,047,975

PROCESS FOR THE PRODUCTION OF A BIPOLAR INTEGRATED CIRCUIT

Dietrich Widmann, Unterhaching, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 2, 1976, Ser. No. 702,062
Claims priority, application Germany, July 2, 1975, 2529598
Int. Cl.² H01L *21/265*, *21/302*
U.S. Cl. 148—1.5 **16 Claims**



1. The method of making a bipolar integrated circuit having transistors therein, which includes covering a semiconductor substrate of a first impurity type with an insulating layer, etching a plurality of non-intersecting troughs having sloping side walls in said insulating layer and partially into said substrate, doping by ion implantation the substrate side walls and the bases of said troughs with impurity ions opposite to the impurity type of said substrate, annealing said substrate to cause the impurities introduced by ion implantation to further diffuse and to thereafter provide base zones for said transistors, further doping the side walls and the bases of a first group of said troughs with impurity ions of the same impurity type as said substrate while leaving a second group of troughs still doped with impurities of the opposite type to said substrate, thermally oxidizing said substrate, then carrying out an ion etching step with a homogeneous vertical ion beam until portions of the substrate surface of the sloping side walls of said troughs are exposed, selectively doping by ion implantation to form emitter zones and collector zones, whereby transistors are formed between selected troughs, and forming circuit conductors on the sloping side walls in contact with said emitter zones, said collector zones and said base zones, respectively.

4,047,976

METHOD FOR MANUFACTURING A HIGH-SPEED SEMICONDUCTOR DEVICE

Jerry L. Bledsoe, Phoenix, and Clarence A. Lund, Mesa, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed June 21, 1976, Ser. No. 698,444
Int. Cl.² H01L *21/263*
U.S. Cl. 148—1.5 **6 Claims**

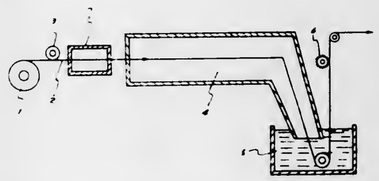
1. A method for increasing the switching speed of a semiconductor device comprising the step of selectively reducing minority carrier lifetime by high energy proton implantation.

4,047,977

METHOD OF CONTINUOUS GALVANIZING STEEL STRIP ON PARTIAL OR ONE SIDE

Katsuyoshi Yoshida, and Yukio Kitajima, both of Tokai, Japan, assignors to Nippon Steel Corporation, Japan

Continuation-in-part of Ser. No. 356,171, May 1, 1973, abandoned. This application Oct. 30, 1975, Ser. No. 627,472
Claims priority, application Japan, May 4, 1972, 47-44418
Int. Cl.² C23C *1/02*
U.S. Cl. 148—6.2 **9 Claims**



1. A method of continuous galvanizing a steel strip partially or one side, which comprises applying a silicone resin selected from the group consisting of polysilalkylenes and polysiloxanes to a part or on one side of the steel strip which is to be left non-plated in a subsequent continuous molten zinc coating, baking the silicone resin coated steel strip at a temperature ranging from 300° to 800° C for 2 to 30 seconds in an oxidizing atmosphere to deposit a masking film, and subjecting the steel strip to heat treatment in a reducing atmosphere and introducing the heat treated steel strip to a zinc coating bath.

6. A method according to claim 1, in which the residual resin coating, after plating, is removed by etching with chromate treating liquid effective to prevent white rust on zinc coated steel plates.

4,047,978

PROCESSING COPPER BASE ALLOYS

Prakash D. Parikh, and Eugene Shapiro, both of Hamden, Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 568,870, April 17, 1975, abandoned. This application Sept. 29, 1976, Ser. No. 727,728
Int. Cl.[2] C22F *1/08*
U.S. Cl. 148—11.5 C 13 Claims

1. A process for obtaining an improved combination of strength and bend properties in copper base alloys having low stacking fault energy which comprises:

A. providing a copper base alloy having a stacking fault energy of less than 30 ergs per square centimeter consisting essentially of a first element selected from the group consisting of about 2 to 12% aluminum, about 2 to 6% germanium, about 2 to 10% gallium, about 3 to 12% indium, about 1 to 5% silicon, about 4 to 12% tin, about 8 to 37% zinc, and the balance essentially copper wherein said alloy is fully recrystallized and has a fine grain size of less than 0.015 mm;

B. cold working said alloy at least 60%;

C. annealing said alloy at a metal temperature of from 280° to 425° C to obtain a non-random texture with a plastic strain ratio measured 90° to the rolling direction of less than about 0.75; wherein the grain structure after said annealing is either unrecrystallized or partially recrystallized; and

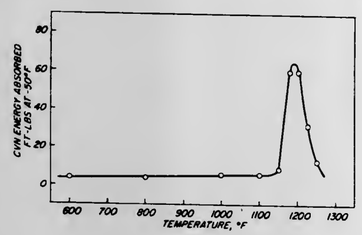
D. finally cold working said material less than 40%.

4,047,979

HEAT TREATMENT FOR IMPROVING THE TOUGHNESS OF HIGH MANGANESE STEELS

Raymond A. Grange, Roseburg, Oreg., and Robert L. Miller, Hempfield Township, Westmoreland County, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 8, 1976, Ser. No. 730,894
Int. Cl.[2] C21D *7/14*; C22C *38/04*
U.S. Cl. 148—12 R 11 Claims



1. A method for the production of high Mn steels with enhanced notch toughness, which comprises,

hot rolling plate consisting essentially of Mn . . . 2.1 to 6%, C . . . 0.25% max., Ni . . . 1.5% max. and Si . . . 1.0% max., said hot-rolling producing a metallurgical structure which is substantially fully austenitic,

cooling the plate at a rate sufficient to transform said austenitic structure to austenite decomposition products consisting substantially of martensite, bainite and mixtures thereof,

annealing the plate composed of said austenite decomposition products at a temperature within the range A_1 to A_1 + 75° C for a time sufficient (i) to form at least 1% by volume of retained austenite at the grain boundaries, but insufficient to form more than a negligible amount of non-retained austenite and (ii) to provide a CVN increase, measured at −45.5° C of at least 20 ft-lbs over that of the same plate which has been similarly prepared but tempered at a temperature just below that of the A_1 of that steel.

4,047,980

PROCESSING CHROMIUM-CONTAINING PRECIPITATION HARDENABLE COPPER BASE ALLOYS

W. Gary Watson, Cheshire, and John F. Breedis, Trumbull, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 4, 1976, Ser. No. 728,976
Int. Cl.[2] C22F *1/08*
U.S. Cl. 148—12.7 C 16 Claims

1. A process for improving both the strength and electrical conductivity properties of copper base alloys, which comprises:

a. casting a chromium-containing precipitation hardenable copper base alloy;

b. hot working the alloy at a starting temperature of 950°–1000° C to effect the maximum solid solution of all alloying elements;

c. rapidly cooling the alloy to maintain said maximum solid solution of all alloying elements;

d. cold working the alloy to a total reduction of at least 60%;

e. aging said alloy at 400°–500° C for one to 24 hours;

f. cold working the alloy to a further total reduction of at least 50%; and

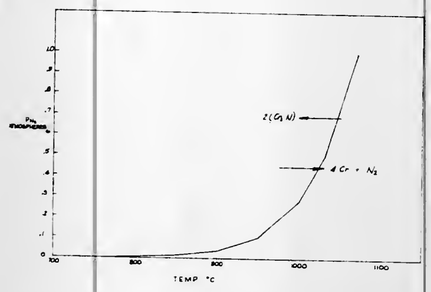
g. aging said alloy at 150°–250° C for 1 to 24 hours.

4,047,981

INTERNALLY NITRIDED FERRITIC STAINLESS STEEL STRIP, SHEET AND FABRICATED PRODUCTS AND METHOD THEREFOR

Jerry L. Arnold, Franklin, and Joseph A. Douthett, Monroe, both of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed June 30, 1976, Ser. No. 701,089
Int. Cl.[2] C22C *38/40*; C21D *1/48*
U.S. Cl. 148—16 16 Claims



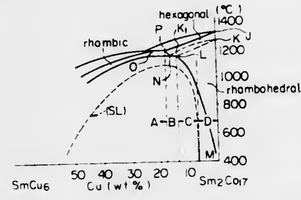
1. Internally nitrided substantially fully ferritic stainless steel cold reduced strip and sheet and products fabricated therefrom comprising a non-hardenable AISI Type 400 series ferritic stainless steel containing a nitride former chosen from the group consisting of titanium, zirconium, hafnium, columbium, vanadium, tantalum and rare earth metals, said nitride former being present in excess of the amount required to react completely with residual nitrogen and carbon in said steel, said excess nitride former being reacted with nitrogen internally to a depth sufficient to obtain an elevated temperature creep strength superior to that of AISI Type 316 austenitic stainless steel, by the 982° C Sag Test defined herein, and an oxidation resistance superior to that of AISI Type 316 austenitic stainless steel, by the Cyclic Oxidation Resistance Test defined herein, said nitrided strip, sheet and fabricated products exhibiting good room temperature formability, substantial freedom from chromium nitrides and chromium oxides, and containing less than about 5% austenite.

4,047,982

PERMANENT MAGNET AND PROCESS FOR PRODUCING THE SAME

Masato Sagawa; Takeaki Sakai, both of Yokohama; Tatsuji Sasaki, and Zenzo Henmi, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed July 8, 1976, Ser. No. 703,367
Claims priority, application Japan, July 18, 1975, 50-87196
Int. Cl.[2] H01F *1/02*; C22C *23/00*
U.S. Cl. 148—101 29 Claims



1. In a permanent magnet of an RCo type, wherein the R component Co is cobalt or both cobalt and iron, and the molar ratio of said R component to said Co component is from 1:5 to 1:8.5,

an improvement comprising replacing a part of said Co component with both vanadium and copper, in a manner such that said vanadium and said copper are included from 0.5 to 6% by weight, respectively, based on said components R and Co.

4,047,983

PROCESS FOR PRODUCING SOFT MAGNETIC MATERIAL

Edward C. Falkowski, Pittsburgh, and Carl E. Ruppel, Bridgeville, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 417,682, Nov. 20, 1973, abandoned, which is a continuation of Ser. No. 238,516, March 27, 1972, abandoned. This application Apr. 24, 1975, Ser. No. 571,169
Int. Cl.[2] H01F *1/14*
U.S. Cl. 148—105 4 Claims

1. A process for producing a phosphorus containing iron soft magnetic material consisting essentially of iron up to 0.05% carbon, up to 1.0% manganese, up to 0.05% sulfur, up to 0.5% silicon, and from 0.5 to 1.5% phosphorus, which comprises the steps of: blending iron powder and ferro phosphorus powder containing from 22 to 30% phosphorus into a mixture containing from 0.5 to 1.5% phosphorus; pressing said blended mixture; and sintering said mixture in a non-oxidizing atmosphere of dry hydrogen at a temperature and for a period of time sufficient to produce a density of at least 7 grams per cubic centimeter, said sintering temperature being at least 2200° F; said soft magnetic material being characterized by a magnetizing force to reach 10 kilogauss of no more than 2.0 oersteds, and a coercive force from 10 kilogauss of no more than 0.9 oersted.

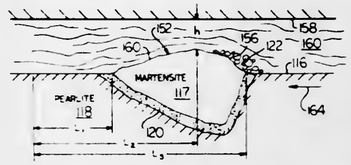
4,047,984

CORPUSCULAR ENERGY BEAM PRODUCED MICROASPERITIES

William H. Belke; Joseph C. Hafele; Ernest W. Landen, and Thomas J. Richards, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 17, 1975, Ser. No. 632,602
Int. Cl.[2] C21D *1/06*; C22C *35/00*
U.S. Cl. 148—152 8 Claims

1. A method of producing asperities on a body defining a surface, comprising the steps of selecting a body of unhardened pearlite carbon steel material having the property of expanding by grain structure change under the action of a beam of corpuscular energy, impinging a beam of corpuscular energy on said surface, varying the intensity of said beam from a minimum to a maximum value and then abruptly dropping the intensity back to said minimum so as to produce asperities,
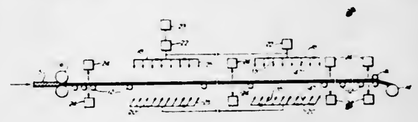


moving said body in a predetermined path relative to said beam while varying the intensity of said beam, and, repeating the above steps so as to produce a plurality of spaced, raised, martensitic asperities defining a height, length and width on said surface.

4,047,985

METHOD AND APPARATUS FOR SYMMETRICALLY COOLING HEATED WORKPIECES

Joseph Irwin Greenberger, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Feb. 9, 1976, Ser. No. 656,689
Int. Cl.[2] C21D *01/00*
U.S. Cl. 148—153 2 Claims



1. In a method of cooling a heated elongated metallic workpiece so that the cross-sectional thickness thereof is symmetrically cooled as it assumes a longitudinal position,

supporting by spaced-apart means the lower surface of said workpiece while in said assumed position,

causing the workpiece while so supported to pass between upper and lower coolant discharge headers to subject the corresponding upper and lower halves of the workpiece to cooling, during which the upper and lower cooled halves of the workpiece have different cooling rates,

causing the discharge of said upper and lower headers to take the form of a rectangular cross-sectional laminar wall of coolant at the point where the coolant contacts the workpiece, and

varying the cross-sectional thickness of the wall of coolant of said lower header to vary the coolant rate of the lower half of said workpiece in comparison with the cooling rate of the upper half thereof, to substantially equalize the cooling rate of both halves.

4,047,986

EPITAXIAL FILM FORMATION OF A LIGHT EMITTING DIODE AND THE PRODUCT THEREOF

Jack Isaac Hanoka, Highland Park, N.J., assignor to Integrated Display Systems, Inc., Edison, N.J.

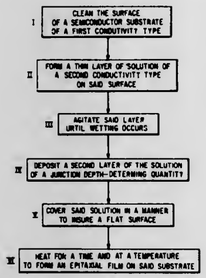
Filed May 10, 1976, Ser. No. 684,587
Int. Cl.[2] H01L *21/208*
U.S. Cl. 148—171 8 Claims

1. A method for forming an epitaxial film for a light emitting diode on a single crystal substrate of semiconductor material of a first conductivity type;

said method comprising the steps of clea ning the surface of said substrate;

coating said surface with a thin layer of a first solution from which an epitaxial film of a second conductivity type can be formed; wherein said first solution was formed at an elevated temperature, stored in a vessel at slightly above room temperature and applied at normal room temperature;

agitating said thin layer in a manner and for a time to ensure complete wetting of said surface by said layer;



adding to said thin layer a second measure of said first solution from said storage vessel to form a second layer of solution substantially thicker than said first layer for determining the depth of a rectifying junction formed in said substrate during a subsequent heating step;

and heating said coated substrate at a temperature and for a time to form an epitaxial layer.

4,047,987

UNDERWATER BLASTING EXPLOSIVES

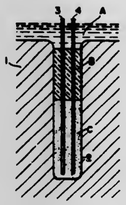
Masao Kusakabe; Shuzo Fuziwara, both of Hiratsuka, and Kazuo Shiino, Odawara, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Division of Ser. No. 445,911, Feb. 26, 1974, Pat. No. 3,952,655. This application Dec. 11, 1975, Ser. No. 639,962

Claims priority, application Japan, Feb. 27, 1973, 48-22628; May 9, 1973, 48-51345; May 10, 1973, 48-51937

Int. Cl.² C06B *33/00, 33/10, 29/00;* C07B *21/00*

U.S. Cl. 149—37 **11 Claims**



1. A fluid explosive composition which comprises urea perchlorate as the essential explosive agent and a normally liquid combustible polar organic compound.

4,047,988

LIQUID MONOPROPELLANT COMPOSITIONS

Paul B. Weill, Newport, and Paul L. Darby, Middletown, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 29, 1967, Ser. No. 651,099

Int. Cl.² C06B *47/04*

U.S. Cl. 149—74 **10 Claims**

1. A liquid monopropellant adaptable for underwater propulsion which consists of an aqueous solution comprising;

a. a secondary or tertiary amine salt of an oxidizing acid selected from the group consisting of perchloric acid and nitric acid

b. a water soluble oxidant, and

c. water present in an amount of at least 20% by weight of total composition when the amine salt is a nitric acid amine salt, and present in an amount of at least 35% by weight of total composition when the amine salt is a perchloric acid amine salt.

4,047,989

METHOD FOR THE RECOVERY OF BLASTING OIL FROM EFFLUENTS FROM THE PRODUCTION OF NITROGLYCERINE-CONTAINING EXPLOSIVES

Sverre Ludvik Ostern, Ski, Norway, assignor to Dyno Industrier A.S., Oslo, Norway

Filed May 18, 1976, Ser. No. 687,649

Claims priority, application Norway, May 23, 1975, 751834

Int. Cl.² C06B *23/00*

U.S. Cl. 149—109.6 **3 Claims**

1. A method for recovering blasting oil selected from the group consisting of glycol dinitrate, glycerine trinitrate and mixtures thereof from an effluent resulting from the production of blasting oil-containing explosives which comprises extracting the blasting oil from the effluent with a liquid nitroaromatic in an extraction apparatus, said nitroaromatic liquid being a component used in the blasting oil-containing explosive such that the blasting oil-nitroaromatic extract can be utilized for the preparation of the final explosive.

4,047,990

PLASTIC BONDED EXPLOSIVE COMPOSITION

Charles W. Falterman, and Dino A. Sbrocca, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 1, 1967, Ser. No. 659,560

Int. Cl.² C06B *45/10*

U.S. Cl. 149—19.2 **3 Claims**

1. An improved plastic bonded explosive formulation comprising

Ingredients	Percent by weight
High explosive	70 to 85
Binder	15 to 30

said high explosive being a member selected from the group consisting of cyclotetramethylenetetranitramine, cyclotrimethylene-trinitramine and diaminotrinitrobenzene; and

said binder consisting of a mixture of about 10 parts ethyl silicate type silicone resin and about 1 part polymethylsiloxane.

4,047,991

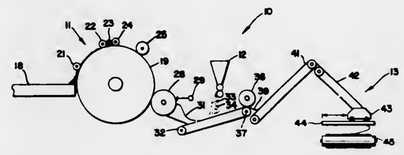
POLYESTER BATT AND METHOD FOR PRODUCING SUCH

George Sumner Buck, Jr.; Robert George Weyker, both of Memphis, and Arthur Gerard Ward, Arlington, all of Tenn., assignors to Fiberlok, Inc., Memphis, Tenn.

Filed Sept. 12, 1975, Ser. No. 612,786

Int. Cl.² B32B *31/00*

U.S. Cl. 156—62.6 **8 Claims**



1. A process for producing a polyester batt comprising the steps of:

I. forming a thin web of polyester fibers;

II. contacting the web with an adhesive amount of particles of a copolymer of vinyl chloride and vinylidene chloride;

III. forming the web into a batt by laying the web transversely back and forth on a moving belt such that the batt comprises a plurality of webs; and then

IV. heating the batt to a temperature above the sticking point of the copolymer but below the melting point of the polyester wherein the copolymer particles have a size range of from 1 to 200 microns, wherein the weight ratio of vinyl chloride to vinylidene chloride is 1:99 to 40:60 and wherein the weight ratio of the copolymer to the polyester is 1:99 to 30:70.

4,047,992

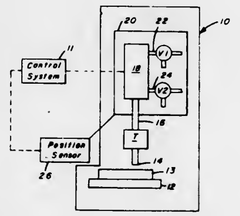
TURN-ON METHOD AND APPARATUS FOR ULTRASONIC OPERATIONS

David Alan Williams, Pittsford; Karl Sperber, Hilton, and Calvin Owen Stoutz, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 2, 1976, Ser. No. 663,024

Int. Cl.² B32B *5/18*

U.S. Cl. 156—73.1 **7 Claims**



1. A method for operating on a workpiece with an ultrasonic transducer vibrating at a predetermined frequency, said transducer having a horn adapted to engage said workpiece, said method comprising the steps of:

energizing said transducer with a low level of power while out of contact with said workpiece, said low power level being sufficient to maintain vibration of said transducer at the predetermined frequency but insufficient to accomplish the operation on said workpiece;

effecting relative movement of said transducer and said workpiece toward one another while said transducer is energized with said predetermined low power level;

sensing the relative position of said transducer and said workpiece and generating a signal when said transducer is within a predetermined distance from said workpiece;

in response to said signal, increasing the power to said transducer to a level of power higher than said predetermined level, said higher power level being sufficient to accomplish the operation on said workpiece;

stopping said relative movement between said transducer and said workpiece with said horn engaging said workpiece; and

maintaining said higher level of power with said horn engaging said workpiece for operating on said workpiece.

4,047,993

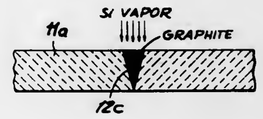
METHOD OF MAKING AN ABRASION-RESISTANT PLATE

Heinrich Bartelmuss, A-8833 Teufenbach 63, Steiermark, Austria

Filed Nov. 13, 1975, Ser. No. 631,618

Int. Cl.² C04B *35/56, 37/00*

U.S. Cl. 156—89 **3 Claims**



1. A method of making an elongate abrasion-resistant plate, comprising the steps of:

sintering a multiplicity of flat sections of like width and thickness from a comminuted refractory material with a predominant ceramic component;

closely juxtaposing said sections in coplanar relationship with formation of narrow gaps between confronting coextensive edges thereof; and

completely filling each of said gaps with a bonding agent of silicon carbide formed by melting pieces of graphite in said gaps in an atmosphere of silicon vapor, thereby uniting said sections into a continuous body.

4,047,994

PROCESS FOR MENDING CLOTHES

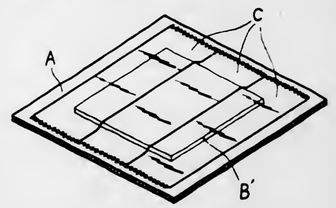
Shigeyoshi Komatsu, 7-20, 1-chome, Abenosuji, Abeno, Osaka, Japan (545)

Filed Feb. 11, 1976, Ser. No. 657,295

Claims priority, application Japan, Jan. 13, 1976, 51-3462

Int. Cl.² B32B *35/00*

U.S. Cl. 156—98 **3 Claims**



1. A process for mending clothes which comprises:

adhering a thermoplastic synthetic resin film by fusion on the back of a basic cloth to be mended and on the back of a mending cloth to prevent fraying;

putting said mending cloth with said adhered film on the surface of said basic cloth with the film side downward to adjust pattern and temporarily fastening with a temporary fastening material which completely covers the mending cloth;

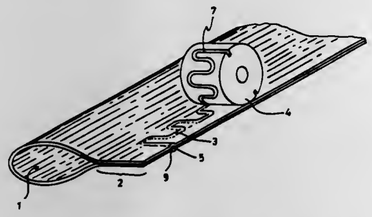
turning the cloths over to be back upward and stamping the clothes with a trimming die;
removing the basic cloth stamped out to leave the mending cloth which forms a fitting cloth;
putting a thermoplastic synthetic resin film on the circumference of the hole stamped out;
cutting the hole portion of the film in an X-shape to facilitate fitting of the fitting cloth in the hole;
fitting the fitting cloth in the hole with the back upward;
putting on a reinforcing cloth and adhering by fusion to the basic cloth and the fitting cloth through their thermoplastic synthetic resin film layers by light heat-pressing;
turning the cloths over and removing the remainders of the mending cloth and the temporary fastening material which remain on the surface of the basic cloth; and
overlaying the surface of the cloth with a polyester film and strongly heat-pressing it to remove the synthetic resin film and the temporary fastening material which remain on the surface of the fitting cloth, the basic cloth and the fitting cloth being adhered by fusion at the border of the fitting portion by the thermoplastic synthetic resin.

4,047,995

HOSES FOR IRRIGATION BY DRIPPING AND THE LIKE AND THE PROCESS TO MANUFACTURE THE SAME

Jaime Leal-Diaz, Escobedo Sur 733-201, Monterrey, Nuevo Leon, Mexico

Filed Feb. 2, 1976, Ser. No. 654,542
Int. Cl.² B05B *1/14*
U.S. Cl. 156—203 **1 Claim**



1. The method of manufacturing irrigation hoses for dripping and the like comprising forming a primary flow duct from a thin plastic film having overlapped layers and passing a smooth roller with at least one groove defined therein over said overlapped layer of plastic film, said smooth roller portion sealing the overlapped layer of plastic and forming said primary flows duct while said at least one groove forming a secondary unsealed, fluid passage therebetween leading from said primary flow duct to an exit position at the edge of said overlapped layers.

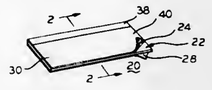
4,047,996

PLASTIC PLATES ADAPTED TO BE IMPRINTED AND METHODS OF MANUFACTURING AND IMPRINTING ON PLASTIC PLATES

James C. Kanzelberger, Riverside, Ill., assignor to Contemporary, Inc., River Forest, Ill.

Division of Ser. No. 454,166, March 25, 1974, Pat. No. 3,940,864. This application Sept. 15, 1975, Ser. No. 613,545
Int. Cl.² B32B *31/00*; B44C *1/24*
U.S. Cl. 156—220 **4 Claims**

4. The process of imprinting and applying an article comprising a plastic layer having a plate portion and an appendage portion, said layer having on one surface thereof an attached overlying carrier film with a transferable layer of coloring matter and a adhesive protected by a backing sheet on the other surface, said process comprising: hot stamping said plate with a heated die to mold and deboss the plastic of the plate and to transfer said coloring matter from said film and into the debossed portions of the plate; removing the carrier film,



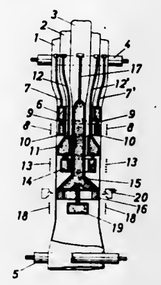
protective cover sheet and appendage portion from the plate; and applying the plate to another article.

4,047,997

METHOD FOR MANUFACTURING A FLATTENED CYLINDRICAL FILM CONSISTING OF LAYERS OF THERMOPLASTIC RESIN STRETCHED LENGTHWISE AND CROSSWISE

Michio Sudo, c/o Nikko Resin Co., Ltd., Fujikoshi Bldg. No. 23-7,5-chome, Higashi, Gotanda, Shinagawa, Tokyo, Japan

Continuation of Ser. No. 539,611, Jan. 8, 1975, abandoned, which is a division of Ser. No. 330,043, Feb. 2, 1973, Pat. No. 3,894,907. This application Feb. 26, 1976, Ser. No. 661,635
Claims priority, application Japan, June 26, 1972, 47-63273
Int. Cl.² B29C *27/02*
U.S. Cl. 156—229 **4 Claims**



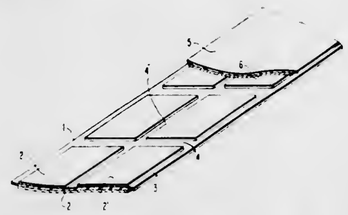
1. A method for producing laminated tubing comprising the steps of simultaneously extruding an outer, an intermediate and an inner tube of plastic material concentrically with at least said outer and said inner tube radially spaced from each other, said intermediate tube being extruded from a material having a lower melting point than the other two tubes; drawing said outer tube over a first mandrel so as to stretch said outer tube only in longitudinal direction; drawing said inner tube over a second mandrel which diverges in said longitudinal direction so as to mechanically stretch said inner tube in a direction transverse to said longitudinal direction to a diameter substantially equal to that of said outer tube; drawing said intermediate tube over a third mandrel so as to stretch said intermediate tube in both longitudinal and transverse directions; and heating said mandrels and transmitting heat from the same to said tubes during the stretching thereof so as to weld said outer tube stretched in said longitudinal direction, said intermediate tube stretched in said longitudinal and said transverse direction, and said inner tube stretched in said transverse direction together by heating said intermediate tube close to its melting point while pressing said tubes against each other.

4,047,998

METHOD OF POLARIZING A THERMOPLASTIC RESIN FILM

Shinsuke Yoshikawa; Syuuzi Terasaki, and Tohru Sasaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1976, Ser. No. 667,311
Claims priority, application Japan, Mar. 17, 1975, 50-31152
Int. Cl.² B29C *19/06*
U.S. Cl. 156—275 **5 Claims**



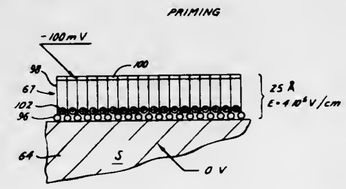
1. A method of polarizing a first thermoplastic resin film having metallic electrodes evaporated on both surfaces thereof, said film being of the type capable of being polarized into a piezoelectric film by application of an electric field of a predetermined amount thereacross, one of said electrodes consisting of a plurality of individual electrode elements separated and insulated from one another, the improvement comprising the steps of placing onto said one electrode a laminate of an additional thermoplastic resin film having an evaporated continuous metal coating on one surface thereof, said laminate being placed so that said metal coating contacts said plurality of individual electrode elements, and applying said electric field between said metal coating and the other metallic electrode of said first thermoplastic resin film.

4,047,999

METHOD OF MAKING A MOBILE ION FILM MEMORY

Francis John Salgo, 5907 Northhaven Road, Dallas, Tex. 75230

Division of Ser. No. 507,278, Sept. 19, 1974, Pat. No. 3,936,690. This application Dec. 22, 1975, Ser. No. 643,547
Int. Cl.² B32B *31/00*
U.S. Cl. 156—280 **1 Claim**



1. A method of making data storage film comprising steps of:
forming at least one monomolecular Langmuir film at a solution pH sufficient to cause vertical alignment of and strong van der Waals attraction between its organic stalks;
adhering said film to a conductive substrate;
bathing said film in a solution containing positive ions such that said ions are incorporated into said film and are mobile therein; and
removing excess water from said film.

4,048,000

PROCESS FOR PROVIDING IMPROVED HEAD POINTS IN CONCRETE BLOCK CONSTRUCTION WITH LATEX-EPOXY-CEMENT ADHESIVE

Elmer L. McMaster; Dallas G. Grenley, both of Midland, and Elton D. Prueter, Saginaw, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 492,566, July 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 295,374, Oct. 5, 1972, abandoned. This application Sept. 18, 1975, Ser. No. 614,729
Int. Cl.² C08K *3/34*; C09J *3/16*
U.S. Cl. 156—304 **3 Claims**

1. A process for providing improved head joints in concrete block construction comprising utilizing as the adhesive in the preparation of said head joints a plastic, aqueous binder composition comprising a mixture of the following in parts by weight of solids; from about 20 to about 85 hydraulic cement; from about 2 to about 25 of a styrene-butadiene polymeric latex, said latex being a plasticizer for the composition; from about 10 to 50 liquid synthetic thermosetting ambient temperature curable epoxide resin and a fat acid polyamide curing agent having an amine value of 290–320 therefor wherein the resin is from about 60 to about 95 percent by weight and the curing agent is the remainder; together with water for curing said cement, wherein said binder composition is prepared by
1. preparing a first mixture comprising a blend of said cement and said epoxide resin wherein said first mixture is subjected to mixing on a compounding mill under conditions of high shear,
2. preparing a second mixture comprising a blend of said polymeric latex with said curing agent wherein said curing agent is dissolved in methyl alcohol, and
3. admixing said first mixture and said second mixture prior to use as an adhesive.

4,048,001

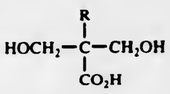
POLYURETHANE TEXTILE ADHESIVE

Kenneth Herald Remley, Warren, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 322,334, Jan. 10, 1973, abandoned. This application Mar. 5, 1975, Ser. No. 555,670
Int. Cl.² C08G *18/12, 18/34*
U.S. Cl. 156—331 **11 Claims**

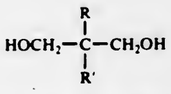
1. A process for preparing a polyurethane textile adhesive composition in the form of an aqueous dispersion comprising the steps of:
1. forming an isocyanate-terminated prepolymer in the presence of from about 10 to 30% by weight thereof of a low molecular weight polymeric plasticizer, by the reaction of from about 1.0 to 1.7 moles of tolylene diisocyanate per mole of a mixture of three hydroxy compounds consisting of:

(a)



wherein R is hydrogen, or lower alkyl,

(b)



wherein R is hydrogen, or lower alkyl, and R' is lower hydroxyalkyl, and



(c)

wherein R_1 is hydrogen, or lower alkyl, and q is an integer sufficiently large to provide an average molecular weight from about 1750 to about 5,000, the molar ratio of (a) to (b) to (c) ranging from 2.0-7.5: 1.0: 2.0-7.5

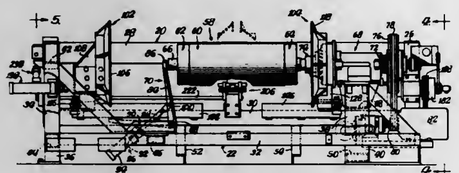
2. forming a latex by stirring said isocyanate-terminated prepolymer mixture in an aqueous medium containing a tertiary amine until all of the residual isocyanate groups have reacted with water;
3. adjusting the viscosity of the latex by adding a thickening agent thereto;
4. applying the composition obtained from step (3) to a textile material or other material; and
5. forming an adhesive bond between said textile material or said other material and another textile material with said composition.

4,048,002

TIRE BUILDING APPARATUS

Edwin F. Mallory, Niles, Mich., assignor to National-Standard Company, Niles, Mich.

Filed July 2, 1973, Ser. No. 375,750
Int. Cl.² B29H *17/22*
U.S. Cl. 156—403 **17 Claims**



1. In tire building apparatus, the combination of main frame means comprises a base frame portion, a rear frame portion integral with said base frame portion and having substantial longitudinal length, and an auxiliary frame portion; rotatable tire building drum means supported by said auxiliary frame portion on a longitudinal axis parallel to said rear frame porton; first and second tire bead placing means supported on said rear frame portion and movable axially inwardly and outwardly longitudinally of said drum means; and said rear frame portion, at the plane perpendicular to the midpoint of the axis of said rotatable tire building drum means and continuously for substantially the entire length of said rear frame portion, extending above a horizontal plane tangent to the bottom of said drum means whereby to form with said base frame portion rigid main frame means to maintain alignment of the tire building elements supported thereby.

4,048,003

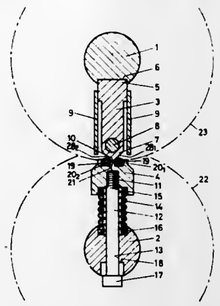
APPARATUS FOR THE TRANSVERSAL WELDING AND SEVERING OF SUPERPOSED WEBS

Hans-Ulrich Bolli, Schleitheim, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Dec. 10, 1975, Ser. No. 639,606
Claims priority, application Switzerland, Jan. 27, 1975, 914/75
Int. Cl.² B32B *31/18, 31/20*
U.S. Cl. 156—515 **6 Claims**

1. In an apparatus for the periodical transverse welding and severing of longitudinally advanced wrapper sheets being in a superposed, face-to-face relationship with respect to one another; the apparatus having first and second oppositely rotated, cooperating welding shoes between which the wrapper sheets pass; the first welding shoe being secured to a first rotary shaft and the second welding shoe being secured to a second rotary shaft; each rotary shaft having an axis; at least one of the welding shoes carrying heating means; a knife edge carried by the first welding shoe; a counterface carried by the second welding shoe and cooperating with the knife edge; upon each revolution of the welding shoes the latter simultaneously engage the wrapper sheets from opposite sides for transversely welding and severing the wrapper sheets; the improvement comprising:

a. mounting means for radially displaceably securing at least one of said welding shoes to its respective shaft to provide for a displacement of said at least one welding shoe towards its shaft upon abutment with the other welding shoe during encounter therewith; said mounting means including
   1. force exerting means for urging the welding shoe radially outwardly relative to the respective shaft; and
   2. a stop determining the outermost position of the welding shoe relative to its shaft; the distance between the



axes of said rotary shafts being smaller than the sum of the distances of said knife edge and said counterface from the axis of their respective rotary shaft in said outermost position of the welding shoes;

b. a wedge-shaped tapered head forming an outer terminal part of said first welding shoe; said head having a leading flank and a trailing flank and ending in an edge constituting said knife edge; and
c. two elongated rod-like resilient members secured to said second welding shoe adjacent and parallel to said counterface on either side thereof; during each revolution of said welding shoes one of said rod-like members engages said leading flank of said head for providing a first weld seam on said wrapper sheets and the other of said rod-like members engages said trailing flank of said head for providing a second weld seam on said wrapper sheets; said knife edge, in cooperation with said counterface, severing said wrapper sheets subsequent to forming said first weld seam and prior to forming said second weld seam.

4,048,004

APPARATUS FOR MOVING A TOOL INTO AND OUT OF ENGAGEMENT WITH A WORKPIECE

Joseph Albert Watkins, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

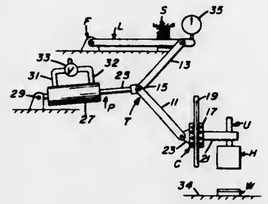
Filed Mar. 29, 1976, Ser. No. 671,459
Int. Cl.² B32B *31/00*; G05G *1/04*; B23K *1/06*
U.S. Cl. 156—580.1 **13 Claims**

1. Apparatus for moving a tool into engagement with a workpiece; said apparatus comprising:

a toggle linkage including first and second links, each of said first and second links defining a central end and an outer end, and means pivotally connecting said central ends of said first and second links together for movement between folded and straightened conditions, the toggle linkage in the straightened condition defining a longitudinal axis extending through the outer ends of said first and second links;

drive means for applying a force to said toggle linkage at said connected central ends to move said linkage from the folded condition to the straightened position, the straightening force applied by said drive means having essentially no component of force along said longitudinal axis in the straightened condition of said toggle linkage;

means connecting said toggle linkage and the tool for moving the tool into engagement with the workpiece in re-



sponse to movement of said linkage from the folded condition to the straightened condition, and,

resilient means for exerting pressure between the tool and the workpiece in the straightened condition of said toggle linkage, said resilient means applying a force along the longitudinal axis in the straightened condition of the linkage;

whereby the pressure between the tool and the workpiece is essentially entirely the force exerted by said resilient means.

4,048,005

PROCESS FOR PRODUCING A LAMINATED METALLIC SHEET

Keisuke Nakagome, and Toshiharu Suzuki, both of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Continuation of Ser. No. 403,311, Oct. 3, 1973, abandoned. This application Nov. 10, 1975, Ser. No. 630,380
Claims priority, application Japan, Oct. 2, 1972, 47-99648
Int. Cl.² C07D *233/80*; H01L *21/312*
U.S. Cl. 156—630 **20 Claims**

11. In a process for the production of heat resistant laminated articles comprising metallic sheets or foils with a polymer binder film laminated therebetween, the improvement comprising:

providing a binder film comprising a film of heat resistant heterocyclic polymer composed of polyhydantoin which exhibits no fusing point, said polymer film having an inherent viscosity greater than about 0.4, and a volatile matter content below about 5.0% by weight, and

laminating said metallic sheets or foils with said binder film therebetween under pressure and at a temperature above the heat distortion temperature of said binder film.

20. A process for producing a substrate for use in the manufacture of printed circuit boards further comprising chemically etching at least a part of the exposed metallic surface of a metallic laminated article produced according to claim 11.

4,048,006

STRIPPING OF ELECTROPLATED NICKEL-IRON ALLOYS

Edward Paul Harbulak, Allen Park, and Ronald J. Lash, Warren, both of Mich., assignors to M&T Chemicals Inc., Greenwich, Conn.

Filed Aug. 5, 1975, Ser. No. 602,141
Int. Cl.² C09K *13/00*; C23F *1/00*
U.S. Cl. 156—664 **43 Claims**

1. A process for selectively removing nickel-iron alloys containing from 5% to 90% iron from the surface of a metal substrate which comprises contacting said nickel-iron alloys with an aqueous bath consisting of:

a. at least one nitro substituted organic compound containing at least one solubilizing group;
b. at least one organic amine or polyamine or substituted amine or polyamine; and
c. at least one aliphatic carboxylic acid or salt thereof, or a compound which will yield said carboxylic acid or salt thereof in solution, further characterized in that additionally said aliphatic carboxylic acid or salt thereof contains at least one substituent group selected from —NH_2, or quaternary amine salts thereof, —OH or —SH.

4,048,007

METHOD OF REMOVING SOLVENT RESIDUES FROM AQUEOUS PAPER PULPS

J. Frank Valle-Riestra, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 577,263, May 14, 1975, abandoned. This application July 9, 1976, Ser. No. 703,983
Int. Cl.² D21C *9/00*
U.S. Cl. 162—57 **10 Claims**

1. The method of removing residual amounts of volatile solvents from aqueous pulps of cellulosic fibers by gas stripping, wherein said pulp contains from about 0.4 to about 1.5 weight percent of said fibers comprising intimately contacting said pulp with *n* volumes of said gas under such conditions of agitation that the pulp consistency remains essentially uniform throughout, thereby removing at least a fraction of said solvent from said pulp,

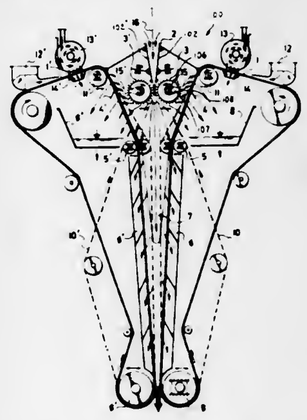
the ratio of *n* to the volumes of said gas required to remove the same fraction of solvent in the same manner, from the same volume of water containing the same initial amount of said solvent, being within the range of from about 1.5/1 to about 6/1.

4,048,008

METHOD OF AND APPARATUS FOR FORMING SHEETS OF FIBROUS MATERIAL BETWEEN CONVERGING SIEVES

Michal Škrabák; Ernest Vavrík; Stanislav Kolařík, and Miloš Mazák, all of Bratislava, Czechoslovakia, assignors to Slovenska Vysoka Skola Technicka, Bratislava, Czechoslovakia

Filed Feb. 13, 1976, Ser. No. 658,079
Claims priority, application Czechoslovakia, Feb. 13, 1975, 902/75
Int. Cl.² D21F *1/00, 11/00*; D21H *1/06*
U.S. Cl. 162—104 **23 Claims**



1. In a method of forming a sheet of fibrous material, comprising the steps of advancing a pair of sieves in a downwardly

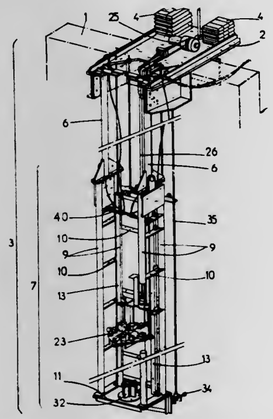
converging manner symmetrical to a longitudinal axis to bound a wedge-shaped working zone between respective inner surfaces thereof, and introducing a fibrous suspension having a liquid phase into the working zone to be formed into a sheet and simultaneously dried via the passage of the liquid phase through the sieves, the improvement wherein the introducing step comprises directing the suspension into a central area of the working zone, and wherein the method further comprises the steps of supporting, in the upper portion of the working zone, a pair of transversely spaced spraying rollers symmetrical to the longitudinal axis and in intercepting relation to the suspension directed into the central area, each roller having a plurality of vanes extending outwardly from the periphery thereof, and rotating the rollers in mutually opposite directions to propel the intercepted suspension in directions symmetrical to the longitudinal axis toward the converging surfaces of the working zone, whereby a uniform, controllable fiber distribution is obtained.

4,048,009

METHOD OF AND APPARATUS FOR CHECKING THE DIMENSIONS OF THE EXTENSIONS OF THE CONTROL RODS OF A NUCLEAR REACTOR

Jean-Claude Weilbacher, L'Isle Adam, France, assignor to Societe France-Americaine de Constructions Atomiques-Framatome, Courbevoie, France

Filed Mar. 8, 1976, Ser. No. 664,639
Claims priority, application France, Mar. 14, 1975, 75.08010
Int. Cl.² G21C *17/00*
U.S. Cl. 176—19 R **5 Claims**



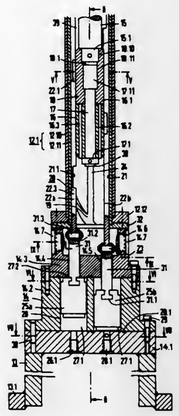
2. An apparatus for checking the straightness of elongated control rod extensions of a nuclear reactor under deep water in a fuel storage pool of the reactor, comprising: a vertical structure removably suspended from the lip of the pool and including: an upper section removably attached to the lip and forming an auxiliary floor, an intermediate section, the height of which is at least equal to the depth of the water, and a lower section including vertical guide members, a support at its lower end having a profile analogous to that of each rod extension and for receiving the lower end of a rod extension when placed in said structure, the rod extension being substantially vertically aligned with said support, means for centering the upper end of the rod extension in said structure; a measuring carriage carrying measuring pick-ups and movable along said guide members between a low position in which said pick-ups are below the lower end of the rod extension as it rests on said support, and a high position corresponding to the upper extension end; means for moving said carriage between the low and high positions and for stopping said carriage; and a readout system outside the pool and connected to said pick-ups to receive data therefrom.

4,048,010

CONTROL ROD DRIVE FOR NUCLEAR REACTORS

Gunther Eschenfelder, Stockstadt, and Rudiger Schultz, Offenbach, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Feb. 10, 1976, Ser. No. 656,896
Claims priority, application Germany, Feb. 11, 1975, 2505692
Int. Cl.² G21C *7/12*
U.S. Cl. 176—36 R **18 Claims**



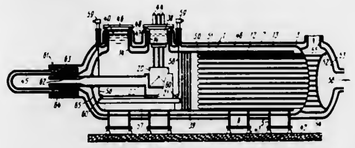
1. In a nuclear reactor, an hydraulic control rod drive comprising a vertically disposed tube, a piston rod mounted in said tube so as to be axially displaceable therein, means for hydraulically driving said piston rod in axial direction in said tube, means located at the upper end of said piston rod for coupling a control rod to said piston, and means for controllably blocking axial displacement of said piston rod in said tube, said blocking means being ineffective during rapid shut-down of the nuclear reactor, said blocking means comprising a threaded piston rotatably mounted on said piston rod and fixed thereon against axial displacement relative thereto, said threaded piston having a thread flank located at the outer periphery thereof, said vertically disposed tube being formed with an inner thread corresponding to said thread flank, said thread flank being received in said thread, said hydraulically driving means comprising at least two hydraulically controlled, axially displaceable switching rods mounted in axial guidance grooves formed at the inner perihery of said vertically disposed tube and interrupting said thread, said switching rods, in a clear position thereof, permitting rotary movement of said threaded piston and, in a locking position thereof, forming a stop for said thread flank and blocking rotary movement of said threaded piston, said switch rods being hydraulically controlled so as to be displaceable stepwise in axial direction during normal operation of the control rod drive.

4,048,011

FAST NUCLEAR REACTOR

Vladimir Mikhailovich Kovin, ulitsa Shalyapina, 19, kv. 11; Fedor Mikhailovich Mitenkov, ploschad Gorkogo, 2, kv. 26; Alexandr Vasilievich Ovechkin, ulitsa Tolbukhina, 6, kv. 2; Vladimir Alexeevich Pankratov, ulitsa Kultury, 3, kv. 456; Nikolai Ivanovich Savin, ulitsa Zvezdinka, 3, kv. 74; Tamara Alexandrovna Ternikova, prospekt Kirova, 2, kv. 63; Vladimir Jurievich Filippov, ulitsa Piskunova, 32, kv. 14; Dmitry Alexandrovich Khramov, ulitsa Kultury, 3, kv. 425; Evgeny Naumovich Chernomordik, ploschad Gorkogo, 2, kv. 30; Vladimir Ivanovich Shirysev, ulitsa Strazh Revoljutsii, 22, kv. 19; Vladimir Romanovich Muzychuk, pereulok Timurovsky, 21, and Alexandr Nikolaevich Savin, ulitsa Zvezdinka, 3, kv. 71, all of Gorky, U.S.S.R.

Filed Sept. 13, 1974, Ser. No. 505,794
Int. Cl.² G21C *15/02*
U.S. Cl. 176—40 **5 Claims**



1. A fast nuclear reactor comprising: a main vessel; a side wall of said main vessel being cylindrical in shape; the axis of said cylinder lying in the horizontal plane; at least two pipe branches penetrating said side wall of said vessel; a nuclear reactor core within said main vessel; heat exchangers comprised of tubes are also disposed within said main vessel; a liquid metal coolant filling said vessel and in said pipe branches; a means for circulating said liquid-metal coolant passing through said core and heat exchanger tubes; and an inert gas medium in said pipe branches and contacting said coolant therein; said reactor further including an additional tubular vessel arranged internally of said main vessel and surrounding said core and said heat exchangers; and an annulus defined between said vessels to form a conduit for the coolant to pass through in a direction from said heat exchanger towards said means for circulating the coolant.

4,048,012

NUCLEAR POWER INSTALLATIONS

Brian Victor George, Willoughby Waterleys, and Colin James Drayrer, Oxon Way, both of England, assignors to Nuclear Power Company (Whetstone Limited), England

Continuation of Ser. No. 390,006, Aug. 20, 1973, abandoned.
This application Dec. 23, 1975, Ser. No. 643,676
Claims priority, application United Kingdom, Aug. 24, 1972, 39409/72
Int. Cl.² G21C *15/00*
U.S. Cl. 176—60 **5 Claims**

1. A gas-cooled nuclear-reactor power-generating installation having

A. a nuclear reactor core,

B. a main stream-generating boiler,

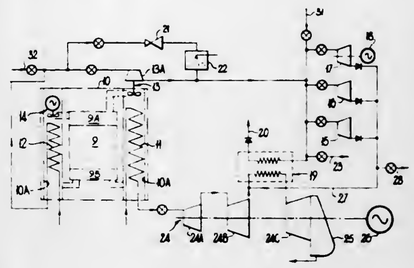
C. an auxiliary steam-generating boiler, independent of said main boiler and distinct therefrom,

D. a main coolant-gas circulator arranged to circulate coolant gas through the core and through the main boiler, independently of the auxiliary boiler, whereby to generate steam in the main boiler,

E. an auxiliary coolant-gas circulator arranged to circulate coolant gas through the core and through the auxiliary boiler, independently of the main boiler, whereby to generate steam in the auxiliary boiler,

F. a main turbogenerator which includes a steam turbine having a plurality of turbine stages through which steam from the main boiler passes in sequence, and

G. a steam reheater unit connected between two of the turbine stages to reheat the said steam from the main boiler,



H. the auxiliary boiler being connected to supply to the reheater unit steam which reheats the said steam from the main boiler.

4,048,013

PROCESS FOR PRODUCING SINGLE-CELL PROTEIN FROM METHANOL USING METHYLOMONAS SP. DSM 580

Fritz Wagner, Stockheim, and Hermann Sahm, Wolfenbuttel, both of Germany, assignors to Gesellschaft fur Molekularbiologische Forschung mbH, Braunschweig, Germany

Filed June 10, 1976, Ser. No. 694,792
Int. Cl.² C12B *1/00*
U.S. Cl. 195—49 **8 Claims**

1. A process for the production of single-cell protein from methanol, which comprises placing, in an aerated fermenter with or without a mechanical stirrer, a growing submerged culture of the obligate methanol-utilizing bacterium Methylomonas sp. DSM 580, produced under aerobic conditions, cultivating it in the presence of methanol, used as the sole source of carbon and energy, and mineral salts, in the presence or absence of growth promoting agents, this system further provided with air or oxygen enriched air at a cultivating temperature from 20° to 45° C, thereafter removing the cell mass out of the three phase system and drying, resulting in a biomass with a crude protein content of at least 60–76% (w/w), a nucleic acid content of 2–17% (w/w), an ash content of 4–6% (w/w), a lipid content of 3–8 (w/w), the culture fluid, after removing the cell mass, is capable of being, at least partially, recycled.

4,048,014

METHOD FOR OBTAINING UROKINASE

Masaharu Urakawa, and Hiroshi Sumiyama, both of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed July 6, 1976, Ser. No. 702,900
Claims priority, application Japan, July 16, 1975, 50-86765
Int. Cl.² C07G *7/026*
U.S. Cl. 195—66 B **6 Claims**

1. A method for obtaining urokinase which comprises contacting a partially purified urokinase-containing solution with diatomaceous earth at a pH range of 4.0 - 8.0, washing said diatomaceous earth adsorbing urokinase thereon with a buffer solution of pH 6.5 - 9.0 and eluting the urokinase from the adsorbate with a basic solution.

4,048,015

FORTIMICIN C AND PROCESS FOR PRODUCTION THEREOF

Takashi Nara, Tokyo; Ryo Okachi; Mitsuyoshi Yamamoto, both of Machida; Yasuki Mori, Kawasaki; Moriyuki Sato, Machida; Masahiro Sugimoto, and Yoshiaki Shimizu, both of Shizuoka, all of Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Filed July 26, 1976, Ser. No. 708,681
Claims priority, application Japan, Aug. 1, 1975, 50-93182
Int. Cl.[2] C12D *9/14*
U.S. Cl. 195—96 4 Claims

1. A process for producing Fortimicin C which comprises culturing a Fortimicin C producing microorganism belonging to the genus Micromonospora in a nutrient medium until substantial antibacterial activity is detected in the culture liquor and thereafter isolating Fortimicin C therefrom.

4,048,016

IDENTIFICATION OF NON-FERMENTATIVE GRAM-NEGATIVE BACTERIA

Lucy A. Otto, Garden Grove, Calif., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 571,502
Int. Cl.[2] C12K *1/10, 1/00*
U.S. Cl. 195—100 9 Claims

1. Assay medium for determining oxidative attack (OA) by Gram-negative non-fermentative bacteria (NFB) consisting essentially of an oxidative alkalination (OAL) assay medium containing 0.02 –0.05% by weight of casamino acids, bromthymol blue indicator, a substrate and buffered to pH 6.0 and an oxidative acidification (OAC) medium containing 0.02–0.03% by weight of tryptone, bromthymol blue indicator, a substrate and buffered to pH 6.7.

4,048,017

INTRODUCTION OF NUTRIENT MEDIUM INTO A FERMENTER

Frank Cornelius Roesler, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 4, 1975, Ser. No. 601,494
Claims priority, application United Kingdom, Aug. 14, 1974, 35754/74; May 19, 1975, 21288/75
Int. Cl.[2] C12B *1/00*
U.S. Cl. 195—109 5 Claims

1. A method for the continuous fermentation of a culture comprising a nutrient medium, one of the constituents of which is a growth limiting nutrient, and microorganisms capable of utilizing the medium for growth wherein the growth limiting nutrient is supplied to the culture in an amount which corresponds stoichiometrically with the locally available supply of oxygen at an average of at least one position per cubic meter of the effective volume of a fermenter in which the fermentation is performed, said effective volume being the volume in which, through mass transfer from gas bubbles, a positive dissolved partial pressure of oxygen can be maintained, whereby substantially all the limiting nutrient supplied at each position is consumed by the microorganisms present in the culture in the vicinity of that position before oxygen nutrient available to them in the culture in the vicinity of that position is exhausted and becomes the limiting nutrient.

4,048,018

METHOD OF CARRYING OUT ENZYME CATALYZED REACTIONS

Robert W. Coughlin, 902 Seventh Ave., Bethlehem, Pa. 18018, and Marvin Charles, 622 N. 29 St., Allentown, Pa. 18104

Continuation-in-part of Ser. No. 495,073, Aug. 5, 1974, abandoned, which is a division of Ser. No. 228,748, Feb. 23, 1972, Pat. No. 3,928,143. This application Mar. 9, 1976, Ser. No. 665,300
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.[2] C12B *1/00*
U.S. Cl. 195—115 13 Claims

1. An improved method of effecting enzymatic reactions in a reactant material which is contained in a carrier fluid by passing the carrier fluid past enzyme material attached to a supporting material comprising:

a. passing the carrier fluid generally upwardly through a reaction zone containing finely divided particles having a size range of 0.01 millimeters to 5 millimeters to which the enzyme material is attached, said particles composed essentially of material having a theoretical density of from about 2.4 grams/cm^3 to 25 grams/cm^3, the volume of the reaction zone being sufficient to contain all of the particulate supporting material in at least an expanded condition wherein the various particles are substantially not supported upon each other,

b. maintaining an upward velocity of carrier fluid through said reaction zone sufficient to suspend and agitate the said particulate supporting material, but insufficient to carry said particulate supporting material from reaction zone.

10. Apparatus for conducting enzymic reactions wherein enzymes are immobilized on particles that are fluidized by the upward flow of carrier fluid containing a reactant material, comprising tube means forming a reaction vessel, enzyme material immobilized on insoluble supporting particles within said reaction vessel, said particles having sizes ranging from about 0.01 millimeter to 5 millimeters and composed essentially of material having a theoretical density ranging from about 2.4 grams/cm^3 to about 25 grams/cm^3, pumping means for causing flow of carrier fluid upwards through said enzyme-bearing particles, with the restriction that the dimensions of said reaction vessel, the sizes and densities of said particles, and the characteristics of said pumping means are such as to result in fluidization of said particles while permitting said particles to remain within said vessel, when said carrier fluid is caused to flow through the said vessel.

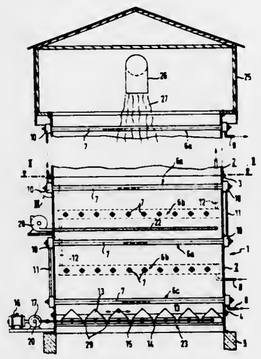
4,048,019

INSTALLATION FOR PRODUCING GREEN MALT FROM BARLEY AND/OR FOR STORING AND CONTINUOUSLY DISPENSING GREEN MALT

Christian Konrad Numberger, St. Wolfgang, Germany (8251)

Filed May 7, 1976, Ser. No. 684,106
Claims priority, application Germany, May 28, 1975, 2523709
Int. Cl.[2] C12C *1/04*
U.S. Cl. 195—129 7 Claims

1. An installation for continuously producing green malt from barley, comprising a container having a top with means for receiving barley, a plurality of superposed, substantially horizontal grids of stationary parallel hollow tubes extending between the walls of the container at different levels throughout the container, the tubes of adjacent grids being angularly offset in relation to each other, the tubes being connected in a closed circuit to a supply system for cooling medium, whereby the germinating barley may be cooled solely through contact



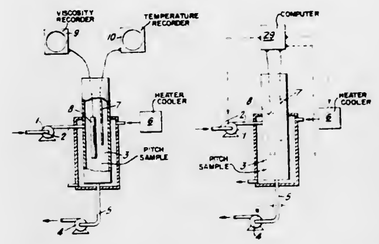
with the tubes, and a bottom on the container including means for dispensing green malt.

4,048,020

METHOD AND APPARATUS FOR THE CONTROL OF PITCH OPERATION

George R. Romovacek, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 383,151, July 27, 1973, abandoned. This application July 30, 1975, Ser. No. 601,071
Int. Cl.[2] B01D *3/42*
U.S. Cl. 196—132 4 Claims



1. An apparatus for controlling the operation of a pitch still reactor comprising a means for removing a sample of pitch from the pitch still reactor, a sample chamber for holding a sample of the pitch, a means for heating the sample, a temperature sensing means and viscosity sensing means that simultaneously measure the viscosity and temperatue of the sample and a means for comparing the simultaneously measured viscosity and temperature with a predetermined viscosity and temperature value and controlling the pitch still reactor in response to comparison.

4,048,021

METHOD OF PURIFYING CRUDE 2,6-NAPHTHALENEDICARBOXYLIC ACID DIMETHYL ESTER

Hiromitsu Takamoto; Kiyoshi Yamamoto; Nobuo Taneda; Toru Matsubayashi, and Gentaro Yamashita, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 548,074, Feb. 7, 1975, abandoned. This application Sept. 23, 1976, Ser. No. 725,834
Claims priority, application Japan, Feb. 12, 1974, 49-16307
Int. Cl.[2] B01D *3/10*
U.S. Cl. 203—91 4 Claims

1. In a method of obtaining purified 2,6-naphthalenedicarboxylic acid dimethyl ester by vacuum distilling crude 2,6-naphthalenedicarboxylic acid dimethyl ester under conditions of application of heat, the improvement which comprises vacuum distilling in a batch or continuous operation, a crude 2,6-naphthalenedicarboxylic acid dimethyl ester having an acid value (A_f), as expressed in milligrams of KOH required for neutralizing the carboxyl groups contained in one gram of said crude 2,6-naphthalenedicarboxylic acid dimethyl ester, of from 1.0 to 50, at a bottom liquid phase temperature T_b of from 190° C. to 340° C., and at a residual rate (W/F) of said dimethyl ester in the distillation zone which satisfies the relationship

$$0.9 \geqq W/F \geqq 10^{(\log A_f - 1/160.T_b)} \geqq 0.0075$$

wherein

W/F is the residual rate;

W is the rate of withdrawal of the bottoms liquid phase at kg/hr in the case of continuous operation, or the amount of the bottoms liquid phase in kg in the case of batch operation;

F is the rate at which the crude 2,6-naphthalenedicarboxylic acid dimethyl ester is fed into the distillation zone at kg/hr in the case of continuous operation, or the amount charged of said ester in kg in the case of batch operation;

A_f is the acid value of the crude 2,6-naphthalenedicarboxylic acid dimethyl ester fed to the distillation zone at a numerical value as indicated by the KOH, mg/g of crude 2,6-naphthalenedicarboxylic acid dimethyl ester; and

T_b is the temperature of the bottoms liquid phase as a numerical value as indicated by ° C and recovering the distilled-off purified 2,6-naphthalenedicarboxylic acid dimethyl ester as distillate and removing any free dicarboxylic acids and mono-methyl esters contained in the crude 2,6-naphthalenedicarboxylic acid dimethyl ester as bottoms liquid phase; the operation of said method within the limits of said relationship being effective to substantially obviate formation of scales within the bottom of said distillation zone, so as to enable recovery of a product ester of high product reproducibility.

4,048,022

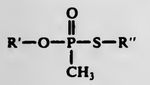
SIMULANT COMPOUND AND METHOD FOR TESTING AN AGENT ALARM

Joseph Epstein, and Lewis M. Berkowitz, both of Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 2, 1976, Ser. No. 702,371
Int. Cl.[2] G01N *27/46, 27/50*
U.S. Cl. 204—1 T 5 Claims

1. A method of challenging a toxic V and G agent alarm so as to test the function and sensitivity of the alarm's conversion prefilter, heating element, and detection cell by using a simulant compound which has no significant toxicity, said alarm including an electrochemical cell with a silver electrode for the detection of CN^- ions, said cell having an electrolyte including an oxime for reaction with phosphonofluoridates, G agents and analogues thereof, whereby CN^- ions are generated, said alarm further including a conversion prefilter impregnated with $AgNO_3$ and KF for the conversion of V agents to their G analogues and a heating element for volatilizing the V agents,

comprising the steps of providing an air sample containing said simulant compound having the formula



wherein R'' is a lower alkyl group selected to produce a readily displaced alkylmercapto moiety when reacted with the $AgNO_3$ and KF of the conversion filter and R' is a longer chain alkyl group selected to give a volatility similar to that of the less volatile G agents, reacting said simulant compound with the $AgNO_3$ and KF of the conversion filter to produce the corresponding fluoridate, heating the resulting fluoridate by means of the alarm heating element to volatilize the fluoridate, passing the volatilized fluoridate to the electrochemical detection cell and reacting said fluoridate with the oxime of the cell electrolyte to produce CN^- ions, reacting the CN^- ions at the silver electrode of the cell to produce a change in potential and monitoring the change in potential to determine the alarm challenge.

4,048,023

ELECTRODEPOSITION OF GOLD-PALLADIUM ALLOYS

Peter Stevens, Parsippany, N.J., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed June 9, 1976, Ser. No. 694,278
Int. Cl.² C25D *3/56, 3/62*
U.S. Cl. 204—44 **8 Claims**

1. In an aqueous gold electroplating bath, free of cyanides and containing about 1 to 50 g/l of gold as an alkali metal gold sulfite and about 0.05 to 10 g/l of palladium as a complex, the improvement which comprises employing palladosamine chloride as the palladium complex and wherein said bath is buffered to a pH within the range of about 5.5 to 11.

4,048,024

BRIGHT LEVELLING ZINC PLATING

Direj Vallabhbhai Patel, South Harrow, and John Joseph Bernard Ward, Wantage, both of England, assignors to International Lead Zinc Research Organization, Inc., New York, N.Y.

Filed Mar. 22, 1976, Ser. No. 669,276
Claims priority, application United Kingdom, Mar. 27, 1975, 13052/75
Int. Cl.² C25D *3/22*
U.S. Cl. 204—55 R **15 Claims**

1. A solution for electrodepositing zinc comprising water, zinc ions in a concentration of at least 0.2 M, peptone in a concentration of at least 100 mg/l and thiourea in a concentration of at least 50 mg/l, the weight ratio of peptone to thiourea being from 1:1 to 5:1.

15. A chelating agent-free aqueous electrolyte solution for electrodepositing zinc comprising zinc ions in a concentration of at least 0.2 M and thallous ions in a concentration of from 1 mg/l to 10 mg/l.

4,048,025

ELECTROLYTIC PROCESS FOR SILVER OXIDATION

Dimiter Panayotov Nenov, and Verginia Ilieva Danova, both of Sofia, Bulgaria, assignors to VMEI "LENIN" — NIS Research Institution, Sofia, Bulgaria

Filed Feb. 2, 1976, Ser. No. 654,245
Int. Cl.² C25D *11/00, 9/06*
U.S. Cl. 204—56 R **1 Claim**

1. Process for oxidation of silver and silver-plated articles by means of an alternating current of 50 hertz, wherein the electrolyte employed is a solution of cupric chloride having a concentration of 5 to 15 g/l and whereby a violet or dark red decorative corrosion resistant coating is obtained.

4,048,026

PROCESS FOR THE ENRICHMENT OF EUROPIUM CHLORIDE

Ekkehard Greinacher, Essen, Germany, assignor to Th. Goldschmidt AG, Germany

Filed Oct. 26, 1973, Ser. No. 410,104
Claims priority, application Germany, Nov. 6, 1972, 2254245
Int. Cl.² C01F *17/00;* **C25B** *1/24*
U.S. Cl. 204—61 **2 Claims**

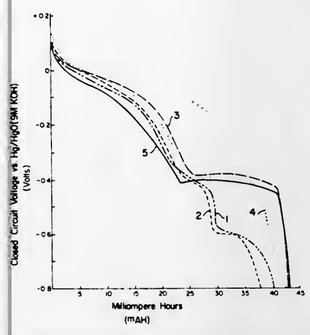
1. A process for the enrichment of europium chloride in a mixture of rare earth halides which comprises adding sufficient alkali, alkaline earth, or rare earth fluoride to a melt of rare earth halides containing europium chloride that the melt contains at least 4% weight of fluoride,
electrolyzing the mixture in the melt,
separating residual salts, cooling,
and washing said residual salts with water.

4,048,027

PROCESS FOR PRODUCING ELECTROLYTIC MNO_2 FROM MOLTEN MANGANESE NITRATE HEXAHYDRATE

Seymour Senderoff, Fairview Park, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,970
Int. Cl.² C25B *1/00*
U.S. Cl. 204—61 **6 Claims**



1. In a process for producing battery grade electrolytic manganese doixide by electrolyzing molten manganese nitrate hexahydrate, the improvement being the electrolyzing of the manganese nitrate hexahydrate at a temperature between about 115° C. and 126° C. and with an anodic current density of from about 140 to about 300 mA/cm².

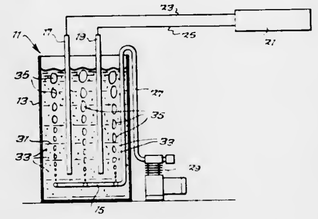
4,048,028

SORBENT PARTICULATE MATERIAL AND MANUFACTURE THEREOF

Karl Moeglich, Williamsville, N.Y., assignor to Clearwater Systems Inc., Williamsville, N.Y.

Filed June 22, 1976, Ser. No. 698,293
Int. Cl.² C25B *1/20*
U.S. Cl. 204—97 **12 Claims**

1. A process for the manufacture of a sorbent particulate material, substantially all of which is of a mean particle diameter of about 0.1 to 10 mm., which comprises passing an electric current between an anode of a metal capable of forming a flocculent hydroxide, which is selected from those of Groups IIA, VIB, VIIB, VIII, IB, IIB, IIIA, IVA and VA and alloys thereof, and a cathode in a turbulent electrolyte containing



dispersed particulate material of the given size, to form a metal hydroxide and deposit it on the dispersed particulate material.

4,048,029

MANUFACTURE OF HYDROGEN

Walter H. Seitzer, West Chester, Pa., assignor to Suntech, Inc., St. Davids, Pa.

Filed July 1, 1976, Ser. No. 701,828
Int. Cl.² C25B *1/02*
U.S. Cl. 204—129 **10 Claims**

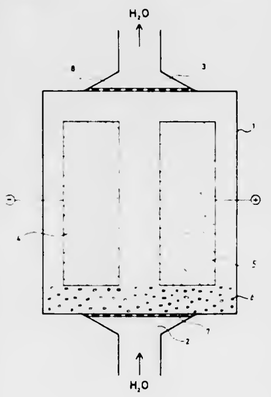
1. In the process of preparing hydrogen by passing a gas containing carbon monoxide over one side of a membrane which transports ionic oxygen and by passing steam over the other side of said membrane whereby the steam is converted to hydrogen and the carbon monoxide is oxidized to carbon dioxide, the improvement which comprises employing as said membrane a metal salt where the metal cation is selected from metals of Group IB, IIB, and VA, and the salt anion is an oxygen containing anion of a metal from Groups VB, VIB, and VIIB.

4,048,030

ELECTROLYTIC CELL FOR TREATMENT OF WATER

Jorge Miller, 8341 Noham 156, Germany

Filed Oct. 30, 1975, Ser. No. 627,192
Claims priority, application Germany, July 16, 1975, 2531850
Int. Cl.² C02B *1/82;* **C02C** *5/12*
U.S. Cl. 204—149 **1 Claim**



1. A continuous process for the treatment of water which comprises passing a stream of water to be treated upwardly through and past electrodes of an electrolytic cell containing particles whose density is higher than that of the water, controlling the speed of said stream to form a fluidized bed of said particles and mechanically maintaining clean said electrodes of said cell by means of the kinetic energy generated from the fluidization of said particles.

4,048,031

METHOD AND APPARATUS FOR PURIFYING EMULSIONS AND CONTAMINATED WATER WITH ELECTOLYSIS

Pentti Antero Valanti, 52200, Puumala, Finland

Filed Nov. 24, 1975, Ser. No. 634,424
Claims priority, application Finland, Nov. 26, 1974, 743404
Int. Cl.² C02C *5/12*
U.S. Cl. 204—149 **15 Claims**



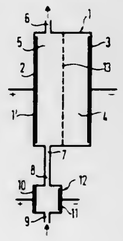
1. A method for purifying emulsions and contaminated water, such as water containing oil, with electrolysis, comprising maintaining at least one aluminum anode a determined distance from a cathode with said anode and cathode both being above a vessel, and treating the emulsion or contaminated water by running it into the space between the anode and the cathode to contact these electrodes, whereby flock is produced and said flock and water drop into said vessel, and then separating the flock from the thereby flocculated emulsion or water.

4,048,032

ELECTROLYTIC PURIFICATION OF AQUEOUS LIQUIDS IN THE PRESENCE OF SILVER IONS

Volker Eibl, Munich, Germany, assignor to Sachs-Systemtechnik GmbH, Schweinfurt am Main, Germany

Filed Aug. 27, 1975, Ser. No. 608,244
Claims priority, application Germany, Sept. 3, 1974, 2442078
Int. Cl.² C02B *1/82, 3/00*
U.S. Cl. 204—151 **4 Claims**



1. A method of destroying oxidizable contaminants in an aqueous liquid which comprises:
a. adding silver ions to said liquid in a first zone;
b. conveying said liquid from said first zone to a second zone;
c. passing electrolyzing current through said liquid in said second zone in the presence of said silver ions and said contaminants between an anode and a cathode, said anode being in direct contact with said liquid and insoluble in said liquid during said passing of said current;
d. independently controlling the magnitude of said current and the amount of said silver ions to respective values

jointly sufficient to destroy said contaminants in said second zone; and

e. withdrawing said liquid in purified condition from said second zone.

4,048,033

PROCESS FOR PREPARING PERCHLOROMETHYLBENZENE

Shigeo Yoshinaka; Seiji Uchiyama, and Masaharu Doya, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

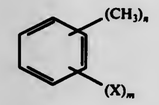
Filed Sept. 10, 1974, Ser. No. 504,989

Claims priority, application Japan, Sept. 10, 1973, 48-101814

Int. Cl.² B01J *1/10*

U.S. Cl. 204—158 HA **11 Claims**

1. A process for the batchwise or continuous production of a perchloromethylbenzene, which comprises reacting a methylbenzene compound selected from the group consisting of compounds of the formula



wherein

X is chlorine or bromine, *m* is zero, 1 or 2 and *n* is an integer of from 1 to 3,

and compounds of the above formula wherein the side chain methyl group is partially chlorinated, with chlorine under the irradiation of light containing ultraviolet rays, the initial stage of the reaction being carried out in the presence of said perchloromethylbenzene in the reaction system as a solvent, in an amount of (1) from 0.3 to 15 times the weight of the starting methylbenzene compound when the process is carried out in a batchwise manner or (2) in an amount of from 40 to 99% by weight of the reaction mixture when the process is carried out in a continuous manner.

4,048,034

PHOTOPOLYMERIZATION USING AN ALPHA-AMINOACETOPHENONE

Michael Martan, Skokie, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 27, 1976, Ser. No. 718,293

Int. Cl.² C08F *2/46, 4/00*

U.S. Cl. 204—159.23 **10 Claims**

1. In a process for the photopolymerization of a polymerizable monomer wherein said monomer is subjected to the emission from an ultra-violet light source having a wave length less than about 4000 Angstroms in the presence of a photosensitizing compound and an activating compound at polymerization conditions, the improvement which comprises utilizing an alpha-aminoacetophenone as combined photosensitizing compound and an activating compound.

4,048,035

PHOTOPOLYMERIZABLE COMPOSITION

Fumio Ide, and Tsuneo Kodama, both of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

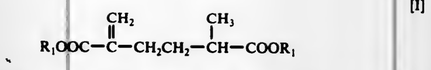
Filed Dec. 17, 1975, Ser. No. 641,763

Int. Cl.² C08F *8/00*; G03C *1/68, 5/00*

U.S. Cl. 204—159.15 **6 Claims**

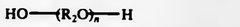
1. A photopolymerizable composition for image formation, which comprises:

30 – 95 wt. % of an unsaturated polyester having an acid value of 5 – 100 which is the condensation product of a carboxylic acid component containing more than 40 mole % of a carboxylic acid compound having the formula



[I]

wherein R_1 represents hydrogen or a C_{1-4} lower alkyl with a polyol component containing more than 30 mole % of a polyol having the formula



[II]

wherein R_2 represents C_{2-4} alkylene or a derivative thereof and *n* is an integer of 2 – 5; and

70 – 5 wt. % of a photopolymerizable unsaturated monomer and a photosensitizer.

4,048,036

PROCESS FOR PRODUCING FILMS OF LOW GLOSS BY EXPOSURE TO ULTRAVIOLET LIGHT

Paul J. Prucnal, Monroeville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 24, 1974, Ser. No. 517,669

Int. Cl.² C08F *2/46, 4/00*

U.S. Cl. 204—159.23 **9 Claims**

1. In the method wherein a coating of an oxygen inhibitable ultraviolet light curable coating composition containing a photoinitiator selected from the group consisting of benzoin, methyl benzoin ether, ethyl benzoin ether, isopropyl benzoin ether, butyl benzoin ether, isobutyl benzoin ether, benzoin acetate, benzoin phenyl carbamate, α,α-diethoxyacetophenone, α,α-diethoxy-α-phenylacetophenone, α,α-dimethoxy-α-phenylacetophenone, 4,4′-dicarboethoxybenzoin ethyl ether, α-chloroacetophenone, α-bromoacetophenone, benzoin phenyl ether, α-methylbenzoin ethyl ether, benzoin acrylate, α-methylolbenzoin methyl ether, α,α,α-trichloroacetophenone, o-bromoacetophenone, 4-(benzoylphenylmethoxycarbonylimino)-2-(acrylyloxyethoxycarbonylimino)-1-methylbenzene, cumene hydroperoxide, benzoyl peroxide, dicumyl peroxide, tert-butyl perbenzoate, α,α′-azobisisibotyronitrile, phenyl disulfide, chloromethylbenzanthrone, chloromethylanthraquinone, chloromethylnaphthalene, bromomethylbenzanthrone, bromomethylanthraquinone and bromomethylnaphthalene, an oxygen inhibitable resin having acrylic unsaturation and a flatting pigment which is generally transparent to ultraviolet light is exposed to ultraviolet light in an atmosphere containing a low gloss imparting amount of oxygen to gel the surface of said coating and to cure the interior of said coating to a greater degree of cure than said surface and thereafter said exposed coating is exposed to ultraviolet light in an atmosphere wherein any oxygen present is insufficient to significantly inhibit free radical curing of said gelled surface, whereby said coating is cured into a hard, mar and abrasion resistant film having a surface of low gloss, the improvement wherein said coating composition contains an air cure promoter selected from the group consisting of anthraquinone, thioxanthone, 4-chlorobenzophenone, 4-methoxybenzophenone, benzophenone, 2-chloroanthraquinone, dibenzosuberone, o-benzoylbenzophenone, chlorinated terphenyls, mercaptoacetic acid and mercaptoethanol in an amount which will impart to said cured film a lower gloss than if said air cure promoter were absent.

4,048,037

METHOD AND MACHINE FOR MANUFACTURING A PLATE-LIKE MATERIAL MADE FROM AGGLOMERATED PARTICLES AND IN PARTICULAR CERAMIC PRODUCTS OBTAINED THEREBY

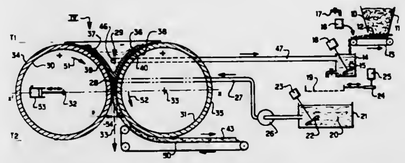
Sten Chronberg, Arnieres-sur-Iton, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Apr. 21, 1976, Ser. No. 679,012

Claims priority, application France, Apr. 25, 1975, 75.13091

Int. Cl.² C25B *7/00*

U.S. Cl. 204—180 R **4 Claims**



1. A method of preparing a plate-like material consisting of particles agglomerated together, selected from the group comprising solid particles, plastic particles and in particular clay-based particles, from a suspension in a liquid such in particular as water, said plate exhibiting a cohesiveness adequate for enabling its being worked subsequently according to any known technichal processes with a view in particular of manufacturing ceramic parts, wherein the improvement consists in that said method comprises the steps of: feeding said suspension such in particular as slip into a space left between two electrodes subjected to a given electrical voltage, located in front of each other and which are travelling continuously; subjecting said suspension to an electrophoretic action between said electrodes and an adjacent counter-electrode subjected to a different electric voltage; and adjusting the formations and in particular the thicknesses of the electrophoretic deposits built up upon said first-named electrodes so that when they leave the electrophoretic field under the travelling actions of said electrodes they will be fused together with their outer surfaces which have contacted each other; and recovering said plate built up continuously by both layers of electrophoretic deposits.

4,048,038

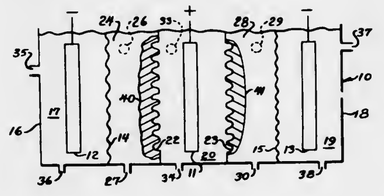
ELECTROFLOCCULATION CELL

Albert C. Kunkle, Macon, Ga., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 486,941, July 8, 1974, abandoned. This application May 24, 1976, Ser. No. 689,632

Int. Cl.² B01D *13/02*

U.S. Cl. 204—180 R **27 Claims**



1. A method of electrokinetically separating finely divided clay particles suspended in an aqueous medium comprising the steps of

introducing a suspension of solid clay particles into an electrokinetic cell provided with an anode and a cathode, and two semi-permeable membranes impermeable to the clay particles separating the anode and cathode, the cathode and a first of said membranes forming a cathodic compartment in the cell, the anode and a second of said membranes forming an anodic compartment in the cell, the space between said first and second membranes constituting a slurry compartment in the cell;

directing the particle suspension into the said slurry compartment;

discharging solid particle depleted effluent from the said slurry compartment;

adding and circulating through the cathodic compartment an electrolyte having a pH of from 2-7;

adding and circulating through the anodic compartment an electrolyte to maintain a predetermined concentration therein;

applying a direct current field between the anode and cathode to cause the solid particle to be electrophoretically deposited from the suspension onto the said second membrane overlaying the anode concomitantly with the aqueous portion of the suspension being caused to migrate electroosmotically through the said first semi-permeable membrane and into the cathode compartment; and

removing the solid particles from the said second membrane overlaying the anode and the water from the cathode compartment.

4,048,039

METHOD OF PRODUCING A LIGHT TRANSMITTING ABSORBING COATING ON SUBSTRATES

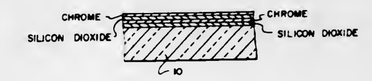
Helmut Daxinger, Wangs, Switzerland, assignor to Balzers Patent und Beteiligungs-AG, Liechtenstein

Division of Ser. No. 664,424, March 8, 1976. This application Oct. 21, 1976, Ser. No. 734,394

Claims priority, application Switzerland, Mar. 7, 1975, 003390/75

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 P **8 Claims**



1. A method of producing a light transmitting, absorbing coating on a substrate, comprising depositing by cathode sputtering, alternate layers of silicon and chrome, with the silicon being deposited in an oxidizing residual gas atmosphere and the chrome in a non-oxidizing residual gas atmosphere.

4,048,040

CLINICAL TESTING APPARATUS

Henry D. Schwartz, Palo Alto, Calif.

Continuation-in-part of Ser. No. 320,264, Jan. 2, 1973, Pat. No. 3,941,565, and Ser. No. 640,542, Dec. 15, 1975, Pat. No. 3,994,171. This application Jan. 2, 1976, Ser. No. 646,288

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 R **16 Claims**

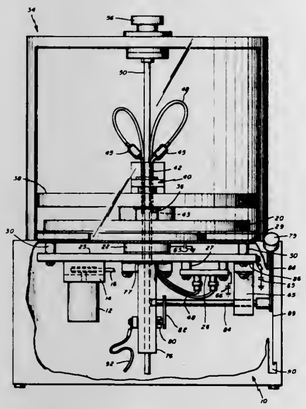
9. In a testing apparatus for measuring ions in body fluid which apparatus includes a rotatable turntable with a plurality of containers mounted thereon, a cover overlying the turntable and contacting the container mouths, and a chassis supporting the turntable and cover, the improvement comprising;

an electrostatic shield means having an open bottom disposed over the chassis to thereby enclose the turntable and cover,

said electrostatic shield means comprising a transparent dome, a membrane member having a transparent thin conductive film layer on the outside thereof, and means securing the membrane member within the dome,

means coupling the shield means to the chassis for supporting the shield means from the chassis,

and means associated with the chassis for lifting the shield means by lifting the supporting means whereby the shield



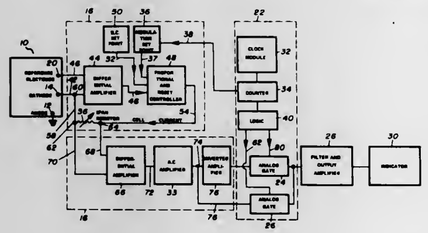
means has at least two stationary positions one of which permits access to the turntable.

4,048,041

ELECTRONIC SYSTEM FOR PROVIDING SPECIFICITY IN AN ELECTROCHEMICAL ANALYTICAL DEVICE

Donald J. David, and Huel C. Tucker, both of Centerville, Ohio, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 24, 1976, Ser. No. 689,287
Int. Cl.[2] G01N *27/48*
U.S. Cl. 204—195 R **8 Claims**



1. An apparatus for providing specificity in an electrochemical analytical device and for continuous determination of a nitroglycerin concentration in a sample solution which comprises:

a three element electrochemical cell having a grounded anode, a calomel reference electrode and a cathode electrode;

modulator circuit means, electrically coupled to said electrochemical cell, for supplying a square wave modulated negative potential signal to said cathode electrode;

demodulator circuit means, electrically coupled to said modulator means, for measuring the difference in the cell current of said electrochemical cell between said cathoe electrode and said anode electrode at the part and finish of said square wave modulated negative potential signal pulse and for generating an output signal proportional to said nitroglycerin concentration;

gating circuit means, electrically connected to said modulator and demodulator means, for supplying a continuous pulse signal to said modulator means and for controlling said demodulator means to allow only the cell current generated by the reduction of said nitroglycerin concentration to pass through said gating means, and to allow substantially all switching current transients generated in said electrochemical cell to decay,

inverter-amplifier means electrically coupled to said gating means for filtering and amplifying said cell current passed by said gating means; and

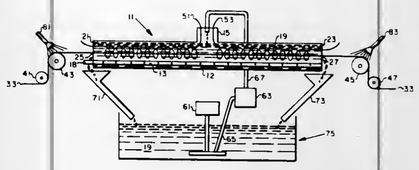
indicator means electrically connected to said amplifier means for providing an output signal proportional to said nitroglycerin concentration in said sample solution.

4,048,042

APPARATUS FOR ELECTROPLATING PLASTIC INSULATING CABLE SHEATHS

Edward J. Quinn, E. Amherst, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 5, 1976, Ser. No. 646,453
Int. Cl.[2] C25D *5/04, 7/06, 17/12*
U.S. Cl. 204—206 **5 Claims**



1. Apparatus for electroplating a wire cable having a plastic sheath with a conductive surface comprising:

a t-shaped tube having an elongated cylindrical portion and a t-inlet portion, each end of the elongated cylindrical portion having a central opening which is substantially coaxial with the axis of the cylinder and is at least larger than the outer diameter of the cable; cathode means external of the tube which are in electrical contact with the conductive sheath of the cable;

one or more anodes having a spiral configuration such that the axis of the spiral is approximately coaxial with the axis of the elongated cylindrical portion of the tube and which creates an electric field which is substantially uniform about the axis of the elongated cylindrical portion of the tube;

means for guiding the cable into the elongated cylindrical portion of the tube via one central opening, along the axis of the spiral and the axis of the cylindrical portion, and out of the tube via the other central opening, so that the axis of the portion of the cable in the cylindrical section of the tube is approximately coaxial with the cylindrical portion;

means for capturing plating solution which flows out of each central opening at the end of each cylindrical portion; and means for adding the plating solution into the t-inlet of the tube.

4,048,043

SELECTIVE PLATING APPARATUS

Maurice Bick, South Orange, and Richard J. DiMurro, Harrison, both of N.J., assignors to Auric Corporation, Newark, N.J.

Filed Feb. 6, 1976, Ser. No. 655,880
Int. Cl.[2] C25D *17/28, 5/02*
U.S. Cl. 204—224 R **6 Claims**

1. Apparatus for continuous electroplating of at least first and second mutually insulated selected portions of an electronic component or the like, while effecting differential plating thicknesses upon said portions, said apparatus comprising:

an electroplating station;

moveable applicator means adapted for carrying electroplating solution on a surface thereof;

means for continuously moving at least a portion of said applicator means surface through said electroplating station;

means for applying electroplating solution to said applicator surface;

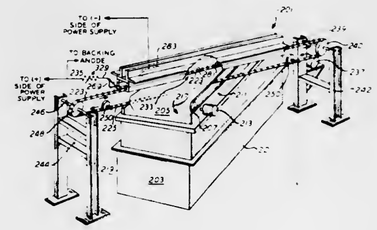
means for moving said components through said electroplating station with said portions to be electroplated in contact with said applicator surface;

a source of electrical plating potential;

means connecting the negative side of said potential source to each of said mutually insulated portions of said components during movement of said components through said electroplating station;

anodic means underlying said applicator surface at said electroplating station, and connected in a circuit with the positive side of said potential source in order to effect a plating current;

a shunt path means connected between one of said component portions and the positive side of said potential source for shunting at least a portion of the current to said one portion, back to said potential source, whereby to effect differential plating between said first and second portions



of said component in accordance with the current proportioning effected by said shunt path;

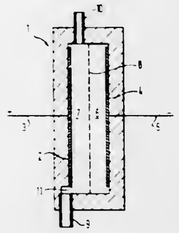
the components to be plated in said apparatus being of the type comprising an electrically conductive body terminating in a die-receiving face, and including a plurality of electrical contacts formed as insulated islands at said die-receiving face, with flexible wire leads being connected to at least some of said contacts and extending oppositely from said die-receiving face beyond the body of said component, at least some of said leads being electrically insulated from said body; said selective portions to be electroplated being said die-receiving face, and said electrical contacts; and wherein said apparatus includes electrically conductive guide means for guiding said components through said electroplating station with the said component body in electrical contact with said guide, and with said die-receiving face and said contacts in contact with the said applicator surface; the said means connecting the negative side of said potential source to at least said leads comprising an electrically conductive brush mounted at said electroplating station; and said shunt path being provided by a connection between said guide means and the positive side of said potential source.

4,048,044

WATER-PURIFYING APPARATUS

Volker Eibl, and August Reis, both of Munich, Germany, assignors to Sachs-Systemtechnik GmbH, Schweinfurt am Main, Germany

Continuation-in-part of Ser. No. 473,389, May 28, 1974, Pat. No. 3,923,632. This application Oct. 6, 1975, Ser. No. 619,696
Claims priority, application Germany, June 9, 1973, 2329628
The portion of the term of this patent subsequent to Dec. 2, 1992, has been disclaimed.
Int. Cl.[2] C02B *1/82, 3/10*
U.S. Cl. 204—257 **4 Claims**



1. Apparatus for purifying water contaminated with microorganisms and having a specific resistance in the range of about 0.5×10^3 ohm.cm to about 6.6×10^3 ohm.cm which comprises:

a. a container enclosing a space adapted to hold water;

b. a diaphragm dividing said space into a first compartment and a second compartment and having respective faces in said compartments;

c. inlet means for admitting said contaminated water to said first compartment;

d. outlet means for withdrawing purified water from said first compartment;

1. said first compartment connecting the inlet and outlet means for flow of said water from the inlet means to the outlet means;

e. an anode of conductive, silver-containing material having a surface in said first compartment substantially parallel to the direction of said flow of water and to the face of said diaphragm in said first compartment at a distance of about 1 mm to about 4 mm from said diaphragm;

f. a cathode having a surface in said second compartment; and

g. lead means connected to said anode and to said cathode respectively for passing an electric current between said anode and said cathode through said contaminated water in said first compartment and a conductive liquid in said second compartment.

4,048,045

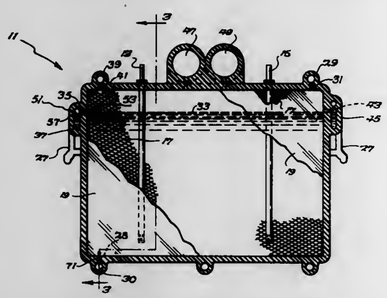
LENGTHENING ANODE LIFE IN ELECTROLYTIC CELL HAVING MOLDED BODY

Jeffrey D. Eng, N. Vancouver, Canada; Edward H. Cook, Jr., Lewiston, and Wilfredo E. Figueras, E. Amherst, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 534,332, Dec. 19, 1974, abandoned. This application Oct. 20, 1975, Ser. No. 624,140
Int. Cl.[2] C25B *1/26, 9/00, 11/10, 11/02*
U.S. Cl. 204—263 **6 Claims**

1. An electrolytic cell comprising a frame of non-conductive material, an anode, a cathode, a permselective membrane which divides the cell into anolyte and catholyte compartments, an anolyte discharge header and an anolyte drain header, and passageways connecting the anolyte compartment with said headers, said cell having a conductor passing through said passageway between said anode and said anolyte dis-

charge header thereby electrically connecting said anode and the anolyte in said discharge header, said conductor beng of a



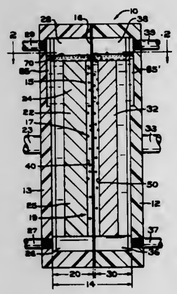
material resistant to electrolytic attack and facilitating the flow of a small proporation of current from said anode to the anolyte in said anolyte discharge header,.

4,048,046

ELECTROLYTIC CELL DESIGN

Robert Burns MacMullin, Lewiston, N.Y., assignor to The B. F. Goodrich Company, Akron, Ohio

Filed June 16, 1976, Ser. No. 696,583
Int. Cl.² C25B *1/16, 1/26*
U.S. Cl. 204—266 **12 Claims**



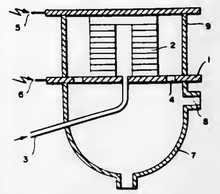
1. In an electrolytic cell comprising:
a. a cell wall portion at least partially defining boundary of said cell;
b. a first vertically extending electrode having a top portion and a bottom portion on a vertically extending surface;
c. a second vertically extending electrode, adjacent said first electrode and having a vertically extending surface opposing said vertically extending surface of said first electrode; and
d. an electrolysis zone between said first and second electrodes, said electrolysis zone having an upper portion, a lower portion and a middle portion intermediate said upper and lower portions and defined by the opposing surfaces of said electrodes;
e. an upper electrolyte plenum chamber adjacent said top portion of said first electrode; and
f. a lower electrolyte plenum chamber adjacent said bottom portion of said first electrode; the improvement wherein at least one of said first and second electrodes includes at least one vertically extending channel-like portion which at least partially defines a recirculation passageway extending between said upper and lower electrolyte plenums of said cell, said channel-like portion of said electrode spaced from said vertically extending surface such that no fluid communication between said channel-like portion and said surface is possible.

4,048,047

ELECTROCHEMICAL CELL WITH BIPOLAR ELECTRODES

Fritz Beck, Ludwigshafen-Oggersheim; Diethard Francke, Ludwigshafen; Heinz Nohe, Meckenheim; Heinz Hannebaum, Ludwigshafen-Oppau, and Manfred Stroezel, Ilvesheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jan. 14, 1976, Ser. No. 648,917
Claims priority, application Germany, Jan. 21, 1975, 2502167
Int. Cl.² C25B *1/26, 9/00*
U.S. Cl. 204—270 **2 Claims**



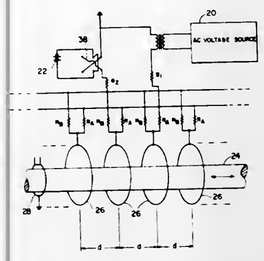
1. In an electrochemical cell, wherein plane electrodes of circular shape are located in a conjoint electrolyte chamber and are spaced from 0.05 to 2 mm apart, the spacing being fixed by radial insulating strips, sets of several electrodes being so arranged, in the form of a stack, that with the exception of the outermost electrodes each electrode acts both as an anode and as a cathode, and the entire stack being accommodated in a closed reaction vessel and being provided with means whereby electrolyte liquid can be fed into the center of the stack, the improvement that the electrode stack is built up on a central baseplate which serves as a carrier, contains means of feeding-in the electrolyte liquid and is in electrically conductive connection with the plate stack whilst being electrically insulated from the reaction vessel.

4,048,048

APPARATUS FOR MAKING A MEMORY WIRE

Charles Bennett, Framingham, and Emil Toledo, Newton, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 501,305, Aug. 28, 1974, Pat. No. 3,982,235.
This application Apr. 7, 1976, Ser. No. 674,356
Int. Cl.² C25D *17/00, 17/12*
U.S. Cl. 204—279 **1 Claim**



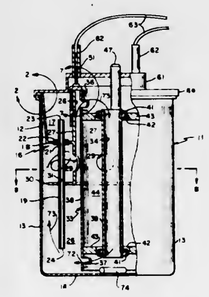
1. An electrical circuit for the electrodeposition of metal on a wire or for the removal of metal from the surface of a wire, comprising a plurality of physically spaced ring-like electrodes adapted to be immersed in an electrolyte and through which the wire is adapted to progressively pass, a source of D.C. potential, a source of A.C. potential, and connections for connecting said sources in electrically parallel relation and for applying equal values of the resultant potential to said ring-like electrodes, a reversing switch having contacts connected to said source of D.C. for reversing the polarity of said source of D.C. with respect to said ring-like electrodes, and a mercury contact pool at ground potential arranged in line with but to one side of said ring-like electrodes for grounding said wire as it advances through said electrodes.

4,048,049

TUBE GEL ELECTROPHORESIS DEVICE

Stanton A. Hoefer, San Francisco, Calif., assignor to Hoefer Scientific Instruments, San Francisco, Calif.

Filed Nov. 19, 1976, Ser. No. 743,483
Int. Cl.² G01N *27/26*
U.S. Cl. 204—299 R **14 Claims**



1. Tube gel electrophoresis apparatus, comprising:
an outer container having an upper open end and a lower closed end,
an annular inner container having an upper open end and lower closed end,
said annular inner container forming an upper buffer chamber therewithin and being supported at the upper open end of said outer container forming a lower buffer chamber therebetween,
a plurality of gel holding tubes sealably passing between and having opposed open ends exposed one each to said upper and lower buffer chambers said gel holding tubes having most of their length disposed in said lower buffer chamber,
a cooling core extending through said annular inner container into said lower buffer chamber, said cooling core having a cooling passage therethrough communicating with said lower buffer chamber and further having a contained coolant chamber therein,
an upper and lower buffer chamber electrode in each of said upper and lower buffer chambers respectively,
means for conducting a coolant to and from said contained coolant chamber
said lower buffer chamber and cooling core providing a path for circulating a buffer solution in said lower buffer chamber through said cooling passage, whereby heat generated in gels in said gel tubes during electrophoresis is conducted away by the circulating lower buffer solution and transferred in said cooling passage to the coolant.

4,048,050

CHILD-PROOF CONTAINER FOR MEDICINES AND THE LIKE

Ernest C. Hillman, 1277 S. Adams St., Glendale, Calif. 91205

Filed Feb. 7, 1977, Ser. No. 766,130
Int. Cl.² B65D *43/20, 85/56*
U.S. Cl. 206—1.5 **22 Claims**



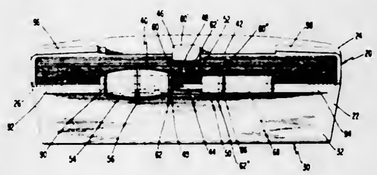
1. A closable container that is not readily openable by children comprising:
an enclosure;
a cover for said enclosure;
hinge means for connecting said cover to said enclosure while permitting both pivotal opening movement and longitudinal sliding movement of said cover relative to said enclosure;
pivot latch means for preventing said pivotal movement of said cover prior to longitudinal movement thereof; and
slide latch means for restraining longitudinal movement of said cover.

4,048,051

BOX WITH CHILD RESISTANT CLOSURE

Charles Gretz, Calabasas, Calif., assignor to Nutrilite Products, Inc., Buena Park, Calif.

Filed Dec. 21, 1976, Ser. No. 753,095
Int. Cl.² A45C *13/10, 13/18*
U.S. Cl. 206—1.5 **11 Claims**



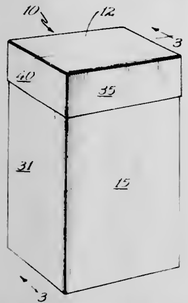
1. A container suitable for holding one or more small objects comprising:
first and second container portions movable between an open configuration and a closed configuration, the first and second container portions cooperating in the closed configuration to define a compartment;
latching means provided on the container portions, operable to releasably maintain the first and second container portions in the closed configuration;
slide closure means provided on the container portions and operable to slide between a first position and a second position while the container portions are in the closed configuration, in the first position the slide closure means prevents release of the latching means and in the second position the slide closure means permits release of the latching means; and
detent means provided on one of the container portions operable to releasably maintain the slide closure means in the first position.

4,048,052

RECLOSEABLE CARTON

William M. Tolaas, St. Paul, Minn., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Feb. 3, 1977, Ser. No. 765,227
Int. Cl.² B65D *5/54, 5/68, 17/24*
U.S. Cl. 206—625 **2 Claims**



1. A blank made of foldable paperboard erectable into a reclosable flip top carton having a locking cover, said blank comprising;
   - a substantially rectangular sheet of said paperboard defined by parallel horizontal top and bottom edges and parallel vertical side edges;
   - three horizontal spaced apart hinge lines intermediate said top and bottom edges defining, respectively, a top panel, a back panel, a bottom panel, and a front panel;
   - minor closure flaps hingedly attached along the side edges of said top and bottom panels;
   - a flange assembly hingedly connected to said top edge of said blank including a rectangular top cover front flange connected to said top panel, a tab connected along each lateral edge of said front flange, and a top cover depending inner skirt section hingedly connected to the top edge of said front flange;
   - said skirt section having formed therein a transverse slit extending substantially horizontally intermediate the lateral edges thereof;
   - a locking flange hingedly connected to the bottom edge of said blank;
   - major flaps connected to the lateral edges of said back panel and extending the length thereof;
   - major flaps connected to the lateral edges of said front panel; and
   - a removable section formed in each of said front panel major flaps defined by frangible score lines positioned horizontally near the bottom of said flaps and a frangible vertical score line near the bottom of the hinge lines connecting said major flaps to said front panel.

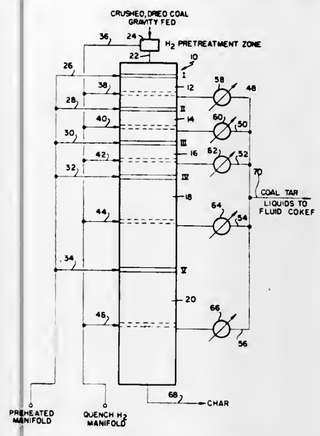
4,048,053

UPGRADING SOLID FUEL-DERIVED TARS PRODUCED BY SHORT RESIDENCE TIME LOW PRESSURE HYDROPYROLYSIS

Marvin Greene, Somerset, N.J., assignor to Cities Service Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 627,448, Oct. 30, 1975, Pat. No. 4,012,311. This application Feb. 13, 1976, Ser. No. 657,790
The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.
Int. Cl.² C10G *1/06, 13/24, 37/02*
U.S. Cl. 208—8 **12 Claims**

1. A process of producing and upgrading carbonaceous tars, comprising, in serial combination,
   - a. adding liquid or crushed solid carbonaceous material into a first reaction zone of a reactor having at least two noncatalytic reaction zones, and a pressure of between atmospheric pressure and 450 psia;
   - b. adding hot hydrogen to the stream of carbonaceous material to effect a reaction with same to produce reaction products, the reaction temperature in the reaction zone varying from about 400° to about 2000° C;
   - c. quenching the mixture of step (b) while insuring that the total residence time, including heat-up, reaction and quench time, varies from about 2 milliseconds to about 2 seconds;
   - d. removing at least a portion of the reaction products from



   said quenched mixture of step (c), leaving a residual carbonaceous material;
   - e. introducing the residual carbonaceous material into a subsequent reaction zone and repeating steps (a)-(d) for said subsequent reaction zone; and
   - f. introducing carbonaceous tars produced in step (d) directly into a fluid coking zone to obtain gas, upgraded tars, and hot coke.

4,048,054

LIQUEFACTION OF COAL

Robert C. Green, Berkeley Heights, and Robert L. Dubell, Florham Park, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 23, 1976, Ser. No. 707,964
Int. Cl.² C10G *1/06*
U.S. Cl. 208—8 **10 Claims**

1. A process for the production of liquid hydrocarbons from coal or similar liquefiable carbonaceous solids which comprises contacting said carbonaceous solids with a hydrogen-donor solvent and molecular hydrogen under liquefaction conditions in a liquefaction zone to produce a liquefaction effluent; separating said liquefaction effluent into a hot vapor stream and a liquid stream; recovering coal liquids in the solvent boiling range from said liquid stream; cooling said hot vapor stream sufficiently to condense vaporized normally liquid hydrocarbons from the vapor; separating condensed normally liquid hydrocarbons from the cooled vapor; mixing said coal liquids in the solvent boiling range with the cooled vapor and with makeup hydrogen to form a solvent hydrogenation feed stream; passing said solvent hydrogenation feed stream to a catalytic solvent hydrogenation zone maintained under solvent hydrogenation conditions; recovering a hydrogenated effluent from said solvent hydrogenation zone; separating said hydrogenated effluent into a vaporous fraction containing molecular hydrogen and a liquids fraction; recycling a portion of said vaporous fraction including molecular hydrogen and at least a portion of said liquids fraction to said liquefaction zone; purging a portion of said vaporous fraction; and recycling fluid separated from sAid hydrogenated effluent to said solvent hydrogenation zone as a quench.

4,048,055

PROCESS FOR REGENERATING AQUEOUS UREA SOLUTIONS

Hans-Georg Wegner, Toppenstedt, and Maximilian Kunert, Neu-Wulmsdorf, both of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Apr. 19, 1976, Ser. No. 677,935
Claims priority, application Germany, Apr. 18, 1975, 2517310
Int. Cl.² C07B *21/00;* C10G *43/04*
U.S. Cl. 208—25 **5 Claims**

1. In a process for regenerating aqueous urea solutions used in dewaxing of mineral oils containing n-paraffins by (a) reacting said urea solutions with said mineral oils to form solid n-paraffin-urea adducts, (b) recovering said urea solutions by decomposition of said adducts and, (c) reusing said urea solutions for the formation of adducts, the improvement which comprises:
   passing at least a portion of said aqueous urea solution recovered from the decomposition of said adducts in contact with acidic ion exchange resin.

4,048,056

METHOD FOR THE CONTROL OF PITCH OPERATION

George R. Romovacek, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 383,151, July 27, 1973, abandoned. This application June 2, 1975, Ser. No. 582,693
Int. Cl.² C10C *3/06*
U.S. Cl. 208—41 **1 Claim**



1. A method for controlling the operation of a pitch still comprising the steps of:
   - a. simultaneously measuring the viscosity and temperature of a sample of the pitch at a changing but exactly known temperature;
   - b. comparing the measured value with a predetermined correlation of viscosity and temperature;
   - c. adjusting the parameters of the pitch still operation in response to the comparison.

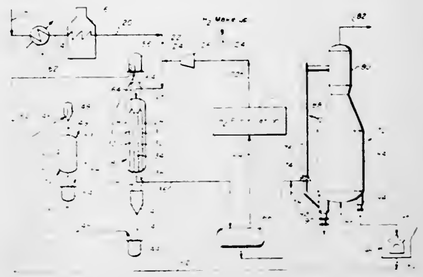
4,048,057

INTEGRATED HEAVY OIL CRACKING PROCESS UTILIZING CATALYST SEPARATED FROM CRACKING IN PRETREATING ZONE

James R. Murphy, Houston, Tex., assignor to Pullman Incorporated, Chicago, Ill.

Filed Oct. 4, 1976, Ser. No. 729,528
Int. Cl.² C10G *23/00*
U.S. Cl. 208—89 **17 Claims**

1. An integrated heavy oil cracking process for catalytically cracking a petroleum feedstock containing at least about 5 ppm metals and having a Ramsbottom carbon residue of from about 2 weight percent to about 25 weight percent comprising the steps of:
   - a. contacting the feedstock in a pretreating zone in the presence of 700 to 3000 psig partial pressure of hydrogen at a temperature from about 750° F. to about 850° F. with equilibrium catalyst withdrawn from a heavy oil cracking unit;
   - b. separating the treated feedstock from the equilibrium catalyst;



   - c. feeding the separated, treated feedstock of step (b) to a fluid catalytic cracking zone of a heavy oil cracking unit in the presence of a fluid cracking catalyst to produce a cracked effluent; and
   - d. withdrawing equilibrium catalyst from the heavy oil cracking unit for use in the pretreating zone of step (a).

4,048,058

METHODS TO BE USED IN REFORMING PROCESSES EMPLOYING MULTI-METALLIC CATALYSTS

Richard D. Petersen, Valparaiso, Ind., and Rodney L. Mieville, Evanston, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 9, 1975, Ser. No. 621,047
Int. Cl.² C10G *35/08;* B01J *27/02*
U.S. Cl. 208—138 **39 Claims**

22. A method for initiating the reforming of a petroleum hydrocarbon feedstock in a reforming reaction zone containing a bi-metallic catalyst or a multi-metallic catalyst, the various metals of said catalyst comprising the total active metal of said catalyst, which method comprises introducing a stream of hydrogen-rich gas containing light hydrocarbons into said reaction zone at a pressure of about 0 to about 1,000 psig, passing said stream through said reaction zone, adjusting the temperature in said reaction zone to a value of about 350° F. to about 470° F., injecting a sulfur-containing compound into said stream up-stream from said catalyst in order to provide a sulfur-carrying gas, contacting said catalyst with said said sulfur-carrying gas at said temperature and at a gas flow rate of about 0.25 to about 100 SCF of gas per pound of catalyst for a time that is sufficient to provide a sulfur concentration on said catalyst of about 0.1 to about 2.5 moles of sulfur per mole of total active metal, when sufficient sulfiding has occurred, discontinuing the injection of said sulfur-containing compound into said stream, adjusting the temperature, pressure, and hydrogen-rich-gas flow rate in said reaction zone to values that are to be used during the reforming operation, and introducing said feedstock into said reaction zone.

4,048,059

PALLET RACK AND DECKING COMBINATION

Robert J. Evans, Aurora, Ill., assignor to Aurora Equipment Company, Aurora, Ill.

Filed Nov. 24, 1975, Ser. No. 634,433
Int. Cl.² A47B *47/00*
U.S. Cl. 108—155 **3 Claims**

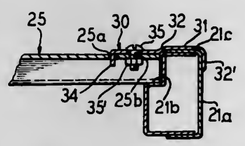
1. In combination, a pallet rack comprising
   a pair of spaced uprights,
   spaced beams positioned between the spaced uprights with each beam having its opposite ends mounted on the spaced uprights,
   the beams being arranged in pairs with each pair disposed in

a common horizontal plane, each beam having beam ledges,

a decking panel structure having edges carried by the beam ledges, said edges abutting against a vertical wall portion of each beam ledge, a top surface of said decking panel having slots adjacent said edges,

decking panel retainer means for securing the decking panel structure to said beams,

said retainer means retainingly securing said associated pair of beams against bowing, including an angular clip having a generally horizontal leg portion secured to a top surface



of the decking panel structure and also resting on a top surface of said beams and a first down turned hooked end engaging a rear side of the associated beam, and

fastener means securing each of said angular clips to said decking panel structure to prevent the decking panel structure from being displaced from said beams and dropping vertically free of the associated spaced beams, said fastener means comprising a second hooked end on said horizontal leg portion positioned in said slot and a bolt means compressing together said retainer horizontal leg portion and top surface of said panel structure.

4,048,060

TWO STAGE HYDRODESULFURIZATION OF OIL UTILIZING A NARROW PORE SIZE DISTRIBUTION CATALYST

Kenneth L. Riley, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 29, 1975, Ser. No. 644,834
Int. Cl.² C10G *23/02*
U.S. Cl. 208—210 **23 Claims**

1. A process for hydrodesulfurizing a sulfur and metal-containing heavy hydrocarbon feed, which comprises:

a. contacting said feed in a first hydrodesulfurization zone with hydrogen and a first catalyst under hydrodesulfurization conditions to produce a first hydrodesulfurized hydrocarbon product, said first catalyst comprising an oxide or a sulfide of a Group VIB metal and an oxide or a sulfide of a Group VIII metal deposited on an alumina support, said first catalyst having a median pore radius being in the range from about 30 to about 60 Angstroms, and

b. contacting at least a portion of said first hydrodesulfurized hydrocarbon product in a second hydrodesulfurization zone with hydrogen and a second catalyst under hydrodesulfurization conditions, said second catalyst having a median pore radius greater than said first catalyst, the median pore radius of said second catalyst being in the range from about 70 to about 95 Angstroms, said second catalyst comprising a hydrogenation component selected from the group consisting of at least one elemental metal, metal oxide or metal sulfide of a Group VIB metal and at least one elemental metal, metal oxide or metal sulfide of a Group VIII non-noble metal, said hydrogenation component being composited with an alumina support, said second catalyst having the following physical characteristics: a total pore volume between 0.45 and 1.50 ml/g; less than 0.05 ml/g pore volume in pores with radii greater than 100 Angstroms; at least 0.40 ml/g pore volume having a narrowness index in pores with radii between said median pore radius of said second catalyst and from about 10 Angstroms above and 10 Angstroms below said median pore radius of said second catalyst, at least 75% of the pore volume of said second catalyst having said narrowness index with radii between the median pore radius and 10 Angstroms above and 10 Angstroms below said median pore radius of said second catalyst; less than 0.05 ml/g of the pore volume in pores with radii below 60 Angstroms, and a total surface area ranging between 130 and 500 square meters per gram.

4,048,061

PROCESS FOR REMOVAL OF METAL COMPOUNDS FROM HYDROCARBONS

George C. Blytas, 14323 Appletree St., Houston, Tex. 77024

Filed Apr. 5, 1976, Ser. No. 673,311
Int. Cl.² C10G *25/00*
U.S. Cl. 208—251 R **9 Claims**

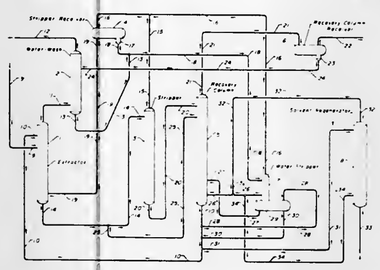
1. A process for the reducing of levels of compounds of metals of Groups *Ib*, IV*a*, V*b*, VI*b* and VIII in light hydrocarbon liquids which comprises contacting said liquids with a sorbent consisting essentially of particulate active carbon having at least a majority of its pore volume in pores having a diameter greater than 0.9 nm, which sorbent has previously been oxidized by contact with a highly acidic oxidizing fluid and substantially separated from said oxidizing fluid.

4,048,062

AROMATIC EXTRACTION WITH SOLVENT RECOVERY AND REGENERATION

George F. Asselin, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 22, 1976, Ser. No. 679,274
Int. Cl.² C10G *21/28*
U.S. Cl. 208—321 **10 Claims**



1. A method for recovering and regenerating a substantially hydrocarbon-free, polar hydrocarbon selective solvent from a mixture of an aqueous selective solvent with polar hydrocarbons and non-polar hydrocarbons, which method comprises the steps of:

a. introducing said mixture into a first fractionation column, removing a water-containing non-polar hydrocarbon-rich stream from an upper portion of said first column and removing a first solvent-rich, polar hydrocarbon-containing stream from a lower portion of said first column;

b. introducing at least a portion of said first solvent-rich, polar hydrocarbon-containing stream into a second fractionating column, removing a polar hydrocarbon-rich stream, substantially free from solvent and non-polar hydrocarbons, from an upper portion of said second column, and removing a second solvent-rich stream, substantially free from hydrocarbons, from a lower portion of said second column;

c. introducing a first vaporous stripping medium into said second fractionation column through a locus above that from which said second solvent-rich stream is removed;

d. separating water from said non-polar hydrocarbon-rich stream removed from the upper portion of said first column in step (a) and vaporizing the same to form steam;

e. introducing a portion of said second solvent-rich stream into the upper section of a solvent regenerating zone and introducing steam from step (d) as a second vaporous stripping medium into the lower section of said regenerating zone;

f. recovering a regenerated solvent stream containing substantially all of said second vaporous stripping medium; and,

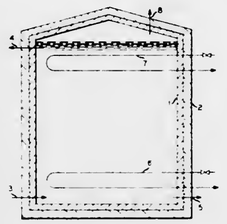
g. introducing said regenerated solvent stream, containing said second stripping medium, into said second fractionation column as at least a portion of said first vaporous stripping medium.

4,048,063

INDUCED TEMPERATURE GRADIENT SETTLING VESSEL

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 12, 1975, Ser. No. 586,324
Int. Cl.² B01D *21/00*
U.S. Cl. 210—72 **4 Claims**



1. a method for settling solids particles of micron and submicron size from a liquid in which the particles are contained, said method comprising:

a. admitting said liquid containing solids particles through an inlet into the lower portions of a settling vessel having vertical dimensions sufficient in reltion to the overall capacity of the vessel to allow a temperature gradient between the upper and lower portions of the liquid contained therein and sufficiently insulated to minimize changes of temperature inside the vessel in response to changes in ambient temperature outside the vessel;

b. cooling the liquid by indirect contact with a cooling fluid in the lower portion of said vessel;

c. allowing said liquid to pass upward into contact with means in the upper portion of said vessel for heating said liquid;

d. heating said liquid by indirect contact with a heating fluid;

e. retaining said liquid within the vessel for a time sufficient to allow settling of said solids particles at least from the liquid contained in the upper portions of said vessel;

f. removing clarified liquid through an outlet from the upper portions of said vessel; and

g. removing said settled solids particles from the lower portion of said vessel.

4,048,064

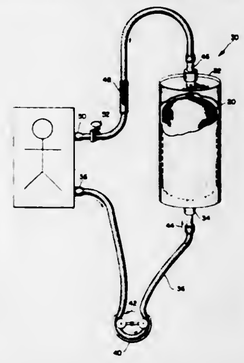
BIOCOMPATIBLE HEMOPERFUSION SYSTEM

William T. Clark, III, Number Six Davis Blvd., New Orleans, La. 70121

Filed Apr. 23, 1976, Ser. No. 679,853
Int. Cl.² A61K *23/02*; B01D *3/00*
U.S. Cl. 210—23 R **25 Claims**

12. A process for extracorporeal hemoperfusion comprising the step of passing the blood through a polymer-coated detoxicant composition adapted for reaction in an extracorporeal shunt with waste metabolites and toxins found in blood and which composition comprises a solid detoxicant having a semipermeable polymer coating: having an effective coating pore size permitting waste metabolites and toxins to diffuse therethrough; having free heparin therein; having an effective coating pore size permitting substantial retention of the free heparin by the polymer coating; being insoluble in blood.

18. A cartridge for extracorporeal hemoperfusion comprising a plurality of particles of solid detoxicant having a semiper-



meable polymer coating: having an effective coating pore size permitting waste metabolites and toxins to diffuse therethrough; having free heparin therein; having an effective coating pore size permitting substantial retention of the free heparin by the polymer membrane; being insoluble in blood held under movement-inhibiting compression within a blood-permeable container.

4,048,065

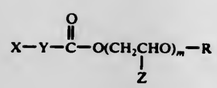
CONTROL OF CORROSION AND SCALE IN CIRCULATING WATER SYSTEMS BY MEANS OF PARTIAL ESTERS OF POLYFUNCTIONAL ORGANIC ACIDS

Tzeng Jiueq Suen, New Canaan; Arthur James Begala, Jr., Fairfield, and Martin Grayson, Cos Cob, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

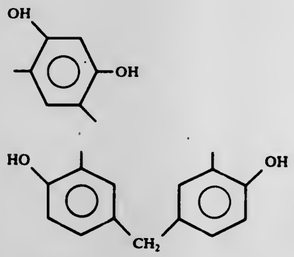
Continuation-in-part of Ser. No. 456,119, March 29, 1974, Pat. No. 3,974,083. This application July 17, 1975, Ser. No. 596,786
Int. Cl.² C02B *5/06*
U.S. Cl. 210—58 **9 Claims**

1. A process for inhibiting corrosion and scale on ferrous metal surfaces in a circulating water system comprising the addition to circulating water in said system of from 10 - 500 parts per million parts water of additive selected from compounds having the formula:

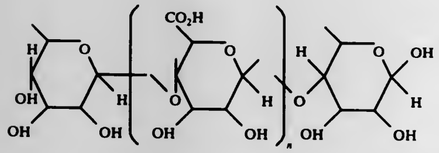
$$HOOC-(CH)_n-(CH_2)_y-(CH)_mCO_2(CH_2CH_2O)_xH$$
$$\quad\quad\quad



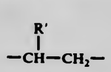
R is a hydrocarbon radical having 8 to 20 carbon atoms selected from alkyl, alkenyl, cycloalkyl and arylalkyl;
m is a value from 1 to 5;
Z is hydrogen or methyl;
Y is selected from alkylene or arylene having 2 to 8 carbon atoms,



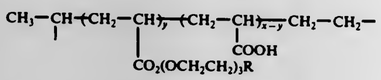
where *n* is from 2 to 6,



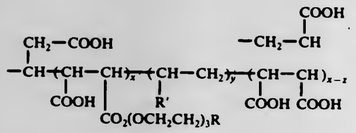
where *n* is from zero to 3,



wherein R' is alkyl or alkenyl of 1 - 12 carbon atoms,



where *y* is ≦ *x*, where *x* ≦ 300, and



wherein *x* is ≧ 0, *x* = *y* ≧ *z*, where *x* + *y* ≦ 300 and R' is phenyl or a hydrocarbon radical of from 10 to 18 carbon atoms, and
wherein *m* and Z are as defined before, and
M is selected from hydrogen, ammonium, alkylammonium, polyalkylammonium, alkali metal, or alkali earth metal; and
X is selected from COOM, $PO(OM)_2$ and SO_3M wherein M is as defined before.

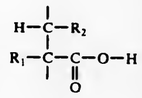
4,048,066

METHOD OF INHIBITING SCALE

Dionisio Guerrero Cuisia, Chicago, and Chih Ming Hwa, Palatine, both of Ill., assignors to Chemed Corporation, Cincinnati, Ohio

Filed Nov. 17, 1976, Ser. No. 742,521
Int. Cl.[2] C02B *5/06*
U.S. Cl. 210—58 **9 Claims**

1. A method for inhibiting deposits of scale, sludge, and other foulants in aqueous systems, said method consisting essentially of adding to the said systems 0.01 to 500 ppm of a composition selected from the group consisting of (A) water-soluble copolymers of styrene sulfonic acid with another polymerizable monoethylenic compound, and their water-soluble salts or (B) mixture of polystyrene sulfonic acid with an acrylic polymer whose polymer chain structure comprises units having the following formula:



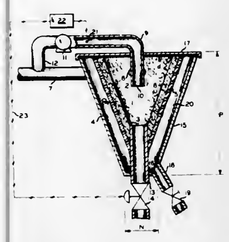
wherein R_1 is selected from the group consisting of H or CH_3 and R_2 is selected from the group consisting of H or COOH, and their water-soluble salts.

4,048,067

FILTERING PROCESS AND APPARATUS

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 12, 1975, Ser. No. 586,319
Int. Cl.[2] B01D *37/00, 21/26*
U.S. Cl. 210—73 R **8 Claims**



1. A filtering process comprising
a. tangentially introducing a liquid having entrained solid particles therein into a separating chamber confined by a downwardly converging, essentially conically shaped wall which is porous to said liquid but essentially impervious to said solid particles;
b. withdrawing a first portion of said liquid as a lean liquid approximately at the axis of said separating chamber from the upper section of said separating chamber and reintroducing at least a portion thereof tangentially into said separating chamber;
c. withdrawing a second portion of said liquid as a mixture of said solids and said liquid from the lower section of said separating chamber;
d. recovering a third portion of said liquid as clean liquid that has passed through said wall which is porous to said liquid as a product of the process, and wherein
the solids content of said first portion of liquid is sensed, a corresponding signal is generated and said withdrawal of said second portion of said liquid is actuated responsive to said signal, whenever said signal has reached a value corresponding to an upper limit of solids concentration in said first portion withdrawn from the upper section of said separating chamber.

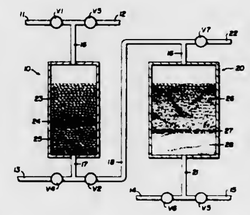
5. An apparatus for filtering a liquid containing solid particles comprising
a. a separating chamber having an upper section and a lower section confined by an essentially conically shaped wall, said wall
aa. converging in downward direction and
bb. being of sufficient porosity to permit passage of liquid but essentially impervious to solids;
b. first conduit means attached to said apparatus for essentially tangential introduction of a liquid into the upper section of said separating chamber;
c. second conduit means attached to said apparatus for withdrawal of lean liquid essentially in an axial and upward direction, said second conduit having a suction opening arranged in the upper portion and on the axis of said separating chamber and an outlet connected to said first conduit means such as to recycle the lean liquid from the separating chamber to the inlet thereof;
d. third conduit means connected to the lower portion of said separating chamber to remove a solids-rich liquid;
e. collecting means for collecting and removing from said apparatus the liquid penetrating through said conically shaped wall;
f. sensing means for sensing the solids content of the liquid in the second conduit means;
g. signal generating means connected to said sensing means for generating a signal corresponding to the solids content sensed;
h. a valve connected to said third conduit means; and
i. valve actuating means the input of which is connected to said signal generating means and the output of which is connected to said valve such as to actuate said valve whenever a signal is received which corresponds to an upper limit of the solids content in the liquid in the second conduit means.

4,048,068

METHOD OF AND APPARATUS FOR FILTERING

Gene Hirs, Livonia, Mich., assignor to Amsted Industries, Inc., Chicago, Ill.

Filed Jan. 9, 1974, Ser. No. 432,010
Int. Cl.[2] B01D *29/08*
U.S. Cl. 210—80 **7 Claims**



5. In a method of filtering, comprising the steps of:
flowing a contaminated liquid at a first flow rate through a first filter layer of substantially uniform graular medium size to obtain a partially filtered liquid flow, said first flow rate being sufficient to cause substantially all the particulate contaminants in said contaminated liquid to penetrate the inlet surface of said first filter layer to thereby minimize blinding off of the first layer by accumulation of contaminants at said inlet surface;
flowing the partially filtered liquid at said first flow rate successively through a first interface layer and a second medium layer, said second medium layer comprised of a substantially uniform granular medium size finer than that of said first filter layer, said interface layer comprised of a mixture of granules from both said first and second layers, said interface layer being in intimate contact with and between said first and second layers thereby reducing the accumulation of contaminants at the inlet surface of said second layer during filtration flow;
flowing the liquid from said second layer and through a third filter layer at a second flow rate less than said first flow rate, said first flow rate being at least approximately twice as great as said second flow rate, and said third filter layer being separated from said second layer and comprised of a substantially uniform size granular medium finer than said second layer granular medium;
flowing the liquid from said third layer successively through a second interface layer and a fourth filter medium layer at said second flow rate to generate a clarified liquid flow, said fourth medium layer comprised of a substantially uniform granular medium size finer than said third granular medium size, said second interface layer comprised of a mixture of granules from both said third and fourth medium layers and being between and in intimate contact with said third and fourth layer thereby reducing the accumulation of contaminants at the inlet surface of said second layer during filtration flow.

7. In a method of filtering a contaminated liquid, the steps of:
1. flowing the contaminated liquid at a first flow rate through a first filter vessel containing at least two distinct, vertically superimposed layers of granular filter medium, said first flow rate being sufficient to cause substantially all of the contaminants to penetrate the first layer in a direction of filtration flow, said layers being intermixed along an interface to enhance particulate contaminant penetration into the second layer in the direction of filtration flow, and the granules of said first layer having an average size larger than the average size of the granules in said second layer;
2. subsequently flowing the liquid from said first vessel through at least two additional distinct, vertically superimposed layers of granular filter medium in a second filter vessel at a flow rate which is approximately only about one-half the flow rate through the first vessel to cause substantially all of the non-filtered contaminants to penetrate the first layer in the direction of filtration flow in the second vessel yet be entrapped within either said first or second additional layers, said additional layers being intermixed along an interface to enhance particulate contaminant penetration into the second additional bed in the direction of filtration flow, and the granules of said first additional layer having an average size smaller than the average particle size of the granules comprising the second layer in said first vessel but larger than the second layer in the second vessel;
3. rejuvenating the filter layers by introducing backwash liquid into each of said vessels in the opposite direction of filtration flow at a rate to expand said layers and remove a substantial portion of accumulated contaminants, and
4. reforming the distinct superimposed layers and intermixed interface regions in each vessel after backwashing.

4,048,069

SMALL SURFACE LIQUID DECANTATION APPARATUS AND PROCESS FOR MAKING SAME

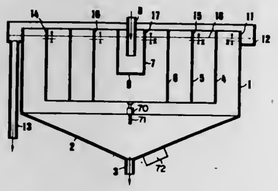
Roger Cuvillier, Darvoy Jargeau (Loiret), and Richard Cohen-Alloro, Olive (Loiret), both of France, assignors to Bureau de Recherches Geologiques et Minieres, France

Filed Feb. 2, 1976, Ser. No. 654,605
Int. Cl.[2] B01D *21/10*
U.S. Cl. 210—84 **21 Claims**

1. A small surface liquid decantation apparatus comprising a main revolution tank, with a central inlet, an exhaust for the

products decanted by the bottom and an exhaust on the upper peripheral edge for the purified liquid, wherein the main body comprises arcuate compartments defined at least in part by adjacent arcuate walls and in communication with the lower portion of the main body, provided with the exhaust for the decanted products, at least one indented zone, forming an overflow channel for exhausting the upper layer of purified water, being formed in the upper edge of a wall of each compartment, the said indented zones being circumferentially spaced from one compartment to the next.

16. A liquid decantation process comprising the steps of providing a space of revolution filled with a liquid mass, con-



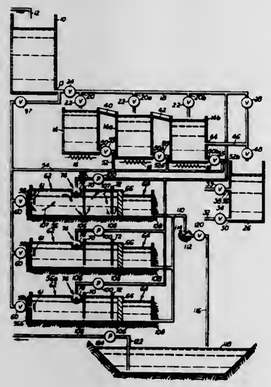
tinuously delivering to the center of the space of revolution and into the liquid mass a liquid holding in suspension particles having a density greater than the density of the liquid, presenting the movement of the liquid mass in a radial direction and effecting vertical decantation of the dense particles, and at the same time providing for movement of a surface layer of the liquid generally in a horizontal plane with each unit volume of the liquid in the surface layer progressively moving from the center of the space of revolution to an exhaust at the periphery of the space of revolution while controlling the path of movement of each unit volume of the liquid in the horizontal plane to be along successive spiral fractions, and removing the dense particles from a lower portion of the space of revolution.

4,048,070

OIL AND WASTE WATER RECEPTION FACILITY AND PROCESS

Carl F. Propp, Rte. 2, Box 97, Estacada, Oreg. 97023

Filed June 3, 1976, Ser. No. 692,283
Int. Cl.² B01D *35/00, 35/14*
U.S. Cl. 210—85 **5 Claims**



1. A system for recovering oil from an oil-water mixture and at the same time purifying the water sufficient to make it acceptable for deposit in disposal means, comprising
   a. a holding tank arranged to initially receive a supply of oil-water mixture,
   b. at least one decantation tank arranged to receive a mixture of oil and water from said holding tank and arranged to allow oil in the water to separate out and float to the top,
   c. liquid conveying means leading from an upper portion of said decantation tank arranged to discharge oil,
   d. a horizontal elongated separator tank open at the top and having inlet and outlets ends,
   e. liquid conveying means leading from a lower portion of said decantation tank to the inlet end of said separator tank for directing water from said decantation tank to said separator tank to allow further settling out of oil that may remain in the water,
   f. liquid conveying means leading directly from said holding tank to said separator tank,
   g. control means associated with said latter liquid conveying means arranged to direct the flow of oil-water mixture to either of said decantation tank or said separator tank,
   h. oil skimming means at an upper portion of said separator tank located between said inlet and outlets ends,
   i. liquid conveying means leading from said skimming means for discharging oil that has separated in said separator tank,
   j. circulating means in said separator tank for agitating the mixture of oil and water, comprising an upright partition in said tank on the outlet side of said skimming means, forming a second tank portion open at the top, said partition having a top edge forming a weir over which water spills to said second tank portion, said top edge having groove means therein extending transversely of said tank; said groove means functioning to produce a rippling effect in the liquid flowing thereover so as to further separate oil from water in said liquid,
   k. an open top inspection tank,
   l. liquid conveying means leading from the outlet of said separator tank to said inspection tank,
   m. storage means having an outlet for the treated water,
   n. liquid conveying means leading from said inspection tank to said storage means,
   o. and oil storage means arranged to receive oil from said decantation tank and from said skimming means.

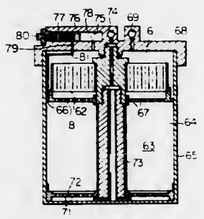
5. A system for recovering oil from an oil-water mixture and at the same time purifying the water sufficient to make it acceptable for deposit in disposal means, comprising
   a. at least one decantation tank arranged to receive a mixture of oil and water and arranged to allow oil in the water to separate out and float to the top,
   b. liquid conveying means leading from an upper portion of said decantation tank arranged to discharge oil,
   c. a horizontal elongated separator tank open at the top and having inlet and outlet ends.
   d. liquid conveying means leading from a lower portion of said decantation tank to the inlet end of said separator tank for directing water from said decantation tank to said separator tank to allow further settling out of oil that may remain in the water,
   e. oil skimming means at an upper portion of said separator tank located between said inlet and outlet ends,
   f. liquid conveying means leading from said skimming means for discharging oil that has separated in said separator tank,
   g. at least two upright transverse baffles in said separator tank on the outlet side relative to said skimming means, said baffles extending above the fluid level in said separator tank,
   h. means defining a fluid path adjacent the lower end of said baffles whereby water in flowing between the inlet and outlet of said separator tank must circulate down and then upward at said baffles,
   i. an upright partition in said tank on the outlet side of said baffles forming a second tank portion open at the top, said partition having a top edge forming a weir over which water spills to said second tank portion,
   j. said top edge having groove means therein extending transversely of said tank ; said groove means functioning to produce a rippling effect in liquid flowing thereover so as to further separate oil from water in said liquid,
   k. an open top inspection tank,
   l. conveying means leading from said separator tank to said inspection tank,
   m. storage means having an outlet for the treated water,
   n. liquid conveying means leading from said inspection tank to said storage means,
   o. and oil storage means arranged to receive oil from said decantation tank and from said skimming means.

4,048,071

LIQUID FILTERING DEVICE

Yoshio Yamada, 101-118, Hatta, Higashi, Fukuoka, Fukuoka, and Yoneji Wada, 1-1, Hakatasekimae 2-Chome, Hakata, Fukuoka, Fukuoka, both of Japan

Continuation of Ser. No. 461,435, April 15, 1974, abandoned.
This application Oct. 22, 1975, Ser. No. 624,882
Int. Cl.² B01D *35/00, 35/14*
U.S. Cl. 210—90 **1 Claim**



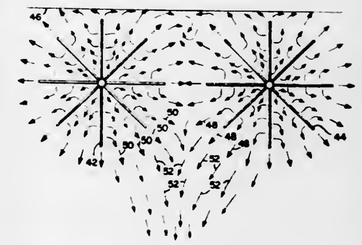
1. A filter device comprising:
   a tank covered by a cover plate;
   a hollow shaft within said tank, said shaft having a radial opening through the wall thereof;
   a first filter unit for removing relatively coarse contaminants;
   a second filter unit for removing relatively fine contaminants;
   said first and second filter units being connected in cascade in said tank with said first filter unit above said second filter unit;
   said first filter unit comprising:
      a coil of spirally wound filter web which is liquid tightly mounted about said hollow shaft;
      a liquid impervious flexible coating covering the outer peripheral surface of said coil;
      supporting disc means, secured to said hollow shaft and liquid tightly contacting the outer periphery of a first, lower end of said coil, for radially receiving and positioning said first, lower end of said coil;
      a space being defined between said first, lower end of said coil and said supporting disc means; and
      said coil having a second, upper end, the outer periphery of which is unsupported and radially unrestrained, said filter web of said second, upper end of said coil having the property of being free, upon the receipt and absorption thereby of liquid, to expand radially;
   means for supplying liquid containing solid contaminants into said second. upper end of said coil of said first filter unit and passing said liquid axially through said coil from said second, upper end to said first, lower end thereof, for causing said filter web of said second, upper end of said coil to radially expand and thereby trap relatively coarse contaminants, for then passing said liquid still having therein relatively fine contaminants through said second filter unit and thereby purify said liquid, and for passing the thus purified liquid through said radial opening and into the interior of said hollow shaft; and
   means responsive to the pressure differences between the inlet and outlet sides of said first filter unit for determining the amount of said contaminants collected by said first filter unit, said pressure difference responsive means comprising:
      a cylinder formed in said cover plate of said tank;
      a piston slidably positioned in said cylinder;
      a first passage communicating the interior of said cylinder on a first side of said piston with said inlet side of said first filter unit;
      a second passage communicating the interior of said cylinder on a second side of said piston with said outlet side of said first filter unit;
      a spring positioned in said cylinder and in contact with said second side of said piston; and
      a switch mounted on said cover plate at a position to be operated by said piston when said piston is moved against the force of said spring by a pressure difference between said inlet and outlet sides of said first filter unit.

4,048,072

AIR DIFFUSERS

J. Robert McCullough, West Chester, Pa., assignor to Schramm, Inc., West Chester, Pa.

Filed Oct. 23, 1975, Ser. No. 624,747
Int. Cl.² B01F *3/04;* **C02C** *1/12*
U.S. Cl. 210—220 **24 Claims**

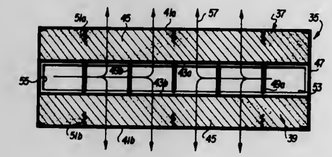


1. A system for treating sewage or liquid industrial waste by aeration comprising:
   a lagoon for temporarily containing said sewage or liquid industrial waste during aeration thereof, said lagoon having a substantially flat bottom portion and at least one sloping side extending upwardly and outwardly from said bottom portion;
   a plurality of air diffusers within said lagoon, located on and essentially confined to said bottom portion, each of said diffusers comprising an air manifold and at least four flexible diffuser tubes, each tube being connected to receive air from said manifold and to release said air in bubble form along substantially its entire length; the connections of said diffuser tubes to said manifold, all being projectable into a horizontal circle having a radius less than approximately one-tenth of the average length of said diffuser tubes, and said diffuser tubes extending substantially radially outwardly from said manifold in horizontal directions, there being at least one of said diffuser tubes in each quadrant; and
   pumping means for supplying air to each manifold in the system;
   said diffusers being arranged adjacent said sloping side, and at least two of the flexible tubes of each diffuser being arranged to diverge from each other in the direction from the manifold thereof toward said sloping side, whereby a resultant outwardly directed radial surface flow is produced above said sloping side.

12. A flexible air diffuser tube for aerating bodies of water such as reservoirs or sewage or waste treatment lagoons, comprising:
   a flexible inner conduit connectable to receive air from a

manifold, said inner conduit having perforations spaced along its length to release air to its exterior, a foraminous fabric tube surrounding said inner conduit and being of a size such as to provide a space at least between the perforations of said inner conduit and the interior of said fabric tube, means securing the ends of said fabric tube to said inner conduit in order to enclose the ends of said space so that escape of air from the fabric tube is essentially limited to the foramina thereof, and means comprising a quantity of loose pellets filling said space and providing resistance to the flow of air within said space.

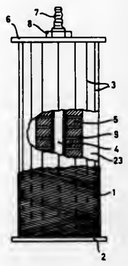
4,048,073
FILTER BED ASSEMBLY
Lawrence J. Rose, Littleton, Colo., assignor to Helix Technology Corporation, Waltham, Mass.
Filed Mar. 1, 1976, Ser. No. 662,777
Int. Cl.² B01D *29/06*
U.S. Cl. 210—284 **9 Claims**



8. A filter bed assembly comprising:
a frame for defining a space through which fluids to be filtered flow;
first and second separate beds positioned in said space, said first and second separate beds each including an adsorbent material held between first and second parallel perforate sheets, said perforate sheets being attached along outer edges thereof to said frame, said first perforate sheets having first folded pleats therein, said first folded pleats extending approximately perpendicular to the plane of said first perforate sheets into said adsorbent material, said second perforate sheet having second folded pleats formed therein, said second folded pleats extending substantially perpendicular to the plane of said second perforate sheets away from said adsorbent material;
the perforate sheets of said first and second beds being attached to said frame to be parallel to one another with the respective second perforate sheets being adjacent one another but spaced from one another a distance approximately equal to the lengths of said second folded pleats, said second folded pleats contacting the second perforate sheets of the other respective beds to maintain said spacing.

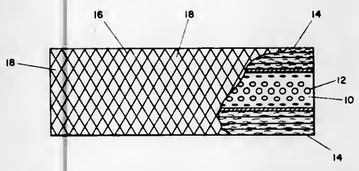
4,048,074
APPARATUS FOR SEPARATING SOLIDS FROM LIQUIDS OR GAS
Hilmar Bruenemann, Ludwigshafen, and Guenter Stoeckelmann, Frankenthal, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany
Filed Mar. 2, 1976, Ser. No. 663,209
Claims priority, application Germany, Mar. 14, 1975, 2511195
Int. Cl.² B01D *33/04*
U.S. Cl. 210—323 T **1 Claim**

1. A filtration apparatus for separating solid particles from liquids or gases, said apparatus comprising:
a plurality of filter elements separated from each other by side walls which define separate segments of the filter apparatus;
each of said filter elements comprising a permeable hollow cylinder closed at both ends by end plates, at least one of said end plates having a feed orifice provided therein, and at least one layer of threads wound about said cylinder, said thread being connected at one of its ends to a take-up spool through a cleaning means;
a first support means rotatably mounting said filter elements and side walls;
a second fixed support means mounting feed lines and a rewinding drive whereby the relative movement of said first and second support means brings said feed lines and rewinding drive into engagement with said filter elements;



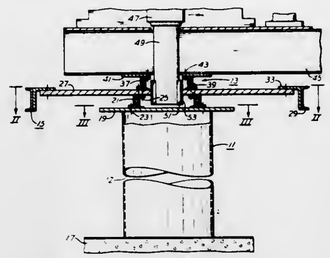
a plurality of separate discharge channels mounted on said second fixed support means, said discharge channels being in communication with each of said filter segments by means of collar mounted about said first rotatable support means and by means of central channel mounted at the axis of rotaion thereof whereby the liquids or solids leaving each of said filter elements are separately channeled away therefrom in accordance with the particular rotational position of said filter elements and filter segments.

4,048,075
FILTER CARTRIDGE
Floyd E. Colvin, and John E. Luttrell, both of Tell City, Ind., assignors to The Carborundum Company, Niagra Falls, N.Y.
Continuation of Ser. No. 467,433, May 6, 1974, abandoned, which is a continuation of Ser. No. 334,531, Feb. 22, 1973, abandoned, which is a continuation-in-part of Ser. No. 185,621, Oct. 1, 1971, abandoned. This application Jan. 2, 1975, Ser. No. 537,974
Int. Cl.² B01D *27/00*
U.S. Cl. 210—484 **8 Claims**



1. A filter cartridge for separating particles from fluid flowing inwardly through the cartridge, wherein the improvement consists essentially of: an inner tubular perforated core member; a pre-formed needle punched mat of non-woven unbonded fibrous filtering material having a width substantially equal to the length of said core member and wrapped in a continuous spiral layer around only said core member and itself, to form a roll of said mat; and a strand wound in a criss-cross open weave pattern around only the outer periphery of said roll and itself to form an open mesh network containing said roll.

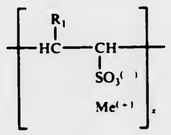
4,048,076
CENTER COLUMN DRIVE ARRANGEMENT FOR CIRCULAR CLARIFIERS
Stephen G. Pearre, Essex, and Bobby L. Craighead, Baltimore, both of Md., assignors to Environmental Elements Corporation, Baltimore, Md.
Filed Dec. 29, 1975, Ser. No. 644,827
Int. Cl.² B01D *21/06*
U.S. Cl. 210—528 **4 Claims**



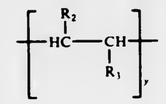
1. An improved circular clarifier apparatus of the type including a tank having a fixed center column and having connected to the center column a torque cage rotatable about the center column and a superstructure, wherein the improvement comprises:
a. a first bearing axially mounted to the top of the center column;
b. the torque cage mounted to the top of the first bearing and rotatable about the axis of the center column;
c. a second bearing axially mounted to the top of the torque cage and connected to the bottom of the superstructure;
d. drive means for rotating the torque cage, the drive means having a vertical drive shaft extending through the center of the second bearing and keyed to the torque cage.

4,048,077
AQUEOUS CLAY BASE MUD FOR DEEP DRILLING
Friedrich Engelhardt, Frankfurt am Main; Martin Hille, Bad Soden, Taunus, and Dieter Ulmschneider, Konigstein, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Filed Sept. 9, 1975, Ser. No. 611,616
Claims priority, application Germany, Sept. 14, 1974, 2444108
Int. Cl.² C09K *7/02*
U.S. Cl. 252—8.5 C **4 Claims**

1. An aqueous clay base mud containing per m^3 from about 0.5 to 40 kg of a protective colloid, the protective colloid contained in the mud being a copolymer which has a K-value of about 110 to 200 and which is constituted by the components of the formulae I, II and III

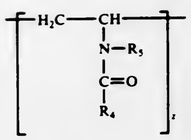


I



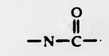
II

-Continued



III

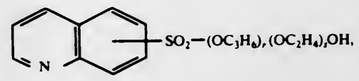
in which R_1 and R_2 each is hydrogen or $-CH_3$; R_3 is $-CO-NH_2$, $-CN$ or $-COOCH_3$; R_4 is hydrogen, $-CH_3$ or $-C_2H_5$; R_5 is $-CH_3$ or $-C_2H_5$ or R_4 and R_5 together represent a propylene group forming a pyrrolidone radical with the inclusion of the radical



Me is ammonium, potassium, sodium or lithium and x is 5 to 50, y is 40 to 80 and z is 3 to 70, or by the alkaline hydrolysis products thereof and which contains the components in the parts by weight of the starting monomers indicated by the indices x, y and z.

4,048,078
OIL RECOVERY PROCESS UTILIZING AIR AND SUPERHEATED STEAM
Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.
Filed July 14, 1975, Ser. No. 595,652
Int. Cl.² E21B *43/22*
U.S. Cl. 252—8.55 D **4 Claims**

1. A fluid which comprises about 20 to about 80 weight percent steam and about 80 to about 20 weight percent of air together with about 0.001 to about 0.02 weight percent of a solubilizing agent having the structural formula:



wherein r is an integer of from 3 to 10, s is an integer of from 5 to about 50 and wherein the sum of r plus s is not more than 55 and from about 0.001 to about 0.05 weight percent of an alkaline agent.

4,048,079
AQUEOUS GELS AND USES THEREOF
Richard L. Clampitt, and James E. Hessert, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 404,746, Oct. 9, 1973, Pat. No. 3,908,760. This application Aug. 6, 1975, Ser. No. 602,352
Int. Cl.² C09K *3/00*; B01J *13/00*
U.S. Cl. 252—8.55 D **15 Claims**

1. An aqueous gel, suitable for use in secondary recovery operations for the recovery of oil and in other oil field operations wherein subterranean formations are contacted with a fluid medium, said gel comprising water having incorporated therein:
a water-thickening amount of a biopolysaccharide produced by the action of bacteria of the genus Xanthomonas on a carbohydrate;
a water-soluble compound of chromium, wherein the valence of the chromium therein is +6 and is capable of being reduced to +3, in an amount which is sufficient to cause gelation of said water when the valence of at least a portion of said +6 chromium is reduced to +3; and

a water-soluble reducing agent in an amount which is effective to reduce at least a portion of said +6 chromium to +3 chromium and cause said gelation with the formation of said gel, said reducing agent being selected from the group consisting of hydroquinone, sodium sulfide, hydrogen sulfide, sodium hydrosulfite, potassium hydrosulfite, potassium sulfite, sodium bisulfite, potassium bisulfite, sodium metabisulfite, potassium metabisulfite, sodium sulfite, sodium thiosulfate, potassium thiosulfate, thioacetamide, p-hydrazinobenzoic acid, hydrazine phosphite, hydrazine dihydrochloride, and mixtures thereof.

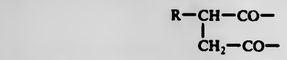
4,048,080

LUBRICATING OIL COMPOSITION

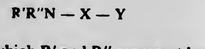
Gary D. Lee; Paul F. Vartanian, and Joseph B. Biasotti, all of Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 7, 1976, Ser. No. 693,458
Int. Cl.² C07D *41/00, 41/06*
U.S. Cl. 252—51.54 **14 Claims**

1. A lubricating oil composition comprising a major proportion of a base oil of lubricating viscosity and a minor dispersant amount of a reaction product prepared by the process which comprises reacting an alkenyl succinic acid or anhydride having the structural unit represented by the formula:



in which R is an alkenyl radical having a molecular weight ranging from about 250 to 3000 with an amine represented by the formula:



in which R′ and R″ represent hydrogen or a monovalent alkyl, aminoalkyl or hydroxyalkyl radical having from 1 to 8 carbon atoms, X is a divalent hydrocarbon radical having from 2 to 8 carbon atoms and Y is radical selected from the group consisting of hydrogen, amino, hydroxyl and a radical having the formula $O(R'''O)_xH$ in which R‴ is an alkylene radical having from 2 to 3 carbon atoms and x is an integer from 1 to 5, in the presence of a free radical initiator, the molar proportion of said amine to said succinic acid or anhydride being greater than one.

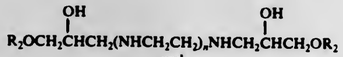
4,048,081

MULTIPURPOSE FUEL ADDITIVE

Warren H. Machleder, Blue Bell, and Joseph M. Bollinger, North Wales, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

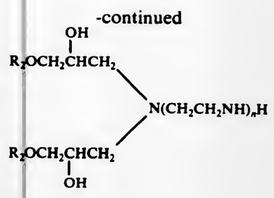
Continuation-in-part of Ser. No. 536,074, Dec. 24, 1974, abandoned. This application Mar. 29, 1976, Ser. No. 671,462
Int. Cl.² C10M *1/32*
U.S. Cl. 252—51.5 R **11 Claims**

1. A multipurpose gasoline or lubricating oil additive, comprising an adduct selected from compounds, and mixtures thereof, of the formulas:



and

-continued



wherein n is 1–5 and R_2 is a benzene group having at least one polyalkylene substituent.

4,048,082

ORGANIC LUBRICATING COMPOSITIONS CONTAINING ESTERS OF BENZOTRIAZOLE

John C. Nnadi, Glassboro, and Phillip S. Landis, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 17, 1975, Ser. No. 596,934
Int. Cl.² C10M *1/32, 3/26*
U.S. Cl. 252—51.5 A **8 Claims**

1. An organic composition comprising oils of lubricating viscosity or greases prepared therefrom containing a minor anti-rust improving amount of an oil-soluble ester of an adduct of benzotriazole and an unsaturated dicarboxylic acid or anhydride thereof selected from the group consisting essentially of maleic anhydride, fumaric acid and acetylene dicarboxylic acid prepared by reacting said benzotriazole and said unsaturated dicarboxylic acid or anhydride thereof in a mole ratio of from about 0.5:1 to about 2:1 benzotriazole to acid or anhydride at a temperature of from about 80 to about 250° C and thereafter esterifying said adduct.

4,048,083

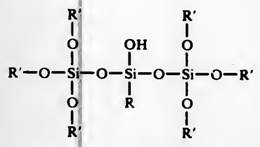
FUNCTIONAL FLUID SYSTEMS CONTAINING ALKOXYSILANOL CLUSTER COMPOUNDS

Karl O. Knollmueller, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 616,439, Sept. 24, 1975, Pat. No. 3,965,135. This application Apr. 12, 1976, Ser. No. 675,881
The portion of the term of this patent subsequent to June 22, 1993, has been disclaimed.
Int. Cl.² C10M *3/46*
U.S. Cl. 252—78.3 **14 Claims**

1. In a method wherein a first mechanical effort is converted to pressure at a first location, the pressure is transmitted from said first location to a second location via a hydraulic fluid, and said pressure is converted to a second mechanical effort at said second location, the improvement which comprises using as said hydraulic fluid one which comprises an effective amount of a compound having the formula:

(I)

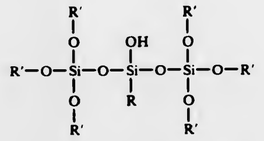


wherein R is hydrogen, an alkyl, alkenyl, aryl or aralkyl, and each R′ is independently selected from the same group as R with the proviso that at least a majority of R′ radicals are sterically hindered alkyl groups having at least 3 carbon atoms.

8. In a method wherein heat is passed from a first heat conductor to a heat transfer fluid at a first location, the heat is transmitted from said first location to a second location, via said heat transfer fluid and said heat is passed from said heat

transfer fluid to a second heat conductor at said second location, the improvement which comprises using as said heat transfer fluid one which comprises an effective amount of a compound having the formula:

(I)



wherein R is hydrogen, an alkyl, alkenyl, aryl or aralkyl, and each R′ is independently selected from the same group as R with the proviso that at least a majority of R′ radicals are sterically hindered alkyl groups having at least 3 carbon atoms.

4,048,084

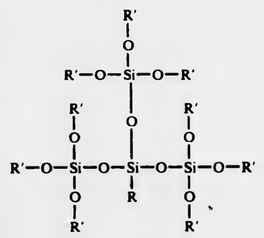
FUNCTIONAL FLUID SYSTEMS CONTAINING ALKOXYSILANE CLUSTER COMPOUNDS

Karl O. Knollmueller, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 616,438, Sept. 24, 1975, Pat. No. 3,965,136. This application Apr. 12, 1976, Ser. No. 675,882
The portion of the term of this patent subsequent to June 22, 1993, has been disclaimed.
Int. Cl.² C10M *3/46*
U.S. Cl. 252—78.3 **14 Claims**

1. In a method wherein a first mechanical effort is converted to pressure at a first location, the pressure is transmitted from said first location to a second location via a hydraulic fluid, and said pressure is converted to a second mechanical effort at said second location, the improvement which comprises using as said hydraulic fluid one which comprises an effective amount of a compound having the formula:

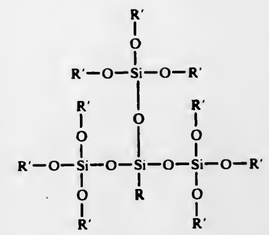
(I)



wherein R is hydrogen, an alkyl, alkenyl, aryl or aralkyl, and each R′ is independently selected from the same group as R with the proviso that at least a majority of R′ radicals are sterically hindered alkyl groups having at least 3 carbon atoms.

8. In a method wherein heat is passed from a first heat conductor to a heat transfer fluid at a first location, the heat is transmitted from said first location to a second location via said heat transfer fluid, and said heat is passed from said heat transfer fluid to a second heat conductor at said second location, the improvement which comprises using as said heat transfer fluid one which comprises an effective amount of a compound having the formula:

(I)



wherein R is hydrogen, an alkyl, alkenyl, aryl or aralkyl, and each R′ is independently selected from the same group as R with the proviso that at least a majority of R′ radicals are sterically hindered alkyl groups having at least 3 carbon atoms.

4,048,085

PREPARATION OF DETERGENT COMPOSITIONS

Robin Snell Heslam, Wallasey, England, assignor to Lever Bros. Co., New York, N.Y.

Filed Apr. 19, 1976, Ser. No. 678,270
Claims priority, application United Kingdom, Apr. 18, 1975, 16147/75
Int. Cl.² C11D *7/54, 7/60, 7/32*
U.S. Cl. 252—102 **7 Claims**

1. A process for preparing a detergent powder composition comprising the steps of forming an alkaline aqueous slurry having a pH value (measured on a 1% solids solution) of about 8.5 to 12 and comprising a surface-active agent selected from the group consisting of anionic, nonionic, zwitterionic, amphoteric and cationic detergents and mixtures thereof in an amount of about 1–20% by weight; a builder salt selected from the group consisting of inorganic and organic complex-forming substances and mixtures thereof in an amount of about 5–40% by weight, an organic activator for peroxy compounds having a hydrolysis rate of not more than 15%, in an amount of about 0.2–10% by weight; and water in an amount of about 40–60% by weight, heating said aqueous slurry to a temperature of about 60°–90° C, and subjecting it to a spray-drying operation to form a particulate detergent composition having the organic activator homogeneously distributed therein.

4,048,086

COBALTIC ACCELERATORS WITH GROUP II METAL OXIDES AND HYDROXIDES

Melville W. Uffner, Glen Mills, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed June 3, 1975, Ser. No. 583,500
Int. Cl.² C08G *63/12*
U.S. Cl. 252—182 **7 Claims**

1. An accelerator composition suited for providing extended shelf life to sheet and bulk molding compound while providing accelerated cure rates at molding temperatures which comprises in combination:

a cobaltic promotor selected from the group consisting of cobaltic halides, cobaltic salts of monocarboxylic acids having from two to 20 carbon atoms, cobaltic sulfate, and cobaltic beta-diketones; and

from about 1 to 4,500 parts, per part of cobaltic metal in said cobaltic promotor, of a coupler containing either calcium or magnesium.

4,048,087

CRYSTALLIZING SOLUTION AND METHOD OF PREPARATION THEREOF

Roger D. Daniels, and John A. Snover, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 684,099, Nov. 15, 1967, Pat. No. 3,819,335. This application Oct. 23, 1968, Ser. No. 770,127
Int. Cl.[2] C09K *3/00;* C01F *7/00*
U.S. Cl. 252—188 13 Claims

1. A process for preparing an aluminum hydride crystallizing liquid comprising:

a. providing a nucleating liquid comprising aluminum hydride and lithium aluminum hydride carried in a mixture of an inert organic liquid with a boiling point greater than about 60° C. and an aliphatic ether having a lower boiling point than the inert organic liquid, said aluminum hydride and lithium aluminum hydride being present in sufficient quantities so that the concentration of aluminum hydride in the nucleating liquid is within the range of about 0.05 to about 1 molar, and the aluminum hydride/lithium aluminum hydride mole ratio is within the range from about 2 to about 10, said ether being present in a sufficient amount to maintain the aluminum hydride in solution,

b. providing a bath or organic liquid heated to a volatilization temperature,

c. introducing said nucleating liquid into said heated organic liquid thereby to form a pre-crystallizing bath while maintaining the temperature of the pre-crystallizing bath at or above said volatilizing temperature, and

d. continuing to introduce said nucleating liquid into the pre-crystallizing bath and maintaining the temperature of the bath at or above the volatilization temperature until crystals of aluminum hydride form in the pre-crystallizing bath.

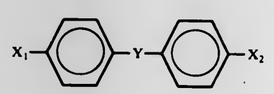
4,048,088

NEMATIC LIQUID CRYSTAL COMPOSITIONS

Mashachika Yaguchi, Yokohama, and Kenji Nakamura, Kamakura, both of Japan, assignors to Dai Nippon Toryo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 501,923, Aug. 30, 1974, Pat. No. 3,989,639. This application Apr. 23, 1976, Ser. No. 679,586
Claims priority, application Japan, Aug. 31, 1973, 48-97216; Aug. 31, 1973, 48-97217
Int. Cl.[2] C09K *3/34;* G02F *1/13*
U.S. Cl. 252—299 10 Claims

1. A nematic liquid crystal composition with positive dielectric anisotropy which comprises a mixture of 2 to 50% by weight of at least one of compounds represented by the formula,



wherein X_1 is halogen or a nitro group, X_2 is hydrogen or —R or —OR radicals wherein R is an alkyl group of 1 to 18 carbon atoms, and Y is —N=N— and 50 to 98% by weight of a nematic liquid crystal material.

4,048,089

NEMATIC LIQUID CRYSTAL COMPOSITION

Yoshi Arai, Oyama; Kazuo Kimura, Tokyo; Hisato Sato, Tokyo; Takasi Yamaki, Tokyo; Katsuhiko Morita; Masanao Ohzeki, both of Urawa; Haruyoshi Takatsu, Kodaira; Yutaka Fujita, Yokohama, and Masayuki Tazume, Urawa, all of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo and Kawamura Institute of Chemical Research, Saitama, both of Japan

Filed July 6, 1976, Ser. No. 702,500
Claims priority, application Japan, July 31, 1975, 50-92571
Int. Cl.[2] C09K *3/34;* G02F *1/13*
U.S. Cl. 252—299 2 Claims

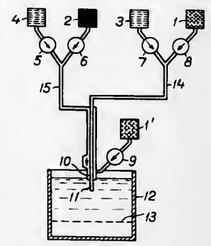
1. A nematic liquid crystal composition comprising 5 to 70 mole% of (I) 4-n-valeryloxy-4'-cyanobiphenyl, 5 to 40 mole% of (II) 4-n-caproyloxy-4'-cyanobiphenyl, 5 to 60 mole% of (III) 4'-cyanophenyl-4-n-heptylbenzoate, and 5 to 45 mole% of (IV)4'-cyanophenyl-4-n-butylbenzoate.

4,048,090

REACTOR FUEL IN THE FORM OF MIXED OXIDE PARTICLES AND A METHOD FOR MANUFACTURING SUCH MIXED OXIDE PARTICLES

Kare Hannerz, Vasteras, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Dec. 4, 1975, Ser. No. 637,635
Claims priority, application Sweden, Dec. 5, 1974, 7415226
Int. Cl.[2] G21C *3/62*
U.S. Cl. 252—301.1 R 6 Claims



1. Mixed oxide fuel consisting essentially of uranium dioxide and plutonium dioxide in the form of mixed oxide particles with a diameter of 0.2 to 2 mm, a surface layer of the particles consisting essentially of UO_2 having a thickness of at lest 0.05 mm with a plutonium content per unit of volume of at the most 15% of the average plutonium content per unit of volume of the particle.

4,048,091

PROCESS FOR THE PREPARATION OF REDUCING GASES

Pierluigi Barnaba, Rome, Italy, assignor to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed Oct. 9, 1975, Ser. No. 621,229
Claims priority, application Italy, Oct. 11, 1974, 53486/74
Int. Cl.[2] C07C *2/14, 2/16*
U.S. Cl. 252—373 1 Claim

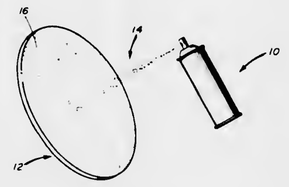
1. A process for the production of reducing gases having a high content of CO and H_2, comprising, in a first stage, partially combusting methane with a gas containing 20 to 100% by volume oxygen, the molar ratio of oxygen in the oxygen-containing gas to methane being between 0.60 and 0.75, and, in a second stage converting the gas from said first stage on a catalytic bed of porous alumina or magnesia and then on a catalytic bed of nickel oxide supported on porous alumina or magnesia, at a temperature between 900° and 1500° C, by adding further methane such that the oxygen in the oxygen-containing gas of said first stage has a molar ratio to the initial first stage methane and added second stage methane which is about 0.5, while the uncombusted methane from the first stage plus the added methane in the second stage has a molar ratio to the H_2O plus CO_2 in the gases from the first stage which is between 0.8 and 1.

4,048,092

CATALYTIC MIXTURE AND METHOD OF USE THEREFOR

Ronald F. Davies, Elkton, Md., and George J. Benvegno, Aston, Pa., assignors to Colonial Metals, Inc., Elkton, Md.

Division of Ser. No. 338,352, March 5, 1973, Pat. No. 3,915,350. This application Sept. 2, 1975, Ser. No. 609,494
The portion of the term of this patent subsequent to Sept. 10, 1991, has been disclaimed.
Int. Cl.[2] B01D *15/06*
U.S. Cl. 252—412 7 Claims



1. A method of rejuvenating a spent catalyst-coated surface, comprising the steps of:

applying to said surface an aqueous composition selected from the group consisting of (1) chloroplatinic acid, a high surface refractory, dextrose, and triethanolamine, (2) chloroplatinic acid and sodium citrate, (3) ammonium chloroplatinite and dimethyl form amide; and

heating the applied mixture, whereby a catalyst which has lost its catalytic activity in service may be rejuvenated.

4,048,093

PROCESSES FOR REGENERATING DISPERSIONS OF LIGAND-STABILIZED, PALLADIUM(II) HALIDE COMPLEXES USED IN CARBONYLATION CATALYSTS

John F. Knifton, Poughquag, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 28, 1975, Ser. No. 635,995
Int. Cl.[2] B01J *31/40, 27/32;* C07C *51/00;* C11C *3/02*
U.S. Cl. 252—414 2 Claims

1. A process for regenerating spent palladium catalysts utilized in olefin carbonylation reactions consisting of dispersions of ligand-stabilized palladium(II) halide complexes in quaternary ammonium, phosphonium and arsonium salts of trihalostannate(II) and trihalogermanate(II) by the steps of:

a. Forming a reaction mixture consisting essentially of spent palladium catalyst selected from the group consisting of:
$[(C_2H_5)_4N][SnCl_3]$-$PdCl_2[P(C_6H_5)_3]_2$,
$[(C_2H_5)_4N][SnCl_3]$-$PdCl_2[P(p\text{-}Ch_3.C_6H_4)_3]_2$,
$[ClCH_2(C_2H_5)_3P][SnCl_3]$-$PdCl_2[P(C_6H_5)_3]_2$,
$[(n\text{-}C_4H_9)_4N][SnCl_3]$-$PdCl_2[P(C_6H_5)_3])_2$,
$[(C_6H_5)_4As][SnCl_3]$-$PdCl_2[P(C_6H_5)_3]_2$,
$[(C_2H_5)_4N][GeCl_3]$-$PdCl_2[P(C_6H_5)_3]_2$,
$[(C_2H_5)_4N][SnCl_3]$-$PdCl_2[P(p\text{-}CH_3O.C_6H_4)_3]_2$, and
$[(C_7H_{13})_4N][GeCl_3]$-$PdCl_2[As(C_6H_5)_3]_2$,
with organic peroxide in the mole ratio of 1 to 10^4 mole of organic peroxide per gram atom of palladium present in the spent catalyst, and in the presence of dry inert solvent selected from the group consisting of unsubstituted aromatic hydrocarbons, unsubstituted paraffins, chlorinated paraffins, chlorinated aromatic hydrocarbons, ketones and sulfones and inert gaseous environment, until a reaction mixture is formed, said organic peroxide in the reaction mixture being selected from the group consisting of:
t-butyl hydroperoxide,
dumene hydroperoxide,
benzoyl peroxide,
acetyl peroxide,
di-t-butyl peroxide,
methyl ethyl ketone peroxide, and
dicumyl peroxide;

b. Heating said regeneration reaction mixture between 20° to 150° C until the spent catalyst is regenerated in said reaction mixture,

c. Removing the excess solvent under reduced pressure,

d. Adding additional stabilizing ligand selected from the group consisting of triphenylphosphine, triphenylarsine, and tri-p-methoxyphenylphosphine to the solid catalyst in the mole ratio of 1–10 mole of ligand per gram atom of palladium present, and

e. Recycling the regenerated catalyst with fresh olefin feed back to the carbonylation reaction.

4,048,094

REACTIVATION OF HYDROTREATING CATALYST BY OPERATING AT A TEMPERATURE IN EXCESS OF NORMAL OPERATING TEMPERATURE

Roland L. Menzl, Hammond, Ind., and P. Donald Hopkins, St. Charles, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 527,827, Nov. 27, 1974, abandoned. This application Aug. 23, 1976, Ser. No. 716,716
Int. Cl.[2] B01J *23/94;* C10G *43/02, 23/02*
U.S. Cl. 252—414 3 Claims

1. A process for the reactivation of deactivated catalyst used in the hydrotreating of a hydrocarbon feedstream, which hydrotreating is conducted within a temperature range from about 500° F. to about 800° F. and a hydrogen partial pressure within the range from about 500 to about 2500 psia, wherein the catalyst comprises a Group VIa and Group VIII metal on a solid porous refractory oxide support of alumina having a pore diameter greater than about 80 A. and up to about 250 A, and wherein said feedstream comprises unfinished petroleum crude scale wax, which process comprises first contacting said catalyst with a mixture of steam containing about 0.2 to about 4 volume percent oxygen at a temperature of about 750° F. to about 1050° F. in a conventional air-steam catalyst regeneration, and then contacting said catalyst with said hydrogen and feedstream at a temperature from about 25° F. to about 200° F. in excess of the normal operating temperature that would be used for said hydrotreating stream, said contacting being conducted for a time that is sufficient to reactivate said catalyst.

4,048,095

ANTIMONY HALIDE CATALYST SYSTEM

Ronald Thomas Wojcik, Stamford, and Erwin Richard Ruckel, Darien, both of Conn., assignors to Arizona Chemical Company, Wayne, N.J.

Division of Ser. No. 654,687, Feb. 3, 1976, Pat. No. 4,016,346. This application May 12, 1976, Ser. No. 685,471
Int. Cl.[2] C08F *4/12, 4/20*
U.S. Cl. 252—429 R 2 Claims

1. A catalyst system adapted for use in carbocationic polymerization which consists essentially of (1) from 30% to 10% of an antimony halide and (2) from 70% to 85% of aluminum chloride or aluminum bromide or mixtures of the latter.

2. The catalyst system according to claim 1 wherein an amount ranging from 0% to 5% of adjuvant selected from the group consisting of lower alkyl halide, lower alkenyl halide and aralkyl halide is included.

4,048,096

SURFACE IMPREGNATED CATALYST

Thomas Charles Bissot, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 12, 1976, Ser. No. 675,766
Int. Cl.² B01J *31/04*
U.S. Cl. 252—430 **19 Claims**

14. A catalyst having a specific activity of at least about 83 grams of vinyl acetate per gram of precious metal per hour measured at 150° C. consisting essentially of

1. a catalyst support having a particle diameter of from about 3 to about 7 mm, and a pore volume of from about 0.2 to about 1.5 mlg, a 10% by weight water suspension of said support having a pH of from about 3.0 to about 9.0,
2. a palladium-gold alloy distributed in a surface layer of said support, said surface layer extending less than about 0.5 mm from the surface of said support, the palladium in said alloy being present in an amount of from about 1.5 to about 5.0 grams per liter of catalyst, the gold being present in an amount of from about 0.5 to about 2.25 grams per liter of catalyst and
3. from about 5 to about 60 grams per liter of catalyst of alkali metal acetate.

4,048,097

SULFONATED METAL PHTHALOCYANINE CATALYST

Walter M. Douglas, Streamwood, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 19, 1976, Ser. No. 659,394
Int. Cl.² B01J *31/18*
U.S. Cl. 252—431 N **5 Claims**

1. A metal phthalocyanine composition of matter prepared by reacting a 4-sulfophthalic acid or salt thereof, a Group VIII metal salt, an ammonium donor compound decomposable to ammonia or ammonium moiety, and water, at a temperature of 255° to 325° C. for ½ to 10 hours.

4,048,098

CATALYST FOR PURIFICATION OF EXHAUST GASES AND PROCESSES FOR ITS PRODUCTION AND USE

Edgar Koberstein, Alzenau, and Eduard Lakatos, Rhinefelden, Baden, both of Germany, assignors to Dentsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Feb. 4, 1974, Ser. No. 439,174
Claims priority, application Germany, Feb. 9, 1973, 2306395
Int. Cl.² B01J *21/00, 21/04, 21/08, 21/12, 23/64, 23/74*
U.S. Cl. 252—432 **54 Claims**

1. A carrier catalyst comprising an intermetallic system of at least three metals as catalytically active component, said catalyst comprising the product obtained by contacting a catalyst carrier with an aqueous solution comprising a halide of at least one metal selected from the group consisting of (a) rhodium, palladium and platinum, and a halide of at least one base metal selected from the group consisting of (b) aluminum, titanium, chromium, manganese, cobalt and nickel; drying the resulting impregnated carrier; and reducing the halides at a temperature of about 450°–1000° C in a stream of hydrogen; wherein said group (a) metals and said group (b) metals are in an atomic ratio of group (a) metals to group (b) metals of about 1 : 4 to 1 : 1; provided that, when said system contains platinum, rhodium and at least one of said base metals, said atomic ratio is 1 : 4 to 1 : 2.4.

4,048,099

HYDROCARBON CONVERSION WITH AN ACIDIC TRIMETALLIC CATALYTIC COMPOSITE

John C. Hayes, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 442,714, Feb. 14, 1974, Pat. No. 3,928,177, which is a continuation-in-part of Ser. No. 216,739, Jan. 10, 1972, Pat. No. 3,806,446, which is a division of Ser. No. 17,886, March 9, 1970, abandoned. This application Sept. 22, 1975, Ser. No. 615,647
Int. Cl.² B01J *27/06, 27/02*; C10G *35/06*
U.S. Cl. 252—441 **15 Claims**

1. An acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 5 wt. % Group IV-A metal, about 0.01 to about 3 wt. % Group VI-B transition metal and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, Group IV-A metal and Group VI-B transition metal are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the Group IV-A metal and the Group VI-B transition metal are present in oxide form; wherein the halogen component is present in the form of combined halide, and wherein the atomic ratio of Group VI-B transition metal to platinum group metal is about 0.05:1 to about 4:1.

4,048,100

POLYHALOGENATED POLYOLS AND FOAMED POLYURETHANES PREPARED FROM THEM

Arthur E. Gurgiolo, and Llewellyn D. Booth, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 462,143, April 18, 1974, abandoned. This application July 14, 1975, Ser. No. 595,972
Int. Cl.² C08G *18/14*
U.S. Cl. 260—2.5 AJ **12 Claims**

1. A semi-rigid to rigid foamed polyurethane product having predominantly closed cells which comprises the reaction product of

1. a polyol having the formula

$$(Q)_a—N(R)_b—[(CH_2)_cN(Q)]_d(CH_2)_cOH$$

wherein Q is 3-polyhalophenoxy-2-hydroxypropyl; R is $—(CH_2)_cOH$ or $—(CH_2)_cCH_3$; *a* is 1 or 2; *b* is 0 or 1; *c* is 2–4 and *d* is 0 or 1 with the proviso that when *a* is 2, *b* is 0 and halo is bromine or chlorine,

2. an aryl polyisocyanate,
3. a polyurethane blowing agent, and
4. a surfactant,

wherein said polyisocyanate is used in amounts corresponding to from 0.9 to 2.0 NCO groups for each active hydrogen atom in the mixture of reactive materials.

4,048,101

PROCESS FOR PREPARING A FOAMED BODY HAVING AN ANNULAR RING PATTERN IN CROSS-SECTION

Akio Nakamachi, and Zenichi Maruo, both of Sakai, Japan, assignors to Daicel Ltd., Osaka, Japan

Filed Dec. 22, 1975, Ser. No. 643,138
Claims priority, application Japan, Dec. 27, 1974, 50-3632
Int. Cl.² C08J *9/20*
U.S. Cl. 260—2.5 E **6 Claims**

1. A process for preparing a foamed molding having an annual ring pattern in cross-section, which comprises the steps of:

I. dry blending particles of a first styrene resin A having a particle size in the range of from 10 to 150 mesh, with additives consisting essentially of

1. from 0.1 to 5 parts by weight, per 100 parts by weight of said resin A, of an organic, heat-decomposable, solid, gas-releasing foaming agent having a decomposition temperature of from 150° to 120° C,
2. from 0.1 to 5 parts by weight, per 100 parts by weight of said resin A, of a foaming assistant effective for controlling the decomposition temperature of said foaming agent,
3. from 0.1 to 5 parts by weight, per 100 parts by weight of said resin A, of a finely divided, inert, inorganic substance effective for forming pore nuclei in said resin A during foaming thereof, and
4. a dry colorant, for altering the normal color of said resin A,

whereby to coat the particles of resin A with said additives;

II. dry blending with the product of step I, a substance consisting essentially of colored pellets of a second styrene resin B colored within a colorant or colorants for altering the normal color of said resin B wherein said resin B has a melt index which is less than the melt index of said resin A by a value of from one to 20 melt index units and wherein said resin B pellets are free of said additives and have at least one dimension which is from 0.5 to 7 mm larger than the largest dimension of said resin A particles, the amount of said resin B pellets being from 5 to 70 parts by weight per 100 parts by weight of said resin A particles, said resin B pellets being colored with a color or colors different from that of said dry colorant for said resin A;

III. placing the product of step II in a molding machine and therein heating and mixing the product of step II by screw means to form a hot, viscous, molten, molding composition consisting essentially of a resin A phase and a resin B phase and in which said additives are present primarily in the resin A phase and said foaming agent is partially decomposed, and then passing the molding composition through an orifice into a zone of lower pressure wherein the molding composition expands to form a foamed molding, wherein the ratio of the volume of the molten molding composition prior to molding : the volume of the foamed molding is from 1:1.1 to 1:3, said foamed molding having in cross-section an annular ring pattern consisting essentially of layers of foamed resin A and substantially unfoamed resin B.

4,048,102

PROCESS FOR PREPARING FLEXIBLE POLYURETHANE FOAMS

Billy Quock, Richwood; Don Howard Kelley, Lake Jackson, and Sehon Lester Warneke, Brazoria, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 569,904, April 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 507,893, Sept. 20, 1974, abandoned, and a continuation-in-part of Ser. No. 634,674, Nov. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 570,336, April 21, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,768
Int. Cl.² C08G *18/06, 18/14, 18/28*
U.S. Cl. 260—2.5 AM **22 Claims**

1. A process for preparing flexible polyurethane foam having a modulus of at least about 2.3 which comprises subjecting to foaming conditions, a composition comprising:

A. 1. from about 50 to 100 percent by weight of a primary, hydroxyl-containing polyether triol having an average hydroxyl equivalent weight of from about 900 to about 2500,

2. from 0 to about 50 percent by weight of a polyol selected from a diol, a triol, a polymer-containing diol, a polymer-containing triol or mixtures thereof wherein said diols and triols have an average hydroxyl equivalent weight of from about 500 to about 2500 and said polymer has an average molecular weight of at least about 5000;

B. an organic polyisocyanate consisting of

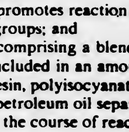
1. from about 50% to 100% by weight of 2,4-toluene diisocyanate, 2,6-toluene diisocyanate, NCO-containing prepolymers thereof, and
2. from 0 to about 50% by weight of an organic polyisocyanate having an average NCO functionality of at least 2;

C. from about 1.0 to about 5 parts by weight of water per 100 parts by weight of Component (A);

D. from about 0 to about 20 parts of a low boiling auxiliary blowing agent per 100 parts by weight of Component (A);

E. from about 0.1 to about 10 parts per 100 parts by weight of Component (A) of a crosslinker composition consisting essentially of

1. from 5 to 100 percent by weight of compounds or mixtures of compounds represented by the formula



wherein A is represented by the group

each R, R_1 and R_2 are independently hydrogen or an alkyl group having from 1 to about 4 carbon atoms, *x* has a value from zero to about 4; *y* has a value of 1 or 2; *z* has a value of zero or 1, and when *y* is 2, *z* is zero and the sum of *y* and *z* is 2, as a primary crosslinker component, and

2. from 0 to about 95 percent by weight of an auxiliary crosslinker component;

F. from about 0.5 to about 4 parts by weight per 100 parts by weight of Component (A) of a catalyst for the urethane reaction;

G. from abut 0.005 to about 2.5 parts by weight per 100 parts by weight of Component (A) of a silicone oil cell control agent;

and wherein Components (A), (B), (C) and (E) are present in quantities so as to provide an NCO:active hydrogen equivalent ratio of from about 0.8:1.0 to about 1.3:1.0.

4,048,103

COMPOSITION BASED ON PHENOLIC RESIN, POLYISOCYANATE, AND PETROLEUM OIL

Joseph Graham, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 9, 1976, Ser. No. 656,536
Int. Cl.² C08J *9/00*
U.S. Cl. 260—2.5 B **29 Claims**

1. A curable composition of matter comprising

a. an oil-soluble phenolic resin;

b. polyisocyanate carrying on the average at least two isocyanate groups per molecule capable of reacting with hydroxyl groups on said phenolic resin to form a cured reaction product;

c. a catalyst that promotes reaction between said isocyanate and hydroxyl groups; and

d. petroleum oil comprising a blend of aromatic and paraffinic oils and included in an amount sufficient to dissolve said phenolic resin, polyisocyanate, and catalyst to a flowable form; the petroleum oil separating from said reaction product during the course of reaction as a uniform disper-

sion of minute droplets entrapped within the reaction product.

4,048,104

POLYISOCYANATE PREPOLYMERS FROM SCRAP POLYESTER AND POLYURETHANE FOAM PRODUCTS OBTAINED THEREFROM

Glenn R. Svoboda, Grafton; John T. Suh, Mequon; William L. Carlstrom, and Gary L. Maechtle, both of West Bend, all of Wis., assignors to Freeman Chemical Corporation, Port Washington, Wis.

Filed Aug. 5, 1976, Ser. No. 711,831
Int. Cl.² C08G *18/14, 63/76;* C08J *11/04;* C08G *18/10*
U.S. Cl. 260—2.5 AN **14 Claims**

1. The method of preparing a polyisocyanate prepolymer comprising

A. Digesting polyalkylene terephthalate having a molecular weight greater than 15,000 in a reactive solvent selected from the class consisting of organic diols and triols having a molecular weight from 62 to 500 until the digestion product is soluble in acetone at room temperature;

B. Reacting the said digestion product with an organic polyisocyanate to produce a polyisocyanate-terminated prepolymer substantially free of unreacted hydroxyl radicals.

4,048,105

HIGH DENSITY URETHANE FOAM FOR RIM

Wayne C. Salisbury, Middleton, N.H., assignor to McCord Corporation, Detroit, Mich.

Filed Dec. 19, 1975, Ser. No. 642,559
Int. Cl.² C08J *9/00*
U.S. Cl. 260—2.5 AC **6 Claims**

1. A polyurethane foam prepared by intimately mixing

A. a polyol blend comprising (parts by weight):

long chain polyol	50 to 100
cross linker/extender	0 to 25
aromatic polyamine	1 to 6
alkylene amine catalyst	0.01 to 3.0
organometal catalyst	0.01 to 0.05

with

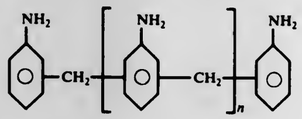
B. a quasi prepolymer of an alkane diol and an aromatic diisocyanate, said quasi prepolymer having a free NCO in the range of 20 to 27 percent;

wherein:

said long chain polyol has a molecular weight in the range of 3000 to 6000, a functionality in the range of 2 to 3, and an equivalent weight of 1500 to 3000:

said crosslinker/extender has a molecular weight in the range of 62 to 250 and is selected from the group consisting of alkane diols and triols;

said aromatic polyamine has the formula



and *n* has the value in the range of 0.1 to 0.7, and

said polyol blend and said quasi prepolymer are admixed to an Index in the range of 98 to 106.

4,048,106

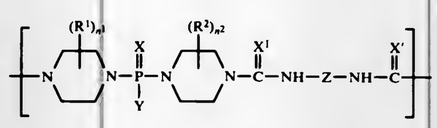
NOVEL POLYUREAS PREPARED BY REACTION OF A DIAMINE WITH A DIISOCYANATE OR A DIISOTHIOCYANATE

Johny C. Hermans, Wespelaar, Belgium, assignor to s.a. Texaco Belgium n.v., Brussels, Belgium

Filed Nov. 3, 1975, Ser. No. 628,263
Claims priority, application United Kingdom, May 21, 1975, 21772/75
Int. Cl.² C08G *18/14, 18/32, 18/38*
U.S. Cl. 260—2.5 AV **13 Claims**

1. Polyureas containing repeating groups of the formula

I



X is absent or represents an oxygen or sulphur atom or a group of the formula = N—R in which R represents an aliphatic, cycloaliphatic or aromatic group or a heterocyclic group;

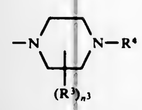
X' represents an oxygen or sulphur atom;

Y represents an aliphatic, cycloaliphatic or aromatic hydrocarbon group or heterocyclic group;

a group of the formula $-NR_2$ wherein R has the meaning given above or wherein the two groups R and the nitrogen atom to which they are attached together represent a N-containing heterocyclic ring;

a group of the formula —OR in which R has the meaning given above; or a group of the formula

II



R^1, R^2, R^3 and R^4 each represent a substituent on the piperazine ring said substituents R^1, R^2 and R^3 containing no active hydrogen atoms reactive with isocyanate or isothiocyanate groups, and substituent R^4 being hydrogen or a substituted or unsubstituted aliphatic, cycloaliphatic or aromatic hydrocarbon group, a heterocyclic group, an acyl group, a sulphonyl group, or a substituted carbamoyl group, —CO—NHR, wherein R has the meaning give above,

n^1, n^2 and n^3, which may be the same or different each represents O or an integer; and

Z represents the residue obtained by removal of the NCO or NCS groups from an organic diisocyanate or diisothiocyanate.

4,048,107

POLYURETHANE FOAM PREPARATION USING AMINO ACETAL CATALYST

John S. Babiec, Jr., Orange; Steven T. Nakos, Wallingford, and Stephen L. Goldstein, Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 12, 1976, Ser. No. 648,451
Int. Cl.² C08G *18/18*
U.S. Cl. 260—2.5 AC **17 Claims**

1. A process for preparing a polyurethane foam from a reaction mixture which comprises an organic polyisocyanate, a polyol, a foaming agent and a catalytic proportion of an amino acetal catalyst selected from the group consisting of:

1,1-bis(2-dimethylaminoethoxy)ethane,

bis(2-dimethylaminoethoxy)methane,

1,1-bis(2-dimethylaminoethoxy)propane, and

1,1,2,2-tetrakis(2-dimethylaminoethoxy)ethane.

4,048,108

OLIGOMERIZATION PROCESS AND CATALYST THEREFOR

Ji-Yong Ryu, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1975, Ser. No. 645,116
Int. Cl.² B01J *27/12*
U.S. Cl. 252—442 **8 Claims**

1. A catalyst preparation method which comprises heating a metal oxide which possesses surface hydroxyl groups with hydrogen or nitrogen at a temperature of from about 350° to about 550° C., impregnating the thus heated metal oxide with a solution of titanium tetrafluoride, cold rolling the impregnated oxide for a time period of from about 0.5 to about 4 hours, then steam drying at about 100° C. and further drying at about 200°-600° C. in an inert atmosphere.

4,048,109

OLIGOMERIZATION PROCESS AND CATALYSTS THEREFOR

Ji-Yong Ryu, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1975, Ser. No. 645,118
Int. Cl.² B01J *27/10*
U.S. Cl. 252—442 **10 Claims**

1. A catalyst preparation method which comprises heating a metal oxide having surface hydroxyl groups at a temperature in the range from about 400° to about 600° C., thereafter contacting the metal oxide with titanium tetrachloride vapor in a series of steps at progressively higher temperatures within the range of from about 50° to about 600° C. to deposit titanium tetrachloride on the metal oxide, and then heating the impregnated metal oxide in contact wth hydrogen gas at a temperature in excess of 300° C. up to about 700° C. to reduce the titanium to a valence state of less than +4.

4,048,110

RHENIUM CATALYST COMPOSITION

Thomas H. Vanderspurt, Gillette, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed May 12, 1976, Ser. No. 685,596
Int. Cl.² B01J *27/20, 31/12*
U.S. Cl. 252—443 **10 Claims**

1. A rhenium containing catalyst composition prepared by thermally decomposing a rhenium-containing compound having the initial structure selected from at least one member of the group consisting of $Re_2(CO)_{10}$, $[\pi\text{-}C_5H_5(CO)_3]$, $\pi\text{-}C_5H_5Re(CO)_3$, $\pi\text{-}(C_5H_5)_2ReH$, $C_{10}H_{11}Re(CO)_2$ and $ReR(CO)_5$ wherein R is a radical selected from the group consisting of phenyl, methyl and perfluropropyl, to an extent sufficient to provide a pluraltiy of coordination vacancies on the surface thereeof which are capable of inducing the selective conversion of alpha, beta-ethylenically unsaturated aldehydes, to alpha, beta-ethylenically unsaturated alcohols which thermal decompositions is achieved by

a. adsorbing said rhenium-containing compounds on the surface of a catalyst support, having a plurality of pores with an average pore diameter of at least 40 A,

b. heating the catalyst support having the rhenium-containing compounds adsorbed thereon at a temperature of about 125° C to 325° C in the presence of a hydrogen-containing gas while maintaining a positive pressure.

4. The rhenium catalyst composition of claim 1 wherein the rhenium-containing compound which is thermally decomposed is $RE_2(CO)_{10}$.

4,048,111

METHOD FOR MANUFACTURING AN ADSORBENT USEFUL FOR OLEFIN SEPARATION

Donald H. Rosback, Elmhurst, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 586,446, June 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 317,861, Dec. 12, 1972, Pat. No. 3,929,669. This application June 7, 1976, Ser. No. 693,656
The portion of the term of this patent subsequent to Dec. 30, 1992, has been disclaimed.
Int. Cl.² B01J *29/06*
U.S. Cl. 252—455 Z **8 Claims**

1. A method for the production of improved adsorbent particles having increased capacity for olefins and decreased catalytic activity from a precursor mass comprising sodium Y zeolite having a Na_2O/Al_2O_3 ratio less than about 0.7 and amorphous material selected from the group consisting of silica, alumina and slica-alumina mixtures and silica-alumina compounds which method comprises the steps of:

a. contacting said precursor mass with an aqueous sodium hydroxide solution at ion exchange conditions to increase the sodium cation content to a Na_2O/Al_2O_3 ratio of greater than about 0.7 and to remove from about 1 to about 15 wt. % silica and alumina from the precursor mass;

b. washing said mass with water to remove therefrom excess sodium hydroxide; and,

c. at least partially dehydrating said mass at dehydrating conditions.

4,048,112

CATALYST FOR SELECTIVE REDUCTION OF NITROGEN OXIDES

Kunichi Matsushita, Kawasaki; Hikaru Sakurada, Yokohama; Kazuhiko Onuma, and Shinichi Fujii, both of Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 504,824, Sept. 10, 1974, abandoned. This application May 12, 1976, Ser. No. 685,920
Claims priority, application Japan, Sept. 10, 1973, 48-101975; Oct. 9, 1973, 48-113620; Oct. 11, 1973, 48-114134; Oct. 15, 1973, 48-115630
Int. Cl.² B01J *21/06, 23/22*
U.S. Cl. 252—461 **3 Claims**

1. A catalyst for the selective reduction of nitrogen oxides in exhaust gases in the presence of ammonia, which consists of: vanadium oxide supported on a carrier of the anatase form of titanium oxide.

4,048,113

CATALYTIC COMBUSTION MASS

Roger Paul Pierre Risse, Caluire, France, assignor to Societe Lyonnaise des Applications Catalytiques S.A., Rillieux, La Pape, France

Filed Oct. 21, 1975, Ser. No. 624,469
Claims priority, application France, Oct. 21, 1974, 74.40568
Int. Cl.² B01J *21/04, 23/10, 23/26, 23/42*
U.S. Cl. 252—462 **6 Claims**

1. A contact mass for heterogeneous catalysts which comprises:

a sheet having a thickness of 5 to 20 mm of alumina fibers of a mean diameter of the order of 3 microns with a specific surface area of about 120 to 150 m^2/g and having a decrease in specific surface area of only 11 to 15% upon heating to 700° C

a coating of platinum catalyst on said fibers;

a layer of mineral wool in contact with said sheet and capable of withstanding a surface temperature of at least 500° C.

4,048,114
METHOD OF MAKING COPPER CATALYST ON A SUPPORT

Kenneth Worden Saunders, Owen Sound, Canada, assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 26, 1976, Ser. No. 735,486
Int. Cl.² B01J *21/04, 23/72*
U.S. Cl. 252—463 **8 Claims**

1. In the method of catalyst making which comprises imbibing a catalyst support with aqueous solution of cuprous salt, evaporating the solvent and reducing the residual cuprous salt to elemental copper, the improvement wherein the solvent for the cuprous salt comprises both ammonium carbonate and ammonium hydroxide in combination in aqueous solution and the cuprous salt concentration in the solution is greater than the saturation concentration of the same cuprous salt in water alone or in a solution with either of the ammonium hydroxide or ammonium carbonate cosolvents used alone.

4,048,115
HYDRODESULFURIZATION CATALYST AND METHOD OF PREPARATION

Mark J. O'Hara, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed June 18, 1976, Ser. No. 697,800
Int. Cl.² B01J *21/04, 23/64, 23/84*
U.S. Cl. 252—465 **2 Claims**

1. A method of preparing a catalyst comprising an inorganic oxide carrier material, from about 0.1 to about 20% by weight of a Group VIB metal component and from about 0.1 to about 10% by weight of a Group VIII metal component, calculated as the elemental metals, which method comprises the steps of:
   a. extruding said carrier material in admixture with a salt of a Group VIII metal in an amount sufficient to supply at least 10% but not all of said Group VIII metal component;
   b. drying the resultant extrudate;
   c. calcining said dried extrudate at 700°–1200° F;
   d. impregnating the calcined extrudate with Group VIB and Group VIII metal salts in sufficient amount to supply the remainder of said Group VIII metal component and all of said Group VIB metal component;
   e. drying the thus impregnated extrudate, and
   f. calcining the said impregnated extrudate at 800°–1400° F.

4,048,116
CATALYST FOR THE HYDROGENATION OF ACETYLENE ALCOHOLS

Dieter Voges, Mannheim; Karl Baer, Weinheim; Juergen Boudler, Duerkheim; Siegfried Winderl, Heidelberg-Wieblingen, and Herwig Hoffmann, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed July 19, 1976, Ser. No. 706,471
Claims priority, application Germany, Aug. 14, 1975, 2536273
Int. Cl.² B01J *23/72, 23/84, 23/88*
U.S. Cl. 252—470 **4 Claims**

1. An essentially unsupported nickel catalyst which comprises nickel as the main ingredient, from about 30 to 40% by weight of copper, based on nickel, and from about 1 to 10% by weight of a mixture of manganese and molybdenum oxides, based on the total weight of the catalyst.

4,048,117
VACUUM SWITCH CONTACT MATERIALS

Werner S. Emmerich, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

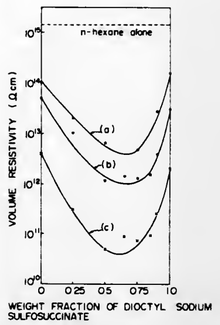
Filed Oct. 29, 1974, Ser. No. 518,908
Int. Cl.² H01B *1/02, 1/06*
U.S. Cl. 252—513 **8 Claims**

1. A contact material consisting essentially of a refractory material matrix which comprises at least 50% by weight of the contact material, said refractory material matrix having a melting point in excess of 1250° C and a boiling point of less than 3500° C, from about 0.3% to about 2.0% of an element displaying antiwelding characteristics in a vacuum environment and which has a solubility of less than 1.5% at the melting point temperature of the matrix material and the balance essentially being a metal having a high electrical and thermal conductivity.

4,048,118
ANTISTATIC ORGANIC LIQUID COMPOSITION

Yukinori Suzaka, and Shigeru Saeda, both of Oita, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed July 18, 1975, Ser. No. 597,162
Claims priority, application Japan, Aug. 27, 1974, 49-97522
Int. Cl.² H01B *1/06;* C10L *1/26;* C09K *3/16*
U.S. Cl. 252—518 **10 Claims**



1. A composition with increased antistatic properties, consisting essentially of
   A. an organic liquid of low conductivity having a volume resistivity greater than 1×10^{10} ohm.cm,
   B. at least one alkali metal salt of an organic acid selected from the group consisting of organic carboxylic acids, organic sulfonic acids, partial alkyl esters or organic polycarboxylic acids and alkyl esters of organic sulfocarboxylic acids, the acids containing 1 to 30 carbon atoms per molecule, and the alkyl group in the alkyl esters having 1 to 22 carbon atoms, and
   C. a polyalkyleneimine salt of phytic acid, the salt being selected from the group consisting of unsubstituted and substituted salts, the substituent being selected from the group consisting of hexyl, octyl, lauryl, stearyl, and oleyl radicals, the total amount of components (B) and (C) being 0.001 to 1000 mg per liter of component (A).

4,048,119
HEATING ELEMENT COMPOSITION AND METHOD FOR PREPARING TUBE FILLINGS OF HIGH ELECTRICAL RESISTANCE FROM FUSED MAGNESIUM OXIDE FOR TUBULAR ELECTRIC HEATING ELEMENTS

Gerd-Edzard Bockstiegel, Troisdorf-Sieglar; Manfred Neidhardt, Siegburg, and Gerhard Rehfeld, Aachen, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed June 1, 1976, Ser. No. 691,956
Claims priority, application Germany, June 7, 1975, 2525441
Int. Cl.² H01B *1/08*
U.S. Cl. 252—521 **16 Claims**

1. In an electrical heating element composition comprising crystals of a fused magnesium oxide, the improvement for reducing electrical conductivity of said composition which comprises 0.05 to 5% by weight, based on the amount of said fused magnesium oxide, of a granular magnesium additive composition having a mineralogical composition within the $MgO—SiO_2—Al_2O_3$ system, said additive composition consisting essentially of amorphous phases and micro- to cryptocrystalline phases, the crystal sizes of the crystalline portions not exceeding 10 microns, said additive having excellent lubricating properties in respect of said magnesium oxide crystals and reacting therewith at 800° to 1050° C with active conductivity centers at the surface of one or more adjacent magnesium oxide crystals.

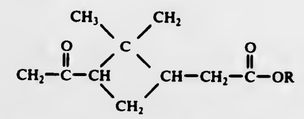
4,048,120
METHOD OF IMPROVING, ENHANCING OR MODIFYING PERFUME USING CYCLOBUTANE DERIVATIVES

Valentin Rautenstrauch, Grand-Lancy, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

Filed May 26, 1976, Ser. No. 690,359
Claims priority, application Switzerland, June 6, 1975, 7355/75
Int. Cl.² C11B *9/00*
U.S. Cl. 252—522 **1 Claim**

1. A method for improving, enhancing or modifying the organoleptic properties of perfumes which comprises adding thereto a small but effective amount of at least one compound having the formula

(I)



wherein the symbol R represents a linear or branched alkyl radical containing from 1 to 6 carbon atoms.

4,048,121
LOW TEMPERATURE METAL CLEANING COMPOSITION

Edward H. Chang, Burnsville, Minn., assignor to Fremont Industries, Inc., Shakopee, Minn.

Filed Jan. 24, 1977, Ser. No. 761,582
Int. Cl.² C11D *1/825, 3/43;* C23G *1/14, 5/02*
U.S. Cl. 252—527 **3 Claims**

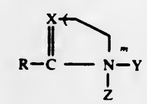
1. Metal cleaning composition comprising a formulation for preparing aqueous metal cleaning and polishing baths, with the formulation including:
   a. an alkaline builder which consists of sodium metasilicate together with an alkaline ingredient selected from the group consisting of sodium hydroxide, sodium carbonate, and mixtures thereof, with said alkaline builder being present in the formulation in an amount equivalent to between about 55 percent and 65 percent by weight of said formulation;
   b. sodium gluconate in an amount equivalent to between about 5 percent and 15 percent by weight of said formulation;
   c. the tetrasodium salt of ethylenediaminetetraacetic acid (dihydrate) in an amount equivalent to between about 1.5 percent and 5 percent by weight of said formulation;
   d. kerosine, a distilled hydrocarbon having a boiling point of between about 150° C. and 300° C. in an amount equivalent to between about 1.5 percent and 3 percent by weight of said formulation; and
   e. a biodegradable wetting agent system consisting of a mixture of first and second linear primary alcohol polyethers and a linear alcohol alkoxylate wherein said first linear primary alcohol polyether has a cloud point of about 40° C. said second linear primary alcohol polyether has a cloud point of about 26° C., and said linear alcohol alkoxylate has a cloud point of about 20° C., and wherein the weight ratios of said first linear primary alcohol polyether to said second linear primary alcohol polyether to said linear alcohol alkoxylate ranges from between about 1.5–6.0:1.5–3.5:1.0–2.0.

4,048,122
CLEANING AGENTS FOR CONTACT LENSES

Murray J. Sibley, Berkeley; Gordon H. K. Yung, Sunnyvale, and Petronio D. Urrea, Pleasanton, all of Calif., assignors to Barnes-Hind Pharmaceuticals, Inc., Sunnyvale, Calif.

Filed Jan. 23, 1976, Ser. No. 651,744
Int. Cl.² C11D *1/38, 3/20, 3/26, 3/37*
U.S. Cl. 252—541 **9 Claims**

1. An aqueous composition for the cleaning of soft and silicone contact lenses which comprises:
   a. a water soluble polyalkyleneoxy modified dimethysilicone resin in an amount of about 0.5 to 2 weight percent
   b. at least one fatty acid amide or nitrogen analog thereof of the formula



wherein:
   R is an aliphatic group of from 9 to 13 carbon atoms having a total unsaturation of from 0 to 1 site of olefinic unsaturation;
   X is oxygen or nitrogen;
   m is 0 when X is oxygen and 1 when X is nitrogen, wherein the nitrogen to which Y and Z are bonded is positive;
   when *m* is O, Y and Z are hydroxyethyl; and
   when *m* is 1, Y is carboxymethyl and Z is 2'-(carboxymethoxy) ethyl-1;
   with the proviso that the carboxy group may be present as the acid or its physiologically acceptable salt;
   and wherein the total amount of fatty acid amide and nitrogen analog thereof present is in the range of about 0.25 to 2.5 weight percent, and wherein the remainder of the composition is water.

4,048,123
ABRADANT SKIN CLEANSER

Jack Hramchenko, Menlo Park, and Murray J. Sibley, Berkeley, both of Calif., assignors to Barnes-Hind Pharmaceuticals, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 389,297, Aug. 17, 1973, Pat. No. 3,944,506. This application July 3, 1974, Ser. No. 485,397
Int. Cl.² A61K *7/50;* C11D *3/12, 3/22, 17/08*
U.S. Cl. 252—545 **2 Claims**

1. An abradant skin cleansing cream composition having from 35 to 60 weight percent of sodium citrate particles of an average particle size in the range of about 125 to 750μ and from 40 to 65 weight percent of a cream base composition comprising from about 10 to 50 weight percent of a sodium taurate anionic foaming agent; from about 3 to 12 weight percent of a polyol fatty acid ester nonionic surfactant; from about 40 to 60 weight percent water; and from about 0.05 to 8 weight percent of the sodium salt of laurylsulfoacetate.

2. An abradant skin cleansing cream composition having from 35 to 60 weight percent of sucrose particles of an average particle size in the range of about 125 to 750μ from 40 to 65 weight percent of a cream base composition comprising from about 10 to 50 weight percent of a sodium taurate anionic foaming agent; from about 3 to 12 weight percent of a polyol fatty acid ester nonionic surfactant; from about 40 to 60 weight percent water; and from about 0.05 to 8 weight percent of the sodium salt of laurylsulfoacetate.

4,048,124

PRESSURE SENSITIVE ADHESIVE

Atsuo Ishikawa, Kamakura; Hidemi Tsubaki, Kawasaki; Hitoshi Takahata; Riso Iwata, both of Kamakura, and Yonesaku Shinohara, Toyama, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Feb. 10, 1976, Ser. No. 656,978

Claims priority, application Japan, Feb. 13, 1975, 50-18341

Int. Cl.[2] C08L *7/00, 9/00, 9/06*

U.S. Cl. 260—5 **10 Claims**

1. A pressure sensitive adhesive composition comprising (A) 100 parts by weight of a conjugated diene rubber selected from the group consisting of natural rubber and synthetic rubber having a Mooney viscosity (ML_{1+4}/100° C) of at least 30 and containing at least 50% by weight of a conjugated diolefin unit in the polymer chain, and (B) 30 to 250 parts by weight of a hydrocarbon resin having a softening point of 60° C to 140° C and consisting essentially of (a) 45 to 85% by weight of a unit derived from 1,3-pentadiene, (b) 10 to 45% by weight of a unit derived from α-methylstyrene, (c) 3 to 20% by weight of a unit derived from cyclopentene, (d) 0 to 20% by weight of a unit derived from 1,3-butadiene, and (e) 0 to 5% by weight of a unit derived from copolymerizable monomer selected from isoprene, cyclopentadiene and dicyclopentadiene.

4,048,125

ANTI-MIGRATORY ADDITIVE FOR EMULSIFIED PHENOLIC RESIN SYSTEMS CONTAINING A PROTEINACEOUS COLLOID

Woodrow Hayes Ingram, II, Hampden, Mass., assignor to Monsanto Company, St. Louis, Mich.

Division of Ser. No. 323,680, Jan. 15, 1973, Pat. No. 3,932,333, which is a continuation-in-part of Ser. No. 142,905, May 13, 1971, Pat. No. 3,719,616, which is a continuation-in-part of Ser. No. 8,679, Feb. 4, 1970, abandoned. This application Dec. 1, 1975, Ser. No. 636,476

The portion of the term of this patent subsequent to May 30, 1989, has been disclaimed.

Int. Cl.[2] C08L *89/00, 89/02*

U.S. Cl. 260—7 **8 Claims**

1. An emulsified liquid phenolic resin system containing spherules of phenolic resin dispersed in aqueous medium, at least about 80 percent of the spherules ranging in size from about 0.01 to 0.8 microns, and comprising:

A. a quantity of solids ranging from about 5 to 45 parts by weight, comprising the phenolic resin, a water soluble dissolved proteinaceous protective colloid in basic form, and a water soluble dissolved polyacrylate salt,

B. a quantity of organic liquid ranging from about 0 to 20 parts by weight, and

C. a quantity of water ranging from 35 to 95 parts by weight; wherein:

a. the phenolic resin is characterized by:

1. having a water dilutability of from 15 percent to 2000 percent based on the resin solids,

2. having a formaldehyde to phenol combined mole ratio of from about 0.85 to 3.0, and

3. having a viscosity in methanol solution at 60 weight percent solids concentration of not greater than about 10,000 centipoises;

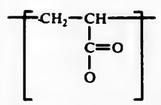
b. the polyacrylate salt is characterized by:

1. having its cations selected from the group consisting of alkali metals and ammonium,

2. having a molecular weight of from about 100,000 to 700,000,

3. having a pH of from about 8 to 10 when in a 13 weight percent aqueous solution, and

4. containing at least about 100 units per molecule of the structure:



; and

c. the ratio of phenolic resin to proteinaceous colloid is in the range of 99:1 and 88:12, the ratio of phenolic resin to polyacrylate salt is in the range of 98.6:0.4 and 70.4:20, and the solids comprise between 0.04 and 20 parts by weight of polyacrylate salt per 100 parts of solids.

4,048,126

PROCESS FOR PRODUCING CARBOHYDRATE-PHENOL CONDENSATION RESINS

John P. Gibbons, Western Springs, and Lawrence Wondolowski, Downers Grove, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed July 22, 1976, Ser. No. 707,598

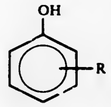
Int. Cl.[2] C08L *3/02*

U.S. Cl. 260—17.2 **13 Claims**

1. A process for producing a carbohydrate-phenolic resin comprising reacting

1. dextrose or a carbohydrate which hydrolyzes to form dextrose, and

2. a phenolic compound having the formula



wherein R is selected from the group consisting of C_1 to C_3 alkyl, C_1 to C_3 alkoxy, halogen, hydroxy and hydrogen, in the presence of a metal salt Lewis acid catalyst to form a solid, fusible resin, and separating the resin from the reaction mixture.

4,048,127

CARBOHYDRATE-BASED CONDENSATION RESIN

John P. Gibbons, Western Springs, and Lawrence Wondolowski, Downers Grove, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed July 22, 1976, Ser. No. 707,600

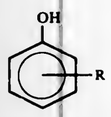
Int. Cl.[2] C08L *3/02*

U.S. Cl. 260—17.2 **23 Claims**

1. A process for producing a carbohydrate-phenolic resin comprising reacting in the presence of an acid catalyst

1. an aldose saccharide;

2. a phenolic compound having the formula



wherein R is selected from the group consisting of C_1 to C_3 alkyl, C_1 to C_3 alkoxy, halogen, hydroxy and hydrogen; and

3. urea;

to form a solid, fusible resin, and separating the resin from the reaction mixture.

4,048,128

THERMALLY STABILIZED SEGMENTED COPOLYESTER ADHESIVE

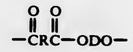
Ernest Francis Eastman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 443,984, Feb. 20, 1974, abandoned. This application Nov. 21, 1975, Ser. No. 634,064

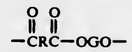
Int. Cl.[2] C08K *3/22;* **C08L** *67/00, 91/00*

U.S. Cl. 260—22 R **66 Claims**

1. A thermally stabilized thermoplastic segmented copolyester consisting essentially of a multiplicity of recurring short chain ester units and long chain ester units joined through ester linkages, said short chain ester units amounting to 15 to 75 percent by weight of said copolyester and being of the formula

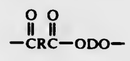


and said long chain ester units amounting to 25 to 85 percent by weight of said copolyester and being of the formula

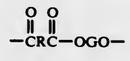


wherein R is the divalent radical remaining after removal of the carboxyl groups from a dicarboxylic acid having a molecular weight of less than 350, D is the divalent radical remaining after removal of the hydroxyl groups from organic diol having a molecular weight of less than 250, and G is the divalent radical remaining after removal of the terminal hydroxyl groups from long chain glycol having an average molecular weight of 350 to 6000, said copolyester having a melt index of less than 150, a melting point of at least 90° C., an inherent viscosity in the range of 1.0 to 1.7 and an acid number not greater than 3, stabilized with 0.05 to 3.0 percent by weight, based on the weight of copolyester, of an alkaline earth oxide stabilizer.

22. A thermally stabilized thermoplastic hot melt adhesive composition in the molten state which comprises, based on the total thermoplastic components, (A) 1 to 99 percent by weight of thermoplastic segmented copolyester consisting essentially of a multiplicity of recurring short chain ester units and long chain ester units joined through ester linkages, said short chain ester units amounting to 15 to 75 percent by weight of said copolyester and being of the formula



and said long chain ester units amounting to 25 to 85 percent by weight of said copolyester and being of the formula



wherein R is the divalent radical remaining after removal of the carboxyl groups from a dicarboxylic acid having a molecular weight of less than 350, D is the divalent radical remaining after removal of the hydroxyl groups from organic diol having a molecular weight of less than 250, and G is the divalent radical remaining after removal of the terminal hydroxyl groups from long chain glycol having an average molecular weight of 350 to 6000, said copolyester having a melt index of less than 150, a melting point of at least 90° C., an inherent viscosity in the range of 1.0 to 1.7, and an acid number of less than 3; (B) 1 to 99 percent by weight of low molecular weight thermoplastic resin which forms compatible mixtures with the segmented copolyester, is thermally stable at 150° C., and has a melt viscosity of less than 10,000 centipoises at 200° C.; stabilized against substantial loss in viscosity in said molten state with (C) 0.1 to 4.0 percent by weight, based on the weight of copolyester and resin, of an alkaline earth oxide.

4,048,129

PREPARING THERMO-PLASTIC OR ELASTOMERIC MATERIALS FOR CROSS-LINKING OF GRAFTED SILANE

Hermann Uwe Voigt, Langenhagen, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Sept. 8, 1975, Ser. No. 611,519

Claims priority, application Germany, Sept. 19, 1974, 2444829

Int. Cl.[2] C08F *8/12, 8/42, 8/00, 8/06*

U.S. Cl. 260—23 H **17 Claims**

1. In a method cross-linking thermo-plastic or elastomeric material in the presence of moisture, the material being prepared by grafting a silane compound, the improvement comprising the step of adding to and mixing with the material, compounds which form water by chemical reaction, the adding being carried out prior to grafting to obtain cross-linking of grafted silane through the water as formed in situ by the reaction and throughout the material.

4,048,130

PROCESS FOR THE PRODUCTION OF SELF-CROSS-LINKING LACQUERS

Marcel Brunold; Klaus Hering; Paul Wicht; Christian Voulanthen, all of Fribourg; Jurg Kislig, Ostermundigen, and Theodor Volker, Fribourg, all of Switzerland, assignors to Lonza Ltd., Gampel, Valais, Switzerland

Filed Mar. 10, 1975, Ser. No. 557,061

Claims priority, application Switzerland, Mar. 8, 1975, 3265/75

Int. Cl.[2] C08L *35/02*

U.S. Cl. 260—29.6 NR **34 Claims**

1. The process for preparing a lacquer utilizing an aqueous dispersion, the lacquer being pigmented or non-pigmented, being self-cross linking upon heat treatment and containing a binder consisting essentially of the copolymer obtained from the copolymerization of the following monomers:

a. 30 to 70 parts by weight, based on the total weight of the binder, of at least one monomer whose homopolymer has a theoretical glass temperature of less than 10° C.,

b. 30 to 70 parts by weight, based on the total weight of the binder, of at least one monomer whose homopolymer has a theoretical glass temperature of more than 30° C.,

c. 0.5 to 5 parts by weight, based on the total weight of the binder, of at least one polymerizable acid or anhydride thereof or a compound thereof which is an amide, halide, nitrile or semiester thereof, said polymerizable acid being an olefinic acid having 3 to 7 or more carbon atoms, an unsaturated dibasic acid having 4 to 8 or more carbon atoms,

d. 2 to 35 parts by weight, based on the total weight of the binder, of at least one reactive monomer, said reactive monomer being a monomer having at least one hydroxyl group and which is the reaction product of a dihydric alcohol having 1 to 8 carbon atoms or of a trihydric alcohol having 1 to 8 carbon atoms and an olefinic acid having 3 to 8 carbon atoms, a monomer having at least one hydroxyl group and which is the ester of an unsaturated dibasic acid having 4 to 8 carbon atoms in the acid group, a chlorohydroxy ester of an unsaturated acid, a monomer having a functional amide group or groups, a monomer having a methylolized amide group, n-butoxymethyleneacrylic amide, a monomer with a functional allyl grouping or groups or a monomer having a functional aziridinyl grouping or groups,

e. 0.5 to 35 parts by weight, based on the total weight of the binder, of at least one alkali metal or ammonium salt of a polymerizable sulfonic acid compound, which comprises conducting the polymerization in an aqueous dispersion in

a reaction vessel at a preselected temperature between 15° and 30° C. and at a starting pH of 3 to 4 in the presence of a redox system consisting of 0.005 to 0.5 percent by weight, based on the total weight of the monomers, of at least one alkali metal and/or ammonium persulfate, 0.001 to 0.5 percent by weight ascorbic acid, based upon the total weight of the monomers, and 10 to 30 p.p.m., of at least one iron (II)-salt, no more than 30 percent of the monomers and the majority of the persulfate being inserted into the reaction vessel before the polymerization step itself starts, after the polymerization step itself starts, dosing in the remaining amount of monomers concurrently and parallel with the iron (II)-salt and the ascorbic acid in such a manner that the preselected polymerization temperature remains almost constant.

4,048,131

POLYOXYETHYLENE ALKYL ETHER ADDITIVES IN IMPACT RESISTANT COMPOSITIONS OF POLYPROPYLENE

Robert G. Keske, Naperville; Wassily W. Poppe, Lombard, and Ivor R. Fielding, Naperville, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

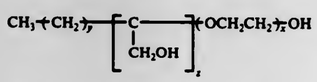
Filed July 25, 1975, Ser. No. 599,086
Int. Cl.² C08K *5/06*
U.S. Cl. 260—33.2 R **9 Claims**

1. An impact and flow modified polypropylene composition comprising:

a. a polypropylene having a flow rate, determined according to ASTM D1238 Condition L, in the range of 0.2 to 25 grams/10 minutes; and

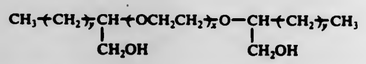
b. a polyoxyethylene alkyl ether derivative, in an amount effective to increase both impact resistance at room temperature and flow rate of said composition, selected from the group consisting of:

i. a compound defined by a first formula:



where in said first formula *x*, *y*, and *z* are selected from the group consisting of: (1) *x* which is in the range 3–10, *y* which is in the range 12–15, and *z* which is 1; and (2) *x* which is in the range 5–12, *y* which is in the range 11–13, and *z* which is 0; and

ii. a compound defined by a second formula:



where in said second formula the *x* and each *y* are individually selected from the group consisting of:

1. *x* is in the range 7–11, and *y* which is in the range 12–15; and
2. *x* which is in the range 12–14, and *y* which is in the range 8–11.

4,048,132

PRINTING INK COMPOSITION

Shozo Tsuchiya, Kawasaki; Hideo Hayashi, and Akio Oshima, both of Yokohama, all of Japan, assignors to Nippon Oil Company Ltd., Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 710,659
Claims priority, application Japan, Aug. 5, 1975, 50-94694
Int. Cl.² C08F *232/06, 232/08;* **C08K** *5/01*
U.S. Cl. 260—33.6 UA **12 Claims**

1. Printing ink composition characterized by containing as a vehicle a resin having a softening point of 100° C. or more and an acid value of 5 to 50, said resin being obtained by reacting the following three components A, B and C, i.e.,

A Component:
at least one compound selected from the group consisting of cyclopentadiene, dicyclopentadiene and their C_1–C_6 alkyl-substituted derivatives;

B Component:
at least one α,β-unsaturated monocarboxylic acid selected from the group consisting of acrylic acid and methacrylic acid;

C Component:
at least one alkyl ester of said α,β-unsaturated monocarboxylic acid as the B component with the proviso that the number of carbon atoms of said alkyl group is from 1 to 22;

in proportions of such amounts as to satisfy the following formulae (1) and (2),

$$0.05 \leqq \frac{[B]+[C]}{[A]} \leqq 1.0 \qquad (1)$$

$$1/5 \leqq \frac{[C]}{[B]} \leqq 5 \qquad (2)$$

at a temperature in the range of 150°–350° C. in the absence of a catalyst.

4,048,133

GLASS FIBER-REINFORCED THERMOPLASTIC POLYCARBONATE MOLDING COMPOSITIONS WITH IMPROVED TOUGH-ELASTIC PROPERTIES

Siegfried Adelmann; Dieter Margotte, both of Krefeld, and Josef Merten, Korschenbroich, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 584,553, June 6, 1975, abandoned. This application July 6, 1976, Ser. No. 702,549
Claims priority, application Germany, June 21, 1974, 2429816
Int. Cl.² C08E *63/62;* **C08G** *65/00;* **C08L** *69/00*
U.S. Cl. 260—37 PC **5 Claims**

1. Polycarbonate molding compositions based on high molecular thermoplastic aromatic polycarbonates containing 10–30% by weight of glass fibers (relative to the total weight of polycarbonate + glass fibers) and containing 1–5% by weight of poly-(256-dialkyl-1,4-phenylene oxide) (relative to the weight of glass fibers).

4,048,134

REFRACTORY HEAT-INSULATING MATERIALS

John Henry Courtenay, and Martin Bernard Peter Wardell, both of Birmingham, England, assignors to Foseco Trading A.G., Chur, Switzerland

Filed Feb. 5, 1976, Ser. No. 655,372
Claims priority, application United Kingdom, Feb. 10, 1975, 5636/75
Int. Cl.² C08K *3/22*
U.S. Cl. 260—38 **9 Claims**

1. A refractory heat-insulating composition consisting essentially of, by weight:

1 to 11% fibrous material 4 to 8% synthetic resin binder and 80 to 95% a mixture of particulate magnesia and particulate olivine,

the weight ratio of magnesia: olivine being from 1:10 to 4:1 and the composition containing not more than 4% by weight of cellulosic fibrous material and not more than 7% by weight refractory fibrous material.

4,048,135

POLYESTER MOLDING COMPOSITIONS OF REDUCED FLAMMABILITY

Rolf Wurmb, Heidelberg; Bernd Leutner; Wolfgang Seydl, both of Frankenthal; Hans-Ulrich Schlimper, Speyer, and Hans-Josef Sterzel, Dannstadt-Schauernheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 8, 1976, Ser. No. 665,062
Claims priority, application Germany, Mar. 21, 1975, 2512504
Int. Cl.² C08K *3/40, 3/34, 5/03*
U.S. Cl. 260—40 R **6 Claims**

1. Thermoplastic molding composition composed of

A. a linear saturated polyester, and

B. from 6 to 30% by weight, based on the total weight of the molding composition, of a flameproofing additive of an organic halogen compound and antimony trioxide,

said antimony trioxide having been precipitated onto a support from an aqueous antimony (III) halide solution by the addition of an aqueous solution of a base to increase the pH to from 6 to 8, followed by isolation of the solids from the aqueous phase, said support

3. A molding composition as set forth in claim **1** wherein said composition further contains from 10 to 60% by weight, based on the total weight of the molding composition, of reinforcing fillers.

4,048,136

METALLIC TONE POWDER COATING COMPOSITION

Sadao Kobayashi; Hiroshi Ozawa, and Nobuki Kobayashi, all of Yokohama, Japan, assignors to Mitsui Toatsu Kagaku Kabushiki Kaisha (Mitsui Toatsu Chem., Inc.), Tokyo, Japan

Continuation of Ser. No. 485,637, July 3, 1974, abandoned. This application Oct. 10, 1975, Ser. No. 621,518
Claims priority, application Japan, July 7, 1973, 48-76784
Int. Cl.² C08K *9/04, 9/10*
U.S. Cl. 260—42.14 **8 Claims**

1. A powdery metallic powder-acrylic resin coating composition comprising a mixture of (a) solid powder particles of vinyl copolymer having a glass transition point of at least 20° C and wherein an acrylic ester and a methacrylic ester monomer together constituting at least 30% by weight of the total monomers of said copolymer, and (b) for each about 100 parts by weight of said copolymer particles about 0.1–50 parts by weight of solid particles of a polymer-encapsulated metal powder obtained by activating a metallic powder by treatment with (1) an organic or mineral acid followed by neutralization of the thus-treated powder with an alkali, or (2) an aqueous solution of phosphoric acid; and subjecting the activated metallic powder to an in situ polymerization in an aqueous medium of at least one vinyl monomer in the presence of a radical polymerization initiator, the amount of such vinyl monomer being such as to form about 0.2 – 20 parts by weight of said encapsulating polymer per 100 parts of said metallic powder.

4,048,137

ELASTOMERIC MATERIALS REINFORCED WITH SMALL DIAMETER GLASS FIBERS

Glenn Alvin Heitmann, Morrison, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 629,200, Nov. 5, 1975, abandoned. This application Aug. 9, 1976, Ser. No. 712,616
Int. Cl.² C08K *7/14*
U.S. Cl. 260—42.15 **13 Claims**

1. A composition of matter comprising an elastomeric matrix of natural or synthetic rubber reinforced with 5 to 150 phr of glass fibers having diameters in the range of 0.5 to 3.8 microns and lengths in the range of 3 to 50 mm.

4,048,138

STABILIZATION OF TALC-FILLED POLYSTYRENE

Christian John Miga, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed July 19, 1976, Ser. No. 706,878
Int. Cl.² C08K *3/34*
U.S. Cl. 260—42.37 **12 Claims**

1. A polystyrene composition filled with at least 20% by weight of talc and stabilized against short-term color degradation, which comprises, in parts by weight:

polystyrene	25 to 80 parts
talc	20 to 75 parts

and 0.5 to 5 parts of a mixture of polyester forming reactants comprising a polybasic organic acid or anhydride and a polyhydric alcohol, each having a melting point in the range of 250° to 550° F, said organic acid or anhydride and said alcohol each being present in said mixture in an amount of from 1 to 2 parts by weight per 3 parts by weight of said mixture.

4,048,139

RENDERING POLYBENZIMIDAZOLE SOLID MATERIALS MORE RESISTANT TO DARKENING UPON EXPOSURE TO LIGHT

Gordon W. Calundann, North Plainfield, and Edward J. Powers, Gillette, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 11, 1975, Ser. No. 549,040
Int. Cl.² C08K *3/22, 3/30, 5/34, 5/36*
U.S. Cl. 260—45.8 N **32 Claims**

1. An improved process for the formation of a polybenzimidazole solid material having an enhanced resistance to undergo the usual color darkening upon exposure to light comprising:

a. forming a solution of polybenzimidazole in a solvent selected from the group consisting essentially of N,N-dimethyacetamide, N,N-dimethylformamide, dimethylsulfoxide, and N-methyl-2-pyrrolidone, with said solution having dispersed therein a minor concentration of finely divided pigment selected from the group consisting essentially of arsenic thioarsenate, copper phthalocyanine, anatase titanium dioxide, and mixtures of the foregoing, and

b. substantially removing said solvent from said polybenzimidazole to form a polybenzimidazole solid material wherein said finely divided pigment is substantially uniformly dispersed therein in a concentration of about 0.1 to 8 percent by weight based upon the weight of the polybenzimidazole.

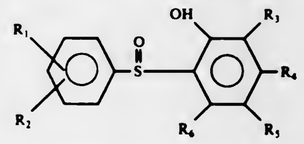
4,048,140

LIGHT RESISTANT POLYOLEFIN COMPOSITIONS

Dwight William Chasar, Northfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 2, 1976, Ser. No. 738,267
Int. Cl.² C08K *5/41*
U.S. Cl. 260—45.95 C **9 Claims**

1. A polyolefin containing a stabilizing amount of a 2-hydroxydiphenyl sulfoxide of the general formula



wherein R_1 is hydrogen, R_2 is a lower alkyl or halogen, R_3 is

hydrogen or a lower alkyl, R_4 is hydrogen or lower alkyl, R_5 is hydrogen or a lower alkyl and R_6 is hydrogen or lower alkyl.

4,048,141

LATENT CATALYSTS FOR PROMOTING REACTION OF EPOXIDES WITH PHENOLS AND/OR CARBOXYLIC ACIDS

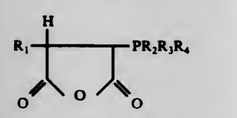
George A. Doorakian, Bedford, Mass.; Dennis L. Schmidt, Houston, Tex., and Martin C. Cornell, III, Sao Paulo, Brazil, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 629,345, Nov. 6, 1975, abandoned, which is a continuation of Ser. No. 417,844, Nov. 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 290,891, Sept. 21, 1972, abandoned. This application Jan. 19, 1976, Ser. No. 650,212

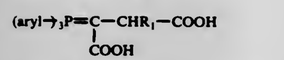
Int. Cl.[2] C08G *30/04*

U.S. Cl. 260—47 EC **20 Claims**

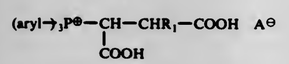
6. A composition comprising (a) an epoxide bearing at least one vicinal epoxy group per molecule; (b) a phenol and (c) a small but catalytic amount of a phosphorus-containing catalyst corresponding to the formula



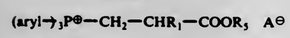
I,



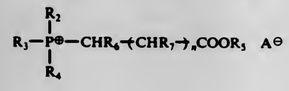
II,



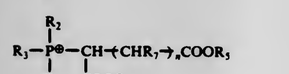
III,



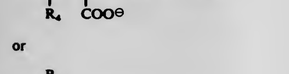
IV,



V,



VI,



or

VII,

or a mixture thereof, wherein:

R_1 is hydrogen or hydrocarbyl,

R_2–R_4 are hydrocarbyl groups, with the proviso that R_2–R_4 are not each aryl in formula VII,

R_5 is hydrogen or alkyl,

R_6 is hydrogen, alkyl, carboxy, or alkoxy carbonyl,

R_7 is hydrogen or hydrocarbyl,

n is from 0 to about 20, and

A^- is a compatible anion.

4,048,142

POLYETHERIMIDES

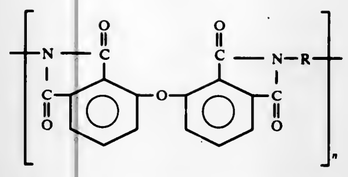
Tohru Takeuchi, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 514,030, Oct. 11, 1974, abandoned. This application Dec. 4, 1975, Ser. No. 637,698

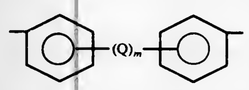
Int. Cl.[2] C08G *73/10*

U.S. Cl. 260—47 CP **5 Claims**

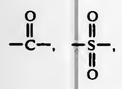
1. Polyetherimides having the formula



where R is a divalent organo radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (b) alkylene radicals, $C_{(2\text{-}8)}$ alkylene terminated polydiorganosiloxane cycloalkylene radicals having from 2-20 carbon atoms, and (c) divalent radicals included by the formula,



where Q is a member selected from the class consisting of —O—,



—S—, $-C_xH_{2x}-$ and x is a whole number from 1 to 5 inclusive, m is 0 or 1 and n is an integer equal to from 2 to 2500 inclusive.

4,048,143

PROCESS FOR CAPPING POLYPHENYLENE OXIDE

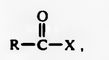
Allan S. Hay, and Dwain M. White, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 441,294, Feb. 11, 1974, abandoned. This application Sept. 15, 1975, Ser. No. 613,072

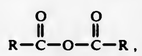
Int. Cl.[2] C08G *65/44, 65/48*

U.S. Cl. 260—47 ET **8 Claims**

1. A process comprising contacting a polyphenylene oxide with a capping agent selected from the class consisting of monoacyl halides of the formula



hydrocarbon monosulfonyl halides of the formula $R—SO_2—X$, anhydrides of monocarboxylic acids of the formula



alkyl halides of the formula R-X, dialkyl sulfates of the formula $R—O—SO_2—O—R$, wherein R is alkyl, cycloalkyl, or mixtures thereof, X is chlorine, bromine, fluorine or iodine, wherein the mole ratio of capping agent to hydroxyl group per polymer unit is within the range of from about 0.5:1 to about 10:1 and wherein said contacting is carried out at a temperature within the range of from about 0° to about 100° C. in the presence of (1) a water soluble base selected from the class consisting of alkali metal and alkaline earth metal hydroxide or carbonate bases, (2) a catalytic phase transfer agent, and optionally, (3) an effective organic phase reducing agent.

4,048,144

PREPARATION OF SOLID POLYMERS FROM AROMATIC PRIMARY DIAMINE AND ACYL HALIDE OF TRIMELLITIC ANHYDRIDE

James R. Stephens, Gary, Ind., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 596,765, Nov. 25, 1966, Pat. No. 3,920,612, which is a continuation-in-part of Ser. No. 252,557, Jan. 21, 1963, abandoned, Ser. No. 336,857, Jan. 10, 1964, abandoned, and Ser. No. 535,367, March 18, 1966, abandoned. This application Aug. 4, 1975, Ser. No. 601,798

The portion of the term of this patent subsequent to Nov. 18, 1992, has been disclaimed.

Int. Cl.[2] C08G *73/14*

U.S. Cl. 260—47 CP **7 Claims**

1. A process for preparing high molecular weight solid polymers having film-forming properties and being soluble in an organic solvent, which process comprises (a) reacting essentially equimolar amounts of a carbocyclic aromatic primary diamine and an acyl halide derivative of trimellitic anhydride which contains at least one acyl halide group and that in the 4-ring position, in said organic solvent, under substantially anhydrous conditions, and for a period of time and at a temperature, below 150° C., controlled to produce a polymer with free carboxyl groups and amide groups available for further reaction, said polymer being soluble in said organic solvent and wherein the reaction produces hydrogen halide, and (b) washing with water said polymer.

4,048,145

PHENOLIC POLYMER PREPARED FROM O-CRESOL

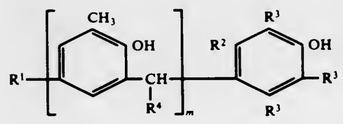
Ernest K. Moss, St. Petersburg, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 509,565, Sept. 27, 1974, Pat. No. 3,953,645, which is a division of Ser. No. 354,636, April 26, 1973, Pat. No. 3,876,620. This application Sept. 17, 1975, Ser. No. 614,086

Int. Cl.[2] C08G *5/08*

U.S. Cl. 260—57 R **7 Claims**

1. An alkylol group containing phenolic polymer of Formula I:



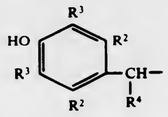
(I)

wherein:

a. R^1 is



hydrogen or a radical of Formula II:



(II)

b. the R^2's are independently selected from the group consisting of lower alkyl, phenyl, benzyl, halo, nitro and hydrogen,

c. The R^3's are independently selected from the group consisting of



hydrogen or a radical of Formula II, wherein at least one of the R^3's is alkylol,

d. the R^4's are independently selected from the group consisting of lower alkyl, hydrogen, phenyl, benzyl, or furyl,

e. m is an integer from 2 to 10 inclusive,

f. the phenolic polymer has a molecular weight between 200 and 2000.

4,048,146

RADIATION SENSITIVE POLYMERS OF OXYGEN-SUBSTITUTED MALEIMIDES AND ELEMENTS CONTAINING SAME

John Charles Wilson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

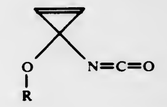
Division of Ser. No. 621,728, Oct. 14, 1975. This application Dec. 20, 1976, Ser. No. 752,229

Int. Cl.[2] C08F *26/06*

U.S. Cl. 260—63 UY **30 Claims**

1. A crosslinkable polymer comprising:

A. from about 1 to 100 mole percent of a polymerized monomer having the formula

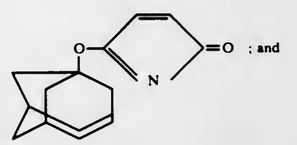


wherein R is a hydrocarbon group having from 2 to 20 carbon atoms; and

B. from 0 to about 99 mole percent of at least one additional polymerized ethylenically unsaturated monomer.

7. A radiation sensitive polymer comprising

A. from about 1 to 100 mole percent of a polymerized monomer having the formula

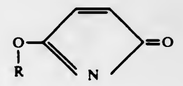


; and

B. from 0 to about 99 mole percent of at least one additional polymerized ethylenically unsaturated monomer.

9. A radiation sensitive element comprising a support having coated thereon at least one radiation sensitive layer comprising a radiation sensitive polymer comprising

A. from about 1 to 100 mole percent of a polymerized monomer having the formula



wherein R is a hydrocarbon group having from 2 to 20 carbon atoms; and

B. from 0 to about 99 mole percent of at least one additional polymerized ethylenically unsaturated monomer.

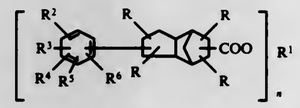
4,048,147

CARBOXYLIC ACID OF CYCLOPENTADIENE DERIVATIVE, SALT THEREOF, OR ESTER THEREOF AND PROCESS FOR PRODUCING THESE COMPOSITIONS

Masatoshi Arakawa; Ryotaro Ohno; Katuhiro Ishikawa; Noboru Yamahara, and Hisashi Matsui, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,630
Claims priority, application Japan, Nov. 30, 1974, 49-136642
Int. Cl.[2] C08G *2/00, 2/18, 10/00*
U.S. Cl. 260—67 UA **34 Claims**

1. A composition represented by the formula,



wherein R is hydrogen or an alkyl group having 1 to 3 carbon atoms, said four R groups being the same or different; R^1 is hydrogen, a mono- to tetra-hydric aliphatic alcohol moiety having 1 to 12 carbon atoms, an alkali or alkaline earth metal, an ammonium group, or an organic amine residue; *n* is an integer of 1 to 4; and R^2, R^3, R^4, R^5 and R^6, which may be the same or different, are independently hydrogen or alkyl groups having 1 to 6 carbon atoms, or R^2 and R^3 may form a ring when taken together.

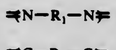
4,048,148

POLYAZOMETHINE FIBERS AND FILMS

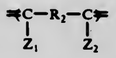
Paul Winthrop Morgan, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 576,236, May 9, 1975, abandoned. This application Mar. 19, 1976, Ser. No. 667,431
Int. Cl.[2] C08G *12/08, 12/00;* **G08G** *2/16, 2/14*
U.S. Cl. 260—72.5 **20 Claims**

1. Fibers or films of (co)polyazomethines consisting essentially of the following recurring structural units


(I)

and


(II)

wherein units I and II are present in substantially equimolar amounts; Z_1 and Z_2, which may be the same or different, are selected from the group of a hydrogen atom or a methyl or ethyl radical; and R_1 and R_2, are radicals selected from the group of (1) single and fused 6-membered carbocyclic ring systems in which one of the ring carbons of an aromatic ring, if present, may be replaced by nitrogen and wherein the chain extending bonds of the ring system, if attached to a single ring, are positioned 1,4- to each other, and if attached to different rings, are in positions parallel and oppositely directed, and (2) multiple ring systems in which the individual rings are joined by a chemical bond or a bridging unit not exceeding fourteen atoms in length and in which the chain extending bonds of each ring are in the 1,4-positions and R_1 may be a chemical bond.

4,048,149

WATER-SOLUBLE SULFONATED POLYESTERS

Jacques Fritz, Champagne au Mont d'Or; Paul Roux, Fontaine sur Saone, and Jean Néel, Lyon, all of France, assignors to Rhone-Poulenc Industries, Decines, France

Continuation-in-part of Ser. No. 371,534, June 19, 1973, abandoned. This application June 10, 1975, Ser. No. 585,679
Claims priority, application France, Jan. 10, 1973, 73.01358
Int. Cl.[2] C08G *63/68, 63/76;* **C07C** *69/80, 69/82*
U.S. Cl. 260—75 S **2 Claims**

1. A water-soluble, sulfonated polyester, comprising the polycondensation product of a mixture of dicarboxylic compounds consisting essentially of:
   a. an aromatic diacid or one of its diesters selected from the group consisting of isophthalic and terephtalic acids and the methyl, ethyl, propyl and butyl diesters thereof, and
   b. an unsaturated aliphatic diacid or anhydride or diester thereof selected from the group consisting of maleic, fumaric, and itaconic acids, the anhydrides thereof, and the methyl, ethyl, propyl and butyl diesters thereof
   the molar ratio of said aliphatic unsaturated diacid to said mixture of dicarboxylic compounds being comprised between 0.1 and 0.5; with
   c. a saturated glycol selected from the group consisting of ethyleneglycol and di-, tri-, tetra-, and penta ethyleneglycol, propyleneglycol and butyleneglycol
   said condensation product being sulfonated by the quantitative addition of sodium bisulfite or metabisulfite onto the unsaturated aliphatic chains thereof.

4,048,150

LEADER OF A CARRIER OF INFORMATION IN THE FORM OF A WEB

Rolf Bergmann, Wiesbaden-Schierstein; Klaus Hoheisel, Wiesbaden-Biebrich; Helmut Schafer, Russelsheim, and Manfred Unger, Schlangenbad, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 15, 1975, Ser. No. 640,774
Claims priority, application Germany, Dec. 16, 1974, 7441800[U]
Int. Cl.[2] G11B *5/78*
U.S. Cl. 260—75 T **3 Claims**

1. A leader of an information carrier web suitable for photoelectric control, comprising a polyester film oriented by biaxial stretching having a greater strength in the machine direction than in the transverse direction and being internally colored with an organic dye which is sufficiently heat-resistant and which has a sufficiently low light absorption said leader having one layer and a transparency of at least 60 percent when exposed to light of a wavelength of 750 nm.

4,048,151

CATIONIC DYES CONTAINING AN OPTIONALLY SUBSTITUTED BICYCLIC OR POLYCYCLIC ARYLOXYALKYL GROUP

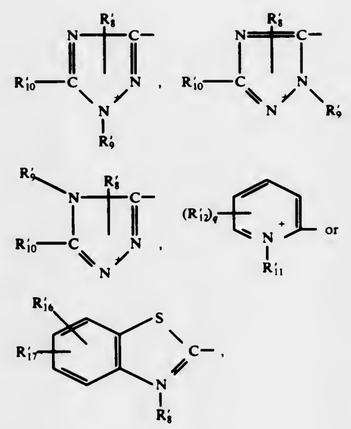
Beat Henzi, Neuallschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed July 30, 1973, Ser. No. 383,781
Claims priority, application Switzerland, July 31, 1972, 11354/72; Feb. 21, 1973, 2523/73
Int. Cl.[2] C09B *1/32, 23/10, 23/12, 29/08*
U.S. Cl. 260—156 **23 Claims**

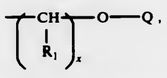
1. A dye of the formula

$$P—N=N—K' \; A^-,$$

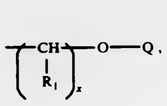
wherein
P is



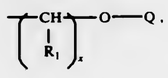
wherein
R'_8 is alkyl of 1 to 4 carbon atoms; alkyl of 1 to 4 carbon atoms substituted by hydroxy, halo, cyano, phenyl or carbamoyl; alkenyl of 2 to 4 carbon atoms; alkenyl of 2 to 4 carbon atoms substituted by hydroxy, halo, cyano, phenyl or carbamoyl; cyclohexyl; cyclohexyl substituted by alkyl of 1 to 4 carbon atoms; or



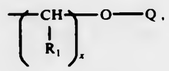
R'_9 is alkyl of 1 to 4 carbon atoms; alkyl of 1 to 4 carbon atoms substituted by hydroxy, halo, cyano, phenyl or carbamoyl; cyclohexyl; cyclohexyl substituted by alkyl of 1 to 4 carbon atoms; phenyl; phenyl substituted by halo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms; or



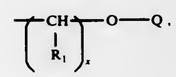
R'_{10} is hydrogen or R'_9,
R'_{11} is alkoxy of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms substituted by hydroxy, halo, cyano, phenyl or carbamoyl; alkyl of 1 to 4 carbon atoms; alkyl of 1 to 4 carbon atoms substituted by hydroxy, halo, cyano, phenyl or carbamoyl; alkenyl of 2 to 4 carbon atoms; alkenyl of 2 to 4 carbon atoms substituted by hydroxy, halo, cyano, phenyl or carbamoyl; or



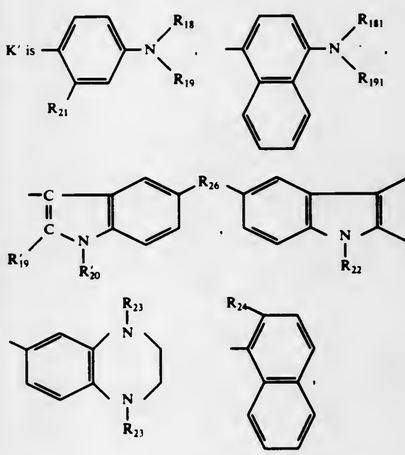
each
R'_{12} is independently phenyl, halo, nitro, cyano, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or



each of
R'_{16} and R'_{17} is independently hydrogen; halo; alkyl of 1 to 4 carbon atoms; alkyl of 1 to 4 carbon atoms substituted by phenyl, hydroxy, carbamoyl, cycloalkyl of 5 or 6 carbon atoms, cyano or halo; alkoxy of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms substituted by phenyl, hydroxy, carbamoyl, cycloalkyl of 5 or 6 carbon atoms, cyano or halo; phenoxy; —CO—Ro; —CO—O—Ro; —CO—NH—Ro; —CO—$N(Ro)_2$; —NH—CO—Ro; —SO_2—Ro; —SO_2—NH—Ro; —SO_2—$N(Ro)_2$; —NH—SO_2—Ro or

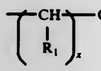


wherein each
Ro is independently alkyl of 1 to 4 carbon atoms or phenyl, or
R'_{16} and R'are on adjacent carbon atoms and taken together are —CH=CH—CH=CH—,
and
q is 0, 1 or 2,



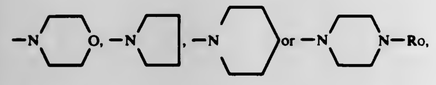
wherein each of
R_{18} and R_{19} is independently hydrogen; phenyl; cyclohexyl; alkyl of 1 to 4 carbon atoms or alkyl of 1 to 4 carbon atoms substituted by alkoxycarbonyl wherein the alkoxy moiety

has 1 to 4 carbon atoms, benzoyloxy, phenoxy, halo, hydroxy, phenyl, cyano, alkoxy of 1 to 4 carbon atoms, alkylcarbonyloxy wherein the alkyl moiety has 1 to 4 carbon atoms, N,N-dialkylamino wherein each alkyl independently has 1 to 4 carbon atoms or



with the proviso that when one of R_{18} and R_{19} is phenyl or cyclohexyl, the other is other than phenyl or cyclohexyl, or

R_{18} and R_{19} taken together and with the nitrogen atom to which they are joined are



wherein

Ro is alkyl of 1 to 4 carbon atoms or phenyl,

R'_{19} is phenyl, alkyl of 1 to 4 carbon atoms or alkyl of 1 to 4 carbon atoms substituted by phenyl,

R'_{20} is hydrogen, phenyl or alkyl of 1 to 4 carbon atoms,

R_{21} is hyrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halo,

R_{22} is alkyl of 1 to 4 carbon atoms,

each

R_{23} is independently alkyl of 1 to 4 carbon atoms,

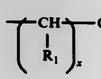
R_{24} is hydroxy, amino or anilino,

R_{25} is hydrogen, alkyl of 1 to 4 carbon atoms or alkyl of 1 to 4 carbon atoms substituted by alkoxy of 1 to 4 carbon atoms,

R_{26} is hydrogen, halo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms,

each of

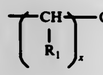
R_{181} and R_{191} is independently hydrogen; phenyl; cyclohexyl; alkyl of 1 to 4 carbon atoms or alkyl of 1 to 4carbon atoms substituted by alkoxycarbonyl wherein the alkoxy moiety has 1 to 4 carbon atoms, benzoyloxy, phenoxy, halo, hydroxy, phenyl, cyano, alkoxy of 1 to 4 carbon atoms, alkylcarboxyloxy wherein the alkyl moiety has 1 to 4 carbon atoms, N,N-dialkylamino wherein each alkyl independently has 1 to 4 carbon atoms or



with the proviso that at least one of R_{181} and R_{191} is hydrogen or alkyl of 1 to 4 carbon atoms, and

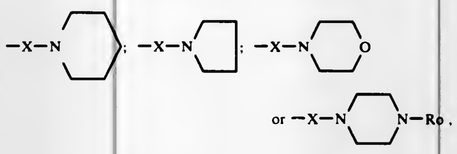
W is =O or =NH, and

A^- is an anion, with the proviso that each molecule contains 1 to 3 groups of the formula



each of which is independently a significance of R'_8, R'_9, R'_{10}, R'_{11}, R'_{12}, R'_{16} or R'_{17} or is attached to R_{18}, R_{19}, R_{181} or R_{191}, wherein each

Q is biphenylyl, dibenzofuranyl, carbazolyl, dibenzothienyl, dibenzothiophendioxydyl, dibenzothiophenmonoxydyl, fluorenyl or fluorenonyl, or a substituted derivative thereof having 1 or 2 substituents, wherein each substituent is independently hydroxy; halo; alkyl of 1 to 4 carbon atoms; alkyl of 1 to 4 carbon atoms substituted by halo, hydroxy, cyano, phenyl or phenoxy; alkoxy of 1 to 4 carbon atoms; alkoxy of 1 to 4 carbon atoms substituted by halo, hydroxy, cyano, phenyl or phenoxy; cycloalkyl of 5 or 6 carbon atoms; cycloalkyl of 5 or 6 carbon atoms substituted by alkyl of 1 to 4 carbon atoms; trifluoromethyl; cyano; nitro; phenoxy; phenylazo; —CO—Ro; —CO—O—Ro; —O—CO—Ro; —CO—NH—Ro; —CO—N(Ro)$_2$; —NH—CO—Ro; —SO_2—Ro, —SO_2—NH—Ro, —SO_2—N(Ro)$_2$; —O—SO_2—N(Ro)$_2$;



wherein each

Ro is independently alkyl of 1 to 4 carbon atoms or phenyl, and

each

X is —CO— or —SO_2—,

each

R_1 is independently hydrogen, phenyl, cycloalkyl of 5 to 6 carbon atoms, alkyl of 1 to 4 carbon atoms or alkyl of 1 to 4 carbon atoms substituted by halo, alkoxy of 1 to 4 carbon atoms or phenoxy, and each

x is 1, 2 or 3,

wherein each halo is independently chloro, bromo or iodo.

4,048,152

MODIFIED FORM OF DISAZO PIGMENT CI 20040

Joachim Ribka, Offenbach am Main; Wolfgang Rieper, Frankfurt am Main, and Siegfried Schwerin, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

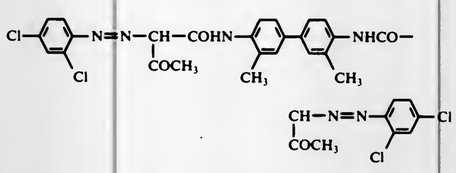
Continuation of Ser. No. 434,037, Jan. 17, 1974, abandoned. This application Nov. 11, 1975, Ser. No. 631,122

Claims priority, application Germany, Jan. 19, 1973, 2302481

Int. Cl.² C09B *43/00*

U.S. Cl. 260—176 **1 Claim**

1. A disazo pigment of the formula



characterized by a specific surface of 10 - 20 m^2/g, a maximum of the grain size distribution of between 500 and 1000 nm with a proportion of these grain sizes in the total distribution of at least 30 % and by a proportion of the grain sizes exceeding 1000 nm of no more than 25 % in the total distribution.

4,048,153

AZO DYES HAVING AN OPTIONALLY SUBSTITUTED 1-AZO-3-NITRO-4-ARYLAMINOPHENYL NUCLEUS

Daniel Van Assche, Binningen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

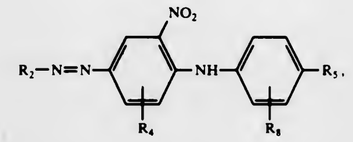
Continuation of Ser. No. 253,411, May 15, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 528,357

Claims priority, application Switzerland, May 17, 1971, 7230/71

Int. Cl.² C09B *29/08, 29/32, 29/36, 31/04*

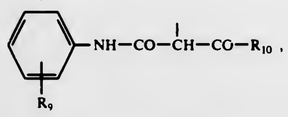
U.S. Cl. 260—193 **25 Claims**

1. A compound of the formula

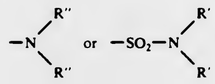


wherein

R_2 is phenyl, substituted phenyl, naphthyl, substituted naphthyl, substituted phenoxyphenyl, anilinophenyl, substituted anilinophenyl, phenylsulfinylphenyl, substituted phenylsulfinylphenyl, substituted phenylsulfonylphenyl, phenylazophenyl, substituted phenylazophenyl or



wherein each substituent of substituted phenyl, substituted naphthyl, substituted phenoxyphenyl, substituted anilinophenyl, substituted phenylsulfinylphenyl, substituted phenylsulfonylphenyl, and substituted phenylazophenyl is independently alkyl of 1 to 12 carbon atoms, alkyl of 1 to 12 carbon atoms substituted by halo, hydroxy, cyano, phenyl or naphthyl, alkoxy of 1 to 4 carbon atoms, sulfoalkoxy of 1 to 4 carbon atoms, phenylsulfonyl, naphthylsulfonyl, phenoxy, naphthyloxy, halo, nitro, alkoxycarbonyl wherein the alkoxy radical has 1 to 4 carbon atoms, sulfo, —$CONH_2$, carboxy, phenyl, naphthyl, cyclohexyl, alkylsulfonyl of 1 to 12 carbon atoms, phenylsulfonyloxy, p-tolylsulfonyloxy, benzoyloxy, trifluoromethyl, trichloromethyl,



wherein

R_9 is hydrogen, halo or alkoxy of 1 to 4 carbon atoms,

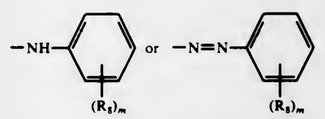
R_{10} is methyl or phenyl,

each R' is independently hydrogen, alkyl of 1 to 4 carbon atoms, phenyl, naphthyl or cyclohexyl, and

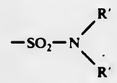
each R'' is independently hydrogen or alkyl of 1 to 12 carbon atoms,

R_4 is hydrogen, alkyl of 1 to 12 carbon atoms, alkoxy of 1 to 4 carbon atoms, halo, carboxy or alkoxycarbonyl wherein the alkoxy radical has 1 to 4 carbon atoms,

R_5 is



each R_8 is independently hydrogen acetamido, alkyl of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms substituted by halo, hydroxy, cyano, phenyl or naphthyl, alkoxy of 1 to 4 carbon atoms, phenyl, naphthyl, sulfo, halo, nitro or



wherein

each R' is independently hydrogen, alkyl of 1 to 4 carbon atoms, phenyl, naphthyl or cyclohexyl, and

m is 0, 1 or 2,

wherein each halo is independently chloro, bromo, fluoro or iodo,

with the proviso that the molecule contains 1 to 2 sulfo groups.

4,048,154

MONOAZO DYESTUFFS DERIVED FROM P-SULFO-HALOPHENYL DIAZO MOIETY AND P-AMINO-O-ALKYL COUPLER MOIETY

Jochen Westphal, Dusseldorf, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

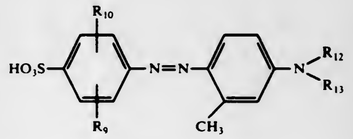
Filed Nov. 18, 1974, Ser. No. 524,989

Claims priority, application Germany, Nov. 20, 1973, 2357934

Int. Cl.² C09B *29/08*; D06P *1/06, 3/06, 3/16*

U.S. Cl. 260—205 **2 Claims**

1. Monoazo dyestuff which in the form of the free acid has the formula



wherein

R_9 is chlorine or bromine;

R_{10} is hydrogen, chlorine, bromine, cyano or trifluoromethyl; and

R_{12} and R_{13} are hydrogen or C_1-C_4-alkyl.

4,048,155

PROCESS FOR PREPARING 7 α-ALKOXYCEPHALOSPORIN DERIVATIVES

Hiroaki Yanagisawa; Akiko Ando; Masami Fukushima, and Hideo Nakao, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

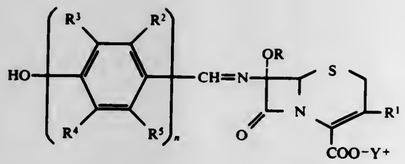
Filed Oct. 30, 1975, Ser. No. 627,111

Claims priority, application Japan, Nov. 15, 1974, 49-131761

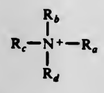
Int. Cl.² C07D *501/18, 501/36*

U.S. Cl. 542—422 **7 Claims**

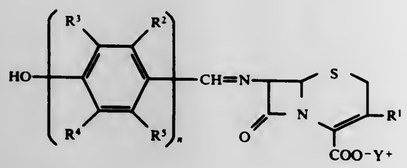
1. A process for the preparation of 7β-benzylideneamino-7α-alkoxy-3-cephem compounds having the formula



wherein R represents an alkyl group having 1–4 carbon atoms, R^1 represents a hydrogen atom, methyl group, cyanomethyl group, an acyloxymethyl group, carbamoyloxymethyl group, an alkoxymethyl group, an alkylthiomethyl group or a heterocyclic thiomethyl group selected from the group consisting of 2-pyridylthiomethyl, 1-methyl-1H-tetrazol-5-ylthiomethyl, 2-(1,3,5-triazolo)thiomethyl, 2-pyrazolothiomethyl, 1-imidazolinylthiomethyl and 5-methyl-1,3,4-thiadiazolyl-2-thiomethyl, R^2, R^3, R^4 and R^5 are the same or different and each represents a hydrogen atom or a straight or branched alkyl group having 1–4 carbon atoms, *n* is an integer of 1 or 2 and Y^+ is a cation selected from the group consisting of an alkali metal ion and an ammonium ion having the formula



wherein R_a, R_b, R_c and R_d can be the same of different and each represents, a hydrogen atom, a straight or branched alkyl group having 1–8 carbon atoms, a cycloalkyl group having 5–7 carbon atoms, phenyl group or a phenylalkyl group having 1–4 carbon atoms in the alkyl moiety, or R_a and R_b can be linked together with N to form a saturated heterocyclic ring selected from the group consisting of pyrrolidine, piperidine and morpholine, or R_a, R_b and R_c can be linked together with the N atom thereof to form a heteroaromatic ring selected from the group consisting os pyridine, picoline, lutidine, quinoline, quinaldine and pyrimidine, which comprises oxidizing a 7-benzylideneamino-3-cephem compound having the formula



wherein R^1, R^2, R^3, R^4, R^5, n and Y^+ are as defined above with an oxidizing agent selected from the group consisting of lead dioxide, manganese dioxide, dicyanodichlorobenzoquinone, tert.-butylhypochlorite, N-bromosuccinimide and N-chlorosuccinimide, and contacting the resulting oxidation product with an alkanol having 1–4 carbon atoms.

4,048,156

CARBAMOYLPHOSPHONATES

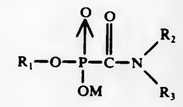
William P. Langsdorf, Jr., Wilmington, Del., assignor to E. I Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 553,423, Feb. 26, 1975, Pat. No. 3,997,544, which is a division of Ser. No. 283,769, Aug. 25, 1972, Pat. No. 3,846,512, which is a continuation-in-part of Ser. No. 85,221, Oct. 29, 1970, Pat. No. 3,819,353, which is a continuation-in-part of Ser. No. 803,962, March 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 731,732, May 24, 1968, Pat. No. 3,627,507. This application Sept. 14, 1976, Ser. No. 723,332

Int. Cl.[2] C07F *9/40*

U.S. Cl. 260—239 A **1 Claim**

1. A compound of the formula



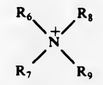
where

R_1 is alkyl of one through six carbon atoms, chloroalkyl of one through six carbon atoms containing up to three chlorine atoms, bromoalkyl of one through six carbon atoms, containing up to three bromine atoms, alkoxy alkyl of three through seven carbon atoms, alkenyl of two through six carbon atoms, alkynyl of three through four carbon atoms, phenyl or benzyl;

R_2 is hydrogen or methyl;

R_3 is hydrogen or methyl;

M is zinc or



where R_6 and R_7 can be taken together to form a ring that is $-(CH_2)_2-O-(CH_2)_2-$ or $-(CH_2)_n-$ where *n* is 2–6 and R_8 and R_9 are hydrogen.

4,048,157

4(FORMYLTHIO)-AZETIDIN-2-ONES AND OZONIZATION PROCESS THEREFOR

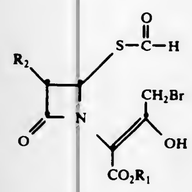
Robin D. G. Cooper, and Douglas O. Spry, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 29, 1975, Ser. No. 626,946

Int. Cl.[2] C07D *205/08*

U.S. Cl. 260—239 A **9 Claims**

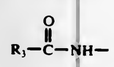
1. A compound of the formula



wherein:

R_1 is a readily removable carboxylic acid protecting group which is substantially unreactive toward ozone; and

R_2 is phthalamido or a group having the formula



wherein:

R_3 is

1. hydrogen, C_1–C_3 alkyl, halomethyl, benzyloxy, 4-nitrobenzyloxy, tert.-butyloxy, 2,2,2-trichloroethoxy, 4-methoxybenzyloxy, 4-protected amino-4-protected carboxybutyl in which the amino protecting group and carboxy protecting group are substantially unreactive toward ozone; or
2. a group of the formula

$$R_4-(O)_m-CH_2-$$

wherein:

m is 0 or 1; and

R_4 is phenyl or phenyl substituted with 1 or 2 halogens, nitro, cyano, trifluoromethyl, C_1–C_4 alkyl, C_1–C_2 alkoxy, protected hydroxy in which the hydroxy protecting group is substantially unreactive toward ozone; or

3. a group of the formula



wherein:

R_4 is as defined above and

W is protected hydroxy, protected carboxy, or protected amino in which the hydroxy protecting group, the carboxy protecting group and the amino protecting group are substantially unreactive toward ozone.

4,048,158

D-α-ISOBUTYLSULFOBENZYLPENICILLIN HEMI-SOLVATE CRYSTALS

Keiichi Sugimoto, Kawanishi; Koji Nishijima, Ibaraki; Tadashi Hanaoka, Suita; Hiroshi Akimoto, Nishinomiya, and Nobuharu Kakeya, Kawanishi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

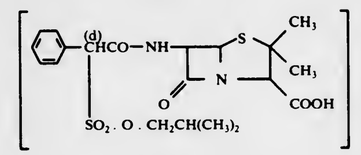
Filed Dec. 31, 1975, Ser. No. 645,913

Claims priority, application Japan, Jan. 20, 1975, 50-8998

Int. Cl.[2] C07D *499/62*

U.S. Cl. 260—239.1 **7 Claims**

1. Pure d-α-Isobutylsulfobenzylpenicillin hemi-solvate crystals of the formula



wherein A is a solvent selected from the group consisting of alcohols of 1 to 4 carbon atoms, ethers of 4 to 6 carbon atoms, ketones of 3 to 6 carbon atoms and esters of 3 to 6 carbon atoms.

4,048,159

TETRAHYDROPYRANYL ETHERS OF ESTROGENS

Pietro de Ruggieri, and Orazio Sighinolfi, both of Milan, Italy, assignors to Farmila Farmaceutici, Italy

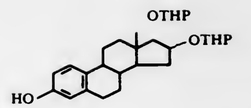
Filed Nov. 19, 1975, Ser. No. 633,477

Claims priority, application Italy, Dec. 13, 1974, 30574/74

Int. Cl.[2] C07J *17/00*

U.S. Cl. 260—239.55 R **14 Claims**

1. Process for preparing a compound of the formula



which comprises debenzylating by catalytic hydrogenation the corresponding 3-benzyloxy-16α- or 16-β-, 17β-bis-(2'-tetrahydropyranyloxy) compound in an organic solvent.

3. A compound comprising of 3-benzyloxy-17β-(2'-tetrahydropyranyloxy)-estra-1,3,5(10)-trien-16-one.

4,048,160

PROCESS FOR PREPARATION OF 7-ALKOXY-3-BROMOMETHYLCEPHEMS

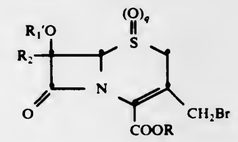
Gary A. Koppel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 22, 1976, Ser. No. 669,366

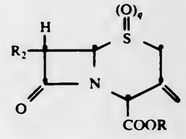
Int. Cl.[2] A61K *31/545*; C07D *501/04*

U.S. Cl. 544—21 **12 Claims**

1. A process for preparing a 3-bromomethylcephem compound of the formula



which comprises reacting a compound of the formula



with from about 4 to about 8 equivalents of an alkali metal salt of a C_1–C_7 primary alcohol of the formula $R_1'OH$ in the presence of about 4 to about 8 equivalents of a positive brominating agent selected from the group consisting of bromine, DBU hydrobromide perbromide, iodine monobromide and tert-butyl hypobromite in an inert organic solvent at a temperature of −80° to about −20° C. wherein in the above formulae

q is 1 or 0;

R is a carboxylic acid protecting group;

R_1' is primary C_1–C_6 alkyl or benzyl; and

R_2 is an amido group of the formula



wherein R_3 is

a. hydrogen, C_1–C_3 alkyl, halomethyl, 3-(2-chlorophenyl)-5-methylisoxazol-4-yl or 4-protected amino-4-protected carboxybutyl;

b. benzyloxy, 4-nitrobenzyloxy, 2,2,2-trichloroethoxy, tert-butoxy, or 4-methoxybenzyloxy;

c. the group —R'' wherein R'' is 1,4-cyclohexadienyl, phenyl or phenyl substituted with 1 or 2 substituents independently selected from the group consisting of halo, protected hydroxy, nitro, cyano, trifluoromethyl, C_1–C_3 alkyl, and C_1–C_7 alkoxy;

d. an arylalkyl group of the formula

$R''-(O)_m-CH_2-$

wherein R'' is as defined above, and *m* is 0 or 1;

e. a substituted arylalkyl group of the formula



wherein R''' is R'' as defined above, 2-thienyl or 3-thienyl, and W is protected hydroxy or protected amino; or

f. a heteroarylmethyl group of the formula

$R''''-CH_2-$

wherein R'''' is 2-thienyl, 3-thienyl, 2-furyl, 2-thiazolyl, 5-tetrazolyl, 1-tetrazolyl, or 4-isoxazolyl;

with the limitation that when R''' or R'''' is 2-thienyl, 3-thienyl or 2-furyl the reaction is carried out at a temperature below about −40° C. and a halogen quenching agent is added before the mixture is allowed to warm above about 0° C.

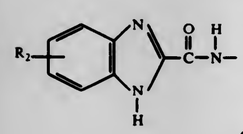
4,048,161

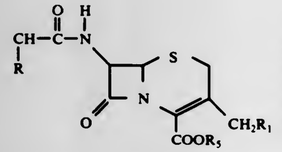
7-[α-(BENZIMIDAZOL-2-YLCARBONYLAMINO)-ARYLACETAMIDOCEPHALOSPORINS

William H. W. Lunn, and Edward V. Mason, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 20, 1976, Ser. No. 687,976
Int. Cl.² C07D *501/20*
U.S. Cl. 544—27 **16 Claims**

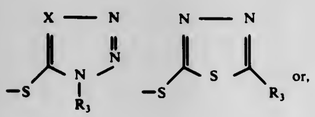
1. A compound of the formula

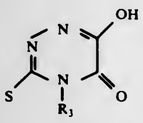




in which R is phenyl, monohydroxyphenyl, dihydroxyphenyl, monohalophenyl, monohydroxy substituted monohalophenyl, thienyl, or furyl;

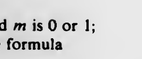
R_1 is





in which, in any of the above, X is =CH— or =N—, and R_3 is hydrogen or C_1–C_4 alkyl;

R_2 is hydrogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, chloro, bromo, or fluoro; and R_5 is hydrogen, indanyl, phthalidyl, an acyloxymethyl group of the formula



in which Y is C_1–C_4 alkyl or phenyl, or, when R_5 is hydrogen, the pharmaceutically acceptable non-toxic salts thereof.

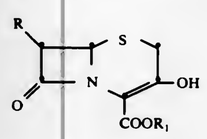
4,048,162

PROCESS FOR PREPARING 3-HYDROXY CEPHALOSPORINS

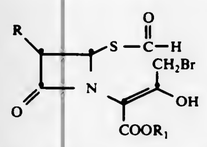
Stjepan Kukolja, and Charles F. Murphy, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 29, 1975, Ser. No. 626,683
Int. Cl.² C07D *501/02, 501/08*
U.S. Cl. 544—22 **10 Claims**

1. A process for preparing a 3-hydroxycephalosporin of the formula



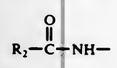
which comprises reacting a compound of the formula



with an amine selected from the group consisting of 1,5-diazabicyclo[5.4.0]undec-5-ene and 1,5-diazabicyclo[3.4.0]non-5-ene at a temperature of from about 0° C. to about 25° C., in which, in the above formulae, R_1 is a carboxylic acid protecting group, and R is

a. phthalimido,

b. an amido group of the formula



in which R_2 is

1. hydrogen, C_1–C_3 alkyl, halomethyl, thienyl-2-methyl, 4-protected-amino-4-protected carboxybutyl, benzyloxy, 4-nitrobenzyloxy, t-butyloxy, 2,2,2-trichloroethoxy, 4-methoxybenzyloxy;
2. a group of the formula R'—$(O)_m$—CH_2— in which *m* is 0 or 1, and R' is phenyl or phenyl substituted with 1 or 2 halogens, protected hydroxy, nitro, cyano, trifluoromethyl, C_1–C_4 alkyl, or C_1–C_2 alkoxy;
3. a group of the formula



in which R' is as defined above and W is protected hydroxy, protected carboxy, or protected amino; or

c. an imidazolidinyl group of the formula



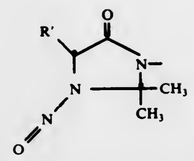
in which R_3 is

a. hydrogen, C_1–C_3 alkyl, halomethyl, 3-(2-chlorophenyl)-5methylisoxazol-4-yl or 4-protected amino-4-protected carboxybutyl;

b. benzyloxy, 4-nitrobenzyloxy, 2,2,2-trichloroethoxy, tert-butoxy, or 4-methoxybenzyloxy;

c. the group —R'' wherein R'' is 1,4-cyclohexadienyl, phenyl or phenyl substituted with 1 or 2 substituents independently selected from the group consisting of halo, protected hydroxy, nitro, cyano, trifluoromethyl, C_1–C_3 alkyl, and C_1–C_7 alkoxy;

d. an arylalkyl group of the formula



in which R' is as defined above.

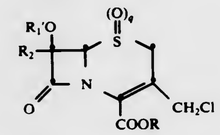
4,048,163

PROCESS FOR PREPARATION OF 7-ALKOXY-3-CHLOROMETHYLCEPHEMS

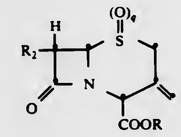
Gary A. Koppel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 22, 1976, Ser. No. 669,368
The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.
Int. Cl.² C07D *501/04;* A61K *31/545*
U.S. Cl. 544—21 **10 Claims**

1. A process for preparing a 3-chloromethylcephem compound of the formula



which comprises reacting a compound of the formula



with from about 1 to about 5 equivalents of an alkali metal salt of a primary C_1–C_7 alcohol of the formula $R_1'OH$ in the presence of from about 1 to about 5 equivalents of tert-butyl hypochlorite in an inert organic solvent at a temperature of about −80° to about 0° C., wherein in the above formulae

q is 1 or 0;

R is a carboxylic acid protecting group;

R is a carboxylic acid protecting group;

R_1' is primary C_1–C_6 alkyl or benzyl; and

R_2 is an amido group of the formula



wherein R_3 is

$R''-(O)_m-CH_2-$

wherein R'' is as defined above, and *m* is 0 or 1;

e. a substituted arylalkyl group of the formula

wherein R''' is R'' as defined above, 2-thienyl or 3-thienyl, and W is protected hydroxy or protected amino; or

f. a heteroarylmethyl group of the formula

$R''''-CH_2-$

wherein R'''' is 2-thienyl, 3-thienyl, 2-furyl, 2-thiazolyl, 5-tetrazolyl, 1-tetrazolyl; or 4-isoxazolyl.

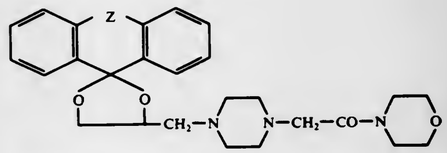
4,048,164

N'-SUBSTITUTED DERIVATIVES OF 4'-(N-PIPERAZINYLMETHYL)SPIRO DIBENZOCYCLOHEPTADI- (OR TRI-) ENE-5,2'-DIOXOLANE(1',3')

Claude P. Fauran; Guy M. Raynaud; Michel J. Turin, all of Paris, and Janine M. Thomas, Neuilly (Hauts de Siene), all of France, assignors to Delalande S.A., Courbevole, France

Continuation-in-part of Ser. No. 263,409, June 16, 1972, abandoned. This application Jan. 16, 1975, Ser. No. 541,609
Claims priority, application France, June 18, 1971, 69.22226
Int. Cl.² C07D *413/14*
U.S. Cl. 544—121 **3 Claims**

1. A compound of the formula



wherein Z is $-CH_2CH_2-$ or $-CH=CH-$, and the pharmacologically acceptable acid addition salts thereof.

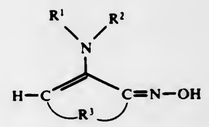
4,048,165

MANUFACTURE OF 1-SUBSTITUTED OXIMINO CYCLO ALKENES-(1)

Hans-Martin Weitz, Frankenthal; Kurt Kahr, Neustadt, and Rolf Fischer, Heidelberg, all of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Germany

Filed Aug. 11, 1975, Ser. No. 603,440
Int. Cl.² C07D *295/12*
U.S. Cl. 544—166 **7 Claims**

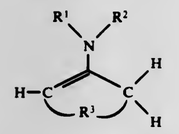
1. A process for the manufacture of 1-substituted oximino cycloalkenes-(1) of the formula



I

in which R^1 and R^2 are the same or different and individually denote an alkyl of from 1 to 8 carbon atoms or form, together with the adjacent nitrogen atom, members of a 5- or 6-membered heterocyclic ring selected from the group consisting of morpholino-, piperidino-, pyrrolidino-, piperazino-, imidazolidino-, pyrrolino-(Δ2'), and imidazolo-, and R^3 is alkyl-

ene of from 2 to 10 carbon atoms, which comprises: reacting cycloalkenes of the formula



II

wherein R^1, R^2 and R^3 have the meanings stated above, with from 1 to 2.5 moles of nitrogen monoxide and from 0.25 to 1 mole of oxygen per mole of starting material II in organic solvents which are inert under the conditions of the reaction.

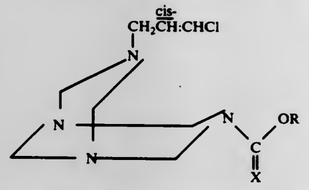
4,048,166

3-CARBOALKOXY (OR PHENOXY) AND 3-THIOCARBO-(3-CHLORO-2-PROPENYL)-1,3,5,7-TETRAAZABICYCLO(3.3.1)NONANE AND PREPARATION

Albertha M. Paul, Holliston, Mass., and Charles E. Moppett, Mystic, Conn., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 11, 1976, Ser. No. 741,089
Int. Cl.² C07D *257/10, 519/00*
U.S. Cl. 544—215 **5 Claims**

1. A compound corresponding to the formula



wherein X represents O or S and R represents C_{1-4} alkyl, phenyl or (C_{1-4} alkyl)phenyl.

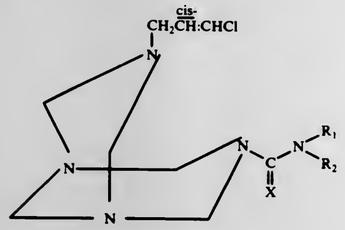
4,048,167

N,N-DISUBSTITUTED DERIVATIVES OF 3-CARBOXAMIDE OR 3-THIOCARBOXAMIDE-7-(3-CHLORO-2-PROPENYL)-1,3,5,7-TETRAAZABICYCLO(3.3.1)NONANE AND PREPARATION II

Albertha M. Paul, Holliston, Mass., and Charles E. Moppett, Mystic, Conn., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 11, 1976, Ser. No. 741,090
Int. Cl.² C07D *257/10, 519/00*
U.S. Cl. 544—215 **7 Claims**

1. A compound corresponding to the formula



wheren X represents O or S and R_1 and R_2 each represents lower alkyl, phenyl or (lower alkyl)phenyl.

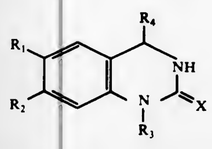
4,048,168

PROCESS FOR PREPARING 1-POLYHALOALKYL-3,4-DIHYDRO-2-(1H)-QUINAZOLINONES

Michihiro Yamamoto, Nishinomiya; Shigenari Katayama, Takarazuka; Masao Koshiba, Nishinomiya, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

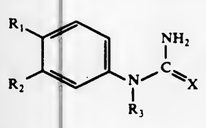
Filed Dec. 27, 1976, Ser. No. 754,640
Claims priority, application Japan, Jan. 23, 1976, 51-6920
Int. Cl.² C07D *239/82*
U.S. Cl. 260—251 QB **4 Claims**

1. A process for preparing a 3,4-dihydro-2(1H)-quinazolinone derivative of the formula,



(I)

wherein R_1 and R_2 are each independently hydrogen, lower alkyl, lower alkylthio or lower alkoxy, or, when taken together, R_1 and R_2 may form methylenedioxy; R_3 is polyhalolower alkyl; R_4 is phenyl, halophenyl, lower alkoxyphenyl, lower alkylphenyl or thienyl; and X is oxygen or sulfur, which comprises reacting a compound of the formula,



(II)

wherein R_1, R_2, R_3 and X are as defined above, with a compound of the formula,



(III)

wherein R_4 is as defined above, with heating in the presence of a zinc halide, optionally in an inert solvent.

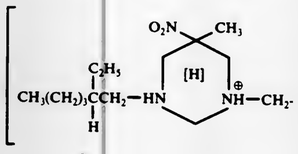
4,048,169

1,3-BIS-(β-ETHYLHEXYL)-5-NITRO-5-METHYL-HEXAHYDROPYRIMIDINE-NAPHTHALENE-1,5-DISULPHONATE

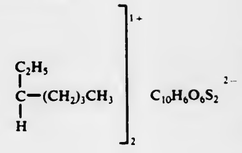
Fritz-Walter Lange, Gauting; Gert Haffner, Laupheim, and Jens Müller, Gauting, all of Germany, assignors to MEDITEST Institut fur medizinisch pharmazeutische Untersuchungen GmbH, Neu-Ulm, Germany

Division of Ser. No. 544,217, Jan. 27, 1975, Pat. No. 4,010,160. This application Nov. 8, 1976, Ser. No. 739,427
Int. Cl.² C07D *239/04*
U.S. Cl. 260—251 R **1 Claim**

1. 1,3-bis-(β-ethylhexyl)-5-nitro-5-methyl-hexahydropyrimidine-naphthalene-1,5-disulphonate of the formula



-continued



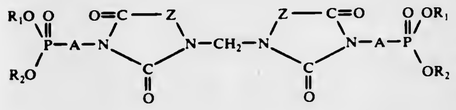
4,048,170

DIALKOXYPHOSPHONOALKYL DERIVATIVES OF DIHYDROURACILS

Daniel Porret, Binninen, and Jürgen Habermeier, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 574,798, May 5, 1975, Pat. No. 3,978,076, which is a division of Ser. No. 419,313, Nov. 27, 1973, Pat. No. 3,892,765. This application July 8, 1976, Ser. No. 703,406
Claims priority, application Switzerland, Dec. 12, 1972, 18030/72
Int. Cl.² C07D *239/54*
U.S. Cl. 260—256.4 E **6 Claims**

1. A dialkoxyphosphonoalkyl derivative of the formula



wherein Z is ethylene, or ethylene substituted by alkyl of 1 to 4 carbon atoms, R_1 and R_2 is alkyl of 1 to 4 carbon atoms, alkenyl of 3 to 4 carbon atoms, or wherein said alkyl or alkenyl is substituted by chloro, or R_1 and R_2 together form an alkylene of 2 to 5 carbon atoms, and A is alkylene of 1 to 12 carbon atoms, or $—CH_2CH_2OCH_2CH_2—$.

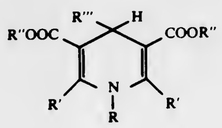
4,048,171

1,4-DIHYDROPYRIDINES

Friedrich Bossert, Wuppertal-Elberfeld, and Wulf Vater, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Feb. 5, 1971, Ser. No. 113,038
Claims priority, application Germany, Feb. 5, 1970, 2005116
Int. Cl.² C07D *211/84*
U.S. Cl. 260—256.4 C **39 Claims**

1. A compound of the formula:



wherein

R is hydrogen, alkyl of 1 to 4 carbon atoms or benzyl;

R′ is alkyl of 1 to 4 carbon atoms;

R″ is alkenyl of 3 or 4 carbon atoms or alkinyl of 3 or 4 carbon atoms; and

R‴ is cyclohexyl; phenyl unsubstituted or substituted by 1 to 3 groups selected from the group consisting of nitro, chlorine, bromine, 1 to 3 methoxy moieties, trifluoromethyl, carbomethoxy, carboxy and 1 or 2 hydroxymethylene moieties; pyridyl; thienyl; pyrrolyl; N-methylpyrrolyl; and dimethoxypyrimidyl.

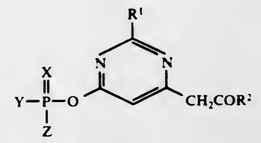
4,048,172

CARBONYLMETHYLPYRIMIDIN-6-YL PHOSPHATES AND PHOSPHOROTHIONATES

Graham Paul Cotterrell, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 451,368, March 14, 1974, Pat. No. 3,932,631. This application July 24, 1975, Ser. No. 598,879
Claims priority, application United Kingdom, Mar. 29, 1973, 15159/73
Int. Cl.² C07F *9/65*
U.S. Cl. 260—256.5 R **4 Claims**

1. A compound of formula:



wherein X is oxygen or sulphur; Y is alkoxy containing from one to four carbon atoms, alkylamino containing from one to four carbon atoms, or dialkylamino containing from one to four carbon atoms in each alkyl moiety; Z is alkoxy containing from one to four carbon atoms; R^1 is alkyl containing from one to four carbon atoms, phenyl, chlorophenyl, alkylamino containing from one to four carbon atoms, dialkylamino containing from one to four carbon atoms in each alkyl moiety, or N-carboxylic acyl alkylamino containing from one to four carbon atoms in the carboxylic acyl moiety and from one to four carbon atoms in the alkyl moiety; and R^2 is alkoxy containing from one to four carbon atoms, amino, alkylamino containing from one to four carbon atoms, dialkylamino containing from one to four carbon atoms in each alkyl moiety, or alkenyl amino containing three to five carbon atoms.

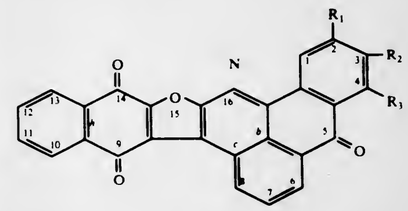
4,048,173

HETEROCYCLIC POLYNUCLEAR PIGMENTS AND PROCESS FOR PREPARING SAME

Giuseppe Ribaldone, Gallarate (Varese), and Giampiero Borsotti, Novara, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Mar. 2, 1976, Ser. No. 663,151
Claims priority, application Italy, Mar. 6, 1975, 20988/75
Int. Cl.² C09B *5/14*
U.S. Cl. 260—272 **7 Claims**

1. A compound having the formula:



wherein R_1, R_2 and R_3 may be the same or different and are selected from the class consisting of H, Cl and OCH_3.

6. A process for preparing a compound having the formula of claim 1, characterized in that a substituted or unsubstituted 1-aza-2-hydroxybenzanthrone is reacted with 2,3-dichloro-1,4-naphthoquinone in the presence of pyridine at a temperature

between 80° and about 120° C, a substantially stoichiometric molar ratio of the reactants being employed.

4,048,174

PROCESS FOR PREPARING 1,2-FUSED-1,3-DINITROGEN-HETEROCYCLIC COMPOUNDS

Artur Botta, Krefeld, and Christian Rasp, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 30, 1975, Ser. No. 591,789
Claims priority, application Germany, July 23, 1974, 2435406
Int. Cl.² C07C 487/04
U.S. Cl. 260—283 SY **13 Claims**

1. Process for preparing a 1,2-fused five-membered or six-membered 1,3-dinitrogen-heterocyclic compound having the formula

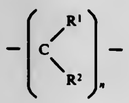
(I)



wherein

A is an arylene radical and

B is unsubstituted or halogen, lower alkyl, CF_3, alkoxy, aryloxy or dialkylamino substituted alkylene chain



wherein

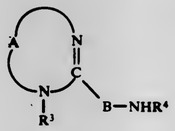
R^1 and R^2 individually represent hydrogen and/or unsubstituted or halogen, lower alkyl, CF_3, alkoxy, aryloxy or dialkylamino substituted aliphatic, cycloaliphatic, araliphatic or aromatic radicals and

n represents a number from 3 to 6, or

B is unsubstituted or a halogen, lower alkyl, CF_3 alkoxy, aryloxy or dialkylamino substituted 1,8-naphthylene, 2,2'-diphenylene or 4,5-phenanthrylene radical,

which comprises subjecting a five-membered or six-membered 1,3-dinitrogen-heterocyclic compound, which contains a 2-(ω-amino group) side chain, having the formula

(II)



wherein

A and B have the meanings indicated above and

R^3 and R^4 are hydrogen, lower alkyl, cycloalkyl or aralkyl but at least one of the two radicals R^3 and R^4 must represent hydrogen to a temperature of 150° to 400° C.

4,048,175

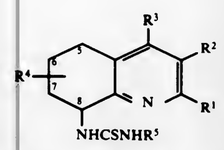
TETRAHYDROQUINOLINE DERIVATIVES

Adrian Charles Ward Curran, South Cave; Roger Crossley, Reading, and David George Hill, Cookham, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 554,259, Feb. 28, 1975, Pat. No. 3,991,065. This application Apr. 2, 1976, Ser. No. 673,173
Claims priority, application United Kingdom, Mar. 5, 1974, 9763/74
Int. Cl.² C07D 215/40
U.S. Cl. 260—283 S **4 Claims**

1. A compound of formula I

(I)



and pharmaceutically acceptable acid addition salts thereof, wherein R^1, R^2 and R^3 are the same or different and represent hydrogen, or a lower alkyl of 1–6 carbon atoms, R^4 represents hydrogen or substitution at the 5, 6 or 7-position by lower alkyl of 1–6 carbon atoms, R^5 is lower alkanol of 2–7 carbon atoms, benzoyl or halobenzoyl with the proviso that when any two of R^1, R^2 and R^3 are lower alkyl and are on adjacent carbon atoms then they are selected from normal and secondary alkyl groups.

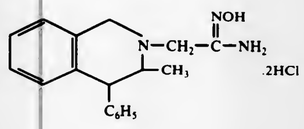
4,048,176

2-(3-METHYL-4-PHENYL-1,2,3,4-TETRAHYDRO-2-ISOQUINOLYL)-ACETAMIDOXIME DIHYDROCHLORIDE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed July 23, 1976, Ser. No. 708,066
Int. Cl.² C07D 217/04
U.S. Cl. 260—286 R **1 Claim**

1. A compound of the formula:



4,048,177

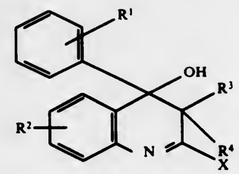
CERTAIN 2-SUBSTITUTED 4-PHENYLQUINOLINE-4-OLS

Robin Michael Black, Porton, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Filed Jan. 7, 1976, Ser. No. 647,278
Claims priority, application United Kingdom, Jan. 16, 1975, 1932/75
Int. Cl.² C07D 215/22, 215/38
U.S. Cl. 260—288 R **7 Claims**

1. A 4-phenylquinolin-4-ol selected from the group consisting of compounds having the formula (I)

(I)



and the pharmaceutically acceptable acid addition salts thereof, wherein R^1 and R^2, which may be the same or different, each represent hydrogen, lower alkyl, lower alkoxy, trifluoromethyl or halogen, R^3 and R^4, which may be the same or different, each represent lower alkyl and X represents hydrazino, amino, (lower)alkylamino, or di(lower)alkylamino, with the proviso that R^3 and R^4 cannot be groups which give rise to steric hindrance.

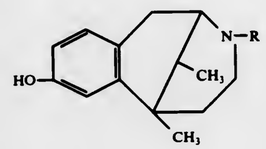
4,048,178

NOVEL N-ALLYL AND N-PROPARGYL BENZMORPHAN DERIVATIVES

Maxwell Gordon, Elkins Parks, and John J. Lafferty, Levittown, both of Pa., assignors to SmithKline & French Laboratories, Philadelphia, Pa.

Filed Mar. 10, 1960, Ser. No. 13,982
The portion of the term of this patent subsequent to Oct. 3, 1984, has been disclaimed.
Int. Cl.² C07D 221/26
U.S. Cl. 260—293.54 **3 Claims**

1. A chemical compound having the following formula:



In which R is a member selected from the group consisting of carbethoxy, formyl, carbomethoxy and carbobenzoxy.

4,048,179

PROCESS FOR PREPARING WATER-DILUTABLE, HEAT-CURING COATING COMPOSITIONS

Kwan Ting Shen, Lakewood, N.J.; John Allister Gannon, Danbury, Conn., and Robert Charles Nelson, Middletown, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 532,141, Dec. 12, 1974, abandoned. This application Oct. 1, 1975, Ser. No. 618,728
Int. Cl.² C08L 61/24, 61/28, 63/02
U.S. Cl. 260—29.4 R **18 Claims**

1. A process for preparing water-dilutable, heat-curing coating compositions which comprises

a. reacting an aromatic polyglycidyl ether having a molecular weight in the range of 360 to 500 with a polyethylene glycol having an average molecular weight in the range of 400 to 800 in the presence of 0 to 20% by weight of a polyhydric phenol to form a water-dilutable, hydroxy-containing adduct, wherein the moles of aromatic polyglycidyl ether to combined moles of polyethylene glycol plus polyhydric phenol are in the ratio of 1.0/1.0 to 3.0/1.0 and wherein the moles of polyethylene glycol to moles of polyhydric phenol are in the ratio of 1.0/0.0 to 1.0/1.5,

b. adding 5 to 50% by weight of solids of an aminoplast curing agent, and

c. diluting with water to bring the total percent solids in the range of 10 to 80% by weight and to yield a stable, aqueous composition containing no particles larger in size than 0.1 micron.

4,048,180

PYRIDYL-TETRAHYDROPYRANS AND PROCESS FOR PREPARING SAME

Roy Dennis Bowden, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 804,993, March 6, 1969, Pat. No. 3,651,071. This application Aug. 24, 1971, Ser. No. 174,522
Claims priority, application United Kingdom, Mar. 18, 1968, 13008/68; Dec. 20, 1968, 60714/68; Dec. 20, 1968, 60715/68; Dec. 20, 1968, 60716/68
Int. Cl.² C07D 405/04
U.S. Cl. 260—297 R **7 Claims**

1. A compound selected from the group consisting of 4-(4'-pyridyl)-tetrahydropyran, 2-(2'-pyridyl)-tetrahydropyran, 4-(2'-pyridyl)-tetrahydropyran, and 4-(3'-pyridyl)-tetrahydropyran.

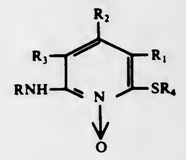
4,048,181

DERIVATIVES OF MERCAPTOPYRIDINE-1-OXIDE

Miriam Lois Douglass, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 6, 1975, Ser. No. 629,436
Int. Cl.² C07D 213/40
U.S. Cl. 260—294.8 G **7 Claims**

1. A mercaptopyridine-1-oxide compound having the following structural formula:



wherein R is selected from the group consisting of the acyl radical $R_o C{=}O$ and the alkoxycarbonyl radical $R_o\text{-}OC{=}O$, where R_o is a C_1–C_6 alkyl, aryl selected from the class consisting of phenyl or naphthyl or aralkyl, said alkyl having portion 1–6 carbons or halobenzyl; R_1, R_2 and R_3 are each independently selected from the group consisting of hydrogen, methyl, two of said terms may represent methoxy and the other hydrogen, one of said terms may represent ethyl, n-butyl, methoxy, ethoxy, phenyl, bromophenyl, chlorophenyl, trichlorophenyl, naphthyl, chlorobenzyl, dichlorobenzyl or furyl and the other two terms represent hydrogen; R_4 is selected from the group consisting of hydrogen, an alkali metal, and an alkaline earth metal.

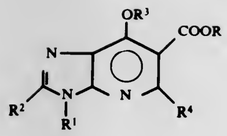
4,048,182

DERIVATIVES OF IMIDAZO [4,5-b]PYRIDINES

Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 665,754, March 11, 1977, Pat. No. 4,003,908. This application Oct. 29, 1976, Ser. No. 736,986
Int. Cl.² C07D 471/04
U.S. Cl. 260—295.5 B **6 Claims**

1. A compound of the formula



wherein
R is hydrogen or lower alkyl;
R^1 is hydrogen, lower alkyl, phenyl, phenyl-lower alkyl or cyclo-lower alkyl;
R^2 is hydrogen, lower alkyl, phenyl or phenyl-lower alkyl;
R^3 is di-lower alkylamino-lower alkyl;
R^4 is hydrogen, lower alkyl or phenyl;
and physiologically acceptable salts thereof.

4,048,183

1,3,5-TRISUBSTITUTED-1,2,4-TRIAZOLE COMPOUNDS

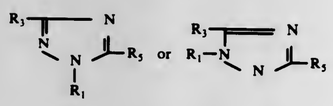
John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 599,504, July 28, 1975, Pat. No. 3,978,054, which is a division of Ser. No. 527,992, Nov. 29, 1974, Pat. No. 3,928,361, which is a division of Ser. No. 361,914, May 21, 1973, Pat. No. 3,882,134. This application Apr. 2, 1976, Ser. No. 672,899

Int. Cl.² C07D *401/14*

U.S. Cl. 260—296 R **4 Claims**

1. A compound of the formula



wherein R_1 is a pyridyl substituted lower alkyl;
R_3 is pyridyl; and
R_5 is pyridyl.

4,048,184

6-PHENYL-2H-PYRAZOLO[3,4-B]PYRIDINES

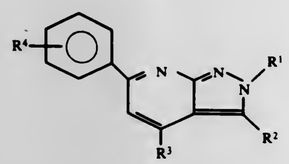
Hans Hoehn, Tegernheim, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 15, 1976, Ser. No. 741,572

Int. Cl.² C07D *471/04*

U.S. Cl. 260—296 H **9 Claims**

1. A compound of the formula



wherein
R^1 is lower alkyl, phenyl, phenyl-lower alkyl or cyclo-lower alkyl;
R^2 is hydrogen, lower alkyl or phenyl;
R^3 is lower alkylamino of di(lower alkylamino);
R^4 is hydrogen, halogen, hydroxy, lower alkoxy or amino; and physiologically acceptable acid addition salts thereof.

4,048,185

BENZOXAZOLE DERIVATIVES, PROCESS FOR THEIR PREPARATION AND THEIR USE AS OPTICAL BRIGHTENERS

Ulrich Pintschovius, Hattersheim (Main); Erich Schinzel, Hofheim, Taunus, and Günter Rosch, Altenhain, Taunus, all of Germany, assignors to Hoechst Atiengesellschaft, Frankfurt am Main, Germany

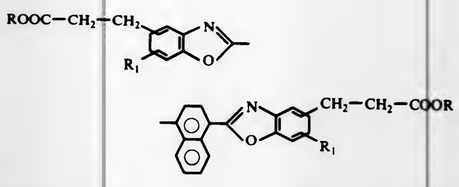
Filed June 8, 1976, Ser. No. 693,941

Claims priority, application Germany, June 12, 1975, 2526230

Int. Cl.² C07D *263/54*

U.S. Cl. 260—307 D **2 Claims**

1. A compound of the formula



wherein
R is hydrogen, ethoxyethyl, methyl, ethyl, propyl or butyl and
R_1 is hydrogen or methyl.

4,048,186

ANTIBACTERIAL SUBSTITUTED AZETIDINONES

Allan Guildford Brown, Cranleigh, and Thomas Trefor Howarth, Rudgwick, both of England, assignors to Beecham Group Limited, England

Filed Sept. 30, 1975, Ser. No. 618,013

Claims priority, application United Kingdom, Oct. 28, 1974, 46626/74

Int. Cl.² C07D *263/18*

U.S. Cl. 260—307 FA **1 Claim**

1. The compound which is sodium 3-[2′-(phenoxyacetoxy)ethyl]-7-oxo-1-aza-4-oxabicyclo[3,2,0]heptane-2-carboxylate.

4,048,187

5-(2-HYDROXYPHENYL)TETRAZOLYL COMPOUNDS

Brian Anderson; Raymond Frederick Dalton, and Philip Martin Rowbotham, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

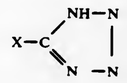
Filed May 25, 1976, Ser. No. 689,931

Claims priority, application United Kingdom, June 9, 1975, 24629/75

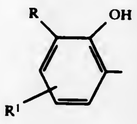
Int. Cl.² C07D *257/04*; C07F *1/08, 1/10, 1/12*

U.S. Cl. 260—308 D **6 Claims**

1. A heterocyclic compound of the formula



wherein X is a substituted o-hydroxyphenyl group of the formula



wherein R is hydrogen, halogen, nitro or alkyl and R^1 is hydrogen or alkyl, with the proviso that R and R^1 together contain from 5 to 18 aliphatic carbon atoms.

4,048,188

1-CARBONAMIDO IMIDAZOLES

Maurice W. Baker; John C. Kerry; Kenneth J. Nichol; John R. Marshall; David M. Weighton, and Antonin Kozlik, all of Nottingham, England, assignors to The Boots Company Limited, Nottingham, England

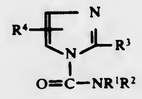
Division of Ser. No. 311,009, Nov. 30, 1972, Pat. No. 3,868,458. This application Jan. 22, 1975, Ser. No. 543,285

Claims priority, application United Kingdom, Dec. 7, 1971, 56781/71; July 26, 1972, 3498/72

Int. Cl.² C07D *233/56*

U.S. Cl. 548—341 **4 Claims**

1. A compound of the formula



in which R^3 is selected from the group consisting of hydrogen, methyl and ethyl, R^4 is an alkyl group selected from the group consisting of tert.butyl, sec.butyl, propyl, 1-ethylpropyl, isopropyl and tert.pentyl, and R^1 and R^2 are both methyl.

4,048,189

LIPOPHILIC PHTHALOCYANINES

Jean Andre Paul Kienzle, Creil, France, assignor to Pechiney Ugine Kuhlmann, Paris, France

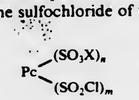
Filed Jan. 18, 1973, Ser. No. 324,715

Claims priority, application France, Jan. 20, 1972, 72.01855

Int. Cl.² C09B *47/04*

U.S. Cl. 260—314.5 **6 Claims**

1. Product obtained by reacting, at a temperature between 50° C. and 100° C. and in the presence of an alkaline agent, one mole of phthalocyanine sulfochloride of the formula:



wherein Pc is phthalocyanine or copper phthalocyanine not more than one SO_2Cl or SO_3X group being present on each benzine ring of Pc, X is hydrogen or alkali metal, *n* is a whole number or a fraction from 0 to 2 inclusive, *m* is a whole number or a fraction from 2 to 4 inclusive, and the sum $m+n$ is equal to 3 or 4, with at least *m* moles of a propylenediamine or mixture of propylenediamines of the formula:

$$R - NH - CH_2 - CH_2 - CH_2 - NH_2$$

wherein R is linear alkyl or alkenyl containing 12 to 18 carbon atoms.

4,048,190

PREPARATION OF BISPHENOL-A BISIMIDES

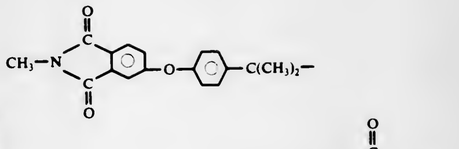
Donald S. Johnson, and Frank J. Williams, III, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,501

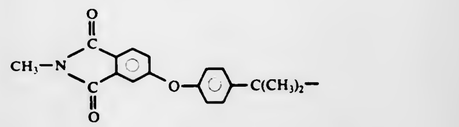
Int. Cl.² C07D *209/34*

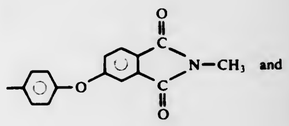
U.S. Cl. 260—326 N **1 Claim**

1. The process for purifying a 4-isomer bisimide of the formula

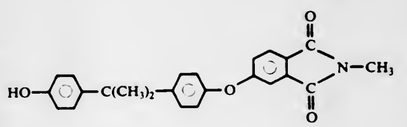


which contains as impurities, at least one of an imide compound selected from the class consisting of





and



which process comprises dissolving at a temperature from 20° to 100° C. the aforementioned 4-isomer bisimide in methanol, for a period of time sufficient to take up in said solvent these impurities, and separating the purified 4-isomer bisimide substantially free of the impurities.

4,048,191

HALO-SUBSTITUTED 1-LOWERALKYL-5-AROYLPYRROLE-2-ACETIC ACID COMPOUNDS

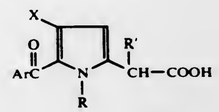
John Robert Carson, Norristown, Pa., assignor to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Filed June 27, 1975, Ser. No. 591,217

Int. Cl.² C07D *207/34*

U.S. Cl. 260—326.47 **12 Claims**

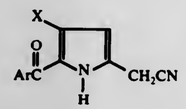
1. A halo-substituted 1-loweralkyl-5-aroylpyrrole-2-acetic acid compound of formula:



wherein X is a member selected from the group consisting of chloro and bromo, R is loweralkyl, R′ is a member selected from the group consisting of hydrogen and loweralkyl, and Ar is a member selected from the group consisting of phenyl and phenyl substituted with from one to three members each selected from the group consisting of halo, loweralkyl, loweralkoxy, trifluoromethyl, methylthio, and methylsulfinyl provided

that no more than two are selected from the group consisting of trifluoromethyl, methylthio, and methylsulfinyl.

6. A halo-substituted 5-aroylpyrrole-2-acetonitrile compound of formula:



wherein X is a member selected from the group consisting of chloro and bromo and Ar is a member selected from the group consisting of phenyl and phenyl substituted with from one to three members each selected from the group consisting of halo, loweralkyl, loweralkoxy, trifluoromethyl, methylthio, and methylsulfinyl provided that no more than two are selected from the group consisting of trifluoromethyl, methylthio, and methylsulfinyl.

4,048,192

WATER-DILUTABLE TETRAPOLYMERS OF VINYL ACETATE, MALEIC DIESTERS, CROTONIC ACID AND HYDROPHILIC UNSATURATED COPOLYMERIZABLE ESTERS

Alois Stoll, and Eduard Bergmeister, both of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Oct. 30, 1975, Ser. No. 627,103
Claims priority, application Germany, Nov. 12, 1974, 2453655
Int. Cl.² C08F *4/32, 20/04, 22/04*
U.S. Cl. 260—33.4 R **10 Claims**

1. A vinyl acetate copolymerizate of monomers being a free-radical polymerized copolymerizate having monomer units consisting essentially of

a. from 60% to 80% by weight of vinyl acetate units,
b. from 10% to 20% by weight of units of a maleic acid diester with straight-chained primary alcohols selected from the group consisting of n-octanol-1, n-decanol-1 and mixtures thereof,
c. from 5% to 20% by weight of units of a mono-olefinically unsaturated ester copolymerizable with vinyl acetate and having from 6 to 8 carbon atoms and a hydrophilic group selected from the group consisting of carboxyl groups, hydroxyl groups and keto groups, and
d. from 3% to 10% by weight of crotonic acid units; and the copolymers thereof neutralized by salt forming compounds.

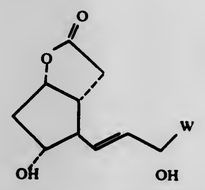
4,048,193

PROCESS FOR BICYCLIC LACTONE DIALS

Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

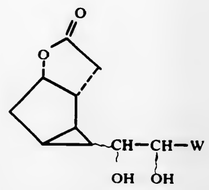
Division of Ser. No. 374,349, June 28, 1973, Pat. No. 3,904,648. This application June 4, 1975, Ser. No. 583,556
Int. Cl.² C07D *317/30*
U.S. Cl. 260—343.3 R **6 Claims**

1. A process for preparing an optically active bicyclic lactone diol of the formula

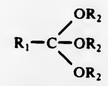


or a racemic compound of that formula and the mirror image thereof, wherein W is 1-pentyl, cis 1-pent-2-enyl, or 1-pent-2-ynyl, and ~ indicated attachment of the hydroxyl to the side chain in alpha or beta configuration, which comprises the steps of

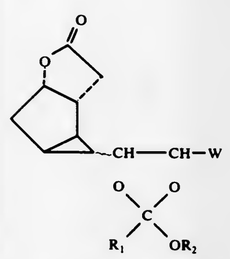
a. reacting an optically active tricyclic lactone glycol of the formula



or a racemic compound of that formula and the mirror image thereof, wherein W is as defined above and ~ indicates attachment of the moiety to the cyclopropane ring in exo and endo configuration and to the side chain in alpha or beta configuration, and an ortho ester of the formula

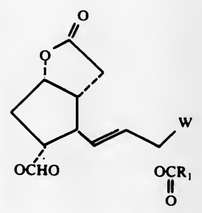


wherein R_1 is hydrogen, alkyl of 1 to 19 carbon atoms, inclusive, or aralkyl of 7 to 12 carbon atoms, inclusive, substituted with zero to 3 halo atoms; and R_2 is methyl or ethyl in the presence of an acid catalyst, to form an optically active cyclic ortho ester of the formula



or a racemic compound of that formula and the mirror image thereof, wherein R_1, R_2, W, and ~ are as defined above;

b. reacting said cyclic ortho ester with anhydrous formic acid to form an optically active diol diester of the formula



or a racemic compound of that formula and the mirror

image thereof, wherein R_1, W, and ~ are as defined above; and

c. replacing the acyl groups of said diol diester with hydrogen by alcoholysis in the presence of a base.

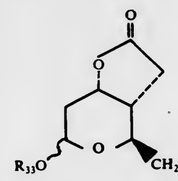
4,048,194

6α-METHOXY-4α-HYDROXY-2β-HYDROXYMETHYL-3α-TETRAHYDROPYRANACETIC ACID 4α γ-LACTONE ETHERS AND ACYLATES

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 14, 1976, Ser. No. 676,893
Int. Cl.² C07D *493/04*
U.S. Cl. 260—343.6 **3 Claims**

1. A thromboxane intermediate of the formula



wherein R_{31} is a hydroxy-hydrogen replacing group selected from the group consisting of R_9, R_{10}, and R_{34};
wherein R_9 is an acyl protecting group selected from the group consisting of

a. benzoyl;
b. benzoyl substituted with one to 5 alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 12 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents are other than alkyl, and that the total number of carbon atoms in the substituents does not exceed 10 carbon atoms, with the further proviso that the substituents are the same or different;
c. benzoyl substituted with alkoxycarbonyl of 2 to 5 carbon atoms; inclusive;
d. naphthoyl;
e. naphthoyl substituted with one to 9, inclusive, alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 10 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents on either side of the fused aromatic rings are other than alkyl and that the total number of carbon atoms in the substituents on either of the fused aromatic rings does not exceed 10 carbon atoms, with the further proviso that the various substituents are the same or different; and
f. alkanoyl of 2 to 12 carbon atoms, inclusive;

wherein R_{10} is a blocking group selected from the group consisting of

a. tetrahydropyranyl;
b. tetrahydrofuranyl; and
c. a group of the formula

$$-C(OR_{11})(R_{12})-CH(R_{13})(R_{14}),$$

wherein R_{11} is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with one to 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_{12} and R_{13} are alkyl of one to 4 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 alkyl or one to 4 carbon atoms, inclusive, or when R_{12} and R_{13} are taken together $-(CH_2)_2-$ or $-(CH_2)_b-O-(CH_2)_c-$, wherein *a* is 3,4, or 5, or *b* is one, 2, or 3, and *c* is one, 2, or 3, with the proviso that *b* plus *c* is 2,3, or 4, with the further proviso that R_{12} and R_{13} may be the same or different, and wherein R_{14} is hydrogen or phenyl;
wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of

a. benzyl,
b. benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive, with the further proviso that the various substituents are the same or different,
c. benzhydryl,
d. benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive, with the further proviso that the various substituents are the same or different,
e. trityl, and
f. trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive, with the further proviso that the various substituents are the same or different; and

wherein R_{33} is alkyl of one to 5 carbon atoms, inclusive.

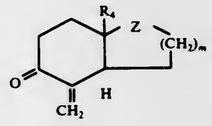
4,048,195

PROCESS OF SYNTHESIZING SUBSTITUTED INDANONES

Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 482,711, June 24, 1974, Pat. No. 3,984,473, which is a division of Ser. No. 765,023, Oct. 4, 1968, Pat. No. 3,897,460. This application July 14, 1976, Ser. No. 705,302
The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.
Int. Cl.² C07D *309/12*; C07C *79/46, 69/76, 69/02*
U.S. Cl. 260—345.9 S **1 Claim**

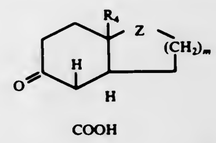
1. A process for the preparation of a compound of the formula



wherein

R_4 is hydrogen or lower alkyl; Z is $CH(OR_2)$; R_2 is tetrahydropyranyl, lower alkanoyl, benzoyl, nitrobenzoyl, or carboxy-benzoyl; *m* is an integer having the value of 1 or 2,

which comprises dissolving a compound of the formula



wherein

R_4, Z and *m* are as defined above in dimethylsulfoxide and then adding to the reaction mixture formaldehyde in the presence of a compound selected from the group consisting of methylamine, butylamine, benzylamine and heterocyclic secondary amines and salts thereof derived from strong mineral acids or organic acids.

4,048,196
MANUFACTURE OF BUTANEDIOL AND/OR TETRAHYDROFURAN FROM MALEIC AND/OR SUCCINIC ANHYDRIDE VIA γ- BUTYROLACTONE

Franz Josef Broecker, Ludwigshafen, and Matthias Schwarzmann, Limburgerhof, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Nov. 14, 1975, Ser. No. 631,911
Claims priority, application Germany, Nov. 23, 1974, 2455617
Int. Cl.² C07D *307/08, 31/18, 29/00*
U.S. Cl. 260—346.11 4 Claims

1. A process for the manufacture of 1,4-butanediol and/or tetrahydrofuran by catalytic hydrogenation of maleic anhydride and/or succinic anhydride (in the former case via succinic anhydride), with formation of γ-butyrolactone as an intermediate, wherein the improvement consists in

a. hydrogenating maleic anhydride or succinic anhydride in the presence of γ-butyrolactone over a catalyst containing nickel, to give γ-butyrolactone,

b. removing the water formed during the hydrogenation by separating γ-butyrolactone and water from succinic anhydride by distillation, recycling succinic anhydride and separating γ-butyrolactone and water by distillation, and

c. converting γ-butyrolactone into butanediol and/or tetrahydrofuran over a catalyst containing copper.

4,048,197
2,3,3',4'-BIPHENYLTETRACARBOXYLIC ACID DIANHYDRIDE

Hiroshi Itatani; Mikito Kashima; Masaoki Matsuda; Hataaki Yoshimoto, and Hiroyuki Yamamoto, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Division of Ser. No. 324,050, Jan. 19, 1973, Pat. No. 3,940,426. This application July 21, 1975, Ser. No. 597,789
Claims priority, application Japan, Apr. 3, 1972, 47-32554; May 19, 1972, 47-49143
Int. Cl.² C07D *307/89*
U.S. Cl. 260—346.3 1 Claim

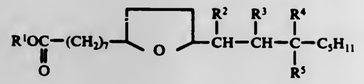
1. 2,3,3',4'-Biphenyltetracarboxylic acid dianhydride.

4,048,198
CERTAIN 8-(2-TETRAHYDROFURYL)OCTANOIC ACID COMPOUNDS WITH PROSTAGLANDIN LIKE BIOLOGICAL EFFECTS

Poul Nedenskov, Birkerod, and Karol Alster, Farum, both of Denmark, assignors to Aktieselskabet Grindstedvaerket, Arhus, Denmark

Continuation-in-part of Ser. No. 480,722, June 19, 1974, abandoned. This application May 17, 1976, Ser. No. 686,987
Claims priority, application United Kingdom, June 20, 1973, 29241/73
Int. Cl.² C07D *307/16*
U.S. Cl. 260—347.4 8 Claims

1. A tetrahydrofuran derivative of the formula



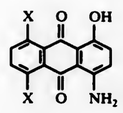
wherein R^1 represents hydrogen or a lower alkyl group, each of R^2 and R^3 represents hydrogen, or R^2 and R^3 together represents a further bond between the two carbon atoms, one of R^4 and R^5 represents hydrogen or a lower alkyl group and the other a hydroxy group, or R^4 and R^5 together represents an oxygen atom.

4,048,199
PRODUCTION OF AMINONITRODIHYDROXYANTHRAQUINONES BY PARTIAL REDUCTION DINITRODIHYDROXYANTHRAQUINONES

Wolfgang Elser, Wachenheim, and Gerhard Epple, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 543,246, Jan. 23, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,856
Claims priority, application Germany, Feb. 7, 1974, 2405812
Int. Cl.² C07C *49/68;* C09B *1/22*
U.S. Cl. 260—380 17 Claims

1. A process for the production of an aminonitrodihydroxyanthraquinone of the formula:



in which one X is hydroxyl and the other X is nitro, by partial reduction, which comprises heating a reaction mixture consisting essentially of 1,5-dinitro-4,8-dihydroxyanthraquinone, 1,8-dinitro-4,5-dihydroxyanthraquinone or a mixture thereof and a reductant selected from the group consisting of unsubstituted phenol, pyrogallol, resorcinol, hydroquinone, hydroquinone monomethyl ether, substituted phenol having on the phenyl nucleus besides the phenolic -OH one or more substituents selected from the group consisting of alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, halogen and amino and mixtures thereof, at from 80° to 250° C until one of the two nitro groups of each respective 1,5-dinitro-4,8-dihydroxyanthraquinone and 1,8-dinitro-4,5-dihydroxyanthraquinone is reduced to the amino group and the reduction product of the above formula is then separated.

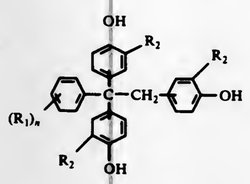
4,048,200
1,1,2-TRIS-(o/p-HYDROXYPHENYL)-1-PHENYL-ETHANES

Erhard Tresper; Dieter Neuray, and Dieter Freitag, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Feb. 24, 1976, Ser. No. 660,850
Claims priority, application Germany, Feb. 28, 1975, 2508710
Int. Cl.² C07C *39/16*
U.S. Cl. 260—395 4 Claims

1. Trisphenols [1,1,2-tris-(o/p-hydroxyphenyl)-1-phenylethanes] of the general formula (I):

(I)



wherein

R_1 and R_2, which may be the same or different, denote hydrogen, a C_1–C_{18} alkyl group, a cyclohexyl group or an optionally substituted C_6–C_{15} aryl group, a halogen or a nitro group, and

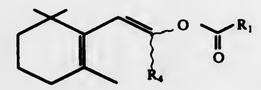
n represents an integer from 1 to 5.

4,048,201
NOVEL ENOL ESTERS

Alan Owen Pittet, Atlantic Highlands; Erich Manfred Klaiber, Neptune; Manfred Hugo Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y., and Joaquin Vinals, Red Bank, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 662,820, March 1, 1976, Pat. No. 4,000,329, which is a continuation-in-part of Ser. No. 620,355, Oct. 7, 1975, Pat. No. 4,000,090, which is a continuation-in-part of Ser. No. 507,412, Sept. 19, 1974, Pat. No. 3,940,499. This application Sept. 15, 1976, Ser. No. 723,536
Int. Cl.² C09F *5/08*
U.S. Cl. 260—410 9 Claims

1. "Cis" or "trans" or mixtures of "cis" and "trans" 2(2,2,6-trimethyl-1-cyclohexen-1-yl)ethen-1-ol ester defined by the structure:



wherein R_1 is C_1-C_{11} alkyl and R_4 is hydrogen or methyl.

6. The compound of claim 1 wherein R_1 is n-heptyl and R_4 is hydrogen.

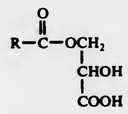
4,048,202
3-O-ALKANOYLGLYCERIC ACIDS

Charles I. Beck, Skokie, and Roger M. Layton, Buffalo Grove, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Apr. 11, 1975, Ser. No. 567,400
Int. Cl.² C11C *3/02;* C07C *69/02*
U.S. Cl. 260—410.6 7 Claims

1. A compound of the formula

(I)



wherein R is alkyl having from 1 to 20 carbon atoms, or alkenyl having from 10 to 20 carbon atoms, and the corresponding non-toxic pharmaceutically acceptable salts thereof.

4,048,203
PURIFICATION OF LUTEIN-FATTY ACID ESTERS FROM PLANT MATERIALS

Thomas Philip, 248 E. Adams St., Tucson, Ariz. 85705

Filed Dec. 6, 1976, Ser. No. 747,826
Int. Cl.² C11B *1/10, 7/00*
U.S. Cl. 260—412.8 9 Claims

1. A method of purifying lutein-fatty acid esters from plant materials containing lutein which comprises dissolving oleoresin, which contains said lutein-fatty acid ester, from such materials in hot alkanol containing not more than four carbon atoms and precipitating the lutein-fatty acid esters by cooling the solution, followed by removal of alkanol by filtration and drying the lutein-fatty acid esters under vacuum.

4,048,204
C20 AND C22 ACIDS TO PROMOTE WOUND HEALING

Kwan-Hua Lee, San Francisco, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 630,483, Nov. 10, 1975, abandoned, which is a continuation of Ser. No. 498,796, Aug. 19, 1974, abandoned, which is a continuation of Ser. No. 207,623, Dec. 13, 1971, abandoned. This application Sept. 10, 1976, Ser. No. 722,247
Int. Cl.² C11C *1/00;* C07C *61/38*
U.S. Cl. 260—413 1 Claim

1. An acid 2,6,6,-Trimethyl-1-(10'-carboxy-deca-1',3',5',7',9'-pentaenyl) cyclohex-1-ene.

4,048,205
PROCESS FOR SEPARATING AN ESTER OF A MONOETHANOID FATTY ACID

Richard W. Neuzil, Downers Grove, and Armand J. deRosset, Clarendon Hills, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 2, 1976, Ser. No. 710,829
Int. Cl.² C11C *1/08*
U.S. Cl. 260—428 27 Claims

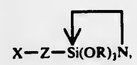
1. A process for separating an ester of a monoethanoid fatty acid from a mixture comprising an ester of saturated fatty acid and an ester of an unsaturated fatty acid consisting essentially of an ester of a monoethanoid fatty acid which process comprises contacting at a temperature within the range of from about 20° C. to about 200° C. and a pressure within the range of from about atmospheric to about 500 psig. said mixture with an adsorbent comprising a X or a Y zeolite containing at exchangeable cationic sites copper cations and one or more second cations selected from the group consisting of sodium, potassium, rubidium and cesium, thereby selectively adsorbing said ester of a monoethanoid fatty acid and thereafter recovering said ester of a monoethanoid fatty acid.

4,048,206
PROCESS FOR THE PRODUCTION OF 1-ORGANYLSILATRANES AND CARBOFUNCTIONAL DERIVATIVES THEREOF

Mikhail Grigorievich Voronkov, ulitsa Lermontova, 315, kv. 32, and Valery Mikhailovich Dyakov, ulitsa Lermontova, 263, kv. 23, both of Irkutsk, U.S.S.R.

Filed Apr. 22, 1975, Ser. No. 570,493
Int. Cl.² C07F *7/18*
U.S. Cl. 260—448.8 R 7 Claims

1. A process for the production of a 1-organylsilatrane of the formula



where R is selected from the group consisting of —CH_2—CH_2— and —$CH(CH_3)CH_2$—; Z is a bivalent hydrocarbon radical; X is selected from the group consisting of H, alkyl, aryl, F, Cl, Br, I, CF_3, CN, NH_2, SH, CNS, R^1M, $(R^2O)_2P(O)$ and $R^3C(O)M$, where R^1 is selected from the group consisting of alkyl, aryl, aralkyl or alkaryl; M is selected from the group consisting of O and S; R^2 is alkyl; and R^3 is selected from the group consisting of alkyl, aryl, R_F and A—$C_6H_4OCH_3$, where R_F is a fluorocarbon chain containing from 1 to 10 carbon atoms and A is selected from the group consisting of halogen, an alkyl group and an alkoxy group, which comprises reacting an amine of the formula

$N(ROH)_3$,

where R is selected from the group consisting of —CH_2—CH_2— and —$CH(CH_3)CH_2$—, with a 1-organyltrialkoxysilane of the formula

$X - Z - Si(OR^4)_3$,

where R^4 is alkyl; X is selected from the group consisting of H, alkyl, aryl, I, Br, Cl, F, CF_3, CN, NH_2, SH, CNS, R^1M, $(R^2O)_2P(O)$ and $R^2C(O)M$, where R^1 is selected from the group consisting of alkyl, aryl, aralkyl and alkaryl; M is selected from the group consisting of O and S; R^2 is alkyl; and R^3 is selected from the group consisting of alkyl, aryl, R_F and $A—C_6H_4OCH_2$, where R_F is a fluorocarbon chain containing from 1 to 10 carbon atoms and A is selected from the group consisting of halogen, an alkyl group and an alkoxy group, in the presence of a low-boiling polar organic solvent at 20° to 100° C. and subsequently recovering the desired product, and the amine is initially admixed with said solvent, after which the 1-organyltrialkoxysilane is added to the reaction mixture.

4,048,207

POLYMERIC MATERIALS WITH SILANE END GROUPS

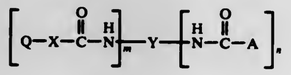
Frank N. Jones, Louisville, Ky., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 622,430, Oct. 14, 1975, which is a continuation-in-part of Ser. No. 329,156, Feb. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 133,424, April 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 39,533, May 21, 1970, abandoned. This application Nov. 5, 1976, Ser. No. 739,285

Int. Cl.² C07F 7/18

U.S. Cl. 260—448.8 R **8 Claims**

1. A polymeric material represented by the structure



where

Q is a non-resinous polymeric or copolymeric segment of

a. an ester of acrylic acid or methacrylic acid with an alkanol of 1–18 carbon atoms;

b. styrene or acrylonitrile;

c. a vinyl ester whose ester moiety contains 2–18 carbon atoms; or

d. a vinyl ether;

X is the residue of a chain transfer agent;

Y is the residue of a di-, tri-, or tetraisocyanate radical after removal of isocyanate groups;

A is the residue of a mercapto-, hydroxy- or aminoalkyl alkoxy silane radical; and

m and *n* are 1, 2 or 3, the total not exceeding 4, provided that when *n* is 2 or 3, only one of A need be as defined

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4,048,208

METHOD FOR PREPARING IMPROVED EXPANDED POLYSTYRENE SHEET

John P. Spicuzza, Jr., Pittsburgh, and Joseph M. Sutej, New Brighton, both of Pa., assignors to ARCO Polymers, Inc., Philadelphia, Pa.

Filed Dec. 31, 1975, Ser. No. 645,856

Int. Cl.² B29D 27/00

U.S. Cl. 264—45.3 **13 Claims**

1. In a process for producing microcellular expanded styrene polymer sheet by extruding a mixture containing styrene polymer, a blowing agent and a nucleating system, the improvement comprising extruding with said mixture about 0.002 to 2% of a hydrophilic silica and about 0.002 to 2% of an alkaline earth metal oxide, the percentages of hydrophilic silica and alkaline earth metal oxide being based on the total weight of styrene polymer and said hydrophilic silica and alkaline earth metal oxide being uniformly distributed throughout said mixture whereby said sheet has improved flexibility.

4,048,209

ISOMERIZATION OF THE CIS, TRANS ISOMERS OF 1,2,5,6-TETRASUBSTITUTED-1,5-CYCLOOCTADIENES TO THE CORRESPONDING CIS, CIS-ISOMERS

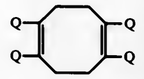
Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 642,097, Dec. 18, 1975, abandoned. This application Sept. 13, 1976, Ser. No. 722,915

Int. Cl.² C07C 121/48, 69/74, 61/26, 103/19

U.S. Cl. 260—464 **6 Claims**

1. A process for the production of a 1,2,5,6-tetrasubstituted-cis,cis-1,5-cyclooctadiene of the formula



wherein each Q is individually selected from the group consisting of —CN, —COOH, $—CONH_2$, —COX and —COOR, wherein R is an alkyl group having from 1 to 4 carbon atoms and X is selected from the group consisting of Cl and Br, which comprises isomerizing the corresponding 1,2,5,6-tetrasubstituted-cis,trans-1,5-cyclooctadiene in the presence of an isomerization promoting amount of a halogen promoter selected from the group consisting of chlorine, bromine and iodine, at a temperature in the range of −50° to 100° C, for a time sufficient to effect said isomerization, in the absence of light.

4,048,210

TRANSCYANOHYDRINATION

Royston H. Davis, Rainham, England, assignor to Shell Oil Company, Houston, Tex.

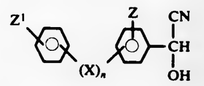
Filed June 2, 1976, Ser. No. 692,180

Claims priority, application United Kingdom, June 11, 1975, 25017/75

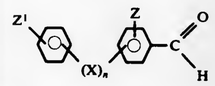
Int. Cl.² C07C 120/00, 121/66

U.S. Cl. 260—465 F **7 Claims**

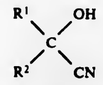
1. A process for making cyanohydrins having the formula:



where *n* is an integer between 0 and 1 inclusive, X is an oxygen or sulfur atom, Z and Z^1 each are independently hydrogen, alkyl, alkenyl, haloalkyl, alkoxy, aryl, cyano or nitro groups having up to 6 carbon atoms which comprises contacting at a temperature between 0° and 50° C at pressures up to 10 atmospheres and for a time ranging from about 10 minutes to about 24 hours a substantially water-insoluble aldehyde having the formula:



where *n*, X, Z and Z^1 are defined as above with a ketocyanohydrin having the formula:



where R^1 and R^2 are alkyl groups having 1 to 6 carbon atoms or R^1 and R^2 together are a 5 or 6 membered alkylene group, in an inert organic solvent in the presence of an organic nitrogen-base wherein the molar ratio of ketocyanohydrin to aldehyde is between about 1 to about 15 and the base is present in an amount equal to about 5 to 50 wt percent based on the ketocyanohydrin.

4,048,211

MODIFICATION OF METHADONE SYNTHESIS PROCESS STEP

Charles J. Barnett, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 10, 1976, Ser. No. 685,034

Int. Cl.² C07C 120/00, 121/78

U.S. Cl. 260—465 E **3 Claims**

1. In a process for preparing a mixture of 2,2-diphenyl-4-dimethylaminovaleronitrile and 2,2-diphenyl-3-methyl-4-dimethylaminobutyronitrile by the reaction of diphenylacetonitrile and 1-dimethylamino-2-chloropropane, the improvement which consists in carrying out the reaction in an inert polar, aprotic solvent having a dielectric constant greater than 28 at 25° C. by forming the sodium salt of diphenylacetonitrile with sodium hydroxide and then adding thereto 1-dimethylamino-2-chloropropane.

4,048,212

PROCESS FOR THE MANUFACTURE OF 1,4-DICYANONAPHTHALENES

Leonardo Guglielmetti, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

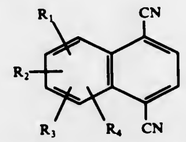
Division of Ser. No. 629,180, Nov. 5, 1975, Pat. No. 4,011,261. This application Sept. 17, 1976, Ser. No. 724,142

Claims priority, application Switzerland, Nov. 14, 1974, 15190/74; Nov. 14, 1974, 15191/74

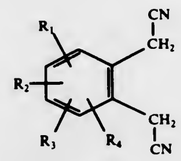
Int. Cl.² C07C 121/62

U.S. Cl. 260—465 H **7 Claims**

1. A process for the manufacture of 1,4-dicyano-substituted bicyclic or tricyclic compounds of formula



wherein R_1 represents hydrogen, halogen, alkyl, alkoxy, carboxy, carbalkoxy, $—CONR_5R_6$, wherein each of R_5 and R_6 independently represents hydrogen or alkyl, or together they complete a 5- or 6-membered heterocyclic ring, sulpho-, $—SO_2NR_5R_6$, in which R_5 and R_6 are as defined hereinbefore, alkylsulphonyl, arylsulphonyl, cyano, nitro, or together with R_2 completes a 6-membered aromatic ring or represents the methylenedioxy radical, R_2 represents hydrogen, halogen, alkyl, alkoxy, carboxy, carbalkoxy, $—CONR_5R_6$, wherein R_5 and R_6 are as defined hereinbefore, alkylsulphonyl, nitro, or together with R_1 completes a 6-membered aromatic ring or represents the methylenedioxy radical, R_3 represents hydrogen, halogen or alkyl and R_4 represents hydrogen, halogen or alkyl, which process comprises reacting an o-xylene dicyanide of formua



wherein R_1, R_2, R_3 and R_4 are as defined hereinbefore, with glyoxal, in the presence of a base and a solvent, at temperatures below 50° C.

4,048,213

(((ARYL)THIO)METHYLENE)-PROPANEDINITRILES

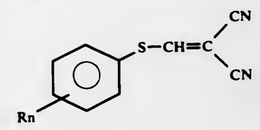
Craig E. Mixan, and R. Garth Pews, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 15, 1976, Ser. No. 742,037

Int. Cl.² C07C 121/70

U.S. Cl. 260—465 F **12 Claims**

1. A compound of the formula

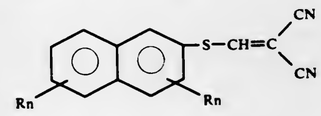


wherein

each R substituent individually represents F, Cl, Br, a straight or branched chain alkyl group, or an alkoxy group, said groups having from 1 to 4 carbon atoms, and

n is an integer with a value of 0, 1 or 2.

11. A compound of the formula



wherein

each R substituent individually represents F, Cl, Br, a straight or branched chain alkyl group, or an alkoxy group, said groups having from 1 to 4 carbon atoms, and

n is an integer with a value of 0, 1 or 2.

4,048,214

PRODUCTION OF ALICYCLIC UNSATURATED COMPOUNDS HAVING PENDENT FUNCTIONAL GROUPS

Günther Wilke, and Paul Heimbach, both of Mulheim (Ruhr), Germany, assignors to Studiengesellschaft Kohle m.b.H., Mulheim (Ruhr), Germany

Division of Ser. No. 250,533, May 5, 1972, Pat. No. 3,965,142, which is a continuation of Ser. No. 845,904, July 29, 1960, abandoned, which is a continuation-in-part of Ser. No. 582,775, Sept. 27, 1966, abandoned. This application Aug. 15, 1975, Ser. No. 605,367

Claims priority, application Germany, Sept. 29, 1965, 2443912

The portion of the term of this patent subsequent to June 22, 1993, has been disclaimed.

Int. Cl.² C07C 67/30

U.S. Cl. 560—128 **1 Claim**

1. A process for preparing 3,7-cyclodecadiene carboxylic acid ethyl ester which comprises contacting butadiene and acrylic acid ethyl ester at a temperature of from about −10° to 200° C in the presence of a O-valent nickel complex combined with tri-(ortho phenyl phenyl) phosphite as the sole electron donor, the mol ratio of butadiene to acrylic acid ethyl ester being at least 2:1, the reaction being carried out for a period of time sufficient to prepare said 3,7-cyclodecadiene carboxylic acid ethyl ester.

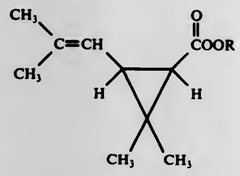
4,048,215

PROCESS FOR PREPARATION OF TRANS-CHRYSANTHEMATES

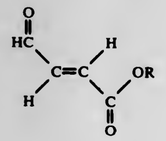
Alain Krief, Boainne, and László Hevesi, Jambes, both of Belgium, assignors to Roussel Ulcaf, Paris, France

Filed Apr. 5, 1976, Ser. No. 673,458
Claims priority, application Belgium, Apr. 7, 1975, 155168
Int. Cl.² C07C *67/30*
U.S. Cl. 560—124 **6 Claims**

1. A process for the preparation of an ester of the formula



wherein R is alkyl of 1 to 6 carbon atoms comprising reacting at least 2 molar equivalent of a triphenyl isopropyl phosphonium halide based on the 4-oxo-2E-butenoate with a strong base and reacting the resulting ylide with an alkyl 4-oxo-2E-butenoate of the formula



4,048,216

PROCESS FOR THE MANUFACTURE OF DICYANOBUTENE

Dhafir Yusuf Wadden, Wilton, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sept. 8, 1976, Ser. No. 721,507
Claims priority, application United Kingdom, Oct. 1, 1975, 40136/75
Int. Cl.² C07C *120/02*
U.S. Cl. 260—465.3 **16 Claims**

1. A process for the manufacture of dicyanobutene which comprises reacting butadiene with hydrogen cyanide in the molar ratio of 1:10 to 10:1 and oxygen or an oxygen-containing gas with oxygen in molar excess in relation to whichever of the hydrogen cyanide and butadiene is used in the smaller molar amount, in the presence of a catalyst comprising copper ions and halide ions and of a solvent for the catalyst at a temperature of 10° to 150° C and a pressure of 0.2 to 50 bar, the amount of copper ion and the amount of halide ion being from 0.001 to 0.2 mole per mole of butadiene.

4,048,217

2-METHYL-3-NITROBENZOIC ACID ESTERS

Otto Rohr, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 9, 1975, Ser. No. 594,471
Claims priority, application Switzerland, July 15, 1974, 9702/74
Int. Cl.² C07C *79/46*
U.S. Cl. 560—20 **5 Claims**

1. 2-Methyl-3-nitrobenzoic acid allyl ester.

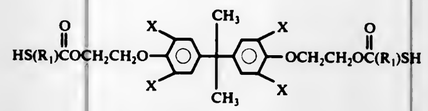
4,048,218

FLAME RETARDANT MERCAPTOCARBOXYLIC ACID ESTERS OF HALOGENATED AROMATIC POLYOLS

Charles R. Morgan, Brookeville, and David E. Kramm, Laurel, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,674
Int. Cl.² C07C *149/20, 149/22*
U.S. Cl. 560—147 **2 Claims**

1. As a composition of matter, a halogen-containing polythiol of the formula



wherein X is a halogen selected from the group consisting of Cl and Br, and R_1 is an alkyl group containing 1–16 carbon atoms.

4,048,219

ACETALS DERIVED FROM NEGATIVELY SUBSTITUTED ALDEHYDES AND POLYNITRO- OR HALONITROETHANOLS

Horst G. Adolph, Beltsville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 461,554, April 17, 1974, abandoned. This application Dec. 12, 1975, Ser. No. 640,091
Int. Cl.² C07C *69/66*
U.S. Cl. 560—156 **3 Claims**

1. A compound which is $RO_2CCH(OR)_2$ wherein R is selected from the group consisting of $-CH_2CYZ(NO_2)$ and $-CH_2C(NO_2)_2CH_3$ wherein Y and Z vary independently and are selected from the group consisting of Cl, F, and NO_2.

4,048,220

PROCESS FOR PREPARATION OF 1,4-HALOALLYLIC ESTERS FROM DIENES

Carlos G. Cardenas, Jacksonville, Fla., assignor to SCM Corporation, New York, N.Y.

Filed May 30, 1975, Ser. No. 582,112
Int. Cl.² C07C *67/04, 67/24, 67/28*
U.S. Cl. 560—237 **9 Claims**

1. In a process for the synthesis of 1,4-haloallylic esters from C_4–C_8 conjugated alkadienes which comprises reacting the conjugated alkadiene, a halogenating agent and a carboxylic acid, said carboxylic acid being a compound selected from the group consisting of alkanoic acids having one to eight carbon atoms, and benzoic acid to form a reaction product mixture containing 1,4-and 1,2-halocarboxylates and 1,4-haloethers, the improvement comprising;

a. adding to said reaction product mixture a catalytic amount of strong acid having a dissociation constant above about 1×10^{-3}; and

b. stirring the mixture at room temperature to 100° C. for a sufficient period of time to convert a substantial portion of the 1,2-halocarboxylate product and haloethers in the reaction mixture to the 1,4-halocarboxylate product.

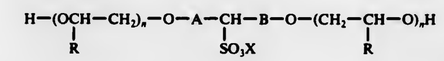
4,048,221

DIOLS CONTAINING SULPHONIC ACID GROUPS BASED ON DIHYDROXY ALKENES

Gerhard Dieter Wolf, Dormagen; Francis Bentz, Cologne, and Gunther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 4, 1975, Ser. No. 555,228
Claims priority, application Germany, Mar. 7, 1974, 2410862
Int. Cl.² C07C *143/42, 143/10;* C08G *63/12*
U.S. Cl. 260—512 C **2 Claims**

1. Dihydroxy sulphonates containing ether groups and corresponding to the general formula



in which,

A and B, which may be the same or different, represent straight-chain or branched alkylene radicals with 1 to 6 carbon atoms, the total number of carbon atoms in A and B being from 3 to 7,

R represents hydrogen C_1–C_4-alkyl or phenyl,

X represents NH_4 or an alkali metal, and

n is a number from 1 to 30.

4,048,222

PROCESS FOR PREPARING TRANS-4-AMINOMETHYL-CYCLOHEXANE-1-CARBOXYLIC ACID

Tsuyoshi Saito, and Kiro Asano, both of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1974, Ser. No. 447,794
Int. Cl.² C07C *99/00*
U.S. Cl. 260—514 J **10 Claims**

1. A process for preparing trans-4-aminomethylcyclohexane-1-carboxylic acid which comprises simultaneously reducing and trans-isomerizing, for 0.5 to 20 hours, at a pressure of 20–200 Kg/cm², at a temperature of 70°–200° C, in the presence of a ruthenium catalyst, 5–50% by weight of solvent of p-aminomethylbenzoic acid or a derivative thereof in an aqueous solution or an alkanol solution of a strong acid selected from the group consisting of hydrochloric acid, sulfuric acid, phosphoric acid, formic acid, acetic acid and mixtures thereof as a solvent, said alkanol having 1 to 6 carbon atoms.

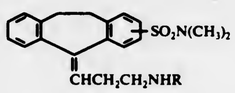
4,048,223

3-DIMETHYLSULFAMOYL-5-[AMINO(ALKYL OR ALKYLIDENE)]-5H-DIBENZO [A,D]CYCLOHEPTENES

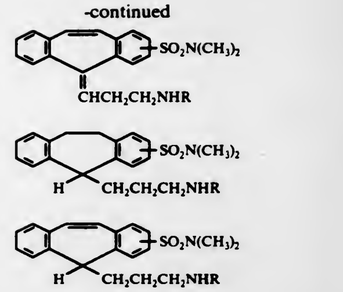
Edward L. Engelhardt, Gwynedd Valley, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 567,166, April 11, 1975, which is a division of Ser. No. 297,710, July 25, 1963, Pat. No. 3,922,305, which is a continuation-in-part of Ser. No. 215,770, Aug. 9, 1962, abandoned, which is a continuation-in-part of Ser. No. 140,223, Sept. 25, 1961, abandoned, which is a continuation-in-part of Ser. No. 120,835, May 24, 1961, abandoned. This application Oct. 6, 1976, Ser. No. 729,939
Int. Cl.² C07C *143/72, 143/84*
U.S. Cl. 260—556 AR **2 Claims**

1. A compound selected from the group consisting of:



-continued



and acid addition salts thereof wherein R is selected from the group consisting of hydrogen and methyl.

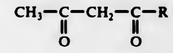
4,048,224

PROCESS FOR RESOLVING ALANINE, 3-FLUORO AND 2-DEUTERO-3-FLUORO-DL-ALANINE

John M. Chemerda, and George Gal, both of Watchung, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 5, 1976, Ser. No. 664,328
Int. Cl.² C07C *101/10;* A61K *31/195*
U.S. Cl. 260—534 C **5 Claims**

1. The process for resolving a DL-mixture of an alanine compound which is alanine, 3-fluoroalanine, or 2-deutero-3-fluoro alanine which comprises reacting approximately equimolar amounts of the alanine compound, a resolving base which is quinine, quinidine, brucine, strychnine, d-α,N,N-trimethylbenzylamine, or 1-α,N,N-trimethylbenzylamine, and a β-dicarbonyl compound of the formula



wherein R is methyl, phenyl or alkoxy of 1–5 carbon atoms, in a solution of a lower alkanol of 1–5 carbon atoms at reflux for ½–3 hours, and separating the salt parts of the diastereomers by crystallization, then treating both separately, first with an alkali metal hydroxide, then with H_3O^+, and recovering the respective individual isomers.

4,048,225

PROCESS FOR THE PRODUCTION OF PURE RACEMIC ACID AND MESOTARTARIC ACID

Gunter Prescher, and Gerd Schreyer, both of Hanau, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Feb. 24, 1976, Ser. No. 660,789
Claims priority, application Germany, Sept. 29, 1975, 2543333
Int. Cl.² C07C *59/14*
U.S. Cl. 260—536 **30 Claims**

1. A process for the production of pure racemic acid and mesotartaric acid comprising reacting an alkali maleate with aqueous hydrogen peroxide in a molar ratio of hydrogen peroxide to maleate of greater than 1:1 and also in the presence of (1) an alkali molybdate or (2) a mixture of an alkali molybdate and an alkali tungstate as a catalyst to form the alkali metal salt of cis-epoxysuccinic acid in solution, passing the reaction solution thus formed over a strongly acidic cation exchanger to form free cis-epoxysuccinic acid and free (1) molybdic acid or (2) a mixture of free molybdic acid and free tungstic acid, hydrolyzing the free cis-epoxysuccinic acid to form a hydrolysis mixture containing racemic acid and mesotartaric acid, removing the (1) molybdic acid or (2) mixture of molybdic acid and tungstic acid with an anion exchanger, crystallizing out the racemic acid from the (1) molybdic acid or (2) mixture of

molybdic acid and tungstic acid free hydrolysis mixture by lowering the temperature of said hydrolysis mixture while retaining the mesotartaric acid in the mother liquor remaining after crystallization of the racemic acid and recovering the mesotartaric acid from the mother liquor.

4,048,226

COPPER CATALYST FOR HYDRATION OF NITRILES TO AMIDES

William Austin Barber, and John Allan Fetchin, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 16, 1972, Ser. No. 226,863
Int. Cl.² C07C *103/133*
U.S. Cl. 260—561 N **2 Claims**

1. In a process for hydration of acrylonitrile to acrylamide wherein acrylontrile and water are reduced in contact with a solid heterogeneous catalyst comprising elemental copper as the active catalytic agent, the improvement wherein said copper catalytic agent consists esstentially of reduced copper produced by reduction of a copper sulfate salt in aqueous solution with a borohydride reducing agent in aqueous alkaline solution.

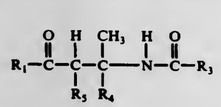
4,048,227

N-(OXOPROPYL)AMIDE DERIVATIVES

Syed K. Mowdood, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 548,481, Feb. 10, 1975, abandoned, which is a continuation of Ser. No. 355,628, April 30, 1973, abandoned, which is a continuation of Ser. No. 159,046, July 1, 1971, abandoned. This application Mar. 3, 1976, Ser. No. 663,391
Int. Cl.² C07C *103/42, 103/62, 103/80*
U.S. Cl. 260—562 P **3 Claims**

1. An amide selected from the group consisting of N-(1,3-diphenyl-1-methyl-3-oxo-propyl)acetamide, N-(1,3-diphenyl-1-methyl-3-oxo-propyl)-4'-(salicyloyl)benzamide, N-(1,3-diphenyl-1-methyl-3-oxo-propyl)benzamide and amides having the structure:



where R_3 is selected from methyl, ethyl, propyl, pentyl, hexyl, heptyl and octyl radicals, where R_1 is a radical selected from 2'-hydroxy benzophenone, 4'-octyl benzophenone, 2'-hydroxy-4'-octyl benzophenone and ortho hydroxy-p-octyl phenyl, R_4 is selected from the radicals of R_1 and from aliphatic hydrocarbon radicals having 1–8 carbon atoms and R_5 is selected from hydrogen and methyl radicals.

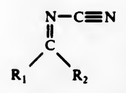
4,048,228

SUBSTITUTED CYANAMIDIC COMPOUNDS

James P. Shoffner, Elk Grove Village, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 611,581, Sept. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 358,285, May 7, 1973, abandoned. This application Jan. 12, 1977, Ser. No. 758,617
Int. Cl.² C07C *119/00*
U.S. Cl. 260—566 R **6 Claims**

1. A substituted cyanamidic compound having the general formula:



in which R_1 and R_2 are selected from the group consisting of hydrogen, aryl, alkyl having from 1 to about 30 carbon atoms, cycloalkyl having from 5 to 12 carbon atoms in the ring, alkyl-substituted cycloalkyl, aryl-substituted cycloalkyl, aralkyl, and alkaryl radicals.

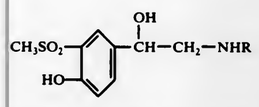
4,048,229

α-AMINOMETHYL-4-HYDROXY-3-METHYLSULFONYL BENZYL ALCOHOLS

Donald F. Colella, West Norriton, Pa., and Carl Kaiser, Haddon Heights, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Jan. 8, 1975, Ser. No. 539,492
Int. Cl.² C07C *91/18*
U.S. Cl. 260—570.6 **5 Claims**

1. A chemical compound of the formula:



or a pharmaceutically acceptable acid addition salt of said compound, wherein:

R is straight or branched chain lower alkyl of from 1 to 6 carbon atoms, cycloalkyl or cycloalkylmethyl, the cycloalkyl moiety having from 3 to 6 carbon atoms, $XC_6H_4CH_2CH(CH_3)$, $XC_6H_4CH_2C(CH_3)_2$ or $XC_6H_4CH_2CH_2CH(CH_3)$; and

X is hydrogen, hydroxy or methoxy.

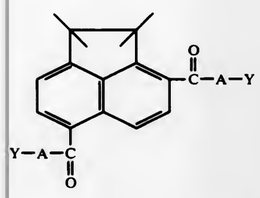
4,048,230

AMINOACETYL-ACENAPHTHENES

Arthur D. Sill, and Francis W. Sweet, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Dec. 21, 1972, Ser. No. 317,248
Int. Cl.² C07C *97/10*
U.S. Cl. 260—570.5 C **5 Claims**

1. A 3,6-bis-basic ketone of acenaphthene having the formula:



wherein A is a straight or branched alkylene chain having from 1 to 6 carbon atoms; and Y is selected from the group consisting of:

a.



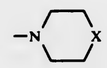
wherein R_1 and R_2 are individually selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkenyl having from 3 to 6 carbon atoms in which the unsaturation is in a position other than the 1-position of the alkenyl group;

b.



wherein *n* is an integer of from 4 to 6, and R_3 is selected from the group consisting of hydrogen, lower alkyl having from 1 to 4 carbon atoms, phenyl and benzyl in which said R_3 group is linked to any of the heterocyclic carbon atoms;

c.



wherein X is selected from the group consisting of oxygen and NR_4, in which R_4 represents hydrogen or a lower alkyl group having from 1 to 4 carbon atoms; and the pharmaceutically acceptable salts thereof.

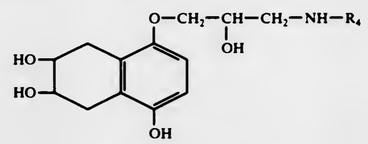
4,048,231

4-[3-(SUBSTITUTED AMINO)-2-HYDROXYPROPOXY]-5,6,7,8-TETRAHYDRO-1,6,7-NAPHTHALENETRIOLS

Frederic P. Hauck, Somerville; Michael E. Condon, Lawrenceville, and Rita T. Fox, Princeton, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 9, 1976, Ser. No. 656,769
Int. Cl.² C07C *93/06*
U.S. Cl. 260—570.7 **5 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof wherein R_4 is lower alkyl having 1 to 4 carbon atoms.

4,048,232

PROCESS FOR THE PRODUCTION OF 3-METHYLMERCAPTOPROPIONALDEHYDE

Edgar Koberstein, Alzenau; Klaus Muller, and Ferdinand Theissen, both of Grossauheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

Filed Sept. 20, 1973, Ser. No. 399,127
Claims priority, application Germany, Apr. 21, 1973, 2320544
Int. Cl.² C07C *47/02*
U.S. Cl. 260—601 R **8 Claims**

1. In a process for the production of 3-methylmercaptopropionaldehyde from acrolein and methyl mercaptan the improvement comprising carrying out the reaction in the presence of hexamethylenetetramine as a catalyst.

4,048,233

PROCESS FOR PREPARING A SYNTHESIS GAS SUITABLE AS STARTING MATERIAL FOR THE OXO-SYNTHESIS

Jurgen Falbe, Dinslaken, and Heinz-Dieter Hahn, Oberhausen-Sterkrade-Nord, both of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen-Holten, Germany

Continuation of Ser. No. 421,318, Dec. 3, 1973, abandoned, which is a continuation of Ser. No. 869,898, Oct. 27, 1969, abandoned. This application Dec. 2, 1975, Ser. No. 636,790
Claims priority, application Germany, Nov. 19, 1968, 1809727
Int. Cl.² C07C *45/02*
U.S. Cl. 260—604 HF **4 Claims**

1. In an oxo process wherein an olefin is hydroformylated to an oxygen-containing product having one or more carbon atom than said olefin, and wherein after recovery of said product there remains a thick oil residue comprising aldehydes, alcohols, acetals, aldols and esters, the improved method of converting said thick oil to useful product comprising cracking said thick oil over a supported nickel catalyst containing in the range of 2 to 25 weight percent nickel in the presence of in the range of 1.5 to 2.5 moles water vapor and 1.6 to 3.0 moles carbon dioxide per g-atom in said thick oil, and at a temperature in the range of 600° C to 900° C and a pressure in the range up to 30 atmospheres, recovering from the material so cracked a synthesis gas mixture consisting essentially of carbon monoxide and hydrogen, and controlling the amount and properties of said water vapor and carbon dioxide used to yield a hydrogen/carbon monoxide ratio in said synthesis gas mixture in the approximate range of 1:1 to 2:1 and recycling said hydrogen and carbon monoxide to said oxo process.

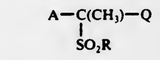
4,048,234

SULPHONES

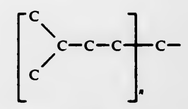
Pierre Chabardès, Sainte Foy les Lyon; Marc Julia, Paris, and Albert Menet, La Mulatiere, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Nov. 6, 1973, Ser. No. 413,246
Claims priority, application France, Nov. 8, 1972, 72.39513
Int. Cl.² C07C *147/06*
U.S. Cl. 260—607 AR **13 Claims**

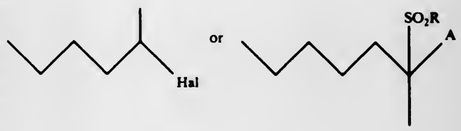
1. A sulphone of the formula:



in which R is substituted or unsubstituted aryl, A is a radical having the carbon skeleton



in which *n* is 1 to 3 and which contains an odd number of hydrogen atoms from $8n + 1$ to $10n + 3$, such that the said radical is saturated, unsaturated, or of the conjugated or unconjugated polyene type, and which may contain a 2,6,6-trimethylcyclohex-1-enyl radical when n is 2 or 3, and Q is hydrogen, a radical within the aforesaid definition of A, or a radical of formula:



where Hal is halogen, R and A are as hereinbefore defined, and the indicated bonds are single or double.

4,048,235

PROPENYLOXY BENZENE COMPOUNDS

Friedrich Karrer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 340,806, March 13, 1973, abandoned. This application June 26, 1975, Ser. No. 590,658
Claims priority, application Switzerland, Mar. 16, 1972, 3935/72; Feb. 16, 1973, 2327/73
Int. Cl.² C07C *43/27*
U.S. Cl. 260—612 R **3 Claims**

1. 4-Benzyl-1-(3-Chloro-2-propenyl-1-oxy)-benzene.
2. 4-Cyclohexyl-1-(3-methyl-2-pentenyl-1-oxy)-benzene.
3. 4-benzyl-1-(2,3-dichloro-2-propenyl-1-oxy) benzene.

4,048,236

PROCESS FOR PREPARING o-ALKOXY-p-ALLYLPHENOLS

Shigeki Nagai; Fumio Iwata, and Kenzi Kubo, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Feb. 17, 1976, Ser. No. 658,452
Claims priority, application Japan, Mar. 7, 1975, 50-27004; Mar. 7, 1975, 50-27005; Mar. 7, 1975, 50-27006
Int. Cl.² C07C *41/00*
U.S. Cl. 260—613 D **14 Claims**

1. In a process for preparing an o-alkoxy-p-allylphenol in which the alkoxy is methoxy or ethoxy comprising contacting an o-alkoxyphenol in which the alkoxy is as defined above, with an allyl halide in the presence of an aqueous solution of an alkali metal hydroxide, the improvement which comprises employing a copper-containing compound and a nitrogen-containing compound as a catalyst, said copper-containing compound being selected from the group consisting of copper (I) chloride, copper (II) chloride, copper (I) bromide, copper (II) bromide, copper (II) sulfate, copper phosphate, copper acetate and copper oxide, the amount of the copper contained in said copper-containing compound being from 0.01 to 0.2 gram atom per one mole of the o-alkoxyphenol, and the said nitrogen-containing compound being selected from the group consisting of ammonia, ammonium chloride, ammonium phosphate, hydroxylamine hydrochloride, allylamine, an alkylamine having from 1 to 4 carbon atoms, an alkoxyalkylamine having 2 to 4 carbon atoms, an ethylenediamine, a carboxylic acid amide having 1 to 4 carbon atoms, a hydrazine having 0 to 4 carbon atoms and an amino acid, a temperature of from about 0° to about 50° C. being employed when the said nitrogen-containing compound is ammonia and a temperature of from about 0° to about 60° C. being employed when the said nitrogen-containing compound is other than ammonia.

4,048,237

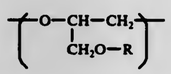
PROCESS FOR THE DEALKYLATION OF T-BUTYL AND T-AMYL ETHERS ON POLYMERIC BACKBONES

David L. Wolfe, and Arthur R. Sexton, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 415,458, Nov. 12, 1973, abandoned. This application June 23, 1975, Ser. No. 589,643
Int. Cl.² C07C *41/00*
U.S. Cl. 260—615 B **12 Claims**

1. In a process for removing at least one —R where —R is tertiary butyl or tertiary amyl from a polymer comprising one or more units represented by the formula

(I)



by contacting at above about 90° C the polymer, which is in the liquid phase, with a sulfonic acid, the improvement comprising contacting the polymer with the sulfonic acid under essentially anhydrous conditions of less than about 7 percent water based on the weight of the polymer.

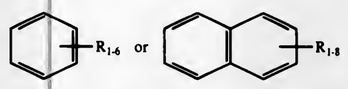
4,048,238

PROMOTED LIQUID PHASE OXIDATION OF ALKYL AROMATIC COMPOUNDS

Lloyd E. Gardner; Darryl R. Fahey, and John E. Mahan, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 7, 1975, Ser. No. 620,464
Int. Cl.² C07C *27/12, 29/00*
U.S. Cl. 260—618 R **10 Claims**

1. A process for oxygenating an alkyl-substituted aromatic compound of the formula



wherein each R is selected from branched or unbranched alkyl groups having from one to about 6 carbon atoms, at least one R being an alkyl group free of quaternary carbon atoms, comprising a liquid phase and elevated temperature contacting of said compound with molecular O_2 in the presence of an alkanoic acid having from 1 to about 6 carbon atoms per molecule, an at least partially soluble Te or Se compound, an inorganic bromine compound, and a compound selected from inorganic nitrates and compounds convertible to inorganic nitrates at conditions of the present process said compounds selected from the group consisting of alkali metal nitrates, nitric acids, and oxides of nitrogen.

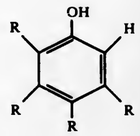
4,048,239

PROCESS FOR THE ORTHO ALKYLATION OF PHENOLS USING ALDEHYDES AND HYDROGEN IN THE PRESENCE OF A COPPER-CHROMIUM CATALYST

William Edward Smith, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Apr. 13, 1976, Ser. No. 676,501
Int. Cl.² C07C *39/06, 37/12*
U.S. Cl. 260—624 C **7 Claims**

1. A process for the selective ortho-alkylation of a phenolic compound of the general formula:



wherein each R is a monovalent substitutent selected from the group consisting of hydrogen, alkyl of 1 to 12 carbon atoms, aryl of 6 to 12 carbon atoms and alkaryl of 7 to 12 carbon atoms, the process comprising reacting at a temperature of from about 185° to about 400° C in the presence of a copper-chromium oxide catalyst said phenolic compound with hydrogen and an aldehyde represented by the formula



wherein R' is hydrogen or an alkyl or alkenyl radical of up to about 12 carbon atoms, straight or branched chain, with said copper-chromium oxide catalyst being chosen from the group consisting of crystalline copper chromites, amorphous mixed oxides of copper and chromium, and mixtures thereof.

4,048,240

METHOD OF OXIDIZING OR BLEACHING A CONTAMINANT IN A NON-AQUEOUS FLUID

Robert Frederick Connelly, Akasaka P.O. Box 10, Tokyo 107-91, Japan

Filed Oct. 19, 1976, Ser. No. 733,877
Claims priority, application Japan, Oct. 22, 1975, 50-126445
Int. Cl.² C07C *9/00, 19/00*
U.S. Cl. 260—652 P **6 Claims**

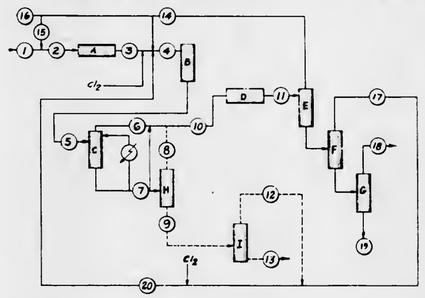
1. A method for oxidizing or bleaching a contaminant in a non-aqueous fluid which comprises forming nitrogen trichloride in situ by the reaction of a chlorine source and a nitrogen source in said fluid, and adsorbing said contaminant and said nitrogen trichioride on a solid adsorbent, and recovering said fluid substantially free of acid contaminant.

4,048,241

PROCESS FOR PREPARING 1,1,1-TRICHLOROETHANE

Theodore S. Boozalis; Darryl E. Cragar; John B. Ivy; Gordon G. Willis, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 462,701, April 22, 1974, abandoned. This application Mar. 31, 1965, Ser. No. 563,940
Int. Cl.² C07C *19/00*
U.S. Cl. 260—658 R **4 Claims**



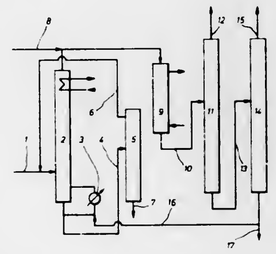
1. A method for preparing 1,1,1-trichloroethane which comprises:
1. reacting ethylene, recycle ethylene from a later step in the process and hydrogen chloride, said hydrogen chloride being obtained from another step in the process, together in a liquid boiling reaction medium in the presence of a Fridel-Crafts aluminum chloride ($AlCl_3$) catalyst thereby to produce predominantly ethyl chloride;
2. reacting in the gas phase in a thermal reactor the so-produced ethyl chloride, recycle ethyl chloride from a later step and recycle 1,1-dichloroethane stream from another step in the process with chlorine at a temperature of from 400° to 550° C;
3. subjecting the so-produced reaction mixture from the thermal chlorination Step (2) to a hydrochlorination reaction in a liquid reaction medium in the presence of a Friedel-Crafts ferric chloride ($FeCl_3$) catalyst to convert vinylidene chloride in the said so-produced thermal chlorination reaction mixture to 1,1,1-trichloroethane and vinyl chloride in said so-produced thermal chlorination reaction mixture to 1,1-dichloroethane;
4. separating the hydrochlorination reaction mixture from Step (3) by distillation to recover a) 1,1,1-trichloroethane, as product, b) a lights fraction predominantly comprised of ethylene, ethyl chloride, and hydrogen chloride for recycling to Step (1), and c) a recycle fraction boiling between about 37° and about 60° C at atmospheric pressure which is principally 1,1-dichloroethane for recycle to Step (2).

4,048,242

PROCESS FOR THE PRODUCTION OF CYCLOPENTENE FROM DICYCLOPENTADIENE

Hubert Lauer, Straberg; Norbert Schenk, and Wulf Schwerdtel, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 8, 1975, Ser. No. 575,661
Claims priority, application Germany, May 24, 1974, 2425289
Int. Cl.² C07C *5/06, 5/16*
U.S. Cl. 260—666 A **17 Claims**



1. In a process for the production of cyclopentene from dicyclopentadiene which comprises splitting dicyclopentadiene under heat to form cyclopentadiene; partially hydrogenating the cyclopentadiene to form a crude cyclopentene containing an impurities fraction boiling at a higher boiling point than cyclopentene and containing cyclopentane; purifying the crude cyclopentene by distillation in which said impurities fraction is separated from the crude cyclopentene; the improvement which comprises recycling at least part of the separated impurities fraction as the impurities fraction is produced in said distillation to the dicyclopentadiene splitting stage, said separated impurities fraction comprising predominantly cyclopentane.

4,048,243

METHOD FOR THE PRODUCTION OF ETHYLBENZENE

Gerhard Ruckelshauss, Dorsten, Germany, assignor to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Jan. 6, 1976, Ser. No. 646,944
Claims priority, application Germany, Mar. 18, 1975, 2511674
Int. Cl.² C07C *15/02*
U.S. Cl. 260—668 D **10 Claims**

1. In the method for the production of ethylbenzene by catalytic dehydrogenation of cycloolefins having 8 carbon atoms and 2 double bonds in the presence of aromatization catalysts, the improvement comprising: said cycloolefins having a 6 carbon atom ring with at least one double bond, said dehydrogenation is carried out at a temperature of about 20° to 150° C and under a pressure of about 0.8 to 2 atmospheres, and said aromatization catalysts consisting essentially of about 5 to 25 percent by weight of an alkali metal and about 75 to 95 percent by weight aluminum oxide support.

4,048,244

DEHYDROGENATION METHOD USING SULFIDED NONACIDIC MULTIMETALLIC CATALYST

John C. Hayes, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 535,078, Dec. 20, 1974, Pat. No. 3,980,726, which is a continuation-in-part of Ser. No. 365,877, June 1, 1973, Pat. No. 3,856,870, which is a continuation-in-part of Ser. No. 27,457, April 10, 1970, abandoned. This application Sept. 10, 1976, Ser. No. 722,320

Int. Cl.² C07C *5/18*

U.S. Cl. 260—668 D **17 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon at dehydrogenation conditions with a sulfided nonacidic catalytic composite comprising a porous carrier material consisting essentially of, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % iridium, about 0.1 to about 5 wt. % alkali metal or alkaline earth metal, about 0.01 to about 5 wt. % tin or lead, and about 0.01 to about 1 wt. % sulfur; wherein the platinum or palladium, iridium, alkali metal or alkaline earth metal and tin or lead are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium and iridium are present in a sulfided state or in a mixture of the elemental metallic state and the sulfided state; wherein substantially all of the tin or lead and alkali metal or alkaline earth metal are present in an oxidation state above that of the elemental metal; and wherein the composite has been sulfided, prior to contact with any hydrocarbon and after substantially all of the platinum or palladium and iridium contained therein have been reduced to the corresponding elemental metallic state, by treatment with a sulfiding gas at conditions selected to incorporate about 0.01 to about 1 wt. % sulfur.

4,048,245

DEHYDROGENATION METHOD AND NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 522,209, Nov. 8, 1974, Pat. No. 3,960,710. This application May 24, 1976, Ser. No. 689,317

The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.

Int. Cl.² C07C *5/18*; B01J *27/06*

U.S. Cl. 260—668 D **34 Claims**

1. A method for dehydrogenating a hydrocarbon comprising contacting the hydrocarbon, at dehydrogenation conditions, with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, and about 0.01 to about 5 wt. % tin; wherein the platinum group metal, catalytically available cobalt and tin are uniformly dispersed throughout the porous carrier material; wherein the average crystallite size of the tin and catalytically available cobalt is less than 100 Angstroms in maximum dimension; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt is present in the element metallic state or in a state which is reducible to the elemental metallic state under dehydrogenation conditions or in a mixture of these states.

19. A nonacidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.1 to about 5 wt. % alkali metal or alkaline earth metal, and about 0.01 to about 5 wt. % tin; wherein the platinum group metal, catalytically available cobalt, tin and alkali metal or alkaline earth metal are uniformly dispersed througout the porous carrier material; wherein the average crystalite size of the tin and catalytically available cobalt is less than 100 Angstroms in maximum dimension; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrogenation conditions or in a mixture of these states; and wherein substantially all of the tin and alkali metal or alkaline earth metal are present in an oxidation state above that of the elemental metal.

4,048,246

DEHYDROGENATION METHOD AND NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 574,222, May 5, 1975, Pat. No. 3,959,121. This application May 24, 1976, Ser. No. 689,314

The portion of the term of this patent subsequent to June 25, 1993, has been disclaimed.

Int. Cl.² C07C *5/18*; B01J *27/06*

U.S. Cl. 260—668 D **35 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at dehydrogenation conditions, with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, and about 0.01 to about 5 wt. % indium; wherein the platinum group metal, catalytically available cobalt and indium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the indium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrogenation conditions or in a mixture of these states.

19. A nonacidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.1 to about 5 wt. % alkali metal or alkaline earth metal, and about 0.01 to about 5 wt. % indium; wherein the platinum group metal, catalytically available cobalt, indium and alkali metal or alkaline earth metal are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrogenation conditions or in a mixture of these states; and wherein substantially all of the indium and alkali metal or alkaline earth metal are present in an oxidation state above that of the elemental metal.

4,048,247

PROCESS FOR THE CONVERSION OF AROMATIC HYDROCARBONS

Ji-Yong Ryu, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1975, Ser. No. 644,783

Int. Cl.² C07C *3/06*

U.S. Cl. 260—671 P **6 Claims**

1. A process for the alkylation of an aromatic hydrocarbon which comprises contacting the aromatic hydrocarbon with an alkylating agent at aromatic alkylation conditions in the presence of a catalyst system consisting essentially of titanium tetrachloride on an activated Group III-A metal oxide having surface hydroxyl groups, said catalyst system having been prepared by passing $TiCl_4$ vapor with an inert gas over said metal oxide at a temperature of 20° to 400° C. for 1 to 10 hours and thereafter thermally treating the resultant $TiCl_4$-containing oxide in an inert atmosphere at a temperature of from about 135° to about 550° C.

4,048,248

PROCESS AND CATALYST FOR THE CONVERSION OF AROMATIC HYDROCARBONS

Ji-Yong Ryu, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1975, Ser. No. 644,786

Int. Cl.² C07C *3/56*

U.S. Cl. 260—671 P **12 Claims**

1. A process for the alkylation of an aromatic hydrocarbon comprising contacting the aromatic hydrocarbon with an alkylating agent at aromatic hydrocarbon alkylation conditions in the presence of a catalyst consisting essentially of titanium tetrafluoride composited with a support which contains surface hydroxyl groups, and recovering an alkylated aromatic hydrocarbon as a product of the process.

4,048,249

DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 593,086, July 3, 1975, Pat. No. 3,972,806. This application July 22, 1976, Ser. No. 707,730

The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.

Int. Cl.² C07C *5/22*

U.S. Cl. 260—673.5 **27 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comrising contacting the hydrocarbon at dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % gallium and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt and gallium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the gallium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrocyclization conditions or in a mixture of these states.

4,048,250

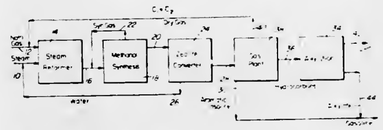
CONVERSION OF NATURAL GAS TO GASOLINE AND LPG

William E. Garwood, Haddonfield; Solomon M. Jacob; James C. Kuo, both of Cherry Hill, all of N.J., and John J. Wise, Media, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 8, 1975, Ser. No. 566,168

Int. Cl.² C07C *3/52, 3/54*

U.S. Cl. 260—683.43 **10 Claims**



1. A process comprising:

reforming natural gas with steam to a synthesis gas product comprising hydrogen and carbon monoxide in ratio of about 1 to 5 to 1;

converting said synthesis gas product to a product comprising water, C_4^- light hydrocarbon gas and C_5^+ gasoline boiling range hydrocarbons containing monocyclic aromatics utilizing at least one catalyst comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least 12 and a constraint index of 1 to 12;

separating the hydrocarbon portion of said conversion product into water, C_4^- hydrocarbon gas and C_5^+ gasoline;

separating said C_4^- gas into C_2^- tail gas, and on alkylation feed fraction comprising saturated and unsaturated C_3 and C_4 hydrocarbons;

recycling said tail gas to said steam reforming;

reacting said alkylation feed fraction in contact with an acid catalyst to gasoline boiling range aliphatic products comprising C_7 and C_8 alkylate; and

admixing said alkylate gasoline and said aromatic gasoline.

4,048,251

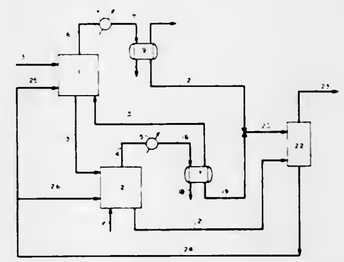
AUTOREFRIGERATED ISOMERIZATION PROCESS

Robert P. Cahn, Millburn, and Michael Siskin, Maplewood, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Jan. 2, 1976, Ser. No. 646,285

Int. Cl.² C07C *5/28*

U.S. Cl. 260—683.68 **26 Claims**



1. In an isomerization process which comprises reacting a hydrocarbon feed stock which comprises a saturated acyclic hydrocarbon having at least four carbon atoms, a saturated alicyclic hydrocarbon having at least six carbon atoms or mixtures thereof with hydrogen in a reaction zone comprising at least one reactor having therein at least one temperature zone and with a catalyst comprising a metal halide selected from the group consisting of the bromides and the chlorides of aluminum and gallium and the chlorides, bromides and fluorides of niobium, tantalum, molybdenum or tungsten and including in said isomerization zone at least an equal molar amount, based on the metal halide, of a hydrogen halide selected from the group consisting of hydrogen fluoride, hydrogen chloride and hydrogen bromide, at least a portion of said metal halide being dissolved in said hydrogen halide, said reaction zone being maintained at isomerization conditions which include at least a portion of the catalyst and hydrocarbon feed stock being in the liquid phase, thereby forming a reaction product of enhanced octane, the improvement which comprises controlling the temperature in said at least one temperature zone by vaporizing at least a portion of said hydrogen halide.

4,048,252

COATING COMPOSITIONS AND PROCESS THEREFOR

Klaus Behmel, Graz, Austria, assignor to Vianova-Kunstharz, A.G., Vienna, Austria

Continuation-in-part of Ser. No. 298,388, Oct. 17, 1972, Pat. No. 3,882,188. This application May 5, 1975, Ser. No. 574,447
Claims priority, application Austria, Oct. 29, 1971, 9369/71; Mar. 22, 1972, 2430/72; Mar. 10, 1972, 1995/72
Int. Cl.[2] C08G 63/06; C08L 77/00
U.S. Cl. 260—850 34 Claims

1. Process for producing thermosetting coating compositions from saturated polyesters containing hydroxy groups and aminoplast resins, characterized in that

A. n mols of one or more compounds having two free or latent hydroxy groups are reacted with

B. $n+1$ mols of a dicarboxylic acid which will not form an anhydride, to form a polyester AB carrying terminal carboxy groups,

C. thereafter each mol of polyester AB is reacted with an amine alcohol of the general formula

$$HO-(CX_2)_n-NH_2$$

n being 2 or 3 and X is equal or different and stands for hydrogen, or an alkyl, aryl or hydroxy alkyl radical, the amount of AB to amine being equal to $(e_s - e_p)\ M_A$ wherein M_A is the molecular weight of the amine alcohol; e_s equals the number of carboxy equivalents in the polyester; and e_p equals the number of hydroxy equivalents in the polyester, and not exceeding 2 mols amine alcohol per mol polyester AB, to provide a polyester containing terminal oxazoline groups,

D. reacting ABC with an aldehyde in an amount sufficient to introduce sufficient hydroxyl groups at the carbon atoms alpha to the oxazoline group of ABC in order that ABC will undergo reaction with an aminoplast resin, and

E. combining ABCD with 10 - 60 percent by weight of an aminoplast resin.

4,048,253

ADHESIVE COATINGS FROM ETHER-TYPE POLYESTER, URETHANE ELASTOMER, AND POLYISOCYANATE

Seiichi Ooba, Odawara, and Shinichi Hirayama, Fukuyama, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Division of Ser. No. 428,998, Dec. 27, 1973, abandoned. This application Sept. 10, 1975, Ser. No. 612,131
Claims priority, application Japan, Dec. 27, 1972, 48-2208
Int. Cl.[2] C08G 18/42; C08L 75/00
U.S. Cl. 260—858 10 Claims

1. An adhesive composition consisting essentially of an ether group containing polyester obtained by the heat treatment of a polyethylene terephthalate with at least one glycol having at least 3 carbon atoms to substitute the ethylene glycol components in the polyethylene terephthalate by said glycol having at least 3 carbon atoms, wherein 30 to 100% of the ethylene glycol components in the polyethylene terephthalate are substituted by said glycol having 3 or more carbon atoms

a linear thermoplastic high molecular weight urethane elastomer; and

a polyisocyanate which differs from said elastomer.

4,048,254

BLEND OF THERMOPLASTIC POLYMERS WITH BLOCK RADIAL BUTADIENE-STYRENE POLYMERS

Edward Lawrence Hillier; Glen Henry Graham, and Warren Evan Eichelberger, all of Ashland, Ohio, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 26, 1975, Ser. No. 607,978
Int. Cl.[2] C08L 27/00, 51/00
U.S. Cl. 260—859 R 22 Claims

1. An unvulcanized radial block copolymer mixture having a high degree of clarity and resealability consisting essentially of (a) from about 10 - 90% by weight of a butadiene-styrene radial block copolymer having a butadiene content in the range of about 85 - 60% by weight and a styrene content in the range of about 5 - 40% by weight, (b) from about 90 - 10% by weight of a butadiene-styrene radial block copolymer having a different butadiene-styrene content in the range of about 85 - 60% by weight and a styrene content in the range of about 15 - 40% by weight and (c) about 5 - 75% by weight of said radial block copolymer mixture of a clear polymeric material selected from the group consisting of polyether and polyester urethane polymers and mixtures of said clear polymeric material, both said radial block copolymers having an average molecular weight of at least 150,000 as measured by inherent viscosity in toluene, wherein said polyether urethane polymers are the reaction products of polyether glycols and aromatic diisocyanates and said polyester urethanes are the reaction products of linear hydroxyl terminated aliphatic polyesters, an aromatic diisocyanate and an aliphatic diol.

4,048,255

BLEND OF THERMOELASTIC POLYMERS WITH BLOCK RADIAL POLYMERS USED AS PHARMACEUTICAL SEALING AND RESEALING MATERIALS

Edward Lawrence Hillier; Glen Henry Graham, and Warren Evan Eichelberger, all of Ashland, Ohio, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Aug. 26, 1975, Ser. No. 607,979
Int. Cl.[2] C08L 27/00, 51/00
U.S. Cl. 260—859 R 11 Claims

1. A radial block copolymer mixture having a high degree of resealability and noncoring properties consisting essentially of (a) from about 10 - 90% by weight of a butadiene-styrene radial block copolymer having a butadiene content in the range of about 85 - 60% by weight and a styrene content in the range of about 15 - 40% by weight, (b) from about 90 - 10% by weight of a butadiene-styrene radial block copolymer having a differing butadiene content in the range of about 85 - 60% by weight and a styrene content in the range of about 15 - 40% by weight and (c) about 3 - 75% by weight of said block copolymer mixture of chlorinated polyethylene, which results in a nonclear composition, both said radial block copolymers having an average molecular weight of at least 150,000 as measured by inherent viscosity in toluene.

4,048,256

NORMALLY-SOLID, BIOABSORBABLE, HYDROLYZABLE, POLYMERIC REACTION PRODUCT

Donald James Casey, Ridgefield, and Martin Epstein, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 1, 1976, Ser. No. 691,749
Int. Cl.[2] C08G 63/12, 63/52
U.S. Cl. 260—860 13 Claims

1. A normally-solid, bioabsorbable, hydrolyzable, polymeric reaction product of (A) a polyglycolic acid composition and (B) a polyester of diglycolic acid and an unhindered glycol; wherein the amount of (B) used is between about 2% and 50%, by weight, based on the total weight of (A) and (B); wherein (A), before reaction with (B), has a molecular weight of at least 30,000 and (B), before reaction with (A), has a molecular weight sufficiently high so as to provide a polymeric material possessing self-supporting film-forming properties.

4,048,257

PIGMENTABLE LOW SHRINK THERMOSETTING POLYESTERS

Donald R. Stevenson, Dover, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 520,455, Nov. 4, 1974, abandoned, and a continuation-in-part of Ser. No. 516,446, Oct. 21, 1974, abandoned, and a continuation-in-part of Ser. No. 514,372, Oct. 15, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,757
Int. Cl.[2] C08L 67/06
U.S. Cl. 260—862 10 Claims

1. A molded part produced from a pigmented low-shrink, thermosetting, unsaturated polyester resin molding composition curable to form a low-profile molded structure having a uniformly pigmented surface, the improvement comprising:

said molding resin composition being a mixture comprising by weight at least 25% of a thermosetting ethylenically unsaturated polyester polymer, about 5% to 25% of lightly cross-linked preformed polymer particles, and about 30% to 70% of an ethylenically unsaturated monomer copolymerizable with said thermosetting polyester polymer for forming a thermoset matrix binding said preformed polymer particles;

said lightly cross-linked, preformed polymer particles having an average particle size between about 15 and 100 microns and being a linear polymer selected from the group consisting of copolymerized ethylenic monomers, polyesters, polyurethanes, polyamines, epoxides, alkyd polyesters, polyethers, and polycarbonates, said linear polymer cross-linked with minor amounts of multifunctional monomer providing cross-linking sites in the preformed polymer particles, said preformed polymer particles having a cross-linking density of between about 0.005 to 2 equivalent cross-linking sites per kilogram of said preformed polymer.

4,048,258

METHOD FOR PREPARING MOISTURE CURABLE POLYMERS CONTAINING RANDOMLY DISTRIBUTED SITES OF CONJUGATED OLEFINIC UNSATURATION

Francis P. Baldwin, Summit; James A. Rae, Cranford, and Gary Ver Strate, Matawan, all of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 507,227, March 18, 1974, abandoned. This application Apr. 23, 1976, Ser. No. 679,809
Int. Cl.[2] C08F 255/08, 255/10, 279/02
U.S. Cl. 260—879 29 Claims

1. A method for preparing an elastomeric polymer, curable by addition of a catalytic amount of water which comprises reacting a polymer containing randomly distributed sites of conjugated olefinic unsaturation, under anhydrous conditions, with up to 1 mol of a cyclic unsaturated anhydride per mol of conjugated units present in the polymer, then blending the reaction product with a polyvalent metal compound wherein the polyvalent metal compound is an oxide, hydroxide or alkoxide.

4,048,259

ANAEROBICALLY COMPOSITIONS CONTAINING ACRYLIC ESTER-ACIDS

Bernd Wegemund, Haan, and Joachim Galinke, Langenfeld, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany

Filed July 2, 1976, Ser. No. 702,229
Claims priority, application Germany, July 4, 1975, 2529891
Int. Cl.[2] C08F 4/32, 20/10, 120/68
U.S. Cl. 260—881 14 Claims

1. An anaerobically setting adhesive and sealing composition consisting essentially of a polymerizable acrylic ester of spreadable viscosity, an organic aerobically inactive, anaerobically active peroxide polymerization initiator therefor, and an effective amount as latent agent improving the adhesiveness of said composition for metals when anaerobically set, in the range of 3% to 25% by weight, of an acrylic ester-acid of the formula:

$$CH_2=\underset{\displaystyle R}{\underset{|}{C}}-COO-\underset{\displaystyle R'}{\underset{|}{X}}-COOH$$

wherein R represents a substituent selected from the group consisting of —H and $—CH_3$, R' represents a substituent selected from the group consisting of H, halogen, —COOH, —CN, and loweralkyl, and X represents a divalent C_{1-6} hydrocarbon group.

4,048,260

THERMOPLASTIC COMPOSITIONS WITH IMPROVED PROCESSING PROPERTIES

Franz Haaf, Bad Durkheim; Guenter Hatzmann, St. Ilgen; Karl Herrle, Ludwigshafen, and Petr Simak, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed July 6, 1976, Ser. No. 702,974
Claims priority, application Germany, July 12, 1975, 2531197
Int. Cl.[2] C08L 27/06
U.S. Cl. 260—884 9 Claims

1. A thermoplastic composition containing a mixture of a vinyl chloride polymer and an acrylic ester copolymer or methacrylic ester copolymer, which mixture has been manufactured by polymerization of

A. from 99.9 to 80 parts by weight of vinyl chloride or of a mixture of vinyl chloride with up to 30 percent by weight of one or more other monomers copolymerizable with vinyl chloride, in aqueous dispersion, in the presence of

B. from 0.1 to 20 parts by weight of a copolymer of an acrylic acid ester or a methacrylic acid ester which contains

B1. From 99.9 to 60 percent by weight of copolymerized units of an acrylic acid alkyl ester or methacrylic acid alkyl ester of 2 to 6 carbon atoms in the alcohol component,

B2. from 0.1 to 30 percent by weight of units which contain a lactone ring structure and

B3. from 0 to 39.9 percent by weight of units of one or more other copolymerizable monomers, the percentages being based on the above copolymer B.

4,048,261

VULCANIZABLE COMPOSITIONS OF A HALOGEN-CONTAINING POLYMER AND A DIENE-NITRILE RUBBER HAVING ACTIVE HALOGEN CURE SITES

Philip Hubert Starmer, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 10, 1975, Ser. No. 630,452
Int. Cl.[2] C08L 23/28, 47/00
U.S. Cl. 260—888 11 Claims

1. A vulcanizable composition comprising (A) a polymer blend of (1) from about 1 part to about 99 parts by weight of a diene/nitrile rubber having a halogen content of from about 0.2 percent to about 5 percent by weight based on the polymer and comprised of interpolymerized units of from 50 percent to about 98 percent by weight of a non-halogen containing conjugated diene monomer having from 4 to about 10 carbon atoms, from about 1 percent to about 49 percent by weight of a non-halogen containing monoolefinically unsaturated nitrile monomer having 3 to about 6 carbon atoms, and from about 0.5 percent to about 20 percent by weight of a halogen-containing monomer have a Q value of from about 0.1 to about 6 and selected from the group consisting of halogen-bearing vinylidene hydrocarbons, halogen-containing acrylates, and halogen-containing vinyl ketones, and (2) from about 1 part to about 99 parts by weight of a halogen-containing polymer

selected from the group consisting of halogen-containing acrylate rubbers, halogen-containing diene rubbers, epihalohydrin polymers, and polyfluorocarbons, and (B) a cure system for the polymer blend consisting essentially of from about 0.1 part to about 7 parts by weight of curative ingredients for the halogen-containing polymer of (A) (2) above, all parts by weight based upon 100 parts by weight of the polymer blend.

4,048,262

POLYDODECENAMERS AS REINFORCING RESINS FOR ELASTOMERS

Horst Haag; Karl-Heinz Nordsiek; Roland Streck, all of Marl, and Dieter Zerpner, Oer-Erkenschwick, all of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Dec. 10, 1975, Ser. No. 639,364
Claims priority, application Germany, Jan. 2, 1975, 2500025
Int. Cl.² C08L 9/00, 23/00
U.S. Cl. 260—889 **14 Claims**

1. A method for improving the properties of elastomeric vulcanizates comprising compounding with 100 parts by weight of an elastomer prior to vulcanization 25–250 parts by weight of a polydodecenamer reinforcing resin having a reduced specific viscosity, measured in decahydronaphthalene at 135° C., of 0.5 - 6 dl./g., and a trans-vinylene content of more than 60%, obtained by polymerication of a mixture of
   a. 50–95% by weight of cyclododecene,
   b. 5–40% by weight of cyclododecadiene, and
   c. up to 10% by weight of 1,5,9-cyclododecatriene, in a solvent by a methathesis catalyst; and vulcanizing the compounded elastomer.

4,048,263

RUBBER MODIFIED FIRE RETARDANT POLYMER COMPOSITIONS

Yoon C. Lee, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 644,492
Int. Cl.² C08L 27/00, 47/00
U.S. Cl. 260—890 **10 Claims**

1. A composition of matter comprising:
A. from 48 to 94 percent by weight based on the total weight of the molding composition of a polyblend of:
   a. a matrix polymer of
      1. from 55 to 85 percent by weight of a styrene monomer;
      2. from 5 to 25 percent by weight of a maleic anhydride monomer; and
      3. from 10 to 20 percent by weight of a brominated monomer selected from the group consisting of bromophenyl acrylates, bromophenyl methacrylates, bromoneopentyl acrylate and bromoneopentyl methacrylates with the proviso that the amount of bromine in the polymer is at least 6 percent by weight and
   b. a rubber component wherein the amount of rubber in the polyblend is in the range of from 1 to 30 percent by weight based on the weight of the polyblend;
B. from 3 to 12 percent by weight based on the total weight of the molding composition of a metal oxide;
C. from 3 to 25 percent by weight based on the total weight of the molding composition of a smoke suppressant which is selected from the group consisting of smoke suppressing hydrates, carbonates and borates, and
D. from 0 to 15 percent by weight of a brominated aromatic fire retardant additive.

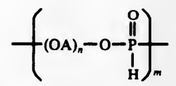
4,048,264

POLYMERIC PHOSPHORAMIDES

Derek Redmore, Ballwin, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 26,402, April 7, 1970, abandoned, which is a division of Ser. No. 596,798, Nov. 25, 1966, Pat. No. 3,524,908. This application Oct. 3, 1975, Ser. No. 619,516
Int. Cl.² C07F 9/24
U.S. Cl. 260—929 **6 Claims**

1. A polymeric phosphoramide compound selected from the group consisting of polymeric phosphoramides and hydrohalide salts thereof prepared by reacting
   1. a polymeric ester of the formula



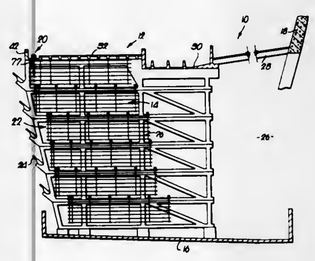
   where A is an alkylene radical,
   n is about 1 to 50 and
   m is about 2 to 40 and
   2. ammonia, an aliphatic or cycloaliphatic or arylamine having at least one primary or secondary amino group or a mixture of said amines, in the presence of an aliphatic polyhalide reactant and a tertiary amine to form the polymeric phosphoramides and in the presence of an aliphatic polyhalide reactant alone to form the hydrohalide salts thereof.

4,048,265

DEICEING APPARATUS FOR WATER COOLING TOWERS INCLUDING SLOTTED DISTRIBUTION BASIN AND SELECTIVELY ACTUATABLE VALVE MECHANISM

Homer E. Fordyce, Kansas City, Mo., and William C. Carter, Lenexa, Kans., assignors to The Marley Company, Mission, Kans.

Filed Mar. 1, 1976, Ser. No. 662,560
Int. Cl.² F28C 1/04
U.S. Cl. 261—111 **11 Claims**



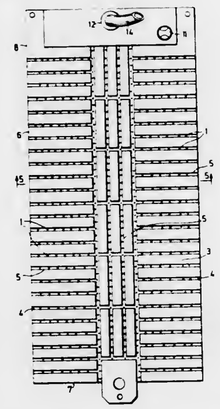
1. A water cooling tower comprising:
a hot water distribution basin having a generally horizontal bottom wall;
fill structure beneath said distribution basin for dispersing hot water gravitating from the latter for enhancing the evaporative cooling of the hot water;
a cold water collection basin beneath said fill structure for collecting cooled water gravitating from the latter;
means for directing ambient derived air currents through said fill structure for cooling of the hot water gravitating therethrough; and
selectively actuatable deicing means for deicing the outer margin of said tower, including
horizontal, elongated slot means extending through the bottom wall of the distribution basin at an area of said bottom wall generally parallel to and overlying the outer margin of said tower, said slot means being configured and arranged for downward delivery of sufficient quantities of hot water therethrough directly onto at least a portion of said outer margin of the tower to effect deicing thereof under cold weather conditions;
elongated, shiftable cover means overlying said slot means in at least partial water flow-blocking disposition thereto; and
selectively actuatable means for shifting said cover means as desired from said flow-blocking disposition to a deicing position permitting free flow delivery of hot water through said slot means, and for selective return of said cover means to said flow-blocking disposition when deicing of the tower is complete.

4,048,266

AIR BUBBLING MAT FOR USE IN BATHTUBS FOR PRODUCING BUBBLING AND FULL-FOAM BATHS

Ludwig G. Baumann, Ch 9527 Im Reckholder, Niederhelfenschwil, Switzerland (CH9527)

Filed July 21, 1975, Ser. No. 597,353
Claims priority, application Germany, Aug. 30, 1974, 2441686; Nov. 11, 1974, 2453291
Int. Cl.² B01F 3/04
U.S. Cl. 261—122 **4 Claims**



1. An air bubbling mat for use in a bathtub which can be selectively utilized to produce either a bubbling bath or a full-foam bath, comprising a substantially flat, elongated mat having opposed upper and lower walls forming respectively the upper and lower surfaces, opposed end and side walls interconnecting said upper and lower walls about the periphery of said upper and lower walls defining a hollow mat body, means disposed in said mat body to define a manifold chamber, said manifold chamber having an inlet means which is adapted to be connected to a source of compressed air, partition means disposed between said upper and lower walls to define therewith a plurality of air distributing channels through which air is distributed when said mat is utilized to produce a bubbling bath, said upper wall having a plurality of grooves formed on the surface thereof, said grooves extending transversely of each of said air distributing channels, and said grooves having a plurality of apertures formed therein disposed in communication with the associated air distributing channel through which the air distributed to said distributing channels flows when used to make a bubbling bath, and a second partition means disposed between said upper and lower walls and defining with said side walls separate foaming air channels, said side walls having a series of openings formed therein communicating with said foaming air channels through which air is permitted to flow outwardly from said mat when said mat is utilized as a full-foam bath mat, said manifold having a plurality of outlets, said outlets being respectively in communication with each of said plurality of air distributing channels and said foaming air channels, and means for selectively opening and closing said outlets for selectively distributing air from said manifold to one or more of said air distributing channels or to said foaming air channel only.

4,048,267

AERATION SYSTEM WITH FOLDABLE LOW-LOSS DOWNCOMERS AND METHOD OF OPERATION THEREOF

James Donald Walker, and Leslie F. Kline, both of Aurora, Ill., assignors to Chicago Bridge & Iron Company, Chicago, Ill.

Continuation of Ser. No. 217,523, Jan. 13, 1972, abandoned. This application Mar. 21, 1974, Ser. No. 453,260
Int. Cl.² B01F 3/04
U.S. Cl. 261—122 **8 Claims**



5. Air diffuser apparatus including a low-loss downcomer for delivering air from a supply fitting to a header carried at its foot for deep submergence in an aeration tank, the downcomer being foldable at an intermediate level by virtue of hinge means rigidly associated with upper and lower sections of the downcomer and hinged together about an axis which passes in substantially nonintersecting relationship to the air flow space within the downcomer, the hinged parts, with their upper and lower sections, being substantially sealed to one another when the hinge means is closed and breaking open to the surrounding medium as the downcomer folds and the downcomer being readily manipulatable to bring the header to adjacency with the supply fitting;
spring means effective when the hinge mean is closed for holding it closed firmly to maintain a seal and proper alignment of the sections.

4,048,268

STABILIZATION METHOD

Nelson Henry Ludwig, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 551,194, Feb. 19, 1975, abandoned. This application Dec. 4, 1975, Ser. No. 637,697
Int. Cl.² B29C 17/14
U.S. Cl. 264—15 **8 Claims**

1. The method of stabilizing the antibiotic tylosin for use in an animal feed premix and in animal feeds, which method comprises the steps of:
A. intimately blending a mixture comprising from about 1 to about 40 percent on a dry weight basis of the antibiotic, about 50 to about 98 percent on a dry weight basis of a finely ground diluent selected from the group consisting

of solvent-extracted soybean feed and alfalfa meal, with water, or intimately blending a mixture comprising from about 1 to about 20 percent on a dry weight basis of the antibiotic, about 50 to about 98 percent on a dry weight basis of a finely ground diluent selected from the group consisting of soybean mill run, milo flour, wheat middlings, and corn flour, with water, to form an intimate admixture;

B. blending the intimate admixture (A) with a physiologically-acceptable binder selected from the group consisting of hydrolyzed starch, gelatin, polyvinylpyrrolidone, soy protein, cellulose, bentonite, acacia powder, and lignin sulfonate, the binder amounting to from about 1 to about 10 percent of the weight of the components of step (A), to produce a wet but freeflowing particulate material;

C. extruding the blend of (B) under pressure through round perforations of from about 0.3 mm. to about 1.0 mm. in diameter, forming an extrudate of elongated strands having a length generally exceeding the cross-sectional dimension;

D. reducing the strands of extrudate (C) into particles of from about one to about five times their cross-sectional dimension in length; and

E. drying the particles from (D) at a temperature ranging from about room temperature to about 70° C. to a residual moisture content of from about 5 to about 12 percent.

4,048,269

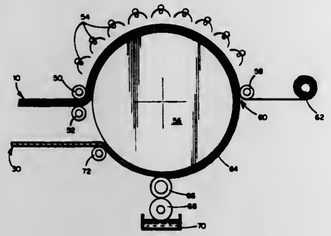
EMBOSSED SUEDE MATERIAL AND METHOD OF PREPARING SAME

Reuben Wisotzky, Lexington, and John C. Bolger, Chelmsford, both of Mass., assignors to Pandel-Bradford, Inc., Lowell, Mass.

Division of Ser. No. 458,644, April 8, 1974, abandoned. This application Jan. 8, 1976, Ser. No. 647,588

Int. Cl.² B29D *27/00*

U.S. Cl. 264—25 **4 Claims**



1. A method of preparing a preferentially embossed suede-like sheet material, which method comprises:

a. providing an integral laminate sheet material, the sheet material comprising a paper sheet, a plasticized vinyl-chloride resin foam layer adjacent the paper sheet, a solid plasticized vinyl-chloride resin adjacent the foam layer and a woven fabric adjacent the other surface of the solid layer;

b. placing the laminate sheet material into contact with the surface of a heated rotating drum and partially about the surface of the drum, with the fabric portion of the laminate against the heated surface of the drum;

c. heating the external paper sheet material of the laminate with infrared-radiant heaters, while rotating the sheet laminate material on the surface of the rotating drum, to heat the laminate sheet material by the heat of the rotating drum and the infrared heaters to a temperature of from about 250° to 350° F;

d. stripping the paper sheet from the sheet material with a portion of the foam layer while heating the laminate to provide a suede-like sheet material comprising the woven fabric and the solid layer, with a hot plasticized vinyl-chloride resin foam surface layer on the rotating drum, the foam surface having a suede-like surface appearance and composed of tensile-ruptured foam cells; and

e. embossing a desired surface design onto the suede-like foam surface, while retaining the fabric of the suede-like sheet material against the surface of the rotating heated drum, by lightly contacting the hot suede-like surface of the sheet material with slightly more than contacting pressure by an embossing roll, the heated suede-like material passed between the surface of the embossing roll and the surface of the drum, the embossing roll having a temperature lower than the temperature of the hot suede surface to be embossed, certain surface areas of the embossing roll not being placed in contact with certain portions of the original suede-like surface of the sheet material during the embossing step, while the contacting portion of the embossing roll forms a smooth, continuous, nonsuede-like skin layer composed of the cellular vinyl-chloride resin in the contacting areas to provide an embossed suede-like material having peak and valley areas, the unembossed peak areas characterized by the original suede-like tensile-ruptured surface and original cellular foam density, and the embossed valley areas comprising a nonsuede-like surface skin layer thereon and a denser cellular foam thereunder than under the peak areas.

4,048,270

DISPOSABLE MOLD FORM AND METHOD OF MOLDING

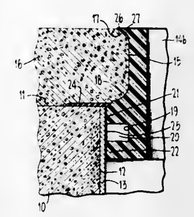
William J. Stegmeier, 878 Erickson Road, Concord, Calif. 94520

Division of Ser. No. 761,726, Sept. 23, 1968, Pat. No. 3,967,422. This application July 24, 1975, Ser. No. 598,700

The portion of the term of this patent subsequent to Mar. 18, 1992, has been disclaimed.

Int. Cl.² E04B *1/16*

U.S. Cl. 264—34 **3 Claims**



1. In a method of forming a coping along the upper edges of the generally vertical walls of a swimming pool, the steps of providing an integral elongated form section of a foamed synthetic plastic material having a surface portion thereof configured in the finished shape to be imposed thereby upon such coping and having also an attachment portion facing in the same general direction as said configurated surface portion, equipping said upper edges of said generally vertical walls with a water-impervious finish layer, securing one side of a relatively non-stretchable double-faced pressure-sensitive tape strip to said attachment portion and securing the other side thereof to said water-impervious finish layer on said walls adjacent the upper edges thereof with said configurated surface portion of said form section projecting thereabove, spreading a moldable mass of concrete against said form section, and stripping said form section and said tape strip from attachment to said water-impervious finish layer after said concrete mass is cured, whereby a concrete coping is provided along said wall upper edges.

4,048,271

DRY PROCESS FOR FORMING POLYCARBONATE MEMBRANES

Robert E. Kesting, Irvine, Calif., assignor to Chemical Systems, Inc., Irvine, Calif.

Division of Ser. No. 293,943, Oct. 2, 1972, Pat. No. 3,945,926, which is a continuation-in-part of Ser. No. 190,415, Oct. 18, 1971, abandoned. This application Jan. 5, 1976, Ser. No. 646,735

Int. Cl.² B29D *27/04*

U.S. Cl. 264—41 **17 Claims**

1. The dry process for preparing high void volume, integral, microporous membranes consisting essentially of the steps of:

preparing a casting solution containing from about 3 to about 10 grams of polycarbonate homopolymers or copolymers having a molecular weight of between about 46,000 ([η] = 75) and 145,000 ([η] = 190) in about 100 ml of solution consisting essentially of from about 30 to about 90 ml of solvent for said polymer and from about 5 to about 50 grams of nonsolvent swelling agent for said polymer,

casting the solution upon a substrate, and

allowing the casting solution to evaporate to completion thereby forming an integral, high void volume, microporous membrane.

4,048,272

METHOD FOR PREPARING IMPROVED EXPANDED POLYSTYRENE SHEET

John P. Spicuzza, Jr., Pittsburgh, Pa., assignor to ARCO Polymers, Inc., Philadelphia, Pa.

Filed Jan. 2, 1976, Ser. No. 646,293

Int. Cl.² B29D *27/00*

U.S. Cl. 264—45.3 **11 Claims**

1. In a process for producing microcellular expanded styrene polymer sheet by extruding a mixture containing styrene polymer, a blowing agent and a nucleating system, the improvement comprising extruding with said mixture about 0.002 to 2%, based on the total weight of styrene polymer, of hydrophobic silica, said hydrophobic silica being uniformly distributed throughout said mixture whereby said sheet has improved flexability.

4,048,273

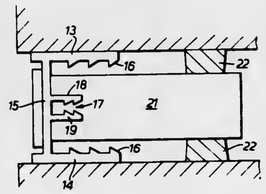
METHOD OF MAKING A STRUCTURAL ELEMENT

Alan Pryce-Jones, Cheltenham, England, assignor to Jeremy Bruce Holt, Cheltenham, England, a part interest

Filed Oct. 17, 1975, Ser. No. 623,650

Int. Cl.² B29D *27/00*

U.S. Cl. 264—46.5 **3 Claims**



1. A method of making a structural element which includes:

a. providing a mould element,

b. providing a plurality of frame members including spaced parallel limbs the inner faces of which are provided with keying formations,

c. assembling the frame members to form a framework in engagement with the mould element so that the framework cooperates with the mould element to define the periphery of a mould cavity, and

d. injecting foamed plastics material into said mould cavity so as to form a structural element which comprises foamed plastics material surrounded by the framework and mechanically interlocked with the keying formations on the inner faces of the frame members.

4,048,274

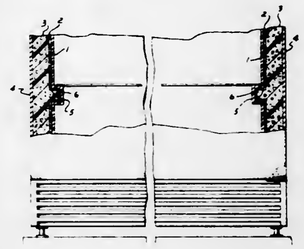
PROCESS FOR REFRIGERATOR CONSTRUCTION

A. Russell Hoge, and Robert A. Myers, both of Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 594,927, July 10, 1975, abandoned, which is a division of Ser. No. 535,548, Dec. 23, 1974, abandoned. This application May 26, 1976, Ser. No. 690,115

Int. Cl.² B29D *27/04*

U.S. Cl. 264—46.5 **10 Claims**



1. In a process for preparing a refrigerator cabinet comprising an exterior surface, a sheet of ABS which forms the interior surface of the refrigerator, and a layer of a gas filled cellular insulation material which is interposed between the exterior surface and the ABS sheet, said process comprising (1) placing the member which forms the exterior surface and the ABS sheet in a spaced apart relationship; (2) introducing a foamable resin composition containing a halogenated apliphatic or cycloaliphatic hydrocarbon between the exterior surface and the ABS sheet; and (3) foaming the foamable resin composition to form a cellular insulation material wherein a major amount of the cells in the insulation material are filled with a halogenated aliphatic or cycloaliphatic hydrocarbon, the improvement which comprises using an ABS sheet which has bonded thereto a coextensive sheet of a rubber-modified high nitrile polymer wherein the rubber-modified high nitrile polymer is facing the exterior surface and is in laminated contact with the foam in the refrigerator cabinet wherein the rubber-modified high nitrile polymer contains from 45 to 85 percent by weight, based on the total polymer weight of a nitrile monomer unit and from 5 to 30 percent by weight of a synthetic or natural rubber component.

4,048,275

CROSS-LINKING AND FOAMING INJECTION MOLDING PROCESS FOR ETHYLENIC POLYMERS

Teruyoshi Usamoto, Higashi Osaka; Kenji Miyawaki, Ibaraki; Toshiaki Shiota, Takatsuki; Hideki Takeuchi, Toyonaka, and Yoshio Tadokoro, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 30, 1975, Ser. No. 627,409

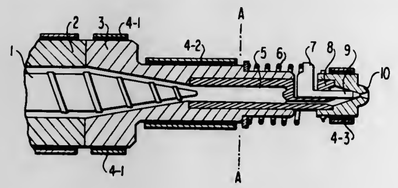
Claims priority, application Japan, Oct. 30, 1974, 49-125916

Int. Cl.² B29D *27/00*; B29F *1/08*

U.S. Cl. 264—54 **8 Claims**

1. A process for injection molding a cross-linked foamed ethylenic polymer article, which comprises plasticizing a molding composition comprising an ethylenic polymer, a cross-linking agent, and a foaming agent without substantially decomposing the cross-linking agent and the foaming agent, transporting said plasticized composition to a holding chamber, holding and heating said molding composition tempera-

ture and time sufficient to decompose the cross-linking agent and the foaming agent in said holding chamber while maintaining sufficient pressure on said composition to prevent foaming



thereof and to thereby cross-link said ethylenic polymer to a gel percentage of less than about 40%, and then injecting said molding composition into a mold to form said article.

4,048,276

STRUCTURAL BUILDING COMPONENTS AND METHOD FOR PRODUCTION ON THE BASIS OF LATERITE

Torben Christen Hansen, and Thomas Ringsholt, both of Lyngby, Denmark, assignors to Frede Hilmar Drostholm, Vedbaek, Denmark

Continuation of Ser. No. 290,260, Sept. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 236,205, March 20, 1972, abandoned. This application Mar. 6, 1975, Ser. No. 556,015

Claims priority, application United Kingdom, Mar. 22, 1971, 7517/71

Int. Cl.² C04B *41/30*

U.S. Cl. 264—79 **25 Claims**

1. A method for production of high strength structural building components, comprising preparing a moldable mixture of lime, laterite and water, the laterite comprising laterite particles containing iron oxide and silicon and aluminum, in the form of oxides and/or silicates thereof, and containing at least 8 weight percent of aluminum calculated as Al_2O_3 and at least 4 weight percent of Fe_2O_3, and the silicon content of the laterite including from 10 to 50 percent of quartz sand based on the weight of the laterite, the laterite comprising from 55 to 93 weight percent, the line from 5 to 15 weight percent and the water from 10 to 20 weight percent of the moldable mixture, the moldable mixture having the consistency of a free flowing mass, forming the components by pressure molding the mixture in a mold to form components which are sufficiently coherent to withstand transport, handling and stacking without damage, the pressure applied to the mixture being sufficient to provide a density in said components of 2000 to 2200 kg/m³, transporting the components to a curing station comprising an enclosure having a moisture saturated environment at atmospheric pressure and curing the pressure molded components at atmospheric pressure in said moisture saturated environment at a temperature between 70° C and 100° C, the curing being continued until the components attain a compressive strength of at least 140 kg/cm² and a lime (as CaO) content of less than one or two percent.

2. A method for production of structural building components, comprising preparing a moldable mixture of lime, laterite and water, the laterite comprising laterite particles containing iron oxide and silicon and aluminum, in the form of oxides and/or silicates thereof, forming the building components from said mixture by applying pressure to said mixture in an amount sufficient to provide a density in said components of 2000 to 2200 kg/m³, the laterite comprising from 55 to 93 weight percent and the lime from 5 to 15 weight percent of the moldable mixture and the quantity of water being sufficient to yield pressure formed components which are sufficiently coherent and shape retaining to withstand transport, handling and stacking without damage, transporting the components to a curing station, and at said station curing the pressure formed components at atmospheric pressure in a moisture saturated environment and at a temperature of from 60° C to 100° C, the curing being continued until the components have a compressive strength of at least 140 kg/cm² and a lime (as CaO) content of less than one or two percent.

4,048,277

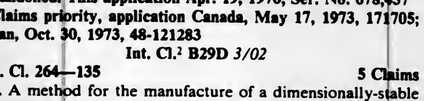
SPLICE FOR USE DURING THE THERMAL STABILIZATION OF A FLAT MULTIFILAMENT BAND OF AN ACRYLIC FIBROUS MATERIAL COMPRISING AT LEAST TWO SEGMENTS

Robert A. Breznak, Clifton, and James A. Parker, Somerville, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Dec. 15, 1975, Ser. No. 641,066

Int. Cl.² D06M *3/36*

U.S. Cl. 264—83 **7 Claims**



1. In a process for the thermal stabilization of a substantially flat multifilament band of an acrylic fibrous material wherein the ends of at least two discrete band segments are joined and continuously are passed in a successive manner in the direction of their length through a heated thermal stabilization zone while maintaining the original fibrous configuration of the same substantially intact for a residue time sufficient to render said band black in appearance, and non-burning when subjected to an ordinary match flame; the improvement comprising joining the ends of at least two of said band segments by (1) surrounding an end of each band segment with a fabric which is capable of withstanding the heated thermal stabilization zone having a weave configuration through which heat of reaction is permitted to dissipate with a portion of said fabric extending beyond each enclosed end of said band segment to form a substantially flat fabric extension, (2) sewing said fabric to each band segment in the area were said band is enclosed by said fabric with a thread which is capable of withstanding the heated thermal stabilization zone while maintaining the enclosed portion of said band in a substantially flat configuration, (3) overlapping a pair of said substantially flat fabric extensions in the absence of any substantial overlap of the acrylic fibrous material of each band segment with each of said band segments extending in an opposite direction, and (4) sewing together said overlapped substantially flat fabric extensions with a thread which is capable of withstanding the heated thermal stabilization zone to join said band segments of acrylic fibrous material in the absence of any substantial overlap of the acrylic fibrous material of each band segment.

4,048,278

METHOD FOR MANUFACTURING DIMENSIONALLY-STABLE SHAPED ARTICLES

George D. Mosky, Lancaster, Canada, assignor to Intalite International N.V., Netherlands Antilles

Continuation-in-part of Ser. No. 470,648, May 16, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,457

Claims priority, application Canada, May 17, 1973, 171705; Japan, Oct. 30, 1973, 48-121283

Int. Cl.² B29D *3/02*

U.S. Cl. 264—135 **5 Claims**

1. A method for the manufacture of a dimensionally-stable shaped article for use as a ceiling coffer, comprising the steps of soaking asbestos paper sheets in a bath containing a mineral acid selected from the group consisting of sulfuric acid, hydrochloric acid and phosphoric acid, applying in a substantially pressureless manner at least one sheet of the soaked asbestos paper sheet as a layer to a mold and drying at normal room temperature, whereby to form a shrink-proof article without application of heat.

4,048,279

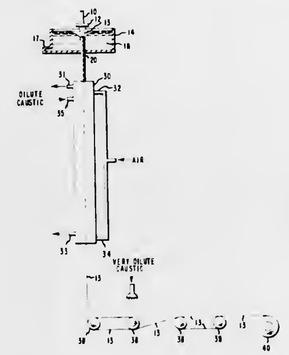
WASHING PROCESS FOR INORGANIC ACID CONTAINING POLYAMIDE FIBERS

Joseph Zimmerman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 25, 1975, Ser. No. 590,373

Int. Cl.² D01F *6/00*; B08B *3/00*

U.S. Cl. 264—184 **3 Claims**



1. Process for the continuous high-speed production of neutral to very slightly basic polyamide yarn comprising in sequence

1. extrusion of an inorganic acid containing spin dope through a plurality of orifices,
2. coagulation of the yarn in an aqueous bath,
3. stripping of entrained liquid,
4. treating the yarn with a caustic solution having a concentration of 0.3 to 1.3%,
5. stripping the liquid from the yarn,
6. treating the yarn with a caustic solution having a concentration of 0.01 to 0.1%,
7. drying the yarn and
8. winding the yarn in a package.

4,048,280

METHOD OF MANUFACTURING ELECTROTECHNICAL ARTICLES

Jury Gordeevich Borzyak, Armyansky pereulok, 1/3, kv. 76; Alexandr Ivanovich Borisenko, prospekt Pravdy 7, kv. 274; German Mikhailovich Tjuflin, Moskovsky prospekt, 192/4, kv. 46; Alexandr Ivanovich Rolik, ploschad Teveleva 2/2, kv. 58, and Alexandr Ivanovich Yakovlev, 601 mikroraion 23, kv. 54, all of Kharkov, U.S.S.R.

Filed Sept. 17, 1971, Ser. No. 181,413

Int. Cl.² B29C *15/00*; B29D *7/10*

U.S. Cl. 264—102 **4 Claims**

1. A method for the manufacture of electrotechnical articles, such as magnetic core members for electrical machines, from a magnetodielectric composition which comprises mixing together iron powder and a thermosetting resin containing a curing agent in vacuo to remove air inclusions and thermosetting reaction volatile products; batching the resulting composition; rolling the batched composition to obtain flat sheet blanks having a thickness greater than that of finished articles; molding and simultaneously pre-forming said sheets to obtain compacted blanks; and curing said blanks first under natural conditions and thereafter by step-wise heat treatment.



4,048,281

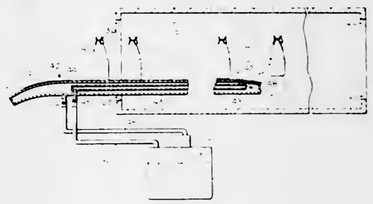
METHOD OF ASSEMBLING PLASTIC WRAP ON A GLASS CONTAINER

Marshall G. Brummett, Toledo; Russell W. Heckman, Perrysburg; George A. Nickey, and James E. Taylor, both of Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 17, 1976, Ser. No. 658,651

Int. Cl.² B29C *27/20*

U.S. Cl. 264—230 **7 Claims**



1. The method of making a container having an encircling plastic covering thereon comprising conveying containers in line in an upright position along a first path, moving heat shrinkable thermoplastic sleeves in line in an upright position along a second path that includes a portion in underlying axial registry with containers being conveyed along said first path, transferring the registered sleeves to overlie the respective containers while in axial registry in said first and second paths, moving the containers and sleeves thereon in said first path to and through a heating zone wherein the sleeves are sufficiently heated to completely shrink them snugly over the container exterior surface, holding the sleeves in said transferred position while moving the containers and sleeves to and through the heating zone by passing them over a sleeve supporting bar underlying said first path in engagement with the end of said sleeves until they are heated sufficiently to shrink said sleeves annularly and hold the sleeves in said position on the containers, and maintaining the surface of the supporting bar engaging said sleeves at a temperature below 200° F to avoid sticking of the plastic thereon.

4,048,282

SOLVENT EXTRACTION OF COPPER WITH DILUTION OF THE ORGANIC PHASE

William Hopkin, Bristol, England, assignor to Metallurgical Processes Limited, Nassau, Bahamas and I.S.C. Smelting Limited of London, London, England

Filed Aug. 5, 1975, Ser. No. 602,023

Claims priority, application United Kingdom, Aug. 23, 1974, 37096/74

Int. Cl.² C01G 3/00

U.S. Cl. 423—24 4 Claims

1. In a method of extracting copper from an aqueous ammoniacal leach solution which is derived from the leaching of copper dross and which contains impurity cations, comprising contacting the leach solution with a copper-selective organic phase comprising a copper selective hydroxy-oxime organic extractant in an organic diluent to take copper into the organic phase to form a highly loaded copper organic phase, washing the highly loaded copper organic phase with a dilute acid and stripping the copper from the washed highly loaded copper organic phase into an aqueous phase, the improvement comprising reducing the concentration of copper in the copper-loaded organic phase by from 5% to 20% before the highly loaded copper organic phase is washed with the dilute acid.

4,048,283

REMOVAL OF HEAVY METALS FROM AQUEOUS SOLUTIONS

John Malcolm Lee, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 4, 1976, Ser. No. 693,048

Int. Cl.² C01G 37/14

U.S. Cl. 423—92 12 Claims

1. A process for removing organic Pb compounds from an aqueous brine solution, the said process comprising,

providing an acidic aqueous brine solution containing organic Pb compounds,

adding to said solution chromate or dichromate ions in an amount sufficient to oxidize at least a substantial portion of said organic Pb compounds,

subjecting the solution to a temperature above ambient temperature but below boiling temperature for a time sufficient to cause oxidation of the organic Pb,

raising the pH of the solution to a pH of at least about 7.0 by adding OH^- ions thereto, thereby causing precipitation of Pb chromate, and

separating the precipitate from the solution.

4,048,284

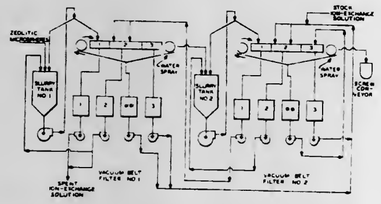
METHOD AND SYSTEM FOR ION-EXCHANGING PARTICLES

Norman H. Horton, and John L. Smith, both of Tallahassee, Fla., assignors to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Mar. 8, 1976, Ser. No. 665,095

Int. Cl.² F01C 19/02; B01J 8/00, 29/06

U.S. Cl. 423—112 8 Claims



1. A method for ion-exchanging zeolitic particles of a size suitable for use in fluidized bed processes with an ion-exchange solution containing cations capable of replacing cations in the zeolitic particles which comprises carrying out the ion-exchange reaction in stages by continuously passing the zeolitic particles, in series, over a continuously moving horizontal vacuum belt filter where the particles are in the form of a thin porous cake, into an agitated vessel to form a slurry and then over another continuously moving horizontal vacuum belt filter where the zeolitic particles are again in the form of a thin porous cake, while continuously contacting the zeolitic particles during such passage countercurrently with ion-exchange liquid, and washing the ion-exchanged zeolitic particles with water only after discharge from the last belt filter inthe series.

4,048,285

PROCESS FOR THE EXTRACTION OF ALUMINA FROM MINERALS, ROCKS AND INDUSTRIAL BY-PRODUCTS

Karoly Szepesi; Lajos Mészáros, both of Budapest; János Majer, Godollo; József Zöldi, Tatabanya, all of Hungary, and Karl Entzmann, Vienna, Austria, assignors to Chemokomplex Vegyipari Gep-es Berendezes Export-Import Vallalat, Budapest and Tatabanyai Szenbanyak, Tatabanya, both of, Hungary

Continuation of Ser. No. 562,399, March 27, 1975, abandoned. This application Sept. 30, 1976, Ser. No. 728,283

Claims priority, application Germany, Apr. 4, 1974, 2416407

Int. Cl.² C01F 7/12, 7/18

U.S. Cl. 423—132 11 Claims

1. A process for recovering alumina present in an alumina-bearing material selected from the group consisting of minerals, rocks, and industrial waste products derived from such minerals or rocks comprising the steps of:

a. kneading particles of said alumina-bearing materials with lime and water to form a homogeneous plastic mass, said lime being present in an amount of 1 to 3 moles per mole of alumina in said alumina-bearing material;

b. forming said homogeneous plastic mass into a plurality of shaped bodies;

c. maintaining said shaped bodies under hydrothermal conditions at a temperature of up to 200° C for a time sufficient for the bodies to harden by hydraulic setting and to solubilize the alumina in the bodies by reaction with said lime;

d. comminuting the hardened bodies; and

e. leaching the solubilized alumina from the comminuted hardened bodies.

4,048,286

PROCESS FOR THE DECONTAMINATION OF WASTE MATERIALS

Viktor Rossmaier, deceased, late of Oberaudorf, Germany, by Emmy Rossmaier, heiress, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

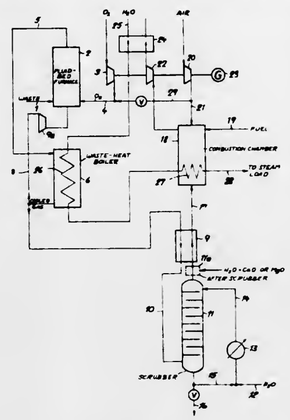
Filed Mar. 25, 1976, Ser. No. 670,541

Claims priority, application Germany, Apr. 1, 1975, 2514198

Int. Cl.² C01B 17/60

U.S. Cl. 423—242 10 Claims

1. A process for the decomposition of a carbonaceous and sulfur-containing waste comprising the steps of burning said waste with a combustion-sustaining gas stream having an oxygen concentration of at least 50% by volume to produce an exhaust gas containing carbon oxides and sulfur dioxide; and scrubbing said sulfur dioxide from said exhaust gas to produce



a scrubbed gas substantially free from sulfur oxides and a scrubbing liquid containing sulfur dioxide.

4,048,287

SULFUR RECOVERY METHOD

Raymond L. Kelleher; Ivan A. Shirk, both of Spokane, Wash., and Timothy J. O'Leary, deceased, late of Spokane, Wash., assignors to The Corporation of Gonzaga University, Spokane, Wash.

Continuation of Ser. No. 429,280, Dec. 28, 1973, abandoned, which is a continuation of Ser. No. 157,951, June 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 788,460, Jan. 2, 1969, abandoned. This application Aug. 18, 1975, Ser. No. 605,330

Int. Cl.² C01B 17/60

U.S. Cl. 423—242 4 Claims

1. In the method of removing sulfur dioxide (SO_2) from the exhaust gases of a sulfide ore smelter or the like, wherein the exhaust gases contain at least about 2% SO_2 and are subjected to liquid spray scrubbing on a continuous basis in scrubbing tower means at essentially ambient pressure to remove SO_2 prior to discharge of the gases to the atmosphere and wherein the scrubbing liquid outflow from the scrubbing tower means is processed to remove the SO_2 and at least in part recycled through the scrubbing tower means, the improvements in said method comprising:

a. by refrigeration, cooling the exhaust gases to a temperature of about 40°–60° F. prior to introduction thereof to said scrubbing tower means;

b. by refrigeration, cooling the scrubbing liquid recycled through said scrubbing tower means so that it is also at a temperature of about 40°–60° F. during contact thereof with the exhaust gases;

c. recycling the scrubbing liquid from one cycling tank to said scrubbing lower means, while simultaneously passing scrubbing liquid previously collected in another cycling tank to a solid sulfite separation state wherein lime is added to the scrubbing liquid in substantially stoichiometric proportion to precipitate and remove essentially all of the SO_2 content from the liquid as calcium sulphite, and returning the desulphitized liquid to such other cycling tank;

d. interrupting the recycling of the scrubbing liquid from the one cycling tank to the scrubbing tower means at a time when the SO_2 content thereof is still at a concentration substantially less than the saturation concentration thereof in the scrubbing liquid so that no SO_2 containing precipitate is present in the scrubbing tower means, and initiating the recycling of desulphitized scrubbing liquid to said scrubbing tower means from another cycling tank;

e. interrupting the recycling of the scrubbing liquid from such other cycling tank to the scrubbing tower means at a time when the SO_2 content thereof is still at concentration substantially less than the saturation concentration thereof in the scrubbing liquid so that no SO_2 containing precipitate is present in the scrubbing tower means; and

f. desulphitizing the scrubbing liquid in such other cycling tank in like manner as in step (c) while recycling desulphitized scrubbing liquid from the one cycling tank to the scrubbing tower means, and so on, cyclically;

the spray scrubbing of the exhaust gases being thereby carried out on a continuous basis at low temperature and without any SO_2 containing precipitate being present in the scrubbing tower means, while the scrubbing liquid is thereby desulphitized on a batch basis.

4,048,288

METHOD FOR PREVENTING EVAPORATION-CONDENSATION CAKING OF SODIUM CHLORIDE AT HIGH TEMPERATURES

Gerard C. Sinke; Martin A. Langhorst, and James A. May, Sr., all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 14, 1975, Ser. No. 558,403

Int. Cl.² C01D 3/26, 3/04, 3/22

U.S. Cl. 423—267 13 Claims

1. A method for preventing caking in a body of granules of sodium chloride at temperatures within the range of from about 400° C up to the melting point of sodium chloride, or up to temperatures of at least about 600° C but less than the melting point of sodium chloride where melting occurs at such temperatures due to impurities in the sodium chloride, comprising:

1. dispersing throughout the sodium chloride an effective amount of a solid additive selected from the group consisting of binary oxides, carbonates, sulfates, phosphates, and hydroxides of Group II and Group IV elements, or mixtures thereof, wherein at least about 75% of the additive has a particle size sufficiently small to pass through a No. 230 sieve; and

2. following said dispersing step, maintaining the sodium chloride as granules substantially free from caking at a temperature within the above recited temperature range for a period of time greater than that for which a substantially identical body of sodium chloride having no such additive could be maintained without caking under substantially identical conditions, said maintaining step including heating said sodium chloride to said temperature if said sodium chloride is at a lesser temperature at the time said dispersing step is carried out.

4,048,289

STABILIZATION OF WET-PROCESS PHOSPHORIC ACID

Sergio Ortega Pierres, Mexico City, Mexico, assignor to Fertilizantes Fosfatados Mexicanos, S.A., Mexico City, Mexico

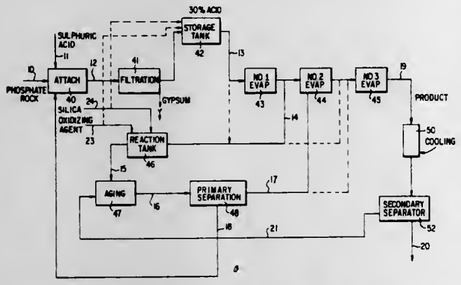
Continuation of Ser. No. 424,578, Dec. 13, 1973, abandoned. This application Nov. 10, 1975, Ser. No. 630,492

Int. Cl.² C01B 25/16, 25/22; C05B 7/00

U.S. Cl. 423—317 5 Claims

1. A method for the preparation of merchant grade phosphoric acid stabilized against sludge formation which comprises concentrating a wet process phosphoric acid solution having a P_2O_5 content of about 28% to 32% by weight and containing in said solution Fe, Al, Si, F, and Na and K impurities to a P_2O_5 content of about 35% to 42% by weight; adding to the concentrated acid solution in a reaction tank, about 0.1 to 1.0% by weight of inorganic oxidizing agent to change the redox potential of the solution to increase the solubility of said Fe and Al impurities and to maintain same in said acid solution, adding to

said concentrated acid solution in said reaction tank about 0.1 to 1.0% of activated silica; aging the thus treated solution for a time sufficient for said silica to react with said F impurities in said concentrated acid solution and cause formation of a solid phase precipitate and a liquid phase of stabilized phosphoric acid containing substantial amounts of said Fe and Al impurities; separating the liquid and solid phases by a first centrifugation; concentrating the separated liquid phase from the first centrifugation to a P_2O_5 content of at least 50% by weight; separating the solids formed in the concentrated liquid phase by a second centrifugation to obtain a clarified product solution having less than 1% solids; and recycling the solids from the second centrifugation to said reaction tank.

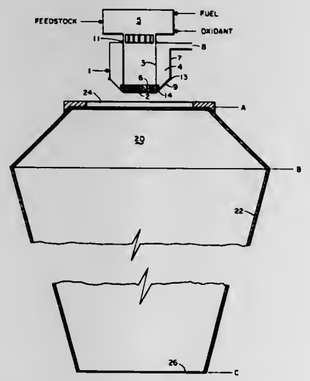


4,048,290

PROCESS FOR THE PRODUCTION OF FINELY-DIVIDED METAL AND METALLOID OXIDES

Kam Bor Lee, Chelmsford, Mass., assignor to Cabot Corporation, Boston, Mass.

Filed Jan. 28, 1976, Ser. No. 653,116
Int. Cl.² C01B *33/18, 13/14*
U.S. Cl. 423—336 **6 Claims**



1. In a process for the production of finely-divided metal or metalloid oxides by vapor phase hydrolysis of corresponding metal or metalloid halide feedstocks in the presence of a flame provided by combustion of a hydrogen-containing fuel with an oxygen-containing gas, the improvement which comprises: flowing the feedstock vapor through burner means as one or more enclosed streams thereof and discharging it therefrom into a reaction zone, and

at the dischange end of said burner means, transpiring through a porous diffusion means a hydrogen-containing fuel gas or vapor at a fouling preventive rate along and surrounding each boundary of each such enclosed feedstock vapor-containing steam.

4,048,291

PROCESS FOR PREPARING HYDROXYLAMMONIUM SALTS

Hussain El-Ghatta, Chur, GR, and Johann Karl Forrer, Domat-Ems, GR, both of Switzerland, assignors to Inventa AG fur Forschung und Patentverwertung, Zurich, Switzerland

Filed May 2, 1975, Ser. No. 573,854
Claims priority, application Switzerland, May 10, 1974, 6406/74
Int. Cl.² C01B *21/14*
U.S. Cl. 423—387 **11 Claims**

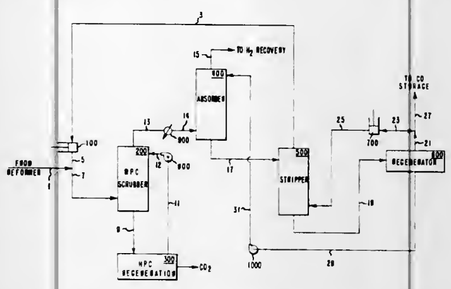
1. In a process for the preparation of hydroxyl ammonium salts by hydrogenation of nitric oxide in an acid medium in the presence of a platinum conatining catalyst, the improvement which comprises said catalyst containing 15 to 50 atom percent of selenium based on said platinum, and said acid medium having a concentration of at least 2N throughout said hydrogenation.

4,048,292

CO PURIFICATION PROCESS

Ralph V. Green, Charleston, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 29, 1976, Ser. No. 681,593
Int. Cl.² C01B *31/18;* B01D *53/34*
U.S. Cl. 423—415 A **7 Claims**



1. A process for the preparation of high purity CO from a CO_2-free gaseous stream containing at least about 25% volume CO and also containing H_2 comprising

a. countercurrently contacting the gaseous stream with a liquid aqueous absorbent solution containing dissolved therein as copper ammonium C_{1-2} acylate from 10 to 18 pbw copper in an amount equivalent to from about 0.2 to about 2.0 gallons of absorbent solution per ft³ (26.7 - 267 l/m³) of CO in the gaseous stream at a CO partial pressure of at least about 30 psia (2.1 kg/cm$_2$), by which CO reacts with the copper compound to form a stable water-soluble complex, small amounts of H_2 and other gases are absorbed into the absorbent solution and the non-absorbed and non-complexed components of the gaseous stream are separated from the absorbent solution;

b. while maintaining the absorbent solution above its decomplexing pressure, countercurrently contacting the absorbent solution with a stream of purified gaseous CO, as defined hereinbelow, by which the absorbed gases are desorbed and separated from the absorbent solution;

c. regenerating the absorbent solution from step (b) by reducing the pressure thereon to a level at which the CO is decomplexed and purified gaseous CO is separated from the absorbent solution;

d. recycling purified gaseous CO to step (b) of the process in an amount equivalent to from about 0.03 to about 0.5 ft³ of CO per ft³ of total gaseous CO product separated in step (c); and

e. recycling regenerated absorbent solution to step (a) of the process.

4,048,293

PROCESS FOR PURIFYING A SULFUR DIOXIDE CONTAINING GAS

Philippe Renault; André Deschamps, both of Noisy le Roe; Sigismond Franckowiak, Rueil Malmaison, and Claude Dezael, Maisons Laffitte, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 29, 1976, Ser. No. 671,711
Claims priority, application France, Apr. 11, 1975, 75.11592
Int. Cl.² C01B *17/04*
U.S. Cl. 423—574 L **17 Claims**

1. In a process for purifying a sulfur dioxide containing gas, which comprises the steps of (a) washing the gas with an aqueous solution of ammonia and/or ammonium sulfite and then separating the gas from the resulting aqueous solution of increased ammonium sulfites content, (b) heating the aqueous solution obtained in step (a) to decompose at least a portion of the sulfites and produce a stream of gas containing sulfur dioxide, ammonia and steam, (c) reacting hydrogen sulfide with the gas stream obtained in step (b), thereby producing elemental sulfur and a gas containing ammonia, steam and unconverted hydrogen sulfide, and separating the elemental sulfur from said gas, and (d) recycling to step (a) the ammonia obtained in step (c), the improvement which comprises subjecting the ammonia-containing gas separated in step (c) to controlled oxidation to selectively convert residual hydrogen sulfide to sulfur dioxide, and conducting step (d) by recycling ammonia and at least one member of the group consisting of sulfur dioxide and ammonium sulfite to step (a).

4,048,294

PREPARATION OF STANNIC OXIDE

Carl R. Gloskey, Wilton, Conn., and Stanley Littman, Edison, N.J., assignors to M&T Chemicals Inc., Greenwich, Conn.

Filed Nov. 3, 1975, Ser. No. 628,361
Int. Cl.² C01G *19/02*
U.S. Cl. 423—618 **1 Claim**

1. A method for preparing particulate stannic oxide exhibiting an optical density of between 200 and 400, a bulk density of between 6.3 and 9.0 grams per cubic inch, and a Gardner color of between 3 and 6, said method comprising the steps of

a. maintaining a uniformly agitated aqueous solution of sodium stannate exhibiting a pH of between 8 and 9,

b. gradually adding to said uniformly agitated solution over a period of between 5 and 15 minutes a stoichiometric amount of an aqueous solution containing an alkali metal bicarbonate, thereby precipitating hydrated stannic oxide, and isolating said stannic oxide,

c. washing the precipitated oxide with an aqueous solution of sodium carbonate,

d. washing the precipitated oxide with aqueous sulfuric acid exhibiting a pH between 3.5 and 4,

e. calcining the hydrated stannic oxide at a temperature between 950° and 1050° C. for a period of time sufficient to convert the hydrated stannic oxide to an anhydrous form exhibiting a Gardner color of between 3 and 6, and

f. classifying the anhydrous oxide as required to remove a first fraction wherein 90% of the particles are larger than about 4 microns,

g. recovering the remaining fraction of said anhydrous oxide.

4,048,295

PROCESS FOR MAKING EXTRUDATES FROM ALUMINUM OXYHYDRATES

Martin Wassermann, Hamburg, and Arnold Meyer, St. Michaelisdonn, both of Germany, assignors to Condea Chemie GmbH, Germany

Filed Dec. 16, 1975, Ser. No. 641,170
Claims priority, application Germany, Dec. 21, 1974, 2460921
Int. Cl.² C01F *7/02*
U.S. Cl. 423—626 **10 Claims**

1. A process consisting essentially of peptizing with an aqueous acid selected from the group consisting of nitric acid, acetic acid, citric acid, hydrochloric acid, sulfuric acid, formic acid, propionic acid, monochloracetic acid, dichloroacetic acid and trichloroacetic acid at a concentration of 0.3 to 10% a Boehmite aluminum oxyhydrate containing 65 to 85% by weight Al_2O_3, a bulk density of 500 to 700 g/l, a B.E.T. specific surface area of 140 to 300 m²/g and an average particle size below 100 microns, then adding an aqueous solution of ammonia or an ammonia liberating compound having a concentration of 0.1 to 3%, there being employed 50 to 70 parts of acid solution and 35 to 50 parts of ammonia solution per 100 parts of aluminum oxyhydrate, to form an extrudable mass, extruding said extrudable mass, drying and then calcining the extrudate.

4,048,296

RADIOPHARMACEUTICAL SCANNING AGENTS

Robert George Wolfangel, Ballwin, Mo., assignor to Mallinckrodt, Inc., St. Louis County, Mo.

Filed May 27, 1975, Ser. No. 581,315
Int. Cl.² A61K *29/00, 43/00;* G01T *1/161*
U.S. Cl. 424—1 **20 Claims**

1. A dispersion useful in forming an injectable radiopharmaceutical scanning agent comprising a stannous sulfur colloid dispersed in an aqueous buffer solution.

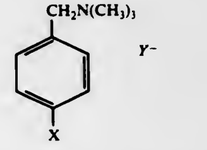
4,048,297

NOVEL QUATERNARY AMMONIUM SALTS, COMPOSITIONS AND METHODS FOR THEIR USE

Raymond E. Counsell, Ann Arbor, and Terry Ta-Jen Yu, Warren, both of Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation of Ser. No. 526,830, Nov. 25, 1974, abandoned. This application Dec. 18, 1975, Ser. No. 642,036
Int. Cl.² A61K *29/00, 43/00;* C07C *87/30;* G01T *1/161*
U.S. Cl. 424—1 **7 Claims**

1. A compound of the formula



wherein X is iodine, ^{123}iodine, ^{125}iodine or ^{131}iodine and Y^- represents a pharmaceutically acceptable anion.

4,048,298

SOLID PHASE DOUBLE-ANTIBODY RADIOIMMUNOASSAY PROCEDURE

Gordon Dean Niswender, Fort Collins, Colo., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Feb. 25, 1975, Ser. No. 552,917
Int. Cl.² G01N *33/00;* G21H *5/02*
U.S. Cl. 424—1.5 **10 Claims**

1. In a method for determining the presence of an antigenic ligand in a body fluid suspected of containing the ligand comprising:

1. mixing together an aqueous medium

a. a sample of the body fluid;

b. a corresponding antigenic ligand labeled with a radioactive isotope;

c. a soluble antibody against the antigenic ligand immunogenically produced in an animal other than that from which the sample is obtained, and

d. a second antibody against said soluble antibody immunogenically produced in an animal other than those which the sample and said soluble antibody are derived,

2. incubating the resulting aqueous medium to allow the

unlabeled ligand, if any, in (a) and labeled ligand (b) to competitively bind on said soluble antibody (c) and to cause mutual precipitation of antibodies of (c) and (d),

3. separating the precipitated antibodies carrying bound ligand from the residual liquid medium containing free ligand, and
4. subsequently measuring the radioactivity of the precipitated antibodies or of the residual liquid, or of both to determine the content of ligand in the sample,

the improvement wherein said second antibody (d) is immobilized or insolubilized to a solid phase by polymerization with an aldehyde or alkyl haloformate; by physical entrapment in a gel polymer of an insoluble nature or by covalent coupling with a water-insoluble polymeric material or by adsorption on a water-insoluble polymeric material before it is added in step (1) above.

4,048,299

ANTICARIES CONFECTIONARIES AND ORAL HEALTH PRODUCTS

John H. Litchfield, Worthington, and Victor G. Vely, Columbus, both of Ohio, assignors to William Wrigley, Jr. Co., Chicago, Ill.

Continuation-in-part of Ser. No. 855,763, Sept. 5, 1969, Pat. No. 3,679,792, Ser. No. 855,764, Sept. 5, 1969, Pat. No. 3,629,395, Ser. No. 855,770, Sept. 5, 1969, Pat. No. 3,749,766, and Ser. No. 858,996, Sept. 18, 1969, Pat. No. 3,651,206, which is a continuation-in-part of Ser. No. 790,314, Jan. 10, 1969, abandoned. This application May 6, 1970, Ser. No. 35,246

Int. Cl.[2] A61K *5/00, 9/68, 7/16*

U.S. Cl. 424—49 **16 Claims**

1. An oral health composition comprising an effective amount of pyruvaldehyde to inhibit the acid production and growth of oral microorganisms and a dental vehicle.

4,048,300

DENTAL PREPARATION CONTAINING MATERIALS HAVING CALCIUM AND PHOSPHATE COMPONENTS

Kenneth Toulinson, Bramhall, and Edward John Duff, Sandbach, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 431,945, Jan. 9, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 653,998

Claims priority, application United Kingdom, Jan. 11, 1973, 1633/73; July 25, 1973, 35459/73; July 25, 1973, 35471/73

Int. Cl.[2] A61K *7/18*

U.S. Cl. 424—52 **31 Claims**

1. A dental cream preparation for remineralising teeth and providing fluoride to pits and fissures of teeth which comprises about 20–75% by weight of liquid selected from the group consisting of water, humectant and mixture thereof and about 0.5–5% by weight of gelling agent proportioned to form an extrudible creamy mass and about 20% by weight to about 99% by weight of a dental polishing or abrasive agent, said polishing or abrasive agent including, in amount of about 10% by weight to about 90% by weight based on the weight of said dental preparation, a material selected from the group consisting of:

1. fluorapatite;
2. fluorohydroxyapatite;
3. apatite, calcium deficient apatite, hydroxyapatite, fluorohydroxyapatite or fluorapatite each containing monofluorophosphate ions;
4. fluorapatite or fluorohydroxyapatite wherein about 0.1–1% by weight of the calcium content of each is replaced by a non-toxic divalent metal ion selected from the group consisting of zinc, copper, cadmium, nickel, cobalt, iron, manganese, chromium, magnesium strontium and barium; and
5. hydroxyapatite substituted by a fluoro anion of a non-toxic divalent transition metal;

wherein said material is prepared by a process comprising reacting reactants at ambient temperature initially at about pH 7, maintaining this pH until equilibrium is substantially established, reducing said pH to about 4, maintaining this pH until equilibrium is substantially established, raising the pH to about 7 until equilibrium is reached and crystallite growth occurs, and repeating said fluctuating pH cycle for a total of about 2 to about 5 times terminating at pH 7, wherein said reactants to prepare said materials are selected from the group consisting of:

a. equimolar amounts of hydrofluoric acid in aqueous solution and hydroxyapatite suspended in said solution to form said fluorapatite (1);

b. hydrofluoric acid in aqueous solution and hydroxyapatite suspended in said solution, said hydrofluoric acid being present and being in an amount less than equimolar of the amount of said hydroxyapatite, to form said fluorohydroxyapatite (2);

c. calcium fluoride in aqueous solution and calcium and phosphate reactant selected from the group consisting of $CaHPO_4$; $Ca_5OH(PO_4)_3$; $CaHPO_4.2H_2O$; and phosphoric acid and a calcium salt which provides calcium and phosphate reactant to calcium fluoride up to a molar ratio of about 20:1, to form said fluorapatite (1) or said fluorohydroxyapatite (2);

d. a monofluorophosphate salt in aqueous solution and a material selected from the group consisting of apatite, calcium deficient apatite of the formula: $Ca_{10-y}H_y(OH)_{2-y}(PO_4)_6.nH_2O$ where $0 \geq n \leq 10$ and $0 \geq y \leq 2$, hydroxyapatite, flurohydroxyapatite and fluorapatite, the amount of said monofluorophosphate salt being up to about equimolar to the amount of said material, to form said material (3) which is substituted with monofluorophosphate ions;

e. a water-soluble non-fluoride compound which provides a non-toxic divalent metal ion selected from the group consisting of zinc, copper, cadmium, nickel, cobalt, iron, manganese, chromium, magnesium, strontium and barium and a suspension of fluorapatite or fluorohydroxyapatite to form the fluorapatite or fluorohydroxyapatite (4) material in which about 0.1–1% by weight of the calcium thereof is replaced by said nontoxic divalent metal ion;

f. hydrogen fluoride or a water-soluble alkali metal salt thereof and a suspension of hydroxyapatite to form said fluorapatite or fluorohydroxyapatite (4) in which about 0.1–1% by weight of the calcium thereof is replaced by a non-toxic divalent metal ion selected from the group consisting of zinc, copper, cadmium, nickel, cobalt, iron, manganese, chromium, magnesium, strontium and barium which is formed in a reaction of said process (e) between a water-soluble non-fluoride compound of a compound which provides said non-toxic divalent metal ion and hydroxyapatite in suspension; and

g. a compound which provides a fluoride ion and a compound which provides a non-toxic divalent transition metal ion selected from the group consisting of zinc, copper, cadmium, nickel, cobalt, iron, manganese and chromium simultaneously and hydroxyapatite in a slurry, the amount of said divalent transition metal ion being about 0.1–1% by weight of the calcium in said apatite, said compound which provides a fluoride ion being in amount sufficient to react with said transition metal ion, to form said apatite (5) in which orthophosphate groups in said hydroxyapatite are replaced by said fluroanion of the transition metal.

4,048,301

SHAMPOO COMPOSITION CONTAINING A DETERGENT AND A GRAFT CATIONIC COPOLYMER

Christos Papantoniou, Epinay-sur-Seine, France, assignor to L'Oreal, Paris, France

Filed May 27, 1976, Ser. No. 690,782

Claims priority, application Luxembourg, May 28, 1975, 72593

Int. Cl.[2] A61K *7/06*

U.S. Cl. 424—70 **8 Claims**

1. A cosmetic shampoo composition for treating the hair comprising a cosmetic carrier for application to the hair, at least one detergent in an amount between 0.2 and 25 weight percent based on the total weight of said composition and at least one graft cationic polymer of

a. 3 to 95 weight percent N-vinylpyrrolidone,
b. 3 to 95 weight percent dimethylaminoethyl methacrylate, and
c. 2 to 50 weight percent polyethylene glycol,

said graft cationic copolymer being present in an amount between 0.1 and 5 weight percent based on the total weight of said composition and having a molecular weight ranging between 10,000 and 1,000,000.

4,048,302

AQUEOUS PESTICIDAL SOLUTIONS CONTAINING POLYETHYLENE GLYCOL

William R. Coleman, Miami, and Thomas E. Duffey, Hialeah, both of Fla., assignors to Riviana Foods Inc., Houston, Tex.

Filed June 3, 1974, Ser. No. 476,061

Int. Cl.[2] A61K *31/74*

U.S. Cl. 424—78 **3 Claims**

1. An aqueous pesticidal solution for the treatment of the skin and costs of domesticated animals to kill fleas, ticks, lice, mites, cattle face flies and hornflies consisting essentially of a solution of about 5 to 15 weight percent of o-isopropoxyphenyl methycarbamate and about 95 to 85 weight percent polyethylene glycol having a molecular weight of about 200 to 600 dissolved in about 10 to 50 parts by weight water per part of the combined weights of said o-isopropoxyphenyl methylcarbamate and said polyethylene glycol.

4,048,303

METHOD OF PREPARING ENZYME CHOLIC ACIDS COMPLEX

Jean Bolge, Aulnay sous Bois, France, assignor to L'Opochimie, Fontvieille, Monaco

Filed Nov. 11, 1975, Ser. No. 630,763

Claims priority, application United Kingdom, Nov. 29, 1974, 51853/74

Int. Cl.[2] A61K *37/48, 35/38*

U.S. Cl. 424—94 **3 Claims**

1. A method of preparing an enzyme-hormone complex containing between approximately 8 and 12 units/mg of enterokinase, more than 40 units/mg of maltase, more than 10 units/g of alkaline phosphatase, more than 2 units/mg of aminopeptidase and trehalase, glutamyl transferase, ornithine carbamyl transferase, saccharase, lactase, enterogastrone, secretin, cholecystokinin, caerulin and pancreozymin, from the small intestine of pigs or bullocks, comprising the steps of:

a. mixing pieces of fresh or refrigerated small intestine with an aqueous solution containing between 100 and 600 g of cholic acids constituted by a mixture of cholic acid, desoxycholic acid, glycocholic acid and taurocholic acid and between 50 and 400 ml of polyethylene glycol mono-para (1,1,3,3 tetramethyl butyl)phenyl ether per 100 liters of water, the proportion of said aqueous solution being between about 100 and about 250 liters per 100 kg of small intestine;
b. maintaining the resulting mixture for about 2 to about 12 hours at a temperature between 0 to 5° C and at a pH of about 6 to 7; and
c. separating from the mixture the treated pieces of small intestine by filtration in order to obtain a solution containing said enzymes and hormones.

4,048,304

POLYCYCLIC ETHER ANTIBIOTIC FOR COMBATING INSECTS

Walter D. Celmer, New London; Walter P. Cullen, East Lyme; Charles E. Moppett; John R. Oscarson, both of Grotoa, and John B. Routien, Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 548,421, Feb. 10, 1975. This application Mar. 1, 1976, Ser. No. 662,700

Int. Cl.[2] A61K *35/74*

U.S. Cl. 424—122 **5 Claims**

1. The method of combatting insects which comprises contacting said insects with an effective insecticidal amount of antibiotic compound 38,986 or a cationic salt thereof, said antibiotic compound when in the form as the free acid having an optical rotation of $[\alpha]_D^{25°} = -7.5°$ at a concentration of 1% of acetone; an average composition by weight of 65.11% carbon, 9.54% hydrogen and 25.35% oxygen (by difference); and, when pelleted in KBr, exhibiting characteristic absorption in the infrared region at the following wavelengths in microns: 2.98, 3.44, 5.75, 5.78, 6.85, 7.24, 7.98, 8.38, 8.65, 9.00, 9.23, 9.42, 9.67, 9.83, 10.10, 10.38, 10.92, 11.18, 11.45, 11.85, 13.40, 13.70 and 14.10.

4,048,305

TRIPEPTIDES, THEIR ESTERS AND AMIDES, AND ANTI-ULCERA ACTIVITY THEREOF

Luigi Molteni, Malnate, Varese; Gian Piero Vercesi, Rho, Milan, and Eraldo Antonini, Rome, all of Italy, assignors to Dr. L. Zambeletti S.p.A., Milan, Italy

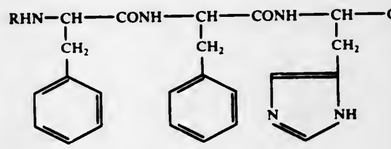
Filed Apr. 8, 1976, Ser. No. 674,947

Claims priority, application Italy, Apr. 9, 1975, 22190/75

Int. Cl.[2] A61K *37/00*

U.S. Cl. 424—177 **9 Claims**

1. Tripeptides of the general formula:



wherein

R = — H, $COCH_3$, alkyl

R_1 = —OH, $—NH_2$, —NH alkyl (C_1-C_5) —O alkyl (C_1-C_5)

resulting from condensing of racemic, levorotatory and dextrorotatory phenylalanine and histidine.

9. A pharmaceutical composition with anti-ulcer activity, containing, as an active element, 50 to 400 mg of one or more of the tripeptides of claim 1.

4,048,306

ALDEHYDE-ERYTHROMYCYLAMINE CONDENSATION PRODUCTS

Roland Maier; Eberhard Woitun; Bernd Wetzel, all of Biberach; Wolfgang Reuter, Laupertshausen; Hanns Goeth, Biberach, and Uwe Lechner, Ummendorf, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

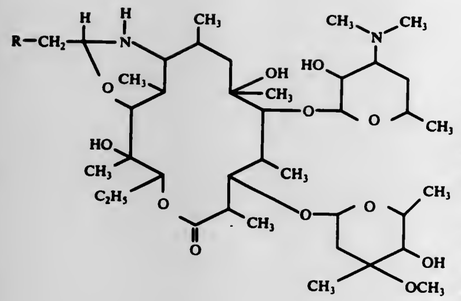
Filed Mar. 29, 1976, Ser. No. 671,421

Claims priority, application Germany, Apr. 7, 1975, 2515075; Feb. 14, 1976, 2606030

Int. Cl.[2] A61K *31/70*

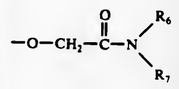
U.S. Cl. 424—180 **13 Claims**

1. An erythromycylamine-aldehyde condensation product of the formula

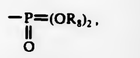




where R_4 is straight or branched alkyl of 1 to 5 carbon atoms, benzyl or phenyl; —NH—CO—R_5, where R_5 is straight or branched alkyl of 1 to 5 carbon atoms, mono- or dihalo-substituted-(alkyl of 1 to 5 carbon atoms), cyano-(alkyl of 1 to 5 carbon atoms), phenyl-(alkyl of 1 to 3 carbon atoms) where the phenyl moiety may be mono- or di- or trimethoxy- or mono- or di-halo-substituted and the alkyl moiety may be monohalo-substituted, phenoxy-(alkyl of 1 to 3 carbon atoms), phenyl-(alkenyl of 2 to 4 carbon atoms), phenyl or phenyl having one or more methyl, hydroxyl, methoxy, nitro or chloro substituents attached thereto; or R_5 is pyridyl; furyl; fluoro-furyl; thienyl; N-phenyl-carbamoyl;

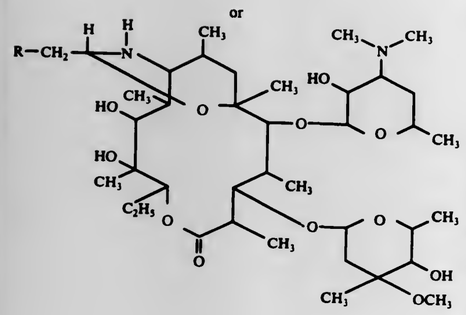


where R_6 and R_7, which may be identical to or different from each other, are each methyl, ethyl, propyl or isopropyl;



where R_8 is straight or branched alkyl of 1 to 5 carbon atoms; —NH—SO_2—R_9, where R_9 is alkyl of 1 to 4 carbon atoms or phenyl or (alkyl of 1 to 3 carbon atoms)-phenyl; or —SO_2—R_{10}, where R_{10} is alkyl of 1 to 3 carbon atoms or phenyl or (alkyl of 1 to 3 carbon atoms)-phenyl;
or a non-toxic, pharmacologically acceptable acid addition salt thereof.

or



wherein R is hydroxyl; phenoxy; phenyl-(alkoxy of 1 to 3 carbon atoms); alkoxy of 1 to 4 carbon atoms; hydroxy-(alkoxy of 1 to 4 carbon atoms); (alkoxy of 1 to 3 carbon atoms)-(alkoxy of 1 to 4 carbon atoms); di(alkyl of 1 to 3 carbon atoms)amino-(alkoxy of 1 to 4 carbon atoms); (alkoxy of 1 to 3 carbon atoms)-carbonyl(alkoxy of 1 to 4 carbon atoms); mercapto; phenyl-mercapto, where the phenyl moiety is unsubstituted or methyl-, methoxy-, ethoxy-, isopropoxy- or propoxy-substituted; phenyl-(alkyl of 1 to 3 carbon atoms)-mercapto; (straight or branched alkyl of 1 to 5 carbon atoms)-mercapto; cyclohexyl-mercapto; hydroxy-(alkyl of 1 to 3 carbon atoms)-mercapto; di(alkyl of 1 to 3 carbon atoms)amino-(alkyl of 1 to 3 carbon atoms)-mercapto; (alkoxy of 1 to 3 carbon atoms)-carbonyl-(alkyl of 1 to 3 carbon atoms)-mercapto; cyano-(alkyl of 1 to 3 carbon atoms)-mercapto; —NR_2R_3, where R_2 and R_3, which may be identical to or different from each other, are each hydrogen, phenyl, phenyl-(alkyl of 1 to 3 carbon atoms), alkyl of 1 to 4 carbon atoms or, together with each other and the nitrogen atom to which they are attached, a 5- to 6-membered monocyclic heterocyclic ring which may contain an oxygen, sulfur or additional nitrogen atom;

13. The method of combatting bacterial infections in a warm-blooded host, which comprises perorally or parenterally administering to said host an effective antibacterial amount of a compound of claim **1**.

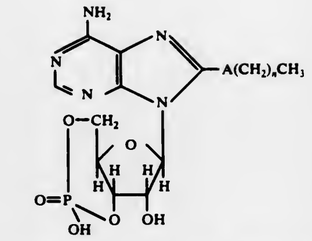
4,048,307

CYCLIC ADENOSINE MONOPHOSPHATE 8-SUBSTITUTED DERIVATIVES

Takeshi Yokota, Funabashi; Nobuyuki Suzuki, Hyuga; Tsuneo Sowa, Nobeoka; Yasuharu Sasaki, Nobeoka, and Yasutaka Ono, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 24, 1975, Ser. No. 616,356
Claims priority, application Japan, Dec. 26, 1974, 49-3185; Dec. 27, 1974, 49-148935
Int. Cl.[2] A61K *31/70;* **C07H** *19/20*
U.S. Cl. 424—180 **37 Claims**

1. A cyclic adenosine monophosphate represented by the formula, or its pharmaceutically acceptable non-toxic inorganic or organic salt:



wherein A stands for —S— or —NH— and *n* is an integer of from 5 to 12.

31. A method of treating diseases caused by disorder of the intracellular cyclic adenosine monophosphate level which comprises administering to a patient suffering from such disease an effective amount of a cyclic adenosine monophosphate or pharmaceutically acceptable non-toxic inorganic or organic salt thereof according to claim **1**.

4,048,308

ACELLULAR PLANKTONIC PRODUCT, METHOD OF PREPARING SAME AND COSMETIC COMPOSITION CONTAINING THE SAME

Lucien Paul Aubert, Nice, France, assignor to L'Oreal, Paris, France

Filed July 21, 1975, Ser. No. 597,571
Claims priority, application Luxembourg, July 24, 1974, 70601
Int. Cl.[2] A61K *35/78*
U.S. Cl. 424—195 **8 Claims**

1. A cosmetic composition for application to the skin consisting essentially of an aqueous solution or suspension or an acellular planktonic product consisting essentially of the cytoplasmic content of cellular planktonic membranes of sulfurous spa origin, said planktonic product being an emollient and being present in an effective amount to produce an emollient or softening effect on the skin.

4,048,309

TOPICAL STEROID OINTMENT FORMULATIONS

James Ling Chen, East Brunswick, and Jean M. Battaglia, North Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 24, 1976, Ser. No. 660,964
Int. Cl.[2] A61K *31/56*
U.S. Cl. 424—238 **22 Claims**

1. A non-aqueous composition for topical application in the form of an ointment, gel or lipophilic stick comprising at least one steroid selected from the group consisting of 21-chloro-9α-fluoro-Δ^4-pregnene-11β,16α,17α-triol-3,20-dione 16,17-acetonide; 21-chloro-9-fluoro-2',3'-dihydro-11β-hydroxy-5'-phenylpregna-1,4-dieno[16α,17-b][1,4]dioxin3,20-dione:dichloro methane solvate (1:1), and 9α-fluoro-11β,16α,17,21-tetrahydroxy-pregna-1,4-diene-3,20-dione 16,17-acetonide, a ricinoleate vehicle in which said steroid is at least partially soluble, and an oleaginous material, said oleaginous material is selected from the group consisting of petrolatum, mineral oil thickened or gelled with polyethylene, high molecular weight paraffin waxes, mono and diglycerides of fatty acids gelled with high molecular weight fatty acids or polyamide complex of hydroxystearate, propylene glycol isostearate or isostearyl alcohol gelled with high molecular weight fatty acids and mixtures thereof.

13. A composition useful as a vehicle for steroids in the form of a lipophilic stick, comprising a ricinoleate and an oleaginous material selected from the group consisting of petrolatum, mineral oil thickened or gelled with polyethylene, high molecular weight paraffin waxes, mono and diglycerides of fatty acids gelled with high molecular weight fatty acids or polyamide complex of hydroxystearate, propylene glycol isostearate or isostearyl alcohol gelled with high molecular weight fatty acids and mixtures thereof, said ricinoleate being present in an amount within the range of from about 50 to about 70% by weight of the composition and said oleaginous material being present in an amount within the range of from about 20 to about 50% by weight of the composition, and a steroid present in an amount within the range of from about 0.005 to about 0.6% by weight of the total composition said steroid being selected from the group consisting of 21-chloro-9-fluoro-2',3'-dihydro-11β-hydroxy-5'-phenylpregna-1,4-dieno[16α,17-b][1,4]dioxin-3,20-dione:dichloro methane solvate (1:1), 21-chloro-9α-fluoro-Δ^4-pregnene-11β,16α,17α-triol-3,20-dione 16,17-acetonide, and 9α-fluoro-11β,16α,17,21-tetrahydroxy-pregna-1,4-diene-3,20-dione 16,17-acetonide.

4,048,310

TOPICAL STEROID FORMULATION IN FORM OF LOTION OR CREAM

James Ling Chen, East Brunswick, and Jean M. Battaglia, North Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 24, 1976, Ser. No. 660,963
Int. Cl.[2] A61K *31/56, 31/58*
U.S. Cl. 424—238 **25 Claims**

1. A composition for topical application in the form of a cream or lotion, comprising at least one steroid wherein said steroid is selected from the group consisting of 21-chloro-9α-fluoro-Δ^4-pregnene-11β, 16α,17α-triol-3,20-dione 16,17-acetonide; 21-chloro-9-fluoro-2',3'-dihydro-11β-hydroxy-5'-propylpregna-1,4-dieno[16α,17-b][1,4]-dioxin-3,20-dione:dichloro methane solvate (1:1); and 9α-fluoro-11β, 16α,17,21-tetrahydroxy-pregna-1,4-diene-3,20-dione 16,17-acetonide, a ricinoleate vehicle in which said steroid is at least partially soluble, an emulsifier-thickener comprising a polyethylene glycol ether of a fatty alcohol, an oleaginous material or emollient, a preservative and water.

25. The composition as defined in claim **1** further including propylene glycol monostearate.

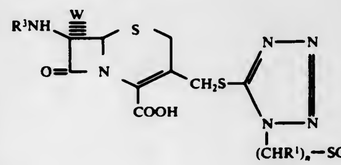
4,048,311

7-ACYL-3-(SULFONIC ACID AND SULFAMOYL SUBSTITUTED TETRAZOLYL THIOMETHYL)CEPHALOSPORINS

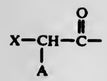
David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 647,394, Jan. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 559,609, March 18, 1975, abandoned. This application May 19, 1976, Ser. No. 687,792
Int. Cl.[2] C07D *501/20;* **A61K** *31/545*
U.S. Cl. 424—246 **31 Claims**

1. A compound of the formula



in which:
W is hydrogen or methoxy;
each individual R^1 is hydrogen or lower alkyl;
n is one to ten;
R^2 is hydroxy, amino, lower alkylamino or di(lower)alkylamino;
R^3 is an acyl group of the formula:



where:

X is thienyl; dihydrophenyl; phenyl; phenyl monosubstituted with hydroxy, hydroxymethyl, formamido, ureido or carboxymethylamino; or 3-fluoro-4-hydroxyphenyl; and

A is NH_2, OH, COOH or SO_3H; or formyloxy when X is phenyl;

or a non-toxic pharmaceutically acceptable salt thereof.

21. An antibacterial pharmaceutical composition comprising a compound as claimed in claim 1 and a pharmaceutically acceptable carrier therefor.

4,048,312

2,4-DIAMINOQUINAZOLINES AS ANTITHROMBOTIC AGENTS

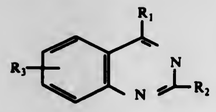
William B. Lacefield, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 411,115, Oct. 30, 1973, Pat. No. 3,956,495. This application Dec. 4, 1975, Ser. No. 637,781

Int. Cl.[2] **A61K** *31/535, 31/505*

U.S. Cl. 424—248.56 **23 Claims**

1. A method of inhibiting platelet aggregation in a warm-blooded animal in need of such inhibition which comprises parenterally administering to said animal an effective and nontoxic amount of a compound of the formula,



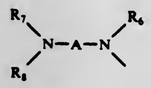
wherein R_1 and R_2 are monovalent groups independently selected from the group consisting of

a.



wherein R_4 and R_5 independently are selcted from the group consisting of hydrogen, C_1–C_6 alkyl, and cycloalkyl having fewer than about 12 carbon atoms, with the proviso that both R_4 and R_5 cannot be cycloalkyl;

b.



wherein R_6, R_7, and R_8 independently are selected from the group consisting of hydrogen and C_1-C_6 alkyl, and A is a divalent organic group having from about two to about six carbon atoms such that the two nitrogen atoms are separated by at least two carbon atoms; and

c. monocyclic heterocyclic-amino consisting of substituted or unsubstituted five- or six-membered single heterocyclic rings having no more than about 12 atoms and containing one nitrogen hetero atom and one oxygen hetero atom as the only hetero atoms; with the proviso that at least one of R_1 and R_2 must be selected from group (c); and

R_3 is selected from the group consisting of hydrogen, halogen, and C_1-C_3 alkyl; and physiologically-acceptable salts thereof.

4,048,313

BENZENE SULPHONAMIDES PROCESSES FOR PRODUCING THE SAME AND PHARMACEUTICAL COMPOSITIONS INCORPORATING THEM

Michel Vincent, Bagneux; Georges Remond, Versailles; Xavier Pascaud, Paris, and Jean-Claude Poignant, Bures, Yvette, all of France, assignors to Science Union et Cie, Neuilly, France

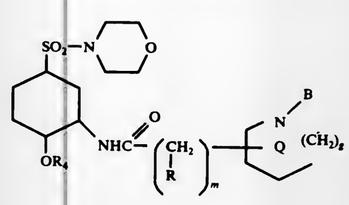
Filed Jan. 9, 1975, Ser. No. 540,032

Claims priority, application United Kingdom, Jan. 9, 1974, 959/74

Int. Cl.[2] **A61K** *31/535;* **C07D** *295/00*

U.S. Cl. 424—248.5 **11 Claims**

1. A *m* acylamino benzene sulphonamide of the formula



wherein

B is lower alkyl,

m is zero or an integer of 1 to 4, *g* is zero, 1, or 2, R is a hydrogen atom or a lower alkyl group,

R_4 is lower alkyl or lower alkenyl;

wherein the heterocycle designated Q is joined to the $(CH_2)_m$ group at positions 2 or 3 of the said heterocycle.

10. A method for stimulating gastric evacuation while inhibiting emesis and gastric secretions in warm-blooded animals suffering from digestive ailments which are in need of the foregoing stimulation of gastric evacuation which consists in administering to said patients a safe but effective amount of a compound of claim 1 or salt thereof.

4,048,314

MORPHOLINO CONTAINING 4-ARYLPIPERIDINE DERIVATIVES

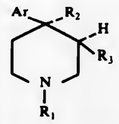
Rudolph Kubela, Cote St. Luc, Canada, and Jose Maria Do Nascimento, Moscavide, Portugal, assignors to Delmar Chemicals Limited, Ville la Salle, Canada

Filed Dec. 17, 1974, Ser. No. 533,642

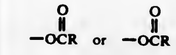
Int. Cl.[2] **C07D** *413/04*

U.S. Cl. 424—248.55 **4 Claims**

1. A 4-arylpiperidine derivative of the formula I:



wherein R_1 is hydrogen, lower alkyl, phenyl or phenyl lower alkyl; one of R_2 and R_3 represents morpholino, and the other of R_2 and R_3 represents hydroxyl,



wherein R is lower alkyl; and Ar represents phenyl or naphthyl; or a pharmaceutically acceptable addition salt thereof with an organic acid or inorganic acid.

4. An antidepressant pharmaceutical composition comprising an effective amount of said 4-arylpiperidine derivative of claim **1**, as the active antidepressant ingredient, in combination with a pharmaceutically acceptable carrier or diluent thereof.

4,048,315

PREPARATION OF NEW 1,3-IDENTICALLY SUBSTITUTED-TRIAZINE-2,4-DIONES

Hellmut Bredereck, Stuttgart; Willi Kantlehner, Aalen-Dewangen; Wolfgang Kugel, Stuttgart; Edgar Mohring, Berg. Gladbach, and Peter Roessler, Bensberg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

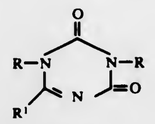
Filed Sept. 9, 1976, Ser. No. 722,300

Claims priority, application Germany, Sept. 30, 1975, 2543497; July 9, 1976, 2630849

Int. Cl.[2] **C07D** *251/20;* **A61L** *13/00;* **A01N** *9/22*

U.S. Cl. 424—249 **13 Claims**

1. A 1,3-identically substituted-triazine-2,4-dione of the formula



(I)

in which

each R is the same and is alkyl with 2 to 6 carbon atoms, cycloalkyl with 5 or 6 carbon atoms, phenyl, naphthyl, or phenyl or naphthyl substituted by halogen, nitro or alkyl with 1 to 4 carbon atoms, and

R^1 is hydrogen or alkyl with 1 to 4 carbon atoms.

4,048,316

COMPOSITION FOR ANTAGONIZING THE NARCOTIC EFFECTS OF BARBITURATE ADDICTION AND WITHDRAWAL EFFECTS, AND FOR TREATMENT OF BARBITURATE POISONING

Nathar W. Penn, 463 Glendale Road, Wyckoff, N.J. 07481

Filed Mar. 4, 1974, Ser. No. 447,659

Int. Cl.[2] **A61K** *31/505*

U.S. Cl. 424—251 **2 Claims**

1. An intravenous composition for antagonizing the narcosis effect of barbiturates which comprises.

5-hydroxymethylcytosine 0.7 to 1.4 Gm

thymine 0.27 to 0.55 Gm

pyridoxal hydrochloride 0.2 to 0.5 Gm

nicotinamide 0.5 to 2.0 Gm

thiamine hydrochloride 0.04 to 0.09 Gm

4,048,317

CHROMAN DERIVATIVES

Eric Alfred Watts, Harlow, England, assignor to Beecham Group Limited, England

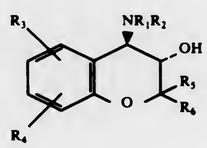
Filed May 14, 1975, Ser. No. 577,614

Claims priority, application United Kingdom, May 31, 1974, 24348/74

Int. Cl.[2] **C07D** *405/04;* **A61K** *31/445*

U.S. Cl. 424—267 **55 Claims**

1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable acid addition salt thereof wherein

NR_1R_2 is a 3- to 8-membered heterocycle wherein the nitrogen atom is the only heteroatom, unsubstituted or substituted by 1 or 2 methyl groups;

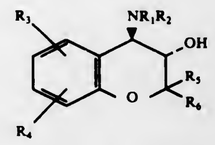
R_3 is hydrogen, halogen, alkyl of 1 to 6 carbon atoms, amino, alkylamino of 1 to 6 carbon atoms in the alkyl moiety, dialkylamino of 1 to 6 carbon atoms in each alkyl moiety, nitro, trifluoromethyl or lower alkanoylamino of 2 to 7 carbon atoms;

R_4 is hydrogen, halogen, methyl or methoxy;

R_5 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl; and

R_6 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl.

20. A pharmaceutical composition useful for treating hypertension in humans and animals which comprises an antihypertensively effective amount of a compound of the formula (I)



(I)

or a pharmaceutically acceptable acid addition salt thereof wherein

NR_1R_2 is a 3- to 8-membered heterocycle wherein the nitrogen atom is the only heteroatom, unsubstituted or substituted by 1 or 2 methyl groups;

R_3 is hydrogen, halogen, alkyl of 1 to 6 carbon atoms, amino, alkylamino of 1 to 6 carbon atoms in the alkyl moiety, dialkylamino of 1 to 6 carbon atoms in each alkyl moiety, nitro, trifluoromethyl or lower alkanoylamino of 2 to 7 carbon atoms;

R_4 is hydrogen, halogen, methyl or methoxy;

R_5 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl; and

R_6 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl;

in combination with a pharmaceutically acceptable carrier.

4,048,318

1-SUBSTITUTED-1,2,4-TRIAZOLE FUNGICIDES

Werner Meiser; Karl Heinz Buchel; Wolfgang Krämer, all of Wuppertal, and Ferdinand Grewe, Burscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

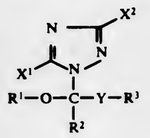
Division of Ser. No. 550,242, Feb. 14, 1975, which is a continuation-in-part of Ser. No. 318,963, Dec. 27, 1972, Pat. No. 3,912,752. This application July 9, 1975, Ser. No. 594,487

Claims priority, application Germany, Jan. 11, 1972, 2201063

Int. Cl.[2] **A01N** *9/00*

U.S. Cl. 424—269 **15 Claims**

1. A fungicidal composition comprising a fungicidally effective amount of a 1,2,4-triazole derivative of the formula



(I)

in which

X^1 represents hydrogen or alkyl of 1 to 3 carbon atoms,

X^2 represents hydrogen or alkyl of 1 to 3 carbon atoms,

R^1 represents alkyl of 1 to 8 carbon atoms, alkenyl or alkynyl of 2 to 6 carbon atoms, cycloalkyl or cycloalkenyl of 5 to 7 carbon atoms, or optionally substituted aryl or aralkyl with 6 to 10 carbon atoms in the aryl moiety and 1 or 2 carbon atoms in the alkyl moiety, the optional substituents being selected from the group consisting of halogen, nitro,

amino, alkyl with 1 to 6 carbon atoms, alkoxy or alkylthio with 1 to 4 carbon atoms, haloalkyl with 1 or 2 carbon atoms and 1 to 5 halogen atoms, haloalkylthio with 1 or 2 carbon atoms and with 3 to 5 halogen atoms, haloalkyl sulfonyl with 1 or 2 carbon atoms and 1 halogen atom, o-phenyl and p-phenyl,

R^2 represents hydrogen or alkyl of 1 to 8 carbon atoms, alkenyl or alkynyl of 2 to 6 carbon atoms, cycloalkyl or cycloalkenyl of 5 to 7 carbon atoms, or optionally substituted aryl or aralkyl with 6 to 10 carbon atoms in the aryl moiety and 1 or 2 carbon atoms in the alkyl moiety, the optional substituents being selected form the group consisting of halogen, nitro, amino, alkyl with 1 to 6 carbon atoms, alkoxy or alkylthio with 1 to 4 carbon atoms, haloalkyl with 1 or 2 carbon atoms and 1 to 5 halogen atoms, haloalkylthio with 1 or 2 carbon atoms and 3 to 5 halogen atoms, haloalkyl sulfonyl with 1 or 2 carbon atoms and 1 halogen atom, O-phenyl and p-phenyl,

R^3 represents hydrogen or alkyl of 1 to 8 carbon atoms, alkenyl or alkynyl of 2 to 6 carbon atoms, cycloalkyl or cycloalkenyl of 5 to 7 carbon atoms, or optionally substituted aryl or aralkyl with 6 to 10 carbon atoms in the aryl moiety and 1 or 2 carbon atoms in the alkyl moiety, the optional substituents being selected from the group consisting of halogen, nitro, amino, alkyl with 1 to 6 carbon atoms, alkoxy or alkylthio with 1 to 4 carbon atoms, haloalkyl with 1 or 2 carbon atoms and 1 to 5 halogen atoms, haloalkylthio with 1 or 2 carbon atoms and 3 to 5 halogen atoms, haloalkyl sulfonyl with 1 or 2 carbon atoms and 1 halogen atom, o-phenyl and p-phenyl, and

Y represents —CO—, $C(OH)_2$— or —$C(OR)_2$— wherein R is methyl or ethyl,

or a salt thereof, in admixture with a diluent.

4,048,319

METHOD OF INHIBITING HISTAMINE ACTIVITY WITH QUANIDINE COMPOUNDS

James Whyte Black, Hemel Hempstead; Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

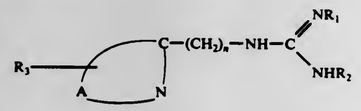
Division of Ser. No. 526,767, Nov. 25, 1974, Pat. No. 3,968,216, which is a division of Ser. No. 310,302, Nov. 29, 1972, Pat. No. 3,868,457, which is a continuation-in-part of Ser. No. 80,795, Oct. 14, 1970, abandoned. This application Mar. 19, 1976, Ser. No. 668,364

Claims priority, application United Kingdom, Oct. 29, 1969, 52891/69

Int. Cl.² A61K *31/41*

U.S. Cl. 424—269 **5 Claims**

1. A method of inhibiting H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, which comprises administering internally to an animal requiring inhibition of said H-2 histamine receptors in an amount sufficient to inhibit said H-2 histamine receptors a compound of the formula:



in which:

n is 2 to 5;

A taken together with the carbon and nitrogen atoms to which it is attached forms a triazole;

R_1 is hydrogen, alkyl having 1 to 4 carbon atoms or benzyl;

R_2 is hydrogen, alkyl having 1 to 4 carbon atoms, benzyl, imidazolylethyl or amino or R_1 and R_2 together form an ethylene bridge and

R_3 is hydrogen, alkyl having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms or amino or pharmaceutically acceptable acid addition salts thereof.

4,048,320

PENICILLINS

John Peter Clayton, Horsham, and Peter Hubert Bentley, Rudgwick, both of England, assignors to Beecham Group Limited, England

Filed Jan. 7, 1976, Ser. No. 647,131

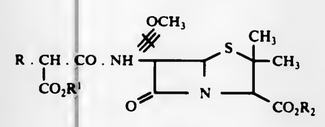
Claims priority, application United Kingdom, Jan. 17, 1975, 2021/75; June 17, 1975, 25669/75; Aug. 16, 1975, 34182/75

Int. Cl.² A61K *31/43;* **C07D** *499/50*

U.S. Cl. 424—271 **7 Claims**

1. A compound of formula (I):

(I)



where R is 2- or 3- thienyl and R^1 is hydrogen or a pharmaceutically acceptable salting ion and R^2 is hydrogen, or a pharmaceutically acceptable salting ion or conventional pharmaceutically acceptable hydrolysable ester radical.

4,048,321

DISUBSTITUTED AZABICYCLOALKANES

Laszlo Beregi, Boulogne, Seine; Pierre Hugon, Rueil-Malmaison; Xavier Pascaud, Paris, and Jean-Claude Poignant, Bures, Yvette, all of France, assignors to Science Union et Cie, Suresnes, France

Division of Ser. No. 525,623, Nov. 20, 1974, Pat. No. 3,972,994. This application May 13, 1976, Ser. No. 685,756

Claims priority, application United Kingdom, Dec. 14, 1973, 58034/73

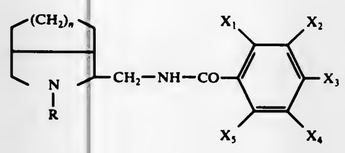
Int. Cl.² A61K *31/40;* **C07D** *207/12*

U.S. Cl. 424—274 **11 Claims**

1. A compound selected from the group consisting of:

A. Disubstituted azabicycloalkanes of the general formula I:

I



wherein:

n is 1;

R is selected from the group consisting of saturated and unsaturated aliphatic hydrocarbon having from 1 to 5 carbon atoms inclusive in straight and branched chain, and,

X_1, X_2, X_3, X_4 and X_5 are each selected from the group consisting of hydrogen, halogen, hydroxy, alkyl and alkoxy each having from 1 to 5 carbon atoms inclusive, trifluoromethyl, nitro, amino, and sulfamoyl, and,

B. Physiologically tolerable acid addition salts thereof.

11. A method for treatiang a living animal body afflicted with a nauseous syndrome of central origin, comprising the step of administering an amount of a compound of claim **1**, which is effective for the alleviation of the said condition.

4,048,322

BRONCHIALLY EFFECTIVE XANTHENE-9-CARBOXYLATES

Egon Kárpáti; László Szporny, both of Budapest; Mihaly Bartók, Szeged; József Czomboa, Szeged; Károly Felfoldi, Szeged; Marta Laszlavik, Szeged, and Ferenc Notheisz, Szeged, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

Filed Apr. 2, 1976, Ser. No. 673,135

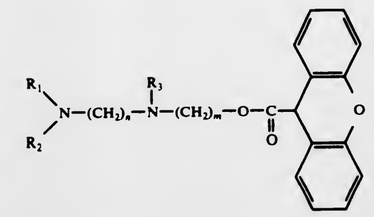
Claims priority, application Hungary, June 27, 1975, RI 569

Int. Cl.² C07D *311/84*

U.S. Cl. 424—283 **9 Claims**

1. A xanthene-9-carboxylate of the formula (I),

(I)



wherein

R_1 and R_3 are the same or different and each is lower alkyl,

R_2 is lower alkyl and *n* and *m* each are integers of 2 to 5, or a pharmaceutically effective salt thereof.

5. A pharmaceutical composition with cholinolytic and bronchospasmolytic effect containing as active ingredient a compound as defined in claim 1 of the formula (I), along with a carrier of diluent.

4,048,323

ANTIMICROBIAL (2-NITRO-3-BENZOFURANYL)-BENZOIC ACIDS

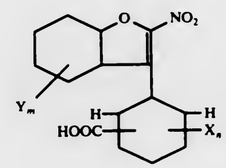
Robert A. Scherrer, White Bear Lake, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Continuation-in-part of Ser. No. 616,275, Sept. 24, 1975, abandoned. This application Sept. 20, 1976, Ser. No. 724,719

Int. Cl.² A01N *9/28;* **C07D** *307/82*

U.S. Cl. 424—285 **10 Claims**

1. A compound of the formula



wherein X is fluorine, chlorine, lower alkyl or lower alkoxy, Y is methyl, methoxy, fluorine or chlorine and *m* and *n* are independently zero, 1 or 2 or a pharmaceutically acceptable salt thereof.

8. A method for inhibiting or arresting the growth of microorganisms which comprises contacting said microorganisms with an effective amount of a compound of claim **1**.

4,048,324

FUNGICIDAL COMPOSITION AND METHOD

Armand Kohn, 5, Avenue Foch, 92 Garches, France

Filed Dec. 24, 1974, Ser. No. 536,159

Claims priority, application France, June 10, 1974, 74.19091; Dec. 28, 1973, 73.46835

Int. Cl.² A01N *11/04*

U.S. Cl. 424—294 **24 Claims**

1. A fungicidal composition comprising a mixture of

a. at least one amine or amino acid of the formula

$$R—NH\,(CH_2)_n\,Z-(CH_2)_m\,Z^1—(CH_2)_p\,Z^2$$

wherein R is alkyl or alkenyl of 4–18 carbon atoms; *n* is 1–6; Z and Z^1 are individually — NHR^1 or —COOH when monovalent and —NH— or — NR^1 when divalent; Z^2 is — NHR^1 or —COOH; R^1 is alkyl of 4–18 carbon atoms, alkenyl of 4–18 carbon atoms or —$(CH_2)_q$— COOH where *q* is 1–4; *m* is an integer of 0–6 and Z^1 is not present when *m* is 0; and *p* is an integer of 0–6 and Z^2 is not present when *p* is 0; said amine or amino acid having at least 8 carbon atoms; and

b. a cupric salt of a non-toxic acid; wherein the amount of amine is such that there are 0.1–10 aminic nitrogen atoms per Cu atom and wherein at least a part of the copper being combined with the amine in the form of a complex.

4,048,325

LOW TOXICITY METHOD OF INHIBITING SICKLING OF SICKLE ERYTHROCYTES

Lester Packer, Orinda, and Edwin N. Bymun, Oakland, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 5, 1976, Ser. No. 646,707

Int. Cl.² A01N *1/02;* **A61K** *31/21;* **G01N** *1/30*

U.S. Cl. 424—298 **9 Claims**

1. A method of inhibiting sickling of human sickle erythrocytes which comprises intermixing the erythrocytes with a water-soluble monofunctional imidoester having the general formula RC(=NH)OR' wherein R is an alkyl group of 1–8 carbon atoms and R' is an alkyl group of 1–4 carbon atoms in a amount effective to inhibit sickling and below the toxicity level of the imidoester.

4,048,326

TREATMENT OF HELMINTH INFECTIONS WITH SUBSTITUTED 1,2-BIS(THIOUREIDO)BENZENE

Samuel Sidney Berg, Ilford; David Conwil Jenkins, Gidea Park, and Ronald Frederick Phillipson, Brentwood, all of England, assignors to May & Baker Limited, England

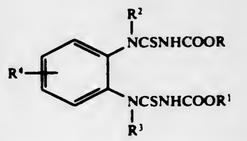
Filed June 15, 1971, Ser. No. 153,409

Claims priority, application United Kingdom, June 16, 1970, 29529/70; June 22, 1970, 30244/70; Sept. 4, 1970, 42609/70; Mar. 31, 1971, 8292/71; France, June 11, 1971, 71.21293

Int. Cl.² A61K *31/27*

U.S. Cl. 424—300 **15 Claims**

1. A method for the treatment of helminth infections in man and domestic animals which comprises administering to man or a domestic animal infected with helminths an anthelmintically effective amount of at least one benzene derivative of the formula;



wherein R and R^1 each represent an aliphatic hydrocarbon

group of 1 to 4 carbon atoms which is unsubstituted or substituted by halogen or alkoxy of 1 to 4 carbon atoms, R^2 and R^3 each represent hydrogen or methyl, and R^4 represents hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkanoylamino of 1 to 4 carbon atoms which is unsubstituted or substituted by cycloalkyl of 3 to 6 carbon atoms, alkoxycarbonylamino of 2 to 4 carbon atoms, alkanoyl of 2 to 4 carbon atoms, benzoyl or N-methylmethanesulphonylamino.

4,048,327

(4-PHENOXYPHENOXY)ALKYL CYCLOPROPANECARBOXYLATES

Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

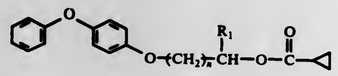
Filed July 20, 1976, Ser. No. 707,150

Claims priority, application Switzerland, July 25, 1975, 9734/75; June 17, 1976, 7744/76

Int. Cl.² C07C *61/04;* A01N *9/28*

U.S. Cl. 424—305 **13 Claims**

1. A cyclopropanecarboxylate of the formula I



(I)

wherein

R_1 represents hydrogen, methyl or ethyl and

n is 1, 2 or 3.

4,048,328

ALKYL DERIVATIVES OF 4,5-DEHYDRO PGF_1

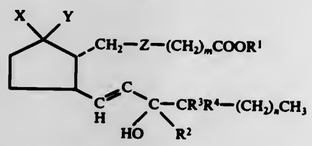
Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 578,593, May 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 351,381, April 16, 1973, Pat. No. 3,917,668. This application June 15, 1976, Ser. No. 696,453

Int. Cl.² C60 *121;* C07C *177/00;* A61K *31/19, 31/215*

U.S. Cl. 424—305 **10 Claims**

1. A compound of formula



in which *m* is an integer from 0 to 2 *n* is an integer from 2 to 5 X represents hydroxy and *Y* is hydrogen, Z represents the radical cis—CH_2—CH=CH—, R^1 is hydrogen or lower alkyl and R^2, R^3 and R^4 each are hydrogen or lower alkyl with the provisos that at least one of R^2, R^3 or R^4 is lower alkyl and at least one of R^2, R^3 or R^4 is hydrogen.

4,048,329

ALKYL DERIVATIVES OF 4,5-DEHYDRO PGE_1

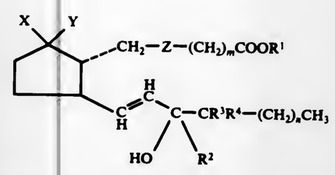
Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 578,593, May 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 351,381, April 16, 1973, Pat. No. 3,917,668. This application June 15, 1976, Ser. No. 696,328

Int. Cl.² C07C *177/00;* A61K *31/19, 31/215*

U.S. Cl. 424—305 **7 Claims**

1. A compound of formula



in which m is an integer from zero to two, n is an integer from two to five, X and Y together represent oxo, Z represents the radical cis-CH_2—CH=CH—, R^1 is hydrogen or lower alkyl and R^2, R^3 and R^4 each are hydrogen or lower alkyl with the provisos that at least one of R^2, R^3 or R^4 is lower alkyl and at least one of R^2, R^3 or R^4 is hydrogen.

4,048,330

COMPOSITIONS CONTAINING 2-(6'-SUBSTITUTED-2'-NAPHTHYL)ACETIC ACID ESTERS USED FOR TREATING INFLAMMATION, PAIN OR PYREXIA

John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Palo Alto, Calif.

Continuation of Ser. No. 394,751, Sept. 6, 1973, abandoned, which is a continuation-in-part of Ser. No. 195,869, Nov. 4, 1971, abandoned, and Ser. No. 195,877, Nov. 4, 1971, abandoned, and Ser. No. 195,878, Nov. 4, 1971, and Ser. No. 372,028, June 21, 1973, said Ser. No. 195,869, is a division of Ser. No. 810,014, March 24, 1969, abandoned, said Ser. No. 195,877, is a division of Ser. No. 810,013, March 24, 1969, abandoned, said Ser. No. 195,878, is a division of Ser. No. 694,771, Dec. 7, 1967, abandoned, said Ser. No. 372,028, is a continuation of Ser. No. 176,740, Aug. 31, 1971, abandoned, which is a continuation-in-part of Ser. No. 694,771, Ser. No. 810,013, and Ser. No. 810,014, said Ser. No. 694,771, is a continuation-in-part of Ser. No. 608,997, Jan. 13, 1967, abandoned, said Ser. No. 810,013, and Ser. No. 810,014, each is a continuation-in-part of Ser. No. 608,997, and Ser. No. 694,771,. This application Aug. 18, 1975, Ser. No. 605,477

The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.

Int. Cl.² A61K *31/235*

U.S. Cl. 424—308 **4 Claims**

1. A composition for treating inflammation, pain or pyrexia in mammals comprising a pharmaceutically acceptacle non-toxic excipient and a therapeutically effective amount of the isopentyl ester of d 2-(6'-methoxy-2'-naphthyl)propionic acid.

4,048,331

PROCESS OF TREATMENT

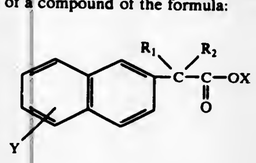
Neel C. Sekhar, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 514,839, Oct. 15, 1974, which is a continuation-in-part of Ser. No. 370,990, June 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 276,714, July 31, 1972, abandoned. This application Nov. 10, 1975, Ser. No. 630,139

Int. Cl.² A61K *31/19*

U.S. Cl. 424—317 **3 Claims**

1. A process for reducing platelet adhesiveness comprising the administration of an effective amount for reducing platelet adhesiveness of a compound of the formula:



wherein Y is lower alkyl of 1 to 8 carbon atoms, cyclopropyl, ethinyl, $-CF_3$, —F, —Cl, $-OCH_3$, $-OCH_2OCH_3$, $-SCH_3$, $-SCHF_2$, $-SCH_2OCH_3$, acetyl; R_1 and R_2 are H, CH_3, CHF_2, or taken together are $=CH_2$ or $=CF_2$; and X is hydrogen, or a pharmacologically acceptable cation, to a human or animal having elevated platelet adhesiveness.

4,048,332

PHENYLALKANOIC ACIDS

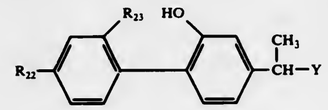
Stewart S. Adams; Bernard J. Armitage, and John S. Nicholson, all of Nottingham, England, assignors to The Boots Company Limited, Nottingham, England

Continuation-in-part of Ser. No. 367,614, June 6, 1973, Pat. No. 3,969,402. This application Feb. 9, 1976, Ser. No. 656,220

Int. Cl.² A61K *31/05, 31/19, 31/42, 31/165*

U.S. Cl. 424—317 **23 Claims**

1. A therapeutic composition useful in the treatment of pain, inflammation or pyretic conditions or in preventing or inhibiting aggregation of blood platelets which comprises, as active ingredients, a compound of formula I



I

wherein R_{22} and R_{23} are selected from hydrogen and halogen and Y is COOH,

or a pharmaceutically acceptable ester or a salt of a compound wherein Y is COOH and a pharmaceutically acceptable carrier.

4,048,333

METHOD FOR TREATING A PICORNA VIRUS INFECTION

Angel Simeonov Galabov; Lubomir Mihaylov Shindarov; Georgi Nikolov Vassilev; Ragka Taneva Vassileva; Zlatka Petkova Dimcheva; Dushka Staneva Stoycheva, and Emilia Hristova Velichkova, all of Sofia, Bulgaria, assignors to Medizinska Akademia, Sofia, Bulgaria

Continuation of Ser. No. 282,918, Aug. 23, 1972, abandoned. This application June 10, 1975, Ser. No. 585,517

Claims priority, application Bulgaria, Aug. 23, 1971, 17294

Int. Cl.² A61K *31/17, 31/44, 31/34, 31/27*

U.S. Cl. 424—322 **1 Claim**

1. A method of treating a picorna virus infection which comprises orally administering to a patient an anti-picorna virus effective amount of N-phenyl-N-4-hydroxy-phenylthiourea or N-phenyl-N-3-hydroxy-phenylthiourea.

4,048,334

ACTIVE DERIVATIVES OF METHYLAMINO IN THERAPEUTIC COMPOSITIONS AND METHODS OF USE

Charles Pigerol, Saint-Ouen; Pierre Eymard, Fontaine; Jean-Claude Vernieres, La Troache, and Jean-Pierre Werbenec, Seyssinet, all of France, assignors to Labaz, Paris, France

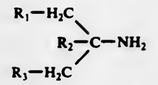
Division of Ser. No. 577,732, May 15, 1975. This application Aug. 22, 1975, Ser. No. 606,880

Claims priority, application Belgium, May 20, 1974, 144519

Int. Cl.² A61K *31/13*

U.S. Cl. 424—325 **6 Claims**

1. Method of treating Parkinson's disease and correcting extra-pyramidal disturbances provoked by neuroleptics comprising the administration to a subject in need of such treatment of an effective dose of at least one methylamine derivative of the formula:



or a pharmaceutically acceptable acid addition salt thereof, in which R_1 represents ethyl, R_3 represents methyl or ethyl, and R_2 represents

a. ethyl, n-propyl, isopropyl, isobutyl, tert-butyl, or 1-butenyl when R_3 is ethyl, or

b. n-butyl or isobutyl when R_3 is methyl.

4,048,335

METHOD OF INHIBITING MYOCARDIAL ISCHEMIA IN MAMMALS USING QUATERNARY SALTS

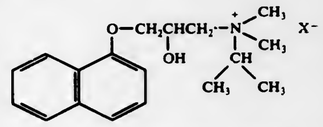
Benedict R. Lucchesi, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Division of Ser. No. 480,114, June 17, 1974, Pat. No. 4,001,327, which is a continuation-in-part of Ser. No. 269,128, July 5, 1972, Pat. No. 3,840,666. This application Aug. 19, 1976, Ser. No. 715,961

Int. Cl.² A61K *31/14, 31/685*

U.S. Cl. 424—329 **4 Claims**

1. A method of inhibiting myocardial ischemia in mammals which comprises administering to mammals requiring inhibition of myocardial ischemia a therapeutically effective amount of a compound of the formula



wherein X^- is the anion of pharmaceutically acceptable non-toxic acid.

4,048,336

MEANS FOR KILLING BACTERIAL SPORES WITH GLUTARALDEHYDE SPORICIDAL COMPOSITIONS

Murray A. Winicov, Flushing, N.Y., and Abraham Cantor, Elkins Park, Pa., assignors to West Chemical Products, Incorporated, Long Island City, N.Y.

Continuation of Ser. No. 463,200, April 22, 1974, abandoned, which is a division of Ser. No. 157,681, June 28, 1971, abandoned. This application Apr. 23, 1975, Ser. No. 570,638

Int. Cl.² A01N *9/24*

U.S. Cl. 424—334 **17 Claims**

1. A process for killing bacterial spores on instruments, appliances, eating utensils, walls, floors, and beds which comprises treating same with a sporicidally effective amount of a sporicidal composition comprising:

a. a solvent consisting of water

b. 0.5 to 6% by weight glutaraldehyde, and

c. 0.5 to 10% by weight monoaldehyde, said monoaldehyde being selected from the group consisting of formaldehyde, acetaldehyde and propionaldehyde,

and said composition being further characterized as having a pH no less than 6.5 and no greater than 7.4.

4,048,337

GYPSUM DUST DILUENTS FOR USE IN PESTICIDES AND FERTILIZING PRODUCTS

Bruno Fabbian, Via XI Febbraio, 27 Asigliano Veneto (Vicenza), Italy

Continuation-in-part of Ser. No. 495,330, Aug. 7, 1974, abandoned. This application Oct. 21, 1975, Ser. No. 624,573
Claims priority, application Italy, Aug. 24, 1973, 85592/73
Int. Cl.[2] A01N 9/00
U.S. Cl. 424—357 3 Claims

3. A diluent or carrier for incorporation in pesticidal compositions containing a pesticidally active ingredient prepared by baking a calcium sulfate mineral at a temperature between 120°–1000° C to produce baked chalk, alpha chalk, beta chalk, gamma chalk or hydraulic chalk, adding water in amount between 15 and 70% of the weight of said baked calcium sulfate to form a dispersion, allowing settling to occur, adding 0.001–10% by weight of an additive, in an amount which is effective to reduce the rate of decomposition of the pesticidally active ingredient, said additive being a double sulfate of aluminum and potassium, a non-ionic, anionic or cationic surface active agent, carboxymethylcellullose, urea, a glycol, hexamethylene-tetramine, sodium bisulfate dihydrate, polyvinyl acetate, polyvinyl chloride or monobasic calcium phosphate, converting the material thus obtained to granular or powdery form and drying at 30°–300° C.

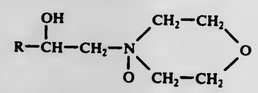
4,048,338

AQUEOUS COSMETIC COMPOSITION CONTAINING AMINE OXIDES

John Fred Gerecht, Somerville, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 414,586, Nov. 9, 1973, Pat. No. 3,926,861, which is a division of Ser. No. 166,253, July 26, 1971, Pat. No. 3,809,659, which is a division of Ser. No. 677,723, Oct. 24, 1967, Pat. No. 3,637,682. This application July 24, 1975, Ser. No. 613,370
Int. Cl.[2] A61K 7/50
U.S. Cl. 424—358 7 Claims

1. An aqueous cosmetic composition intended for application to the skin in the form of a lotion, cream, gel or clear liquid containing a morpholine oxide of the formula



wherein R is alkyl of 6 to 20 carbon atoms.

4,048,339

PREPARATION OF CHEESE WITH A MICROBIAL MILK COAGULATING ENZYME

Maria Stefanova Kondratenko; Lyubomir Todorov Nachev; Petrushka Atanassova Dedova, and Tamara Nikolaevna Antonova, all of Sofia, Bulgaria, assignors to DSO "Mlechna Promishlenost", Sofia, Bulgaria

Filed Nov. 20, 1975, Ser. No. 633,697
Claims priority, application Bulgaria, Nov. 22, 1974, 28256
Int. Cl.[2] A23C 19/00; C07G 7/02
U.S. Cl. 426—39 1 Claim

1. In a process for preparing hard and soft cheese from cow milk comprising the steps of:

1. mechanically cleaning of supply of cow milk;
2. cooling said milk;
3. pasteurizing the milk;
4. again cooling the milk;
5. adding a starter comprising lactic acid microorganisms to the milk;
6. adding the equivalent of 0.025 to 0.030% by volume based on the milk a solution of 50% calcium chloride to the milk;
7. adding liquid rennet to the milk to produce coagulation;
8. and processing the cheese product; the improvement which comprises:
   1. increasing the acidity of the milk before pasteurization to about 21°–24° T (0.189 to 0.216%) lactic acid;
   2. increasiing the said equivalent amount of calcium chloride described in step 6 added to the milk by 2 to 4 fold;
   3. adding sufficient of the enzyme obtained from *Bacillus subtilis mesentericus* to produce coagulation within 25–40 minutes.

4,048,340

KOJI MAKING METHOD

Masahiko Izumi, 8,26-ban, 5-chome, Hiikawa, Nish, Fukuoka, Japan

Filed July 6, 1976, Ser. No. 702,605
Claims priority, application Japan, July 21, 1975, 50-088408; July 23, 1975, 50-089176; Feb. 27, 1976, 51-020084; Mar. 26, 1976, 51-032493; May 6, 1976, 51-050944
Int. Cl.[2] A23L 1/23, 1/34
U.S. Cl. 426—46 7 Claims

7. A process for making Koji using an apparatus comprising a Koji making chamber, a ventilation line leading to said chamber, removal means in said ventilation line for removing dust and infectious microbes from the gas passing through said ventilation line, an exhaust line leading from said chamber and connecting with said ventilation line upstream of said separation means, by-pass means connecting the ventilation line and the exhaust line in parallel with said chamber, control means for controlling the amount of ventilation gas passing through said by-pass means, means for adding ventilation gas, means for venting ventilation gas, means for adding oxygen containing gas, means for adding heated aqueous vapor to the ventilation gas, and means for circulating the ventilation gas through the system, comprising:

adding Koji making starting materials to said chamber;

causing ventilation gas which is an inert as substantially free of oxygen to circulate through the system, adding sufficient heated aqueous vapor to heat the ventilation gas for avoidance of infectious microbes and maintain the temperature thereof at 32–38° C, and controlling said control means to maintain the germination temperature, humidity and flow rate in said chamber, until germination of the Koji-mould; and

after germination of the Koji-mould continuing said steps of causing circulation and adding heated aqueous vapor, adding sufficient oxygen containing gas to said ventilation gas to maintain an oxygen concentration necessary for growth in the system and controlling said control means to maintain the growth temperature, humidity and flow rate in said chamber, until the Koji is completed.

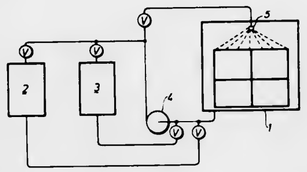
4,048,341

PROCESS AND AN APPARATUS FOR INCREASING THE FEED VALUE OF LIGNOCELLULOSIC MATERIALS

Gösta Bertil Lagerström, Glumslov, and Olof Arthur Mattsson, Viken, both of Sweden, assignors to Boliden AB, Stockholm, Sweden

Filed July 7, 1975, Ser. No. 593,662
Claims priority, application Sweden, July 8, 1974, 7408979
Int. Cl.[2] A23K 1/00, 3/00
U.S. Cl. 426—69 12 Claims

1. Process for increasing the feed value of lignocellulosic materials which comprises contacting lignocellulosic material with an alkaline liquid, wherein the alkaline liquid is supplied in excess and the excess is allowed to run off the lignocellulosic material before any substantial alkalization effect has been reached and wherein the excess alkali that is allowed to run off may be used for the treatment of a new quantity of said material, and that, after the alkaline liquid absorbed in the lignocellulosic material has provided its alkalization effect for a time necessary to partially break down the lignin or create openings in the lignin and expose the cellulose for celluose-degrading enzymes in the rumen of a ruminant animal, an acid solution or nutritive solution is added to the treated material for neutralization, said solution being supplied in such an amount as to at least correspond to the residual absorption capacity of the lignocellulosic material resulting from the effect of the alkaline liquid absorbed by the material.



4,048,342

PET FOOD PRESERVATION

Gerhard Julius Haas, Woodcliff Lake, N.J., and Edwin Bernard Herman, Yorktown Heights, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 9, 1976, Ser. No. 665,206
Int. Cl.[2] A23B 4/12
U.S. Cl. 426—129 10 Claims

1. In a method for preparing an intermediate-moisture food comprising pasteurized meat and containing an antimicrobial agent selected from the group of linear aliphatic acids, their edible salts, and combinations thereof, the improvement comprising:

packaging said food in a substantially gas impervious packaging material, and filling the free space in the package with carbon dioxide,

said food containing a level of said antimicrobial agent which is ineffective in the absence of the carbon dioxide to prevent microbial growth, but effective to prevent microbial growth when the food is packaged in carbon dioxide.

4,048,343

METHOXYMETHANE STERILIZATION METHOD

Irving E. Levine, Mill Valley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 504,130, Sept. 9, 1974, abandoned, which is a division of Ser. No. 387,869, Aug. 13, 1973, abandoned, which is a division of Ser. No. 337,519, March 2, 1973, Pat. No. 3,795,750, which is a continuation-in-part of Ser. No. 65,695, Aug. 20, 1970, abandoned, and Ser. No. 238,601, March 27, 1972, abandoned, said Ser. No. 236,601, is a continuation-in-part of Ser. No. 163,532, July 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 65,695,. This application Feb. 11, 1976, Ser. No. 657,119
The portion of the term of this patent subsequent to Aug. 19, 1992, has been disclaimed.
Int. Cl.[2] A23C 3/00; A23L 3/00
U.S. Cl. 426—330.2 5 Claims

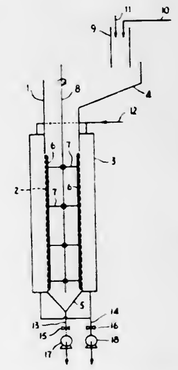
1. Sterilization or preservation method comprising physically contacting substances of the class consisting of solid foods and beverages contaminated by microorganisms with an effective amount of methoxymethane under pressure and temperature sufficient to maintain the methoxymethane in liquid state and for a contact time with said microorganisms sufficient to effectively control the microorganisms, releasing the pressure and removing methoxymethane by evaporation.

4,048,344

PREPARATION OF TEA EXTRACTS

Rupert Josef Gasser, and Steven N. Watercutter, both of Marysville, Ohio, assignors to Societe d'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland

Division of Ser. No. 421,852, Dec. 5, 1973, Pat. No. 3,992,983. This application June 26, 1975, Ser. No. 590,466
Int. Cl.[2] A23F 3/00
U.S. Cl. 426—385 25 Claims



1. A process for continuously preparing a tea extract which comprises continuously feeding an aqueous tea slurry at a temperature of at least about 90° C through a first zone at a predetermined rate while continuously feeding an aqueous extraction liquid at a temperature of at least about 90° C through a second zone at a predetermined rate concurrently with feed through said first zone and in contact with a barrier separating said two zones, said barrier being permeable to tea soluble solids flow therethrough but impermeable to tea insolubles flow therethrough to permit diffusion of tea solubles from the aqueous tea slurry into the aqueous extraction liquid, the volume of the slurry being about 0.5 to 2.5 times the volume of the aqueous extraction liquid, continuously removing aqueous slurry and extraction liquid from the respective two zones, the extraction liquid being removed from the second zone at a greater rate than at which it is supplied thereto, the aqueous slurry being removed from the first zone at a lesser rate than that at which it is supplied thereto with the aqueous slurry having a residence time in said first zone of at least about 2 minutes, and thereafter combining at least a part of the tea solubles diffused into the extraction liquid with tea solubles remaining in the aqueous slurry.

4,048,345

COFFEE PERCOLATION PROCESS

Saul Norman Katz, Monsey, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 417,312, Nov. 19, 1973, abandoned. This application Feb. 2, 1976, Ser. No. 654,447
Int. Cl.[2] A23F 1/08
U.S. Cl. 426—432 2 Claims

1. In a percolation process wherein roasted and ground coffee is loaded into a series of fixed volume extraction columns in a manner such that said roasted and ground coffee exhibits packed bed characteristics and is concurrently contacted with an aqueous extraction liquid, the improvement whereby uniform quality and operating characteristics are obtained at reduced output rates, said improvement comprising loading spent coffee grounds and roast ground coffee into said extraction columns to obtain a packed bed such that said aqueous extraction liquid entering said columns contacts said spent grounds prior to contacting the roasted and ground

coffee to be extracted whereby said packed bed characteristics are maintained throughout the extraction process.

4,048,346

METHOD OF STABILIZING LACTOSE COMPOSITIONS

Jerry H. Stoller, Houston, Tex., assignor to Stoller Chemical Company, Inc., Houston, Tex.

Filed Nov. 17, 1975, Ser. No. 632,236
Int. Cl.² A23C *21/00*
U.S. Cl. 426—583 **20 Claims**

1. A method of providing a flowable composition having a high concentration of solid lactose comprising concentrating a lactose containing mixture to obtain a product having from about 20 to about 45% by weight lactose and admixing said product with a stabilizing amount of an ingestible, non-toxic lignin sulfonate, said lignin sulfonate being present in an amount sufficient to maintain said composition in a flowable form, said lignin sulfonate being added prior to substantial crystal growth of said lactose.

4,048,347

METHOD OF COATING LAMP ENVELOPE WITH HEAT REFLECTING FILTER

Martin P. Schrank, Ipswich, and Richard M. Coppola, Beverly, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Continuation-in-part of Ser. No. 603,415, Aug. 11, 1975, abandoned. This application Nov. 24, 1976, Ser. No. 744,556
Int. Cl.² B05D *5/06, 1/36*
U.S. Cl. 427—10 **2 Claims**

1. The method of depositing a dichroic coating on the tubular envelope of an incandescent lamp comprising the steps of disposing said envelope in an evacuable bell jar and in line of sight with an evaposating source therein; evacuating said bell jar; heating and rotating said envelope while two different materials are alternately evaporated and deposited on the envelope, the envelope being heated during deposition to a temperature of at least about 300° C by energizing the lamp filament; and monitoring the thickness of said coating by beaming light on a plate located in the bell jar in line of sight with the evaporating source, recording the intensity of light reflected from said plate, determining the thickness of coating on said plate by means of said intensity of reflected light and multiplying said thickness of coating on said plate by a predetermined ratio to determine the coating thickness on said envelope.

4,048,348

METHOD OF APPLYING A FUSED SILICA COATING TO A SUBSTRATE

Cecil Bailey, Woodlyn; Walter C. Balchunas, Linfield, both of Pa., and John E. Zlupko, Delran, N.J., assignors to General Electric Company, Philadelphia, Pa.

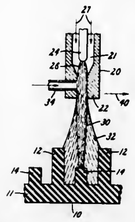
Continuation of Ser. No. 190,190, Oct. 18, 1971, Pat. No. 3,814,620. This application Nov. 7, 1973, Ser. No. 413,489
The portion of the term of this patent subsequent to June 4, 1991, has been disclaimed.
Int. Cl.² B05D *3/06*
U.S. Cl. 427—34 **2 Claims**

1. A method of applying to a substrate of refractory nonmetallic material a coating consisting essentially of fused silica that is firmly bonded to said substrate, said substrate comprising a base with elongated fins projecting therefrom, the method comprising the steps of:

a. providing an arc plasma spray gun that comprises an arc chamber in which an electric arc is established, means for feeding gas into the arcing chamber to develop a high temperature arc plasma, a nozzle through which said arc plasma is exhausted from said gun, and means through which particles of coating material can be fed into said arc plasma to melt the particles and entrain them in the arc plasma exhausted from said gun,

b. developing high-temperature arc plasma within said gun and projecting said arc plasma from the gun onto a surface of said refractory non-metallic substrate material,

c. feeding into said arc plasma a powder consisting essentially of particles of a material consisting essentially of crystalline silica, which particles are substantially completely melted by said high-temperature arc plasma and entrained in said arc plasma as droplets of molten fused silica that impinge against the surface of said substrate when said arc plasma is projected thereon,



d. holding said nozzle close enough to said substrate during the times that arc plasma containing said molten fused silica droplets is being projected thereon to effect melting of the substrate surface that said molten silica droplets are impinging against, and

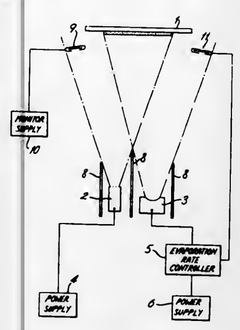
e. moving said arc plasma spray gun generally perpendicular to the length of said fins during the arc plasma spraying step of (c) and (d).

4,048,349

COMPOSITE METAL POLYMER FILMS

Martin White, Hassocks, and Niyom Boonthanoom, Brighton, both of England, assignors to National Research Development Corporation, London, England

Filed Dec. 5, 1974, Ser. No. 530,018
Claims priority, application United Kingdom, Dec. 7, 1973, 56788/73
Int. Cl.² B05D *5/12*; C23C *11/00*
U.S. Cl. 427—58 **17 Claims**



1. A process for producing a composite metal polymer film having a negative temperature coefficient of resistance, comprising

co-depositing, by evaporation from separate sources in a vacuum, metalliferous particles and insulative polymer particles onto a substrate, the proportion of metalliferous particles being such that the metal in the film is discontinuous, the metal particles being present in the form of islands with intervening zones of polymeric material, the islands having diameters of from 110A to 1000A, and

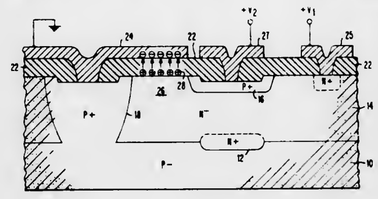
subjecting the film in an oxidizing atmosphere at from 200° to 220° C to an oxidative treatment in which substantial oxidation of the separate metal islands is achieved before loss of the polymer by oxidation and/or evaporation.

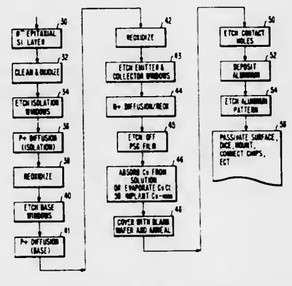
4,048,350

SEMICONDUCTOR DEVICE HAVING REDUCED SURFACE LEAKAGE AND METHODS OF MANUFACTURE

Reinhard Glang, Reston, Va., and Stanley Irwin Raider, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 19, 1975, Ser. No. 615,040
Int. Cl.² H01L *21/283, 21/461*
U.S. Cl. 427—93 **9 Claims**





1. A process for fabricating a semiconductor comprising steps of

a. forming an insulating layer on a semiconductor substrate,

b. forming a layer of positive ions on the surface of the insulating layer,

c. covering the insulating layer with a blank wafer to prevent gaseous escape of the positive ions from the insulating layer, and

d. driving the positive ions toward the substrate/insulating layer interface to achieve a positive charge level exceeding 2×10^{11} ions/cm² to prevent the formation of surface leakage paths on the substrate by potentials across the insulating layer exceeding 10 volts.

4,048,351

GRANULAR CALCIUM HYPOCHLORITE COATED WITH A LOW MELTING INORGANIC SALT BY SPRAY GRAINING

Walter C. Saeman, Hamden, Conn., and Noel N. Coe, West Lake, La., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 521,417, Nov. 6, 1974, which is a continuation-in-part of Ser. No. 276,615, July 31, 1972, abandoned. This application Mar. 12, 1975, Ser. No. 557,715
Int. Cl.² B05D *7/00*
U.S. Cl. 427—213 **16 Claims**

1. A method for preparing coated particulate solid calcium hypochlorite from a pumpable and sprayable molten hydrated low melting inorganic salt which comprises:

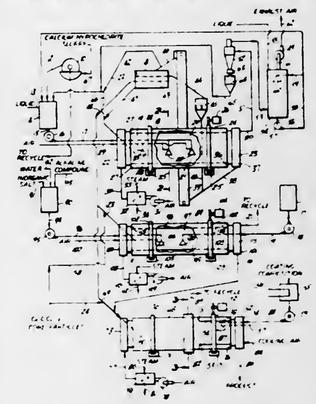
a. maintaining a moving bed of particulate solid calcium hypochlorite core particles containing from about 50 to about 85 percent available chlorine on a dry basis and from about 0.5 to about 30 percent by weight of water in the lower part of a distributing zone having an upper part and a lower part,

b. maintaining a temperature in said distribution zone in the range from about 0 to about 40° C.,

c. lifting a portion of said moving bed to said upper part and releasing said particles to separately fall through said distributing zone to said bed

d. spraying on said falling particles a melt of hydrated low melting inorganic salt,

e. wherein said low melting inorganic salt is selected from the group consisting of hydrated alkali metal metaborate, hydrated alkali metal tetraborate, hydrated aluminum



sulfate, hydrated magnesium sulfate, eutectic mixtures of alkali metal metaborate and hydrated alkali metal tetraborate, and mixtures thereof,

f. simultaneously cooling and solidifying said melt on the surface of said falling particles whereby said particles are coated with at least one outer layer of said low melting inorganic salt,

g. removing at least a portion of the resulting coated rounded solid calcium hypochlorite particles from said distributing zone,

h. wherein said exterior coating ranges from about 4 to about 45 percent by weight of said particles, and

i. wherein said calcium hypochlorite core particles are prepared by spray graining of a calcium hypochlorite slurry in a distribution zone prior to coating with said hydrated low melting inorganic salt.

4,048,352

METHOD OF PRODUCING A REFRACTORY LINING IN A CYLINDER OR TUBE

Arthur J. Pignocco, Franklin Township, Westmoreland County, and Robert H. Kachik, Washington Township, Westmoreland County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

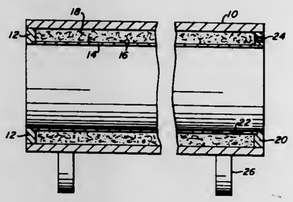
Continuation-in-part of Ser. No. 332,972, Feb. 15, 1973, abandoned. This application Feb. 13, 1975, Ser. No. 549,630
Int. Cl.² B05D *7/22, 3/02*
U.S. Cl. 427—234 **1 Claim**

1. A method of producing an abrasion-resistant refractory lining in a cylindrical hollow metal article having an inner surface area to be lined, comprising:

a. introducing into said metal article a predetermined quantity of an exothermic reaction mixture comprising a powdered fuel metal and a reducible metallic oxide powder, said powdered fuel metal being selected from the group

consisting of aluminum, magnesium, silicon, calcium-silicon alloy and mixtures thereof;

b. igniting said reaction mixture to form a reaction mass comprising a heavier, molten reduced metal phase and a lighter, molten slag phase, and subjecting said cylindrical article to a rotational movement about its longitudinal axis;



c. continuing said rotational movement at a sufficiently slow velocity that centrifugal forces do not prevent the molten metal and slag phases from lying at the bottom of the rotating pipe, and continuing said rotational movement for a time sufficient to cause said slag phase to be deposited against the inner wall of said article, forming the desired abrasion-resistant, refractory lining over said surface, and thereafter removing said metal phase from said article.

4,048,353

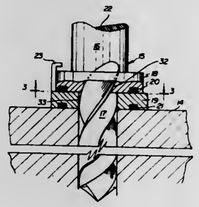
METHOD OF DRILLING AND INJECTING PERSERVATIVE FLUID INTO RAILWAY TIES

John Kenneth Stewart, and Helmuth von Beckmann, both of Columbia, S.C., assignors to Canron, Inc., New York, N.Y.

Filed Mar. 18, 1976, Ser. No. 667,993

Int. Cl.² B23B *35/00*; B27K *3/02*

U.S. Cl. 427—291 **1 Claim**



1. A method of drilling and injecting preservative fluid into a railway tie, the method comprising the steps of initially drilling a hole in the tie with a suitable fluted drill of the kind incorporating an internal, longitudinal fluid flow passage opening adjacent the drill tip, by rotating the drill in the drilling direction and simultaneously axially feeding the drill into the drilled hole, reversing the direction of drill rotation and simultaneously withdrawing the drill to clear the drilled hole of shavings, returning the drill to the hole using drilling rotation, reversing the drill rotation and maintaining the drill fully in the hole, while injecting preservative fluid into the walls of the hole from said opening, sealing the mouth of the hole to prevent the egress of preservative therefrom, and subsequently withdrawing the drill from the hole.

4,048,354

METHOD OF PREPARATION AND USE OF NOVEL ELECTROLESS PLATING CATALYSTS

Nathan Feldstein, P.O. Box 2027, Princeton, N.J. 08540

Filed Oct. 23, 1975, Ser. No. 625,326

Int. Cl.² C23C *3/02*

U.S. Cl. 427—304 **34 Claims**

1. A method for forming an active catalyst useful in electroless plating processes comprising a metal capable of electroless plating initiation derived from the admixing of weakly active colloidal dispersion of said metal or a compound of said metal or alloy of said metal containing a stabilizer so as to render said dispersion stable with a reactivity modifier selected from the groups consisting of surfactants and soluble halides.

4,048,355

PROCESS FOR THE FORMATION OF A POLYOLEFIN COATING LAYER ONTO A METAL SURFACE

Seigo Sakayori, Koga; Tomoyosi Kuro, Izumi; Kazuyuki Morita, Sowa; Nobuya Hinooka, Iwakuni; Hirozi Niimi, Waki, and Kensuke Komatsu, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo and Toa Paint Co. Ltd., Osaka, both of Japan

Filed Nov. 19, 1974, Ser. No. 525,219

Claims priority, application Japan, Nov. 22, 1973, 48-131972

Int. Cl.² B05D *1/36*

U.S. Cl. 427—375 **19 Claims**

1. A process for coating a metal surface with a polyolefin comprising:

I. coating a metal surface with a first layer consisting essentially of an uncured epoxy resin and least one curing agent; and

II. melt-bonding onto the first uncured layer, a second layer which is:

A. a first polyolefin modified by copolymerization with one member of the group consisting of:

i. an unsaturated dicarboxylic acid having the carboxylic groups attached to adjacent carbon atoms,

ii. an anhydride of the acid of (i); or

B. a blend of polyolefins consisting essentially of:

i. a second polyolefin, and

ii. the modified first polyolefin of (A),

the polyolefin of (B) (i) and (B) (ii) being the same or different,

with the provisos that: (1) for (A), the weight percentage of the repeating units of (A) (i) or (A) (ii) is from 10^{-4} to 10% of the modified polyolefin; and (2) for (B), the weight percentage of the repeating units of (B) (ii) is from 10^{-4} to 10% of the polyolefin blend.

4,048,356

HERMETIC TOPSEALANT COATING AND PROCESS FOR ITS FORMATION

Peter Bakos, Endicott; Irving Memis, Vestal, and John Rasile, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1975, Ser. No. 640,511

Int. Cl.² B05D *3/02, 7/26*

U.S. Cl. 427—379 **13 Claims**

1. A process for forming a hermetic seal coating on electronic circuitry comprising applying to said circuitry a mixture which includes:

a. a vinyl unsaturated silane monomer

b. a bifunctional silane adhesion promoter

c. a polymeric plasticizer, and

d. an organic solvent

and curing said mixture to form a solid, adherent, cross-linked polysilane coating on said circuitry.

7. A process for forming a hermetic seal coating over electronic circuitry, which is supported on the surface of a substrate, comprising applying to said surface and circuitry a mixture which includes:

a. 0.5 to 10 parts by weight of a vinyl unsaturated silane monomer selected from the group consisting of, pentamethyldisiloxane methylmethacrylate, vinyltrichlorosilane, vinyltriethoxysilane and vinyltris(2-methoxyethoxy)silane;

b. 0.5 to 10 parts by weight of a bifunctional silane adhesion promoter selected from the group consisting of, gamma-aminopropyltriethoxysilane, beta-(3,4-epoxycyclohexyl)-ethyltrimethoxysilane, gamma-glycidoxypropyltrimethoxysilane, and N-beta(aminoethyl)-gamma-aminopropyl-trimethoxysilane;

c. 0.1–15 parts by weight of a polymeric plasticizer selected from the group consisting of, epoxy resins, polyesters, polycarbonates, polychloroprene, polystyrene, alkyd resins, allyl resins, amino resins, polysulfone resins, vinyl polymers and copolymers, urea and melamine resins and amide/imide polymers,

d. 0.0–80 parts by weight of a stabilizer selected from the group consisting of dimethylacetamide, N N-dimethylaniline, piperidine, 4',4'-dimethoxy-diphenylamine, and phenyl-alpha-naphthylamine, and

e. an organic solvent in an amount to provide 1–50% by weight concentration of the other ingredients,

and curing said mixture to form a solid, adherent, cross-linked polysilane coating having a thickness of from about 50 microinches to about 3 mils on said surface and circuitry.

12. A process for forming a hermetic seal coating on metal conductor lines on the surface of a substrate having integrated circuit chips electrically bonded thereto comprising:

applying to said surface a coating material comprises:

a. 0.5 to 10 parts by weight of, a vinyl unsaturated silane monomer selected from the group consisting of, pentamethyldisiloxane methylmethacrylate, vinyltrichlorosilane, vinyltriethoxysilane and vinyltris(2-methoxyethoxy)silane;

b. 0.5 to 10 parts by weight of a bifunctional silane adhesion promoter selected from the group consisting of, gamma-aminopropyltriethoxysilane, beta-(3,4-epoxycyclohexyl)-ethyltrimethoxysilane, gamma-glycidoxypropyltrimethoxysilane, and N-beta(aminoethyl)-gamma-aminopropyl-trimethoxysilane;

c. 0.1–15parts by weight of a polymeric plasticizer selected from the group consisting of, epoxy resins, polyesters, polycarbonates, polychloroprene, polystyrene, alkyd resins, allyl resins, amino resins, polysulfone resins, vinyl polymers and copolymers, urea and melamine resins and amide/imide polymers,

d. 0.0–80 parts by weight of a stabilizer selected from the group consisting of dimethylacetamide, N N-dimethylaniline, piperidine, 4',4'-dimethoxy-diphenylamine, and phenyl-alpha-naphthylamine, and

e. an organic solvent in an amount to provide 1–50% by weight concentration of the other ingredients,

said coating material being applied to a wet thickness less than the distance between the substrate surface and the bottom surface of the chip with the solid content of said coating material being adjusted to provide a dry coating thickness on said conductor lines of 400 to 500 microinches, and

curing said coating material by a three step heating cycle in which the mixture is first dried to a viscous state by heating at temperatures of from about 40° to 75° C, is next polymerized to a solid film by by heating at temperatures of from about 80° to 110° C and is finally cured to a dimensionally stable state by heating at temperatures of from about 115° to 180° C.

4,048,357

METHOD OF COATING MULTI-LAYER GRAPHIC FILM

August Jean Van Paesschen, Antwerpen, and Lucien Janbaptist Van Gossum, Kontich, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 404,675, Oct. 9, 1973, abandoned. This application Dec. 29, 1975, Ser. No. 645,273

Claims priority, application United Kingdom, Oct. 10, 1972, 46727/72

Int. Cl.² B05D *3/00*; G03C *1/76*

U.S. Cl. 427—387 **6 Claims**

1. In a coating method for preparing a multi-layer material for use in the graphic arts or in X-ray photography in which a web of a polyester film support has applied to one of its sides to form an anchoring layer an aqueous binder latex containing at least one copolymer of vinyl chloride, vinylidene chloride, acrylic or methacrylic acid esters, vinyl esters, or butadiene, the anchoring layer is heated during drying or heat-setting to a temperature above the glass transition temperature of said copolymeric binder and is conveyed while hot by means of conveying rollers contacting said anchoring layer surface, and at least one gelatin-containing hydrophilic layer is applied to the anchoring layer, the improvement of reducing the tendency of said anchoring layer to adhere while hot to said conveying rollers or to a contiguous anchoring layer by incorporating a silane compound in said anchoring layer in the amount of about 5-100% by weight of said copolymer binder, said silane compound corresponding to the formula:



wherein:

each of R and R' represents hydrogen, alkyl, chloroalkyl, aminoalkyl, alkoxy, hydroxyalkoxy, aminoalkoxy, epoxyalkoxy, alkoxyalkoxy, acetyloxy, vinyl or phenyl, wherein alkyl contains 1 to 4 carbon atoms; and each of R'' and R''' represents cyanoalkyl, aminoalkyl, aminoalkoxyalkyl, epoxyalkoxyalkyl, alkoxycarbonylalkyl, (meth-)acryloyloxyalkyl, (meth)acrylaminoalkyl, chloroacetamidoalkyl, N-(aminoalkyl)-aminoalkyl, bis-(hydroxyalkyl)-aminoalkyl, alkoxy, hydroxyalkoxy, aminoalkoxy, epoxyalkoxy, alkoxyalkoxy, phenoxy, acetyloxy, and 3-[7-oxabicyclo-(4,1,0)-heptyl]-alkyl, wherein alkyl contains 1 to 4 carbon atoms

whereby the tendency of the anchoring layer of becoming tacky during drying of said layer or during transversal stretching, heat-setting or relaxation of the polyester film support to which said layer was applied is reduced and sticking of the anchoring layer to the conveyor rollers with which it is brought into contact before it is sufficiently cooled thus obviated without a corresponding reduction in the adhesion of the anchoring layer to said polyester support.

4,048,358

LIQUID CRYSTAL DEVICES

Ian Alexander Shanks, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 636,786, Dec. 1, 1975, abandoned. This application Aug. 18, 1976, Ser. No. 715,263

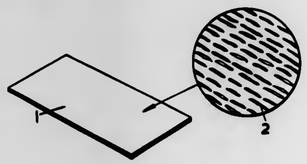
Claims priority, application United Kingdom, Dec. 2, 1974, 52123/74

Int. Cl.² C09K *3/34*

U.S. Cl. 428—1 **11 Claims**

1. A liquid crystal polarizer device comprising a sheet of

plastics material having an open elongated pore structure into which elongated pores a liquid crystal material has been introduced, the size of said pores being slightly larger than the molecular dimensions of said liquid crystal material.

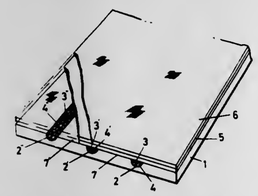


4,048,359

METHOD OF MANUFACTURING POLYCHROMATIC YARNS

Ichiro Shibanai, Tokyo, and Shoji Tanabe, Kamakura, both of Japan, assignors to Japan Jewel Company Limited, Tokyo, Japan

Filed Aug. 19, 1976, Ser. No. 715,738
Claims priority, application Japan, Sept. 23, 1975, 50-114319
Int. Cl.² B44F *1/00*
U.S. Cl. 428—1 **7 Claims**



1. Polychromatic artificial yarns each comprising a transparent plastic film enclosure incorporating (1) a layer of micro-encapsulated liquid crystals mixed with an ultraviolet light adsorbent in fine particle form and (2) a layer of carbon black, and manufactured by the steps of:

forming a plurality of grooves on one surface of a first transparent thin plastic film in parallel and spaced apart relationship with one another;

applying a layer of micro-encapsulated liquid crystals mixed with an ultra-violet light adsorbent onto the surface of each of said grooves;

applying a layer of carbon black over said surface of said first transparent thin plastic film;

covering adhesively said surface of said first transparent thin plastic film with a second transparent thin plastic film;

cutting out said second and first transparent thin plastic films longitudinally between said grooves into linear strips each forming the film enclosure.

2. In a method of manufacturing polychromatic artificial yarns each comprising a transparent plastic film enclosure incorporating therein (1) a layer of micro-encapsulated liquid crystals mixed with an ultra-violet light adsorbent in fine particle form and (2) a layer of carbon black, the improvement characterized by the steps of:

forming a plurality of grooves on one surface of a first transparent thin plastic film in parallel and spaced apart relationship with one another;

applying a layer of micro-encapsulated liquid crystals mixed with an ultra-violet light adsorbent onto the surface of each of said grooves;

applying a layer of carbon black over said surface of said first transparent thin plastic film;

covering adhesively said surface of said first transparent thin plastic film with a second thinner transparent plastic film;

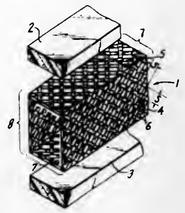
cutting out said second and first transparent plastic films longitudinally between said grooves into linear strips each forming the film enclosure.

4,048,360

LOW-WEIGHT DENT-RESISTANT STRUCTURE AND METHOD FOR PRODUCTION THEREOF

Wolfgang Jonda, Oberpframmern, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Munich, Germany

Filed Apr. 24, 1975, Ser. No. 571,491
Claims priority, application Germany, Apr. 25, 1974, 2419999
Int. Cl.² D02G *3/00*; B32B *5/12*
U.S. Cl. 428—35 **3 Claims**



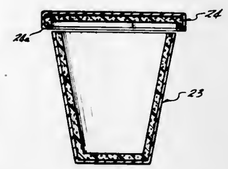
1. In a lightweight dent-resistant hollow structure of the type composed of two spaced apart outer sheets and an inner supporting core, the improvement which comprises said supporting core being composed of a series of rigid support sheets composed of resin-reinforced fibers in the form of a net, wherein at least one support sheet is parallel to and contiguous with each outer sheet and a plurality of said support sheets are disposed perpendicularly to and are secured to the parallel support sheets to maintain the outer sheets in said spaced apart position.

4,048,361

COMPOSITE MATERIAL

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Continuation of Ser. No. 518,264, Oct. 29, 1974, abandoned. This application July 30, 1976, Ser. No. 710,171
Int. Cl.² B65D *23/00, 23/02*
U.S. Cl. 428—35 **15 Claims**



1. A rigid composite container having improved resistance to unwanted gas permeation comprising a first barrier layer having substantial resistance to said gas permeation, a second carrier layer selected from the group consisting of plastic material and cellulosic material adjacent said first layer, the two layers being adhered one to the other substantially over their entire contacting areas, and a uniformly dispersed getter material capable of binding the unwanted gas in an amount sufficient to bind up any unwanted gas permeating the barrier layer, said getter material being carried by said carrier layer, wherein the barrier layer is in the position first exposed to the unwanted gas and is outermost with respect to said carrier layer, whereby the barrier layer provides initial and substantial but incomplete resistance to said gas permeation and gas passing through the barrier layer contacts dispersed getter material and is bound up thereby, said container having a hollow, bottle, jar or cup-like configuration and an open neck closed by a cover having resistance to said unwanted gas permeation.

4,048,362

REINFORCED ELASTOMERIC ARTICLES

Peter Lothar Ernst Moring, and Kenneth William John Raines, both of Sutton Coldfield, England, assignors to Dunlop Limited, London, England

Filed Apr. 19, 1976, Ser. No. 678,123
Claims priority, application United Kingdom, Apr. 25, 1975, 17175/75
Int. Cl.² B32B *27/34*; F16L *11/08*
U.S. Cl. 428—36 **23 Claims**

1. A method of bonding an aromatic polyamide which, if manufactured as a fibre, would be termed an aramid to a nitrile rubber composition comprises applying to the aromatic polyamide a coating of a vinyl chloride polymer, assembling the coated aromatic polyamide with the rubber composition and vulcanising the rubber in contact with the coated surface of said aromatic polyamide.

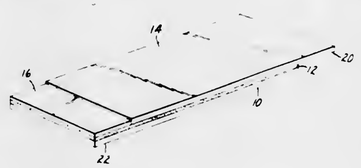
21. A composite article comprising a vulcanised nitrile rubber composition bonded to a vinyl chloride polymer coated surface of an aromatic polyamide which, if manufactured as a fiber, would be termed an aramid.

4,048,363

OFFSET LAMINATED INTUMESCENT MOUNTING MAT

Roger L. Langer, Troy Township, St. Croix County, Wis., and Alan J. Marlor, Minneapolis, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 16, 1976, Ser. No. 696,509
Int. Cl.² B32B *3/00*
U.S. Cl. 428—77 **3 Claims**



1. As an article of manufacture an intumescent conforming mounting pad comprised of at least a first ply of intumescent sheet material having one adhesive-coated face and having ends and edges separated by predetermined dimensions and a second ply of intumescent sheet material of substantially the same dimensions as said first ply longitudinally displaced from one end of said first ply by a predetermined amount and adhered to the adhesive-coated face of said first ply leaving a free end of said first ply with exposed adhesive-coated face.

4,048,364

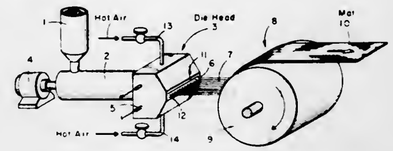
POST-DRAWN, MELT-BLOWN WEBS

John W. Harding, and James P. Keller, both of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 534,835, Dec. 20, 1974, abandoned, which is a continuation of Ser. No. 261,875, June 12, 1972, abandoned. This application Jan. 21, 1976, Ser. No. 651,328
Int. Cl.² B32B *7/14*
U.S. Cl. 428—113 **1 Claim**

1. A soft, glossy ribbon having substantially uniform, parallel, fine polypropylene fibers in a substantially longitudinal direction interspersed with coarse fiber junction points wherein said ribbon is much stronger in its longitudinal direction than in its transverse direction and is much stronger in said longitudinal direction as compared to a precursor, non-woven polypropylene, melt-brown article made from a melt-blowing process, which precursor article comprises

a. a mass of self-bonded, polypropylene fibers in a random network with said fibers
   i. having an average diameter of 10 to 40 microns
   ii. with little or no crystallinity and orientation,
b. having a breaking length of from 600 to 2,000 meters,
c. an elongation before break of at least 50%, and an ability to break sharply at said elongation, and
d. a tenacity of less than 0.4 grams per denier, said ribbon having



a. fibers in the longitudinal direction having an average diameter of 1 to 8 microns and being relatively strong, fine, oriented and crystalline, and
b. fibers in the transverse direction having an average diameter of 10 to 40 microns and being relatively coarse, weak and with little or no crystallinity and orientation, said transverse fibers being essentially of the same physical characteristics of those of said precursor non-woven article before conversion to said ribbon, and
c. said ribbon having a tenacity of at least 1.6 grams per denier in the longitudinal direction

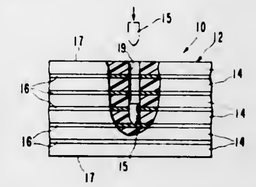
wherein the improved properties of said ribbon as compared to said precursor article are obtained by drawing said precursor article at a draw ratio of from 2:1 to 10:1 at a temperature of 200° to 370° F.

4,048,365

ARMOR STRUCTURE FORMED FROM PLASTIC LAMINATES

William H. Hoover, P.O. Box 2601, San Rafael, Calif. 94902

Continuation of Ser. No. 473,246, May 24, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 610,947
Int. Cl.² B32B *7/02, 17/10*; F41H *5/04, 5/06*
U.S. Cl. 428—215 **5 Claims**



1. Armor structure defining a cured unitary body comprising: a plurality of monolithic plates and means connecting the plates together in a stack with each pair of plates being spaced apart, each plate being comprised of a number of generally spaced mats of glass fibrous material embedded in a cured thermosetting resin to form a monolithic unit each plate having a thickness of at least ¼ inch and a specific gravity of about 1.0, said connecting means comprising a bonding layer including a mat of fibrous material impregnated with a rigid binder material and having a specific gravity of at least 1.5, there being a bonding layer between each pair of adjacent plates, respectively, so as to present an interface between each plate and the adjacent bonding layer at which delamination can occur, each

bonding layer having a thickness in the range of 1/64-inch to 1/16-inch, the outer plates of said stack having exposed outer surfaces through which a projectile must pass before striking the stack so that either outer plate is subject to being directly stuck by a projectile, each bonding layer being bonded to substantially the entire adjacent surface portion of the adjacent plate.

4,048,366

NOISE CONTROL MATERIALS

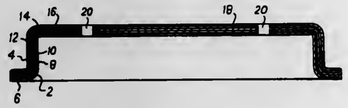
Herbert William Kingsbury, Chislehurst, England, assignor to British Uralite Limited, near Rochester, England

Filed July 14, 1975, Ser. No. 595,722

Claims priority, application United Kingdom, July 26, 1974, 33185/74

Int. Cl.² B32B 7/02, 11/02

U.S. Cl. 428—215 **10 Claims**



1. A noise reducing combination, comprising a component which is prone to vibrate and, applied to at least a part of the surface thereof, a vibration damping material consisting essentially of a laminate of a metallic sheet which is from 0.4 mm to 2 mm thick and has a density of at least 7 gm/cc and wherein the metal is a metal having a shear modulus not exceeding 4×10^{11} dynes per square centimeter and, adhesively bonded to each face of said sheet, a layer of reinforced thermoplastic material comprising a matrix of pliant thermoplastic material reinforced with fibrous material in the form of staple fibers forming a disperse phase in the matrix, wherein the metallic sheet is spaced from said surface of said component by one of said layers of reinforced thermoplastic material.

9. A combination in accordance with claim 1 wherein said laminate comprises a sheet of lead between the bonded to each of two layers of reinforced thermoplastic material each of which comprises bitumen reinforced with staple asbestos fibers which are in the form of a plurality of discrete laminae within the layer, the laminae extending parallel to the plane of the layer and the fibers of each lamina being randomly oriented in the plane of the layer; the lead sheet being from 0.8 to 1.8 mm thick and each layer of reinforced thermoplastic being from 2 mm to 6 mm thick.

4,048,367

PHOTOSTABILIZATION OF POLYMERS

David J. Carlsson, 14 Delong Drive, Ottawa 9, Ontario; Tony Suprunchuk, 2124 Haig Drive, and David M. Wiles, 1927 Fairmeadow Crescent, both of Ottawa 8, Ontario, all of Canada

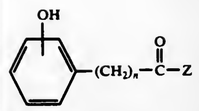
Continuation-in-part of Ser. No. 267,461, June 29, 1972, Pat. No. 3,871,901. This application Mar. 3, 1975, Ser. No. 554,990

Claims priority, application Canada, July 2, 1971, 117203

Int. Cl.² B05D 1/18, 3/14; B32B 27/02, 27/16

U.S. Cl. 428—220 **21 Claims**

1. Thin films, fibers, and filaments of polymeric material having high surface area in relation to volume stabilized against the degradative effects of actinic radiation, comprising said polymeric material containing an energy transfer agent which is incorporated into a thin surface layer having a thickness of not more than 1 micron, said energy transfer agent being a substituted phenol of the formula:



wherein n is 0 or an integer from 1 to 6, and Z is a group —R or —OR wherein R is a hydrocarbyl group, or a derivative of such a substituted phenol in which the benzene ring is substituted by one or more hydroxyl, nitro, halogen, —R or —OR substituents wherein R is a hydrocarbyl group, the amount of energy transfer agent in the layer being at most 0.4% by weight based on the weight of the polymeric material, said energy transfer agent being differentiated from an ultraviolet absorber by a screening test which comprises (i) depositing the energy transfer agent onto a first thin film of a polymeric material in a stabilizing amount, said material having a high inherent transmission of incident ultra-violet radiation in the absence of any ultra-violet stabilizer, (ii) positioning a second film of said polymeric material containing no stabilizer so as to receive only radiation which has passed through said first film; (iii) irradiating said first film which has said agent deposited thereon with ultra-violet light, and (iv) determining the extent of degradation of said second film, said second film being degraded almost as rapidly when an energy transfer agent has been deposited on said first film as when irradiated in the absence of said film, this not being the case when said first film is stabilized with an ultra-violet absorber.

4,048,368

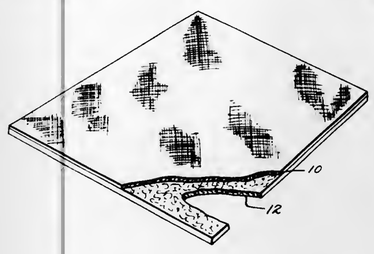
LAMINATED SUBSTRATE FOR AN OFFSET PRINTING BLANKET

Ferrell Daniel Hale, Langdale, Ala., and Charles H. Crowder, West Point, Ga., assignors to West Point Pepperell, Inc., West Point, Ga.

Filed Apr. 19, 1976, Ser. No. 678,436

Int. Cl.² B32B 7/00

U.S. Cl. 428—235 **3 Claims**



1. A substrate for an offset printing blanket comprising:
a woven fabric including spun warp fibers formed from an aromatic polyamide and fill fibers made of polyester, said warp fibers having a tensile stength at least in the order of four times that of cotton; and
a needle-punched non-woven mat laminated to said woven fabric by an adhesive.

4,048,369

METHOD FOR CONTROLLING ALLERGENS

Charles E. Johnson, 5250-19L S. Cherry Creek Drive, Denver, Colo. 80222

Filed Dec. 12, 1975, Ser. No. 640,206

Int. Cl.² B05D 7/24; B32B 27/12

U.S. Cl. 428—262 **4 Claims**

1. A method of controlling pyroglyphid mite activity in fabrics comprising coating the fabric with an aqueous film

forming solution having a pH from between about 7 and 10 to produce a film having a MFT below about 30° C, said film containing a major amount of a polymer having a Tg less than about 20° C wherein the film is hydrophobic, substantially non-nutritive, flexible, continuous and autosoluble.

4,048,370

SHAPED BEARING MEMBER

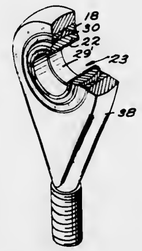
Stanley S. Orkin, Rockville, and Edward John Nagy, Windsor, both of Conn., assignors to Kamatics Corporation, Bloomfield, Conn.

Division of Ser. No. 452,359, March 18, 1974, Pat. No. 3,929,396, which is a continuation-in-part of Ser. No. 241,007, April 4, 1972, Pat. No. 3,806,216. This application Aug. 4, 1975, Ser. No. 601,956

The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.

Int. Cl.² B32B 5/16; F16C 33/00; C10M 7/00

U.S. Cl. 428—323 **1 Claim**



1. A shaped bearing member comprising a substrate provided with a coating of a cured mixture of an acrylate composition and a particulate solid lubricant, said coating having a thickness ranging from 0.002 to 0.125 inch, and said acrylate composition is selected from the group consisting of:

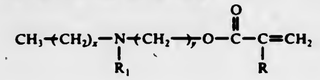
a. a mixture of a major amount of a liquid acrylic ester selected from the group consisting of di-, tri-, and tetraesters of an acrylic acid and a polyhydric alcohol, a minor amount of a low molecular weight prepolymer of an ester of a low molecular weight alcohol having a terminal vinyl group and an aromatic polycarboxylic acid in solution in said acrylic ester and an organic amide of the formula



wherein R is selected from the group consisting of hydrogen and aliphatic hydrocarbon of 1–20 carbon atoms in an amount sufficient to copolymerize said acrylic ester and prepolymer,

b. a mixture of acrylic ester monomer, a peroxidic initiator in an amount sufficient to initiate polymerization of said monomonomer and an aminoalkoxyalkylamine of the formula $R_1N(H)R_3[OR_3]_xN(H)R_4$ wherein x is an integer of 1–6 inclusive, each of R_1 and R_4 is selected from the group consisting of hydrogen and lower alkyl and each of R_3 and R_3 is a lower alkyl linking bridge between N and O, in an amount sufficient to accelerate the polymerization of said monomer,

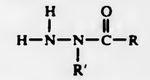
c. a mixture of an acrylic ester of an alkyl amino alkyl alcohol and an effective amount of hydroperoxide catalyst, said acrylic ester having the formula



wherein x is an integer of 0–5 inclusive, y is an integer of 1–6 inclusive, R is selected from the group consisting of hydrogen, halogen, hydroxy, cyano and lower alkyl and R_1 is selected from the group consisting of hydrogen and alkyl having 1–6 carbon atoms,

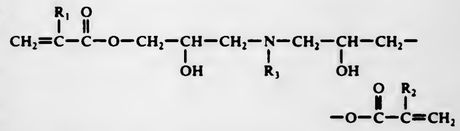
d. a mixture of a liquid acrylic ester monomer selected from the group consisting of diesters of an acrylic acid and a polyhydric alcohol, acrylic esters of cyclic ether alcohols, acrylic esters of amino alcohols and mixtures thereof, a peroxidic initiator and an oxyalkylamine of the formula $(H)_m N[(CH_2)_x(OR_1)_yOR_2]_n$ wherein m and n are each integers of 1 to 2 inclusive, the total of m and n is 3, x is an integer of 1 to 6 inclusive, y is an integer of 0 to 6 inclusive, R_1 is lower alkyl and R_2 is selected from hydrogen and lower alkyl,

e. a mixture of an acrylic ester monomer selected from the group consisting of di-, tri- and tetraesters of an acrylic acid and a polyhydric alcohol, acrylic esters of cyclic ether alcohols, acrylic esters of amino alcohols and mixtures thereof, a peroxidic initiator of an amount sufficient to initiate polymerization of said monomer and a member selected from the group consisting of rhodanine and a hydrazide of the formula.



wherein R and R^1 are selected from separate groups and an interconnected group forming a cyclic ring, R is further selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl and alkoxy and R^1 is selected from the group consisting of hydrogen, alkyl, cycloalkyl, acyl and dithiocrbonyl in an amount sufficient to accelerate the polymerization of said monomer; and

f. a mixture of a monomer of the formula



wherein R_1 and R_2 are selected from the group consisting of hydrogen and lower alkyl and R_3 is selected from the group consisting of lower alkyl, lower hydroxyalkyl, cyano and lower cyanoalkyl; at least one equivalent of an acid for each equivalent of said monomer, said acid being selected from the group consisting of acrylic acid and lower alkyl acrylic acids; an initiator selected from the group consisting of t-butyl perbenzoate, t-butyl peracetate and di-t-butyl diperphthalate, said initiator being present in an amount sufficient to initiate the polymerization of said monomer; a trihydroxy benzene inhibitor and an accelerator selected from the group consisting of benzhydrazide and N-aminorhodanine.

4,048,371

FASCES FIBERS

George Brumlik, Montclair, N.J., assignor to Ingrip Fasteners, Inc., Montclair, N.J.

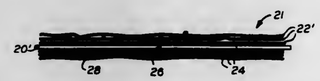
Filed Oct. 17, 1974, Ser. No. 515,793

Int. Cl.² B32B 27/00; D02G 3/00

U.S. Cl. 428—375 **2 Claims**

1. Composite textile filament comprising an assembly of at least two synthetic or natural textile filaments selected from a group consisting of polyester, polyamides, polyimides, rayon, urethane based polymers, cullulose acetate, cellulose triacetate, acrylic polymers, polyolefins, vinyl polymers, protein based polymers, cotton, flax, ramie, wool and animal hair extending together in the longitudinal direction and held to-

gether at joints connecting individual fibers, said joints being spaced in a three-dimensional spatial pattern, said joint pattern



varying both in the axial and radial directions of the individual fibers.

4,048,372

COATING OF CADMIUM STANNATE FILMS ONTO PLASTIC SUBSTRATES

Hiei Ando, and Gottfried Haacke, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 27, 1976, Ser. No. 661,884
Int. Cl.[2] C01G *11/00*; D01K *1/00*; H01L *15/02*
U.S. Cl. 428—412 **8 Claims**

1. In the process for coating a polymeric substrate with a light transmissive, electrically conductive film of cadmium stannate, the improvement which comprises first coating the substrate with a film of a metal oxide, selected from silicon monoxide, silicon dioxide, titanium dioxide, tantalum oxide, antimony oxide, magnesium oxide, chromium oxide and vanadium oxide.

4,048,373

WATER BARRIER PANEL

Arthur G. Clem, Des Plaines, Ill., assignor to American Colloid Company, Skokie, Ill.

Continuation-in-part of Ser. No. 472,668, May 23, 1974, Pat. No. 3,949,560. This application Oct. 28, 1975, Ser. No. 626,572
Int. Cl.[2] B32B *19/00*
U.S. Cl. 428—454 **6 Claims**



1. A panel for providing a water barrier comprising two opposing spaced sheets having between said spaced sheets a sealant composition comprising bentonite; a water soluble dispersing agent selected from the group consisting of a water-soluble salt of acetic acid, a water-soluble salt of phosphoric acid, and a water-soluble salt of boric acid; and a water-soluble polymer selected from the group consisting of polyacrylic acid, water-soluble salts of polyacrylic acid, hydrolyzed polyacrylonitrile, polyvinyl acetate, polyvinyl alcohol, copolymers of the foregoing, and a copolymer of acrylic acid and maleic anhydride, the amount of water-soluble polymer in said sealant composition being from 0.1% to 3.0%, by weight, and the amount of water-soluble dispersing agent in said sealant composition being from 0.1% to 3.0%, by weight.

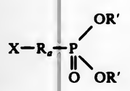
4,048,374

FUNCTIONAL ORGANOPHOSPHONIC ACID ESTERS AS PRESERVATIVE ADHESION PROMOTING AGENTS AND COATING FOR METALS

Hans-Joachim Kötzsch; Claus-Dietrich Seller, both of Rheinfelden, and Hans-Joachim Vahlensick, Wehr, Baden, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Division of Ser. No. 502,125, Aug. 30, 1974. This application June 26, 1975, Ser. No. 590,642
Claims priority, application Germany, Sept. 1, 1973, 2344197
Int. Cl.[2] B05D *1/36, 3/02, 7/14, 7/16*
U.S. Cl. 428—457 **26 Claims**

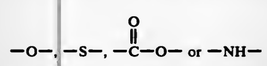
1. A method of protecting the surface of a metal which consists essentially of applying to said metal surface an organophosphorus compound of the formula



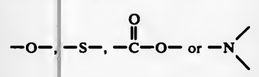
wherein

$a = 0$ or 1

R is a branched or unbranched chain bivalent alkylene radical of 1 to 12 carbon atoms which is substituted or unsubstituted and can contain in the chain structures



R′ is a branched or unbranched chain alkyl radical of 1 to 12 carbon atoms which can be halogen substituted and which can contain in the chain structure



X is an epoxy ring, halogen, alkenyl, carboxylic acid ester residue, amino, isocyanato, isothiocyanato, urea, thiourea, urethano, alkyl substituted thio radical or the radical of a heterocyclic ring containing O, S or N in the ring structure.

4,048,375

MAGNETIC RECORDING MEDIA OF IMPROVED MECHANICAL RESISTANCE

Gustav Loewenberg, Ludwigshafen; Hans-Joerg Hartmann, Freinsheim; Dieter Schaefer, Lindenberg; Herbert Motz, and Helmut Jakusch, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed July 26, 1976, Ser. No. 708,603
Claims priority, application Germany, Aug. 8, 1975, 2535448
Int. Cl.[2] H01F *10/02*
U.S. Cl. 428—474 **4 Claims**

1. In a magnetic recording medium comprising a non-magnetizable base and, applied thereto, a firm adhering coating suitable for magnetic recording and consisting essentially of a finely divided magnetic powder dispersed in an organic polymeric binder, the improvement which comprises: including in said coating from 0.2 to 5% by weight, based on the total weight of the coating, of a neutral salt of (a) a basic polyaminoamide, obtained by condensing dimerized and trimerized unsaturated fatty acids with aliphatic polyamines possessing two primary amino groups and having an amine value of from 100 to 500 and (b) an organic acid ester, obtained by reacting equimolar amounts of a polyalkylene glycol of molecular weight from 100 to 500, a monocarboxylic acid of 10 to 22 carbon atoms and a dicarboxylic acid anhydride or a dicarboxylic acid of 2 to 8 carbon atoms.

4,048,376

LAMINATING COMPOSITIONS AND USES

George E. Unmuth, Tulsa, Okla., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 195,849, Nov. 4, 1971, abandoned. This application Oct. 18, 1974, Ser. No. 516,099
Int. Cl.[2] C09J *3/26*
U.S. Cl. 428—461 **12 Claims**

1. The process of laminating two plys to each other which comprises applying a composition consisting essentially of
   1. about 20–40% by weight of atactic polypropylene having a solid density at 20° C. from 0.75 to 0.89,
   2. about 10–25% by weight of a resin selected from the group consisting of petroleum polymer resins produced by treating hydrocarbon mixtures containing diolefins, olefins, aromatics, paraffins and naphthenes with an aluminum halide catalyst at temperatures from −30° to +75° C., terpene polymer resins, rosin resins, rosin ester resins, coumarone-indene, alpha methyl styrene/vinyl toluene, styrene-indene-isoprene terpolymers, terpene phenolics, hydroabietyl alcohol and esters of hydroabietyl alcohol, and
   3. microcrystalline wax as the balance by weight to one or both plys at a temperature above 225° F. and joining said plys at a temperature above about 225° F. and allowing the joined plys to cool, the resulting laminated structure having good laminating strength at high temperatures.

4,048,377

DRIED REHYDRATABLE FILM CONTAINING AGAROSE OR GELOSE AND PROCESS FOR PREPARING SAME

Egisto Boschetti, Chatou; Yvette Paule Nicole Moroux, Mitry Mory, and Rene Tixier, Paris, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 12, 1976, Ser. No. 648,084
Claims priority, application France, Jan. 14, 1975, 75.00922
Int. Cl.[2] B32B *27/08*; C08L *5/00, 5/12*
U.S. Cl. 428—474 **17 Claims**

1. A process for preparing a dried agarose or gelose-containing film rehydratable into an aqueous gel film of agarose or gelose, said process consisting essentially of the steps of:
   1. forming an aqueous gel film containing at most 5% by weight agarose or gelose and a water-soluble, linear polymer or copolymer of a member selected from the group consisting of acrylamide and methacrylamide, said polymer or copolymer having a viscosity of about 17,000 centipoises or less when in a 5% aqueous solution at a temperature of 22° C, by pouring onto a support a hot glycero-aqueous solution containing the agarose or gelose and said polymer or copolymer and cooling said solution,
   2. drying the resulting aqueous gel film, said polymer or copolymer being present in an amount sufficient to maintain said dried film in storage for an extended period of time.

4,048,378

ADHESIVE LAMINATED PACKAGING MATERIALS

Victor J. Pelzek, Milwaukee, Wis., assignor to Browne Packaging, Inc., Milwaukee, Wis.

Filed Dec. 8, 1976, Ser. No. 748,527
Int. Cl.[2] B32B *27/08, 27/30, 27/36*
U.S. Cl. 428—483 **8 Claims**

5. A flexible, laminated, heat-sealable packaging material comprising

an outer film of biaxially oriented polypropylene or a polyethylene terephthalate, and

an inner film of a heat-sealable, polymeric material bonded to one side of said outer film by an intervening adhesive layer consisting essentially of about 70 to about 90 weight % of an ethylene-vinyl acetate copolymer which contains about 20 to about 40 weight % vinyl acetate, about 10 to about 30 weight % of a tackifying resin, and 0 to about 5 weight % of a plasticizer which is compatible with said ethylene-vinyl acetate copolymer.

4,048,379

WATER-DISPERSION VARNISH FOR ELECTRODEPOSITION

Eiki Jidai; Hiroshi Ono, and Kyoichi Shibayama, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1975, Ser. No. 571,054
Claims priority, application Japan, May 2, 1974, 49-49929; May 9, 1974, 49-51979
Int. Cl.[2] C08F *220/46*
U.S. Cl. 428—500 **5 Claims**

5. A coated product having high scrape abrasion resistance and a high cut-through temperature, wherein the coating, comprises:

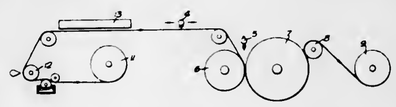
a resin prepared by copolymerizing 30–65 weight percent of acrylonitrile; 5–30 weight percent of ethyl acrylate, n-propyl acrylate, n-butyl acrylate, isopropyl acrylate or n-hexyl acrylate; 2–10 weight percent of glycidyl methacrylate, n-methylol acrylamide, allyl glycidyl ether, methacrylamide or acrylamide, 2–8 weight percent of acrylic acid, methacrylic acid or maleic anhydride and 15–35 weight percent of styrene, methyl methacrylate, alpha-methylstyrene or vinyl acetate.

4,048,380

CAST COATED PAPER AND ITS PRODUCTION AND COMPOSITIONS FOR IT

René C. Blakey, Wrea Green; Robert G. Riddell, Hoghton; John Whittaker, Darwen, and John A. Wilson, Chadderton, all of England, assignors to Star Paper Limited, England

Filed Jan. 26, 1976, Ser. No. 652,118
Claims priority, application United Kingdom, Jan. 31, 1975, 4234/75
Int. Cl.[2] B05D *3/12*
U.S. Cl. 428—511 **28 Claims**



1. A process of forming a cast coating on a substrate comprising: applying to the substrate an aqueous coating composition comprising, per 100 parts by weight solids, at least 60 parts pigment and less than 40 parts of a synthetic resin binder, in which from 40 to 100% dry weight of the binder is a polymer which has a Tg from 0° to 45° C and a Tg—Tf from 5° to 25° C. and which is in the form of a latex having an average particle size of less than 0.5 microns; drying the coated substrate so that at least half the water applied with the coating composition is removed; applying water to the surface of the coating and molding the coating.

4,048,381

METHOD FOR MANUFACTURING AN ELECTRO-GALVANIZED STEEL SHEET EXCELLENT IN BARE CORROSION RESISTANCE AND ADAPTABILITY TO CHROMATING, AND PRODUCT THEREOF

Takeshi Adaniya, and Masaru Ohmura, both of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1975, Ser. No. 644,905
Claims priority, application Japan, Jan. 22, 1975, 50-8627; Mar. 28, 1975, 50-36891
Int. Cl.² B23P *3/00*; C25D *3/56, 5/48*
U.S. Cl. 428—632 **4 Claims**

3. An electro-galvanized steel sheet excellent in bare corrosion resistance and adaptability to chromating, characterized by a first galvanizing layer thereon containing at least one compound selected from the group consisting of the oxides and hydroxides of Cr, In and Zr, and at least one compound selected from the group consisting of the oxides and hydroxides of Co.

4,048,382

HIGH-WEAR-RESISTANT COMPOSITE MACHINE ELEMENT

Werner H. Fengler, 23651 Fordson Drive, Dearborn, Mich. 48124

Continuation-in-part of Ser. No. 604,336, Aug. 13, 1975, Pat. No. 3,992,164, which is a division of Ser. No. 506,332, Sept. 16, 1974, Pat. No. 3,991,229. This application Sept. 29, 1976, Ser. No. 727,781
Int. Cl.² B32B *15/18, 15/20*
U.S. Cl. 428—651 **5 Claims**

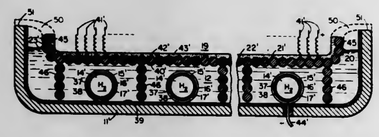
1. A composite wear-resisting element for a running seal of a machine, comprising
- a base portion composed of a metallic material selected from the group consisting of aluminum and iron and subject to excessive wear during operation of the machine,
- and a non-porous exposed wear-resistant coating overlying said base portion in fused interpenetrating relationship therewith,
- said coating consisting of an alloy composed essentially of molybdenum in the proportion of 80 percent to 60 percent and rhenium in the proportion of 20 percent to 40 percent.

4,048,383

COMBINATION CELL

John E. Clifford, Columbus, Ohio, assignor to Battelle Memorial Institute, Columbus, Ohio

Filed Feb. 9, 1976, Ser. No. 656,659
Int. Cl.² H01M *4/00, 8/18*
U.S. Cl. 429—19 **31 Claims**



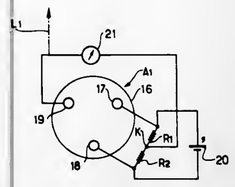
1. A combination water electrolyzer and fuel cell for selectively storing and supplying energy while in a substantially fixed position comprising
- a pan held in a substantially horizontal position,
- an aqueous electrolyte held within the pan,
- means communicating with a supply of hydrogen and forming a container for the hydrogen within the pan,
- a nonporous hydrogen diffusion negative electrode positioned within the pan, forming at least a portion of the hydrogen container, and having one surface in contact with the electrolyte and an opposite surface communicating with the hydrogen,
- means communicating with a supply of oxygen and furnishing the oxygen to a region contiguous with the exposed surface of the electrolyte,
- a porous positive electrode in contact with the electrolyte and having a thin substantially flat major portion adjacent and substantially parallel to the upper surface of the electrolyte with a substantial portion of the surface of the positive electrode contacted by electrolyte and adjacent an interface of the electrolyte and the oxygen,
- the positive electrode comprising a thin porous conductive member, having on its upper surface a thin porous substantially hydrophobic and nonconductive coating, yieldably supported to permit it to float on the electrolyte with the pores of the electrode at least partly below the upper surface of the electrolyte,
- means for connecting the electrodes selectively either to a source of direct current for charging the cell or to an electric load circuit for using the energy stored in the cell when charged,
- means for storing in a first confined region the supply of hydrogen, including that produced during charging,
- means for storing in a second confined region the supply of oxygen, including that produced during charging,
- means for maintaining the temperature, current density, and electrolyte purity and concentration during charging such that substantially all of the hydrogen gas is formed in the hydrogen container, and
- means, comprising the hydrogen container and means communicating therewith and forming an enclosure around the first confined region, for keeping the hydrogen separated from the oxygen.

4,048,384

CONTROL SYSTEM AND APPARATUS FOR REDOX TYPE ELECTROCHEMICAL CELL

Nicole Chillier-Duchatel, Sevres, and Bernard Verger, Chevreuse, both of France, assignors to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie", Paris, France

Filed Apr. 14, 1976, Ser. No. 676,988
Claims priority, application France, Apr. 24, 1975, 75.12850
Int. Cl.² H01M *8/18, 8/04*
U.S. Cl. 429—22 **14 Claims**



1. In an electrochemical cell apparatus of the Redox type having an anode compartment and a cathode compartment separated by a membrane, a first conduit for feeding a reduced form of a first aqueous solution to said anode compartment, a second conduit for conveying an oxidized form of said first aqueous solution from said anode compartment, a first reactor coupled to said first and second conduits and being fed with a combustible reagent for regenerating said reduced form of said first aqueous solution, a third conduit for feeding an oxidized form of a second aqueous solution to said cathode compartment, a fourth conduit for conveying a reduced form of said second aqueous solution from said cathode compartment, and a second reactor coupled to said third and fourth conduits and being fed with an oxidizing reagent for regenerating the said oxidized form of said second aqueous solution,
the improvement comprising

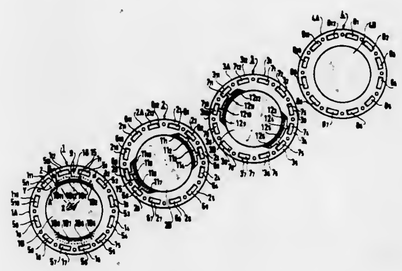
first and second measuring electrodes and a third reference electrode,
- means coupling said three electrodes to at least one of said conduits such that at least an end of each of said electrodes is immersed in the aqueous solution flowing in said at least one conduit, said electrodes being electrically insulated from each other,
- two resistors connected together in series between said measuring electrodes and defining a junction point therebetween,
- a direct current generator coupled to said measuring electrodes for applying a dc voltage across said resistors, and
- means coupled between said reference electrode and said junction point of said two series connected resistors for detecting differences between the signals at said junction point and said reference electrode, and means responsive to said differences in signals for controlling the flow of at least one of said reagents.

4,048,385

CROSS-FEED FUEL CELL BATTERY WITH FILTER PRESS TYPE STRUCTURE OF CYLINDRICAL CROSS-SECTION

Bernard Regnaut, Antony, France, assignor to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie", Paris, France

Filed Feb. 2, 1976, Ser. No. 654,727
Claims priority, application France, Feb. 6, 1975, 75.03664
Int. Cl.² H01M *8/24*
U.S. Cl. 429—34 **9 Claims**



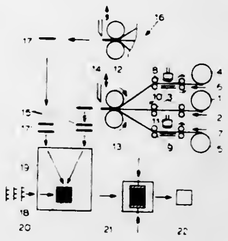
1. A fuel cell battery formed of an assembly comprising plate-like components in a repeating order of sequence combining the elementary sequence of a cathode, a separator, an anode and a collector, each of said components having substantially the same contour and being in the form of thin plates each having a frame of an electrically insulating material surrounding a central active portion, the respective faces of the respective active portions of the cathode and anode components which face away from the separator component being respectively irrigated by the combustion supporting material and by the fuel, and the two faces of the separator component being irrigated by the electrolyte, said fuel cell being characterized by the improvement wherein:
- said frames are of circular contour and are bounded by concentric circles, so that each frame is constituted in the shape of a flat annulus made up of 12 successively contiguous sectors of 30° of arc, and each of said sectors is pierced in the axial direction by an opening of a particular shape which is the same in the same sector of each of said frames,
- when the components and their frame are assembled, the openings in each sector are in registry so that six pairs of channels are provided, of which a first pair provides the supply of the combustion supporting material to the cathode (1), a second pair the supply of electrolyte for irrigating both sides of the separator (2), a third pair the supply of fuel to the anode (3), a fourth pair the removal of the used combustion supporting material, a fifth pair the removal of the electrolyte and a sixth pair the removal of the reaction products of the fuel,
- branch channels are provided by recessed portions of each cathode component frame connecting said first and fourth pairs of channels with the side of said active portion of said cathode component which faces away from the adjacent separator component;
- branch channels are provided by recessed portions of each anode component frame connecting said third and sixth pairs of channels with the side of said active portion of said anode component which faces away from the adjacent separator component;
- branch channels are provided by recessed portions of each separator component frame connecting said second and fifth channels with both sides of said active portion of said separator component, and
- said channels and branch channels are so disposed that the average direction of flow of said electrolyte from said second to said fifth pair of channels across the faces of the separator active portion is at the same predetermined acute angle to the respective average directions of flow of said fuel, from said third to said sixth pair of channels, and of said combustion supporting material, from said first to said fourth pair of channels, across the active portions respectively of said anode and cathode components of the same cell.

4,048,386

PROCESS FOR MAKING AN ELECTROCHEMICAL CELL OR BATTERY, E.G. A FUEL CELL OR FUEL CELL BATTERY, AND A CELL OR BATTERY MADE BY THE PROCESS

Marinus Alfenaar, Schinnen, Netherlands, and Rene L. E. Van Gasse, Opglabbeek, Belgium, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Aug. 11, 1976, Ser. No. 713,584
Claims priority, application Netherlands, Aug. 14, 1975, 7509675
Int. Cl.² H01M *8/24*
U.S. Cl. 429—38 **6 Claims**



1. A process for making an electrochemical cell, consisting of a stack of plate-shaped or sheet-shaped electrodes and, between each of the electrodes, plate-shaped or sheet-shaped frames forming gas or liquid chambers, comprising
- a. providing at least one electrode, in sheet form, and at least one dry sheet of fibrous-web material which contains a dry unpolymerized thermosetting plastic, polymerization catalyst and fibrous filler,
- wherein said sheet of fibrous-web material has been cut to form an opening centrally disposed in the sheet;
- b. disposing two of said sheets of fibrous-web material one of said electrodes and subjecting said assembly to sufficient pressure and temperature to cause the fibrous-web material to adhere to the electrode but insufficient to cause polymerization of the thermosetting plastic;
- c. stacking a plurality of said assembly together, while chan-

nel-forming elements of material inert to the thermoplastic are disposed to intersect with said opening in said insulating material and at least one edge of the sheet of insulating material, to form a stack;

d. subjecting the stack to sufficient pressure and temperature, to cause the thermo-setting plastic to polymerize;

e. withdrawing said channel-forming elements from the stack, thereby producing channels in the resulting block; cutting passages into the block perpendicular to the channels and intersecting with said channels; and sealing the open ends of the channels at the end of the channel which intersected with the edge of the sheet.

4,048,387

SUBSTANCE AND DEVICE FOR THE ABSORPTION OF CATALYST POISONING GASES OUT OF THE OXYHYDROGEN GAS PRODUCED BY LEAD-ACID STORAGE BATTERIES

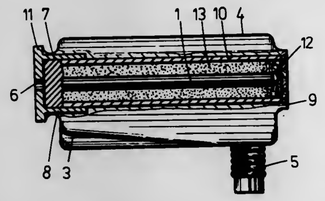
Norbert Wilhelm Lahme, Hoppecke, and Gunter C. Sassmannshausen, Brilon, both of Germany, assignors to Accumulatorenwerk Hoppecke-Carl Zoellner & Sohn, Cologne, Germany

Continuation of Ser. No. 382,201, July 24, 1973, abandoned. This application Jan. 16, 1975, Ser. No. 541,394

Claims priority, application Germany, Aug. 2, 1972, 2237950

Int. Cl.² H01M 2/12, 10/52

U.S. Cl. 429—50 **18 Claims**



1. A device for the catalytic recombination of oxyhydrogen gas produced by a lead-acid storage battery into water and for returning the water to the battery electrolyte, comprising in combination:

a generally gastight housing arranged above the battery electrolyte and connected with the space containing said electrolyte for gas flow communication and for liquid return flow thereto, said housing defining a cavity therein;

a catalyst body mounted in the cavity of the housing, the catalyst body serving to catalyze said recombination of the oxygen and hydrogen gases into water;

a gas permeable containing means positioned in the cavity, said containing means surrounding said catalyst body and being spaced therefrom to define a space therebetween, said containing means also being spaced from the inner wall of said housing, whereby oxyhydrogen gas in said housing cavity is provided access to the entire gas permeable containing means, and therefore, to the entire catalyst body; and

a bed of an absorbing substance comprising a heavy metal manganite and being located in said defined space and surrounding the catalyst body, the absorbing substance serving to eliminate from the oxyhydrogen gas mixture catalyst poisoning gases comprising antimony-hydride and/or arsenic-hydride, which are generated together with the oxyhydrogen gases during battery operation.

4,048,388

CELL OR BATTERY STATE OF DISCHARGE INDICATOR

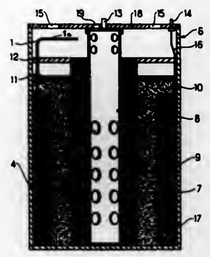
Robert Chevet, St. Benoit, Poitiers, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville and Compagnie Industrielle des Piles Electriques "CIPEL", Levallois-Perret, both of France

Filed Mar. 24, 1976, Ser. No. 669,870

Claims priority, application France, Apr. 10, 1975, 75.11261

Int. Cl.² H01M 6/00

U.S. Cl. 429—91 **14 Claims**



1. Electrochemical generator comprising a positive electrode, an electrolyte, a negative electrode basically containing a first consumable powdered metal and an indicator of the state of discharge of an electrochemical generator comprising a positive electrode, an electrolyte and a negative electrode basically containing a first consumable powdered metal, characterized in that said indicator comprises a sealed transparent enclosure containing a substance which is externally visible and whose appearance changes on coming into contact with the said electrolyte, the said enclosure being sealed by closure means made of a second metal having the same electrochemical behavior as the said first metal.

4,048,389

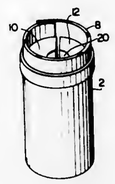
CATHODE OR CATHODE COLLECTOR ARCUATE BODIES FOR USE IN VARIOUS CELL SYSTEMS

Gerald Frank Bubnick, Cleveland, and Lewis Frederick Urry, Columbia Station, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 18, 1976, Ser. No. 659,125

Int. Cl.² H01M 6/14

U.S. Cl. 429—101 **10 Claims**



1. An electrochemical cell comprising a container; an anode disposed within said container; a porous separator disposed within and in surface contact with said anode; a cathode collector in the form of at least two arcuate bodies disposed within said separator; means for biasing said arcuate bodies radially outward against said separator which in turn contacts the anode; and a liquid, active reducible cathode-electrolyte disposed within said container.

4,048,390

NA/S CELL REACTANT CONTAINER WITH METAL ALUMINIDE COATING

Debajyoti Chatterji, Latham, and Robert R. Dubin, Charlton, both of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 20, 1976, Ser. No. 752,369

Int. Cl.² H01M 4/36

U.S. Cl. 429—102 **1 Claim**

1. In a sodium-sulfur battery the improvement which comprises:

electrically conducting components of said battery comprised of a metal or an alloy having a major amount of a metal selected from the group consisting of iron, cobalt and nickel, having an aluminide coating on surfaces in contact with sulfur.

4,048,391

ALKALI METAL-SULPHUR CELLS

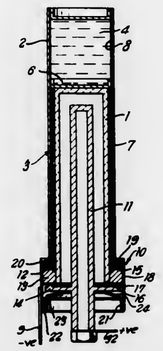
Alec R. Tilley, Blackbrook, near Belper, and Michael D. Hames, Spondon, both of England, assignors to Chloride Silent Power Limited, London, England

Filed Apr. 23, 1976, Ser. No. 679,626

Claims priority, application United Kingdom, Apr. 24, 1975, 17088/75

Int. Cl.² H01M 4/36

U.S. Cl. 429—104 **12 Claims**



1. An alkali metal-sulphur cell comprising an outer tubular casing, an inner tubular solid electrolyte whose interior constitutes the cathode compartment of the cell containing sulphur material, said inner tubular solid electrolyte being spaced from said outer tubular casing to define an annular space therebetween, at least the part of said annular space adjacent to the outer surface of said inner tubular solid electrolyte constituting the anode compartment of the cell and containing alkali metal, an alkali metal reservoir from which alkali metal is supplied to said anode compartment, and means located between said outer tubular casing and said inner tubular solid electrolyte and surrounding the outer surface of said inner tubular solid electrolyte for limiting material upon mechanical failure of said solid electrolyte.

4,048,392

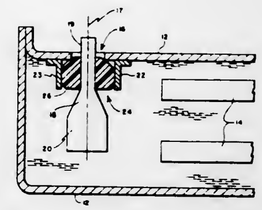
CRIMP SEAL USING POLYPHENYLENE SULFIDE PLASTIC WITH AN ALUMINUM TERMINAL PAN

Kurt F. Garoutte, Furlong, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 13, 1976, Ser. No. 749,950

Int. Cl.² H01M 2/30, 10/38

U.S. Cl. 429—105 **15 Claims**



1. A terminal pin assembly for a battery, comprising:

an elongated cylindrical pin having a first end for extension exterior of said battery and a second end for extension interior of said battery;

header means forming one end of said battery and finding an opening through which said pin extends, said opening having a diameter larger than the first end of said pin;

bracket means mounted on and extending inward from the interior surface of said header means, said bracket means having a diameter larger than said opening end said header; and

sealing means mounted on said pin and having a diameter essentially equal to said bracket means, said bracket means being forceably enclosed about said sealing means.

7. In an electrochemical cell having a lithium anode and sulfur dioxide depolarizer, the improvement comprising:

a terminal pin assembly for a battery having an elongated cylindrical pin with a first end for extension exterior of said battery and a second end for extension interior of said battery;

header means forming one end of said battery and finding an opening through which said pin extends, said opening having a diameter larger than the first end of said pin;

bracket means mounted on and extending inward from the interior surface of said header means, said bracket means having a diameter larger than said opening end said header; and

sealing means mounted on said pin and having a diameter essentially equal to said bracket means, said bracket means being forceably enclosed about said sealing means.

4,048,393

ALKALI METAL BATTERY STRUCTURE

Walter K. Heintz, Westland, and James N. Lingscheit, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 3, 1976, Ser. No. 720,290

Int. Cl.² H01M 2/02

U.S. Cl. 429—104 **3 Claims**

1. A structure for containing an alkali metal battery which comprises:

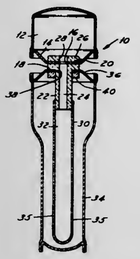
a substantially closed metal housing for containing an electrode reaction zone, said metal housing including a flange, said flange having an opening therethrough;

a first ceramic member bonded to a portion of said flange on an exterior surface of said metal housing, said first ceramic member encircling said opening through said flange and extending away therefrom to define a passageway which is an extension of said opening;

a cation-permeable barrier to mass liquid transfer, said bar-

rier defining an interior volume and its outer surface defining an exterior surface area;

means for connecting said cation-permeable barrier to said first ceramic member in such a manner that the interior volume of said metal housing, said passageway defined by said first ceramic member and said interior volume of said cation-permeable barrier form a first closed electrode reaction zone;



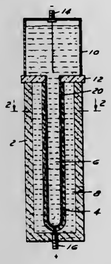
container means including structure contacting said first ceramic member for defining a closed container which encloses said exterior surface area of said cation-permeable barrier, a volume between an interior surface area of said container means and said exterior surface area of said cation-permeable barrier forming a second closed electrode reaction zone.

4,048,394

SECONDARY BATTERY OR CELL WITH VITREOUS CARBON COATED GRAPHITE CURRENT COLLECTOR

Frank A. Ludwig, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 28, 1977, Ser. No. 772,618
Int. Cl.² H01M *10/39*
U.S. Cl. 429—104 **15 Claims**



1. A secondary battery or cell of the type comprising: (A) an anodic reaction zone containing a molten alkali metal reactant-anode in electrical contact with an external circuit; (B) a cathodic reaction zone containing a cathodic reactant which, when said battery or cell is at least partially discharged, is selected from the group consisting of (i) a single phase composition comprising molten polysulfide salts of said anodic reactant and (ii) a two phase composition comprising molten sulfur and molten sulfur saturated polysulfide salts of said anodic reactant; (C) a cation-permeable barrier to mass liquid transfer interposed between and in contact with said anodic and cathodic reaction zones; and (D) a current collector which is at least partially exposed to said cathodic reactant and which is in electrical contact with both said cation-permeable barrier and said external circuit, wherein the improvement comprises:

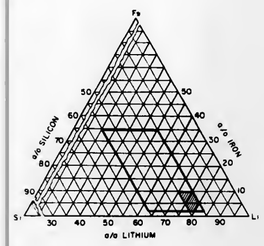
a current collector comprising a graphite body bearing a coating of vitreous carbon on at least those surfaces thereof which are exposed to said cathodic reactant.

4,048,395

LITHIUM ELECTRODE FOR ELECTRICAL ENERGY STORAGE DEVICE

San-Cheng Lai, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 18, 1976, Ser. No. 715,358
Int. Cl.² H01M *4/12*
U.S. Cl. 429—112 **16 Claims**



1. A composite negative lithium electrode structure for an electrical energy storage device wherein said composite electrode structure comprises:

an alloy of lithium, silicon, and iron having the empirical formula Li_xSiFe_y, where x has a value from 1 to 5 and y has a value from 0.125 to 1, and

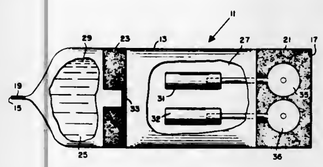
a current-collecting matrix supporting said alloy and in intimate contact therewith.

4,048,396

BATTERY PACKAGE

Edward F. Hollander, Jr., Broomall, Pa., assignor to John P. Glass, Essington, Pa.

Filed Nov. 8, 1976, Ser. No. 739,477
Int. Cl.² H01M *6/30*
U.S. Cl. 429—116 **7 Claims**



1. A battery package for storing an electric battery in unactivated condition and for quickly activating the battery, comprising

a tube of flexible material having first and second ends,

a first seal extending transversely across the tube and closing the first end,

a second seal extending transversely across the tube and closing the second end,

a medial seal extending transversely across the tube at a location between the first and second end seals and forming a first chamber and a second chamber,

an electrolyte contained within the first chamber,

and a pair of electrodes mounted in the second end seal and extending into the second chamber,

said medial seal sealing the electrolyte from the electrodes for storing the battery in unactivated condition,

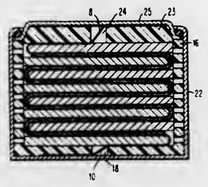
said medial seal being weaker than said first and second seals, whereby the battery may be activated by squeezing the tube to rupture the medial seal and transfer the electrolyte from the first chamber into the second chamber to make contact with the electrodes.

4,048,397

METHOD AND APPARATUS FOR INTERCONNECTING STACKED ELECTRODES OF BATTERIES

Horst Rothbauer, Sarnen, Switzerland, assignor to Maxs AG, Wilen-Sarnen, Switzerland

Continuation-in-part of Ser. No. 541,946, Jan. 17, 1975, abandoned. This application Nov. 24, 1975, Ser. No. 634,548
Int. Cl.² H01M *2/18*
U.S. Cl. 429—131 **5 Claims**



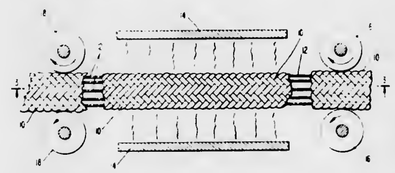
4. Interconnecting and insulating means for electrodes of diverse polarity place one above the other, comprising a band consisting of a length of a conductive strip, a length of an insulating strip, and another length of a conductive strip, said insulating strip being firmly secured between said conductive strips, permitting deformation of said band without disturbing the relative position between said conductive strips and said insulating strip, said band being flexible for placement in zigzag formation over said electrodes and permeable to the electrolyte by virtue of perforations throughout its length.

4,048,398

BATTERY ELECTRODE SHEATHS

Erik Sundberg, Yardley, Pa., assignor to Aktiebolaget Tudor, Sundyberg, Sweden

Filed Sept. 2, 1976, Ser. No. 720,087
Int. Cl.² H01M *2/18*
U.S. Cl. 429—140 **6 Claims**



1. An electrode for a lead-acid storage battery, comprising:

a plurality of spaced parallel rods of metallic material, each of said rods being encompassed along a substantial portion of the axial length thereof with active material;

a tubular sheath substantially coextensive with and encompassing each of said rods, whereby the active material is retained on the rods, said sheath comprising:

a braid or weave of inorganic threads; and

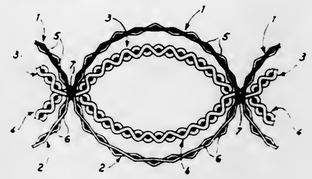
a plurality of spaced axial threads extending along the axial length of the sheath and forming crossing points with the inorganic threads of the braid or weave, said axial threads comprising a mixture of at least two thermoplastic materials having different softening temperatures, the inorganic threads of said sheath being held together by adhesion at the crossing points with said thermoplastic fibers having the lower softening temperature.

4,048,399

DOUBLE WALL MULTITUBE BAGS FOR ENCLOSING THE ACTIVE MATERIAL OF POSITIVE PLATES IN ELECTRIC LEAD BATTERIES

Giovanni Terzaghi, Milan, Italy, assignor to Mecondor S.p.A., Milan, Italy

Continuation of Ser. No. 600,100, July 29, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,897
Claims priority, application Italy, Mar. 26, 1975, 21766/75; Apr. 17, 1975, 22459/75
Int. Cl.² H01M *2/18*
U.S. Cl. 429—141 **15 Claims**



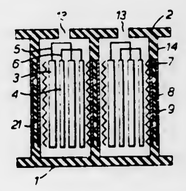
1. A multitube bag for enclosing active materials of positive plates in a lead-acid battery, said multitube bag comprising: four layers of woven fabric tied to one another at regular intervals to provide discrete and successive double wall tubes, weft threads of said four fabric layers being parallel to the axes of said tubes, thermosetting resin covering at least partly the yarns of said four fabric layers for stiffening said multitube bag, two of said layers having inner fabric with a weft of substantially high chemical resistance glass yarn and a warp thread of synthetic yarn, two layers having outer fabric with a warp of synthetic yarn and a weft, the weft threads being larger in number than the warp threads in at least the two layers of inner fabric, said synthetic yarn comprising yarn exhibiting substantially high resistance to diluted sulphuric acid and oxidation, the four layers of woven fabric being tied to one another by weft threads inserted between the warps of the four interwoven fabrics.

4,048,400

MULTICELL ELECTRIC BATTERIES

Charles Arthur John White, Redditch, England, assignor to Chloride Group Limited, London, England

Filed May 4, 1976, Ser. No. 683,210
Claims priority, application United Kingdom, May 6, 1975, 18986/75
Int. Cl.² H01M *2/24*
U.S. Cl. 429—160 **9 Claims**



1. A multicell electric battery comprising a number of intercell partitions, each separating a pair of adjacent cells, two or more electrode plates of each polarity in each cell and an intercell connector associated with each intercell partition comprising two spaced parallel conducting sheet portions forming opposite faces of the partition one exposed to each cell, and at least one conducting bridge passing through the partition at a position remote from the edges of the sheet portions and electrically connecting them, each sheet portion

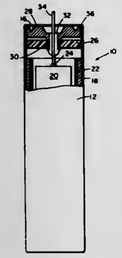
being directly or indirectly connected by pressure contact to the adjacent electrode plate at points distributed over a substantial portion of its area and said plate is electrically connected to at least one other electrode plate of the same polarity in the cell.

4,048,401

HERMETICALLY SEALED PRIMARY ELECTROCHEMICAL CELL AND A METHOD FOR ITS PRODUCTION

James Epstein, Sharon, and Arthur Y. Chin, Pinehurst, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 539,752, Jan. 9, 1975, abandoned. This application Jan. 8, 1976, Ser. No. 647,396
Int. Cl.² H01M 2/02
U.S. Cl. 429—171 **9 Claims**



1. A hermetically sealed primary electrochemical cell comprising:
- a hollow outer cell casing having a single opening therein, the outer cell casing being formed of a conductive material and being a first terminal of the primary electrochemical cell;
- an electrochemical system being disposed within the outer casing and including
  - an anode in mechanical and electrical contact with the outer cell casing,
  - a cathode spaced from the anode material, and
  - a liquid electrolytic solution in contact with the anode and cathode, said electrolytic solution including a solvent and a solute dissolved therein,
  - an electrically, non-conductive separator being interposed between the anode and cathode;
- a glass-to-metal seal being welded into the opening in the outer cell casing to seal hermetically the primary electrochemical cell, the glass-to-metal seal having a metallic feedthrough in the central portion thereof the internal end of which engages the cathode thereby serving as a current collector therefor, the external end serving as a second terminal of the primary elecytrochemical cell, and
- means for establishing a temporary seal within the outer cell casing between the weld and the electrochemical system, whereby escape of any volatilized solvent during welding of the glass-to-metal seal is generally prevented.

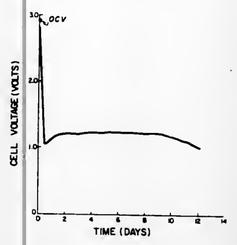
7. A method of producing a hermetically sealed primary electrochemical cell comprising the steps of:
- forming an electrically conductive hollow outer casing having a single opening therein;
- placing an anode of a selected electrochemical system within the outer casing and in mechanical and electrical contact with the outer casing so that the outer casing forms one terminal of the primary electrochemical cell;
- placing a cathode of the selected electrochemical system and a separator of non-conducting material within the outer casing so that physical contact between the anode and cathode materials is prevented;
- filling the outer casing with an effective amount of an electrolytic solution compatible with the selected electrochemical system, said electrolytic solution including a solvent and a solute dissolved therein;
- placing a layer of barrier material in sealing contact with the inner wall of the casing to temporarily seal the electrolytic solution from the casing opening;
- inserting a glass-to-metal seal into the opening in the outer casing, the glass-to-metal seal having a solid metallic feedthrough in the central portion thereof which engages the cathode material upon insertion and which serves as a current collector therefor; and
- welding the glass-to-metal seal to the outer casing to form a hermetic seal, the temporary seal generally preventing volatilization of electrolyte during the welding step.

4,048,402

NON-AQUEOUS CELL HAVING A CATHODE OF LEAD MONOXIDE-COATED LEAD DIOXIDE PARTICLES

Marvin Lee Kronenberg, Cleveland Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,531
Int. Cl.² H01M 6/14
U.S. Cl. 429—194 **10 Claims**



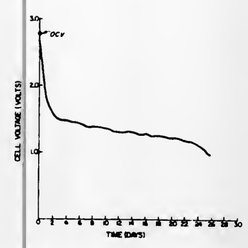
1. A lead oxide cell comprising a highly active metal negative electrode, a positive electrode and a non-aqueous electrolyte comprising a salt dissolved in an organic solvent; said positive electrode comprising lead dioxide particles having a substantially complete outer layer of lead monoxide, and said cell having a substantially unipotential discharge voltage.

4,048,403

NON-AQUEOUS LEAD DIOXIDE CELL HAVING A UNIPOTENTIAL DISCHARGE VOLTAGE

Marvin Lee Kronenberg, Cleveland Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,532
Int. Cl.² H01M 6/14
U.S. Cl. 429—194 **24 Claims**



1. A non-aqueous lead oxide cell comprising a highly active metal negative electrode, a positive electrode comprising lead dioxide and an non-aqueous electrolyte comprising a salt dissolver in an organic solvent housed within a conductive container; a layer of lead monoxide interposed between, and electrically and physically in contact with, said positive electrode and the inner surface of the conductive container; and said cell having a substantially unipotential discharge voltage.

9. A non-aqueous lead oxide cell comprising a highly active metal negative electrode, a positive electrode comprising lead dioxide; and an non-aqueous electrolyte comprising a salt dissolved in an organic solvent housed within a conductive container; a layer of lead interposed between, and electrically and physically in contact with, said positive electrode and the inner surface of the conductive container; and said cell having a substantially unipotential discharge voltage.

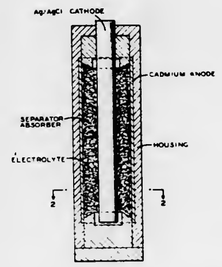
17. A non-aqueous lead oxide cell comprising a highly active metal negative electrode, a positive electrode comprising lead dioxide and an non-aqueous electrolyte comprising a salt dissolved in an organic solvent housed within a conductive container; a layer of lead and lead monoxide interposed between, and electrically and physically in contact with, said positive electrode and the inner surface of the conductive container; and said cell having a substantially unipotential discharge voltage.

4,048,404

ELECTROPHYSICHEMICAL DEVICE

Per Bro, Andover, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 65,174, Aug. 19, 1970, abandoned. This application Mar. 8, 1976, Ser. No. 665,154
Int. Cl.² H01M 6/04
U.S. Cl. 429—199 **6 Claims**



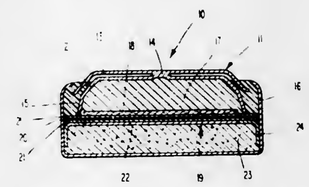
1. An electrical component having a characteristic of both a battery and a capacitor in having a fast chargeable rate much greater than previously available storage batteries comprising; a positive electrode, said positive electroce including a silver element having an active surface layer of solidified, previously fused silver chloride thereon, said silver chloride layer constituting an insoluble, resistive film formed on said silver during charging by passing a high anodic current through the silver element greater than 0.1 amp/cm², which resistive film will rapidly heat to fusion temperature during charging; a negative electrode insulatingly spaced from said positive electrode, said negative electrode being cadmium or zinc; an ionic conductor disposed between said two electrodes; said ionic conductor being water and a zinc or cadmium halide or a mixture thereof; a dielectric spacer between said two electrodes, said spacer being capable of retaining its structural integrity at elevated temperatures and capable of withstanding compressive loading; and an encasing housing.

4,048,405

HIGH DRAIN RATE, PRIMARY ALKALINE CELL HAVING A DIVALENT SILVER OXIDE/MONOVALENT SILVER OXIDE DEPOLARIZER BLEND COATED WITH A LAYER OF SILVER

El Sayed Megahed, Madison, Wis., assignor to ESB Incorporated, Philadelphia, Pa.

Continuation of Ser. No. 666,657, March 15, 1976, abandoned. This application Nov. 15, 1976, Ser. No. 741,658
Int. Cl.² H01M 6/04, 4/02
U.S. Cl. 429—206 **13 Claims**



1. A high drain rate, primary alkaline cell comprising a negative electrode, a divalent silver oxide/monovalent silver oxide depolarizer blend, a separator between said negative electrode and the depolarizer blend, and an aqueous potassium hydroxide electrolyte, said depolarizer blend containing up to about 70% by weight of divalent silver oxide, and a substantially continuous and electrolyte permeable layer of silver on the surface of the depolarizer blend adjacent to the separator, whereby the cell is characterized by the stability of the depolarizer blend in the potassium hydroxide electrolyte, a maximum open circuit voltage of about 1.75 volts, a single voltage plateau during discharge and is capable of providing a flash current greater than an average of 0.2 amps per square centimeter of cell cross-sectional area.

7. A method for manufacturing the depolarizer blend used in the primary alkaline cell of claim 1 which comprises (1) forming the depolarizer blend comprising divalent silver oxide and monovalent silver oxide, (2) compressing the blend to form a pellet, (3) placing the pellet in a cathode container, (4) consolidating the pellet in the container by compression, and (5) treating the consolidated pellet/cathode container component with a strong reducing agent for a period of time sufficient to reduce the surface of the depolarizer blend to metallic silver.

4,048,406

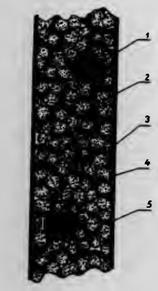
ELECTRODE FOR A RECHARGEABLE ELECTROCHEMICAL CURRENT SOURCE, AND METHOD OF MAKING SAME

Josef Sándera; Milan Calábek; Miroslav Cesek, all of Brno; František Kaláb; Vojtěch Koudelka, both of Mlada Boleslav; Oldřich Kouril, Brno; Jiri Malik, Mlada Boleslav, and Josef Vaňáček, Brno-Slapanice, all of Czechoslovakia, assignors to Prazska akumulatorka, narodni podnik, Mlada Boleslav, Czechoslovakia

Filed May 21, 1975, Ser. No. 579,481
Int. Cl.² H01M 4/02, 4/04
U.S. Cl. 429—209 **7 Claims**

1. In an electrode for a rechargeable storage battery employing an electrolyte, the electrode having a current collector and a mixture of an active mass and a plastic material distributed over the current collector and sintered thereon to form a skeleton of plastic in the body of said electrode, the improvement which comprises a porous layer of material covering at

least a substantial part of the active surface of the electrode, the porous layer being made of an electrically non-conductive



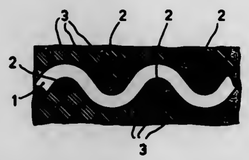
material which is chemically inert with respect to the electrolyte and which is bonded to the skeleton of plastic material.

4,048,407

ELECTRODE FOR PRIMARY OR SECONDARY BATTERY AND METHOD FOR PRODUCING SUCH AN ELECTRODE

Pieter Abraham Boter, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 9, 1976, Ser. No. 721,662
Claims priority, application Netherlands, Sept. 19, 1975, 7411044
Int. Cl.² H01M *4/38*
U.S. Cl. 429—217 **7 Claims**



1. An electrode for a primary or secondary battery comprising a porous metal support, a porous sintered layer of a powder of an intermetallic compound which can absorb and release reversibly hydrogen while forming hydrides, a hydrophilic water-insoluble macromolecular material in the pores of the sintered layer.

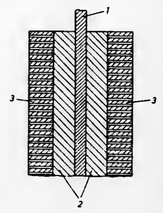
4,048,408

ZINC ELECTRODE FOR ALKALINE RESERVE BATTERIES

Arun Lala, Duisburg, Germany, assignor to Electrochem, Inc., New York, N.Y.

Filed July 26, 1976, Ser. No. 705,750
Claims priority, application Germany, July 16, 1975, 2531751
Int. Cl.² H01M *4/24*
U.S. Cl. 429—229 **12 Claims**

1. An improved zinc electrode for alkaline batteries of the deferred action or reserve type which include a silver oxide electrode and a separator, said zinc electrode including a cur-



rent collector and a thin sheet of extended surface area, comprising aluminum adjacent to the surface to the said electrode.

4,048,409

ARTICLE MADE OF PROPYLENE-ETHYLENE COPOLYMER

Yasunori Sugita, Tokyo, and Yasuhiko Itagaki, Yokohama, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation-in-part of Ser. No. 506,761, Sept. 17, 1974, Pat. No. 3,944,530. This application Mar. 12, 1976, Ser. No. 666,265
Claims priority, application Japan, Sept. 27, 1973, 48-107953
The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.
Int. Cl.² C08F *210/00*
U.S. Cl. 526—5 **6 Claims**

1. An article having improved transparency, impact strength and moldability which is obtained by cooling and solidifying an extruded tubular body of a highly crystalline olefin polymer and thereafter extending it biaxially by orientation blow molding at an orientation temperature below the melting point to attain an extension magnification ratio of at least 1.5 for each of longitudinal and lateral directions, wherein said polymer is a statistical random copolymer of propylene with ethylene which has a melt index of from 0.6 to 3.0 g/10 min. and an ethylene content of from 1.5% to 5.0% by weight.

4,048,410

ENVIRONMENTALLY DEGRADABLE POLYMER COMPOSITIONS

Lynn J. Taylor, Haslett, and John W. Tobias, East Lansing, both of Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 235,793, March 17, 1972, abandoned. This application Oct. 20, 1976, Ser. No. 734,074
Int. Cl.² C08J *3/20*
U.S. Cl. 526—22 **8 Claims**

1. A process for producing and degrading a polymeric composition comprising:

a. incorporating into a polymeric material a metal chelating organic agent to form a polymeric composition, and
b. subjecting said polymeric blend to a catalytic quantity of metal ions in the presence of oxygen, electromagnetic radiation, or an elevated temperature to degrade said composition,
c. the amount of said metal chelating organic agent incorporated in said polymeric material being sufficient to cause degradation of said polymeric composition when subjected to said metal ions in the presence of said oxygen, electromagnetic radiation, or elevated temperature.

4,048,411

MANUFACTURE OF COPOLYMERS OF ETHYLENE

Franz Georg Mietzner, Ludwigshafen; Klaus Pfleger, Wesseling; Hans Gropper, Ludwigshafen; Oskar Buechner, Dudenhofen; Klaus Boettcher, and Wieland Zacher, both of Wesseling, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, (Rhine), Germany

Filed May 19, 1976, Ser. No. 687,868
Claims priority, application Germany, May 31, 1975, 2524230
Int. Cl.² C08F *210/02*
U.S. Cl. 526—64 **6 Claims**

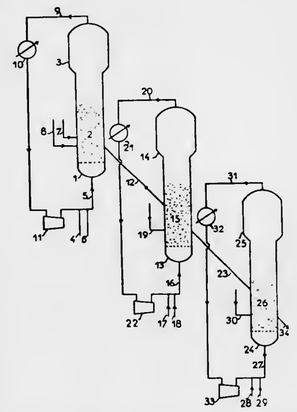
1. A process for the manufacture of an ethylene copolymer which contains up to 30 percent by weight of copolymerized units of vinyl acetate by copolymerization of ethylene and vinyl acetate in a tubular reactor at pressures above 800 atmospheres and at from 150° to 350° C with a mean residence time of at most 100 seconds, wherein the reaction mixture obtained after the polymerization is passed, after leaving the reaction zone, through a cooling zone which is at a pressure below 500 atmospheres and at from 150° to 250° C, into a high-pressure product isolation zone which is immediately downstream from the cooling zone, the pressure in said isolation zone being the same as in said cooling zone, the mean residence time of the reaction product in the cooling zone and product isolation zone together being from 2 to 10 minutes.

4,048,412

DRY POLYMERIZATION OF OLEFINS IN REACTION VESSELS ARRANGED IN SERIES

Francois Caumartin, Martigues; Charles F. Raufast, St. Julien les Martigues, and Laszlo Havas, Martigues, all of France, assignors to Naphtachimie, Paris, France

Filed May 24, 1976, Ser. No. 688,979
Claims priority, application France, May 27, 1975, 75.16514
Int. Cl.² C08F *2/34, 10/00, 297/08*
U.S. Cl. 526—65 **13 Claims**



1. A method of producing polymers having a molecular weight generally higher than 50,000, by the dry polymerization of olefins of the formula $CH_2 = CHR$, in which R is selected from the group consisting of a hydrogen atom and an alkyl radical having from 1 to 8 carbon atoms, in reaction vessels in which the solid polymer in course of formation is kept in the fluidized state by an upward stream of a gaseous mixture containing the olefin or olefins to be polymerized, the reaction vessels being arranged in a series in which the solid polymer in course of formation flows successively from the first reaction vessel through to the last reaction vessel from which the polymer is discharged while a separate recycle is maintained for each reaction vessel with respect to the gaseous mixture of olefin or olefins whereby the said gaseous mixture issuing from one reaction vessel is recycled for reintroduction into the same reaction vessel, polymerization being initiated by introducing into the first reaction vessel a catalyst comprising a solid compound of a transition metal from the subgroups IVa, Va and VIa of the periodic table, and at least one cocatalyst comprising an organo-metallic compound of a metal from group II or III of the periodic table, introducing cocatalyst into the first reaction vessel in an amount such that the atomic ratio of the metal of the co-catalyst or cocatalysts to the transition metal of the catalyst is between 0.1 to 10, and introducing an additional quantity of at least one cocatalyst into at least one of the reaction vessels other than the first.

4,048,413

HIGH-CONVERSION DRIFT-FREE BATCH-TYPE ADDITION COPOLYMERIZATION

James B. Wilkens, Medina, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Filed Dec. 8, 1975, Ser. No. 638,663
Int. Cl.² C08F *2/00*
U.S. Cl. 526—66 **15 Claims**

1. A non-azeotropic batch-type addition copolymerization process for producing copolymer of substantially uniform composition from a plurality of mutually copolymerizable ethylenically unsaturated monomers, each of said monomers designated herein by a different value of the index i other than 0 or ∞, said process comprising

a. forming a reaction mixture comprising a monomer-containing phase in which said monomers are present in substantially those mole ratios f_i of the moles of each of said monomers to the moles of all of said monomers required to initially produce copolymer in which said monomers are incorporated in substantially the desired mole ratios F_i of the moles of each of said monomers incorporated to the moles of all said monomers incorporated, the moles Q_0 of all of said monomers initially present in said monomer-containing phase not substantially exceeding that value which would make the ratio Q_0/Q_∞ equal to the smallest of the ratios F_i/f_i for any of said monomers, where Q_∞ is the total moles of all of said monomers to be copolymerized;
b. initiating an addition copolymerization reaction of said monomers in said monomer-containing phase; and
c. sustaining said reaction in said monomer-containing phase under substantially constant conditions, while simultaneously introducing into said reaction mixture a monomer feedstream which controls the cumulative molar addition of each of said monomers to said monomer-containing phase to have substantially the values given by

$$Q_i = fQ_0 + (F_i - fQ_0/Q_{28})Z$$

when the cumulative moles of all of said monomers converted in said monomer-containing phase to said copolymer is Z, at least until the total unreacted moles of all of said monomers present in said monomer-containing phase is reduced to about $Q_0/2$.

4,048,414

MANUFACTURE OF OLEFIN POLYMERS

Hans Frielingsdorf, Bad Durkheim; Wolfgang Gruber, Frankenthal, and Heinz Mueller-Tamm, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 13, 1976, Ser. No. 657,863
Claims priority, application Germany, Mar. 4, 1975, 2509261
Int. Cl.² C08F *4/02, 4/24*
U.S. Cl. 526—106 **1 Claim**

1. A process for the manufacture of olefin by polymerization of C_{2-8} monoolefins at temperatures of from 60° to 160° C and olefin pressures of from 0.5 to 40 bars using a silicic xerogel/-chromium trioxide catalyst which has been obtained by (1)

synthesizing a particulate silicic xerogel having a particle diameter of from 10 to 2,000μm, (2) doping said xerogel with from 0.1 to 10% by weight, based on the xerogel and calculated as chromium, of chromium trioxide or a chromium compound capable of converting to chromium trioxide under the conditions at stage (3), from a solution with evaporation of the solvent, and (3) finally maintaining the resulting product at a temperature of from 400° to 1,100° C for from 10 to 1,000 minutes in an anhydrous stream of gas containing oxygen in a concentration of more than 10% by volume, wherein the silicic xerogel/chromium trioxide catalyst is one which has been obtained by

1. synthesizing the silicic xerogel in the first stage by
   1.1. taking a silicic hydrogel having a solids content, calculated as silicon dioxide, of from 10 to 25%,
   1.2. extracting water from said hydrogel by means of an organic liquid selected from the series of C_{1-4} alkanols and/or C_{3-5} alkanones until said organic liquid absorbs no further water,
   1.3. extracting said organic liquid from stage (1.2) from the resulting dehydrated gel saturated with said organic liquid from stage (1.2) by means of hydrocarbon or oxohydrocarbon having a boiling point at 1 bar from −20° to +40° C and a latent heat of vaporization of less than 7 kcal/mole and used in liquid form, until said hydrocarbon or oxohydrocarbon absorbs no further organic liquid from stage (1.2) and
   1.4. drying the resulting dehydrated gel saturated with said hydrocarbon or oxohydrocarbon at product temperatures of from 30° to 140° C and pressures of from 1 to 760 mm of Hg until no further loss of weight occurs at a temperature of 120° C under vacuum of 10 mm Hg in a period of 30 minutes, thereby producing a xerogel, and
2. doping said xerogel in the second stage with the desired amount of chromium from a 0.05–5% w/w solution of chromium trioxide in a C_{3-5} alkanone or of a chromium compound capable of converting to chromium trioxide under the conditions of stage (3) in a C_{1-4} alkanol or C_{3-5} alkanone with evaporation of the solvent, the solution of said chromium component not containing more than 20% by weight of water.

4,048,415

PROCESS FOR POLYMERIZATION OF OLEFINS AND CATALYST COMPOSITION THEREFOR

Norio Matsuzawa, Ohtake; Hideaburo Oi, Waki; Hiroshi Nishimura; Shigeru Wada, both of Ohtake, and Juntaro Sasaki, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Sept. 30, 1971, Ser. No. 185,378
Claims priority, application Japan, Oct. 2, 1970, 45-85930
Int. Cl.² C08F *4/66, 10/06*
U.S. Cl. 526—119 **40 Claims**

1. A process for the polymerization of alpha-olefins which comprises,

polymerizing or copolymerizing one or more alpha-olefin monomers selected from the group consisting of ethylene, propylene, 1-butene, 3-methyl-1-butene, 1-pentene, 4-methyl-1-pentene, 1-hexene and styrene in the presence of a catalyst, said catalyst consisting essentially of:

A. a titanium trichloride composition and

B. an organoaluminum compound; said titanium trichloride composition (A) obtained by

a. micro-pulverizing

i. a titanium trichloride component prepared by reduction of titanium tetrachloride with hydrogen, silicon, metallic titanium or metallic aluminum,

ii. in the presence of a complex of aluminum chloride or aluminum bromide with an electron-donor in an amount of from 0.005 to 0.5 mol per mol of said titanium trichloride component (i), said electron donor being selected from the group consisting of

1. an oxygen-containing organic compound selected from the group consisting of
   saturated aliphatic monoethers of 2–32 carbon atoms having an alkyl group,
   aromatic ethers of 7–16 carbon atoms having a saturated alkyl group or aryl group,
   halogenated mono- and diethers of 7–16 carbon atoms having at least one aromatic radical,
   saturated alkyl esters of saturated aliphatic monocarboxylic acids having an aliphatic monocarboxylic acid residual group of 1–21 carbon atoms and a saturated alkyl group of 1–16 carbon atoms, unsaturated alkyl esters of saturated aliphatic monocarboxylic acids having a saturated aliphatic monocarboxylic acid residual group of 1–8 carbon atoms and an unsaturated alkyl group of 2–12 carbon atoms,
   alkyl esters of unsaturated aliphatic monocarboxylic acids having an unsaturated aliphatic monocarboxylic acid residual group of 2–12 carbon atoms and a saturated or unsaturated alkyl group of 1–10 carbon atoms,
   saturated alkyl esters of aromatic monocarboxylic acids having an aromatic monocarboxylic acid residual group of 7–18 carbon atoms and a saturated alkyl group of 1–20 carbon atoms;
   saturated aliphatic monoketones having 3–20 carbon atoms,
   saturated aliphatic diketones having 4–12 carbon atoms, and
   aromatic monoketones having 7–18 carbon atoms;
2. a nitrogen-containing organic compound selected from the group consisting of
   saturated aliphatic primary amines having 1–18 carbon atoms,
   saturated aliphatic secondary amines having 2–24 carbon atoms,
   saturated aliphatic tertiary amines having 3–18 carbon atoms,
   aromatic amines having 6–20 carbon atoms, and heterocyclic amines having 5–18 carbon atoms; and
3. a phosphorus-containing organic compound selected from the group consisting of
   trialkyl phosphines having 3–21 carbon atoms,
   triaryl phosphines having 18–21 carbon atoms,
   trialkyl phosphites having 3–24 carbon atoms,
   triaryl phosphites having 18–24 carbon atoms, and
   hexaalkyl phosphoramides having 1–4 carbon atoms in each alkyl group;

iii. and in the copresence of a polysiloxane and

b. extracting the micro-pulverized titanium trichloride component with a solvent selected from the group consisting of saturated aliphatic hydrocarbons, aromatic hydrocarbons and halogenated aromatic hydrocarbons.

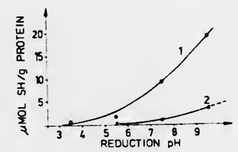
4,048,416

THIOPOLYMERS, THEIR DERIVATIVES AND METHODS FOR THEIR PREPARATION AND USE

Rolf Erik Axel Verner Axen, Balinge; Jerker Olof Porath, and Per Jan Erik Carlsson, both of Uppsala, all of Sweden, assignors to Exploaterings Aktiebolaget T.B.F., Stockholm, Sweden

Filed May 27, 1975, Ser. No. 580,814
Claims priority, application Sweden, May 30, 1974, 7407173
Int. Cl.² C07H *15/04*
U.S. Cl. 526—9 **29 Claims**

1. A product designed for separation purposes, for ion exchange purposes or as basic material for the preparation of various derivatives designed for separation purposes, for the purpose of adsorbing or immobilizing various compounds of in particular biochemical interest, as well as products consisting of derivatives of such product, characterized in that they consist of a water-insoluble hydroxyl or amino group containing polymer substituted with organic side-chains each containing



one or more thiosulphate groups ($—S_2O_3^-$ groups) or derivatives of such groups.

4,048,417

PROCESS FOR PREVENTING BUILD-UP IN POLYMERIZATION REACTORS

Stéphane Noël, Vilvoorde, Belgium, assignor to Solvay & Cie., Brussels, Belgium

Filed Jan. 14, 1976, Ser. No. 649,020
Claims priority, application Luxembourg, Feb. 13, 1975, 71833; July 18, 1975, 73025
Int. Cl.² C08F *2/00*
U.S. Cl. 526—62 **15 Claims**

1. Process for preventing build-up in a reactor during the free radical polymerisation of ethylenically unsaturated monomers, comprising subjecting the walls of the reactor, which reactor is empty of any liquid or solid phase, to heat treatment at a temperature above 60° C for more than one minute before the reactor is charged for purposes of polymerisation.

4,048,418

METHOD OF POLYMERIZATION OF CONJUGATED DIOLEFINS USING IRON CATALYSTS AND NITROGEN LIGANDS

Morford C. Throckmorton, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 22, 1974, Ser. No. 526,345
Int. Cl.² C08D *1/34, 1/14*
U.S. Cl. 526—138 **21 Claims**

1. A process for polymerizing conjugated diolefinic monomers containing from 4 to about 12 carbon atoms by bringing said monomers into contact with a catalytically effective amount of a catalyst consisting essentially of (1) an iron containing compound, (2) an organometallic reducing agent from Groups I and III of the Periodic Table, and (3) a nitrogen-containing ligand characterized in that said ligand has at least two functional groups or atoms wherein the first functional group is a cyano group (—C≡N) and the second functional group is selected from the group consisting of (a) cyano group, (b) azo group, (c) imine group, (d) vinylene group, (e) mercapto group, (f) hydroxyl group, and (g) thio group, and there must not be more than two additional carbon atoms separating the first functional group and the second functional group.

4,048,419

PROCESS FOR THE PRODUCTION OF PARTIALLY CRYSTALLINE POLYBUTENE-1

Albert Frese; Walter Dittmann, and Wolfgang Kilian, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Continuation of Ser. No. 460,904, April 15, 1974, abandoned.
This application May 27, 1975, Ser. No. 581,117
Claims priority, application Germany, Apr. 14, 1973, 2318901
Int. Cl.² C08F *2/06, 10/08*
U.S. Cl. 526—153 **12 Claims**

1. A process for the production of partially crystalline polybutene-1 formable into transparent sheets and films which comprises:

i. solution polymerization at 60°–120° C. of 35–98% of butene-1, based on the starting mixture, in excess butene-1 or an inert, low-boiling liquid C_4 solvent consisting of butene-1 and one or both of butene-2 and butane, employing as the polymerization catalyst a mixed catalyst consisting essentially of (a) a thermally unstable $TiCl_3 \cdot n\ AlCl_3$ (n = 0.2 to 0.6) and (b) a mixture of 85–99.9 molar percent of a dialkyl aluminum monochloride and 0.1–15 molar percent of a trialkyl aluminum in a molar ratio of component (b) to component (a) of from 1 to 4:1; and thereafter

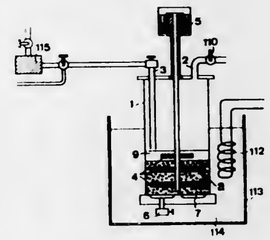
ii. volatilizing the polymerization solvent and recovering the residue containing both the ether soluble and etherinsoluble fractions as the polymerizate.

4,048,420

POLYMERIZATIONS CATALYZED BY VERY FINELY DIVIDED LITHIUM

Bernard Francois, Strasbourg; Michel Vernois, Puteaux, and Emile Franta, Souffelweyersheim, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Jan. 30, 1976, Ser. No. 653,749
Claims priority, application France, Feb. 7, 1975, 75.03891
Int. Cl.² C08F *4/02, 4/08*
U.S. Cl. 526—173 **9 Claims**



1. In a process for the polymerization of monomers comprising reacting at least one conjugated dienic monomer in the presence of an inert solvent and suspended lithium as a polymerization initiator at a temperature between about −40° C to +25° C, the improvement consisting of employing lithium having an average particle diameter of less than about 2 μ.

4,048,421

METHOD OF ANIONING POLYMERIZATION OF UNSATURATED MONOMERS

Jaroslav Kralicek, Prague; Vladimir Kubanek, Kralupy; Jaroslava Kondelikova; Bohuslav Casecasky, both of Prague, and Jiri Machacek, Roztoky, all of Czechoslovakia, assignors to Vysoka skola chemicko technologicka, Prague, Czechoslovakia

Filed Oct. 21, 1974, Ser. No. 516,820
Int. Cl.² C08F *112/08, 120/44, 212/08*
U.S. Cl. 526—177 **12 Claims**

1. Method for the anionic polymerization of an unsaturated monomer of the general formula

$$CH_2 = CXY$$

wherein X and Y are selected from the group consisting of hydrogen, aryl, vinyl, —CN, $—NO_2$, COOR and Cl, R being an alkyl group having from 1–6 carbon atoms which comprises adding to said monomer an organic derivative of a metal alumino hydride having the general formula

$$MeAlH_x(OR')_{4-x}$$

wherein Me is a metal selected from the group consisting of the group I(a) and II(a) metals of the Mendeleef Periodic Table, x is an integer ranging from 1–2, R′ is selected from the group consisting of (a) CH_2CH_2OR'' and (b) $CH_2CH_2N(R'')_2$ wherein R″ is an alkyl group having from 1–4 carbon atoms.

4,048,422

PRODUCTION OF COPOLYMER POWDERS FROM MALEIC ANHYDRIDE AND 1-OLEFINS

Günter Sackmann, Opladen; Günter Kolb, Leverkusen, and Friedhelm Müller, Odenthal, Bergisch-Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Jan. 8, 1976, Ser. No. 647,502
Claims priority, application Germany, Jan. 14, 1975, 2501123
Int. Cl.² C08F *1/09, 15/02*
U.S. Cl. 526—203 **6 Claims**

1. A process for the production of a copolymer which comprises reacting maleic acid anhydride and an excess of at least one 1-olefin having from 2 to 8 carbon atoms at a temperature of from 30° C to 200° C and a pressure of from 1 to 200 atm in an organic dispersion medium comprising said 1-olefin or said 1-olefin and a solvent which is inert with respect to the monomers and which dissolves the 1-olefin but not maleic acid anhydride, the reaction taking place in the presence of a radical former and from 0.5 to 10% by weight based on the maleic acid anhydride of a dispersion agent soluble in the dispersion medium which is obtained by the reaction of:

I. 1 mol of a copolymer of maleic acid anhydride and a 1-olefin having from 2 to 8 carbon atoms, with

II. from 1 to 10 mol of an aliphatic, saturated or monoolefinically unsaturated, linear or branched, monohydric alcohol having from 8 to 22 carbon atoms, or from 1 to 10 mol of an aliphatic, saturated, linear or branched monoamine having from 8 to 22 carbon atoms or from 1 to 10 mol of a mixture of the monohydric alcohol and monoamine, at least 30 mol% of the anhydride groups being esterified to semi-esters or amidated to semi-amides.

4,048,423

PROCESS FOR POLYMERIZING UNSATURATED MONOMERS AND UNSATURATED POLYESTER RESINS EMPLOYING UNSYMMETRICAL TERTIARY-ALIPHATIC AZOALKANES

Ronald Edward MacLeay, Williamsville, and Chester Stephen Sheppard, Tonawanda, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 453,444, March 21, 1974, Pat. No. 4,007,165, which is a continuation-in-part of Ser. No. 149,041, June 1, 1971, abandoned, which is a division of Ser. No. 725,180, April 29, 1968, abandoned, which is a continuation-in-part of Ser. No. 616,158, Feb. 15, 1967, abandoned, which is a continuation-in-part of Ser. No. 409,306, Nov. 5, 1964, abandoned. This application Mar. 29, 1976, Ser. No. 671,914
Int. Cl.² C08F *2/00, 4/04, 20/10, 12/02*
U.S. Cl. 526—209 **4 Claims**

1. In the process for the preparation of polymers or copolymers from unsaturated monomers wherein the polymerization is carried out in the presence of an added free radical affording compound as the polymerization initiator, the improvement which comprises using as said initiator a compound of the formula $(R'')_3C—N{=}N—R'$ in which $(R'')_3C—$ is different from —R′ and wherein:

a. R′ is $—C(R_1)(R_2)(Z)$ or



b. R″ is alkyl of 1–13 carbons, phenalkyl of 7–12 carbons or phenyl, not more than one R″ being phenyl;

c. R_1 and R_2 are alkyl of 1–13 carbons, phenalkyl of 7–12 carbons, cycloalkyl of 3–12 carbons or, taken together, alkylene of 2–16 carbons, and R_2 can also be phenyl;

d. R_3 and R_4 are hydrogen, alkyl of 1–13 carbons, cycloalkyl of 3–12 carbons or, taken together, alkylene of 2–16 carbons;

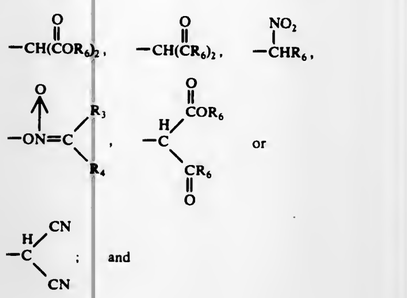
e. R_5 is alkyl of 1–13 carbons, cycloalkyl of 3–12 carbons or aryl of 6–14 carbons;

f. R_6 is alkyl of 1–13 carbons;

g. R_7 and R_8 are hydrogen or alkyl of 1–13 carbons;

h. R_6 and R_7 together can form alkylene of 2–16 carbons;

i. Z is —Cl, —Br, $—OR_5$, $—N_3$, —SCN, —OCN, —OH, $—NHR_5$, $—R_5$, $—NHNHR_5$, $—OC(=O)OR_5$, $—OC(=O)OOR$,



j. R is $(R'')_3C—$.

4,048,424

NOVEL HYDROCARBON RESINS AND PROCESS FOR PREPARATION THEREOF

Atsuo Ishikawa, Kamakura; Hidemi Tsubaki, Kawasaki; Hitoshi Takahata; Riso Iwata, both of Kamakura, and Yonesaku Shinohara, Toyama, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed July 29, 1975, Ser. No. 599,952
Claims priority, application Japan, Aug. 1, 1974, 49-88247
Int. Cl.² C08F *212/34, 4/00, 236/10*
U.S. Cl. 526—237 **11 Claims**

1. A method for preparing hydrocarbon resin polymers which comprises polymerizing a monomeric mixture consisting essentially of about 35 to 85% by weight of 1,3-pentadiene, (b) about 10 to 50% by weight of α-methylstyrene, (c) about 5 to 30% by weight of cyclopentene and (d) 0 to about 15% by weight of 1,3-butadiene in a solvent comprising at least 50% by weight of an aromatic hydrocarbon and in the presence of an aluminum halide as a catalyst.

4,048,425

ALTERNATING ELASTOMERIC INTERPOLYMERS

Irving Kuntz, Linden, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 459,865, April 11, 1974, abandoned. This application Jan. 21, 1976, Ser. No. 650,974
Int. Cl.² C08F *220/12*
U.S. Cl. 526—245 **1 Claim**

1. An alternating cross-linkable elastomeric interpolymer which comprises:

A. about 50 mol percent of one or more C_1-C_{20} acyclic or alicyclic esters of acrylic acid wherein the ester radical moiety is free of olefinic unsaturation and is selected from the group consisting of straight and branched-chain alkyl radicals, arylalkyl radicals, cycloalkyl-alkylene radicals and perfluoroalkyl radicals; and a total of about 50 mol percent of:

B. one or more C_2-C_{20} acyclic or alicyclic monoolefins having the general formulae $R—CH{=}CH_2$ or $R(R')C{=}CH_2$ wherein R and R′ are independently selected from the group consisting of hydrogen, straight and branched-chain alkyl radicals, arylalkyl and cycloalkyl radicals; and

C. 0.3 to 30 mol percent of the total monomers present of vinyl benzyl chloride; wherein the micro-structure of said crosslinkable elastomeric interpolymers is such that monomer units represented by (A) above alternate with either a monomer unit represented by (B) above or a randomly distributed monomer unit represented by (C) above and can be represented schematically by the formula

$$(B\text{-}A)_m \quad (C) \quad (A\text{-}B)_n$$

wherein m and n are integers on the range of 1 to about 500.

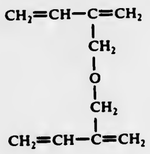
4,048,426

CROSSLINKING IN EMULSION POLYMERIZATION

Paul W. Solomon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 576,945, May 12, 1975, Pat. No. 3,956,400. This application Jan. 26, 1976, Ser. No. 652,443
Int. Cl.² C08F *212/08, 216/12, 236/02*
U.S. Cl. 526—334 **6 Claims**

1. In a process for the production of a copolymer from a mixture of monomers wherein at least one monomer is a conjugated alkadiene having 4 to 8 carbon atoms and at least one other monomer of said mixture is a vinyl-substituted aromatic monomer having 6 to 10 carbon atoms or for the production of a polymer of at least one conjugated alkadiene having 4 to 8 carbon atoms by emulsion polymerization wherein said polymerization is carried out under polymerization conditions in the presence of a polymerization initiator, the improvement which comprises carrying out the emulsion polymerization step in the presence of diisoprenyl ether, said ether having the formula



and being incorporated in an amount sufficient to effect crosslinking of the polymer in said polymerization emulsion.

4,048,427

PREPARATION OF SOLUTION POLYMERS

Ivan Glen Hargis, Tallmadge; Russell Anthony Livigni, and Sundar Lal Aggarwal, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 593,579, July 7, 1975, Pat. No. 3,992,561. This application Apr. 26, 1976, Ser. No. 680,247
Int. Cl.² C08F *4/46, 4/72, 36/06, 112/08*
U.S. Cl. 526—337 **4 Claims**

1. A rubbery polymer selected from the group consisting of homopolybutadiene-1,3 and a random copolymer of butadiene-1,3 and up to about 15% by weight total of said copolymer of copolymerized styrene and/or isoprene, said polymer exhibiting:

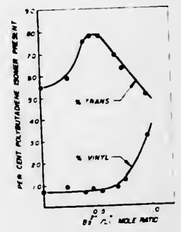
a. a glass transition temperature of from about −80° to −100° C. as determined by differential thermal analysis,

b. a crystalline melting point (peak values) in the unstretched state from about −10° to +43° C. as determined by differential thermal analysis,

c. a trans-1,4 content of from about 70 to 81% and a vinyl content of up to about 12% for the butadiene units,

d. a heterogeneity index of from about 4 to 40,

e. a number average molecular weight of from about 20,000 to 300,000,



f. crystallinity when stretched in the uncompounded and uncured state as shown by x-ray diffraction data,

g. green strength and building tack, and

h. a broad molecular weight distribution as determined by gel permeation chromotography.

4,048,428

METHOD FOR PREPARING A FILM OF VINYLIDENE CHLORIDE POLYMER

William G. Baird, Jr., Winchester; Stanley E. Holbrook, South Acton, and Jeremy A. Platt, Cambridge, all of Mass., assignors to W. R. Grace & Co., Duncan, S.C.

Continuation of Ser. No. 114,692, Feb. 11, 1971, Pat. No. 3,821,182, which is a division of Ser. No. 590,107, June 2, 1966, abandoned, which is a division of Ser. No. 157,194, Dec. 5, 1961, abandoned. This application Apr. 15, 1974, Ser. No. 460,855
The portion of the term of this patent subsequent to June 28, 1991, has been disclaimed.
Int. Cl.² C08F *14/08*
U.S. Cl. 526—343 **5 Claims**

1. A substantially unoriented crystalline copolymer film made from a thermoplastic copolymer of vinylidene chloride and at least one copolymerizable monomer wherein the vinylidene chloride is at least 50 percent of the material in the copolymer, said copolymer film having a shrinkability at 96° C of 1 to 5 percent in the transverse direction and 2 to 10 percent in the longitudinal direction, a haze of not over 7 percent, and an elongation of at least 100 percent in both the transverse and longitudinal directions, said film having been made by coextruding said copolymer as a melt between melts of outer plies of thermoplastic polymer through a die so as to produce a copolymer film between the outer plies, said copolymer film being separable from said outer plies, substantially devoid of pinholes and scratches, and having low oxygen permeability.

4,048,429

PROCESS FOR THE PREPARATION OF POLYMER FIBERS

Cornelis E.P.V. van den Berg, Geleen, and Hubertus J. Vroomans, Beek(L), both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Apr. 18, 1973, Ser. No. 352,330
Claims priority, application Netherlands, Apr. 22, 1972, 7205482
Int. Cl.² C08F *6/12, 6/06*
U.S. Cl. 528—497 **8 Claims**

1. A continuous process for preparing polymer fibers by concurrent precipitation and agitation of a fiber-forming polymer solution comprising the steps of:

a. preparing a solution of a fiber forming polymer by dissolving the polymer in a solvent therefor;
b. continuously supplying the thus-formed polymer solution to a radial symmetrical chamber;
c. continuously supplying a precipitant for said polymer to said radial-symmetrical chamber in an amount and at a temperature such that the temperature of the polymer solution-precipitant mixture is below the precipitation temperature of said polymer;
d. subjecting the introduced polymer solution to shearing forces by creating within said radial symmetrical chamber a rotary flow causing said polymer in the polymer solution to precipitate in a fibrous structure and form fibers under said shearing forces;
e. continuously removing the fibers and solvent as a mixture from the chamber;
f. separating and collecting the fibers from the solvent; and
g. recycling at least a portion of the fiber free solvent to the rotation chamber after conforming the recycle temperature to the temperature of the flow in the rotation chamber.

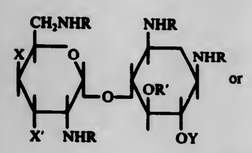
4,048,430

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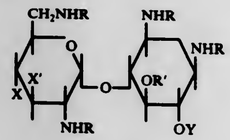
David J. Cooper, Downingtown; John R. E. Hoover, Glenside, both of Pa., and Jerry A. Weisbach, Cherry Hill, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 518,428, Oct. 29, 1974, Pat. No. 3,960,838. This application Dec. 18, 1975, Ser. No. 642,085
Int. Cl.[2] C07H *15/22*
U.S. Cl. 536—17 12 Claims

1. A compound of the formula



or



where

X and X' are each SR" or OR' but are not the same;
each R is hydrogen or an amino protecting group;
each R' is hydrogen or a hydroxy protecting group;
R" is hydrogen or a mercapto protecting group; and
Y is 3-amino-3-deoxy-D-glucopyranosyl, 3-acetamido-3-deoxy-D-glucopyranosyl, 3-acetamido-3-deoxy-2,4,6-O-triacetyl-D-glucopyranosyl, or 3-acetamido-3-deoxy-2,4,6-O-tribenzyl-D-glucopyranosyl.

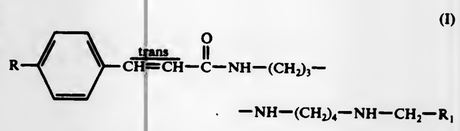
4,048,431

ALKYLATED DERIVATIVES OF ANTIBIOTIC BM123γ

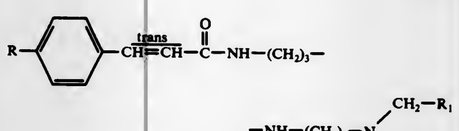
Joseph John Hlavka, Tuxedo, and Panayota Bitha, Pomona, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 612,975, Sept. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 529,862, Dec. 5, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,564
Int. Cl.[2] A61K *31/71;* C07H *15/22*
U.S. Cl. 536—17 36 Claims

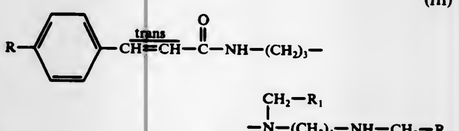
1. A compound selected from the group consisting of those of the formulae:



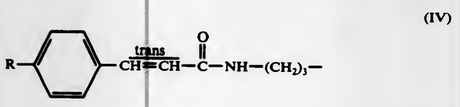
(I)



(II)



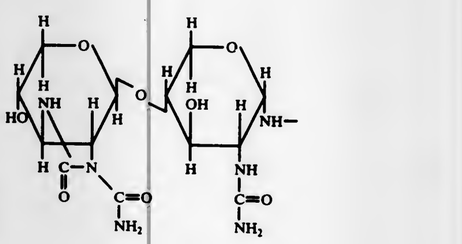
(III)



(IV)



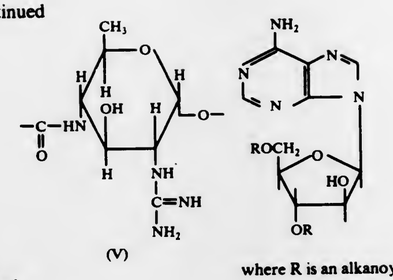
A



B

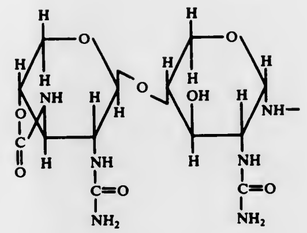
wherein R is a moiety selected from the group consisting of those of the formulae:

-continued



(V)

and



-continued

where R is an alkanoyl group having from 2 to 4 carbon atoms.

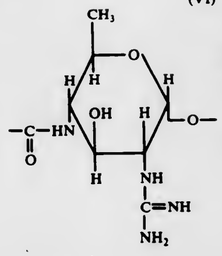
4,048,433

CELLULOSE ETHERS HAVING A LOW MOLECULAR WEIGHT AND A HIGH DEGREE OF METHYL SUBSTITUTION

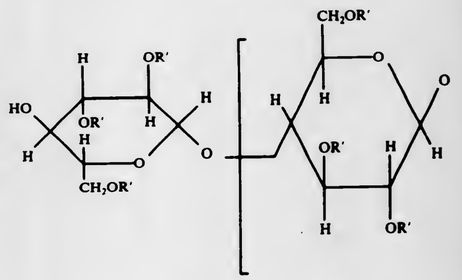
Michael E. Burns, West Chester, and Hans J. Pracht, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

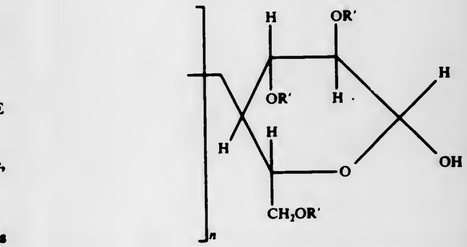
Filed Feb. 2, 1976, Ser. No. 654,431
Int. Cl.[2] C08B *11/02, 11/20*
U.S. Cl. 536—99 4 Claims

1. A methyl cellulose ether having the structure



(VI)





R_1 is selected from the group consisting of hydrogen, lower alkyl, halo substituted lower alkyl, lower alkenyl, phenyl, acetamidophenyl, nitrophenyl, mercaptophenyl, anisyl, tolyl, phenyl lower alkyl, 2-furyl, methyl substituted 2-furyl, 2-thienyl, methyl substituted 2-thienyl, 2-pyrryl, methyl substituted 2-pyrryl, 2-pyridyl and 2-quinolyl; and the pharmacologically acceptable acid-addition salts thereof.

4,048,432

9-(3,5-DI-O-ACYL-β-D-ARABINOFURANOSYL)ADENINE COMPOUNDS AND METHOD FOR THEIR PRODUCTION

David Clarkston Baker, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed May 17, 1976, Ser. No. 687,270
Int. Cl.[2] C07H *19/18*
U.S. Cl. 536—26 8 Claims

1. 9-(3,5-Di-O-acyl-β-D-arabinofuranosyl)adenine compounds having the formula

wherein R' is hydrogen or methyl provided the average degree of methyl substitution on the anhydroglucose unit is from 1.8 to 2.7 and *n* ranges from 14 to 54.

4,048,434
METHOD FOR PREPARING AN ACID MODIFIED OXIDIZED HYDROXYALKYL STARCH

Edwin L. Speakman, Clinton, Iowa, assignor to Standard Brands Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 438,820, Feb. 1, 1974, abandoned. This application May 29, 1975, Ser. No. 582,022
Int. Cl.² C08B *31/18, 33/08*
U.S. Cl. 536—105 **5 Claims**

1. A method for preparing a gelatinizable acid modified oxidized hydroxyalkyl starch by the sequential steps consisting essentially of:

a. reacting granular starch with a 1,2-alkylene epoxide containing 2 to 4 carbon atoms, inclusively, under non-gelatinizing conditions at a pH of above about 10 to obtain a granular starch having a hydroxyalkyl D of S of from about 0.02 to less than about 0.18,

b. adjusting the pH of the hydroxyalkyl starch to a range of from about 6 to about 8,

c. oxidizing the hydroxyalkyl starch with an alkaline hypochlorite under conditions to introduce an amount of carboxylic groups onto said starch, the amount of carboxylic groups, percent by weight dry starch basis, being no greater than about 1.2 minus the product of 7 times the hydroxyalkyl D of S.

d. treating the hydroxyalkyl oxidized starch with an acid to increase the alkaline paste fluidity thereof, said treatment being carried out under conditions such that

1. the starch having a D of S of from about 0.02 to about 0.1 has an alkaline paste fluidity of less than about 293,

2. the starch having a D of S of from about 0.11 to about 0.13 has an alkaline paste fluidity of less than about 283, and

3. the starch having a D of S of from about 0.14 to less than about 0.18 has an alkaline paste fluidity of less than about 210, and

e. recovering the resulting product.

4,048,435
METHOD FOR THE PREPARATION OF HIGHLY SUBSTITUTED GRANULAR STARCHES

Morton W. Rutenberg, North Plainfield; Wadym Jarowenko, Plainfield, and Martin M. Tessler, Edison, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed July 12, 1976, Ser. No. 704,472
Int. Cl.² C08B *31/02, 31/08*
U.S. Cl. 536—106 **9 Claims**

1. A process for the production of highly substituted granular starch products comprising the steps of:

a. reacting the starch in an aqueous system with from 0.5 to 15% by dry weight of the starch of a reagent capable of producing an acetal cross-linkage;

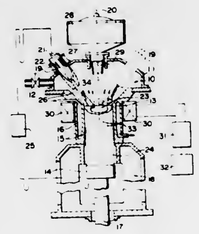
b. reacting said acetal cross-linked starch in an aqueous alkaline system with a mono-functional esterifying or etherifying reagent; and

c. removing said acetal cross-linkages by treating under acidic conditions.

4,048,436
HEAT TREATING

Susumu Hiratake, Kasugaishi, and Mitsuhiro Matsui, Nagoya, both of Japan, assignors to Daidotokushuko-Kabushikikaisha, Nagoya, Japan

Filed Oct. 2, 1975, Ser. No. 619,087
Claims priority, application Japan, Oct. 2, 1974, 49-114216; Oct. 12, 1974, 49-117265
Int. Cl.² H05H *1/10;* H05B *7/00*
U.S. Cl. 13—2 P **3 Claims**



1. Apparatus for melting metal comprising:

i. a crucible for containing metal to be melted therein

ii. a plurality of plasma-forming nozzle devices positioned in fixed relationship with respect to said crucible, each device having means for forming a plasma jet, each such jet forming means being positioned so as, when there is metal in the crucible to be melted, to be directed towards a respective one of a plurality of distinct surface portions of said metal

iii. a first source of direct electric current having two poles, one said pole being electrically connected to each of said nozzle devices, the other said pole being electrically connected to said metal in said crucible

iv. means for generating a magnetic field across said surface portions of said metal in a direction extending at an inclination to the direction in which a respective plasma jet is formed by each said plasma jet forming means, whereby said magnetic field will act on each plasma jet to deflect it,

v. a second source of electric current connected to said magnetic field generating means for supplying current thereto, and

vi. means for controlling the electric current supplied by said second source independently of said direct current, thereby to control said magnetic field to oscillate said plasma jets.

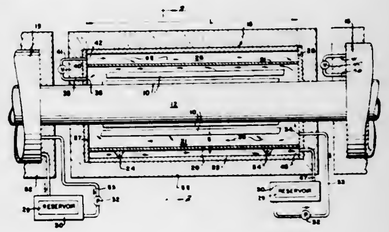
4,048,437
SUPERCONDUCTING MAGNET COOLING SYSTEM

Peter C. Vander Arend, Center Valley, Pa., and William B. Fowler, St. Charles, Ill., assignors to The United States Energy Research and Development Administration, Washington, D.C.

Continuation of Ser. No. 469,919, May 16, 1974, abandoned. This application June 6, 1975, Ser. No. 584,423
Int. Cl.² H01B *12/00*
U.S. Cl. 174—15 S **10 Claims**

1. A conductor and a device for cooling the conductor to the superconducting state, comprising:

a supply of liquid coolant in the supercooled state, an inner conduit being coupled to said supply of liquid coolant and having within the interior thereof the conductor and said liquid coolant in contact with said conductor or the entire length thereof so that said conductor is in the superconducting state, a supply of boiling liquid coolant at lower temperature than said liquid coolant, an outer conduit being positioned about and separated from said inner conduit to form a channel between the outer wall of said inner conduit and the inner wall of said outer conduit, and means coupled to said channel and said supply of boiling liquid coolant for pumping said boiling liquid coolant through said channel, the conductor being so separated from the inner wall of said inner conduit that with heat being generated by the conductor at the superconducting state said heat is by convention within said supercooled liquid coolant carried from the conductor to the inner

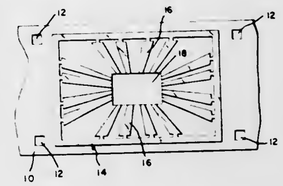


wall of said inner conduit and the flow rate of said boiling liquid coolant through said channel is of such value that sufficient liquid phase remains in said boiling liquid coolant over the length of said conductor to maintain the temperature of the supercooled liquid coolant at a relatively constant value over the length of the conductor.

4,048,438
CONDUCTOR PATTERNED SUBSTRATE PROVIDING STRESS RELEASE DURING DIRECT ATTACHMENT OF INTEGRATED CIRCUIT CHIPS

Richard Henry Zimmerman, Palmyra, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 517,573, Oct. 23, 1974, abandoned. This application Nov. 18, 1975, Ser. No. 633,045
Int. Cl.² H05K *1/02;* H01L *23/48*
U.S. Cl. 174—68.5 **11 Claims**



1. A circuit pattern for direct attachment to at least one semiconductor device, such as an integrated circuit chip having a plurality of terminals fixed thereon and arranged in a predetermined pattern upon one side of the chip, comprising:

a continuous elongated web of flexible insulator material;

a single repetitive pattern of metal having a width less than the width of said web of insulator material with each repetition of said pattern having a plurality of conductive fingers converging on at least one location;

an aperture in said web of insulator material at each said location located centrally of said converging conductive fingers said aperture being smaller than a semiconductor device to be bonded to said circuit pattern and defined by at least two slots radiating from a single point in a star burst configuration; and

each said repetition of said metal pattern being bonded to said flexible insulator material.

4. A process for fabricating a patterned circuit for direct attachment to semiconductor devices, such as integrated circuit chips comprising:

forming in a flexible insulative carrier an aperture having a

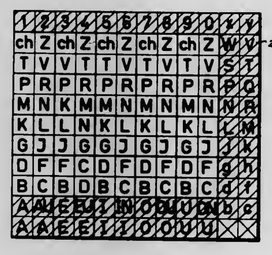
periphery which is substantially smaller than that of a semiconductor device intended to be located thereover,
securing a metallic foil to the carrier and removing portions of the foil to form on the insulative carrier a plurality of spaced finger-like leads each extending inwardly to the periphery of the aperture,
locating over the aperture a semiconductor device having formed on a face thereof metallic contacts, the periphery of the semiconductor device extending beyond the periphery of the aperture and the metallic contacts being registered with the leads,
simultaneously joining the inner terminations of the leads to the registered metallic contacts on the semiconductor device, and
severing the leads beyond the device to separate the semiconductor device from the carrier.

4,048,439

CONTROL DEVICE OF A TELETYPEWRITER TO BE USED BY INVALIDS

Jean-Claude Gabus, Cornaux, Switzerland, assignor to Carba S.A., Liebefeld, Switzerland

Filed Dec. 1, 1975, Ser. No. 636,704
Claims priority, application Switzerland, Dec. 6, 1974, 16209/74
Int. Cl.² G11B *5/02*; G08C *1/00*
U.S. Cl. 178—17 C **4 Claims**



1. In a control device of a teletypewriter to be used by invalids, comprising a synoptical board characterized by a plurality of vowels and consonants thereon arranged in lines and columns, at least one control member for selecting and causing the visible indication of a selected said character on said board, and an electronic part for causing a print-out corresponding to a said selected character; the improvement in which said synoptical board comprises as least one line or column in which all the vowels are grouped without the consonants, there being at least one other line or column on the synoptical board in which a plurality of consonants are grouped without the vowels, said electronic part being characterized by causing the print-out of a said vowel in combination with a said consonant upon selection of a said consonant that lies in a column or line perpendicular to said line or column of vowels and in register with said vowel in the last-mentioned line.

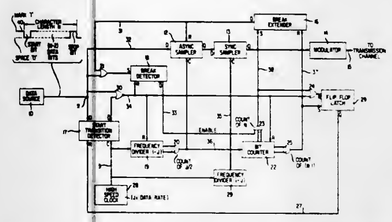
4,048,440

ASYNCHRONOUS-TO-SYNCHRONOUS DATA CONCENTRATION SYSTEM

Richard John Peck, Eatontown, and Shih Yung Tong, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 8, 1976, Ser. No. 739,803
Int. Cl.² H04L *7/00*
U.S. Cl. 178—69.1 **5 Claims**

1. In a synchronous digital data transmission system, including a transmission line between system terminals, converters for data characters having start and stop bits and a fixed number of data bits comprising
at a transmitter for one terminal of said transmission line;
first means responsive to a start-bit transition for synchronously sampling the bits in a character at a phase determined by that of said start bit,
first latching means for inhibiting character bits from said first sampling means for one character length,
second sampling means for retiming character bits from said first sampling means according to the substantially constant phase of the synchronous timing assigned to said transmission line, and
means for applying retimed character bits to said transmission line; and
at a receiver for another terminal of said transmission line;
means for accepting data signals from said transmission line,
second means responsive to a start-bit transition for sampling the bits in a character at a phase determined by that of said start bit but at a rate higher than said synchronous rate,
second latching means for inhibiting character bits from said first sampling means for one character length



storage means traversed by received data signals having at least as many storage positions as there are bits in each character,
means for monitoring the storage positions in said storage means having one binary output when all positions are opposite in binary sense to a stop bit and the other binary output otherwise,
third latching means responsive to the output of said monitoring means for producing a control output when said monitoring means output indicates the absence of a stop bit,
third sampling means for retiming received character bits,
one-bit delay means, and
a pair of steering gates responsive to the control output of said third latching means alternatively providing a direct path or a path through said one-bit delay means for received signals to said third sampling means in accordance with the presence or absence of a stop bit, a missing stop bit being reinserted thereby.

4,048,441

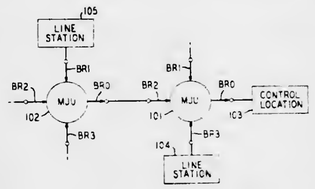
ERROR CONTROL FOR DIGITAL MULTIPOINT CIRCUITS

Charles Edwin Young, Howell Township, Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 6, 1976, Ser. No. 702,957
Int. Cl.² H04H *9/00*; H04Q *5/00*; H04L *25/20*
U.S. Cl. 178—73 **9 Claims**

1. A junction unit having signaling paths interconnecting a plurality of incoming lines with an outgoing line, each of the lines arranged to convey data words which include presence and absence of message information, each of the signaling paths including means for enabling passage of each incoming word on an incoming line to the outgoing line in response to presence of message information in the incoming word whereby the passage enabling means is disabled and blocks the passage of the incoming word in the absence of message information in the word, characterized by

means effective when the passage enabling means is disabled and responsive to an indication of the enabling of the passage of a word by another one of the passage enabling



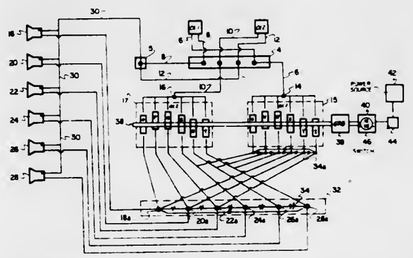
means for rendering the first passage enabling means unresponsive to the presence of message information in subsequent ones of the incoming words on the incoming line.

4,048,442

STEREOPHONIC SOUND ADAPTOR FOR SIMULATING SOUND MOVEMENT

Richard S. Mannila, Star Rt., Box 51, Marcola, Oreg. 97454; Fred E. Mannila, 1425 Hayden Bridge Road, Springfield, Oreg. 97477, and Donald A. Mannila, Star Rte. Box 52, Marcola, Oreg. 97454

Filed May 22, 1975, Ser. No. 579,856
Int. Cl.² H04R *5/00*
U.S. Cl. 179—1 GP **2 Claims**



1. A stereophonic sound system comprising:
electronic signal input means having first and second separate channels;
an electro-mechanical transfer station including an elongate rotatable shaft driven by a variable speed motor, the transfer station having a first and second separate junction block therein, each junction block connected to a separate channel;
a plurality of individual switches within each separate junction block, the switches all operatively connected to the channel associated with the junction block, the junction block associated with the first channel further including a plurality of resistors, one resistor interposed between each switch within the junction block associated with the first channel;
a first set of individual cams mounted eccentrically on the rotatable shaft, each cam operable to open and close a separate switch within the first junction block;
a second set of individual cams eccentrically mounted on the rotatable shaft separate from the first set of cams, each cam operable to open and close a separate switch within the second junction block;
a speaker network including a plurality of speakers, the network including a speaker terminal block which includes an individual terminal operatively connected to one speaker in the network, each speaker in the network being operatively connected through a terminal to one switch in the first junction block and to one switch in the second junction block;
and a plurality of resistors within the speaker terminal block, one resistor interposed between each of the individual terminals within the terminal block;
the cams within the first and second junction blocks operable to simultaneously connect pairs of speakers within the speaker network in a predetermined sequence to produce the illusion of moving sound within a room, one speaker of the pair being connected to the first channel while the second speaker of the pair is simultaneously connected to the second channel, the resistors within the first junction block and the resistors within the speaker terminal block operable so that smooth uninterrupted transition of sound through the speaker network is effected when the cams open and close the switches.

4,048,443

DIGITAL SPEECH COMMUNICATION SYSTEM FOR MINIMIZING QUANTIZING NOISE

Ronald Eldon Crochiere, Chatham; James Loton Flanagan, Warren, and Susan Anne Webber, North Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 12, 1975, Ser. No. 640,218
Int. Cl.² G10L *1/00*
U.S. Cl. 179—1 SA **18 Claims**



1. A digital speech communication system comprising a speech signal source; a plurality of bandpass filters connected to said speech signal source for partitioning the short-term speech spectrum of said speech signal into preselected preassigned intelligibility contributing subband portions, each bandpass filter having a lower frequency limit equal to an integer multiple n of the subband bandwidth and an upper frequency limit equal to an integer multiple $n + 1$ of the subband bandwidth; a plurality of subband encoding means, each subband encoding means comprising sampling means connected to a selected one of said bandpass filters adapted to sample the selected subband portion of said speech signal at a rate corresponding to twice the bandpass filter passband and means for digitally encoding each sample from said sampling means; and means for combining the digital codes of said plurality of subband encoding means and for applying said combined codes to a common communication channel.

4,048,444

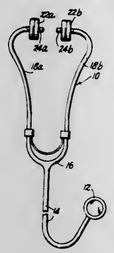
PHONOSTETHOSCOPE CONVERSION UNIT FOR AMPLIFICATION AND CLARIFICATION OF CORPOREAL SOUNDS

Vincent C. Giampapa, 47 Addison Drive, Fairfield, N.J. 07006

Filed Aug. 15, 1975, Ser. No. 605,047
Int. Cl.² H04R *1/46*; A61B *7/04*
U.S. Cl. 179—1 ST **4 Claims**

1. An electronically assisted stethoscope comprising:
a. a chestpiece member;
b. a pair of electronic conversion units;
c. an integral air column member connecting each of said electronic conversion units to said chestpiece member;
wherein said pair of electronic conversion units are independently operable and are positioned at the output end of the acoustic path so as to constitute the output elements of said electronically assisted stethoscope,
and wherein said electronic conversion units each comprise:

a. a primary and a secondary air column;
b. a first electroacoustic transducer means in acoustic communication with said primary air column for converting acoustic signals into corresponding electrical signals;
c. amplifying means connected to said first electroacoustic transducer means for amplifying said electrical signals;
d. a second electroacoustic transducer placed in acoustic



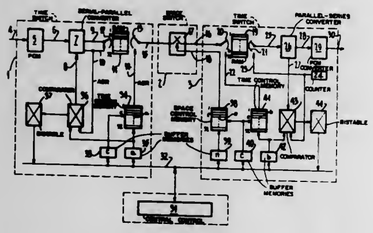
communication with said secondary air column for producing amplified acoustic signals corresponding to said amplified electrical signals;
e. an earpiece member in acoustic communication with said secondary air column; and
f. sound baffle means movably disposed for selectively substantially acoustically isolating said primary and secondary air columns.

4,048,445

METHOD FOR THROUGH CONNECTION CHECK IN DIGITAL DATA SYSTEM

Walter Ghisler, Upplands Vasby, Sweden, assignor to L.M. Ericsson Pty. Ltd., Australia

Filed Aug. 11, 1975, Ser. No. 603,501
Claims priority, application Australia, Aug. 9, 1974, 8462/74
Int. Cl.² H04J *3/14*
U.S. Cl. 179—15 BF **5 Claims**



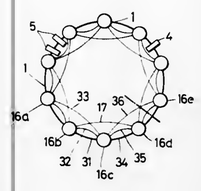
3. A method of checking the correct connection establishment between desired input and output points in a digital data system including one or more switches between said points, said switches being under common control and wherein said data is transmitted with a parity bit, the method comprising the steps of:
a. introducing an incorrect parity bit in one or more particular input words in a digital data bit stream at said desired input point after said connection has been established, and
b. checking the output points of said switch by said common control for parity of the data words corresponding to said particular input words in order to obtain information indicating the correct connection establishment.

4,048,446

DATA TRANSMISSION SYSTEM

Emanuel R. Hafner, Wohlen, and Zdenek Nenadal, Bern, both of Switzerland, assignors to Hasler AG, Bern, Switzerland

Filed Dec. 3, 1975, Ser. No. 637,283
Claims priority, application Sweden, Dec. 10, 1974, 7416355
Int. Cl.² H04J *3/14*
U.S. Cl. 179—15 AL **5 Claims**



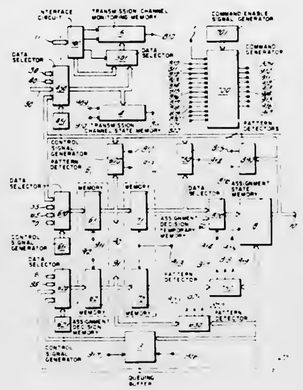
1. A data transmission system comprising
a unidirectional transmission loop, consisting of a plurality of loop sections **(1,7,9)** each having an input and an output end;
a plurality of switching points **(2,6)** each connected between the two adjoining input and output ends of two successive loop sections;
a plurality of subscriber stations **(4,5)** connected in series to the loop;
a plurality of parallel line sections **(3,8,10,11)** each having an input end and an output end and by-passing two successive loop sections, the input end of one parallel line section and the output end of one further parallel line section **(10)** are connected to each switching point **(6)**;
the output end of the loop section **(7)**, which is connected to the switching point **(6)**, is connected to the input end of the said further parallel line section **(10)**;
switching means **(81–83)** included in each switching point having a first position connecting the output end of the loop section **(7)**, which is connected to the switching point, to the input end of the loop section **(9)**, which is connected to the switching point, and having a second position connecting the output end of said parallel line section **(8)**, which is connected with the switching point, to the input end of the loop section **(9)**, which is connected to the switching point;
failure detecting means **(71–74)** included in each switching point having an input connected to the output end of the loop section **(7)** which is connected to the switching point and having an output delivering an output signal in response to signal failures at its input;
control means **(78,80)** each associated to one switching means and having a first control input connected to the output of the failure detecting means of the respective switching point and a second control input connected to the output of the failure detecting means of the preceding switching point;
each switching means **(81–83)** is in the first position when no failure signal is present on the first control input, and is in the second position when a failure signal is present at its first control input and simultaneously no failure signal is present at the second input (FIG. **1** and **5**).

4,048,447

PCM-TASI SIGNAL TRANSMISSION SYSTEM

Rikio Maruta, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 557,835, March 12, 1975, abandoned. This application May 20, 1976, Ser. No. 688,243
Claims priority, application Japan, Mar. 15, 1974, 49-30178; Mar. 22, 1974, 49-32347
Int. Cl.² H04J *6/02*
U.S. Cl. 179—15 AS **7 Claims**



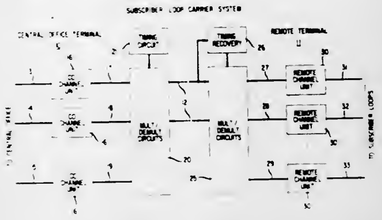
2. A PCM-TASI signal transmission system comprising:
1st to *m*-th input trunks arranged time-serially and consisting of repetition of frames and superframes each comprised of n frames and adapted to be able to carry out time division multiplex transmission of a plurality of intermittent PCM information signals,
information signal detector means for sequentially detecting if said information signal actually exist on each of said input trunks and for transmitting an output signal only when said information signal is detected on the input trunk being monitored,
1st to *s*-th ($s<m$) transmission channels arranged time-serially similarly to said input trunks for transmitting said information signals received via said input trunks,
connecting means capable of selectively connecting said input trunks to said transmission channels,
assignment control means responsive to the output signals transmitted in sequence from said information signal detector means for controlling said connecting means so as to selectively assign said transmission channels to those among said trunks on which said information signals exist only during the period in which said information signal persists,
means for generating signals representing the state of said selective assignment and for transmitting the same along with said information signals, and
means on a receiver side of said transmission system for detecting said signals representing the state of assignment and for distributing the information signals received via said transmission channels to **1st** to *m*-th output trunks in a manner similar to the corresponding input trunks in response to said signals representing the state of assignment; characterized in that said transmission system comprises variable signal transmission means for varying the sequence of transmission of the output signals from said information signal detector means to said assignment control means at least for every one of said superframes.

4,048,448

MULTIPARTY TELEPHONE RINGING

Ronald Jay Canniff, Mount Arlington, and Mark Thomas Manfred, Rockaway, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 19, 1976, Ser. No. 659,369
Int. Cl.² H04M *3/02*
U.S. Cl. 179—17 E **13 Claims**



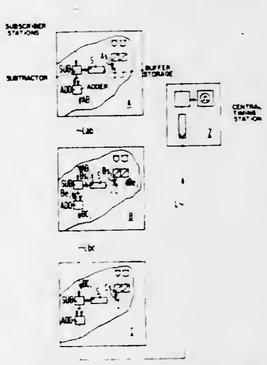
1. A digital selective calling circuit for party line telephone systems comprising:
means connected to termination of said party line for generating repetitive selective party identification cyclic serial pulse coded groups of signals,
detector means connected to the other termination of said party line responsive to each said serial pulse coded signal group to produce a unique response signal regardless of the phase sequence of the pulse positions within said group; and
selective ringing circuits responsive to said response signals to generate selective telephone calling signals.

4,048,449

METHOD FOR FORMING A CONFERENCE CONNECTION IN A TELECOMMUNICATION SWITCHING SYSTEM

Roderich Natebusch, Ottobrunn, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 18, 1975, Ser. No. 614,695
Claims priority, application Germany, Sept. 20, 1974, 2445092
Int. Cl.² H04M *3/56*
U.S. Cl. 179—18 BC **2 Claims**



1. A method for connecting at least three subscribers participating in a conference call in a pulse code modulation (PCM), time division mulitplex(TDM) telecommunication system having subscriber stations connected in a ring-like TDM circuit, comprising the steps of:
generating in each said participating subscriber station a first

TDM signal corresponding to the instantaneous value of a speech signal issuing from that subscriber station,

storing said first TDM signal in the subscriber station where it is generated for a period of a signal cycle through said ring-like circuit,

subtracting a second signal from an incoming signal from other subscriber stations in the time position assigned to the conference call to produce a difference signal, said second signal being a previously stored first signal,

adding said first signal and said difference signal to produce a composite signal, and

transmitting said composite signal over said ring-like circuit from the subscriber station where it was produced,

whereby at least said difference signal is received by a said participating subscriber station as a TDM signal corresponding to instantaneous speech values in others of said participating subscriber stations.

4,048,450

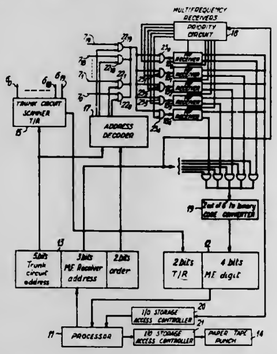
TRUNK CIRCUIT TRAFFIC ANALYZER

Jean-Michel Bernard, 10, rue du Viaduc, 92130 Issy-les-Moulineaux; Lucien Labboz, 25, avenue de Gaulle, 92190 Meudon, and Daniel Vesque, 15 ter, rue Roger Salengro, 92120 Montrouge, all of France

Continuation-in-part of Ser. No. 518,102, Oct. 25, 1974, abandoned. This application Mar. 29, 1976, Ser. No. 671,668

Int. Cl.² H04M *7/06*

U.S. Cl. 179—18 EB **3 Claims**



1. A traffic analyzer in combination with a group of trunk circuits having transmission and reception lines including a bidirectional speech path and a supervisory signalling path connecting two telephone exchanges, each exchange comprising:

decimal code signalling means for conveying decimal code signals over said supervisory signalling path of each trunk circuit;

multifrequency code signalling means for feeding said bidirectional speech path of said trunk circuits with code speech digital signals; and;

said decimal code signals and multifrequency signalling code digits providing pluralities of decimal signalling code signal sequences and multifrequency signalling code digit sequences;

the sequences of decimal code signals being composed of different signals unambiguously defining certain phases of a telephone call and comprising a signalling code change signal and the sequences of multifrequency code digits being catenated sequences defining certain other phases of a telephone call and being composed of a number of multifrequency code digits variable according to the phases they define;

said traffic analyzer comprising means for cyclically sampling said decimal signalling code signals;

means for connecting said sampling means to said transmission and reception lines of said trunk circuits;

means controlled by said sampling means for sensing said signalling code change signal;

a number of multifrequency signalling receivers which are smaller than the number of trunk circuits in said group;

said receivers detecting said multifrequency signalling code digits;

means controlled by said signalling code change signal sensing means for connecting a multifrequency signalling receiver to said bidirectional speech path of a trunk circuit;

a memory having recorded therein at addresses formed by the digits of a given multifrequency code digit sequence which are detected by said multifrequency signalling receiver, the number of digits of a following multifrequency code digit sequence being catenated with said given sequence;

a counter;

means for transferring from said memory to said counter said number of digits of said following sequence;

means for decrementing said counter by the multifrequency digits detected by said connected multifrequency signalling receiver and for transmitting said addresses to said memory which are connected to said multifrequency signalling receivers;

means for sensing the count zero in said counter and means controlled by said count zero sensing means for disconnecting said connected multifrequency signalling receiver.

4,048,451

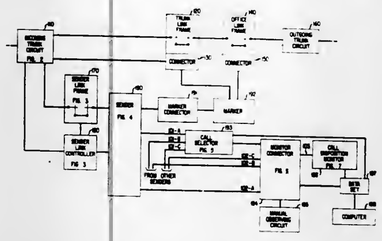
ARRANGEMENT FOR MONITORING LIVE CALL DISPOSITION SIGNALS

Gary Keith McNees, Monmouth Beach, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 19, 1976, Ser. No. 668,596

Int. Cl.² H04M *7/00, 3/24*

U.S. Cl. 179—18 AH **13 Claims**



8. In a telecommunications switching system in which each of a group of signals applicable at a destination side of a cross-office connection during the establishment of a call thereover has a unique tone pattern and represents a distinct disposition of said call, said system including one of a plurality of trunk circuits seized for use to establish said call and operable in a split condition wherein any of said group of signals applied at said destination side is isolated from other signals generated at an originating side of said one of said trunk circuits, an arrangement for automatically monitoring said one of said trunk circuits to determine an actual disposition of said call comprising:

means for maintaining said one of said trunk circuits in said split condition subsequent to the establishment of said call, and

means connected to said destination side of said one of said trunk circuits and operative during the continuance of said split condition by said maintaining means for detecting only a one of said group of signals representing said actual disposition in response to a receipt of a tone pattern thereof in the absence of interference by said other signals generated at said originating side.

4,048,452

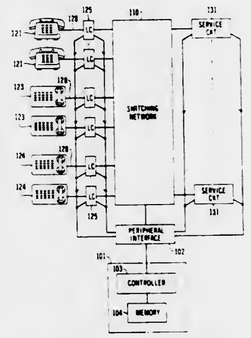
AUTOMATIC CALL DISTRIBUTION SYSTEM

Hans Oehring, Glen Ellyn, and Philip Joseph Rossomando, Downers Grove, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 28, 1976, Ser. No. 690,995

Int. Cl.² H04Q *3/64*

U.S. Cl. 179—27 D **11 Claims**



1. Telephone call handling apparatus for use in combination with a plurality of telephone lines and a plurality of groups of call answering stations, and comprising:

detection means for detecting from said lines dialing signals defining a called number identifying one of said groups of call answering stations;

clock means for generating time signals defining present time;

means for recording the identity of a line from which dialing signals defining a called number are detected by said detection means and for recording time signals generated by said clock means and representing time of request for said called number;

circuit means for comparing said recorded time signal with current time signals generated by said clock means, and for generating difference signals defining a time difference between said recorded time signals and said current time signals;

means for generating time trigger signals defining numerical constants representing first and second time triggers;

means for comparing said difference signals and said time trigger signals for generating a first output signal when the numerical value represented by said difference signals exceeds the numerical value of said first time trigger and for generating a second output signal when the numerical value represented by said difference signals is less than the numerical value of said second time trigger;

means responsive to said first output signal generated with respect to time of request for a first called number and said second output signal generated with respect to time of request for a second called number to connect a line from which dialing signals defining said first called number are detected to a call answering station of the group of call answering stations identified by said second called number.

4,048,453

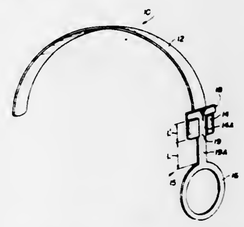
TELEPHONE HANDSET SUPPORT DEVICE

Gustave Seidel, 333 Passaic St., Hackensack, N.J. 07601

Filed Feb. 11, 1976, Ser. No. 656,999

Int. Cl.² H04M *1/05*

U.S. Cl. 179—156 R **8 Claims**



1. Telephone handset supporting device comprising a semicircular headband member and an essentially planar telephone headset attachment member, said headband member being ribbon-like and having interlocking attachment means for detachably receiving a cooperating interlocking member on said telephone attachment member and wherein a flat surface of said headband member cooperates with a flat surface of said attachment member to preclude relative rotation.

4,048,454

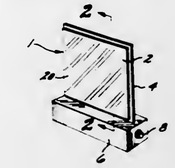
SONIC TRANSDUCER EMPLOYING RIGID RADIATING MEMBER

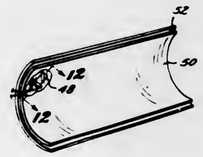
Lester M. Barcus, 252 Tivoli Drive, Long Beach, Calif. 90803, and John F. Berry, 3392 St. Albans Drive, Los Alamitos, Calif. 90720

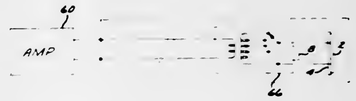
Filed Dec. 2, 1974, Ser. No. 528,671

Int. Cl.² H04R *3/00, 7/02, 7/26, 17/00*

U.S. Cl. 179—110 A **24 Claims**







1. A sonic transducer for transmitting sonic signals in a medium comprising:

piezoelectric sonic energy generating means, said generating means having opposed generally planar electrodes,
sonic energy transmitting means, said transmitting means being sheet-like and rigid and substantially incapable of flexural and diaphragm-like movement,
coupling means for coupling said generating means to said transmitting means,
said coupling means coupling said generating means to said transmitting means with said electrodes of said generating means oriented principally parallel to the general plane of said sheet-like transmitting means, and
means for damping the natural resonant frequencies of said transmitting means.

14. A sonic transducer for transmitting sonic signals in a medium comprising:
compression wave generating means,
transmitting means, said transmitting means being rigid, substantially incapable of flexural and diaphragm-like movement and being sheet-like and generally flat, said transmitting means comprising glass,
coupling means for coupling said generating means to said transmitting means,
means for damping the natural resonant frequencies of said transmitting means, and
said damping means being sheet-like and generally flat and comprising a rigid wooden body adhesively secured to said transmitting means.

17. A sonic transducer for transmitting sonic signals in a medium comprising:
compression wave generating means,
transmitting means, said transmitting means being rigid and substantially incapable of flexural and diaphragmlike movement, said transmitting means being generally curved,
coupling means for coupling said generating means to said transmitting means, and
means for damping the natural resonant frequencies of said transmitting means.

20. A speaker system for radiating sonic energy into a medium and for use with an audio amplifier supplying electronic audio signals comprising:
a. compression wave generating means,
b. means for transmitting sonic energy into said medium, said transmitting means being rigid and substantially incapable of flexural movement,
c. coupling means for coupling said generally means to said transmitting means,
d. means connected to said transmitting means for damping gross vibrations of said transmitting means associated with natural resonant frequencies of said transmitting means,
e. an air core transformer having a primary winding connected to receive said audio signals, said transformer having a secondary winding connected to said compression wave generating means,
f. a diaphragm-type woofer speaker connected in parallel with said primary winding of said air core transformer, and
g. capacitor means connected in series with said primary winding of said air core transformer.

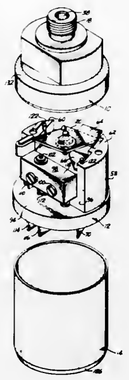
4,048,455

PRESSURE SWITCH WITH PLURAL AXES PIVOTED CONDUCTION PLATE

Alan K. Forsythe, and Charles J. Green, both of Vashon Island, Wash., assignors to Red Dot Corporation, Seattle, Wash.

Filed July 12, 1976, Ser. No. 704,479
Int. Cl.[2] H01H *35/24*
U.S. Cl. 200—81.4 **12 Claims**

1. A switch mechanism comprising:
first and second spaced apart fixed contact members which are electrically insulated from each other and which in use form parts of an electrical circuit;
a movable conductive member which is not connected to either one of said contact members but underlies the first contact member and overlies the second contact member;
a biasing member which is electrically insulated from both of said contact members, making point contact with said conductive member at a location that is offset from both of said contact members on the side of said conductive member facing towards the second contact member;
means mounting said biasing member for reciprocating movement along a line which includes its point of contact with the conductive member and which extends generally transversely of said conductive member;
spring means normally biasing said biasing member towards said conductive member and said conductive member into contact with said first contact member and into a spaced relationship with the second contact member;
a load applying member making contact with said conductive member at a location spaced towards the second contact member from both the first contact member and the biasing member, and on the side of said conductive member opposite the second contact member;
means supporting said load applying member for movement along a line which includes its location of contact with the



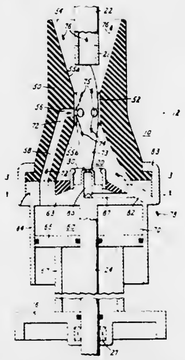
conductive member and which also extends generally transversely of the conductive member; and
with the relative spacing of the first and second contact members, the contact point of the biasing member with the conductive member, and the location of contact of the load applying member with the conductive member, being such that a first movement of the load applying member towards the conductive member will pivot the conductive member in position about a first axis which includes its location of contact with the first contact member, to depress said biasing member, compress said spring means, and move said conductive member into contact with the second contact member and complete a conductive path through the conductive member from one of the contact members to the other, and a subsequent additional movement of the load applying member in the same direction will cause the conductive member to pivot in position about an axis which includes its location of contact with the second contact member, to further depress said biasing member, further compress said spring means, and move said conductive member out of contact with the first contact member to in that manner open said conductive path.

4,048,456

PUFFER-TYPE GAS-BLAST CIRCUIT BREAKER

Heinz Otto Noeske, Cherry Hill, N.J., assignor to General Electric Company, Philadelphia, Pa.

Filed Apr. 1, 1976, Ser. No. 672,822
Int. Cl.[2] H01H *33/70*
U.S. Cl. 200—148 A **5 Claims**



1. A puffer-type gas-blast circuit breaker comprising:
a. a pair of electrodes, spaced apart during an interrupting operation, between which an arc is established,
b. a dual-flow nozzle having a body primarily of electrical insulating material, a flow passage extending axially through said nozzle, through which said arc extends during an interrupting operation, said flow passage containing a throat of electrical insulating material and divergent sections at axially opposed sides of said throat,
c. a plurality of injection passages extending generally radially of said nozzle in the region of said throat and intersecting said throat at the inner ends of said injection passages,
d. a plurality of feed passages located within said nozzle body, communicating with said injection passages, and extending between said injection passages and one end of said nozzle,
e. pump means located at said one end of said nozzle and operable during a circuit-breaker opening operation for injecting arc-extinguishing gas through said feed passages and said injection passages into said throat,
f. and means for forcing the gas injected into said throat to flow within said flow passage axially of said arc in two streams directed in opposite directions from said throat toward said electrodes, said means comprising a plurality of exhaust ports at said one end of the nozzle extending transversely of said flow passage from said flow passage to the exterior of said nozzle in locations circumferentially spaced from said feed passages, the inner ends of said exhaust ports being disposed in a region surrounding one of said electrodes, one of said divergent sections defining a flow zone about the exterior of said one electrode leading to said exhaust ports.

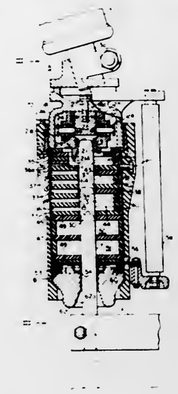
4,048,457

CIRCUIT-INTERRUPTER GRID STRUCTURE FOR AN OIL-BREAK CIRCUIT INTERRUPTER

Charles W. Tragesser, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 343,071, March 20, 1973, abandoned.
This application Jan. 8, 1975, Ser. No. 539,549
Int. Cl.[2] H01H *33/68*
U.S. Cl. 200—150 R **12 Claims**

1. A liquid-break type of circuit-breaker including a tank containing an arc-extinguishing liquid, a pair of terminal-bushings extending downwardly within said liquid-containing tank, each carrying an interrupter grid-unit **(5)**, each grid unit **(5)** including at least three vertically segregated arc-extinguishing liquid chambers **(42, 43, 44)**, means defining a first upper arc-extinguishing liquid chamber **(42)** particularly adaptable for interrupting high-amperage-value fault currents, said first chamber **(42)** being completely enclosed except for a lateral relatively-small vent opening **(11)**, said first chamber **(42)** being partially defined by a lower-disposed valve plate **(37)** having only a small central opening provided therein, stationary contact means **(19)** disposed within said first chamber **(42)** including an elongated off-center finger contact **(21A)** extending downwardly close to said lateral restricted vent opening **(11)**, a rod-shaped movable contact **(7)** movable upwardly and downwardly in its closing and opening movements and cooperable with said elongated stationary finger contact **(21A)** to establish an arc initially wholly within said first arc-extinguishing liquid chamber **(42)** while blocking said central opening **(37)** with valve action, means defining a second liquid interrupting chamber **(43)** disposed below said first chamber **(42)** and having said valve plate **(37)** forming its upper end, said second chamber **(43)** having at least two lateral vent openings **(12, 13)** in alignment with said first-mentioned restricted vent opening **(11)** and having at least one splitter plate **(39)** therebetween for effecting arc looping therearound into said two lateral vent openings **(12, 13)**, said second chamber **(43)** being



particularly adaptable for interrupting medium-value fault currents, a second valve plate **(37)** with a relatively-small central opening closing the lower side of said second interrupting chamber **(43)** with said movable rod contact **(7)** making valve action therewith, means defining a third interrupting chamber **(44)** disposed below said second chamber **(43)** and particularly adaptable for interrupting low-value currents and additionally having at least a pair of lateral vent openings **(15, 16)** therein also in alignment with the aforesaid vent openings **(11, 12, 13)**, said third chamber **(44)** being located below said second-mentioned valve plate **(37)** and having its lower end closed by a third valve plate **(49)** having only a small central valve opening therein, a splitter plate disposed between the two lateral vent openings **(15, 16)** of the third interrupting chamber **(44)** to provide arc looping around the said last-mentioned splitter plate, again the movable contact-rod **(7)** making valve action with said last-mentioned valve-plate, at least one additional lowermost separate liquid completely-confined interrupting chamber **(50, 51)** for assisting in the interruption of the low-value-amperage currents having no lateral venting whatsoever, said lower-most additional liquid chamber **(50, 51)** having its upper and lower boundaries defined by valve-plates **(49)**, and said interrupting unit **5** having a bottom apertured nozzle member **(62)** with a central orifice opening therein out

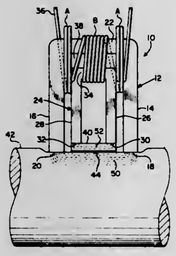
of which the movable contact rod (7) moves at the end of the opening operation.

4,048,458

INDUCTION HEATING CORE STRUCTURE AND METHOD OF HEATING

Robert Louis Zirk, Sr., Huntley, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 21, 1976, Ser. No. 688,860
Int. Cl.² H05B 5/08
U.S. Cl. 219—10.79 **7 Claims**



1. A composite core and coil structure for use in heating workpieces by induction, including a first generally U-shaped core and a second generally U-shaped core nestably associated with the first core, exciter coil means wrapped about portions of each core providing at least one turn which simultaneously encircles portions of both cores, the coil means providing a predetermined number of turns about the first core different than the number of turns about the second core, the length of the legs portions of the first core are greater than the length of the leg portions of the second core.

7. A method of adhesively securing a first metallic workpiece of predetermined volume to a second metallic workpiece of a greater total volume, including the steps of placing the first workpiece on the second workpiece with a layer of heat activable adhesive therebetween, heating by induction, both workpieces simultaneously from a single side so that the faying surface of each will reach a predetermined temperature substantially simultaneously, wherein the induction heat is provided by a pair of nested U-shaped cores with an exciter coil wound about their bight portions so that the outermost core has more windings than the inner core, the outermost core legs contacting the second workpiece while the inner core legs contact the first workpiece whereby the second workpiece will be subjected to a greater amount of heating flux than the first workpiece.

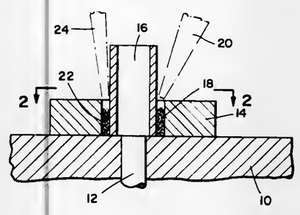
4,048,459

METHOD OF AND MEANS FOR MAKING A METALIC BOND TO POWDERED METAL PARTS

Michael Earle, Mapleton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 17, 1975, Ser. No. 623,540
Int. Cl.² B23K 26/00, 1/04
U.S. Cl. 219—85 BM **6 Claims**

1. The method of making a metallic bond between a powdered metal part and a second part comprising the steps of:
   a. positioning said powdered metal part in selected close spaced juxtaposition to said second part to provide a given space therebetween;
   b. introducing brazing metal powder which melts at a lower temperature than said powdered metal part and said second part into said given space between said parts at a given time rate; and
   c. impinging a beam of coherent electromagnetic energy on said brazing metal powder in said space, said beam being fully received within said space to fully melt said brazing metal powder at said given time rate and of such intensity and for such duration whereby deleterious brazing metal



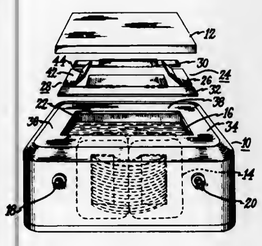
powder absorption by said powdered metal part is substantially minimized.

4,048,460

METHOD OF WELDING A COVER TO A CONTAINER

Moreland P. Bennett, Hickory, and Albert M. Hobbs, Jr., Conover, both of N.C., assignors to General Electric Company, Philadelphia, Pa.

Division of Ser. No. 572,455, April 28, 1975, Pat. No. 3,962,662.
This application Dec. 5, 1975, Ser. No. 637,950
Int. Cl.² B23K 11/10
U.S. Cl. 219—91 **3 Claims**



1. A method of welding a cover to a container using a metal gasket comprising the steps of
   a. providing a metal gasket from a thin strip of metal,
      1. said gasket being bent along its longitudinal axis forming a flat portion and a bent portion,
   b. placing said metal gasket on the edge of the container,
   c. placing said cover on said container in contact with said gasket,
   d. clamping said cover onto said container,
   e. and welding the edges of said cover to said container.

4,048,461

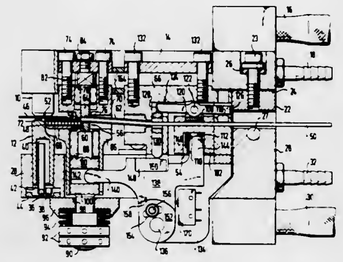
APPARATUS FOR WELDING CONTACT BEADS ON AN ELECTRICALLY CONDUCTIVE SUBSTRATE

Johann Kopf, Buching-Greith, Germany, assignor to Otto Bihler Maschinenfabrik GmbH & Co. KG, Halbiech near Fussen, Germany

Filed Nov. 17, 1975, Ser. No. 632,652
Claims priority, application Germany, Nov. 19, 1974, 2454804
Int. Cl.² B23K 11/02
U.S. Cl. 219—104 **13 Claims**

1. Apparatus for welding a contact bead to a face of an electrically conductive substrate comprising:
   a. a base;
   b. a first electrode fixedly mounted on said base;
   c. a second electrode movably mounted on said base;
   d. actuating means for moving said second electrode between a welding position adjacent said first electrode and

a feeding position remote from said first electrode,
   1. said electrodes in said positions defining therebetween a gap adapted to receive said substrate,
   2. said second electrode being formed with a receptacle open toward said first electrode in the direction of movement of said second electrode and open in a direction transverse to said direction of movement; and



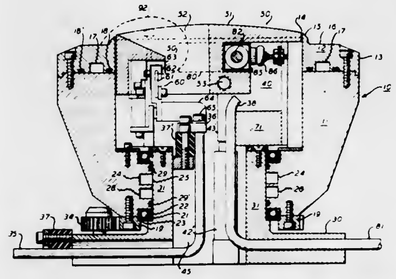
e. feeding means for sequentially feeding blanks of contact bead material to said receptacle, said feeding means including a guide member fixedly mounted in said base and defining a path of movement for said contact bead material aligned with said receptacle in said feeding position and said second electrode, said path extending in said transverse direction.

4,048,462

COMPACT ROTARY EVAPORATION SOURCE

Russell J. Hill, and Kazumi N. Tsujimoto, both of El Cerrito, Calif., assignors to Airco, Inc., Montvale, N.J.

Filed Jan. 17, 1975, Ser. No. 541,743
Int. Cl.² C23C 13/12
U.S. Cl. 219—121 EB **11 Claims**



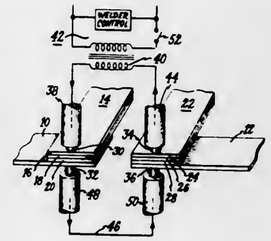
1. An electron-beam apparatus for evaporating material placed on a hearth, comprising:
   a hearth mounted for rotation about a generally vertical axis, the hearth having a point which is furthest from the axis and an annular area for receiving material to be evaporated, the annular area lying generally in a horizontal plane perpendicular to the rotational axis;
   an electron-beam gun which can be energized to form an electron beam for evaporating material located within an impact area in the annular area on the hearth, all of which electron-beam gun is located closer to the rotational axis than the point of the hearth which is furthest from the axis; and
   magnetic means for deflecting the beam from the electron gun to the impact area along a curved path the final portion of which path is directed generally away from the axis of rotation.

4,048,463

METHOD OF JOINING ALUMINUM TO ALUMINUM

Moreland P. Bennett, Hickory, N.C., and William L. Bowers, Shreveport, La., assignors to General Electric Company, Philadelphia, Pa.

Filed Dec. 8, 1975, Ser. No. 638,300
Int. Cl.² B23K 11/18
U.S. Cl. 219—118 **11 Claims**



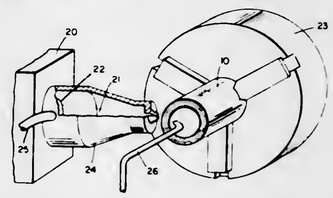
1. A method of welding at least two aluminum members together comprising the steps of retaining the oxide coating on the surfaces of the aluminum to be joined, placing the oxide coated surfaces in overlapping contact, applying pressure to said contacting members through hard, high-electrical resistance electrodes, and applying welding current to said electrodes to weld said aluminum members by thermal heat from said electrodes and resistance heat from said oxide coating.

4,048,464

METHOD OF AND MEANS FOR CUTTING HOSE FOR HIGH PRESSURE HYDRAULIC SYSTEMS

Preston Lee Gale, East Peoria, and Warren Jess Stafford, Peoria, both of Ill., assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 22, 1975, Ser. No. 607,076
Int. Cl.² B23K 26/00
U.S. Cl. 219—121 LM **5 Claims**



1. The method of cutting hose for use in high pressure hydraulic systems to length which hose comprises a rubber wall having a plurality of layers of metal fibers embedded therein and extending longitudinally of said hose, said method comprising the steps of:
   a. positioning a free end of said hose for the cutting of a given length therefrom;
   b. impinging a high power laser beam on a limited area of an exterior surface of said hose at said given length from said free end thereof of sufficient intensity and for a sufficient time to vaporize a portion only of the material of said hose at said limited area without deleterious heating of the material of said hose in immediately adjacent areas thereof in the absence of auxiliary heat sink cooling of said immediately adjacent areas;
   c. moving said impingement of said beam about the periph-

ery of said hose to successively impinge upon contiguous limited areas in a peripheral line corresponding to the desired cut in a plurality of repeated passes until said given length of said hose at said free end thereof is separated from the remainder of said hose by vaporization of material at said line corresponding to the desired cut; and

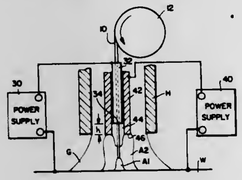
d. simultaneously flooding said limited area of impingement of said beam with an inert gas to prevent combustion of said vaporized material.

4,048,465

METHOD AND TORCH FOR SUSTAINING MULTIPLE COAXIAL ARCS

August Frederick Manz, Union, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 1, 1975, Ser. No. 636,624
Int. Cl.² B23K *9/00*
U.S. Cl. 219—121 R **14 Claims**



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1. An arc working torch for establishing multiple independent arc discharges in a coaxial relationship to one another from at least one source of power, with said arc discharges originating on separate electrodes and terminating upon a common workpiece, comprising:

a first arc electrode having an arc attachment end upon which a first arc originates;

a second arc electrode having an arc attachment end upon which a second arc originates;

the arc attachment end of said second arc electrode having an annular cross-section and forming a cavity within said second arc electrode;

said first arc electrode being disposed within said second arc electrode and extending into said cavity in spaced apart relation to the annular cross-section arc attachment end of said second arc electrode;

the arc attachment end of both said first and second arc electrodes adapted to be spaced apart a predetermined distance respectively from the workpiece to provide a nonconstricting arc sustaining region between said electrodes and said workpiece for establishing separate coaxial arcs between said first and second arc electrodes and the workpiece;

means located a predetermined distance from the arc attachment end of said second arc electrode for transferring current to said first arc electrode;

means for transferring current to said second arc electrode;

means for cooling said first and second arc electrodes; and

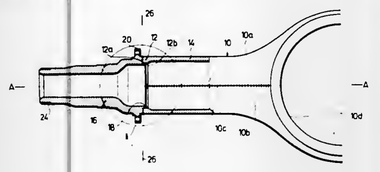
means for shielding said first and second arcs in common with one another.

4,048,466

METHOD OF MANUFACTURING AXLE HOUSINGS WITH HOLLOW AXLES

Laszlo Toth; Janos Schirhuber; Kalman Prepost, and Andras Tassi, all of Gyor, Hungary, assignors to Magyar Vagon- es Gepgyar, Gyor, Hungary

Filed Nov. 6, 1975, Ser. No. 629,228
Claims priority, application Hungary, Nov. 23, 1974, MA 2620
Int. Cl.² B23K *9/00*
U.S. Cl. 219—121 EM **1 Claim**



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1. In a method of manufacturing axle housings of sheet metal with hollow axles, the steps of:

forming a beaded edge on each side of a sheet metal axle housing by means of plastic deformation;

machining both the axle housing and the hollow axles so as to have mutually abutting front surfaces;

fitting the hollow axles each in one of the beaded edges of the axle housing along said mutually abutting front surfaces;

clamping the axle housing with the fitted in hollow axles in a clamping device;

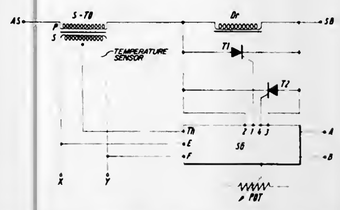
and connecting the hollow axles with the axle housing along said mutually abutting front surfaces by means of electron beam welding.

4,048,467

APPARATUS FOR GENERATING AND REGULATING WELDING CURRENTS

Josef Wertli, Zufikon, and Paul Matter, Muri, both of Switzerland, assignors to Firma WkS-Schweisstechnik Willy Kalnbach, Aalen, Switzerland

Filed Jan. 8, 1976, Ser. No. 647,647
Int. Cl.² B23K *9/10*
U.S. Cl. 219—131 R **8 Claims**



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1. Apparatus for generating and regulating high intensity welding currents which are developed in a welding apparatus having electrodes which are brought in contact with a workpiece comprising:

a. a transformer having a primary winding and a secondary winding, the welding current which is to be regulated being taken from across the secondary winding, said secondary winding being coupled to the electrodes;

b. a choke coupled in series with the primary winding across an a.c. power source;

c. first and second thyristors coupled in parallel with each other and in parallel with the choke and thyristors arranged so as to have opposite polarity;

d. variable phase triggering means for developing firing pulses for said thyristors to control the point in the positive and negative half cycles of the a.c. power at which they are fired, said triggering means including a first RC timing circuit having at least a resistor and capacitor in series; and

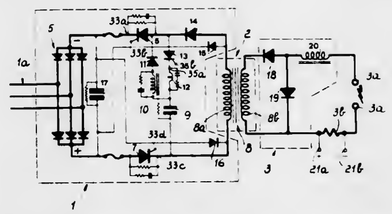
e. means associated with said variable phase triggering means for causing the firing pulse outputs thereof to be shifted in a direction to reduce the effective currents through the thyristors both during turn on of the apparatus and in the case of a short circuit of the secondary of the transformer, said means comprising a semiconductor switch coupled in parallel with said resistor in said first RC timing circuit, said switch having a control electrode, means coupled to the secondary of said transformers for generating a control signal when the voltage at said output is greater than a predetermined value, and a second RC circuit coupling said control signal to the control terminal of said semiconductor switch.

4,048,468

D.C. ARC WELDER WITH SOLID STATE COMPONENTS

Clemente Maule, Via C. Battisti, 6, Vicenza, Italy

Filed Oct. 21, 1975, Ser. No. 624,639
Claims priority, application Italy, Oct. 25, 1974, 41703/74
Int. Cl.² B23K *9/10*
U.S. Cl. 219—135 **3 Claims**



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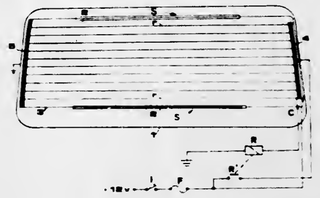
1. A D.C. arc welder with solid state components, having two output terminals and means for generating an arc at said output terminals, said means including means for providing a direct current, a first electric path downstream of said direct current providing means, a transformer having a primary in series with said first electric path and a secondary connected to said output terminals through a second electric path, electronic switching means for causing a pulse train to be generated in said first electric path and in said primary, means for controlling said electronic switching means according to the tension and current conditions at said output terminals, and means for converting the pulse tension signal induced at said secondary by said pulse train in said primary into an unidirectional current signal, wherein said electronic switching means includes a first and a second controlled diode serially connected in said first electric path, one of said controlled diodes being connected upstream and the other downstream of said primary, a further controlled diode and a capacitor connected in series with respect to one another and in parallel with respect to said primary between said primary and said first and second controlled diodes, respectively, an inductance in series with said capacitor and in parallel with said further controlled diode, and wherein said means for controlling said electronic switching means includes a square wave generator providing a half-wave tension signal for simultaneously triggering said first and second controlled diode to become conductive and a half-wave tension signal for triggering said further controlled diode to become conductive, the triggering of said further controlled diode causing said first and said second controlled diodes to be turned off into the non-conductive state, said square wave generator generating a square wave having a period depending on the voltage and current at said output terminals.

4,048,469

AUTOMATIC CONTROL SYSTEM FOR A DEFOGGING CIRCUIT

Giorgio Ciarniello, Vasto, and Oscar De Lena, Termoli, both of Italy, assignors to Societa Italiana Vetro Siv S.p.A., Vasto, Italy

Filed Dec. 9, 1974, Ser. No. 531,098
Claims priority, application Italy, Dec. 12, 1973, 54277/73
Int. Cl.² H05B *1/02, 3/06;* E06B *7/12*
U.S. Cl. 219—203 **6 Claims**



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1. In an automatic control system for a defogging circuit for a glass pane having a central viewing area and which includes a plurality of spaced generally parallel elongated linear heating resistors disposed on a surface of the central viewing area of the pane, the improvement comprising:

an electric power supply including a first bus and a second bus disposed on said surface of the pane laterally of said central viewing area and connected to said resistors for supplying current to said heating resistors, said buses extending generally transversely of said resistors;

a control circuit controllably connected between said power supply and said first and second buses for controlling the supply of current thereto, said control circuit comprising a miniaturized unit mounted in the immediate vicinity of a corner of the pane away from the viewing area and having a control input terminal means; and

a plurality of electrically conductive, moisture-sensing probes spaced apart from each other and said central viewing area at widely spaced zones on the glass pane, at least one of said probes including a conductive member having a portion running substantially parallel to and closely spaced from one of said buses, each of said probes having a portion running substantially parallel to said heating resistors of the defogging circuit, said probes each having a length, exclusive of said portion parallel to said bus, approximately the length of said heating resistors, each of said probes being sensitive to fogging of the glass pane in its immediate vicinity and having a signal output means upon which a signal appears upon occurrence of a given level of fogging, said control input terminal means of said control circuit being connected to each of said probes for receiving signals therefrom for enabling said control circuit to supply current to said heating resistors from said power supply in response to detection of fogging of said pane by any one of said probes.

4,048,470

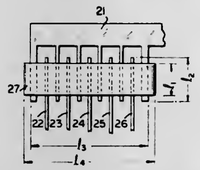
EXOTHERMIC PRINTING HEAD

Takemasa Shindo, and Kenichiro Arai, both of Shiojiri, Japan, assignors to Shinshu Seiki Kabushiki Kaisha and Kabushiki Kaisha Suwa Seikosha, both of Tokyo, Japan

Filed Sept. 23, 1975, Ser. No. 615,864
Claims priority, application Japan, Sept. 30, 1974, 49-112484
Int. Cl.² H05B *1/00*
U.S. Cl. 219—216 **9 Claims**

1. An improved exothermic printing head for thermally recording a printing character on a thermally sensitive medium comprising a substrate, a first conductor means mounted on said substrate, said first conductor means including at least one

pair of commonly referenced conductors, second conductor means mounted on said substrate and including a second conductor disposed intermediate each pair of commonly referenced first conductors, and exothermic means overlying each said first pair of conductors and second conductor disposed



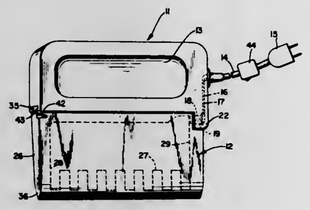
intermediate said pair of first conductors, said exothermic means being adapted to be activated to produce a pair of dots on said thermal sensitive medium in response to said second conductor means being referenced to a potential different than the potential at which said first pairs of conductors are commonly referenced.

4,048,471

ELECTRICALLY HEATED SPREADER ASSEMBLY HAVING A DETACHABLE BLADE

Frank M. Ours, P.O. Box 370, Parsons, W. Va. 26287

Filed June 11, 1975, Ser. No. 585,749
Int. Cl.² H05B *1/00*; B05C *17/10*
U.S. Cl. 219—228 **9 Claims**



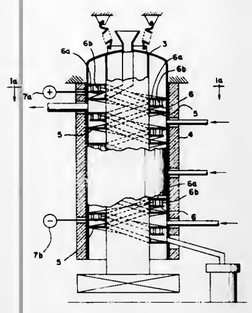
1. A spreader assembly comprising an elongated handle unit having a longitudinal edge and containing electrical contact means attached to means for connecting the same to a source of power and an elongated electrically heated spreader blade unit detachably mounted on said handle unit, said handle unit having slide means along said longitudinal edge, said blade unit having a pair of opposite longitudinal edges, said blade unit having along one longitudinal edge a smooth surfaced spreading and smoothing region laterally tapering to a minimum thickness at said one longitudinal edge and along the opposite longitudinal edge slide means providing an interfitting slide connection with the slide means of the handle unit for detachably coupling said units together and said blade unit having an imbedded electrical heater element connected to contacts positioned on the blade unit so as to engage with the contacts on said handle unit when the blade unit has been slidably mounted in operative position on said handle unit with the slide means of said handle unit and blade unit interfittingly connected.

4,048,472

VIBRATORY SPIRAL CONVEYOR CHUTE AND A RESISTANCE HEATING ELEMENT

Hans Sauer, Idstein-Walsdorf, and Thomas Czerny, Fischbach, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Germany

Filed May 17, 1976, Ser. No. 686,992
Claims priority, application Germany, May 17, 1975, 2522152
Int. Cl.² F27D *11/02*
U.S. Cl. 219—388 **4 Claims**



1. In a system for producing reactions between powdery and gaseous substances, which system comprises a substantially flat-bottomed vibratory spiral conveyor chute postioned within a reaction vessel into which the said substances are introduced, the combination with said conveyor chute of

a substantially planar expanded metal resistance heating element,

insulating means for mounting the resistance heating element above and generally paralleling the flat bottom of the spiral conveyor chute,

electrical connecting means for supplying the resistance element with electrical energy,

portions adjacent the expanded metal body which are of unexpanded metal, and

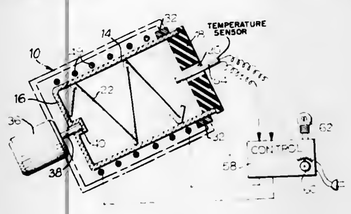
said connecting means comprising electrical connections from the outside of the reaction vessel to said unexpanded portions.

4,048,473

FOOD COOKING MACHINE

William H. Burkhart, Room 190, 960 San Antonio Road, Los Altos, Calif. 94022

Filed Apr. 17, 1975, Ser. No. 568,864
Int. Cl.² H05B *1/02*; A47J *27/00*; B01F *9/00*; F27B *7/08*
U.S. Cl. 219—389 **13 Claims**



1. A general purpose food cooking machine comprising a food-receiving vessel closed at one end, open at the opposite end, and having liquid-impervious walls, said vessel having a removable cap for closing said open end, and said cap being liquid-impervious except for a central vent opening therethrough through which gases may escape from the interior of

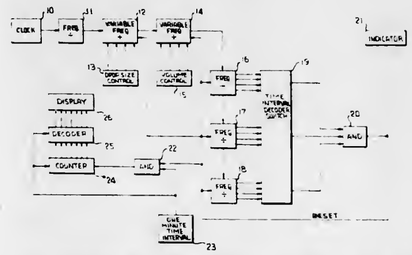
the vessel, a base having means for detachably receiving and supporting said vessel for rotation about an axis of rotation substantially aligned with said vent opening and oriented between horizontal and an acute angle to horizontal, and with the capped end of said vessel at least as elevated as the first-mentioned vessel end, said base having a drive train thereon engageable with said vessel for rotating said vessel about said axis of rotation when the vessel is supported on said base, heater means supported adjacent to and exterior to said vessel and operatively associated therewith for applying heat to contents of said vessel through the walls thereof when said vessel is supported for rotation on said base, and temperature controller means operatively connected to said heater means for controlling said heater means to vary the temperature in said vessel, said temperature controller means having and being responsive to a temperature sensor, said sensor having means for supporting the same on said base substantially in alignment with said vent opening in such a manner that said vent opening is not blocked and rotation of the vessel is not impeded, said sensor being so positioned relative to said vent opening as to sense the temperature of gases which escape from said vessel through said vent opening while said vessel is rotated.

4,048,474

METHOD AND APPARATUS FOR TIMING INTRAVENOUS LIQUID DRIP RATE

Ole V. Olesen, 615 Burley Road, Annapolis, Md. 21401

Filed Jan. 14, 1976, Ser. No. 648,882
Int. Cl.² G06F *15/42*; H03K *3/78*
U.S. Cl. 235—151.34 **7 Claims**



1. Electronic apparatus for monitoring the rate of drop flow of liquid into the drip chamber of an intravenous set, said apparatus comprising:

means for providing a train of clock pulses at a known pulse frequency;

programmable frequency divider means connected to receive and count pulses in said pulse train and provide an output pulse after a controllable number of pulses from said pulse train have been counted, said controllable number being selectively variable;

first operator-controlled means, connected to said programmable frequency divider means and calibrated in drops per unit volume of liquid, for selectively varying said controllable number;

second operator-controlled means connected to said programmable frequency divider means and calibrated in volume, for selectively varying said controllable number;

third operator-controlled means, connected to said programmable frequency divider means and calibrated in time, for selectively varying said controllable number; and

indicator means, connected to receive each output pulse from said programmable frequency divider means, for providing a momentary indication in response to each said output pulse;

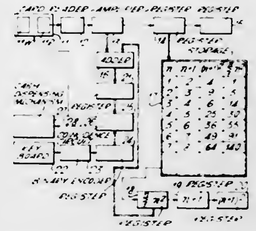
whereby, upon setting said first means to correspond to the desired drop size, the second means to correspond to a specified quantity of liquid to be delivered, and the third means to correspond to the desired time period over which said specified quantity of liquid is to be delivered, an operator can compare the repetition rate of said momentary indication with said rate of drop flow of liquid and adjust the latter as desired.

4,048,475

APPARATUS FOR CHECKING THE USER OF A CARD IN CARD-ACTUATED MACHINES

Shinya Yoshida, Takatsuki, Japan, assignor to Omron Tateisi Electronics Company, Kyoto, Japan

Continuation of Ser. No. 553,568, Feb. 27, 1975, abandoned.
This application Oct. 26, 1976, Ser. No. 735,276
Claims priority, application Japan, Mar. 7, 1974, 49-26964
Int. Cl.² H04Q *1/30*; G06K *7/00*
U.S. Cl. 235—61.7 B **20 Claims**



1. A system for checking the user of a card having recorded thereon coded information including at least a first and a second code, wherein said first code is representative of the number of times of use of said card in said system, said system comprising: means for reading said codes; means responsive to said first code read by said reading means to produce a third code, said third code having a predetermined mathematical relationship with said first code; means operated by the user of said card to enter a card owner code; computational means responsive to said reading means and said means for producing said third code for mathematically combining said second code with said third code, said computational means including coincidence checking means for comparing said entered card owner code with said mathematically combined second and third codes, said coincidence checking means supplying a control signal when said entered card owner code corresponds to said mathematically combined second and third codes; and code changing means responsive to said control signal supplied by said coincidence checking means for changing both said first and second codes on said card, said code changing means increasing said first code by one and changing said second code such that said mathematically combined second and third codes will correspond to said card owner code the next time said card is used in said system.

4,048,476

CARD READER

Ray L. Lawter, Zanesville; Kenneth L. Shooter, Senecaville, and David C. Wills, Cambridge, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

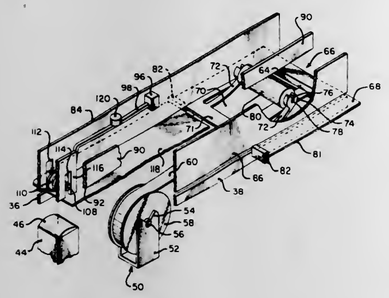
Filed Apr. 9, 1976, Ser. No. 675,395
Int. Cl.² G11B *25/04*; G06K *7/08*
U.S. Cl. 235—61.11 D **14 Claims**

1. Apparatus for reading a record member comprising means for supporting said record member for movement between a first and second position, a read station positioned between said first and second positions, and transport means engaging the record member and movable therewith between said first and second positions, the combination comprising:

a. stationary drag generating means extending between said first and second positions;

b. actuating means operatively associated with said transport

means and responsive to the movement of the transport means to said second position to move the transport means to said first position at a constant acceleration wherein the transport means will move the record member past the read station;



c. and means carried by said transport means for opposing the action of said actuation means including drag means engaging said drag generating means and actuated by movement of the transport means for retarding the movement of the transport means to said first position whereby the record member will move past the read station at a constant velocity.

4,048,477

WEIGHT CONTROL CALCULATOR

Daniel Comstock Hungerford, P.O. Box 14306, North Palm Beach, Fla. 33408

Filed Dec. 19, 1975, Ser. No. 642,595
Int. Cl.² G06C *3/00*
U.S. Cl. 235—88 R **4 Claims**



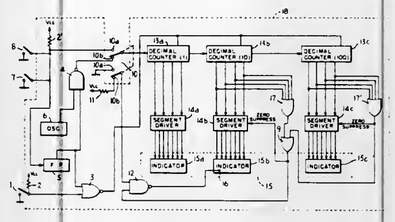
1. A hand-held weight control calculator comprising:
a first display surface having a peripheral edge, said first surface including a plurality of radially disposed indicia columns, each of said columns having an indicia weight range heading disposed near said first surface peripheral edge and a plurality of indicia rows within each column displaying daily intake calorie values as a function of weight range, frame size and activity level; and
a second display surface having an observation aperture sized to display a single indicia column on said first display surface, said second display surface including rows of indicia displaying individual activity levels along one side of said observation aperture; and
first registration indicia for selectively registering said second display surface observation aperture with a particular column on said first display surface.

4,048,478

MARKING APPARATUS WITH ELECTRONIC COUNTERS

Akihoro Miwa, Funabashi, and Shigemi Misono, Tokyo, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed June 18, 1975, Ser. No. 587,870
Claims priority, application Japan, June 18, 1974, 49-69509; June 22, 1974, 49-71579
Int. Cl.² G06M *3/08*
U.S. Cl. 235—92 T **5 Claims**



1. An apparatus for selectively counting events or timing elapsed time comprising: an elongated case configured and sized to be manually held by a person during use of the apparatus; means including an actuatable push-button switch at one end portion of said case for developing a count signal in response to each depression of said push-button switch; means within said case including an oscillator for developing continuous time signals at a frequency suitable for use as a time base; switching means mounted on said case for selectively alternatively switching the count and time signals to a common output terminal; and means within said case connected to said output terminal and responsive to count signals applied to said output terminal for counting the same and providing a corresponding numerical indication of the cumulative number count and responsive to time signals applied to said output terminal for counting the same and providing a corresponding numerical indication of the elapsed time count, said means for providing a numerical indication of the number count and elapsed time count comprising a plurality of indicators disposed about the periphery of said case, and said means for counting the count and time signals comprising a plurality of serially connected decimal counters, and a plurality of drivers each connected to receive the output of respective ones of said decimal counters and operative to generate driving signals corresponding to the outputs of the decimal counters and apply the driving signals to said plurality of indicators.

4,048,479

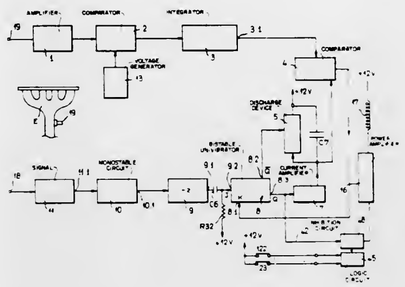
OPTIMUM AIR/FUEL MIXTURE COMPUTER FOR INTERNAL COMBUSTION ENGINES

Jean-Pierre Rivere, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed May 28, 1976, Ser. No. 691,209
Claims priority, application France, May 29, 1975, 75.16751
Int. Cl.² F02M *7/00*; G06G *7/70*
U.S. Cl. 235—150.21 **9 Claims**

1. In a computer for calculating the optimum mixture of combustion agent and fuel for an internal combustion engine, of the type comprising a monostable univibrator operating in synchronism with the rotational velocity of the engine and generating electric pulses of a width subordinate to the value of the voltage measured by a probe for making the chemical analysis of the gases in the exhaust manifold, the thus measured voltage being processed in a regulator provided with an intermediate integrator, said electric pulses being utilised for determining the opening time of a solenoid valve controlling the output of a fluid, whether combustion agent or fuel, of which the metering is measured by said probe, provision is made of a

bistable univibrator coupled at one end to the output of a first comparator having one input connected to said chemical analysis probe via an integration type regulating circuit, said univibrator being connected at its other input to a pulse generator operating in synchronism with the rotational movement of the



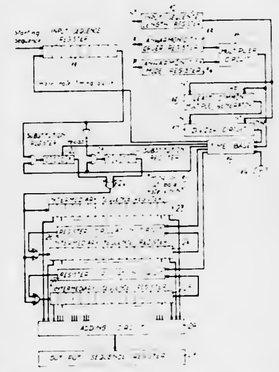
engine, by one of its outputs to an integrator comprising a current amplifier in series with a capacitor and connected to the second input of said first comparator, said one output being also connected to the device controlling the opening time of said solenoid valve, and by its other output to one input of a discharge device for said capacitor.

4,048,480

GENERATORS OF ANHARMONIC BINARY SEQUENCES

Pierre J. M. Minot, 10, rue Monmousseau, 94200 Ivry, France

Filed Apr. 30, 1976, Ser. No. 681,911
Claims priority, application France, Apr. 30, 1975, 75.13691
Int. Cl.² G06F *15/34*
U.S. Cl. 235—152 **6 Claims**



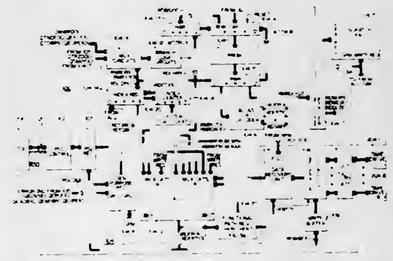
1. A generator of anharmonic binary sequences having N bits and harmonics of orders $k_1, k_2 \ldots k_m$ equal to zeros according respectively to modes $p_1, p_2 \ldots p_m$ derived from a starting anharmonic binary sequence having N' bits and harmonics of orders $k_1, k_2 \ldots k_{m-1}$ equal to zeros according respectively to modes $p_1, p_2 \ldots p_{m-1}$, said generator comprising:
a. means for computing a number N equal to the least common multiple of the number N' and the product $k_m p_m$;
b. means for deriving from the starting anharmonic binary sequence with N' bits an intermediary binary sequence by substituting each one bit of the starting sequence by a one bit followed by $(N/N')-1$ zero bits and each zero bit of the starting sequence by N/N' zero bits;
c. means for shifting said intermediary binary sequence successively by $N/k_m p_m$, $2(N/k_m p_m) \ldots (p_m-1)(N/k_m p_m)$ bits, thereby obtaining (p_m-1) shifted binary sequences; and
d. means for adding p_m binary sequences, said p_m binary sequences being said (p_m-1) shifted binary sequences and said intermediary binary sequence.

4,048,481

DIAGNOSTIC TESTING APPARATUS AND METHOD

Myrl Kennedy Bailey, Jr., North Billerica, and George J. Barlow, Tewksbury, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 17, 1974, Ser. No. 533,743
Int. Cl.² G06F *11/04*
U.S. Cl. 235—153 AK **30 Claims**



1. An improved input/output magnetic tape controller having microprogrammed processing means and data recovery means for assembling into bytes for transfer to a data processing system, digital signals received from a magnetic tape device obtained by reading signals arranged in a predetermined block format and recorded on a multichannel magnetic medium, said recovery means including a plurality of registers for deskewing said digital signals and assembling them into bytes, correction circuits coupled to different ones of said registers for correcting errors detected during said deskewing, a plurality of checking circuits coupled to different ones of said registers for detecting different types of error conditions occurring during said deskewing and assembling of said digital signals and a plurality of error indicator circuits coupled to said checking circuits, said controller further comprising:
a control store having a plurality of resident basic logic test routines, one of said routines for verifying the operation of said data recovery means, said one routine including a plurality of constants representative of initial patterns and expected result patterns;
decoder means for generating control signals in response to decoding microinstructions of said resident basic logic test routines;
selector circuit means coupled to said processing unit to said magnetic tape device and to a first one of said plurality of registers, said selector circuit means being operatively connected to apply selectively digital signals received from said device and said processing means to said first one of said plurality of registers; and,
means coupling said plurality of error indicator circuits to said processing means;
said decoder means being conditioned by microinstructions of said one routine to generate signals for conditioning said selector circuit means to couple said first one of said registers to said processing means inhibiting transfer of said digital signals from said device, other microinstructions of said one routine conditioning said decoder means to generate signals for conditioning said processing means to generate digital signals of a first block from said initial patterns arranged in said predetermined format and said

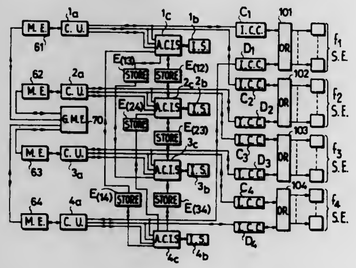
decoder means being conditioned by a sequence of test microinstructions at the completion of said recovery unit having assembled all of said digital signals of said first block into bytes to compare the states of said error indicator circuits with one of said expected result patterns for verifying that said recovery unit is operating properly.

4,048,482

ARRANGEMENT FOR CONTROLLING A SIGNAL SWITCHING SYSTEM AND A METHOD FOR USING THIS ARRANGEMENT

Pierre Charransol; Jacques Hauri, and Roger Danis, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Feb. 23, 1976, Ser. No. 660,676
Claims priority, application France, Feb. 25, 1975, 75.05800
Int. Cl.² G06F *11/00*; H04Q *3/42*
U.S. Cl. 235—153 AE **4 Claims**



1. A control arrangement for a switching system comprising:
- *n* control units each including an independent store (*n* integer greater than 2);
- *p* groups of switching elements connected to said control units, each group capable of performing one of *p* functions (*p* integer greater than 2);
- $n(n-1)/2$ exchange stores of smaller capacity than the independent store;
- and means for coupling each exchange store to a predetermined pair of control units so as to have each control unit capable to perform at least two predetermined functions.

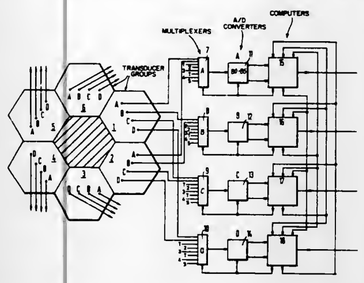
4,048,483

DATA HANDLING SYSTEMS

Albert Brian Keats, Dorchester, England, assignor to United Kingdom Atomic Energy Authority, England

Filed July 23, 1976, Ser. No. 708,020
Claims priority, application United Kingdom, July 25, 1975, 31269/75; May 7, 1976, 18705/76
Int. Cl.² G06F *11/00*
U.S. Cl. 235—153 A **6 Claims**

1. A date handling system comprising
- a scanning means for scanning a number of analogue signals from independent input lines, cyclicly
- a test signal injection means by which test signals are interleaved between at least two of said number of analogue signals,
- an analogue to digital converter means receiving said analogue signals and said test signals and delivering equivalent digital output signals,
- a primary measurement shift register (PMR) connected to receive said digital output signals and operable to overwrite or recycle said digital signals after each complete scan made by the scanning means with freshly scanned signals,
- signal extraction means for extracting signals from the shift register (PMR),
- comparator means for receiving extracted signals and comparing them with stored threshold data to yield a binary 1 or 0 according to the value of each extracted signal relative to said threshold data,
- a primary status register (PSR) in which the digital bits yielded by the comparator means are assembled as a binary word in which the positions of bits are advanced by one space on each cycle of the scanning means and
- a majority voting circuit responsive to a majority *m* out of *n* status bits indicating an out of tolerance condition.

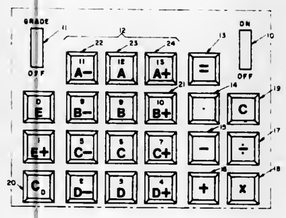


4,048,484

DIGITAL GRADE AVERAGER

John L. Brittan, 1113 Brunn Ave., St. Joseph, Mich. 49085

Filed Apr. 26, 1976, Ser. No. 680,223
Int. Cl.² G06F *15/02, 15/20*
U.S. Cl. 235—156 **16 Claims**



1. A digital calculator apparatus for use by teachers for averaging a sequence of grades in a particular letter grading system, each grade of the system having a preassigned numerical weight, said apparatus comprising:
- a keyboard having a plurality of manually operable grade keys, each key bearing as a label a particular letter grade in said particular system;
- digital display means including a series of discrete signal display units, said display means having a letter grade section, a numerical weight display section and a number of inputs section;
- means for activating said display means such that when a particular grade key is actuated the particular grade of that key is displayed on said letter grade display section, the numerical weight assigned that particular grade is displayed on said numerical weight display section and the cumulative number of grade keys which have been actuated in that particular sequence is displayed on said number of inputs section;
- means for summing the numerical weights of all the particular grade keys which have been actuated in a particular sequence;
- means for dividing said sum of numerical weights by said cumulative number to arrive at an average numerical weight; and

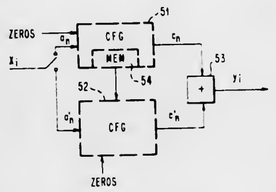
- means for decoding said average numerical weight to deterine its letter grade equivalent and for displaying said letter grade equivalent on said letter grade display section.

4,048,485

DIGITAL FILTER GENERATING A DISCRETE CONVOLUTION FUNCTION

Henri J. Nussbaumer, LaGaude, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 25, 1976, Ser. No. 670,325
Claims priority, application France, Apr. 16, 1975, 75.12557
Int. Cl.² G06F *7/38, 15/34*
U.S. Cl. 235—156 **8 Claims**



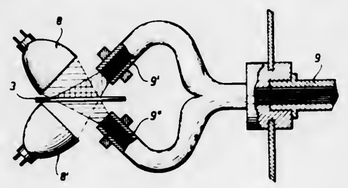
5. A digital filter with filtering coefficients $\{b_n\}$ characterized in that it includes:
- a first means for separating the input signal samples into blocks of $2p$ samples;
- a pair of second means each for appending a sequence of $2p$ consecutive zeroes to alternate blocks of $2p$ samples;
- a third means including a pair of convolution functions generators, each connected to one of said second means to receive therefrom alternate ones of said blocks of $2p$ samples with an appended sequence of zeroes and forming a sequence of terms representing a convolution of said blocks of samples with appended zeroes; and
- a fourth means connected to both said convolution function generators of said third means to add sequentially the terms provided by said function generators.

4,048,486

LIGHTING DEVICE FOR FIBER-OPTIC SYSTEMS

Wolfgang Kriege, Mainz, Germany, assignor to Jenaer Glaswerk, Schott & Gen., Mainz, Germany

Filed Nov. 10, 1975, Ser. No. 630,623
Claims priority, application Germany, Nov. 22, 1974, 2455333
Int. Cl.² G02B *5/16*; F21S *1/14*
U.S. Cl. 240—1 R **10 Claims**



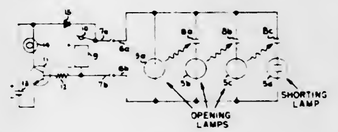
1. A device for illuminating a fiber-optical system comprising
- a. two light sources having broadly directed beams, each beam having an optical axis, the light sources arranged with respect to each other such that the optical axes of the beams intersect at a cross point,
- b. two light entrances to a fiber-optical system aligned with the optical axes of the light sources each located on the opposite side of the cross point from one of the sources, and
- c. a beam splitting mirror arranged in the region of the cross point for dividing the impinging light beam from each of the light sources into two segments such that two of said segments, one from each of the two light sources, are coincident upon one of said two light entrances.

4,048,487

LAST-FLASH INDICATOR SWITCH IN PHOTOFLASH ARRAY

Norman E. Kewley, Pepper Pike, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 8, 1976, Ser. No. 721,202
Int. Cl.² G03B *15/02*
U.S. Cl. 240—1.3 **6 Claims**



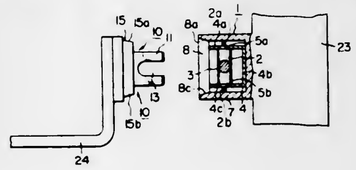
1. A multiple flash array comprising a group of flash lamps of which one of the lamps is to be flashed last, said array being provided with a pair of connector terminals adapted to receive lamp-firing electrical signals for causing said lamps to flash, said flash lamps being respectively connected in lamp circuits which are electrically connected across said connector terminals, all of said lamp circuits except that of the last-to-flash lamp being adapted to have open circuits or high impedances after their lamps are flashed, and said lamp circuit of the last-to-flash lamp being adapted to have a short circuit or low impedance after the lamp is flashed.

4,048,488

COUPLING DEVICE IN A STROBOSCOPE HOLDER WITH A REMOVABLE BRACKET

Michio Kawazoe, 30-11 5 chome, Narita Higashi, Suginami, Tokyo, Japan

Filed Nov. 7, 1975, Ser. No. 629,714
Claims priority, application Japan, June 23, 1975, 50-86807
Int. Cl.² G30B *17/56*
U.S. Cl. 240—1.3 **3 Claims**



1. In a stroboscope holder with a removable bracket wherein the bracket is attached to the stroboscope holder through a coupling device, said coupling device comprising:
- a. retainer including
  - a joint bar with a push rod perpendicular thereto,
  - a guide plate with a channel section comprising top, side, and bottom parts,
  - a pair of slots in the top and bottom parts of said guide plate carrying said joint bar, said slots extending with their longer dimension parallel with the side part of said guide plate and engaging said joint bar near both its ends,
  - a spring with one end fixed at an area outside an extremity

of said slot in the top part of said guide plate and the other end attached to said joint bar, and

a box with an opening therein, said guide plate being mounted with the side part of said guide plate plate fixed on a bottom thereof,

said retainer being mounted on the stroboscope holder; and

b. an insertion mounted on the bracket, said insertion comprising:

a solid body having a recess adapted to receive said joint bar, a guide slope in front of, and in communication with, said recess, for guiding said joint bar into said recess, and a channel for permitting the passage of said push rod into the solid body as the joint bar moves into the recess, and

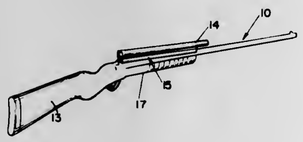
whereby by inserting said insertion into said retainer, the bracket can be easily and quickly attached to the stroboscope holder in one motion, and by pushing said push rod and at the same time pulling out said insertion from said retainer, the bracket can be easily and quickly removed from the stroboscope holder.

4,048,489

LIGHT OPERATED TARGET SHOOTING SYSTEMS

Carlo Giannetti, 541 Dorothy Drive, Fullerton, Calif. 92631

Filed Nov. 10, 1975, Ser. No. 630,091
Int. Cl.² F41G 3/26; F41F 27/00
U.S. Cl. 240—6.41 **13 Claims**



1. A light source for use with a gun in a light responsive target shooting system, comprising:

a switch;

a light emitting semi-conductor and operating means for causing said light emitting semi-conductor to discharge a light beam pulse as an incident to closure of said switch;

means for fixing said light emitting semi-conductor to the upper side of the barrel of the gun such that said light beam pulse is directed in a direction corresponding to that in which said gun is pointed; and

means for closing said switch in response to a movement of said gun corresponding to recoil movement.

12. In a target shooting system, in combination:

a gun having a barrel;

a gun sight holder mounted on said gun and extending along said barrel from a forward end to a rearward end;

said gun sight holder being formed with an inner cavity and a bore extending from said cavity substantially in the direction of said bore and opening at said forward end;

means within said cavity for generating a pulse of beamed light in response to a control signal and directing said pulse of beamed light through said bore to emerge in a direction substantially parallel with the axis of said barrel; and

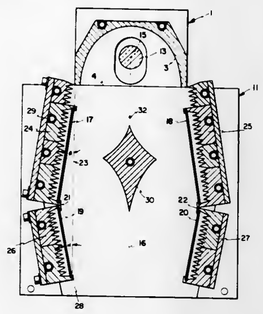
means for developing said control signal.

4,048,490

APPARATUS FOR DELIVERING RELATIVELY COLD UV TO A SUBSTRATE

Harden Henry Troue, Plainfield, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 11, 1976, Ser. No. 694,972
Int. Cl.² 250/504, F21V 7/12
U.S. Cl. 240—41.35 D **2 Claims**



1. Apparatus for providing a high flux beam of substantially all ultraviolet light to a substrate comprising

an elliptical-like reflector housing having an opening at one end and a first focal line;

a linear source of UV light mounted in said housing at the focal line thereof, the longitudinal axis of the line source being contained in a plane of symmetry of the apparatus which is perpendicular to the plane of the opening of said reflector housing;

a first optically flat dichroic surface on each side of said plane of symmetry mounted at one end of such dichroic flat surface adjacent said reflector housing opening;

a second optically flat dichroic surface on each side of said plane of symmetry connected to the other side of said first dichroic flat surface, said first and second dichroic flat surfaces providing a concave surface on each side of said plane of symmetry when viewed therefrom;

a cusp-like member mounted between said concave surfaces so that its longitudinal plane of symmetry coincides with the plane of symmetry of the apparatus and so that the cusp-like member is adjacent the reflector opening beyond the second focal line of said reflector housing

whereby substantially all the UV light from said line source strikes a dichroic surface only once and and substantially all the UV light leaving the apparatus has struck a dichroic surface once.

4,048,491

RECESSED LIGHTING FIXTURE

Leonard A. Wessman, 12 Harbison Circle, Rancho Mirage, Calif. 32270

Continuation of Ser. No. 458,932, April 8, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 640,442
Int. Cl.² F21S 1/02
U.S. Cl. 240—78 H **3 Claims**

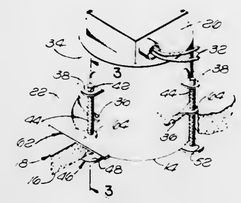
1. Apparatus for mounting a recessed lighting fixture to a wall member having a first side which defines a room surface and a second side which defines an interior surface comprising:

a lighting fixture housing having a side wall, said side wall having an inner surface and an outer surface;

a first generally planar tab member and a second generally planar tab member having surfaces spaced apart in parallel planes intersected by said side wall and secured to said lighting fixture housing;

a slot formed in said housing side wall in a plane parallel to the planes of said surfaces of said tab member;

a positioning means secured between said tab members and having a generally planar fastener secured thereto, said fastener being mounted in a plane perpendicular to said



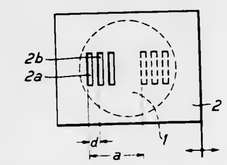
surface of said side wall, said positioning means being rotatable to move said fastener from the interior of said housing adjacent to the outer surface of said housing wall through said housing wall slot and for positioning said fastener adjacent said second tab member, the length of said fastener being greater than the length of said slot.

4,048,492

METHOD AND APPARATUS FOR AUTOMATIC FOCUSING AN OPTICAL SYSTEM WITH A SCANNING GRATING

Horst Hartmann, Nauborn, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany

Filed June 14, 1976, Ser. No. 695,916
Claims priority, application Germany, June 26, 1975, 2528515
Int. Cl.² G01J 1/20
U.S. Cl. 250—201 **2 Claims**



1. In a method for automatically focusing an optical system, comprising locating a grating in the intermediate image plane, said grating defining a spatial frequency filter, associating a photoelectric detection system with said grating, generating electrical control signals which are modulated by the relative motion between an object image and said grating, said motion normal to the longitudinal range of the grating marks, the improvement comprising:

using a grating (2) which is short compared to the range of the intermediate image and generating relative motions extending across several grating constants between said intermediate image (1) and said grating (2).

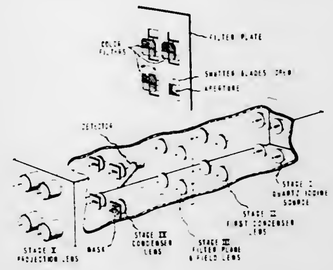
4,048,493

LIGHT-SENSITIVE CONTROL FOR COLORED LIGHT PROJECTOR

Jerald Dana Lee, Mendenhall, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 3, 1976, Ser. No. 711,407
Int. Cl.² G01J 1/32
U.S. Cl. 250—205 **31 Claims**

1. A device for producing variable colors from projected white light comprising (1) an adjustable color filter having at least two primary-color areas upon which a portion of said projected white light is incident, (2) individually actuatable light-attenuation means which attenuates the quantity of light transmitted from each of the primary-color areas as well as the portion of the projected light which is transmitted unfiltered, and (3) control means comprising (a) a lightmeasuring unit for



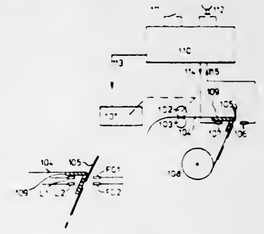
measuring the transmitted light and generating a signal proportional to the amount of light measured, (b) means responsive to said signal to determine the quantity of each component of transmitted light present and (c) means responsive to (b) for controlling each of the light-attenuation means.

4,048,494

DEVICE FOR TAKING PIECES OF MATERIAL STUCK TO A SUBSTRATE WOUND ON A REEL

Bernardus G. Liesting, Aalsburg 1214, Wijchen, Netherlands

Filed Dec. 12, 1975, Ser. No. 640,208
Int. Cl.² B65C 9/42
U.S. Cl. 250—223 R **18 Claims**



1. A device for removing adhesive labels or the like from a substrate comprising:

a reel on which said substrate is wound;

means for mounting said reel for rotation about an axis of rotation;

a housing having a trough in which said reel is mounted with an open upper end, said housing including a horizontal guide having a horizontal surface for supporting said substrate situated at a level higher than said axis of rotation, and a bending edge for the substrate at the end of said guide surface remote from said trough;

a light source disposed adjacent said bending edge;

driving means located below said guide surface for engaging said substrate to pull said substrate past said edge so as to separate one at a time said labels from said substrate;

a photo-electric cell disposed adjacent said bending edge for producing a given electrical signal indicating the presence of a separated label, when said label is located between said source and said cell; and

circuit means connected to said photo-electric cell for dis-

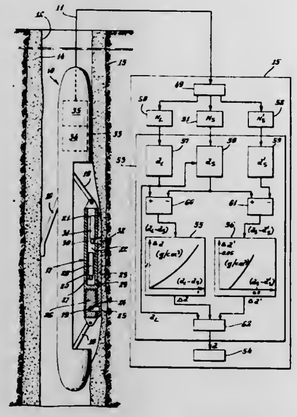
abling said driving means when said given signal is produced.

4,048,495

DOUBLY-COMPENSATED DUAL-DETECTOR DENSITY LOGGING APPARATUS

Darwin V. Ellis, Paris, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jan. 16, 1976, Ser. No. 649,865
Claims priority, application France, Jan. 24, 1975, 75.02206
Int. Cl.² G01V *5/00*
U.S. Cl. 250—264 **18 Claims**



1. A method for determining the density of a geological formation surrounding a borehole, irradiated by gamma rays, comprising:

producing a measurement of the number of backscattered gamma rays which have principally diffused in said formation; and

producing at least two separate measurements of the numbers of backscattered gamma rays which have principally diffused respectively in at least two successive layers of materials near the borehole wall, for use in obtaining an indication of the formation density compensated for the effect of said materials.

4,048,496

SELECTABLE WAVELENGTH X-RAY SOURCE, SPECTROMETER AND ASSAY METHOD

Richard D. Albert, 317 Hartford Drive, Danville, Calif. 94526

Continuation-in-part of Ser. No. 353,451, April 24, 1973, Pat. No. 3,925,660, which is a continuation-in-part of Ser. No. 251,378, May 8, 1972, abandoned. This application Nov. 20, 1975, Ser. No. 633,980
Int. Cl.² G01N *23/20*
U.S. Cl. 250—272 **3 Claims**

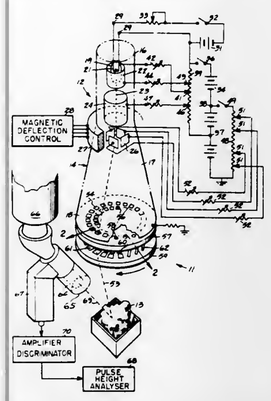
1. An X-ray fluorescence analysis spectrometer comprising:

an X-ray source having means for producing any selected one of a plurality of different specific predetermined X-ray spectra, said X-ray source having means for producing an accelerated charged particle beam and having at least one first primary target positioned to intercept said charged particle beam to produce primary X-rays in response to bombardment thereby and having a first plurality of spacedapart secondary targets each of different composition and means for directing said primary X-rays to any selected one of said secondary targets to produce secondary X-rays thereat which have different X-ray spectra at different ones of said secondary targets,

means for supporting a substance to be analyzed in position to receive said X-rays produced by said selected ones of said secondary targets,

an X-ray detector disposed for detecting characteristic fluorescent X-rays emitted from said substance in response to said irradiation thereof, and

a self-cycling system coupled to said detector and to said X-ray source and having means for controlling said X-ray source to initially irradiate said substance with a polychromatic X-ray spectrum and means coupled to said detector for analyzing the wavelength spectrum of characteristic X-ray fluorescence from said substance in response to said



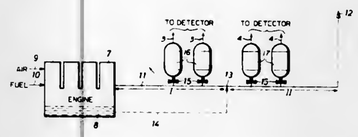
polychromatic irradiation thereof to indentify wavelengths characteristic of specific elements, said self-cycling system further having logic circuit means controlling said X-ray source to sequentially irradiate said substance with a plurality of specific X-ray spectra each selected to cause strong X-ray fluorescence from a particular separate one of said specific elements, and further having means for registering a value having a magnitude proportional to the amount of characteristic fluorescent X-rays of each of said elements which are detected during said irradiation of said substance by said specific X-ray spectra.

4,048,497

METHOD OF MEASURING THE OIL CONSUMPTION OF INTERNAL COMBUSTION ENGINES

Gerhard Fritzsche, Neuthard, Germany, assignor to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Apr. 9, 1976, Ser. No. 675,593
Claims priority, application Germany, Apr. 11, 1975, 2515960
Int. Cl.² G01T *1/161*
U.S. Cl. 250—303 **12 Claims**



1. A method for measuring the oil consumption of an internal combustion engine equipped with an exhaust gas line which carries an exhaust gas stream, comprising:

a. labelling the oil with a radioactive tracer;

b. taking at least one first sample from the exhaust gas stream at a location which only carries activity coming from the oil consumption in the engine;

c. adding to the exhaust gas stream radioactively labelled oil corresponding to the oil in the internal combustion engine;

d. subsequently taking at least one second sample from the exhaust gas stream downstream of the point of addition of the oil, and

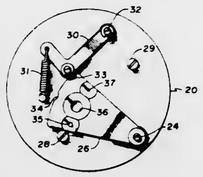
e. comparing the amounts of radioactive tracer present in the first and second samples.

4,048,498

SCANNING AUGER MICROPROBE WITH VARIABLE AXIAL APERTURE

Robert L. Gerlach, Minnetonka, and Paul W. Palmberg, Bloomington, both of Minn., assignors to Physical Electronics Industries, Inc., Eden Prairie, Minn.

Filed Sept. 1, 1976, Ser. No. 719,463
Int. Cl.² H01J *39/00*
U.S. Cl. 250—305 **14 Claims**



1. In a single pass scanning Auger electron analyzer wherein Auger electrons emitted from an irradiated sample pass through a cylindrical mirror analyzer and are analyzed and focused at the axis of the cylindrical mirror analyzer to be detected, the improvement comprising a support member mounted transverse to and extending across the diameter of the inner cylinder of the cylindrical mirror analyzer adjacent to the focus point of said electrons, said support member defining a first opening therethrough along the axis of the cylindrical mirror analyzer for passage of analyzed electrons, a variably sizable exit aperture assembly mounted to said support member, said exit aperture assembly including plate means movable transversely with respect to said cylindrical mirror analyzer, said plate means by movement thereof relative to said support member defining a plurality of different size openigs therethrough in axial alignment with the openins in said support member, and control means external to said cylindrical mirror analyzer including linking means operatively joined to said plate means for moving said plate means relative to said support member.

4,048,499

INFRARED ABSORPTION SPECTROSCOPY OF LIQUIDS EMPLOYING A THERMAL DETECTOR

Lloyd B. Kreuzer, San Francisco, Calif., assignor to Diax Corporation, Sunnyvale, Calif.

Filed Feb. 20, 1975, Ser. No. 551,270
Int. Cl.² G01J *1/00*
U.S. Cl. 250—344 **14 Claims**

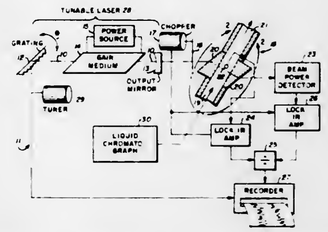
1. In a laser infrared absorption apparatus:

cell means for interposing a liquid sample medium to be analyzed in a beam of infrared radiation;

laser means for producing the beam of infrared radiation as a beam of coherent infrared radiation;

means for modulating the intensity of the beam of coherent infrared radiation; and

thermal detection means disposed in heat exchanging relation with the liquid sample and being responsive to the temperature of the liquid sample for detecting the heating effect at the modulation frequency or harmonics thereof in the liquid sample due to the absorption of infrared radiation by the sample from the modulated beam of infrared radiation.

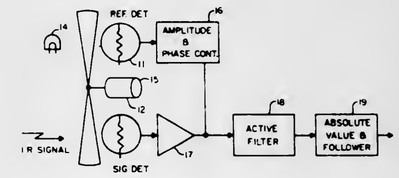


4,048,500

INFRARED BACKGROUND SUPPRESSION

Kenneth L. Moore, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 8, 1976, Ser. No. 739,916
Int. Cl.² G01N *23/00*
U.S. Cl. 250—350 **9 Claims**



1. An infrared analyzer of the signal-and-reference type employing separate detectors for the reference and signal beam comprising:

a single shutter positioned in the field of view of said detectors and driven to interupt the infrared energy reaching the detectors so as to cause the outputs thereof to vary alternatively at a predetermined frequency;

signal combination means effectively connected to the detectors for subtractively combining the detector outputs and for limiting the output to the shutter predetermined frequency; and

signal conversion means connected to said signal combination means for altering the signal to a D.C. analog of the signal intensity.

4,048,501

METHOD AND APPARATUS FOR DETERMINING THE CONDITION OF A BIOLOGICAL SPECIMEN

Raymond P. Grenier, Wilmington, Mass., assignor to Baird-Atomic, Inc., Bedford, Mass.

Filed Jan. 14, 1976, Ser. No. 649,071
Int. Cl.² G01T *1/20*
U.S. Cl. 250—367 **9 Claims**

1. A high resolution radioactivity distribution detection system for determining the condition of a subject under diagnosis, the subject containing a diagnostic dose of a radioactive substance, said system comprising:

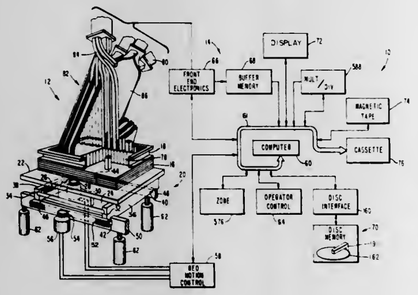
a. an array of sensors for detecting radioactive events within the subject, each said sensor having a unique address location within the array representing a unique spatial

segment of the subject, each said sensor generating a light signal when activated by a radioactive event;

b. a plurality of photo detecting devices optically coupled to said array, unique combinations of said photo detecting devices uniquely identifying said address locations of said sensors, each one of said combinations uniquely identifying one of each said address locations of said sensors, said photo detecting devices converting said light signals generated by said sensors into current signals;

c. front-end electronics means connected to said photo detecting devices, said front-end electronics means digitizing said current signals into data signals constituting the amplitude of said sensed radioactive events and said address location of said sensed events;

d. buffer memory means connected to said front-end electronics means for temporarily storing said data signals, said buffer memory means having address locations corresponding to said address locations of said sensors in said array, said data signals representing said sensed events temporarily stored in said buffer memory means at said corresponding address locations, said data signals representing said sensed events at any one address location accumulated to data signals representing said sensed events at the same address location in said buffer memory means;



e. a general purpose computer connected to said buffer memory means;

f. a disc interface connected to said computer

g. a disc memory means connected to said disc interface, said disc memory means including a disc for storing data signals and a head for writing said data signals onto said disc and for reading said data signals from said head, said disc storing also instructional data for control of said computer, said disc interface configured to transfer data from said computer to said disc memory and to transfer data from said disc memory to said computer; and

h. display means connected to said computer means for presenting said data stored in said disc memory, said display means controlled by said computer;

i. said computer generating command signals which are applied to said buffer memory means for transferring said data stored in said buffer memory means to said disc memory, said data sequentially transferred from said buffer memory means to said computer, then to said disc interface and finally to said disc memory;

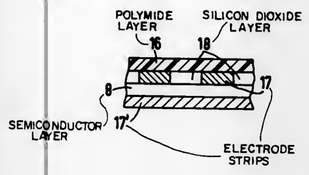
j. said computer generating command for transferring said data stored in said disc memory to said display means for presentation, said data sequentially transferred from said disc memory to said disc interface, then to said computer and finally to said display means.

4,048,502

ELECTRO-OPTICAL TRANSDUCER

Friedrich Gudden, Erlangen, and Herbert Weiss, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 27, 1975, Ser. No. 608,323
Claims priority, application Germany, Sept. 4, 1974, 2442276
Int. Cl.² G01T *1/22*
U.S. Cl. 250—370 **4 Claims**



1. In a gamma-image tube having a vacuum chamber, a photocathode means positioned within said chamber and having an alkali metal therein, a semiconductor means positioned within said chamber in spaced relation to said photocathode means and so as to have a major semiconductive surface thereof facing said cathode means, and a plurality of electrode strips positioned at least on said major semiconductive surface of the semiconductor means so as to define a pattern of electrode-free semiconductive areas; the improvement comprising:

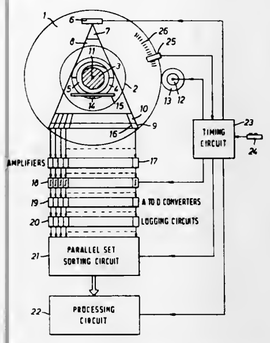
a layer composed of a polyimide positioned on at least said electrode-free semiconductive areas of the major surface of said semiconductor means facing said photocathode, said layer having a thickness of less than 5 μm.

4,048,503

RADIOGRAPHY WITH NOBLE GAS CONTAINING DETECTOR CELLS

Stanley Taylor, Sunbury-on-Thames, England, assignor to EMI Limited, Hayes, England

Filed June 7, 1976, Ser. No. 693,317
Claims priority, application United Kingdom, June 10, 1975, 24904/75
Int. Cl.² G01T *1/18*; G01N *21/34*
U.S. Cl. 250—385 **11 Claims**



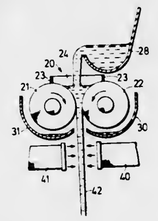
1. Radiographic apparatus comprising means defining a patient position, a source of penetrating radiation, such as X-radiation, arranged to project said radiation through said position along a plurality of substantially co-planar beam paths, means for scanning said source relative to said patient position so as to project said radiation through said position along further beam paths, detector means for detecting the radiation emergent from said position along said paths, including a plurality of cells containing a noble gas and means for sequentially deriving, from each cell, output signals indicative of the amount of radiation emergent from said position along a respective group of said paths, said amount being indicated in each case by the number of electrons and ions of said gas generated by radiation projected through the position along the respective path, means being provided for periodically interrupting the incidence of said radiation upon said cells to provide for the clearance from each cell of ions generated by radiation projected through said position along one of said group of paths before the cell is exposed to the radiation projected through said position along the next path of its respective group.

4,048,504

METHOD AND APPARATUS FOR TREATING FLOWABLE MATERIAL

Ernst Bosshard, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 25, 1975, Ser. No. 552,982
Claims priority, application Switzerland, Dec. 23, 1974, 17237/74
Int. Cl.² G01N *23/12*
U.S. Cl. 250—434 **3 Claims**



1. An apparatus for treating a flowable material comprising

a pair of rollers defining a gap therebetween to form a flow of the flowable material passing in free fall from said rollers into a thin vertical layer, said rollers being counter-rotating to accelerate the flow of material in the direction of free fall prior to formation of said thin layer; and

at least one electron beam generator for directing an electron beam perpendicularly onto said layer below said rollers to form an irradiation zone, said generator moving said beam horizontally to and fro across said thin layer of falling material.

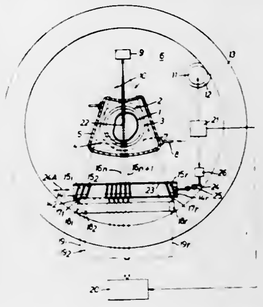
4,048,505

RADIOGRAPHY

Godfrey Newbold Hounsfield, Newark, England, assignor to E M I Limited, Hayes, England

Continuation of Ser. No. 489,084, July 17, 1974, Pat. No. 3,934,142. This application Jan. 16, 1976, Ser. No. 649,595
The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.
Int. Cl.² G03B *41/16*
U.S. Cl. 250—445 T **2 Claims**

1. A medical radiographic apparatus for producing an image of the variation of absorption coefficient, with respect to penetrating radiation, over a slice disposed cross-sectionally in a patient's body, the apparatus including an angularly movable supporting structure having an opening to accommodate the part of the patient's body which contains said slice, a source of a fan-shaped spread of the penetrating radiation, supported by said structure at one side of said opening so as to project said radiation across said opening, a plurality of detectors, supported by said structure at the opposite side of said opening to said source, to receive radiation from said source after it has traversed said opening, said detectors being disposed to receive radiation from said source along respective beam paths diverging from said source and included within said fan-shaped spread of radiation, means for angularly moving said supporting structure, and with it said source and said detectors, about an axis intersecting said slice, through first and second substantial angles and for deriving a series of output signals from each detector during their movement through each of said substantial angles, each output signal being indicative of the radiation transmitted over a respective beam path and obtained whilst



said structure rotates through a relatively small angle, and means for causing the angular positions of the beam paths within said fan-shaped spread to be changed by a small amount relative to the structure for angular movement of said structure through said second substantial angle as compared with the angular positions of the beam paths for the angular movement of said structure through said first substantial angle to provide interleaving beam paths within said fan-shaped spread.

4,048,506

VERSATILE INTRAORAL RADIOGRAPHIC FILM POSITIONING SYSTEM

William J. Updegrave, Riverbend Apt. 603, 3010 N.E. 16th Ave., Ft. Lauderdale, Fla. 33334

Continuation-in-part of Ser. No. 542,073, Jan. 17, 1975, abandoned. This application Jan. 9, 1976, Ser. No. 647,732
Int. Cl.² G03B *41/16*
U.S. Cl. 250—479 **44 Claims**



1. Apparatus for positioning dental x-ray film within the mouth comprising:

a bite block having a bite portion with an upper bite surface and a lower bite surface, a film-holding slot extending substantially vertically through said bite block at one end of said upper and lower surfaces so as to permit a film to extend through said block from a position above said upper bite surface to a position below said lower bite surface and a film-locking slot extending substantially horizontally through said bite portion between said upper bite surface and said lower bite surface and in communication with said film-holding slot;

a bite block holder means including a film-locking portion at one end thereof, said film-locking portion adapted to be removably received by said film-locking slot, said film-

locking portion adapted to engage the film and hold the film in one of a plurality of fixed positions extending above and/or below said upper and lower bite surface respectively; and

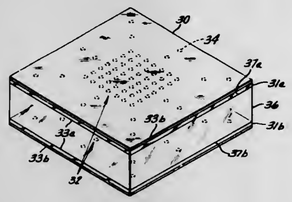
x-ray beam alignment means coupled to said bite block holder means for assisting in the alignment of an x-ray beam with the film in said film-holding slot.

4,048,507

X-RAY BEAM PERPENDICULAR FINDER

Alexis Neal de Gaston, 2190 Santa Anita Road, Norco, Calif. 91760

Filed Feb. 11, 1976, Ser. No. 657,164
Int. Cl.² G03B *41/16*
U.S. Cl. 250—491 **8 Claims**



1. A device for finding the location of the perpendicular ray of an X-ray beam field including:

first and second semi-radio opaque layers each defining a pattern therethrough removed therefrom, said pattern being defined by cutouts formed with edges perpendicular to said semi-radio opaque layers; and

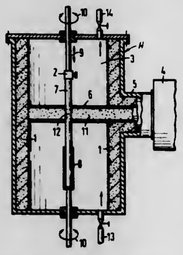
means to space and maintain said first and second semi-radio opaque layers in parallel alignment with their pattern in perpendicular registry, said means including a nonradio opaque member having parallel sides to which said layers are attached.

4,048,508

APPARATUS FOR DOPING A SEMICONDUCTOR CRYSTALLINE ROD

Joachim Martin; Ernst Haas, both of Erlangen, and Manfred Schnoeller, Haimhausen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 11, 1975, Ser. No. 603,680
Claims priority, application Germany, Aug. 12, 1974, 2438710
Int. Cl.² B01J *17/34*
U.S. Cl. 250—492 A **35 Claims**



1. An apparatus for predetermined and reproducible doping of a crystalline semiconductor rod by the formation of dopant atoms via radiogenic radiation initiated by irradiating such rod comprising:

a housing having end and side walls joined together to define a hollow irradiation chamber therein;

an axially and rotatably movable rod support means mounted on an end wall of said housing and extending into said chamber for supporting a semiconductor rod;

a drive means operationally coupled with said rod support means for effecting controlled axial and rotational movement of said support means;

a radiation source positioned outside said housing for producing a radiation field capable of initiating radiogenic reactions in a semiconductor rod; and

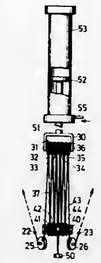
a connection means mounted on a side wall of said housing for providing communication between said chamber and said radiation field.

4,048,509

GAMMA-IRRADIATION TREATMENT APPARATUS

Adolf Sieber, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed July 29, 1975, Ser. No. 599,964
Claims priority, application Switzerland, Aug. 21, 1974, 011443/74
Int. Cl.² H01J *37/00*
U.S. Cl. 250—522 **4 Claims**



1. In an apparatus for treating goods with gamma radiation, the combination of

a frame;

at least one gamma radiation source mounted in said frame for selectively irradiating the goods;

an elevator for moving said frame between a screened non-irradiating position and an irradiating position of said source with respect to the goods to be treated, said elevator including a block and tackle having a fixedly mounted pulley block, a movably mounted pulley block, and at least one run connected to said frame and disposed over said pulley blocks, and

a servomotor including a cylinder and a piston slidably mounted in said cylinder and having a rod directly connected to said movably mounted pulley block for moving said latter pulley block relative to said fixedly mounted block whereby a small movement of said piston causes a corresponding movement of said movable pulley block and a greater movement of said run and said frame.

4,048,510

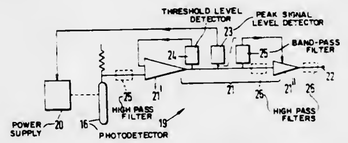
CIRCUIT ARRANGEMENTS FOR CONTROLLING DETECTOR SIGNALS IN SURFACE INSPECTION SYSTEMS

Graham Morley Clarke, and George Fisher, both of Edinburgh, Scotland, assignors to Ferranti Limited, Hollinwood, England

Filed Feb. 24, 1976, Ser. No. 660,928
Claims priority, application United Kingdom, Feb. 27, 1975, 8168/75; Mar. 27, 1975, 13109/75
Int. Cl.² G01N *21/32*
U.S. Cl. 250—563 **10 Claims**

1. A surface inspection system including a detector having

photodetection means responsive to light received to produce a detector signal having an amplitude related to the intensity of the light received, and an equalisation circuit arrangement comprising amplification means operable to amplify the detector signal, first signal level detector means responsive to an amplified detector signal appearing in the amplification means to control the level of the detector signal applied to the amplifi-



cation means, second signal level detection means responsive to said amplified detector signal to compensate for components of the detector signal due to the reception of ambient light, and band-pass filter means responsive to said amplified detector signal to compensate for variations in said signal due to changes in the optical gain of the detector by controlling the gain of the amplification means in accordance with said variations.

4,048,511

AUTOMATIC OUTPUT CONTROL METHOD AND DYNAMO EQUIPMENT FOR GENERATING SETS USING AUTOMOBILE WHEEL FRICTION DRIVE

Tsuguhiko Watanabe, 5-13, 1-chome, Ebara-cho, Nakano, Tokyo, Japan

Continuation-in-part of Ser. No. 499,483, Aug. 22, 1974, Pat. No. 3,943,370. This application Oct. 3, 1975, Ser. No. 619,685
Claims priority, application Japan, Aug. 25, 1975, 50-102221
Int. Cl.² H02P *9/04*
U.S. Cl. 290—1 R **5 Claims**

1. An automatic output control method for dynamos of generating sets using automobile driving wheel friction drive relating to generating sets where electricity generation is achieved by rotating the dynamo shaft in contact with a driving wheel of an automobile, and featuring a drum driving the dynamo by friction from the automobile wheel, the drum being tapered and having a parallel part so as to permit the displacement of the said tapered drum in the axial direction due to the screw action as it revolves freely against the shaft of said dynamo, where the said displacement is deliberately controlled by means of a coil spring incorporated between the said shaft and the tapered drum so as to transmit the driving force, so that, in the operation of the said dynamo, changes in the automobile driving force required for the driving changing load of the dynamo are absorbed automatically by the changing revolution ratio due to differences in the circumference as the said tapered drum moves in the axial direction and so that the changing driving force required for the dynamo under the changing load conditions is continuously maintained at a constant rate or rotation for a given frictional drive force from the automobile wheel.

4,048,512

SYSTEM FOR GENERATING POWER FROM WAVE MOTIONS OF THE SEA

Eric Wood, Ossett, England, assignor to Insituform (Pipes & Structures) Ltd., England

Filed Feb. 6, 1976, Ser. No. 656,043
Claims priority, application United Kingdom, Feb. 7, 1975, 05254/75; Feb. 8, 1975, 05453/75; Apr. 23, 1975, 16740/75; May 1, 1975, 18131/75; May 1, 1975, 18132/75; May 14, 1975, 20247/75; June 12, 1975, 25287/75; Aug. 16, 1975, 34185/75
Int. Cl.² F03B *13/10, 13/12*
U.S. Cl. 290—53 **11 Claims**



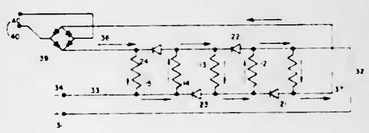
1. A power generation system which is for the generation of energy from the wave motions of the sea and which is buoyantly supported by the sea in use comprising spine elements defining a spine on which ducks are rockably mounted, the system further including tension cable means pressing the spine elements towards each other thereby to define the spine, and energy conversion means for converting the rocking motions of the ducks in to a form which can be transmitted from the system.

4,048,513

RECTIFIER CONTROLLED CIRCUIT

Robert F. Frost, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 16, 1976, Ser. No. 714,416
Int. Cl.² H05B *1/02*
U.S. Cl. 307—28 **9 Claims**



1. An electrical circuit configuration for producing equal power consumption by equal loads when energized selectively from multiple power sources having voltages of differing magnitudes comprising:

a. first and second equal load elements each having a first terminal thereof connected to a first conductive lead and a second terminal thereof connected to a second conductive lead;

b. a rectifier serially connected between said load elements in said first conductive lead;

c. said first and second conductive leads adapted for connection selectively to a first and second power source having voltage of differing magnitudes with the ratio of voltage magnitude of said second power source to the voltage magnitude of said first power source equal to the total number of said load elements; and

d. said rectifier connected for corresponding current flow so that when said electrical circuit configuration is energized selectively by unidirectional current from said first power

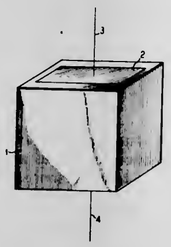
source said rectifier presents a low resistance to current flow and said load elements are connected in parallel and when said circuit configuration is energized selectively by unidirectional current from said second power source said rectifier presents a high resistance to current flow and said load elements are serially connected, said load elements consuming equal power for parallel and serial connection.

4,048,514

PYROELECTRIC NON-LINEAR OPTICAL COMPONENT

Siegfried Haussuehl, Erftstadt-Lechenich, and Kurt Recker, Bonn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 10, 1975, Ser. No. 594,627
Claims priority, application Germany, Aug. 1, 1974, 2437179
Int. Cl.² G02F *1/40*
U.S. Cl. 307—88.3 **5 Claims**



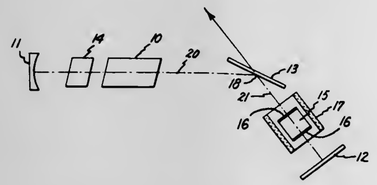
1. A pyroelectric non-linear optical component comprising a body consisting of morocrystalline orthorhombic magnesium barium fluoride ($MgBaF_4$) and means for changing the optical properties of said body.

4,048,515

BROADBAND LASER WITH INTRACAVITY CRYSTAL FOR GENERATING SECOND HARMONIC RADIATION

Yung S. Liu, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 14, 1976, Ser. No. 696,055
Int. Cl.² H02M *5/04*
U.S. Cl. 307—88.3 **14 Claims**



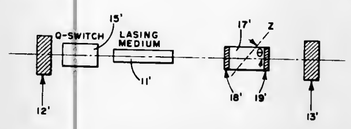
1. A high-power, second harmonic frequency generating laser comprising:
- a neodymium-doped glass radiation-emitting structure disposed within a cavity optically-resonant at the fundamental frequency of said laser, said cavity including first and second reflecting means defining the extreme ends of said cavity, said first reflecting means being oriented normally to the optic axis of said emitting structure;
- a nonlinear doubling crystal disposed within said cavity and oriented such that its phase-matching direction is slightly misaligned from the normal to said second reflecting means, the angular relationship of said first and second reflecting means being selected such that the optic axis of said emitting structure and the phase-matching direction of said doubling crystal intersect at a point within said cavity;
- a Q-switching crystal in said cavity optically aligned with said radiation-emitting structure and adapted to control initiation of oscillation in said cavity; and
- optical means substantially reflective to radiation at said fundamental frequency and substantially transparent to radiation at said second harmonic frequency, said optical means being situated at the intersection of the emitting structure optic axis and the doubling crystal phase-matching direction so as to deflect radiation at said fundamental frequency toward either of said first and second reflecting means and to transmit out of said cavity radiation at said second harmonic frequency received directly from said doubling crystal.

4,048,516

LASER APPARATUS FOR PRODUCING STIMULATED RAMAN SCATTERING

Eugene O. Ammann, Los Altos, Calif., assignor to GTE Sylvania Incorporated, Mountain View, Calif.

Filed Dec. 2, 1976, Ser. No. 746,670
Int. Cl.² H03F *7/00*
U.S. Cl. 307—88.3 **4 Claims**



1. Apparatus for producing stimulated Raman scattering comprising
- a laser having
  - a lasing medium,
  - means to excite said lasing medium whereby to produce a beam of coherent light, and
  - laser mirrors spaced from opposite sides respectively of said medium and traversing said beam whereby to define the laser cavity,
- switch means in said laser cavity operative on said beam,
- means to activate and deactivate said switch means whereby to produce a succession of pulses of said coherent light,
- a body of transparent dielectric material between said lasing medium and one of said mirrors and positioned to be traversed by said light pulses whereby to produce stimulated Raman scattering of the light, and
- means to cause said scattered light to oscillate through said dielectric material comprising said laser mirrors.

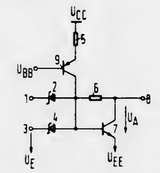
4,048,517

LOGIC ELEMENT

Ronald Rathbone, Taufkirchen, and Peter Rydval, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 28, 1976, Ser. No. 700,734
Claims priority, application Germany, July 8, 1975, 2530424
Int. Cl.² H03K *19/22, 19/08*
U.S. Cl. 307—213 **1 Claim**

1. A logic element, particularly a bipolar gate circuit for an LSI-circuit, comprising a pair of Schottky-diodes, a pair of resistances and a transistor, a first input to which a terminal of a first of said diodes is connected in high resistance direction, a second input to which a terminal of the second of said diodes is connected in high-resistance direction, the second terminals of said diodes being connected to one terminal of a first resistance and to the base of said transistor, the other terminal of said first resistance being connected to a reference potential, said second resistance having one terminal connected to the collector of said transistor, and the other terminal thereof, being connected to the second terminal of said diodes, and a second transistor having its emitter-collector path operatively disposed between the second terminal of said diodes and the associated terminal of the first resistance.

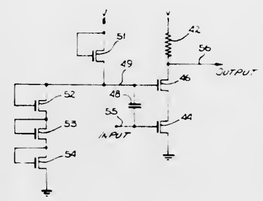


4,048,518

MOS BUFFER CIRCUIT

James T. Koo, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 656,935, Feb. 10, 1976, abandoned. This application Dec. 27, 1976, Ser. No. 754,119
Int. Cl.² H03K *19/40, 17/04*
U.S. Cl. 307—214 **3 Claims**



1. In an MOS inverter which includes an input transistor coupled in series with a load means, an improvement comprising:
- a decoupling transistor coupled between said load means and said input transistor;
- the gate of said decoupling transistor being coupled to a controlled variable potential means for controlling the gate potential of said decoupling transistor in response to a change of voltage on the gate of said input transistor;
- whereby the voltage changes on the respective gates of said input transistor and said decoupling transistor together cause said decoupling transistor to rapidly decouple said input transistor from said load means, thereby allowing the output signal from said inverter to charge more quickly.

4,048,519

REGENERATOR CIRCUIT FOR CCD ELEMENTS

Kurt Hoffmann, Taufkirchen; Guenther Meusburger, and Gottfried Wotruba, both of Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 25, 1976, Ser. No. 717,705
Claims priority, application Germany, Sept. 18, 1975, 2541686
Int. Cl.² H01L *29/78*; H03K *5/18*; G11C *19/28*
U.S. Cl. 307—221 D **6 Claims**

1. Regenerator circuit for CCD elements comprising a first CCD and a second CCD, a first MOS capacitance, a second capacitance connected in series with said first capacitance, the point at which said two capacitances are connected in series with one another being the output of said regenerator circuit and being connected to an input electrode of said second CCD, the output of said first CCD including an output stage, an output diffusion zone, a terminal to which a potential ϕ, can be connected, a transistor connected on the one hand to said point and on the other hand to said terminal, a gate electrode of said transistor being connected by a line to said output diffusion zone of said first CCD stage.



4,048,520

THREE-PHASE SCR DRIVE CIRCUIT USING AN OPTO-COUPLED PULSE AMPLIFIER

Nicholas G. Muskovac, Rockville, Md., and Bruce I. Formhals, Norwood, Mass., assignors to Vectrol, Inc., Rockville, Md.

Filed May 24, 1976, Ser. No. 689,261
Int. Cl.² H03K *17/72, 1/12*
U.S. Cl. 307—252 Q **6 Claims**



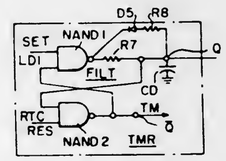
1. An SCR drive circuit comprising:
- a plurality of means for selectively shifting each phase of multiple phase electrical signals;
- respective means each having an output and connected in circuit with an output of each phase shifting means for shaping each of the phase shifted signals; and
- respective opto-coupled means connected in circuit with an output of a respective shaping means for generating trigger signals for firing SCR devices connected as loads to respective opto-coupled means;
- respective means connected between an input of each phase shifting means and power lines for isolating the respective phase shifting means from direct connection to the power lines.

4,048,521

FLIP-FLOP WITH FALSE TRIGGERING PREVENTION CIRCUIT

Francis T. Thompson, Murrysville, and Michael B. Brennen, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 535,626, Dec. 23, 1974, Pat. No. 3,989,999. This application July 14, 1976, Ser. No. 705,301
Int. Cl.² H03K *3/286*
U.S. Cl. 307—291 **4 Claims**



1. A set-reset flip-flop, comprising:
- gate means, the set input terminal of said flip-flop being connected to an input terminal of said gate means, said

gate means having an output terminal at which a logic level appears in response to the occurrence of a triggering signal at said set input terminal, the duration of said logic level and said triggering signal being substantially the same;

delay means for delaying for a predetermined period of time a logic level which appears on the input terminal thereof from appearing on the output terminal thereof, said input terminal of said delay means being connected to said output terminal of said gate means, said output terminal of said delay means comprising an output and cross-coupling terminal of said flip-flop, said delay means comprising resistive means and capacitive means connected together in integrating circuit relationship for effecting said delay as a function of the charging time constant thereof and said logic level, said output and cross-coupling terminal disposed between said resistive means and said capacitive means; and

discharge means interconnected with said terminal for discharging said capacitive means with a time constant which is smaller than said charging time constant, said charging time constant representing a time which is shorter than the duration of a desired triggering signal but larger than the expected duration of an undesired noise pulse on said set input terminal to thus allow said desired triggering signal to change the logic level at said output of said flip-flop after said predetermined time but to prevent said undesired noise pulse from changing said logic level at said output of said flip-flop.

4,048,522

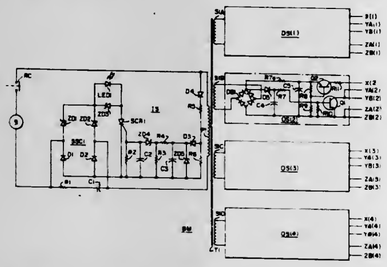
SOLID STATE BREAK-BEFORE-MAKE BASE MODULE AND ASSOCIATED CONTACT ELEMENTS

Wardell Gary, and Emroy W. Lange, both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 576,833, May 12, 1975, abandoned. This application Feb. 3, 1977, Ser. No. 765,507

Int. Cl.² H03K *3/295, 5/13, 17/60*

U.S. Cl. 307—293 **8 Claims**



1. A solid state relay, comprising:

a. input circuit means having switch means therein; and

b. bracketing break-before-make means connected to said switch means of said input circuit means, said bracketing break-before-make means operating to provide a first contact-break output signal at a first set of output terminals thereof generally concurrently with a first change of state of said switch means, said bracketing break-before-make means operating to provide a first contact-make output signal at a second set of output terminals thereof at a first delay time plus an on delay time after said first change of state of said switch means, said bracketing break-before-make means operating to provide a second contact-break output signal at said second set of output terminals generally conurrently with a subsequent change of state of said switch means, said bracketing break-before-make means operating to provide a second contact-make output signal at said first output terminals thereof at a second delay time plus said on delay time after said subsequent change of state of said switch means.

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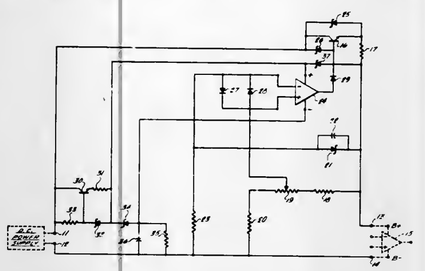
ELECTRONIC FILTER WITH ACTIVE ELEMENTS

Joseph John Curcio, Boalsburg, Pa., assignor to Paoli High Fidelity Consultants Inc., Paoli, Pa.

Filed Oct. 1, 1976, Ser. No. 728,786

Int. Cl.² H03K *1/02, 1/12*

U.S. Cl. 307—297 **7 Claims**



1. An electronic filter for eliminating alternating current components from a direct current power supply and for continuously producing a direct current potential at its output with a predetermined value, regardless of the change in load across the output of the filter, wherein said filter comprises:

a. amplifier means having negative and positive input channels;

b. first feedback loop connected from the filter output to the negative input channel of the amplifier means;

c. second feedback loop connected from the filter output to the positive input channel of the amplifier means, said second feedback loop having greater resistance than the first feedback loop so that the combination of the signals received on the input channels is always negative, and the amplifier remains stable;

d. means, responsive to the output of the amplifier means, for controlling the current flowing from the filter input to the filter output, whereby the output voltage of the filter is controlled in response to the potential difference between the two feedback loops;

e. means for providing positive and negative bias voltage for the amplifier means; and

f. means, responsive to the filter output voltage, for varying the providing means so that the positive bias voltage for the amplifier is related to the filter output voltage.

4,048,524

MOS VOLTAGE LEVEL DETECTING AND INDICATING APPARATUS

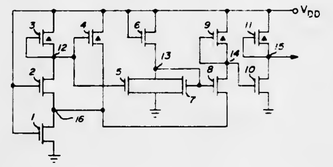
Ronald C. Laugesen, Sunnyvale, and Mark Shin-Dong Shieu, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 21, 1976, Ser. No. 679,120

Int. Cl.² H03K *5/153, 3/295, 3/353, 17/30*

U.S. Cl. 307—304 **3 Claims**

1. In a MOS integrated circuit, a voltage level detecting and indicating circuit apparatus comprising: MOS integrated circuit means responsive to a change in the magnitude of a voltage in said circuit having a first node at which occurs a first signal when said magnitude of said voltage is changed to a first predetermined magnitude, said occurrence of said first signal being independent of at least one of a plurality of process variables including threshold voltage, mobility, body effect factor and lateral diffusion within a predetermined range of magnitude of said variable, and a second node at which occurs a second signal when said magnitude of said voltage is changed to a second predetermined magnitude and a third signal when said magnitude of said voltage is changed to a third predetermined magnitude, said occurrence of said second and third signals being dependent on at least one of said plurality of process variables.



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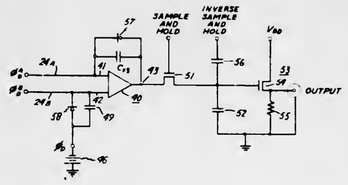
OUTPUT CIRCUIT FOR CHARGE TRANSFER TRANSVERSAL FILTER

Howard S. Goldberg, Schenectady, and William E. Engeler, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,496

Int. Cl.² H03K *5/20, 5/08;* **G11C** *19/28;* **H03H** *7/10*

U.S. Cl. 307—353 **6 Claims**



1. A transversal filter comprising

a substrate of semiconductor material of one conductivity type,

a first plurality of electrodes insulatingly overlying said substrate, each split into a first and a second part with a gap therebetween,

a second plurality of electrodes insulatingly overlying said substrate, each spaced between adjacent electrodes of said first plurality, said first and second pluralities of electrodes forming a plurality of stages of a shift register,

means for connecting the first parts of said electrodes of said first plurality to a first conductive line,

means for connecting the second parts of said electrodes of said first plurality to a second conductive line,

means for introducing packets of charge representing successive samples of an analog signal into said shift register,

charge clocking means to effect the transfer of charge from storage region to storage region underlying said first and said second pluralities of electrodes including means for applying first and second phase related voltages to said first and said second pluralities of electrodes respectively, said first voltage being applied to said first and said second lines, said second voltage having a predetermined periodicity,

differential sensing means connected to said first and second lines for detecting a difference in signal on said lines in response to the transfer of charge from storage regions underlying said second plurality of electrodes to storage region underlying said first plurality of electrodes for obtaining a sum of weighted samples of said analog signal including

a high gain differential amplifier having a pair of input terminals and an output terminal, one of said input terminals being an inverting input terminal and the other being a non-inverting terminal, a first capacitor, said inverting terminal connected to said output terminal through said first capacitor and also connected to said first line, said non-inverting terminal connected to said second line,

a source of said first phase related voltage,

first and second diodes, said first diode connected between said first line and said output terminal, said second diode connected between said second line and said source, said first and second diodes being poled so as to be rendered conductive periodically during a period prior to transfer of charge from the storage regions underlying said second plurality of electrodes to the storage regions underlying said first plurality of electrodes and rendered non-conductive during a time including the time of transfer of charge from the storage regions underlying said second plurality of electrodes to the storage regions underlying said first plurality of electrodes in response to said second phase related voltage on said second plurality of electrodes capacitively coupled to said first plurality of electrodes,

whereby each of said lines is charged to substantially the value of said first phase related voltage of said source periodically prior to the transfer of charge into the storage regions underlying said first plurality of electrodes and thereafter said lines are isolated from said source, and charge periodically transferred from the storage regions underlying said second plurality of electrodes to storage regions underlying said first plurality of electrodes induces different voltages on said lines and causes the voltage of the inverting terminal to follow the voltage of the noninverting terminal by virtue of the feedback through said first capacitor and a total charge is supplied to said first capacitor which is proportional to the difference in charge delivered to said lines during said transfer of charge, said total charge appearing as a change in voltage at said output terminal.

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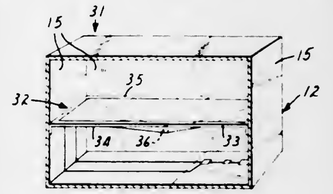
KINETIC SENSOR EMPLOYING POLYMERIC PIEZOELECTRIC MATERIAL

Allen L. Taylor, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 603,193, Aug. 8, 1975, abandoned. This application July 19, 1976, Ser. No. 706,297

Int. Cl.² H01L *41/04*

U.S. Cl. 310—329 **6 Claims**



1. A detector for producing a signal in response to movement of the detector, comprising:

a housing;

a sensing unit fastened by one or more ends thereof to said housing and having:

a flexible layer of poled, polymeric, piezoelectric material that produces electrostatic charges of opposite polarity on its opposite surfaces when subjected to bending; and

a flexible conductive electrode carried on no more than the portions of each surface of said piezoelectric layer adjacent said one or more ends;

a weight connected to said sensing unit in such fashion that said weight acts as an inertial mass to produce bending of

the sensing unit in respect to movement of said detector; and

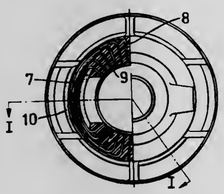
sensing circuitry electrically connected with the conductive electrodes carried on each surface of said piezoelectric layer to sense said electrostatic charges and to provide a signal indicating motion of said detector.

4,048,527

STATOR AGGREGATE FOR ROTATING ELECTRIC MACHINES

Stig Leonart Hallerback, Vastra Frolunda, and Leif Lachonius, Sare, both of Sweden, assignors to SKF Industrial Trading and Development Company, B.V., Jutphaas, Netherlands

Division of Ser. No. 504,460, Sept. 9, 1974, Pat. No. 3,932,929. This application Oct. 9, 1975, Ser. No. 621,031
Claims priority, application Sweden, Sept. 28, 1973, 7313243
Int. Cl.² H02K *1/04*
U.S. Cl. 310—43 **4 Claims**



1. An electric machine consisting of a stator and a rotor. said stator comprising at least two sections made of a moulded plastic material, magnetic flux providing means in the form of laminations formed integrally in each section, said laminations running axially and having inwardly directed terminal edge portions adjacent the inner arcuate surface portions and forming the stator poles, the central part of the laminations forming the stator yoke, each section having circumferentially spaced inner peripheral surface portions of arcuate cross section, said inner peripheral surface portions disposed on the circumference of a circular trace defining the rotor cavity, at least one of said sections having a longitudinally extending interior channel between said inner surface portions forming mounting means for windings, each section having axially spaced pocket sections defining an annular seat for bearings within which the rotor shaft is journalled and clamping means securing the sections together.

4,048,528

STARTING MOTOR FOR LARGE INERTIA LOAD

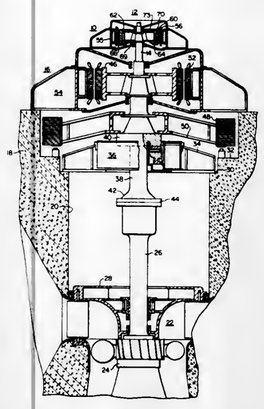
Eugene C. Whitney, Forest Hills, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 14, 1975, Ser. No. 621,993
Int. Cl.² H02K *9/19, 7/02*
U.S. Cl. 310—54 **16 Claims**

1. An induction motor having a rotor disposed for rotation within an annular stator, said rotor comprising:

a continuous circular metallic rim serving as a rotor winding;

a closed container of cooling fluid disposed adjacent and radially inward of said rim, said cooling fluid being in thermal communication with said rim to transfer thermal energy therfrom; and a shaft concentrically disposed within said rim, a metallic web secured to said shaft for supporting said rim for rotation within said stator, said



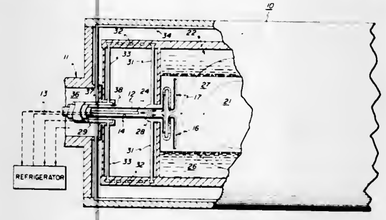
web being resilient to permit radial expansion of said rim in response to temperature changes therein.

4,048,529

FLOW CONTROL DEVICE FOR SUPERCONDUCTIVE ROTOR REFRIGERANT

Bruce D. Pomeroy, Schenectady, N.Y., and Philip G. Kosky, Bethlehem, Pa., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,665
Int. Cl.² H02K *9/20*
U.S. Cl. 310—54 **10 Claims**



1. In a transport mechanism wherein liquefied gas is conducted to the superconductive windings of an electrical generator in order to supply a pool bathing at least part of said windings with the whole of said windings being maintained at cryogenic temperatures, the transport function being accomplished via conduit means disposed generally axially of said generator and in flow communication with the inner end of dispensing means adapted to conduct the liquefied gas to said pool, said pool being disposed radially outward of said despensing means, the improvement comprising:

said dispensing means being tubular and providing a continuous path for fluid flow therethrough, said path being generally radial in disposition with at least one reversal of direction therein to accommodate a single continuous body of liquid such that the net weight of said body of liquid is balanced by the combined weights of two radially-extending columns of vapor, one such column being in contact with each end of said body of liquid; and

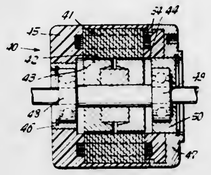
means being provided in flow communication with said conduit means for returning vapor from the inner end of said dispensing means to the outside of said generator.

4,048,530

ELECTRIC MOTOR WITH PLASTIC ENCAPSULATED STATOR

George A. Kaufman, Jr., Avon, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed May 5, 1975, Ser. No. 574,356
Int. Cl.² H02K *5/00*
U.S. Cl. 310—89 **1 Claim**



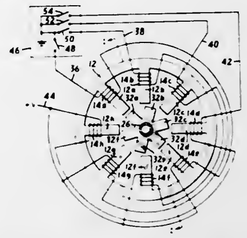
1. An electric motor comprising a stator and a rotor; said stator including a tubular stack of laminations having an axis, winding means positioned on said stack and a hardened plastic covering encapsulating said stack and windings and being formed to provide a through opening aligned with the stack axis; said rotor having portions disposed within the opening and an axis; and support means positioned at each end of the stack including means integral with the plastic covering for supporting the rotor essentially coaxially in the stator and means for securing the integral means to the hardened plastic covering with the covering constituting the sole structure for securing the integral means to the stack to prevent movement of the integral means transverse to the axis of the stator stack and outwardly therefrom, in which the integral means of the support means includes at least a metal insert formed with a through hole positioned adjacent an end portion of the opening and being adhered to the covering, in which the insert has an inner surface transverse to the axis, in which the stator stack has an adjacent surface and in which the inner surface and the adjacent surface abut at the outer periphery of the stack and insert, in which the insert includes a substantial exposed portion extending diametrically along one end surface of the stator, in which the insert and covering are formed to have cooperating mechanically interlocking portions, in which the support means includes another insert having an inner surface transverse to the stator axis, in which the stator stack has an adjacent surface transverse to the stator axis, in which the inner surface of the another insert and its adjacent stack surface are spaced apart with covering material being positioned therebetween for solely supporting the insert, in which the stator stack is formed to have inwardly extending poles having inner faces that define a portion of the through opening, in which the poles are spaced from each other, in which the covering material fills the spaces between the poles to occupy all of the interior of the stator that is unoccupied by the other parts of the stator, in which the covering material in the spaces extends for the complete length of the stator stack to interconnect both support means, in which the support means further includes a bearing positioned adjacent each end of the through opening for rotatably supporting the rotor and in which there are cooperating means on the stator and rotor for limiting axial movement of the rotor with respect to the stator.

4,048,531

VARIABLE RELUCTANCE STEPPER MOTOR

Kenneth G. Buess, Union City, N.J., and Murray Hefter, Far Rockaway, N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed June 5, 1974, Ser. No. 476,547
Int. Cl.² H02K *37/00*
U.S. Cl. 310—49 R **6 Claims**



1. A variable reluctance stepper motor comprising:

a. a first stator having a plurality of poles, with said poles energizable to generate and selectively rotate a magnetic field, including means for energization comprising a first winding encircling each of said poles and first circuit means for providing plural series circuits, each series circuit including therein a distinct group of such first windings, said first stator generating an incrementally rotating magnetic field upon sequential energization of said series circuits;

b. a rotor shaft;

c. a first rotor having a second number of poles different from the number of poles in said first stator, said first rotor supported by said shaft in radially spaced relation to said first stator for imparting rotation to said shaft in accordance with rotation of said magnetic field, said first stator and said first rotor together defining a predetermined number of rotational positions for said first rotor where minimum magnetic reluctance exists between said first stator and said first rotor;

d. a second stator having a third number of poles;

e. a second rotor supported by said shaft in radially spaced relation to said second stator, said second rotor having a fourth number of poles different from said third number of poles with the poles of said rotor and said stator defining a further number of rotational positions for said second rotor wherein a minimum magnetic reluctance exists between said second stator and said second rotor, said further rotational position number being equal to or an integral multiple of said predetermined rotational position number; and

f. means associated with said second stator and said second rotor for generating a fixed magnetic field for restraining rotation of said rotor shaft from one of said further predetermined number of rotational positions upon de-energization of said first stator.

4,048,532

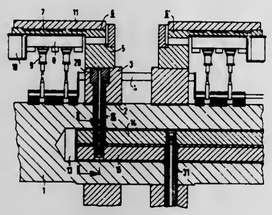
ROTATING RECTIFIER ASSEMBLY

Heinrich Küter, Wattenscheid, and Gerhard Krieger, Mulheim, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Nov. 26, 1975, Ser. No. 635,672
Claims priority, application Germany, Dec. 5, 1974, 2457615
Int. Cl.² H02K *11/00*
U.S. Cl. 310—68 D **3 Claims**

1. In an electrical machine having a rotary shaft, a rotating rectifier assembly comprising two support wheels mounted on the shaft in insulated relationship thereto and formed with respective ring flanges, said two support wheels forming direct

current poles, the shaft being formed with an axial bore, at least two direct current conductors disposed in said axial bore, and three current connecting bolts extending radially from each of said two support wheels at uniformly spaced divisions about the periphery thereof, two of said current connecting bolts extending directly to one of said direct current conductors of



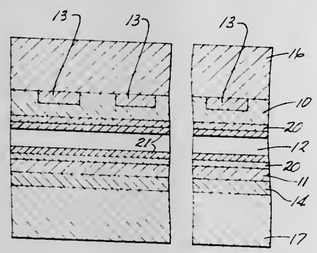
given polarity and the remaining one of said current connecting bolts extending insulatedly through the other of said direct current conductors having a polarity opposite to said given polarity, said three current connecting bolts all terminating in the respective direct current conductor in a common plane transverse to the respective direct current conductor.

4,048,533

PHOSPHOR OVERCOAT

David C. Hinson, Whitehouse; Wolfgang W. Bode, Sylvania; Michael E. Fein, and H. Joseph Hoehn, both of Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 188,490, Oct. 12, 1971, abandoned. This application Oct. 26, 1973, Ser. No. 409,874
Int. Cl.² H01J 1/62
U.S. Cl. 313—188 13 Claims



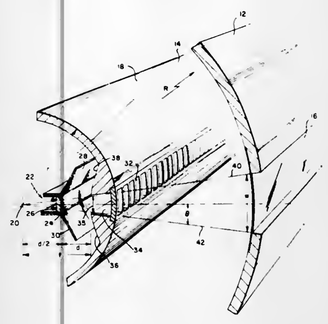
1. In an information display gas discharge device containing opposing electrode arrays defining coplanar multiple gas discharge units in said device, each having a discharge gap under about 10 mils, an ionizable gaseous medium, and a phosphor means selectively excited at least in part by radiation from a selected one of said gas discharge units in the device, the improvement comprising an overcoat on said phosphor, said overcoat being selected from the group consisting of alkali and alkaline earth fluorides, being at least partially transmissive to phosphor excitation radiation from the gas discharge and being of a material having a relatively high coefficient of secondary emission of electrons when struck by photons, ions, metastable atoms, or metastable molecules for conditioning of the gaseous medium and the thickness of said overcoat being sufficient to screen out undesirable particles and radiation to increase the life of the phosphor.

4,048,534

RADIAL FLOW ELECTRON GUN

George R. Brewer, Malibu, and Kurt Amboss, Pacific Palisades, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 25, 1976, Ser. No. 670,471
Int. Cl.² H01J 1/46, 21/10
U.S. Cl. 313—293 3 Claims



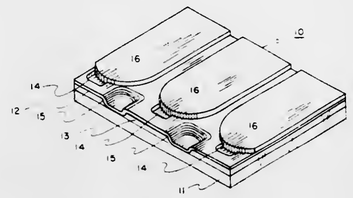
1. An electron gun comprising:
an elongated planar electron source for providing parallel electron flow therefrom along the length of said electron gun said electron source being a heated strip of thermionic material having a front surface for emitting electrons;
a tubular anode having an external surface which is cylindrical with respect to an axis and having a slot therethrough parallel to said axis, said electron source being positioned within said anode between said slot and the axis of said cylindrical anode surface, said anode slot forming an electron lens at the inner surface of said anode, said lens having a focus substantially on said axis to form a cylindrically divergent electron beam in said slot, this positioning being such as to produce divergent electron flow with radial electron paths which are independent of beam current and anode voltage;
Pierce electrodes positioned adjacent said thermionic cathode surface and extending in an axial direction so that a parallel flow of electrons is delivered by said source to said slot and electron lens action in said slot causes beam divergence;
a bar grid in said slot, the external surface of said bar grid lying in line with said cylindrical exterior surface of said anode, said bar grid having bars which have a bar depth in the direction of electron flow at least substantially twice the bar grid spacing in the axial direction so that said bars are of sufficient depth in the direction of beam flow and with close enough spacing in a direction parallel to said axis that the electric field external of said anode does not substantially penetrate and slot so that radial beam flow is unperturbed; and
an accelerator electrode having a cylindrical interior surface with its axis lying on said axis of said anode, a window in said accelerator electrode, said window lying at the interior cylindrical surface of said accelerator electrode so that accelerating electric equi-potential lines between said anode and said accelerator electrode are uniformly cylindrical to accelerate the electron beam in a radial direction with the beam passing through said window so that current density distribution at said window is independent of beam current and anode voltage.

4,048,535

LEAD-TIN-TELLURIDE PHOTODETECTOR ARRAY

John T. Cox, Alexandria; Michael B. Garber, Woodbridge; Marilyn A. Jasper, Springfield, and Paul LoVecchio, Reston, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 4, 1976, Ser. No. 683,441
Int. Cl.² H01J 31/38, 29/45
U.S. Cl. 313—367 1 Claim
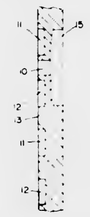


1. A photodiode array comprising:
a wafer of Pb_5Sn_2Te;
an insulating layer covering most of the exposed surface of said chip defining only a plurality of small rectantular windows wherein the surface of the chip is exposed;
a thin layer of indium covering all of said insulating layer and all of said rectangular windows; and
a plurality of thick indium lead-out pads mounted on said thin layer, each pad overlapping only a different one of said rectangular windows.

4,048,536

SHADOW MASK WITH PLURALITY OF RECESSED REGIONS EXTENDING ACROSS MASK IN TWO DIRECTIONS

Silas A. Brown, Lake Elmo, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.

Filed Mar. 18, 1976, Ser. No. 668,317
Int. Cl.² H01J 29/07, 29/08
U.S. Cl. 313—403 6 Claims



1. An aperture mask having a plurality of openings therein for the projection of an electron beam therethrough comprising:
a sheet of metal having a front side and a back side, said sheet of metal having a plurality of openings located therein, said plurality of openings forming a plurality of rows of openings, a plurality of cavities located on the back side of said mask with a cavity located around and including each of said plurality of openings in said mask;
a plurality of recessed regions forming a pattern of recessed regions and located on the front side of said sheet of metal, said pattern of recessed regions extending across said mask in two directions so that said mask can be formed in at least two directions without rupturing said sheet of metal.

4,048,537

PROTECTIVE ULTRAVIOLET-TRANSMITTING SLEEVE FOR FLUORESCENT LAMP

Ronald G. Blaisdell, Saugus; Harold L. Hough, Beverly, and Robert E. Levin, Hamilton, all of Mass., assignors to GTE Sylvania Incorporated, Salem, Mass.

Filed June 4, 1976, Ser. No. 693,026
Int. Cl.² H01J 61/40, 61/42
U.S. Cl. 313—489 21 Claims



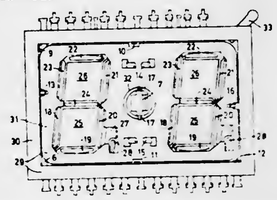
1. A lamp assembly comprising, in combination:
an electric lamp having a frangible envelope and adapted for emitting a significant amount of ultraviolet radiation during normal operation;
a protective shield for said lamp disposed in substantially adjacent relationship with said envelope and formed of a plastic material comprising a fluorocarbon resin having a wall thickness in the range of about 0.010 to 0.040 inch which has a spectral transmittance of at least about 80% of the ultraviolet radiation emitted from said lamp over the wavelength range from about 320 to 400 nanometers and, after at least 100 hours of normal operation of said lamp, maintains a transmittance of at least about 80% of said ultraviolet radiation and substantially maintains its mechanical integrity; and,
means for retaining said shield in the aforesaid relationship with said envelope.

4,048,538

GAS DISCHARGE CHARACTER DISPLAY TUBE WITH APERTURED MICA PLATE

Adrianus A. M. Hendriks, and Henri-Jean G. M. Van Daelen, both of Emmasingel, Eindhoven, Netherlands

Filed June 15, 1976, Ser. No. 696,230
Int. Cl.² H01J 61/067, 61/36, 61/64
U.S. Cl. 313—519 3 Claims



1. A gas discharge tube for displaying at least two characters, comprising an envelope having flat front and rear glass walls and containing an ionizable medium, a plurality of adjacent matrix groups within said envelope, the matrix elements in at least one group comprising two plate-shaped anodes and elongate cathode strips which are arranged around said two plate-shaped anodes as a stylized 8, an additional anode associated with each of said matrix groups, both the cathode strips and the anodes each forming one assembly, supply conductors secured in a vacuum-tight manner to the glass rear wall by means of enamel, a frame of sintered glass connecting said front and rear walls, a mica plate having openings therein to expose the active front sides of the electrodes, said mica plate being clamped between bent parts of the supply conductors and parts of strips fixed by means of enamel with the supply conductors to the rear wall, the distance between the front wall and the rear wall being determined by parts of said strips bent at right angles to the rear wall, the conductors and parts

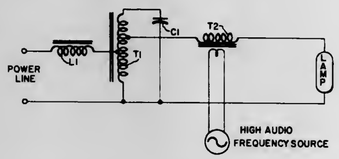
being fixed by enamel to the rear wall only below the frame of sintered glass and the flat-plate anodes being moreover fixed by enamel to the rear wall over a part of their surface.

4,048,539

APPARATUS FOR STARTING HIGH PRESSURE GASEOUS DISCHARGE LAMPS

Loren H. Walker, and William P. Kornrumpf, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 506,116, Sept. 16, 1974, abandoned. This application June 2, 1975, Ser. No. 582,840
Int. Cl.[2] H05B *41/231, 41/24*
U.S. Cl. 315—176 **1 Claim**



1. In a ballast system for a high pressure metal vapor arc discharge lamp including an ionizable gas in which the gas discharge has been extinguished, an improved means for restarting said lamp while the pressure of said lamp is on the order of 1000 Torr and the temperature is approximately 4000° K, said means comprising:
- an inductor adapted to be connected to a low voltage, low frequency power source;
- a ferro-resonant autotransformer connected to said inductor;
- a capacitor connected in parallel with said autotransformer to provide parallel resonance at said low frequency;
- a transformer having primary and secondary windings, said secondary winding connected in series with said autotransformer and said lamp;
- means connected to said primary winding for applying a substantially undamped high audio frequency voltage of between 17,000 and 60,000 Hertz and of a magnitude sufficient to provide a voltage between 2500 and 4000 volts at said secondary winding for a sufficient time after extinction of said lamp and within 1 minute thereof to cause reionization of said gas and increase the level thereof until said lower frequency power source can maintain said ionization.

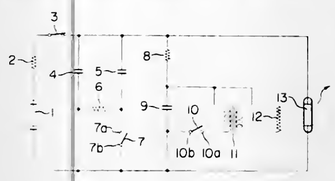
4,048,540

ELECTRONIC FLASH UNIT SERVING BOTH AS TRANSMITTER OF A REMOTE CONTROL AND FLASH UNIT FOR FLASH PHOTOGRAPHY

Yozo Iida, Komae; Yasuhito Kawahara, and Shigemi Igarashi, both of Tokyo, all of Japan, assignors to Nippon Kogaku K.K. and Sato Koki K.K., both of Tokyo, Japan

Filed Jan. 20, 1976, Ser. No. 650,692
Claims priority, application Japan, Jan. 27, 1975, 50-12165[U]
Int. Cl.[2] H05B *41/32*
U.S. Cl. 315—241 P **5 Claims**

1. An electronic flash unit serving both as the transmitter of a remote control device and a flash unit for flash photography, comprising; a power source, a flash discharge tube, a discharging circuit having an interlocking switch (7; 17) adapted to be closed in response to electrical connection of said flash unit to the synchro contacts of a camera body, said discharging circuit producing a greater magnitude of discharging current for the flashing of said flash discharge tube during the closing of said switch than during the opening of said switch, and a trigger circuit (8, 9, 10, 11, 12) having an extraneously operable trigger switch (10, 10a, 10b) and effective to trigger said flash discharge tube to effect the discharge of said discharging circuit, whereby the quantity of flash light emitted from said flash discharge tube when the connection of said flash unit to the



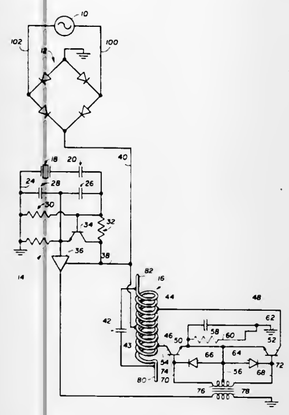
synchro contacts of said camera body is broken is less than that emitted when said connection is established.

4,048,541

CRYSTAL CONTROLLED OSCILLATOR CIRCUIT FOR ILLUMINATING ELECTRODELESS FLUORESCENT LAMP

Guy Adams, Monroe, and Scott D. Goldman, Monsey, both of N.Y., assignors to Solitron Devices, Inc., Tappan, N.Y.

Filed June 14, 1976, Ser. No. 695,852
Int. Cl.[2] H05B *41/16, 41/24*
U.S. Cl. 315—248 **3 Claims**



1. In an electrodeless bulb having a sealed chamber about a cavity leading to a base member adapted to mate with a conventional incandescent lamp socket, a circuit to excite a coating on the inner walls of the bulb by causing radiation of a fluid in said sealed chamber, said circuit comprising:
- a coil having a predetermined number of turns located central to the major bulb area having a first length extending from the turns to a closure at the end of said cavity in the sealed chamber and a second length extending from the turns to a juncture of the cavity with the base member, said lengths being connected by a resonant circuit across said turns and said turns having connections at each end and intermediate the ends;
- a voltage source;
- a crystal controlled circuitry connected to said voltage source, said circuitry providing a voltage output at a frequency below 25 kc;
- a class D amplifier circuit connected to the end connections of the turns of said coil;
- a lead connecting the connection intermediate the ends to the voltage source; and

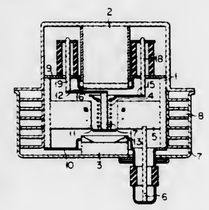
an inductive couple of the crystal circuitry and class D amplifier circuit.

4,048,542

PERMANENT MAGNETS OF DIFFERENT MAGNETIC MATERIALS FOR MAGNETRONS

Hiroshi Miura, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 21, 1976, Ser. No. 678,757
Claims priority, application Japan, Apr. 25, 1975, 50-50348
Int. Cl.[2] H01J *25/50*
U.S. Cl. 315—39.71 **17 Claims**



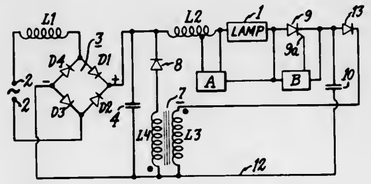
1. A magnetron comprising:
- an anode in which resonance cavities are defined,
- a cathode disposed at the axis of the anode,
- a pair of permanent magnets creating a magnetic field in a direction substantially vertical to an electric field produced between the anode and cathode,
- one of the permanent magnets being made and readily magnetizable and demagnetizable magnetic material and the other being made of difficultly magnetizable and demagnetizable magnetic material having a larger coercive force than that of the magnetic material of the said one of the permanent magnets,
- a yoke magnetically coupled to the pair of permanent magnets, and
- sealing means for hermetically sealing the anode.

4,048,543

DISCHARGE LAMP OPERATING CIRCUIT

Daniel V. Owen, and David W. Knoble, both of East Flat Rock, N.C., assignors to General Electric Company, New York, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,041
Int. Cl.[2] H05B *41/231, 41/30*
U.S. Cl. 315—205 **11 Claims**



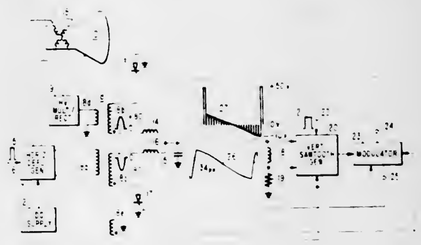
1. A load operating circuit comprising, in combination, a direct current power source, a capacitor connected across said power source, an inductor, controlled switch means and load connecting means connected in series across said power source, a transformer having a primary winding and a secondary winding, said primary winding having a higher inductance than said inductor, first unidirectional conducting means connected in series with said primary winding across said power source, second unidirectional conducting means connected in series with said secondary winding across said power source, and control means coupled to said controlled switch means for repetitively operating the same at predetermined intervals, whereby DC pulses may be applied to the load for operation thereof.

4,048,544

SWITCHED VERTICAL DEFLECTION SYSTEM

Peter Eduard Haferl, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed July 14, 1975, Ser. No. 595,809
Claims priority, application United Kingdom, Feb. 20, 1975, 07161/75
Int. Cl.[2] H01J *29/70, 29/76*
U.S. Cl. 315—408 **11 Claims**



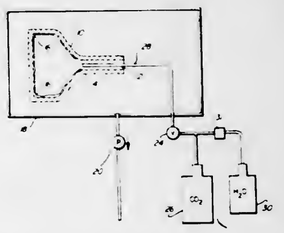
1. In a deflection system for cathode ray tubes, said deflection system of the type including a horizontal deflection circuit for deflecting an electron beam of said cathode ray tube in a horizontal direction in response to a horizontal deflection wave, a vertical deflection circuit comprising:
- a vertical deflection winding responsive to a sawtooth current therethrough for deflecting said electron beam of said cathode ray tube in a vertical direction; and
- means for applying successively smaller portions of the energy of said horizontal deflection wave during one interval of said vertical deflection and successively greater portions of said energy of said horizontal deflection wave during a second interval of said vertical deflection to said vertical deflection circuit for producing all of said sawtooth current in said vertical deflection winding, said first and second intervals occurring during the trace portion of each vertical deflection interval.

4,048,545

CATHODE RAY TUBE PROCESSING

Thomas Harry Madden, Euclid, and Clair Wilbur Reash, Fairview Park, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 24, 1976, Ser. No. 744,819
Int. Cl.[2] H01J *9/50*
U.S. Cl. 316—2 **2 Claims**



1. Method for treating and gettering a picture tube which

has been previously gettered by flashing of a barium-containing material therein and which as a result of said flashing has a barium film on portions of its internal surface, said method comprising:

i. converting said barium film to barium carbonate by contacting the barium film on the inner surface of said previously gettered picture tube with a gas mixture consisting essentially of CO_2 and water vapor said gas mixture being at least about 10% by volume of CO_2 and said water vapor being in an amount of at least about 1% of the volume of CO_2 but less than the amount which corresponds to the dew point of water vapor in said mixture,

ii. subsequently evacuating said picture tube to a pre-gettering vacuum and

iii. gettering said picture tube by flashing a barium-containing getter therein.

4,048,546

DIELECTRIC POWDER COMPOSITIONS

Robert Joseph Bouchard, Wilmington, Del., and Lothar Heinrich Brixner, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 9, 1975, Ser. No. 594,282
Int. Cl.² C04B *35/00, 35/46;* H01G *4/12*
U.S. Cl. 361—321 **16 Claims**

1. A finely divided dielectric powder calcined in air at a temperature in the range 750°-900° C. for at least 5 minutes, the powder having the composition

$$(Sr_xPb_{1-x}TiO_3)_a(PbMg_{0.5}W_{0.5}O_3)_b$$

wherein

x is 0–0.10,

a is 0.35–0.5,

b is 0.5–0.65, and

a plus b equals one,

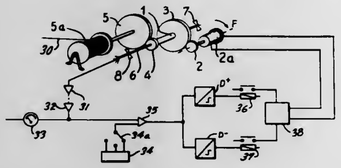
substantially all the powder particles being 20 microns or less in largest dimension, said powder being sinterable in air at temperatures in the range 900°-1050° C. to produce bodies having high dielectric constant.

4,048,547

TORQUE RESPONSIVE DEVICE

Jean Francois Pierre Marie Havard, Carquefou; Michel Marceau Gaschet, Nantes, and Henri Marie Dominique Charonnat, Reze, all of France, assignors to Brissonneau et Lotz, Carquefou, France

Continuation-in-part of Ser. No. 365,424, May 30, 1973, abandoned. This application Jan. 14, 1975, Ser. No. 540,998
Int. Cl.² H02P *7/00*
U.S. Cl. 318—488 **8 Claims**



1. A torque controlling device comprising:

a drive motor,

a driven cable windlass,

a speed reducing interconnected between said drive motor and said driven windlass, said speed reducing device being driven by said motor and including at least one intermediate gear train comprising a unitary pinion and gear mounted for free rotation on a stationary shaft by axially spaced bearings, said shaft being supported at its ends on a fixed support;

at least one pair of stress gauges fixed to said shaft and arranged to respond to bending of said shaft to produce a signal proportional to the torque applied to said intermediate gear train by said motor; and

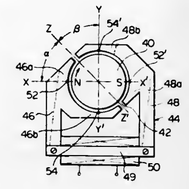
means responsive to predetermined changes in said signal to regulate the torque delivered by said motor to said intermediate gear train.

4,048,548

STEPPING MOTOR

Fumio Nakajima, Tokyo; Takayasu Machida, Iruma, and Kenji Yamada, Koganei, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 24, 1975, Ser. No. 644,262
Claims priority, application Japan, Sept. 27, 1975, 50-116617
Int. Cl.² H02K *29/00*
U.S. Cl. 318—138 **2 Claims**



1. A stepping motor comprising:

a permanent magnet rotor; and

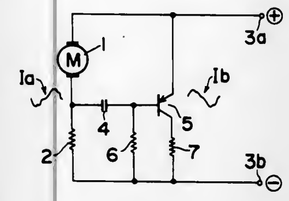
a stator including a driving coil and two stator pole pieces spaced from each other to provide an air gap within which said rotor is rotatably mounted, each of said stator pole pieces including asymmetric first and second portions, said first portions of each stator pole piece being arranged diametrically opposite each other with respect to a central axis between said stator pole pieces, said first and second portions including magnetic flux paths of different lengths whereby one of said portions has a higher flux reluctance to the flux path than the other, a static equilibrium point being provided on one of said first and second portions of each stator pole piece.

4,048,549

CIRCUIT FOR ELIMINATING CURRENT NOISES FROM D.C. MOTOR

Ken Satoh, Tokyo, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed May 27, 1975, Ser. No. 580,777
Claims priority, application Japan, May 30, 1974, 49-62497
Int. Cl.² H02P *5/16*
U.S. Cl. 318—345 F **2 Claims**



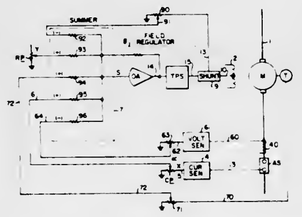
1. A circuit for eliminating current noises from a d.c. motor for use in a d.c. motor drive circuit including a bridge circuit having one branch in which the d.c. motor is connected, the bridge circuit including a pair of feed terminals and a pair of detection terminals, a comparison transistor connected across said pair of detection terminals for detecting a change in the back e.m.f. of the motor as the speed thereof varies so as to control a current flow through a feed transistor which is connected intermediate a power source and one of said feed terminals; said noise elimination circuit comprising a capacitor having its one end connected to one terminal of said d.c. motor, a waveform inverting transistor having its base connected with the other end of the capacitor, and a bias resistor for applying a bias voltage to the transistor, said capacitor being effective to apply a.c. noise current developed by the d.c. motor to the base of the transistor, which in turn inverts the noise current and supplies an inverted current to the power source to substantially eliminate said current noises.

4,048,550

FLUX CORRECTIVE CONTROL APPARATUS FOR MOTOR DRIVES

Walter R. Harris, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 3, 1975, Ser. No. 546,849
Int. Cl.² H02P *3/14*
U.S. Cl. 318—356 **1 Claim**



1. In a direct-current motor control apparatus including a field winding and a field current regulator responsive to an armature current signal and a field reference signal for establishing a drooping speed-load characteristic, the combination of:

means for deriving a motor armature voltage representative signal;

means for deriving a motor armature current representative signal;

means for subtracting said armature voltage signal from said armature current signal to derive a speed correction signal;

means for summing said reference signal with said speed correction signal operative on said regulator to compensate for non-linear field variations as a function of load, thereby to establish a linear speed-load characteristic for said motor through said field current regulator.

4,048,551

BATTERY CHARGING CIRCUIT

Barry Sheldon Bosik, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

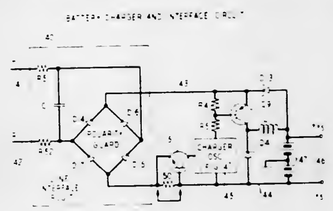
Filed Dec. 5, 1975, Ser. No. 638,164
Int. Cl.² G05F *1/56;* H02J *7/06*
U.S. Cl. 320—21 **10 Claims**

1. A remotely powered battery charger comprising

a switching signal generator,

an energy storage type direct current converter driven by switching signals from said generator,

a rechargeable battery connected to said converter, and



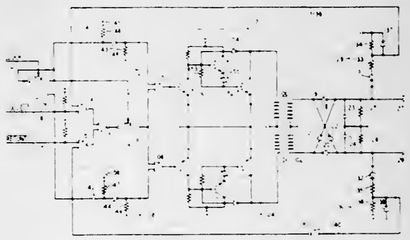
a voltage breakdown device connected in parallel with said converter to charge said battery when said converter becomes inoperative.

4,048,552

DIGITALLY REGULATED INVERTER

Dale Eugene Stone, Cedar Knolls, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 12, 1976, Ser. No. 657,353
Int. Cl.² H02M *3/335*
U.S. Cl. 363—25 **5 Claims**



1. A digitally-controlled inverter comprising:

a source of clock pulses,

a transformer responsive to said clock pulses,

a rectifier connected to the output of said transformer,

means for inhibiting only one or more successive full cycles of said clock pulses, and

means responsive to the output of said rectifier for controlling said inhibiting means.

4,048,553

INTERRUPTION-FREE POWER SUPPLY

Gunter Schierer, Hochstadt, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 24, 1976, Ser. No. 688,985
Claims priority, application Germany, June 5, 1975, 2525138
Int. Cl.² H02M *1/18*
U.S. Cl. 363—57 **6 Claims**

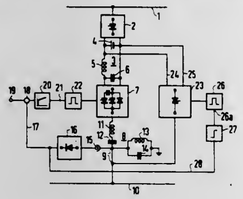
1. An interruption-free power supply for connecting a supply network to a network to be protected comprising:

a line-commutated, controlled rectifier having an input adapted to be connected to said supply network and an output which is adapted to be connected to a battery;

a self commutating controlled inverter connected to the output of said line-commutated, controlled rectifier, said inverter including filter means adapted to be connected to said network to be protected;

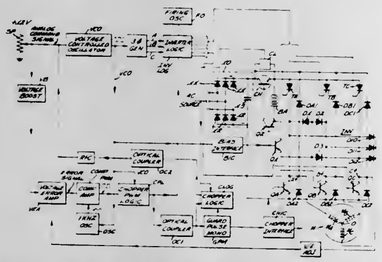
an externally commutated rectifier having a first end con-

nected to the output of said controlled inverter and a second end adapted to be connected to said battery;
means for sensing the output voltage of said inverter;



and means responsive to said sensed output voltage for controlling said externally commutated rectifier so as to enable said externally commutated rectifier to carry increased current when a voltage dependent on said sensed output voltage exceeds a predetermined limit.

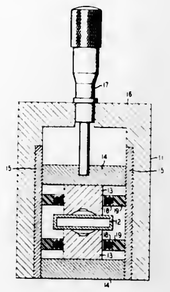
4,048,554
VARIABLE FREQUENCY, VARIABLE VOLTAGE POWER SUPPLY
Frederick A. Stich, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Nov. 22, 1976, Ser. No. 744,131
Int. Cl.² H02M 7/00
U.S. Cl. 363—98 **51 Claims**



1. An inverter for supplying variable frequency and variable magnitude voltage to a load including a voltage-controlling chopper transistor coupled in series respectively with at least a first and second load current carrying controlled rectifier across the positive and negative polarities of said source, means for time ratio controlling said chopper transistor as a function of the magnitude of an analog command signal, means for modulating said controlled rectifiers at a frequency which is a function of the magnitude of said analog command signal to establish inverter output frequency, and commutation means for intermittently applying reverse bias voltage to said controlled rectifiers to commutate them off while said transistor chopper is turned off.

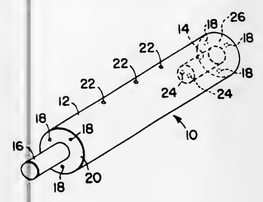
4,048,555
SPIN RESONANCE SPECTROMETER AND MAGNET STRUCTURE
Louis William Rupp, Jr., Kintnersville, Pa., and Walter Michael Walsh, Jr., Berkeley Heights, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed June 15, 1976, Ser. No. 696,471
Int. Cl.² G01R 33/08
U.S. Cl. 324—.5 MA **7 Claims**

1. A magnet structure comprising:
a. a pair of coaxial permanent magnets, each of which is circularly symmetric about the common axis, and each of which possesses a first face and a a second face, the first faces of which are spaced from one another to form a gap free from domain magnetic material, the magnets being axially magnetized with poles of opposite polarity facing one another; and
b. a housing including soft magnetic material in contact with the permanent magnets at the second face of each magnet,



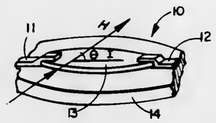
the housing holding the magnets in spaced relationship and providing a return path for magnetic flux around the gap characterized in that the first face of each permanent magnet forms an axial depression so shaped as to be monotonically deeper toward the axis, whereby the radial and axial uniformity of the magnetic field at the center of the gap is improved.

4,048,556
METHOD FOR EVALUATING ELECTRODE CONSUMPTION RATE
Maurice P. Roach, and Stanley L. Strudthoff, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Mar. 31, 1976, Ser. No. 672,307
Int. Cl.² G01R 33/14
U.S. Cl. 324—40 **10 Claims**



1. A method of determining the approximate consumption rate of a plurality of graphite electrodes which comprises:
applying an electrical signal to a number of the plurality of graphite electrodes to generate eddy currents in said electrodes;
sensing the generated eddy current to obtain eddy current values;
using said number of electrodes in an electric arc furnace and measuring the consumption rate of each of the said number of electrodes during said use;
determining a standard correlation between eddy current values and the said measured consumption rates; and
comparing the eddy currents values obtained from the remaining plurality of graphite electrodes with the standard eddy current correlation value to determine the approximate consumption rate thereof.

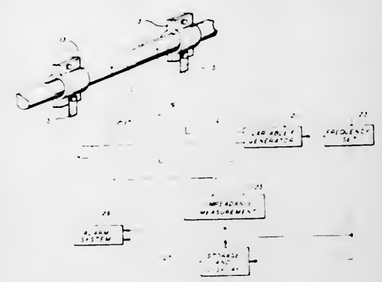
4,048,557
PLANAR MAGNETORESISTANCE THIN FILM PROBE FOR MAGNETIC FIELD ALIGNMENT
Thomas T. Chen, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Nov. 17, 1975, Ser. No. 632,735
Int. Cl.² G01R 33/02
U.S. Cl. 324—46 **13 Claims**



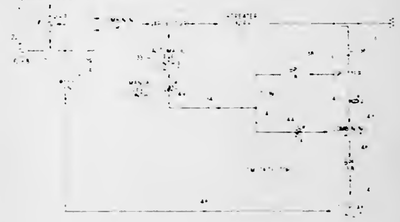
1. In combination,
a magnetic bubble domain structure including;
a layer of material which is capable of forming and supporting magnetic bubble domains therein;
a magnetizable device supported by said layer for selectively manipulating a magnetic bubble domain in said layer; and
means for applying magnetic fields to said structure; said magnetic fields including,
a bias magnetic field which is substantially orthogonal to said structure and is useful in forming magnetic bubble domains in said layer and which bias magnetic field may include an in-plane component which is in the plane of said device, and a propagating magnetic field which is substantially in the plane of said device and is useful in propagating magnetic bubble domains in said layer,
the improvement comprising:
means for detecting the in-plane component of said bias magnetic field including,
a planar magnetoresistance effect probe for measuring the in-plane component of the bias magnetic field applied to said magnetic bubble domain structure,
said probe formed on said layer and substantially coplanar with said device,
said probe comprising at least one magnetic element,
said magnetic element having dimensions such that the demagnetization field of said element is greater than the coercivity and anisotropy fieid thereof;
means for supplying a constant current to said magnetic element; and
means for producing an output voltage signal adapted for sensing and measuring the change in magnetoresistance in said magnetic element in response to a magnetic field which change in magnetoresistance is a function of the in-plane component of the bias magnetic field in the plane of said magnetic element and said magnetic bubble domain device such that any non-symmetry in the output signal is a measure of the in-plane bias component of the bias magnetic field.

4,048,558
METHOD AND APPARATUS FOR DETECTING METAL FAILURES IN SITU
Clark Goodman, 95 Antigua Court, Coronado, Calif. 92118
Filed Aug. 6, 1975, Ser. No. 602,429
Int. Cl.² G01R 27/00
U.S. Cl. 324—57 R **36 Claims**

1. A method of detecting metal failures in situ comprising:
a. conductively coupling an electrical generator to a section of metal to be tested to form a closed conductive circuit;
b. passing currents at different frequencies through said section of metal to be tested;
c. measuring at least one electrical characteristic of the circuit at each of said different frequencies; and
d. comparing said at least one characteristic with a previous value of that characteristic whereby the presence and depth of a failure in said metal can be detected by determining the frequencies at which a change in said characteristic is found.



4,048,559
METHOD AND APPARATUS FOR TESTING MICROWAVE REPEATERS FOR IM DISTORTION
Hotze Miedema, Boxford, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Jan. 5, 1977, Ser. No. 756,959
Int. Cl.² G01R 29/00
U.S. Cl. 324—57 SS **14 Claims**



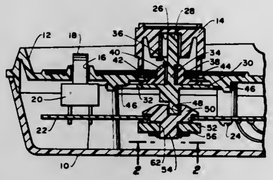
1. Apparatus for measuring the non-linearity of a device subject to distortion, which comprises:
means for generating a first signal of frequency f_o;
means for generating a second signal of frequency $(f_o+\delta)$, where δ is an offset frequency which is small compared to the bandwidth of the device under test;
means for generating a third signal of swept frequency f;
means for combining said first, second and third signals thereby to generate first and second test signals of frequency (f_o+f) and $(f_o+\delta+f)$ respectively, the frequencies f_o f and δ being selected such that the test signals scan the band of interest, said test signals being applied to the input of the device under test; and
detector means, connected to the output of the device under test, for measuring the amplitude of any component in the output signal for the device under test of frequency $(f_o-\delta+f)$ or $(f_o+2\delta+f)$, said measuring means including means for cancelling any component of frequency 2δ caused by distortion within the detector means itself.

4,048,560

ELECTRICAL METER APPARATUS

Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation, Los Angeles, Calif.

Filed Nov. 15, 1976, Ser. No. 741,543
Int. Cl.² G01R *15/08;* H01H *19/58*
U.S. Cl. 324—115 **3 Claims**



1. In combination with an electrical meter apparatus, said electrical meter apparatus being mounted within a housing, said housing being connected with visual observation means for denoting various electrical readings, electronic circuitry mounted on a printed circuit board, said printed circuit board located within said housing, said electrical circuitry connected to operate said visual observation means, said electronic circuitry including a plurality of separate circuit paths, the improvement comprising:

selector means connected to said housing and being movable to select an individual said circuit path of said plurality of separate circuit paths, said selector means including a plug rotatably mounted within an oversized opening within said printed circuit board, said plug capable of a limited amount of canting movement relative to said printed circuit board, an electrical contact member attached to said plug the portion of said contact member to be in physical contact with said printed circuit board, said portion comprising at least a pair of electrical contacts each of which are spring biased towards said printed circuit board with the same degree of force, the resultant force of said spring biased contacts tending to maintain said plug axially aligned within said oversized opening, said electrical contacts being aligned 180° apart about said member; and

said selector means including a manually operatable knob located exteriorly of said housing, said knob being connected with a switch rotor, said switch rotor extending through an opening in said housing, a portion of said switch rotor cooperating in a loose fitting manner with a socket formed within said plug, said switch rotor being rotatable with respect to said housing, the interconnection between said housing and said switch rotor permitting a limited amount of canting movement of said switch rotor relative to said housing.

4,048,561

APPARATUS FOR PREVENTING SIMULTANEOUS TRANSMISSION AND CHANNEL SELECTION IN A TRANSMITTER OR TRANSCEIVER

Glade Wilcox, Kalamazoo, and Keith A. Packard, Greenville, both of Mich., assignors to Robyn International, Inc., Rockford, Mich.

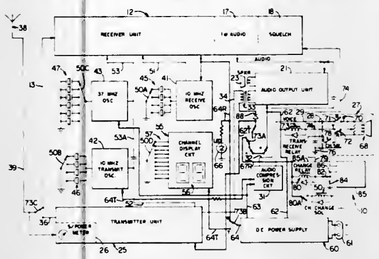
Filed Nov. 28, 1975, Ser. No. 636,021
Int. Cl.² H04B *1/04, 1/54*
U.S. Cl. 325—22 **10 Claims**

1. A radio apparatus, comprising:

a radio transmitter having several alternatively selectable transmission frequencies and a switch connected to said transmitter and having transmit and receive positions, said switch being manually actuable between its transmit and receive positions;

means actuable for switching said transmitter from frequency to frequency among said several frequencies and for stopping said switching at the desired one of the several frequencies; and

locking means operatively connected to said switch and to said frequency switching means and responsive to the



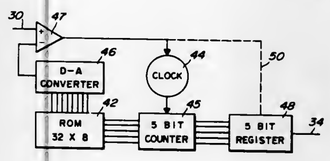
position of said switch for preventing any transmitter frequency switching with said manually actuable switch in its transmit position and for permitting such transmitter frequency switching only with said switch in its receive position.

4,048,562

MONITORING SYSTEM FOR VOLTAGE TUNABLE RECEIVERS AND CONVERTERS UTILIZING VOLTAGE COMPARISON TECHNIQUES

Donald E. Haselwood, Clearwater; Carl M. Solar, Largo, and Jeffrey R. Thumm, Clearwater, all of Fla., assignors to A. C. Nielsen Company, Northbrook, Ill.

Filed May 22, 1975, Ser. No. 580,054
Int. Cl.² 340 *347 DA;* H04B *17/00*
U.S. Cl. 325—31 **15 Claims**



1. Apparatus for determining at a central location the channel to which a remotely located receiver tunable to a plurality of channels by a tuning voltage has been tuned comprising:

means for sequentially generating a plurality of digital indications of numbers identifying said channels;

means responsive to said channel number digital indication generating means for sequentially generating a plurality of coded representations of voltages, each said coded representations corresponding to one of said digital indications and being nonlinearly related to said digital indications;

means for sequentially comparing each of said coded representations with the tuning voltage applied to said receiver;

means responsive to said sequentially comparing means for generating a digital code representative of the digital indication corresponding to the coded representation representing a voltage having an amplitude within a predetermined range of amplitudes relative to the amplitude of the tuning voltage applied to said receiver; and

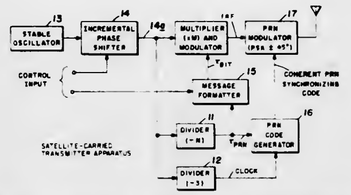
means for transmitting said digital code to the central location.

4,048,563

CARRIER-MODULATED COHERENCY MONITORING SYSTEM

Eugene F. Osborne, Westminster, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 17, 1975, Ser. No. 623,539
Int. Cl.² H04B *7/00*
U.S. Cl. 325—58 **10 Claims**



1. In a radio transmission system for transmitting information between spaced location, the combination comprising:

signal source means for generating a carrier signal of radio frequency, f_{rf},

source means for generating a synchronizing code having a repetitive time frame which is numerically related to the period, $1/f_{rf}$, of said carrier signal by a predetermined fixed multiplier,

modulator means connected to said carrier signal source and said synchronizing code source for modulating said carrier signal with said synchronizing code,

transmitter means for transmitting said modulated carrier signal,

receiver means for receiving said modulated carrier signal and including means for recovering said carrier signal and said synchronizing code from said modulated carrier signal, and

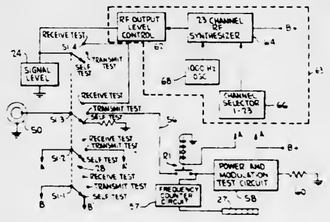
measurement means responsive to said recovered carrier signal and synchronizing code and including counter means and counter control means, said counter control means being responsive to said synchronizing code for controlling said counter means to register a count of the number of whole and fractional cycles of said carrier signal received in a measurement time interval corresponding to the repetitive time frame of said synchronizing code as received.

4,048,564

TRANSCEIVER TEST DEVICE

Thomas Paul Gleeson, Jr., 2118 William St., Cape Girardeau, Mo. 63701

Continuation-in-part of Ser. No. 652,149, Jan. 26, 1976, abandoned. This application Dec. 20, 1976, Ser. No. 752,124
Int. Cl.² H04B *1/38, 17/00*
U.S. Cl. 325—67 **18 Claims**



13. A transceiver test device comprising

panel means mounting connector means adapted to receive an antenna connector of a transceiver to be tested, and indicator means for displaying power received from the transceiver to be tested;

transmit test means including means for receiving the output of the transceiver to be tested via the antenna connector thereof and said connector means, and signal processing means for supplying a signal representative of the transceiver output to said indicator means to display output power received from the transceiver to be tested;

receive test means including channel selector means for supplying a test signal on selected channel frequencies to said connector means for supply to the transceiver to be tested via the antenna connector thereof such that the test signal can be heard on a speaker of the transceiver to be tested to permit testing of the receive operation of the transceiver on various channels; and

test sequence selector means having a transmit test position for connecting said transmit test means with said connector means and a receive test position for connecting said receive test means with said connector means.

4,048,565

LOCATION INDICATING DEVICE

Loyal E. Rice, Sr., Fresno, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 17, 1976, Ser. No. 697,130
Int. Cl.² H04B *1/02*
U.S. Cl. 325—114 **1 Claim**



1. A location indicating device for indicating the location of a craft in need of assistance, said craft having a compartment therein and opening on the outside of the craft and a cover on the compartment releasably covering the opening of the compartment and adapted to open when the craft suffers an impact, said location indicating device comprising

a balloon;

a container mounted on the balloon and borne aloft by the balloon when the balloon is inflated;

compressed gas in the container;

trigger means coupling the container to the balloon and affixed to the cover of the compartment for supplying the gas to the balloon to inflate it when the cover is opened, said trigger means comprising a valve operated by a lanyard coupling the valve to the cover;

radio transmitter means in the container for transmitting distress signals;

light means in the container for producing intermittent blue flashes of light;

switch means connected to the transmitter means, light means and to cover of the compartment for activating said transmitter means and said light means when the cover is

opened, said switch means comprising ON-OFF switches for the transmitter means and light means and a lanyard coupling said switches to the cover; and

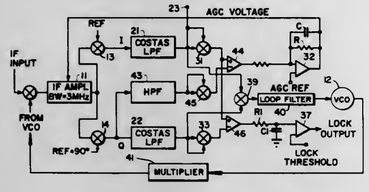
a line wound in the compartment and having a first end affixed to the craft and a second end affixed to the container for tethering the balloon when it is airborne.

4,048,566

SUPPRESSED CARRIER AUTOMATIC GAIN CONTROL CIRCUITRY

Lansing M. Carson, Tempe, and Neil E. Welter, Scottsdale, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jan. 5, 1976, Ser. No. 646,729
Int. Cl.² H04B *1/68*
U.S. Cl. 325—329 **3 Claims**



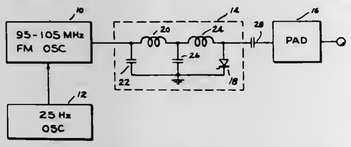
1. In a receiver of the type adapted to receive suppressed carrier signals such as a receiver with a Costas loop configuration, wherein the incoming signal is decomposed into in-phase and quadrature phase components and processed in two channels to obtain data output, and wherein an automatic gain control signal is obtained and used to provide an automatic gain control feedback signal for stabilizing the amplitude level of data output and the loop gain, the improvement which comprises means for deriving a noise estimate signal from one channel and means for subtracting the noise estimate signal from the data and noise signal combination in the other channel to derive the automatic gain control signal and prevent false locking of the receiver.

4,048,567

BROAD BAND MICROWAVE RECEIVER GAIN CALIBRATOR

Edgar A. Johnson, Tujunga, and Bruce L. Myers, Inglewood, both of Calif., assignors to The Singer Company, New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,931
Int. Cl.² H03B *21/00*
U.S. Cl. 325—363 **3 Claims**



1. A gain calibrator for generating a continuous band of calibration pulses of determinable amplitude over a wide calibration range of radio frequencies, said calibrator comprising:

a frequency modulated signal source having a fundamental frequency that is the Nth subharmonic of the lowest radio frequency in the calibration range, the frequency modulated output of said signal source having a total frequency swing of 1/N of said fundamental frequency;

a low frequency oscillator coupled to modulate said signal source; and

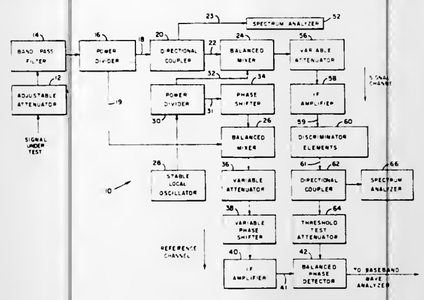
an impulse generator including a step recovery diode coupled to the output of said signal source for producing a continuous and overlapping band of pulses beginning at the lower frequency end of said calibration band and extending to the upper frequency limit of said calibration band.

4,048,568

WIDE OPERATING FREQUENCY RANGE SUPERHETERODYNE FM NOISE ANALYZER

Gustaf J. Rast, Jr.; Thomas A. Barley; Raiford L. Hammond, all of Huntsville, Ala., and James R. Ashley, Colorado Springs, Colo., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 30, 1976, Ser. No. 718,723
Int. Cl.² H04B *17/00*
U.S. Cl. 325—363 **8 Claims**



1. A wide operating frequency range analyzer for measuring input carrier frequency signals of very low signal level comprising:

first and second power dividers each having an input and first and second outputs, the input of said first divider being coupled to receive said input carrier signals; first and second balanced mixers each having first and second inputs and an output, the first input of said first mixer being coupled to the first output of said first divider, the second input of said first mixer being connected to the first output of said second divider, the first input of said second mixer being coupled to the second output of said second power divider and the second input of said second mixer being coupled to the second output of said first power divider for providing superheterodyne mixing of signals coupled thereto; oscillator means coupled to said second power divider input for providing a local oscillation signal thereto; quadrature detection means having first and second inputs and an output, said second input being coupled to the output of said second mixer, the output of said detection means being disposed to couple output signals therefrom; discriminator means coupled between the output of said first mixer and the first input of said detection means; and wave analyzer means coupled to receive said detection means output signals.

4,048,569

RECEIVER AUTOMATIC GAIN CONTROL SYSTEM

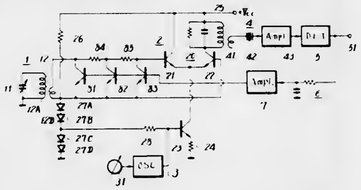
Wataru Yamatani, Hatogayashi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 29, 1976, Ser. No. 671,393
Claims priority, application Japan, Apr. 9, 1975, 50-43033
Int. Cl.² H04B *1/16*
U.S. Cl. 325—414 **5 Claims**

1. A receiver comprising:

a. an antenna circuit having a resonance circuit and which produces an electrical signal in response to a broadcasting signal;

b. automatic gain control coupling means coupled to said resonance circuit and comprising a voltage divider having a plurality of resistive elements connected in series, and a plurality of variable impedance elements connected in parallel and having commonly connected control inputs, each of said variable impedance elements being connected at one end of one of said resistive elements; and



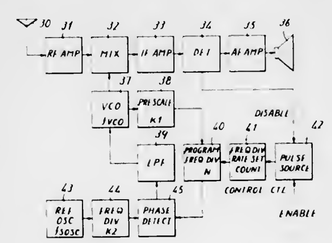
c. circuit means for amplifying and detecting and for providing a DC signal to said automatic gain control coupling means, said DC signal being directly connected to said variable impedance elements commonly connected control inputs to supply an automatic gain control signal to vary their impedance values.

4,048,570

MULTIPLE-BAND DIGITAL FREQUENCY SYNTHESIZER RECEIVER

Yasuaki Sumi, Tottori, Japan, assignor to Sanyo Electric Co., Ltd. and Tottori Sanyo Electric Co., Ltd., both of Moriguchi, Japan

Filed May 11, 1976, Ser. No. 685,343
Claims priority, application Japan, May 30, 1975, 50-65938; May 30, 1975, 50-65940; Aug. 29, 1975, 50-105286; May 30, 1975, 50-73699[U]; Oct. 17, 1975, 50-143254[U]
Int. Cl.² H04B *1/26*
U.S. Cl. 325—459 **13 Claims**



1. A multiple-band superheterodyne receiver, comprising means for receiving a plurality of receiving frequency bands each containing high frequency signals of different frequencies, local oscillating means for providing an oscillation frequency signal the frequency of which is different by a given frequency difference from a said received high frequency signal, mixing means responsive to a said received high frequency signal in a given receiving frequency band and said local oscillation frequency signal for providing an intermediate frequency signal, means for selecting one of said plurality of receiving frequency bands for reception, and means for setting information concerning the frequency of a high frequency signal to be received in a selected receiving frequency band, said local oscillating means comprising

voltage controlled oscillating means for providing an oscillation frequency signal the oscillation frequency of which is variable as a function of a given control voltage,

means for storing information concerning a plurality of frequency differences, each corresponding to one of said plurality of receiving frequency bands and responsive to the operation of said band selecting means for selectively withdrawing the information concerning the frequency differences of the corresponding selected receiving frequency band,

first means responsive to said withdrawn information concerning said frequency difference and said information concerning the frequency of a high frequency signal to be received for producing an output at a first frequency which is a function of the sum or difference of said two pieces of information, and

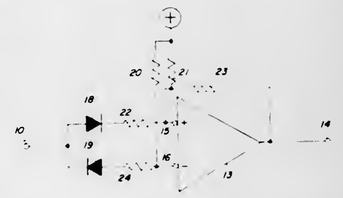
means responsive to the output from said first means for providing a control voltage to said voltage controlled oscillating means, whereby said local oscillating means provides a local oscillation frequency signal the frequency of which is function of the output of said first means which in turn is a function of said two pieces of information.

4,048,571

FREQUENCY DOUBLER

Charles L. Jacobson, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 12, 1973, Ser. No. 340,491
Int. Cl.² H03K *1/16*; H03B *19/00*
U.S. Cl. 328—20 **6 Claims**



1. Circuitry for doubling the frequency of a periodic input signal comprising

a differencing amplifier having a first input terminal, a second input terminal, and an output terminal, said amplifier providing a first signal at said output terminal when said first terminal has a greater applied signal level than said second terminal and providing a second signal at said output terminal when said second terminal has a greater applied signal level than said first terminal,

biasing means connected to said amplifier input terminals for providing a higher signal level to said second terminal than to said first terminal, said biasing means including

a single voltage source,

a first resistor connected between said voltage source and said amplifier first input terminal, and

a second resistor connected between said voltage source and said amplifier second input terminal, said second resistor having a smaller resistance value than said first resistor, and

input means connected to said input terminals for increasing the signal level at said first terminal when said input signal is above a predetermined level and for decreasing the signal level at said second terminal when said input signal is below said predetermined level, said input means including

means for receiving said input signal,

a first branch adapted to unidirectionally conduct current from said receiving means to said amplifier first input terminal when said input signal is above said predetermined level, and

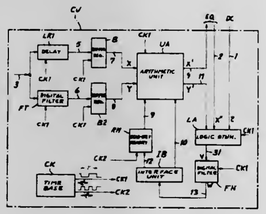
a second branch adapted to unidirectionally conduct current from said amplifier second input terminal to said receiving means when said input signal is below said predetermined level.

4,048,572

ADAPTIVE CORRECTION OF PHASE ERRORS IN NONCOHERENT DEMODULATION OF CARRIER ASYMMETRICALLY MODULATED WITH DIGITAL SIGNALS

Renato Dogliotti; Umberto Mazzei, both of Turin, and Umberto Mengali, Pisa, all of Italy, assignors to CSELT - Centro Studi e Laboratori Telecommunicazioni S.p.A., Turin, Italy

Filed Dec. 20, 1976, Ser. No. 752,168
Claims priority, application Italy, Dec. 18, 1975, 70116/75
Int. Cl.² H03K 9/04
U.S. Cl. 329—104 12 Claims



1. A method of correcting distortions due to phase errors in a train of data signals recovered during successive clock cycles by noncoherent demodulation from an asymmetrically modulated carrier, comprising the steps of:

deriving a train of raw bipolar quadrature signals from the train of recovered raw bipolar data signals;

cross-multiplying said raw data signals and said raw quadrature signals with two mutually conjugate trigonometric functions of a magnitude substantially compensating said phase errors, thereby generating corrected bipolar in-phase signals and corrected bipolar quadrature signals;

generating a series of reference signals by quantizing said corrected in-phase signals;

obtaining a succession of bipolar difference signals by subtractively combining said corrected in-phase signals and said reference signals;

multiplying at least parts of said difference signals with at least parts of said corrected quadrature signals to produce bipolar error signals of a polarity which is the product of the polarities of said difference signals and of said corrected quadrature signals;

averaging said error signals over a plurality of clock cycles to obtain a succession of corrective bipolar feedback signals; and

deriving said trigonometric functions from said feedback signals.

4,048,573

AMPLIFIER IMPROVEMENTS FOR LIMITING CLIPPING

Ronald C. Evans, and Sidney A. Corderman, both of Binghamton, N.Y., assignors to McIntosh Laboratory, Incorporated, Binghamton, N.Y.

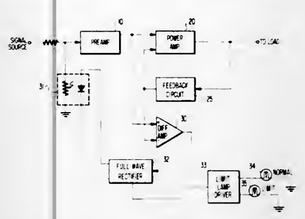
Filed Oct. 15, 1976, Ser. No. 732,824
Int. Cl.² H03G 3/30
U.S. Cl. 330—2 10 Claims

1. A device for maintaining linear amplification and to avoid clipping of an electrical signal applied to one input of an amplifier which amplifier includes a negative feedback coupling means coupling an amplified signal back to another input of said amplifier, said device comprising:

a differential amplifier with a pair of inputs, one coupled to said one amplifier input and the other connected to the output of said negative feedback coupling means, said differential amplifier producing an output signal when its inputs are different;

a full wave rectifier connected to the output of said differential amplifier; and,

signal attenuation means coupling a source of said electrical



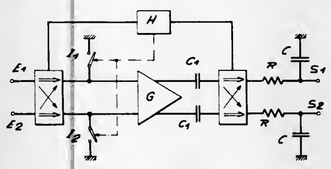
signals to said amplifier and connected to said full wave rectifier for reducing the amplitude of the signal coupled to said amplifier when said differential amplifier produces an output.

4,048,574

METHOD AND A DEVICE FOR ELIMINATING THE RESIDUAL ERROR VOLTAGE OF AN AMPLIFIER

Daniel Barbier, Echirolles; Jean-Michel Ittel, Seyssinet Pariset, and Robert Poujois, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed June 25, 1976, Ser. No. 699,975
Claims priority, application France, Sept. 1, 1975, 75.20599
Int. Cl.² H03F 1/02
U.S. Cl. 330—9 11 Claims



1. A method of elimination of the residual error voltage of an amplifier having two inputs supplied from a signal source and two outputs, said amplifier being intended to deliver a signal into an output element downstream of said amplifier, wherein the connections between the inputs of said amplifier are periodically inverted with said source and the outputs of said amplifier are inverted with said output element and wherein an integration is carried out between the outputs of said amplifier and the inputs of the output element.

4,048,575

OPERATIONAL AMPLIFIER

Fuad H. Musa, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sept. 11, 1974, Ser. No. 505,196
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.² H03F 3/16, 3/45
U.S. Cl. 330—22 4 Claims

3. An operational amplifier comprising:

A. a source of potential having at least a first and a second voltage level;

B. a first and a second differential amplifier, each of said differential amplifiers including:

C. differential input means for receiving two input signals to be compared, each of said differential input means comprising:

1. a first MOSFET input device having source, drain and gate electrodes;

2. a second MOSFET input device having source, drain and gate electrodes:

3. said source electrodes of said first and said second input devices being connected together and being coupled to a MOSFET constant current source means;

4. said gate electrode of said first input device being adapted to receive a first input signal to be compared; said gate electrode of said second input device being adapted to receive a second input signal to be compared;

D. load means comprising active load devices coupled to said differential input means and coupled to one or more terminals for producing an output signal responsive to said differential input means, said output terminal having a quiescent operating point and said load means comprises:

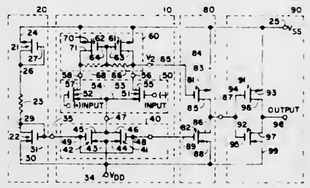
1. a first MOSFET load device having source, drain and gate electrodes;

2. a second MOSFET load device having source, drain and gate electrodes;

3. said source electrode of said first load device being connected to said source electrode of said second load device and to said first voltage level;

4. said drain electrode of said first load device being connected to said drain electrode of said first input device for forming a first output terminal;

5. said drain electrode of said second load device being connected to said drain electrode of said second input device for forming a second output terminal;



6. said gate electrode and said drain electrode of said first load device and said gate electrode and said drain electrode of said second load device each being coupled to a load bias means;

7. said second output terminal being coupled to said output means for providing an amplified output signal;

E. wherein said load bias means coupled to said output terminals and to said active load for generating a compensating response for stabilizing said quiescent operating point comprises:

1. a conductor interconnecting said drain electrode of said first load device, said gate electrode of said same device and said gate electrode of said second load device;

2. a resistor connected between said gate electrode of said second load device and said drain electrode of said same device; and

3. a conductor connecting said gate electrode of said first load device and said gate electrode of said second load device;

F. wherein said MOSFET devices of said differential input means of said first differential amplifier are of a first conductivity type;

G. said MOSFET active load devices of said load means of said first differential amplifier are of a second conductivity type opposite to said first conductivity type;

H. said MOSFET devices of said differential input means of said second differential amplifier are of said second conductivity type; and

I. said MOSFET active load devices of said load means of said second differential amplifier are of said first conductivity type; and said operational amplifier further includes:

J. a MOSFET biasing network connected between said first and said second voltage level for providing a first reference voltage and a second reference voltage;

K. a first MOSFET constant current source means coupled to said differential input means of said first differential amplifier, responsive to said first reference voltage for providing a first constant current, and

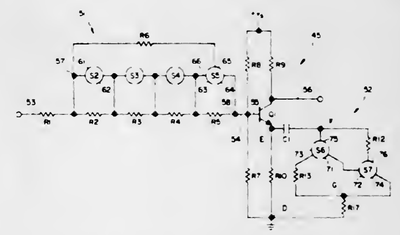
L. a second MOSFET constant current source means coupled to said differential input means of said second differential amplifier, responsive to said second reference voltage for providing a second constant current.

4,048,576

TRANSISTOR AMPLIFIER STAGE WITH SELECTIVELY ADJUSTABLE GAIN CONTROL CIRCUIT

Tom L. Blackburn, San Jose, and Otto G. Wisotzky, San Francisco, both of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 28, 1975, Ser. No. 636,018
Int. Cl.² H03G 3/30
U.S. Cl. 330—29 35 Claims



23. A resistive pad having an attenuation between an input and an output terminal, measured with respect to a reference point, that is variable in discrete steps and having a net resistance between the input and output terminals, comprising:

first and second resistive elements;

first means electrically connecting one of said first and second resistive elements between the input and output terminals and electrically connecting the other of said first and second resistive elements between the reference point and one side of said one resistive element;

a plurality of control resistors;

a plurality of bi-state switch means; and

second means electrically connecting said control resistors and switch means together in a prescribed pattern across said first and second terminals of said first resistive element, the state of at least a certain one of said switch means being changed to produce a step change in the net resistance measured across said first resistive element, which requires that changing the states of individual switch means produce different prescribed step changes in the decibel value of attenuation that are cumulative.

4,048,577

RESISTOR-CONTROLLED CIRCUIT FOR IMPROVING BANDWIDTH OF CURRENT GAIN CELLS

Charles E. Shinn, II, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

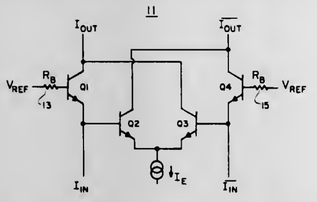
Filed May 7, 1976, Ser. No. 684,516
Int. Cl.² H03F 3/45
U.S. Cl. 330—30 D 4 Claims

1. A gain-cell circuit with transistors each having a base, a collector and an emitter for providing increased signal bandwidth by utilizing the capacitance inherent in the transistors to achieve pole-zero cancellation, the circuit comprising:

a first matchhed differential pair of common emitter transistors for producing a first pair of intermediate signals at its collectors and forming a dominant pole in response to a

bias current applied to its emitters and differential input signal currents applied to its bases;

a second matched pair of common-base transistors, the emitters of which are coupled to the bases of the transistors of the first matched pair and coupled to receive the differential input signal currents for producing a second pair of intermediate signals at its collectors, the collectors of said second matched pair of transistors being cross-coupled to the collectors of the first matched pair of transistors for



producing differential output signal currents by combining selected ones of the first pair of intermediate signals with selected ones of the second pair of intermediate signals; and

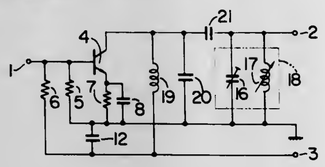
a matched pair of resistor means each coupled to the base of one of said second matched pair of common base transistors and coupled to a common reference voltage source for causing the second matched pair of transistors to form a zero substantially cancelling the dominant pole formed by the first matched pair of transistors.

4,048,578

R.F. AMPLIFIER CIRCUIT

Hiroshi Kimura, Nakaminato, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 27, 1976, Ser. No. 736,097
Claims priority, application Japan, Oct. 31, 1975, 50-130455
Int. Cl.² H03F *3/04*
U.S. Cl. 330—31 **2 Claims**



1. An R.F. amplifier circuit having an LC parallel tuning circuit at an output thereof comprising;

an R.F. choke coil connected between an output electrode of an amplifying transistor and a power supply and having a sufficiently low D.C. resistance,

a first capacitor connected between said output electrode and a ground across said amplifying transistor, and

a second capacitor connected between said output electrode and said LC parallel tuning circuit,

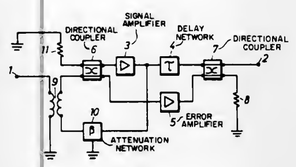
a resonance frequency of said first capacitor and said coil being selected to be sufficiently lower than a resonance frequency of said tuning circuit.

4,048,579

FEED-FORWARD AMPLIFIER

Rolf Christer Carlsson, Hagersten, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed July 26, 1976, Ser. No. 708,845
Claims priority, application Sweden, Aug. 28, 1975, 7509550
Int. Cl.² H03F *1/00*
U.S. Cl. 330—151 **8 Claims**



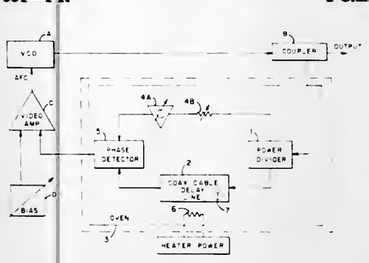
1. A feed-forward amplifier for receiving an input signal and emitting an output signal comprising: a main signal amplifier having an input port and an output port; first signal processing means for forming a difference signal between the received input signal and the signal at the output port of said main signal amplifier; dividing means for dividing the difference signal into first and second difference signal components and having first and second output ports for emitting the first and second difference signal components respectively; first connecting means for connecting the first output port of said dividing means to the input port of said main signal amplifier whereby the first difference signal component is fed to said main signal amplifier; and second signal processing means having first and second input ports and an output port for arithmetically combining the signals received at its input ports and emitting the result signal at its output port; second connecting means for connecting the output of said main signal amplifier to the first input port of said second signal processing means; and third connecting means for connecting the second output port of said dividing means to the second input port of said second signal processing means.

4,048,580

APPARATUS FOR DETECTING A STABLE MICROWAVE DISCRETE FREQUENCY

Richard A. Campbell, Concord; Richard A. Sparks, Bedford, and Robert W. Perry, Holliston, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 18, 1976, Ser. No. 733,629
Int. Cl.² H03B *3/04*
U.S. Cl. 331—1 R **2 Claims**



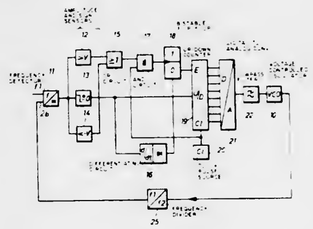
1. A system comprising a source of AC voltage; a power divider having an input and two outputs; said source of AC voltage being connected to the input of said power divider; a phase detector having first and second inputs and an output; first coupling means coupling the first output of said power divider to the first input of said phase detector, said first coupling means being a series connected variable phase shifter and variable attenuator for providing signal alignment and compensation, and being phase insensitive to the frequency of said AC voltage; second coupling means connecting the second output of said power divider to the second input of said phase detector, said second coupling means being a phase stable coaxial cable having an electrical length determined by the periodicity of the frequency reference and the interferometer sensitivity, and having a phase variance in accordance with the variance of the frequency of said source of AC voltage; and an oven means for controlling the ambient temperature; said phase detector, power divider, first coupling means, and second coupling means being inclosed in said oven means.

4,048,581

OSCILLATOR FREQUENCY CONTROL LOOP

Bertil Lyberg, Akersberga, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed May 26, 1976, Ser. No. 690,145
Claims priority, application Sweden, June 17, 1975, 7506978
Int. Cl.² H03B *3/04*
U.S. Cl. 331—1 A **2 Claims**



1. An oscillator device comprising a voltage controlled oscillator having an output and a control input, a low-pass filter, a digital to analog converter having digital inputs and an analog output connected to said oscillator control input through said low-pass filter, a bidirectional counting means having digital outputs connected to the digital inputs on said digital-to-analog converter, said counting means comprising a clock pulse source, a clock pulse input connected to said pulse source, an activation input and an up/down control input for controlling the counting direction, frequency comparator means for comparing the frequency of a signal derived from the output of said voltage controlled oscillator and the frequency of a reference signal, said frequency comparator means generating a difference signal having an amplitude and sign which represent the difference between said signal and said reference signal, threshold means and sign indicating means sampling said difference signal for generating control signals to said activation input and said up/down control input respectively for enabling said clock pulse source to step said counting means in a compensating direction as the difference signal falls outside predetermined thresholds, and means for stopping the counter when the difference signal passes through a zero difference value.

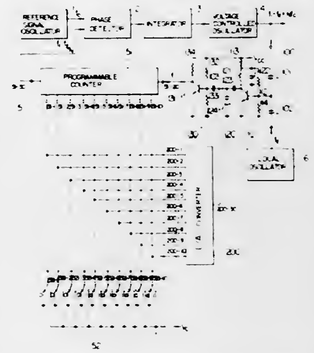
4,048,582

PHASE LOCKED LOOP SYNTHESIZER

Takashi Ihara, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 28, 1976, Ser. No. 736,580
Claims priority, application Japan, Oct. 31, 1975, 50-130328
Int. Cl.² H03B *3/04*
U.S. Cl. 331—16 **12 Claims**

1. A PLL synthesizer comprising a reference signal oscillator; a programmable counter means; a phase detector which detects a phase difference between the output frequencies from said counter means and said signal oscillator and obtains a d.c. voltage in accordance with said phase difference; a voltage controlled oscillator whose oscillation frequency is controlled by the d.c. voltage from said phase detector; a local oscillator; a frequency mixing and extracting means including at least a mixer, which mixes the outputs of said local oscillator and said voltage controlled oscillator and a tuning means which tunes at



a prescribed frequency of the outputs of said mixer and lead the output to said programmable counter means; and a control means which detects a part of frequency division ratio setting digital input data from said programmable counter means and controls the frequency of said tuning means to be tuned to the mixed difference frequency of said mixer in accordance with the detected signal.

4,048,583

LOCKED HYBRID JUNCTION POWER COMBINER

Jan Nigrin, Edmonton, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed July 21, 1976, Ser. No. 707,194
Int. Cl.² H03B *9/12*
U.S. Cl. 331—56 **8 Claims**



1. A locked hybrid junction power combiner comprising:

a. a microwave hybrid junction having four ports, one of which acts as an output port,

b. three one port oscillators connected to the other three ports, one of the oscillators acting as a master oscillator and the other two as slave oscillators locked to the master,

c. a phase-shifting element positioned in one of the connections between one of the ports of the hybrid junction and an oscillator such as to provide an output that has correct phase relation and combines the powers of the three oscillators,

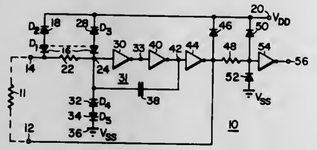
d. four port circulator positioned between the master oscillator and the appropriate arm of the hybrid junction.

4,048,584

INPUT PROTECTION CIRCUIT FOR CMOS OSCILLATOR

Richard Walter Ulmer, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 26, 1976, Ser. No. 745,022
Int. Cl.[2] H02H 7/20
U.S. Cl. 331—62 **8 Claims**



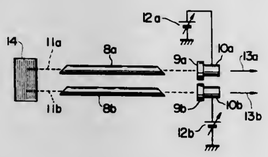
1. An oscillator comprising:
an amplifier means having an input for amplifying a potential at said input, said amplifier also having an output for conducting said amplified potential;
first means coupled between said output and said input for electrically coupling a portion of said amplified potential from said output to said input in order to boost said potential at said input; and
protective means coupled to said input for producing a high impedance at said input when said potential at said input is smaller in magnitude than the magnitude of said boosted potential at said input and for producing a low impedance at said input when said potential at said input is greater in magnitude than the magnitude of said boosted potential at said input.

4,048,585

TUNING TYPE LASER OSCILLATOR APPARATUS AND LASER RADAR SYSTEM AND LASER COMMUNICATION SYSTEM USING THE SAME

Kengo Murasawa, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 22, 1975, Ser. No. 624,985
Claims priority, application Japan, Oct. 23, 1974, 49-121411
Int. Cl.[2] H01S 3/10
U.S. Cl. 331—94.5 C **15 Claims**



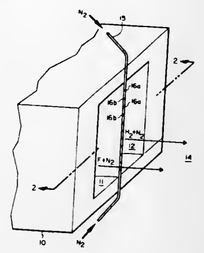
1. A tuning type laser oscillator apparatus comprising:
a plurality of laser tubes each having a respective optical axis;
a plurality of reflection mirrors respectively located at a first end of each of said laser tubes;
first means, coupled to each of said reflection mirrors, for displacing each respective mirror in the direction of the laser tube axis at said first end of which said each respective reflection mirror is located; and
a wavelength selective element disposed at a second end of each of said tubes, opposite said first end, to intersect the optical axis of each of said laser tubes and reflecting a respective wavelength, within a respective range of optical wavelengths capable of being generated by said tubes, back through said tubes along the respective optical axes thereof.

4,048,586

CHEMICAL LASER WITH MIXING ENHANCEMENT DEVICE FOR POWER IMPROVEMENT

Arvel B. Witte, Rolling Hills; James E. Broadwell, Palos Verdes Estates, and Dale L. Hook, Rancho Palos Verdes, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jan. 12, 1976, Ser. No. 648,694
Int. Cl.[2] H01S 3/02, 3/095, 3/22
U.S. Cl. 331—94.5 D **8 Claims**



1. A cavity nozzle for a supersonic CW chemical laser fueled by the reactants (a) atomic fluorine and (b) H_2 D_2 and having a lasing cavity in which said reactants (a) and (b) react, comprising:
a nozzle body having parallel linear nozzle passages with each pair of adjacent passages separated by a wall tapering to a narrow trailing edge at the exit ends of said passages for injecting parallel contiguous streams of said reactants (a) and (b) from said passages, respectively, into said cavity along parallel linear paths at supersonic velocity in a manner such that each pair of contiguous streams of said reactants (a) and (b) have an intervening common mixing region; and
trip means comprising a plurality of trip fluid injection orifices spaced along each trailing wall immediately adjacent the edge between reactant nozzles with certain of the orifices opening toward one adjacent reactant stream path and the remaining orifices opening toward the other adjacent reactant stream path for injecting inert diluent fluid streams laterally into the respective reactant streams as the latter issue from their nozzle passages to induce turbulent-like fast mixing of the contiguous reactant streams within their respective boundary region.

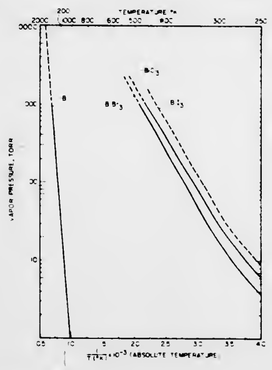
4,048,587

BISMUTH HALIDE VAPOR LASER

Chi-sheng Liu, Monroeville, and Leland A. C. Weaver, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 9, 1976, Ser. No. 703,739
Int. Cl.[2] H01S 3/00
U.S. Cl. 331—94.5 G **7 Claims**

1. In a laser apparatus for obtaining metal vapor laser transitions at temperatures substantially below the metal vaporization temperature, the combination of:
an enclosure,
a bismuth halide selected from the group consisting of BiI_3, $BiCl_3$ and $BiBr_3$ within said enclosure,
means for vaporizing said bismuth halide by heating said bismuth halide to a temperature between approximately 300° C and 500° C while avoiding the formation of the metal dimer Bi_2,
means for dissociating the bismuth halide vapor for providing ground state bismuth metal atoms of sufficient number density to create resonance radiation trapping,
means for creating a population inversion between a desired upper laser level and a lower laser level of the bismuth by exciting ground state bismuth atoms with energized electrons and for maintaining a sufficient number of bismuth atoms in the ground state to preserve said resonance radiation trapping, and
means for stimulating the emission of a beam of radiation from the inverted medium.

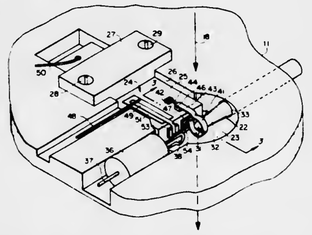


4,048,588

YIG-TUNED BULK SEMICONDUCTOR OSCILLATOR

Kurt E. Zublin, Los Altos, and Walter T. Wilser, Cupertino, both of Calif., assignors to Watkins-Johnson Company, Palo Alto, Calif.

Filed Apr. 8, 1976, Ser. No. 675,245
Int. Cl.[2] H03B 7/14, 9/12
U.S. Cl. 331—96 **6 Claims**



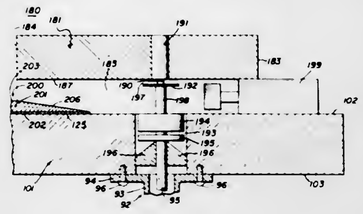
1. A diode oscillator comprising a support structure; an isolation cavity partly defined by said support structure; a diode subassembly mounted on said support structure, said subassembly including a semiconductor diode having two terminals, a conductive support pin for receiving and holding one terminal of said diode, a coupling loop carried by said support pin having one end secured to the other terminal of said diode, and a capacitor mounted on said conductive support pin for supporting and capacitively coupling the other end of the loop to the conductive support pin, said subassembly extending into the cavity; a resonator within said cavity disposed in coupled relationship to said loop; means for applying a uniform magnetic field to said resonator; and, an output loop disposed in said cavity and oriented orthogonally with respect to said input loop and serving to be coupled to the electromagnetic fields at said resonator to provide an output.

4,048,589

RECEIVER MODULE AND COMPONENTS THEREOF

Robert M. Knox, La Grange, and Peter P. Toulios, Westchester, both of Ill., assignors to Epsilon Lambda Electronics Corporation, Batavia, Ill.

Division of Ser. No. 592,065, June 30, 1975, Pat. No. 3,995,238. This application Nov. 8, 1976, Ser. No. 739,614
Int. Cl.[2] H03B 5/18, 7/14
U.S. Cl. 331—107 R **6 Claims**



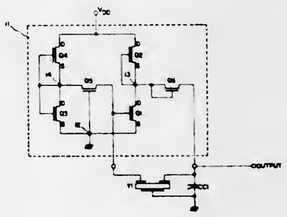
1. An oscillator for use in the frequency range from about 1 GHz to about 1,000 GHz comprising a base plate defining a conductive image plane, a housing mounted on said plate and cooperating therewith to define a resonant cavity, an IMPATT diode mounted within said cavity and having a bias connection therefor extending from said cavity, an elongated high permittivity dielectric waveguide of finite cross section adjacent to said image plane and extending into said cavity, and a thin film of synthetic organic resin disposed between and secured to both said image plane and said dielectric waveguide and extending laterally thereof, said thin film being low loss in character and having a low permittivity compared with that of said dielectric waveguide, the ratio between the thickness of said thin film and the square root of the cross-sectional area of said dielectric waveguide being in the range from about 0.02 to about 1.0, the end of said dielectric waveguide extending into said cavity being tapered toward said diode to provide impedance matching and mode transformation of the energy transmitted between said cavity and said dielectric waveguide.

4,048,590

INTEGRATED CRYSTAL OSCILLATOR CIRCUIT WITH FEW EXTERNAL COMPONENTS

Daniel W. Dobberpuhl, Liverpool, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 21, 1976, Ser. No. 707,275
Int. Cl.[2] H03B 5/36
U.S. Cl. 331—116 R **4 Claims**



1. A semiconductor integrated circuit comprising:
a current path including a first current limiting device serially connected with an active device, the connection between said devices being a nodal point;
a current mirror circuit connected in electrical parallel relationship with said current path for providing a bias voltage to said active device separately and independently of

said current path, said current mirror circuit including second and third current limiting devices serially connected together, the connection therebetween being another nodal point, which other nodal point provides the bias voltage substantially identical to the bias voltage at said one nodal point;

a frequency controlling element operatively connected to said active device for causing said active device to oscillate at a frequency determined by said frequency controlling element; and

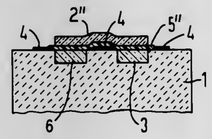
a transistor connected to said other nodal point and said active device for providing said bias voltage to said active device.

4,048,591

INTEGRATED OPTICAL MODULATOR

Franz Auracher, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 1, 1975, Ser. No. 573,553
Claims priority, application Germany, May 2, 1974, 2421285
Int. Cl.² G02B *5/14*; H01S *3/00*
U.S. Cl. 332—7.51 **4 Claims**



1. An integrated optical modulator for modulating optical signals in dielectric wave guides comprising a substrate having a surface and being of a material having an index of refraction n_3; at least two parallel extending electrodes being disposed in spaced relationship on said surface; a first wave guide disposed on said surface between two of said parallel extending electrodes and extending parallel thereto, said first wave guide having an upper surface and an index of refraction n_1; a dielectric, low loss film having an index of refraction n_4, said film being disposed on the upper surface of the first wave guide and covering same; a second wave guide having an index of refraction n_2, said second wave guide being disposed on said film, and a third wave guide being disposed in spaced, parallel relationship and adjacent one of said first and second wave guides, the other of said first and second wave guides having a width approximately equal to the sum of the widths of the third wave guide, said one wave guide and the space therebetween, said film having a width at least as large as the other wave guide so that the film separates the other wave guide from said one and third wave guides, said indices of refraction of the wave guides and film having a relationship of $n_4 < n_1$, n_2, at least said one wave guide being of an electro-optical material so that an application of a potential on said electrodes changes the propagation constants of at least said one wave guide.

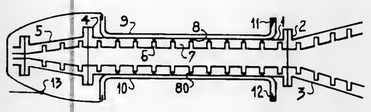
4,048,592

ARRANGEMENT FOR EXTRACTING DIVERGENCE-MEASURING MODES FROM A CORRUGATED GUIDE AND TRACKING ANTENNA INCORPORATING SAME

Serge Drabowitch, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 26, 1976, Ser. No. 661,821
Claims priority, application France, Feb. 28, 1975, 75.06254
Int. Cl.² H01P *5/08, 3/12*; H01Q *13/06*; H01P *1/16*
U.S. Cl. 333—6 **15 Claims**

1. An arrangement for extracting divergence-measuring modes propagating in a corrugated guide having a wall with an inner surface provided with a multiplicity of transverse grooves having a depth of the order of a quarter wavelength of an operating frequency, said grooves being spaced apart by a fraction of said wavelength, said divergence-measuring modes being upper-odd modes derived from a hybrid fundamental mode propagated along said guide, said arrangement compris-



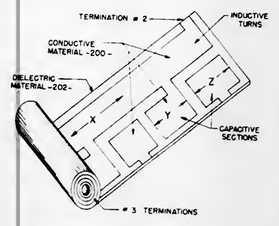
ing collecting means coupled to said guide for extracting therefrom said divergence-measuring modes, said collecting means being so constructed that the phase velocity of their fundamental mode is equal to that of the divergence-measuring modes.

4,048,593

ELECTRICAL COMPONENT FOR PROVIDING INTEGRATED INDUCTIVE-CAPACITIVE NETWORKS

Jack H. Zillman, 30798 Calle Chueca, San Juan Capistrano, Calif. 92675

Continuation-in-part of Ser. No. 469,359, May 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 412,827, Nov. 5, 1973, abandoned. This application Oct. 9, 1975, Ser. No. 620,967
Int. Cl.² H03H *7/04, 13/00*; H01G *4/40, 4/32*
U.S. Cl. 333—70 R **5 Claims**



1. An electrical component comprising: at least one electrically conductive sheet constituting an inductive element and at least one electrically conductive sheet constituting a capacitive element; at least one dielectric sheet formed of electrically insulating material and supporting the conductive sheets as conductive layers thereon in displayed relationship with respect to one another, with said dielectric sheet being generally larger than said conductive sheets to provide a margin area on said dielectric sheet, said electrically conductive sheets and said dielectric sheet being formed into a spiral roll, in which the conductive sheets are embedded into the surface of the dielectric sheet so that the surfaces of the conductive sheets and the dielectric sheet are flush with one another.

4,048,594

SURFACE ACOUSTIC WAVE FILTER

Rolf D. Weglein, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 2, 1976, Ser. No. 646,093
Int. Cl.² H03H *9/26, 9/04*; H01L *41/10*
U.S. Cl. 333—72 **1 Claim**

1. A surface acoustic wave filter comprising:

a substrate of material capable of supporting propagating surface acoustic wave energy;

input means including an input transducer disposed on said substrate for converting electromagnetic energy to surface acoustic wave energy in said substrate and for causing said surface wave energy to propagate along a first path;

output means including an output transducer disposed on said substrate for converting surface acoustic wave energy incident thereon to output electromagnetic energy; and

periodic metallic grating means disposed on said substrate in said first path for reflecting a predetermined fraction of surface wave energy from said input transducer in a predetermined relatively narrow frequency band, said grating means including a plurality of parallel metallic elements spaced at least one wavelength apart, said metallic elements being perpendicular to the direction of said first path the reflected energy propagating back toward said input transducer in a reactive mode of operation.

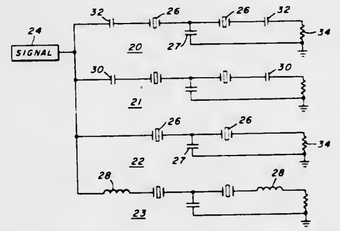


4,048,595

INFORMATION EXTRACTION FOR DOPPLER RADAR

Christopher R. Vale, Elkridge, Md., assignor to Westinghouse Electric Corporation, Pittsbugh, Pa.

Filed Jan. 22, 1976, Ser. No. 651,305
Int. Cl.² H03H *9/32, 7/48*
U.S. Cl. 333—72 **6 Claims**



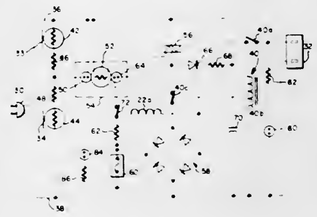
1. A crystal filter array comprising a plurality of individual two-pole bandpass filter networks directly connected together for connection in parallel to a single signal source, each of said filter networks including two crystal resonators connected in series and a capacitor connecting the junction between the resonators to ground, all of the crystals in all of the networks being identical, and reactance means connected in the circuit of at least some of said networks in a manner to modify the frequency response of the network, said reactance means being different in each network.

4,048,596

LIGHT-ACTIVATED REMOTE CONTROL UNIT

Eric A. Kolm, Brookline, Mass., and Robert R. Trottier, Woonsocket, R.I., assignors to Signal Science Systems, Inc., Framingham, Mass.

Filed Apr. 17, 1975, Ser. No. 568,938
Int. Cl.² H01J *39/12*; H01H *47/24, 47/32*
U.S. Cl. 334—8 **9 Claims**



1. An appliance control unit for effecting one or more control operations on an appliance, said control unit comprising

A. first and second photocell units arranged to be substantially equally responsive to ambient household optical radiation, said photocell units including first and second photoconductive cells, respectively, connected in series to a voltage source,

B. detection means including

1. a gaseous discharge first lamp connected across said first photocell so as to be ignited when radiation is preferentially applied to the second photocell, and

2. a third photoconductive cell arranged to respond to light from said first lamp and thereby provide an initiating signal in response to preferential illumination of said second photocell, and

C. a control device

1. for connection to said appliance so as to perform a control operation thereon, and

2. for performing said control operation in response to said initiating signal.

4,048,597

PLANAR PRINTED CIRCUIT BOARD ARRANGEMENT USEFUL IN THE UHF PORTION OF A TELEVISION TUNER

Stanley Paul Knight, Cranbury, N.J., and Thomas Edward Molinari, Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed June 28, 1976, Ser. No. 700,121
Int. Cl.² H03J *3/18*
U.S. Cl. 334—15 **10 Claims**

1. In a tuner, the combination comprising:

a printed circuit board including a slab of dielectric material having conductors formed on one side thereof;

a first of said conductors having an edge and being coupled to a source of fixed potential;

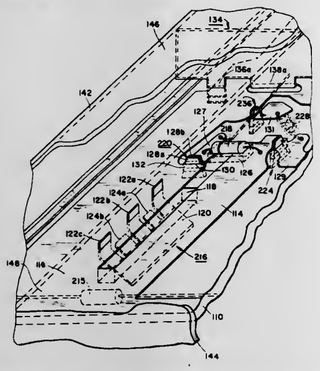
a strip-like conductor having an edge parallel to the edge of said first conductor and spaced at a proximate distance therefrom to define a gap between said conductors, said strip-like conductor being connected at one end thereof to said first conductor, said strip-like conductor having a length and width selected to provide an inductive reactance in the UHF band;

said printed circuit board having a slot formed therethrough in an area including at least a portion of said gap, a portion of said first conductor and a portion of said strip-like conductor to define the position of said one end of said strip-like conductor;

said printed circuit board having a component mounting aperture formed therethrough in an area including an-

other portion of said strip-like conductor to define the position of the other end of said strip-like conductor;

a discrete component mounted in said component mounting aperture; and



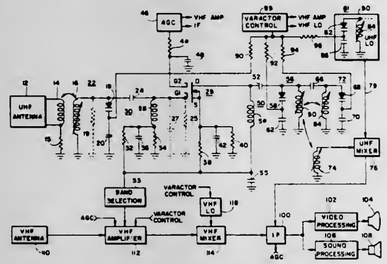
at least another discrete component mounted on the side of said printed circuit board opposite said conductors having leads thereof connected to respective ones of said conductors.

4,048,598

UHF TUNING CIRCUIT UTILIZING A VARACTOR DIODE

Stanley Paul Knight, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 28, 1976, Ser. No. 691,189
Int. Cl.² H03J *3/18, 3/24;* H03H *7/38*
U.S. Cl. 334—15 **7 Claims**



1. In a UHF tuner, the apparatus comprising:

a tuned circuit including a varactor diode;

a field effect transistor having a plurality of electrodes including a gate electrode;

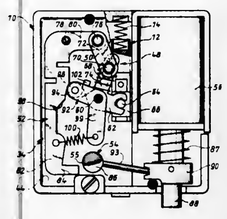
an impedance transformation means coupled between said tuned circuit and said gate electrode of said field effect transistor, said impedance transformation means including capacitance means coupled in series between said tuned circuit and said gate electrode and inductance means coupled in shunt with said gate electrode, said capacitance means and said inductance means being selected to provide a resonant frequency below the lowest channel frequency in the UHF range so that the impedance coupled to said gate electrode is approximately matched with the impedance of said field effect transistor at said gate electrode at the low end of the UHF range and the power gain of said apparatus at the low end of said UHF range is approximately equal to the power gain of said apparatus at the high end of said UHF range.

4,048,599

ELECTRIC SWITCHING DEVICE

Otto Groth, Tailfingen, Germany, assignor to Elektra Tailfingen Ammann & Cie, Tailfingen, Germany

Continuation of Ser. No. 568,028, April 14, 1975. This application May 10, 1976, Ser. No. 684,490
Claims priority, application Germany, Apr. 19, 1974, 2419038
Int. Cl.² H01H *83/00*
U.S. Cl. 335—20 **13 Claims**



1. An electric switch that automatically opens when the voltage carried by the switch falls below a predetermined value comprising, in combination,

a switching element linearly movable along the direction of its longitudinal axis between a cut-in position that closes the switch and a cut-out position that opens the switch and is biased toward its cut-out position,

control means having an electromagnet electrically connected in series with the switch,

a release lever actuated by said control means to move from a first position to a second position when the voltage energizing said electromagnet falls below said predetermined value,

a blocking mechanism operating with said release lever and said switching element to move from a blocking position in which it maintains the switching element in said cut-in position to a release position in which it allows said switching element to move to said cut-out position in response to said release lever moving from said first position to said second position, and

a selector shaft and a first toggle lever acting independently of the blocking mechanism and operatively connecting said selector shaft and said switching element to drive said switching element between said cut-out and cut-in positions in response to a rotation of said selector shaft, said first toggle lever being near its dead center position when said switching element is in its cut-in position.

4,048,600

CONTACT SYSTEM FOR RELAYS, PARTICULARLY POWER RELAYS

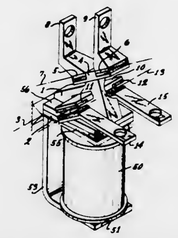
Bernhard Dietrich, Eichenau, Germany, assignor to Schaltbau Gesellschaft MBH., Munich, Germany

Filed Nov. 13, 1975, Ser. No. 631,745
Int. Cl.² H01H *67/02*
U.S. Cl. 335—128 **13 Claims**

1. In a power relay with twin contact making facilities for energized as well as unenergized relay, there being a first pair of stationary contacts for contact making when the relay is energized and a second pair of stationary contacts for contact making when the relay is de-energized, the relay including an armature and a core/coil structure for attracting the armature upon energization of the core/coil structure, the improvement comprising:

a first pair of contacts on the armature and being spaced along a first line which extends at right angles to the direction of movement of the armature upon energization of the core/coil structure, said first pair of stationary contacts being arranged respectively for contact making with the contacts of the first pair of contacts on the armature;

a second pair of contacts on the armature being arranged in a plane different from any plane through the first line, and at right angles to the direction of armature movement, and on a side of the first line opposite said first pair of stationary contacts, said second pair contacts being spaced along a second line which does not intersect but extends at right



angles to said first line when projected into a common plane, further extending at right angles to the direction of movement of the contacts of the second pair, said second pair of stationary contacts being arranged respectively for contact making with the contacts of the second pair of contacts on the armature; and

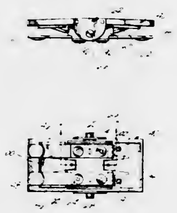
the armature being disposed for pivot motion on an axis which extends parallel to the second line.

4,048,601

SWITCH MOUNTING ASSEMBLY FOR AN ELECTROMAGNETIC RELAY

John C. Schuessler, West Covina, and David J. Tapp, Manhattan Beach, both of Calif., assignors to Leach Corporation, Los Angeles, Calif.

Filed May 28, 1976, Ser. No. 691,003
Int. Cl.² H01H *50/30*
U.S. Cl. 335—193 **10 Claims**



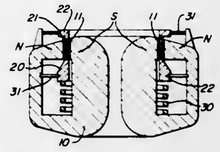
1. A contact blade assembly for a relay or the like comprising a magnetic armature, a contact blade, an insulating contact carrier positioned between the armature and the contact blade, means securing the contact blade to the carrier, the carrier having a pair of recesses formed along opposite margins, and clamping means secured to the armature having cantilevered spring fingers projecting toward each other, the inner end of the fingers engaging said recesses in the carrier for holding the carrier against the armature.

4,048,602

UNIVERSAL IMPEDANCE POWER APPARATUS

Nick D. Diamantides, 2517 14th St., Cuyahoga Falls, Ohio 44223

Filed June 30, 1975, Ser. No. 591,297
Int. Cl.² H01F *7/08*
U.S. Cl. 335—222 **22 Claims**



1. A multimpeder as described comprising in combination

a magnet, said magnet being a permanent magnet having two opposite magnetic poles separated by an air gap, said air gap being traversed by the magnetic field created by said poles, said magnetic field being substantially orthogonal to the faces of said poles,

an armature movably positioned within said air gap, said armature being equipped with a main coil capable of carrying an alternating current, said main coil being within said magnetic field, said armature and main coil being capable of a translational reciprocating motion, said motion having a direction substantially perpendicular to said magnetic field,

a spring supporting said armature and resiliently opposing said armature's motion,

said armature having a mass, and said spring having a resilience, said mass and said resilience being selected as to cause said armature-spring system to be maintained at a desired level of vibratory state at the frequency of said alternating current,

centering means allowing said translational reciprocating motion of said armature, but preventing a motion of said armature parallel to said magnetic field, said centering means maintaining a fixed distance between said armature and said magnetic poles,

said air gap being filled with a ferrofluid, said ferrofluid reducing the magnetic reluctance of said air gap, and adding a viscous force opposing said reciprocating motion of said armature.

4,048,603

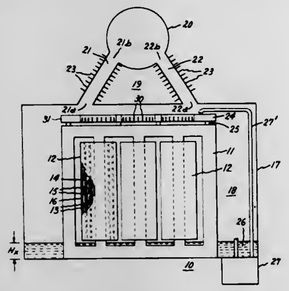
VAPORIZATION COOLED TRANSFORMER

Fred W. Staub, and Heinz Jaster, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,827
Int. Cl.² H01F *27/10*
U.S. Cl. 336—57 **3 Claims**

1. A hermetically sealed vaporization chamber containing heat producing electrical apparatus to be cooled while dielectrically protected and two phase dielectric fluid comprising a liquid and a vapor, said apparatus including a plurality of cooling ducts extending vertically therethrough, said liquid residing at a bottom portion of the chamber and having a liquid level above the bottom of the chamber, said liquid also being distributed as a film which coats the top and the wall surfaces of the vertical ducts, said vapor being produced by vaporization of said liquid by said heat produced by said apparatus, said vapor occupying space in said chamber above said liquid level, a condenser having one end thereof connected to and communicating with an upper portion of said vaporization chamber occupied by said vapor, a reservoir containing a predetermined mass of non-condensable dielectric gas positioned above said condenser, said condenser having another end connected to and communicating with said reservoir and said gas therein,

said gas forming an interfacial contact with said vapor in said condenser at a region therein between said ends of said condenser, said vapor condensing to form liquid condensate in the condenser on one said interfacial contact so that the effective condensation area of said condenser lies between said one end of said condenser and said interfacial contact; distribution means in said chamber positioned above said electrical apparatus for receiving liquid condensate from said condenser, said distribution means comprising a distribution pan with an outer rim, the rim portion of the distribution pan provided with a plurality of apertures to distribute the liquid condensate uniformly as a film over the wall surfaces of the associated vertical ducts, and at least one condensate make-up pump for pumping liquid from the bottom portion of the chamber to said distribution means.

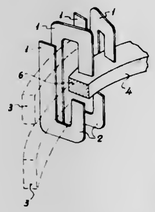


4,048,604

MAGNETIC CORE

Francisco Arjona Vallet, Trav. Jose Antonio No. 1, Avila, Spain

Filed Mar. 25, 1976, Ser. No. 670,356
Claims priority, application Spain, Mar. 25, 1975, 436016
Int. Cl.² H01F *27/24*
U.S. Cl. 336—83 **1 Claim**



1. An improved construction of an electric inductance apparatus, comprising flat magnetic plates joined together to form a toroidal core, said toroidal core having an internal compartment accommodating inductance coils and an annular air gap between said coils, the improvement resulting in enhanced regulation of the mutal inductance of said inductance coils by forming a magnetic shunt between said inductance coils, said improvement comprising:

said flat magnetic plates being shaped to form a lateral air gap groove adjacent to and leading into said compartment within said toroidal core, and

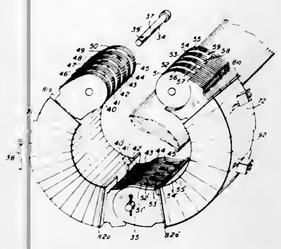
said compartment within said toroidal core being penetrated through said lateral air gap by an open hoop of magnetic material having a thickness of sufficient dimension to enable said open hoop to penetrate into said compartment with said throidal core, said open hoop, being positioned between said inductance coils within said compartment, and the external diameter of said open hoop being of sufficient dimension to penetrate into said compartment and into said annular air gap between said inductance coils while leaving an air gap between a wall of the internal compartment and the outer periphery of said hoop.

4,048,605

SPLIT CORE CURRENT TRANSFORMER HAVING AN INTERLEAVED JOINT AND HINGE STRUCTURE

Samuel C. McCollum, Springfield, Ill., assignor to Sangamo Electric Company, Springfield, Ill.

Filed Apr. 5, 1976, Ser. No. 674,035
Int. Cl.² H01F *17/06, 27/24*
U.S. Cl. 336—176 **1 Claim**



1. In a split core current transformer having first and second arcuate core sections made of lamination members engageable at their respective ends to provide a core structure having a generally circular magnetic path with air gaps located only at the two respective ends of the core sections, the lamination members of the first and second core sections being identical in shape, each of said laminations having a main body portion with a head portion at one end thereof which terminates in a rounded convex end surface and a tail portion at the opposite end thereof which terminates in a rounded concave end surface, the width of the portion of each core section at said first and second ends thereof being greater than the width of the main body intermediate said first and second ends, a first winding wound on the main body portion of said first core section and a second winding wound on the main body portion of said second core section, said first core section and said second core section each hving a first group and a second group of said laminations, the ends of the laminations in adjacent groups projecting alternately from one another to provide staggered projections which extend outwardly at each end of the core to interleave with corresponding projections on the other core section, the width of the projecting portions of the lamination groups which interleave being greater than the width of the main body portion to provide an increased area of magnetic permeable material in the region of the two core air gaps, and hinge means extending through the interleaved projections of increased width at one end of said core section to permit relative pivotal movement of said first and second core sections about said hinge means to bring the projections of increased width at the other end of the first and second cores into interleaved relation.

4,048,606

INDUCTIVE DEVICE WITH BOBBIN

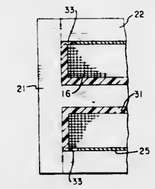
Imrich M. Miller, Paterson, N.J., assignor to Universal Manufacturing Corporation, Paterson, N.J.

Continuation of Ser. No. 580,015, May 22, 1975, abandoned.
This application Oct. 5, 1976, Ser. No. 729,816
Int. Cl.² H01F *27/30*
U.S. Cl. 336—198 **1 Claim**

1. An inductive device comprising in combination:

lamination means defining an open window,

a bobbin of electrically insulating material having a core with a multi-sided polygonal flange on each of its ends, each of said flanges being of a heat settable thermoplastic material and integrally formed with a continuous peripheral stiff edge on at least two of its sides which stiff edge initially extends outwardly from and is thinner than the other portion of the respective flange, the flanges being reduced in thickness on the respective inner faces thereof to form the thinned down edge, a coil of wire on said core



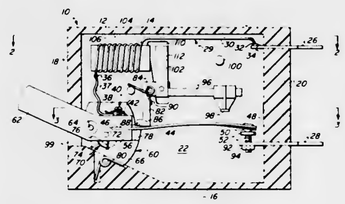
which extends to the inner face of each of said flanges and substantially up to the point where the thinned edge of the flange commences, said bobbin fitting within said lamination window with the thinned down continuous edges of the respective flange heat set and bent over the coil on the bobbin core and said bent down edges lying directly adjacent the corners of the window to reduce the electrical creepage path between the coil and the inner face of the lamination at the corners of the window.

4,048,607

CIRCUIT BREAKER

Adam Smorzaniuk, West Millington, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed June 24, 1976, Ser. No. 699,366
Int. Cl.² H01H *73/48*
U.S. Cl. 337—53 **15 Claims**



1. A circuit breaker for opening a circuit in response to a given temperature change and capable of being reset manually, said circuit breaker comprising:

a frame;

a first contact member affixed to the frame;

an actuating lever assembly mounted upon the frame for pivotal movement between a first position and a second position;

a bimetallic arm carried by the actuating lever assembly for pivotal movement therewith and having a first end affixed to the actuating lever assembly and a second end juxtaposed with the first contact member, the bimetallic arm having a bistable configuration conformable to either one of first and second stable postures such that the second end rests at either one of corresponding first and second locations relative to the first end, the second end being movable in a first direction relative to the first end in response to said given temperature change to effect movement of the bimetallic arm with a snap-action along a prescribed path of travel between the first stable posture and the second stable posture and conform the bimetallic arm to the second stable posture;

a second contact member located adjacent the second end of the bimetallic arm such that the first and second contact members are engaged and the circuit is closed when the actuating lever assembly is in the first position and the bimetallic arm is in the first stable posture, and the contact members are disengaged, and the circuit is open, when the bimetallic arm is in the second stable posture;

resilient biasing means biasing the actuating lever assembly toward the second position;

holding means for maintaining the actuating lever assembly stationary at the first position, said holding means being responsive to movement of the bimetallic arm from the first stable posture to the second stable posture to release the actuating lever assembly for movement toward the second position in response to the biasing means; and

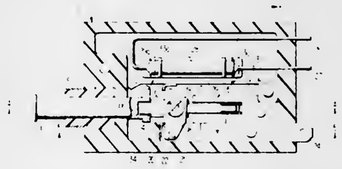
stop means for precluding movement of the second end of the bimetallic arm in said first direction when the actuating lever assembly reaches an intermediate position between said first and second positions, while permitting continued pivotal movement of the actuating lever assembly to the second position to move the first end of the bimetallic arm relative to the second end and conform the bimetallic arm to the first stable posture, whereby return of the actuating lever assembly to the first position thereof will again engage the first and second contact members.

4,048,608

CIRCUIT BREAKER

William P. Riendeau, Leonardtown; Robert R. Blevins, Lexington Park, and Joseph L. Abell, California, all of Md., assignors to Aiken Industries, Inc., New York, N.Y.

Filed Nov. 25, 1975, Ser. No. 635,013
Int. Cl.² H01H *71/16*
U.S. Cl. 337—74 **10 Claims**



1. A double break circuit breaker having ambient compensation and automatic overload current protection comprising:

a hollow casing;

a reset means having a longitudinal axis disposed in said casing for linear movement between an inward and an outward position;

biasing means in said casing for urging said reset means in said outward direction;

a rocker arm pivotally supported on said reset means for rotation about an axis perpendicular to the direction of movement of said reset means;

contact means, disposed in said casing, for providing an electrical path through said circuit breaker when bridged;

a contact bridging bar, mounted on one end of said rocker arm, for bridging said contact means and providing an electrical path through said circuit breaker, said contact bridging bar having a longitudinal axis parallel with the axis of rotation of said rocker arm and being loosely mounted in said rocker arm and freely rotatable about said longitudinal axis;

a trip latch disposed in said casing and engageable with the other end of said rocker arm; and

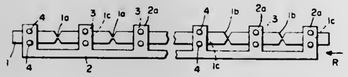
means for causing said trip latch to release said rocker arm so as to move said contact bridging bar away from said contact means in response to an electric current through the circuit breaker exceeding a predetermined value.

4,048,609

LATTICE STRUCTURE FOR ELECTRIC FUSES COMPRISING FUSIBLE ELEMENTS AND INSULATING SUPPORTS THEREFOR

Edward J. Knapp, Jr., Amesbury, Mass., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed Feb. 17, 1976, Ser. No. 658,736
Int. Cl.[2] H01H *85/04, 85/14*
U.S. Cl. 337—159 **5 Claims**



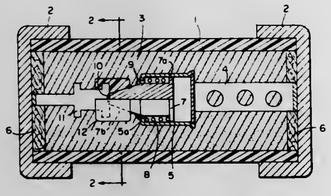
1. A sub-assembly for manufacturing electric fuses including
a. a fusible element in form of a ribbon having a plurality of serially related points of drastically reduced cross-sectional area each formed by a pair of juxtaposed substantially V-shaped incisions;
b. a substantially planar strip of electric insulating material arranged in spaced relation from, and substantially parallel to, said fusible element; and
c. said strip having a plurality of arms projecting transversely therefrom and supporting said fusible element at points situated to opposite sides of pairs of said substantially V-shaped incisions.

4,048,610

ELECTRIC PROTECTIVE DEVICE AND PROCESS OF MANUFACTURING THE SAME

Philip C. Jacobs, Jr., Newtonville, Mass., assignor to Gould, Inc., Newburyport, Mass.

Filed July 30, 1976, Ser. No. 710,251
Int. Cl.[2] H01H *85/38*
U.S. Cl. 337—165 **4 Claims**



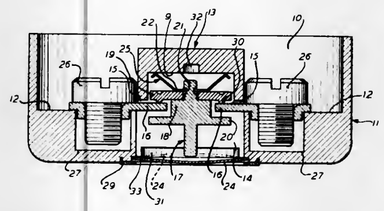
1. An electric protective device including in combination
a. a cylinder;
b. a plunger inside said cylinder;
c. a helical spring having ends resting against said cylinder and said plunger and biasing said plunger to move into said cylinder;
d. heater means connected by a solder joint to said plunger; and
e. a body of a material evolving gases under the heat of an arc in physical engagement with said solder joint, portions of said plunger, and portions of said heater means to evolve an arc-quenching jet of gas upon melting of said solder joint and initiation of an arc.

4,048,611

THERMAL SWITCH

Walter J. Kuczynski, 871 Pennsylvania Ave., and Robert A. Kuczynski, 1075 W. Chestnut St., both of Union, N.J. 07083

Filed June 23, 1976, Ser. No. 699,201
Int. Cl.[2] H01H *37/52*
U.S. Cl. 337—380 **9 Claims**



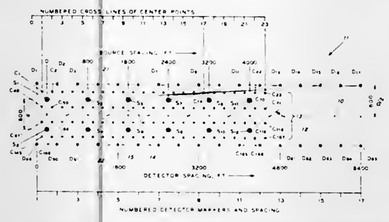
1. A thermal switch comprising:
a. a housing with an open hollow portion at one end,
b. the end of the hollow portion defining a floor,
c. an enlargement on the floor extending into the hollow portion,
d. a cavity at the other end of the housing, extending into the enlargement,
e. a pair of opposed slots communicating between the hollow portion of the housing, through the enlargement into the cavity,
f. a switch means in the cavity responsive to temperature change.

4,048,612

EXPLORATION SYSTEM FOR CROSS-STEERING AND STACKING SEISMIC DATA USING A SAWTOOTH TRAVERSE OF SHOT POINTS CENTRALLY SPACED BETWEEN AT LEAST A PAIR OF LINEAR DETECTOR SPREADS

Leon C. Lawyer, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sept. 12, 1975, Ser. No. 613,009
Int. Cl.[2] G01V *1/16, 1/20*
U.S. Cl. 340—15.5 CP **12 Claims**



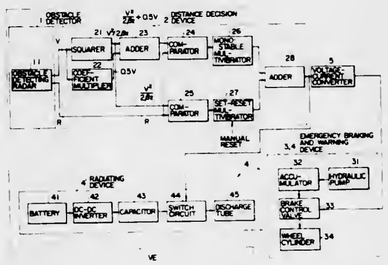
1. A seismic exploration method where seismic impulses are generated successively, one pulse at each of a plurality of source point locations along an asymmetrical sawtooth shot point line, having a stepped segment defining an offset spacing distance (*d*), between adjacent source point locations, and where seismic waves resulting from each of said impulses are detected by at least two detector spreads each containing a plurality of detectors spaced at a series of in-line detector locations, adjacent spreads being offset from each other a distance D, which is related to said source point spacing distance (*d*) by a ratio of 2:1 or greater which comprises:
i. statically and dynamically correcting detected seismic signals so as to produce a series of corrected traces, said series of corrected traces containing sets of common traces associated with common centerpoints of a two-dimensional grid of centerpoints formed between particular source point location and detector spread location pairs, and cross-sets of traces associated with cross-lines of centerpoints of said grid, at least one trace of each set of common centerpoint traces being a product of a source-detector pair having a substantially different horizontal spacing than at least one other source detector pair of other common traces associated with said same set of common centerpoint traces,
ii. stacking said sets of common traces to produce stacked traces having improved primary-to-multiple ratios which improve the portrayal of multifold areal surface structural conditions, and
iii. beam-steering said stacked traces to produce subsets of cross-directional traces having improved directional content and signal-to-noise ratios.

4,048,613

ALARM SYSTEM FOR EMERGENCY BRAKING

Hajime Ito; Teruo Yamanaka, both of Toyota, and Osamu Ozeki, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Feb. 21, 1975, Ser. No. 551,719
Claims priority, application Japan, July 24, 1974, 49-84149
Int. Cl.[2] G08G *1/00*
U.S. Cl. 340—53 **6 Claims**



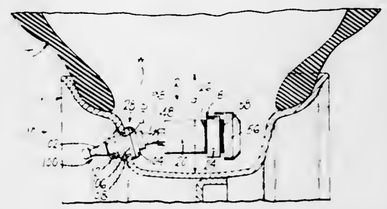
1. For a vehicle emergency braking device which includes a speed and distance detecting device, and which automatically operates to perform an emergency braking action in response to one of a first set of relative speeds and relative distances between the vehicle and an object in the path of the vehicle and which remains inactive insofar as emergency braking is concerned in response to a second set of relative speeds and relative distances, an alarm system comprising: decision means responsive to the first and second sets of relative speeds for determining a first distance from the object at which an emergency braking action would occur, control means responsive to the first and second sets of relative speeds and coupled to the decision means for producing an output signal representing a second distance greater than the first distance, and signal means coupled to said control means and responsive to said detecting device for issuing an alarm signal for vehicle passengers in response to a distance signal from the detecting device being less than the second distance, said signal means ending the alarm signal prior to the emergency braking action and thereafter maintaining the alarm signal inactive will onset of an emergency braking act'on, the duration of the alarm signal being less than the time from the end of the signal until the onset of the emergency braking action.

4,048,614

LOW TIRE PRESSURE WARNING DEVICE

Harry J. Shumway, Clark Road, Naugatuck, Conn. 06770

Filed Jan. 5, 1977, Ser. No. 757,052
Int. Cl.[2] B60C *23/04*
U.S. Cl. 340—58 **6 Claims**



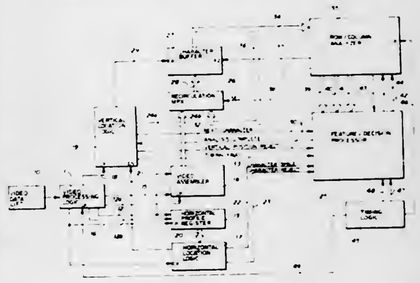
1. A tire pressure alarm system for a vehicle having a wheel with a rim forming an annular well of a predetermined depth, said rim being adapted to receive a tire to form therewith an airtight chamber, said rim having an air inlet valve having a first end outside said airtight chamber and a second end inside said airtight chamber, said alarm system including an elongated operative component adapted to be removably connected to said second end and located entirely within said airtight chamber, so that the elongated direction of said operative component is substantially parallel to the axis of rotation of said wheel, said operative component including an air chamber adapted to receive air from said airtight chamber, said operative component further including an actuable radio transmitter and power source therefor situated within the air chamber, and a switch and diaphragm means, said switch being situated along said elongated direction so as to be substantially impervious to centrifugal force due to rotation of said wheel, said switch and diaphragm means being responsive to the air pressure in said air chamber to close said switch to actuate said transmitter when said air pressure is at a predetermined low pressure.

4,048,615

AUTOMATED CHARACTER RECOGNITION SYSTEM

Ping-chien Chuang, Irving, and Joseph A. Plunkett, Plano, both of Tex., assignors to Recognition Equipment Incorporated, Dallas, Tex.

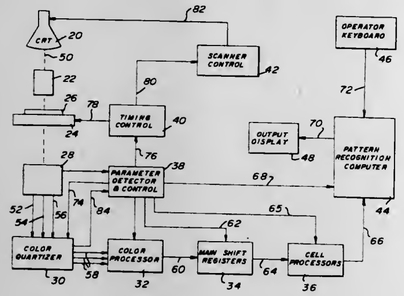
Filed June 4, 1976, Ser. No. 692,767
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 AC **10 Claims**



1. A method of detecting printed characters of plural fonts interspersed on a document surface, which comprises:
a. sensing a character and storing a two-dimensional electronic character image thereof;
b. scanning each row of said character image to detect horizontal primary features including the number of horizon-

tal character segments, and the segment length and rightmost segment coordinate for rows having a single horizontal character segment;
c. scanning each column of said character image to detect vertical primary features including the number of vertical character segments, and the segment length for those columns having a single vertical segment;
d. comparing said horizontal primary features and said vertical primary features of a current row of column with those of previous rows and columns of said character image;
e. assigning a classification code to each row and column of said character image indication of the type and order of occurrence of said horizontal and said vertical character segments in successive rows and columns of said character image;
f. forming secondary features which reflect the order of occurrence of said classification codes; and
g. identifying said character from said secondary features.

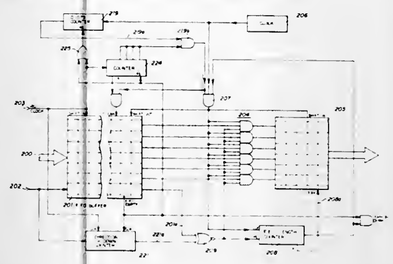
4,048,616
PATTERN RECOGNITION SYSTEM WITH KEYBOARD ENTRY FOR ADAPTIVE SENSITIVITY
Donald J. Hart, Merion; John C. Bouton, Jr., Doylestown, and Eugene H. Poppel, Philadelphia, all of Pa., assignors to Geometric Data Corporation, Wayne, Pa.
Filed Dec. 3, 1975, Ser. No. 637,266
Int. Cl.² G06K 9/00
U.S. Cl. 340—146.3 ED **10 Claims**



1. In a pattern recognition system including scanning means for generating signals representative of a pattern scanned by said scanning means, means for examining the signals from said scanning means for generating parameters of the pattern scanned, pattern recognition means responsive to said parameters for identifying the pattern scanned and an operator keyboard for entering data relating to patterns scanned, an interface between said means for examining and said pattern recognition means, said interface including first temporary storage means for receiving parameters relating to a pattern being scanned and second temporary storage means for receiving data from said keyboard and buffer storage means for concurrent entry of both said parameters and said data into said pattern recognition means to enable said pattern recognition means to adapt to recognize said pattern and like patterns in accordance with both said parameters and said data.

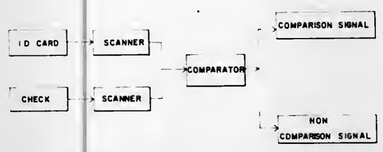
4,048,617
RETRACE DATA ELIMINATION
Marion W. Neff, Irving, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.
Filed July 3, 1975, Ser. No. 593,118
Int. Cl.² G06K 9/00
U.S. Cl. 340—146.3 SY **9 Claims**

1. A system for modifying a set of data signals in a hand scan character recognition system where each data signal representative of a character has an associated scan direction signal generated as a data field, which includes a plurality of data field characters, is scanned comprising:
a. storage means to receive said data signals,



b. means responsive to said direction signals to establish a majority direction signal corresponding to the direction for which the greatest number of data signals have been generated, and
c. means operable to utilize only those data signals from said storage means for which the direction signal is the same sense as the sense of said majority direction signal.

4,048,618
METHOD OF IDENTIFYING A CHECK SIGNER
Seth T. Hendry, Twin Falls, Idaho, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Nov. 24, 1976, Ser. No. 744,722
Int. Cl.² G06K 9/00
U.S. Cl. 340—146.3 E **1 Claim**

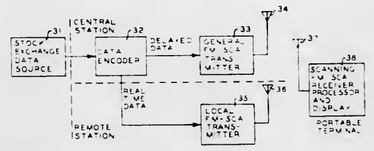


1. A method of identifying a check signer, comprising the steps of
applying a fingerprint of a person to an identification card in invisible ink;
applying the same fingerprint of the person to a check in invisible ink in the presence of a person requested to cash the check;
scanning the fingerprint of the identification card to provide a first set of electrical signals;
scanning the fingerprint of the check to provide a second set of electrical signals;
comparing the first and second sets of electrical signals; and
indicating comparison or non-comparison of the first and second sets of electrical signals to indicate the authenticity of the signer.

4,048,619
SECURE TWO CHANNEL SCA BROADCASTING SYSTEM
Aubry S. Forman, Jr., Toledo, Ohio; Charles A. Schultz, Jr., and William E. Vice, both of Gainsville, Fla., assignors to Digital Data Inc., Toledo, Ohio
Filed Sept. 7, 1976, Ser. No. 721,316
Int. Cl.² H04B 7/26; H04H 1/08; H04J 1/14; H04Q 9/00
U.S. Cl. 340—154 **11 Claims**

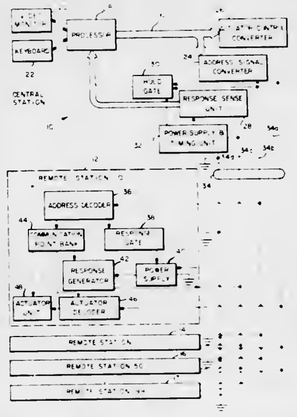
1. A secure two channel information broadcasting system comprising:

a central broadcasting station for encoding and transmitting, as an SCA component of a FM carrier signal having a first frequency, data received from an information source;
a remote broadcasting station for transmitting, as an SCA component of a FM carrier signal having a second frequency, said encoded data received from said central broadcasting station; and
a terminal for receiving, decoding and displaying said encoded data including means for receiving FM carrier signals in a frequency band including said first and second frequency carrier signals, means for alternately generating first and second reference signals each having a frequency which differs by a predetermined frequency from the frequencies of said first and and second frequency carrier



signals respectively, means responsive to said receiving means and to said reference signal generating means for combining said first frequency carrier signal with said first reference signal and for combining said second frequency carrier signal with said second reference signal to generate a difference signal having said predetermined frequency, means responsive to said difference signal for detecting said SCA components and for directing said reference signal generator means to continue to generate the one of said reference signals associated with the one of said carrier signals having its SCA component first detected whereby said receiving means locks on said one carrier signal, and means for decoding and displaying said encoded data from said SCA components of said carrier signals.

4,048,620
CENTRAL STATION TO ADDRESSED POINT COMMUNICATION SYSTEM
Richard E. Crandall, and Denny E. Morgan, both of Cambridge, Mass., assignors to Kinney Safety Systems, Inc., New York, N.Y.
Filed Oct. 2, 1974, Ser. No. 511,109
Int. Cl.² H04Q 9/00
U.S. Cl. 340—163 **18 Claims**

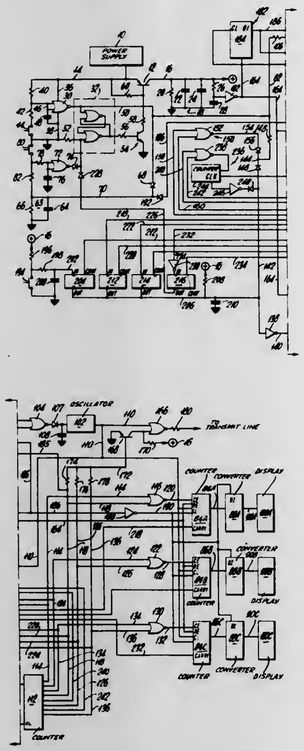


1. A multiple point communication system having a central station, a plurality of communication points organized into groups, each group being associated with a different remote station, and wherein communication can take place between the central station and each communication point, said system comprising:
A. address signal generating means at said central station for producing address signals including at least first signals identifying the remote station to be addressed and second signals identifying the communication point of the group within the remote station which is addressed, said generating means including means for producing said address signals using a total of at least three different values in frequency and/or voltage to identify the remote station address information and communication point address information,
said address signals comprising a plurality of pulses, each pulse being an independent information carrier and being identifiable with a portion of said address signals, said pulses being generated serially,
B. address responsive means associated with each remote station, each said address responsive means
1. applying power to an associated response generating means in response to said first address signals identifying the associated remote station, and
2. coupling to said powered response generating means, in response to said second address signals, the associated communication point identified with said second address signals,
C. signal transmission means for communicating said address signals from said central station to each remote station over a common transmission path and for communicating from said remote stations a report signal to the central station,
D. response generating means associated with each remote station, each said response generating means being normally unpowered and when powered, producing an analog valued report signal, responsive to an electrical parameter present at an associated point coupled therewith, and
E. sensing means at said central station for receiving over said transmission means the output of said response generating means and for producing an output manifestation in response to said report signal.

4,048,621
CODING SYSTEM FOR AN ALARM SYSTEM AND THE LIKE
Robert M. Conklin, Chappaqua, N.Y., and Arthur T. Human, Norwalk, Conn., assignors to Holmes Protection Inc., New York, N.Y.
Filed Mar. 17, 1976, Ser. No. 667,786
Int. Cl.² H04Q 9/00; H03K 21/12
U.S. Cl. 340—168 B **16 Claims**

1. A system for registering and transmitting a preselected code to a receiving station comprising switch means operable between open and closed states; an oscillator responsive to the operation of said switch means to the closed state for producing a pulse train; an advance signal generator for generating an advance signal in response to an energizing signal; control means having a plurality of states and being movable from state to state in response to said advance signal; counting means connected to said oscillator for registering the number of pulses in response to one state of said controlled means; transmitting means responsive to another state of said control means for connecting said oscillator to a transmission line; said counting means comprising energizing signal generating means for

applying an energizing signal to said advance signal generator to change the state of said control means when the number of



pulses transmitted by said transmitting means is equal to the count registered in said counting means.

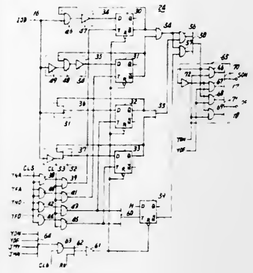
4,048,622

PROGRAMMABLE SEQUENCE CONTROLLER

Toshihiko Yomogida, Kariya, Japan, assignor to Toyoda-Koki Kabushiki-Kaisha, Japan

Filed Aug. 11, 1976, Ser. No. 713,351
Claims priority, application Japan, Sept. 11, 1975, 50-110666
Int. Cl.² G05B *11/32*
U.S. Cl. 364—900 **7 Claims**

1. A programmable sequence controller comprising:
memory means for memorizing a sequence program comprising a train of instructions identified respectively by memory addresses thereof, each of said instructions having command information and address information therein, said command information being selected from a group of control commands including a first control command for examining whether an input is in an ON state under the condition of being ANDed with another input, a second control command for examining whether an input is in an OFF state under the condition of being ANDed with another input, a third control command for examining whether an input is in an ON state under the condition of being ORed with another input, and a fourth control command for examining whether an input is in an OFF state under the condition of being ORed with another input,
an input circuit operatively connected to a plurality of addressed external input devices for converting states of said external input devices into logical values;
an output circuit operatively connected to a plurality of addressed external output devices to be energized or deenergized;
a logic operation circuit operatively connected to said memory means and to said input and output circuits;
means for reading out and feeding said train of instructions from said memory means to said logic operation circuit;
said logic operation circuit comprising:
a line connected to receive a logical value of one of said external input devices specified by the address information;
a first AND gate;
a first flip flop connected to receive an output of said first AND gate and triggered when said first control command is applied;
said first AND gate being connected to said line and to receive an output of said first flip flop;
a second AND gate;



a second flip flop connected to receive an output of said second AND gate and triggered when said second control command is applied;
said second AND gate being connected to said line and to receive an output of said second flip flop;
a first OR gate;
a third flip flop connected to receive an output of said first OR gate and triggered when said third control command is applied;
said first OR gate being connected to said line and to receive an output of said third flip flop;
a second OR gate;
a fourth flip flop connected to receive an output of said second OR gate and triggered when said fourth control command is applied;
said second OR gate being connected to said line and to receive an output of said fourth flip flop;
said first to fourth flip flops being set when triggered and receiving a ONE signal; and
said output circuit being operable to energize or deenergize one of said addressed external output devices in response to the outputs of said first to fourth flip flops.

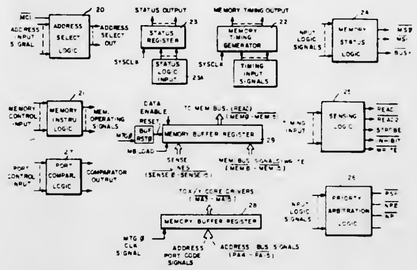
4,048,623

DATA PROCESSING SYSTEM

Ronald H. Gruner, Framingham, Mass., assignor to Data General Corporation, Southboro, Mass.

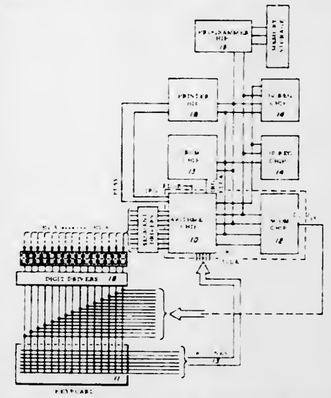
Continuation of Ser. No. 509,159, Sept. 25, 1974, abandoned. This application Dec. 13, 1976, Ser. No. 749,911
Int. Cl.² G06F *13/00*
U.S. Cl. 364—900 **12 Claims**

2. In a data processing system having at least one data accessing control unit, a memory unit comprising a plurality of memory modules interconnected by module interconnecting means, said modules being capable of synchronous or non-synchronous operation;
means for sequentially transferring addresses from said at least one data accessing control unit to the memory modules of said memory unit;
means for sequentially transferring data between said at least one data accessing control unit and the memory modules of said memory unit;
each module including
timing means for initiating the operating time cycle of said each memory module in response to an address transferred thereto from a data accessing control unit;
memory control means including means for generating a data transfer status signal to indicate the data transfer status of said each memory module, the data transfer status signals of each memory module being made avail-



able by said module interconnecting means to all of said memory modules; and
means responsive to a said timing means and to data transfer status signal from another of said memory modules which had been previously started for preventing a transfer of data with respect to said each memory module before data has been completely transferred with respect to said another previously started memory module and including means for permitting a transfer of data with respect to said each memory module when the transfer of data with respect to said another previously started memory module has been completed;
said timing means further including means permitting the operating time cycle of said each memory module to be started before the transfer of data between said another previously started memory module has been completed.

means on only one of said at least two chips at a given time,
e. output means connected to said instruction register means for receiving the instruction word outputted therefrom and for entering said instruction word back into said instruction register means in response to said enabling signal, and



f. decoder means for decoding the instruction word entered into said instruction register means from said output means,
the at least two of said chips being interconnected by the output means thereof to receive the instruction word read out of the memory means on the one of said at least two chips for decoding by the decoder means on the other of said at least two chips.

4,048,624

CALCULATOR SYSTEM HAVING MULTI-FUNCTION MEMORY INSTRUCTION REGISTER

Michael J. Cochran, Richardson, and Charles P. Grant, Jr., Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 396,903, Sept. 13, 1973. This application July 7, 1975, Ser. No. 593,611
Int. Cl.² G06F *1/00, 9/00*
U.S. Cl. 364—200 **4 Claims**

1. In data processing apparatus implemented on a plurality of semiconductor chips at least two of said chips having:
a. memory means for storing a number of program instructions words for defining operation of the apparatus,
b. means for addressing the memory means to cause an instruction word to be read out of the memory means and for outputting a code,
c. instruction register means for receiving the instruction word read out of the memory means and for outputting said instruction word,
d. chip selection means for generating an enabling signal in response to said code being of a preselected setting, said enabling signal being generated by the chip selection

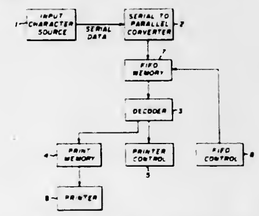
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4,048,625

BUFFERED PRINT CONTROL SYSTEM USING FIFO MEMORY

Samuel C. Harris, Jr., and William A. Surber, both of Waynesboro, Va., assignors to General Electric Company, Waynesboro, Va.

Filed May 5, 1976, Ser. No. 683,417
Int. Cl.² G06F *3/12*; G11C *9/00*
U.S. Cl. 364—900 **12 Claims**



1. In a printer having a plurality of printing characters and means for effectively moving said printing characters during printing such that they appear as a sequence of individually different printing characters moving from column to column along a print line, means for receiving input characters at a first rate, said input characters comprising printable and control characters, a FIFO memory for serially storing said received input characters in the order in which they are received, means coupled to said FIFO memory comprising a circulating memory having a character capacity greater than one character but no greater than a full print line of characters, means responsive to printable received characters for producing column signals representing the columns at which said printable input characters are to be printed, means for applying said column signals

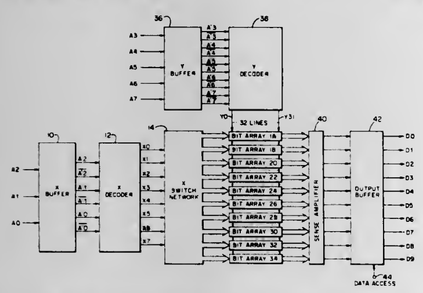
and said received printable characters to said circulating memory for storage to provide stored signals and for circulating said stored signals in synchronism, means for providing position signals identifying each column change in moving printing character positions, means for comparing said stored signals and said position signals to detect printing characters to be printed, means responsive to said detected printing characters to cause printout of the printing characters in the columns indicated by said column signals, means for analyzing said received control characters to detect a line feed signal, means responsive to said line feed signal to disable application of input characters from said FIFO memory to said circulating memory, means coupled to said comparing means and responsive to said detected printing characters for erasing in said circulating memory the characters being printed so that erased portions of said recirculating memory are available for application of additional characters from said FIFO memory, means responsive to erased portions in said circulating memory for applying received input characters from said FIFO memory for storage in said erased portions, means for detecting the absence of printable characters circulating in said circulating memory to enable the execution of said detected line feed signal, and means responsive to the execution of said line feed signal to re-enable application of input characters from said FIFO memory to said circulating memory.

4,048,626

MEMORY DEVICE

Darrell L. Fett, Scottsdale, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 29, 1975, Ser. No. 644,658
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **23 Claims**



1. A data storage system for accessing stored words consisting of n-bits of information, said system comprising:

a plurality of means for storing each of the n-bits of information;

means for receiving an address identifying the location of each of the n-bits of information in each of said plurality of storage means;

means for selectively developing current paths through each of said plurality of storage means in response to said received address;

said means for selectively developing current paths further comprising:

means for applying a first electrical potential upstream of the particular addressed storage location within said storage means;

means for applying a second electrical potential downstream of the particular addressed storage location within said storage means, said second electrical potential being lower than said first electrical potential so as to establish a current path through said particular addressed location;

said means for applying a first electrical potential upstream of the particular addressed storage location still further comprising:

a plurality of means for providing current from said first electrical potential to each of said storage means;

said plurality of means for providing current from said first electrical potential to each of said storage means comprising:

a plurality of conductive lines, each being conductively connected to said storage means;

means for sensing each of said plurality of storage means to ascertain the conductive status of the selectively developed current path therein; each of said storage means comprising:

a plurality of multi-emitter transistors each with a base being connected to one of said plurality of conductive lines; each of said storage means further comprising:

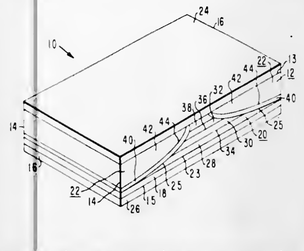
a plurality of emitter lines each of which is conductively closed with respect to at least one of the emitters of said multi-emitter transistors.

4,048,627

ELECTROLUMINESCENT SEMICONDUCTOR DEVICE HAVING A RESTRICTED CURRENT FLOW

Michael Ettenberg, Freehold, N.J., and Harry Francis Lockwood, New York, N.Y., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,812
Int. Cl.² H01L *33/00*
U.S. Cl. 357—17 **11 Claims**



1. An electroluminescent semiconductor device having restricted current flow comprising:

a body of semiconductor material having opposed end surfaces, opposed side surfaces extending to said end surfaces, opposed first and second contact surfaces substantially perpendicular to said end surfaces and said side surfaces;

said body having therein a substrate at said second contact surface having a surface opposite said second contact surface, an active region at least a portion of which is capable of generating electroluminescence, all of said active region being in the form of a mesa, said active region is on a portion of said opposite surface of said substrate and extends to said first contact surface, said active region having side surfaces which are spaced from said side surfaces of said body, and passive regions which extend from the side surfaces of said active region to said side surfaces of said body and said first contact surface, said passive regions having therein a P-N junction extending from said first contact surface to said side surface of said body.

4,048,628

METHOD AND APPARATUS FOR ERASING SCATTERING IN STORAGE-TYPE LIQUID CRYSTALS BY FREQUENCY SWEEPING

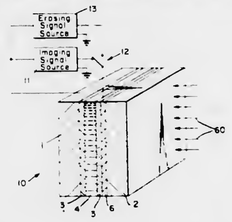
Donald D. Boswell, Granada Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed July 28, 1976, Ser. No. 709,360
Int. Cl.² G02F *1/00*; G11C *11/42, 7/00*
U.S. Cl. 340—173 LM **9 Claims**

6. The method for causing transformation from the scattered to non-scattered state in a storage-type liquid crystal cell having a storage-type liquid crystal layer said method comprising the steps of:

a. applying a precursor signal having an amplitude above the amplitude threshold of the liquid crystal cell at a frequency below the frequency maximum scattering, and

b. secondly, applying an erasing signal across the liquid





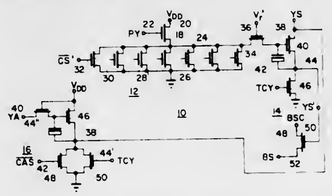
crystal device said signal having a rms amplitude above the amplitude threshold of the liquid crystal layer and variable frequency in the audio frequency range which sweeps continuously from a first frequency to a second frequency higher than said first frequency wherein said second frequency is above the maximum scattering frequency of the liquid crystal cell.

4,048,629

LOW POWER MOS RAM ADDRESS DECODE CIRCUIT

Alan Richard Bormann, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sept. 2, 1975, Ser. No. 609,854
Int. Cl.² H03K *19/34*; G11C *11/34*
U.S. Cl. 340—173 CA **2 Claims**



1. In a MOS semiconductor random access memory chip including a plurality of address inputs, a chip selection input, and a plurality of sense lines, an address decode circuit coupled between first and second voltage conductors comprising:

a dynamic NOR gate responsive to said plurality of address inputs having an output and including a first MOSFET means coupled between said output and said first voltage conductor for precharging said output, and a plurality of input MOSFETs responsive to said address inputs coupled between said output and said second voltage conductor for discharging said output if said dynamic NOR gate is not selected by said plurality of address inputs;

sense line selection circuit means coupled to said output for effecting selection of one of said sense lines in response to said dynamic NOR gate on the condition that said dynamic NOR gate is selected;

MOSFET means responsive to said chip selection input coupled between said output and said second voltage conductor for discharging said output on the condition that said MOS semiconductor random access memory chip is unselected to avoid selection of said one of said sense lines.

4,048,630

DOOR OPERATOR WITH AUTOMATIC CONTROL OF AUXILIARY CIRCUIT

Andrew F. Deming, Alliance, and Alvin J. Carli, Sebring, both of Ohio, assignors to The Alliance Manufacturing Co., Inc., Alliance, Ohio

Filed Jan. 22, 1976, Ser. No. 651,536
Int. Cl.² G08B *13/08*
U.S. Cl. 340—274 R **20 Claims**



1. A door operator having a motor connected to open and close a door, comprising, in combination,

a motor energization circuit,

a lamp,

a lamp energization circuit connected to said lamp,

plural switches connected to control said motor and lamp energization circuits,

an alarm circuit,

and enabling means connecting said alarm circuit to one of said energization circuits so that actuation of one of said switches closes the door and establishes de-energization of said one of said energization circuits and enables said alarm circuit.

4,048,631

PORTABLE VARIABLE INTENSITY SIGNALLING FLASHLIGHT

Jose Flores, 50 Division St., Apt. 7C, Brooklyn, N.Y. 11211

Filed Jan. 15, 1976, Ser. No. 649,259
Int. Cl.² F21L *7/00*
U.S. Cl. 340—321 **1 Claim**



1. A portable variable intensity signalling flashlight comprising a first incandescent lamp, said first incandescent lamp having a first and second electrical terminal, a first variable resistor, said first variable resistor having a first and second terminal, said first terminal of said first incandescent lamp electrically connected to said first terminal of said first variable resistor, a second incandescent lamp, said second incandescent lamp having a first and second terminal, said first terminal a second variable resistor, said second variable resistor having a

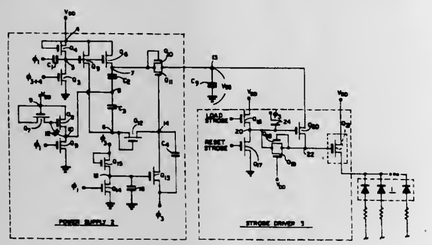
first and second terminal of said second incandescent lamp connected to said first terminal of said second variable resistor, means for manually adjusting the resistance of said first and said second resistors a battery, said battery having a first and second terminal, said second terminal of said first incandescent lamp connected to said second terminal of said second incandescent lamp and to said first terminal of said battery, a slide switch, said slide switch having a first, second, third, fourth, fifth, sixth, seventh, eighth, ninth and tenth contact, each of said first, second, third, fourth and fifth contacts of said slide switch being located a fixed distance apart from adjacent contacts along line, each of said sixth, seventh, eighth, ninth and tenth contacts of said slide switch being located said fixed distance apart from adjacent contacts along a second line, said first line parallel to said second line, said first contact and said sixth contact located on a third line transverse to said first line, said second contact and said seventh contact located on a fourth line transverse to said first line, said third contact and said eighth contact located on a fifth line transverse to said first line, said fourth contact and said ninth contact located on a sixth line transverse to said first line, said fifth contact and said tenth contact on a seventh line transverse to said first line, a pair of contact arms, said pair of contact arms manually slidable along an eighth line, said eighth line parallel to said first line, each of said pair of contact arms spaced apart a distance equal to said fixed distance and extending normal to said eighth line, each of said pair of contact arms having a length sufficient to contact said contacts of said first and said second lines, respectively each of said pair of contact arms electrically insulated from one another, said second terminal of said battery electrically connected to said sixth and said ninth and said tenth contacts, said second terminal of said first variable resistor electrically connected to said first and said fifth contacts, said second terminal of said second variable resistor electrically connected to said fourth contact.

4,048,632

DRIVE CIRCUIT FOR A DISPLAY

John R. Spence, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 5, 1976, Ser. No. 664,222
Int. Cl.² H01L 27/15
U.S. Cl. 340—324 R **14 Claims**



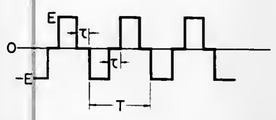
1. In combination:
at least one first multi-terminal semiconductor device,
source means to supply a reference potential signal,
power supply means connected to said source for boosting said reference potential signal, and
driver means connected between said power supply means and said at least one semiconductor device and adapted to selectively apply said boosted signal to a control electrode of said first semiconductor device to thereby drive said device,
said driver means including second and third multiterminal semiconductor devices,
the conduction path of said second semiconductor device selectively connected between said power supply means and the control electrode of said at least one first semiconductor device,
the conduction path of said third semiconductor device connected between one conduction path electrode and the control electrode of said second semiconductor device so as to form a feedback path therebetween, and
the control electrode of said third device connected to the one conduction path electrode of said second device.

4,048,633

LIQUID CRYSTAL DRIVING SYSTEM

Shunichi Sano, Zama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 12, 1975, Ser. No. 557,883
Claims priority, application Japan, Mar. 13, 1974, 49-28104; Mar. 13, 1974, 49-28105; Mar. 13, 1974, 49-28106; Mar. 13, 1974, 49-28107; June 19, 1974, 49-69113
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 M **6 Claims**



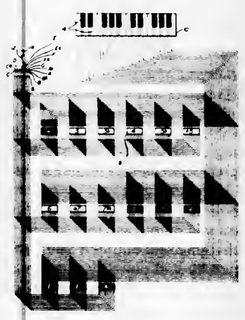
1. A liquid crystal device comprising a liquid crystal cell having at least one first and at least one second electrode disposed therein in a manner spaced from each other and a liquid crystal provided between said first and second electrodes, and means connected across said electrodes for generating a voltage pulse with a composite square wave comprising a train of square wave pulses, the train having a third harmonic wave component and in which the absolute value of the ratio $b3/b1$ where $b3$ represents the amplitude of the third harmonic wave component and b1 represents the amplitude of the fundamental wave component is less than $\frac{1}{3}$.

4,048,634

ELECTRONIC KEYBOARD DISPLAY DEVICE

Daniel Laflamme, 157 Desmarchais Blvd., Verdun, Quebec, Canada

Filed Oct. 26, 1976, Ser. No. 735,819
Int. Cl.² G09B 13/00, 15/08
U.S. Cl. 340—337 **5 Claims**



1. An electronic device for visually illustrating the note of a keyboard instrument represented by any musical interval in any musical key comprising:
1. a series of manually operable on-off key selector switches, one key selector switch associated with each desired key and each said key selector switch being exclusively and not simultaneously operable in the on position;

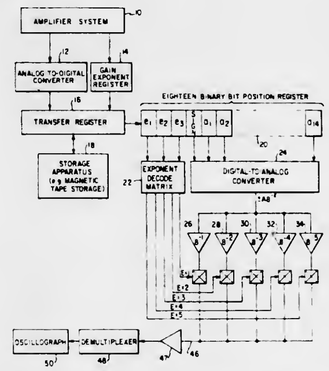
2. a series of manually operable on-off musical interval selector switches, one interval selector switch being associated with the value of each desired musical interval and each of said musical interval selector switch being simultaneously operable with one or more other said musical interval selector switches in the on position;
3. display means electronically associated with said key and musical interval selector switches, said display means consisting of a representation of the notes of a keyboard instrument over a particular range, each of the note representations having independent electronically actuated indicator means associated with it;
4. circuitry associated with said key selector switches, interval selector switches and note indicator means to actuate the indicator means corresponding to the note represented in a selected key by a musical interval of selected value.

4,048,635

SEISMIC PLAYBACK/MONITOR SYSTEM

John R. Bich, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sept. 15, 1975, Ser. No. 597,050
Int. Cl.² H03K 13/03
U.S. Cl. 340—347 DA **6 Claims**



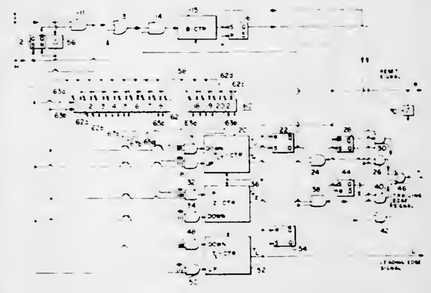
1. In a system wherein a wide dynamic amplitude range analog signal is digitized in floating point word form, said word being represented in digital signal form by the general algebraic form $Q = \pm AB^{-E}$ wherein Q represents the amplitude of the analog signal, A represents the mantissa, B indicates the radix of the number system used, E represents the exponent, and wherein said word is represented by a first plurality of binary bits representing $\pm$ A and a second plurality of binary bits representing E, a system for recreating an analog signal from the floating point words comprising: first means for converting said bits representing A to an analog signal; second means for converting said bits representing E to a plurality of control signals, each control signal representing a particular value of E; a plurality of attenuator means, each attenuator means being coupled to said first converting means for attenuating said analog signal from the first converting means by a different amount to provide an output signal; a plurality of switch means, each switch means being connected to a different attenuator means and receiving a different control signal and controlled by the second converting means to pass or block to an output signal from the attenuator; and amplifier means coupled to all said switch means for providing the recreated analog signal in accordance with an output signal passed by one of the switch means.

4,048,636

SECONDARY RADAR/IFF ANTI-TARGET SPLITTING AZIMUTH DETERMINER

Walton B. Bishop, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 26, 1975, Ser. No. 617,228
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.5 LC **3 Claims**



1. A device for use in conjunction with an IFF system which on the basis of replies to interrogations determines and indicates the IFF target leading edge and trailing edge, said IFF system having receiving means for receiving replies to interrogations and for indicating when a reply is correct, said device comprising:
counting means connected to said IFF system for counting the number of interrogations made by the IFF system;
means, connected to said receiving means and to said counting means, for producing a leading-edge signal when a predetermined number T_L of correct replies are received in any consecutive sequence of W_L responses;
means, connected to said receiving means and to said counting means, for producing a trailing-edge signal upon the occurrence of a number T_Z of non-correct replies in a group of W_2 replies and either at least a number B of successive interrogations have been transmitted after a leading-edge signal has been produced, or a number T_u of correct replies is found to exist in a group of W_u received replies followed by reduction of said number T_u to a smaller number T_r.

4,048,637

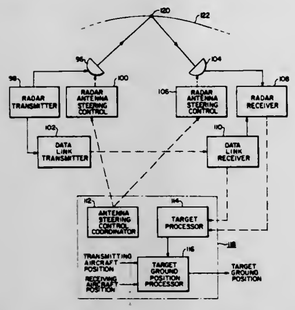
RADAR SYSTEM FOR DETECTING SLOWLY MOVING TARGETS

Omar J. Jacomini, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 23, 1976, Ser. No. 669,550
Int. Cl.² G01S 9/42
U.S. Cl. 343—7.7 **14 Claims**

1. A radar system comprising:
a radar transmitter;
a transmitting antenna associated with the transmitter;
first means for moving the radar transmitting antenna along a first path at a first speed;
a radar receiver;
a receiving antenna associated with the receiver;
second means for moving the radar receiving antenna along a second path at a second speed, said transmitting antenna and said receiving antenna being physically remote from each other;
means for coordinating the scanning of the radar transmitter and receiver antennas;
said first and second paths having suitable directions and said first and second speeds being of suitable values such that the rate of change of the angle between the first path and

a line from the radar transmitter antenna to a target area is substantially equal and opposite to the rate of change of the angle between the second path and a line from the radar receiver antenna to said target area; and



means for determining when a radar return signal is received by the radar receiver from a target.

4,048,638

ANTENNA LENGTH INDICATOR

Joseph B. Cejka, Fair Haven, N.J., assignor to Ward Products Corporation, New Brunswick, N.J.

Filed Dec. 15, 1975, Ser. No. 641,034
Int. Cl.² H01Q *1/10*
U.S. Cl. 343—894 **5 Claims**



1. In a telescoping antenna having at least one moveable telescoping antenna section which telescopes in and out of an adjacent antenna section for substantially the entire length thereof, the improvement which comprises an indicator on said moveable antenna section which indicates the degree of telescopic movement of said moveable antenna section which is necessary to achieve a predetermined overall extended antenna length,

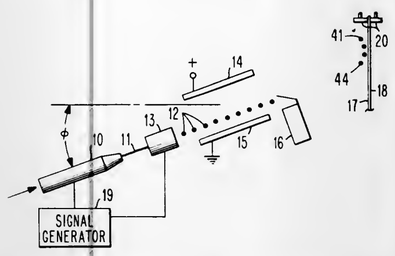
wherein said indicator comprises a sleeve around said moveable antenna section which is freely slidable between the upper end of said moveable antenna section and a sleeve stop provided by an enlargement on said moveable antenna section below said upper end whereby when said sleeve is positioned at said stop and said moveable antenna section is telescoped into said adjacent antenna section so that said sleeve is immediately adjacent the upper end of said adjacent antenna section, said predetermined overall extended antenna length will be achieved.

4,048,639

INK JET NOZZLE WITH TILTED ARRANGEMENT

James Calvin Walsh; Joseph Townsend Wilson, III, both of Endicott, and Bruce Allen Wolfe, Johnson City, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,769
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **5 Claims**



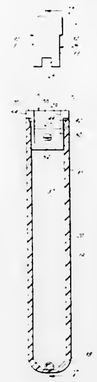
1. In the method of operating a printer by issuing from a nozzle toward a relatively moving recording medium a stream of drops of marking liquid, and deflecting the drops in a plurality, each along a different path to the surface of said medium to impact said surface to form a row of marks thereon, the improvement comprising applying to the first drop in said plurality the greatest deflection and to each succeeding drop in said plurality a decreasing amount of deflection, and relatively positioning said nozzle with respect to said surface such that the drops in said plurality impact said surface substantially simultaneously.

4,048,640

INK PEN CARTRIDGE AND MOUNTING ARM FOR A RECORDING INSTRUMENT

Bruce J. Caldwell, Conroe, Tex., assignor to Tejas Instrument Engineers, Inc., Spring, Tex.

Filed Nov. 15, 1976, Ser. No. 742,397
Int. Cl.² G01D *15/16*
U.S. Cl. 346—140 A **14 Claims**



1. An ink pen cartridge and mounting arm for a recorder comprising,

an ink cartridge including,

a hollow body for holding ink,

a nib adjacent one end of the body,

an opening in the side of the body adjacent to but spaced from the second end of the body,

a cap insertable into the second end and into the interior of the cartridge body, said cap including a first end shaped and coacting with the interior of the body to normally seal against the inside of the body for holding ink in the body,

a post extending outwardly from one side of the cap between the ends of the cap for extending into the body opening for locking the cap in the cartridge body,

said cap having a second end larger than the interior of the cartridge body for abutting the second end of the cartridge body when the cap is positioned in the body,

said cap having a longitudinal recess on the side from which the post extends for receiving one end of a mounting arm, said recess extending from the second end of the cap towards the first end of the cap,

the second end of the cap including an outwardly facing shoulder on each side of the recess for coacting with shoulders on a mounting arm, and a mounting arm including,

an elongate arm having first and second ends,

the first end shaped for attachment to a recorder,

said second end being generally rectangular in cross section and sized for insertion in the recess in the cap, said second end including a notch for engagement with the post, and

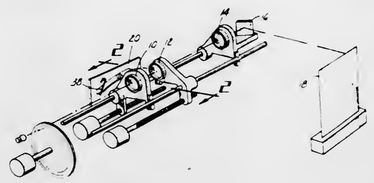
a stop shoulder on each edge spaced from the second end for coaction with the outwardly facing shoulders on the second end of the cap.

4,048,641

MECHANISM TO OPEN AND CLOSE IRIS ON LENS

Robert J. Cieplik, Mount Lakes, and Victor Czarnecki, Madison, both of N.J., assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed June 14, 1976, Ser. No. 695,967
Int. Cl.² G03B *23/00*
U.S. Cl. 354—10 **3 Claims**



2. A cam and cam follower lens system, comprising:

a lens, an iris diaphragm that can be turned by a ring so as to change the diameter of a cnetral opening, said diaphragm and lens mounted on a carriage in juxtaposition whereby the diaphragm effectively controls the aperture of the lens;

way rods defining a carriage track and means mounting said carriage for longitudinal movement on said track;

said iris diaphragm ring having a drive receiving gear configuration, an idler gear engaged with said diaphragm gear;

a follower arm having a first end which is a gear segment and a second end which is a cam follower wheel, a means for pivotally mounting said arm with the gear segment engaged with said idler gear;

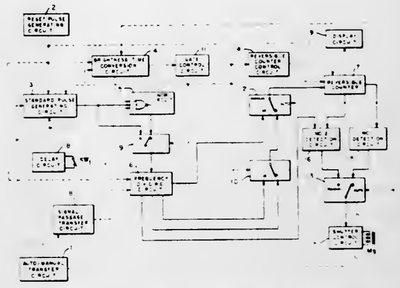
a cam plate extending parallel to said track, said plate having a guide slot which captures said wheel loosely held, said slot and wheel limited to a pressure angle of not more than 40°.

4,048,642

EXPOSURE TIME CONTROL DEVICE OF ELECTRIC SHUTTER FOR CAMERA

Takeo Saito, Yotsukaido, and Youichi Seki, Chiba, both of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Feb. 18, 1975, Ser. No. 550,591
Claims priority, application Japan, Feb. 18, 1974, 49-19271
Int. Cl.² G03B *7/08*
U.S. Cl. 354—23 D **1 Claim**



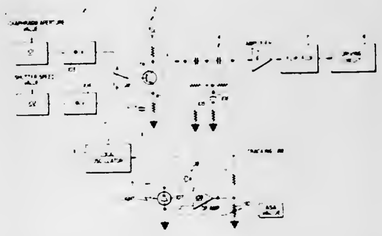
1. In an exposure time control circuit of the type including a reversible counter operable in an addition mode for counting a number of pulses representative of an exposure time, and in a subtraction mode for reading-out the counted pulses for controlling the exposure time; a pulse generator for generating standard pulses at a certain rate; a brightness/time conversion circuit responsive to the brightness of a scene to be photographed for developing a single pulse having a duration proportional to the exposure time; and means for applying standard pulses to said counting circuit to count standard pulses for the duration of the pulse proportional to the exposure time and for switching said counting circuit to the subtraction mode upon the completion of the pulse proportional to the exposure time; the improvement which comprises: said means for applying including control means responsive to the completion of the pulse proportional to the exposure time and responsive to a shutter opening trigger pulse for switching said counting circuit to the subtraction mode upon the occurrence of either, whereby the exposure time control circuit is operative for controlling exposure time if the shutter opening trigger pulse occurs before the pulse proportional to the exposure time is terminated.

4,048,643

EXPOSURE COMPUTATION SYSTEM

Isao Arita, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Dec. 16, 1975, Ser. No. 641,379
Int. Cl.² G03B *7/08*
U.S. Cl. 354—51 **15 Claims**



1. An exposure computation system comprising:

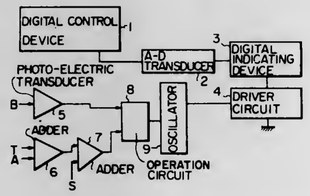
converting means for transforming diaphragm information into a frequency value,
a mixer having two terminals, one of which is connected to said converting means,
a local oscillator for providing a sweep signal, and which is connected to the other terminal of said mixer,
a filter circuit having two input terminals, one of which is connected to said mixer, and whose center frequency is variable according to object luminance information,
an object luminance information receiving means connected to one of said input terminals of the filter circuit, for generating a voltage value proportional to the logarithm of a light intensity to said receiving means, and
a shutter time control circuit to control an opening time of a shutter based on the output of the said filter circuit.

4,048,644

WARNING DEVICE FOR A CAMERA

Saburō Numata, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Mar. 15, 1976, Ser. No. 667,073
Claims priority, application Japan, Apr. 28, 1975, 50-51837
Int. Cl.² G03B *7/00, 17/20*
U.S. Cl. 354—60 L **3 Claims**



1. Warning device for a camera having an operation circuit for determining proper exposure condition of exposure information such as the shutter time according to the informations of the brightness of the object, the diaphragm aperture of the objective and the film sensitivity, a manually operable circuit for manually setting the condition circuit, the improvement comprising a comparison circuit having a first input connected to the output of said operation circuit and having a second input connected to said manually operable circuit, and an oscillator with input connected to the output of said comparison circuit, the output of said oscillator being connected to said optical indicating circuit so as to cause blinking of the optical indication of said optical indicating circuit when the output of said operation circuit differs from the output of said manually operable circuit, said indicating being in a lighted state when the output of said operation circuit coincides with the output of said manually operable circuit, the duty ratio of pulses of said oscillator being varied depending upon the output of said comparison circuit so as to render the duty ratio to be increased to 1 as the output of said manually operable circuit reaches that of said operation circuit; duration of the lighted interval within one blinking cycle being increased as the difference between the outputs of said operation circuit and said manually operable circuit decreases.

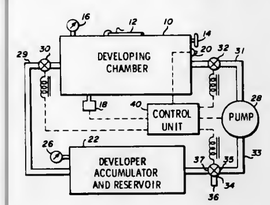
4,048,645

DIAZO EMULSION PROCESSOR

Donald J. Reams, Santa Clara, Calif., assignor to NBK Corporation, Santa Clara, Calif.

Filed Oct. 7, 1976, Ser. No. 730,422
Int. Cl.² G03D *7/00*
U.S. Cl. 354—300 **5 Claims**

1. Apparatus for developing photographic images on diazo emulsion media comprising:
a developing chamber means for containing diazo coated media to be developed;
reservoir means for containing a developing gas;
pump means;
first conduit means for establishing a first fluid flow path between said reservoir means and said chamber means, said first path including a first valve means;
second conduit means for establishing a second fluid flow path between said chamber means and said pump means, said second path including a second valve means;
third conduit means for establishing a fluid flow path between said pump means, the atmosphere, and said reservoir means, said third path including a third valve means having a first position for passing fluid to the atmosphere and a second position for passing fluid to said reservoir means; and



control means including a plurality of programmable switching means for controlling said pump means and said first, second, and third valve means, said control means causing the apparatus to operate in an operative sequence, first to cause said second valve means to open and said third valve means to open to said first position and said pump means to draw a vacuum in said developing chamber means, second to cause said first valve means to open to allow developing gas to flow from said reservoir means into said developing chamber means, and third, after a predetermined period of time has elapsed, to cause said second valve means to open and said third valve means to open to said second position, and said pump means to evacuate the developing gas from said developing chamber means and to return the developing gas back into said reservoir means.

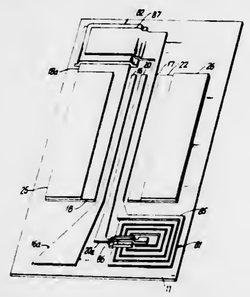
4,048,646

DUAL-GATE SCHOTTKY BARRIER GATE FET HAVING AN INTERMEDIATE ELECTRODE AND A METHOD OF MAKING SAME

Masaki Ogawa; Takashi Furutsuka, and Massoki Ishikawa, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Feb. 25, 1976, Ser. No. 661,256
Claims priority, application Japan, Feb. 26, 1975, 50-23744
Int. Cl.² H01L *29/48, 29/80, 23/48*
U.S. Cl. 357—15 **13 Claims**

1. A dual-gate Schottky barrier gate field effect transistor including a substrate of a semiconductor having a planar surface, a pair of first metal film pieces for use as a first and a second gate electrode on said planar surface, and a pair of second metal film pieces for use as a source and a drain electrode on said planar surface on both sides of said pair of first metal film pieces, wherein the improvement comprises an intermediate metal film piece on said planar surface between said first metal film pieces with a space left between said intermediate metal film piece and each of said first metal film pieces, said intermediate metal film piece being of a metal capable of forming an ohmic contact with said semiconductor substrate at least at its portion contiguous to said planar surface.

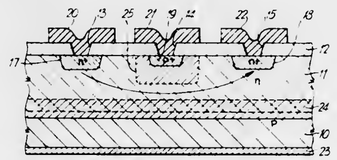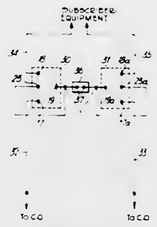


4,048,647

SOLID STATE DISCONNECT DEVICE

Kenneth Arnold Pickar, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sept. 10, 1976, Ser. No. 722,086
Int. Cl.² H01L *29/80*
U.S. Cl. 357—22 **6 Claims**





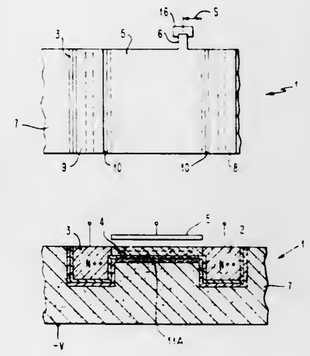
1. A solid state disconnect device for a telecommunication system including a Tip line and a Ring line, comprising: a pinch resistor element in each of said lines, each pinch resistor element including source, drain and gate areas, means connecting said lines to respective source and drain areas to connect said pinch resistor elements in said lines, an element in each line, each resistor element further including a substrate contact;
means for electrically connecting said substrate to said gate area of each resistor element, means for electrically connecting the gate area of each resistor element to the line in which is connected the other resistor element, and a termination device electrically connected between said gate areas of said elements;
the arrangement such that application of a suitable voltage on one of said lines with respect to the other of said lines disconnects said other of said lines and connects said termination device.

4,048,648

HIGH CARRIER VELOCITY FET MAGNETIC SENSOR

Albert Watson Vinal, Cary, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,339
Int. Cl.² H01L *27/22, 29/82, 29/96*
U.S. Cl. 357—27 **9 Claims**



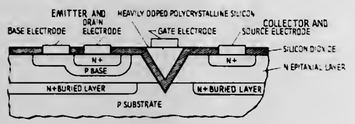
1. A magnetically sensitive field effect transistor structure, comprising:
a substrate of one conductivity type semiconductive material, said substrate having first, second, and third spaced apart contact diffusion regions of opposite conductivity type material to said substrate and defining, respectively, source, drain and output contact diffusion regions in a field effect device on the surface of said substrate;
said source and drain diffusions being separated from one another by a distance L;
a controllable conductance region forming a conduction channel of a field effect device located in the surface of said substrate and connecting said source and drain diffusions;
said channel having integral therewith a signal output probe of channel material itself comprising a lateral projection of said channel generally perpendicular to said length L, said projection lying in the plane of said channel and thereby defining a T-shaped channel and integral probe combination in the surface of said substrate;
said output probe being terminated by said third or output contact diffusion region;
an insulating layer overlying said surface of said substrate, said layer having means therein for enabling electrical contact to be made from above said layer to said source, drain and output contact diffusion regions, respectively; and,
conductive control gate means for controlling the conductance of said channel in said device, said control gate means overlying said insulating layer in an area coextensive with said T-shaped channel and probe combination in the surface of said substrate.

4,048,649

SUPERINTEGRATED V-GROOVE ISOLATED BIPOLAR AND VMOS TRANSISTORS

Richard Bohn, Cleveland, Ohio, assignor to Transitron Electronic Corporation, Wakefield, Mass.

Filed Feb. 6, 1976, Ser. No. 655,638
Int. Cl.² H01L *27/04, 29/78, 29/72, 29/04*
U.S. Cl. 357—43 **3 Claims**



1. A semiconductor structure comprising

a monocrystalline semiconductor substrate of one conductivity type, the substrate having its <100> crystallographic planes at one face thereof,

an epitaxial layer of the opposite conductivity type overlying said one face of the substrate,

a V-groove extending through the epitaxial layer and having its apex in the substrate, the V-groove dividing the epitaxial layer into at least two isolated parts,

an electrically insulative thin film coating the surfaces of the V-groove,

electrically conductive polycrystalline semi-conductor material filling the V-groove,

a first diffusion region of said one conductivity type extending into the epitaxial layer,

a second diffusion region of said opposite conductivity type overlying a portion of said first region and forming a p-n junction therewith,

a third diffusion region of said opposite conductivity type extending into the epitaxial layer, said third region being disposed on a part of said epitaxial layer that is isolated by the V-groove from the part of the epitaxial layer on which said first and second regions are situated,

means on the surface of the semiconductor structure providing electrical connections to each of said diffusion regions and to the polycrystalline material in the V-groove, and

means for biasing the polycrystalline semiconductor material in the V-groove in a polarity which induces a conductive channel under the V-groove that enables the flow of electric current between isolated parts of the epitaxial layer.

4,048,650

STILL COLOR TELEVISION SIGNAL RECORDING AND REPRODUCING APPARATUS

Yoshinori Tanaka, Yokohama; Hajime Shinoda, Tokyo, and Hisaki Narahara, Musashino, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 3, 1976, Ser. No. 692,317
Claims priority, application Japan, June 12, 1975, 50-71204
Int. Cl.² H04N *9/16, 5/76*
U.S. Cl. 358—1 **5 Claims**

1. A still color television signal recording and reproducing apparatus comprising:

a. a color television signal source;

b. a storage tube having horizontal and vertical deflection means;

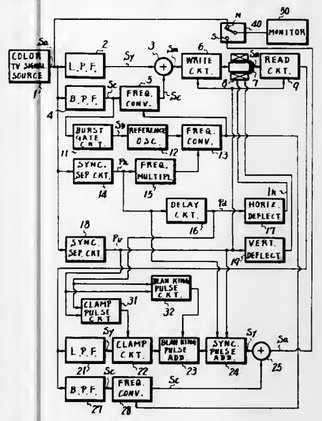
c. WRITE circuit means connected to said signal source for applying a field of a color television signal to said storage tube when operated;

d. READ circuit means connected to said storage tube for reading out a color video signal from the latter when operated;

e. a color picture reproducing means connected to said READ circuit means for receiving said read out color video signal and for reproducing a still color picture therein;

f. a horizontal deflection circuit connected to said signal source for supplying a horizontal deflection signal to the horizontal deflection means of said storage tube; and

g. a vertical deflection circuit connected to said signal source for supplying a vertical deflection signal to the vertical deflection means of said storage tube;



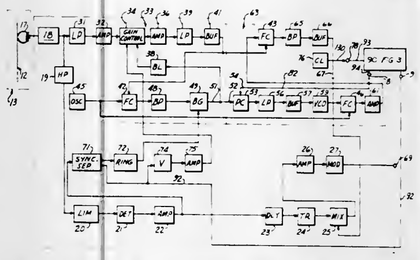
wherein said horizontal deflection circuit includes a delay circuit and the dalay time thereof is selected such that the horizontal scanning period of said storage tube begins at latest at the color burst signal portion of said color television signal from said WRITE circuit means when operated and said color burst signal portion is recorded in said storage tube at the beginning of every horizontal scanning period.

4,048,651

COLOR-CORRECTED VIDEO SIGNAL PROCESSING WITH AUGMENTED COLOR LOCK

James A. Miller, Chatsworth, and Morris L. Firkins, Lake Hughes, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed July 10, 1975, Ser. No. 594,886
Int. Cl.² H04N *5/76*
U.S. Cl. 358—8 **5 Claims**



1. In combination: an information medium having physical characteristics representative of synchronized color video information:

an electric power supply providing alternating-current power subject to frequency fluctuations;

transport means coupled to the power supply for transporting the information medium at a variable relative speed dependent upon the freqency fluctuations of the alternating-current power;

tranducer means disposed in proximity to the information medium and responsive to the physical characteristics of the information medium to provide an electrical signal including a synchronization component and including a chrominance component having color sidebands on a first carrier frequency and a time-base error dependent upon the variable speed of the transport means, said synchronization component including a horizontal synchronization signal affected by said time-base error;

means connected to said transducer means for amplifying said electric signal including said synchronization component and said chrominance component having said color sidebands;

means for compensating the time-base error of the chrominance component of the electric signal including color lock means for providing a direct current signal, automatic phase control means connected to said color lock means and to said amplifying means to provide with the aid of said direct current signal and said amplified electric signal an output signal having a frequency different from said first carrier frequency and being affected by said time-base error, and means connected to said amplifying means and to said automatic phase control means for relocating the amplified color sidebands about a stable second carrier frequency with the aid of said output signal of said automatic phase control means; and

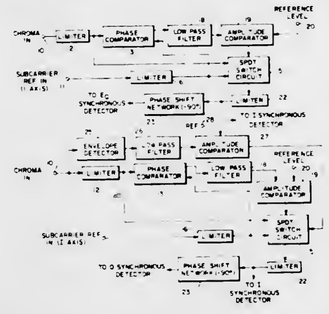
means for augmenting the tolerance of said color lock means to effects of said frequency fluctuations including means for sensing a pulse rate change in said horizontal synchronization signal, means connected to said sensing means for providing a rate change signal corresponding to the sensed rate change, and means for augmenting said direct current signal with said rate change signal.

4,048,652

AUTOMATIC HUE CONTROL SYSTEM

Theodore S. Rzeszewski, Lombard, Ill., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 464,225, April 25, 1974, abandoned. This application Nov. 6, 1975, Ser. No. 629,427
Int. Cl.² H04N *9/535*
U.S. Cl. 358—28 **26 Claims**



15. A method of providing hue control in a color television, including the steps of:

providing first signals at the frequency and phase of the chrominance signal;

providing second signals at a frequency and phase controlled by the reference subcarrier for the chrominance signal;

phase detecting said first and second signals to provide a control signal having an amplitude responsive to the phase differential between said first and second signals; and

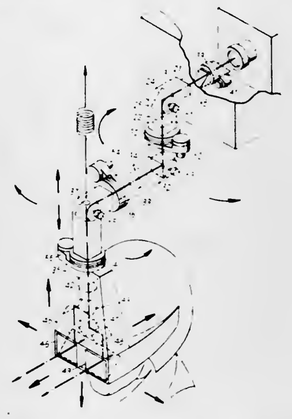
combining said first and second signals to form a chrominance demodulating reference signal, the magnitude of said control signal being capable of controlling the magnitude of at least one of said first and second signals being combined so that said magnitude can have any value within a continuous operating range.

4,048,653

VISUAL DISPLAY APPARATUS

Archer Michael Spooner, South Nutfield, England, assignor to Redifon Limited, England

Filed Oct. 15, 1975, Ser. No. 622,717
Claims priority, application United Kingdom, Oct. 16, 1974, 44837/74
Int. Cl.² *7/18, 5/72*
U.S. Cl. 358—104 **8 Claims**



1. Visual display apparatus, for providing a visual display before a trainee pilot of a moving craft, or like observer, comprising image generating apparatus and image projection apparatus for projecting an image generated by the image generating apparatus, the projection apparatus including a projection screen of highly retroflective material at least partly surrounding the pilot, a helmet or the like, to be worn on the pilot's head, an optical projector for projecting the said image as a light beam and movable optical means defining a movable optical path for the said light beam between the optical projector and the pilot's helmet, light reflective means, carried by the said helmet, for reflecting said image light beam forwardly onto the said projection screen from a position corresponding to the pilot's eyes, means for varying said generated image in accordance with the movement and attitude of the said craft, means for sensing movement in rotation and in inclination of the said helmet and providing control signals corresponding thereto and means, responsive to said control signals, for varying said generated image correspondingly to the orientation of said pilot's helmet.

4,048,654

STEREOPHONIC TELEVISION SOUND TRANSMISSION SYSTEM

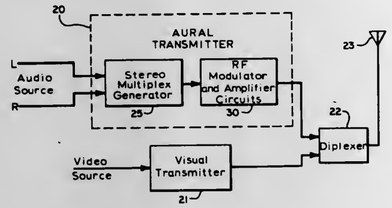
Carl R. Wegner, La Grange, Ill., assignor to Telesonics, Inc., Chicago, Ill.

Filed Feb. 18, 1976, Ser. No. 659,101
Int. Cl.² H04N *7/00*
U.S. Cl. 358—144 **59 Claims**

1. A stereophonic sound transmission system for transmitting within a television broadcast channel having defined frequency limits left and right audio source signals and a video source signal each having a predetermined upper frequency limit, said video source signal being amplitude-modulated on a

video carrier to form an AM signal occupying a first portion of said channel, said system comprising, in combination:

generator means including a stereo multiplex generator for generating a composite signal including a first component representative of the sum of said left and right source signals, a second amplitude-modulated subcarrier component representative of the difference between said left and right signals, said subcarrier component having upper and lower sidebands centered about a suppressed subcarrier, and a pilot component having a frequency one-half the frequency of said suppressed subcarrier;



transmitter means including means for generating a sound carrier within said broadcast channel, and means for frequency-modulating said sound carrier with said composite signal to form an FM signal occupying a second portion of said channel;

receiver means for receiving said television broadcast channel including means for deriving said composite signal; and

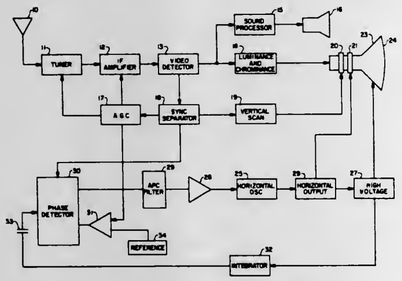
demodulator means for developing said left and right audio source signals from said composite signal.

4,048,655

VARIABLE SPEED HORIZONTAL AUTOMATIC PHASE CONTROL

Judson A. Hofmann, Schaumburg, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jan. 5, 1976, Ser. No. 646,721
Int. Cl.² H04N 5/04
U.S. Cl. 358—148 **6 Claims**



1. In a television receiver including signal means recovering picture, audio and scansion synchronizing information from a received signal; display means; automatic gain control means maintaining the recovered picture information at a substantially constant level, horizontal and vertical scansion means developing a raster on said display means and horizontal scansion synchronization means synchronizing the horizontal scansion of said display with said synchronizing information, the improvement comprising:

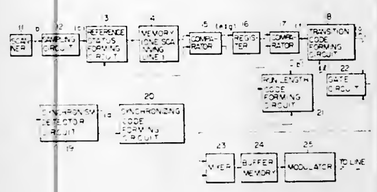
control means producing analog variation of the system response speed of said horizontal scansion synchronization means directly with the amplitude of said received signal.

4,048,656

FACSIMILE DATA COMPRESSION METHOD

Atsushi Ishii; Kiyoshi Oikawa, and Tadaaki Suzuki, Kawasaki; Tetsuro Morita, Tokyo, and Yoshio Iizuka, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 18, 1975, Ser. No. 641,900
Claims priority, application Japan, Dec. 23, 1974, 50-2642
Int. Cl.² HO4N 1/40, 7/12
U.S. Cl. 358—261 **17 Claims**



1. A facsimile data compression apparatus comprising:

a scanner which scans the original figure with scanning lines;

a sampling circuit which samples the output signal of said scanner;

a synchronism detector which detects the synchronizing signal from the output of said scanner;

a reference status forming circuit which generates the reference status based on the output of said sampling circuit and said synchronizing signal;

a first comparator circuit which compares the upper picture elements lying in the nth scanning line and the lower picture elements lying there-beneath in the $n+1$th scanning line and generates status signals corresponding to a combination of said upper picture element and said lower picture element;

a second comparator circuit which successively compares said status signals generated from said first comparator circuit and generates transition signals when the status change is detected between said status signals;

a transition code forming circuit which forms transition codes in accordance with said transition signals of said second comparator circuit;

a run length code forming circuit which receives said status signals of said first comparator and said transition signals of said second comparator and generates the run length codes in accordance with the length of said status signals having the same status;

a mixer circuit which mixes said synchronizing codes, said transition codes and said run length codes and said run length codes and then sends out said codes to a transmission line;

a separator circuit which separates said synchronizing codes, said transition codes and said run length codes from the received signal via said transmission line;

a head mode forming circuit which receives said synchronizing code from said separator circuit and forms the head mode state;

a first decoder and a second decoder which decode said transition code and said run length codes received from said separator circuit;

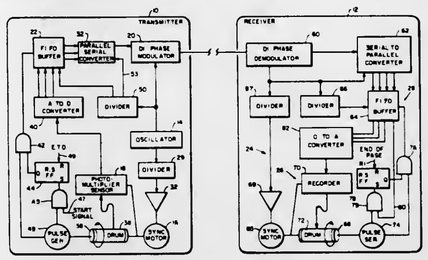
a group of gate circuits which receive the outputs of said head mode forming circuit and said first and second detectors so as to reproduce the information of said original figure.

4,048,657

METHOD AND APPARATUS FOR SYNCHRONIZING A FACSIMILE TRANSMISSION

Kurt E. Knuth, Mount Prospect, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 22, 1975, Ser. No. 642,854
Int. Cl.² H04N 1/04, 1/06, 1/36
U.S. Cl. 358—285 **6 Claims**



3. An apparatus for receiving a diphase facsimile signal comprising:

a demodulator extracting both clock and data informational signals from the incoming diphase signal;

a positionable recorder for recording the said data signal upon a cppy sheet and a variable speed motor coupled to said recorder for positioning thereof, the speed of said motor being determined by the clock signal derived from the demodulator;

means for sequentially storing the data information from said demodulator;

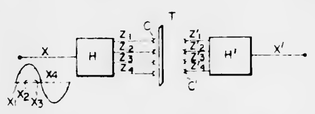
means for generating a signal related to the relative position of said recorder with respect to the copy sheet, the signal from said generating means serving to control the output rate of said storage means feeding said recorder.

4,048,658

VIDEO RECORDING AND REPRODUCING SYSTEM USING HADAMARD MATRIXING

Shiro Nakagawa, Tokyo, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jan. 16, 1975, Ser. No. 541,663
Claims priority, application Japan, Jan. 22, 1974, 49-9834; Mar. 7, 1974, 49-25675; Apr. 17, 1974, 49-42257; Apr. 17, 1974, 49-43717; Aug. 21, 1974, 49-96301; Aug. 21, 1974, 49-96302
Int. Cl.² H04N 5/79
U.S. Cl. 360—9 **2 Claims**



1. An apparatus for recording and playing back a video signal, comprising means for converting analog serial mode signals to parallel mode signals, means for sampling the amplitude of said parallel mode signals for every predetermined duration for converting said parallel mode signals to a PAM signal, Hadamard matrix means connected to convert said PAM signal to an equivalent signal, recording means having a plurality of fixed magnetic heads for recording the output of said matrix circuit on a magnetic medium, reading means having a plurality of fixed magnetic heads for reading data on said magnetic medium, an inverse Hadamard matrix circuit connected to convert the output of said second-mentioned magnetic heads to an equivalent parallel PAM signal, means for converting said last-mentioned parallel PAM signal to a serial PAM signal, and means for converting said serial PAM signal to an analog signal, wherein predetermined control signals are inserted in each of the parallel channels at the time of recording the signal, and the output circuit of each of the reproducing heads corresponding to the channels is provided with an electrically controllable variable delay circuit and connected to a phase discriminator circuit, whereby the output voltage signal from said phase discriminator circuit is fed to said electrically controllable variable delay circuit so as to eliminate any difference among control signals in different channels at the time of reproduction.
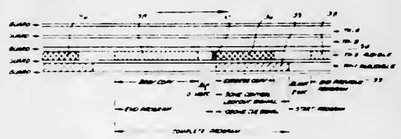
2. An apparatus for recording and playing back a video signal, comprising means for converting analog serial mode signals to parallel mode signals, means for sampling the amplitude of said parallel mode signals for every predetermined duration for converting said parallel mode signals to a PAM signal, Hadamard matrix means connected to convert said PAM signal to an equivalent signal, recording/means having a plurality of fixed magnetic heads for recording the output of said matrix circuit on a magnetic medium, reading means having a plurality of fixed magnetic heads for reading data on said magnetic medium, an inverse Hadamard matrix circuit connected to convert the output of said second-mentioned magnetic heads to an equivalent parallel PAM signal, means for converting said last-mentioned parallel PAM signal to a serial PAM signal, and means for converting said serial PAM signal to an analog signal, wherein the number of magnetic heads in said plurality of fixed magnetic heads is less than the number of the power of the Hadamard matrix of the Hadamard matrix means.

4,048,659

AUTOMATIC CASSETTE REPRODUCING APPARATUS

August A. Fink, Jr., Darien, Conn., and Noel J. Mackisoc, Newton, N.J., assignors to August A. Fink, Jr., Darien, Conn.

Continuation of Ser. No. 473,357, May 28, 1974, abandoned.
This application Mar. 5, 1976, Ser. No. 664,088
Int. Cl.² G11B 15/18
U.S. Cl. 360—72 **7 Claims**



2. An automatic cassette reproducing apparatus for use with a cassette tape with an audio program and a control signal thereon comprising:

a housing adapted to receive said cassette;

cassette tape transport means within said housing for engagement with and transportation of said tape;

said transport means in a first mode adapted to advance the tape at a normal speed at which the audio program thereon can be transmitted to a listener and adapted to be shifted to a second mode to advance the tape at a faster speed to a later portion of the audio program while permitting continuous advancement of the tape by the transport means;

lock means on the housing to automatically retain the transport means in one of said modes for a predetermined length of time;

control means in the housing to automatically activate and deactivate the lock means in response to the control signal on the tape without affecting continuous advancement of the tape;

the lock means retaining the transport means in the first mode for a designated portion of the audio program; and

the control signal being inaudible and appearing intermittently on the tape to activate the lock means and retain the

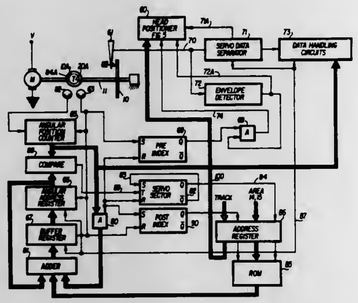
transport means in the first mode for predetermined periods of time during which the transport means cannot be shifted from the first mode.

4,048,660

RECORD TRACK FOLLOWING AND SEEKING

James Clifford Deanison, Broomfield, Colo., and Hjalmar Holmboe Ottesen, Oslo, Norway, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1975, Ser. No. 643,892
Int. Cl.² G11B 5/58, 17/00, 21/10
U.S. Cl. 360—77 **56 Claims**



1. A record member having means for identifying track locating lines for locating parallel record tracks, respectively, said lines being spaced a given distance;

improved track locating line identification patterns, including in combination:

first and second groups of servo signals aligned transversely to said lines and said groups disposed longitudinally along said lines;

each servo signal having an extent transverse to said lines of about said given distance and having differing durations such that servo signals of shorter durations in one of said groups are longitudinally adjacent servo signals of longer durations in another of said groups; and

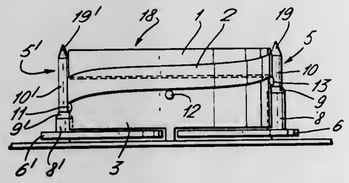
predetermined ones of said servo signals abutting one of said locating lines and other predetermined ones of said servo signals being centered on said locating lines.

4,048,661

DEVICE FOR GUIDING AND WINDING MAGNETIC TAPE IN RECORDING AND/OR REPRODUCING APPARATUS

Theophiel Clement Jozef Lodewijk Staar, Kraainem, Belgium, assignor to Staar, S.A., Brussels, Belgium

Filed July 29, 1975, Ser. No. 600,088
Claims priority, application France, Aug. 5, 1974, 74.27183
Int. Cl.² G11B 15/66
U.S. Cl. 360—130 **4 Claims**



1. In apparatus for positioning and guiding magnetic tape around the drum of a rotary head assembly in a recording and/or reproducing mechanism having at least two guide fingers for guiding the magnetic tape and mounted for movement between a retracted position where the guide fingers engage the magnetic tape in a self-contained cartridge, and an advanced position where the guide fingers dispose the tape along a predetermined helical path on the drum surface, the improvement comprising

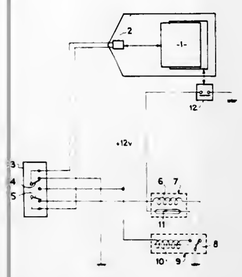
a plurality of guide surfaces projecting from the drum and having convex heads cooperating with said guide fingers for guiding the tape onto said predetermined helical path on the drum surface when the guide fingers are moved from said retracted position to said advanced position, and for maintaining the tape on said helical path during relative movement of the tape and rotary head assembly.

4,048,662

DEVICE FOR AVOIDING ACCIDENTS WHEN CLOSING A MOVABLE PANEL, FOR EXAMPLE THE PANEL OF AN ELECTRICALLY CONTROLLED SLIDING ROOF

Philippe Burguburu, Hericourt, France, assignor to Automobiles Peugeot, Paris, France

Filed Apr. 15, 1976, Ser. No. 677,298
Claims priority, application France, May 7, 1975, 75.14308
Int. Cl.² H02H 7/085
U.S. Cl. 361—31 **1 Claim**



1. A device for avoiding accidents when closing a movable panel, comprising an electric motor for driving said panel between an open position and a closed position, means for connecting the motor to a power supply, means for cutting off the power supply connecting means when the torque furnished by the motor during the displacement of said panel between said positions exceeds a predetermined value, and means for inhibiting said cut-off means when said panel is located in the immediate vicinity of its closed position, wherein said cut-off means comprise a first electromagnetic relay having a coil, a second electromagnetic relay having a coil connected in a first switch capable of being controlled by the coil of the second relay, a second switch capable of being controlled by the first relay, the coil of the first relay being connected in series with the motor and with the first switch, the coil of the second relay being connected between the power connecting means and earth in series with the second switch and the inhibiting means.

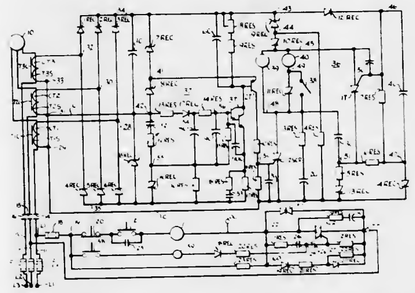
4,048,663

SOLID STATE OVERLOAD RELAY TRANSFORMER CIRCUIT

Winfred R. Lemke, Mequon, Wis., assignor to Square D Company, Park Ridge, Ill.

Filed Feb. 2, 1976, Ser. No. 654,423
Int. Cl.² H02H 3/08, 7/08
U.S. Cl. 361—75 **16 Claims**

5. A device for protecting an alternating current motor from abnormal motor currents comprising: at least one current transformer having a magnet iron core surrounding at least a portion of a conductor connecting the motor to an alternating current source and a secondary winding wound on the core to provide an alternating polarity output in response to the alternating current in the conductor, a current level sensing circuit including a first capacitor and a switching device having an input connected to the first capacitor for providing an output when the charge across the first capacitor exceeds a preadjusted level, a resettable trip circuit including a bistable element connected to be switched to a tripped state in response to a sensing circuit output, means for causing the motor circuit to be interrupted when the element is in its tripped state, and means including a second capacitor for providing energy for



causing the element to switch to its reset state a predetermined time interval after the element is switched to its tripped state and circuit means connected to the secondary winding providing a charging circuit for the first capacitor and a charging circuit for the second capacitor, said charging circuits including diodes poled in their associated charging circuit so the first capacitor and the second capacitor are charged by opposite polarity rectified half wave output current pulses of the secondary winding and an impedance in the charging circuit for the first capacitor for causing the second capacitor to be fully charged before the charge on the first capacitor reaches the preadjusted level.

4,048,664

PROTECTIVE CIRCUIT FOR DYNAMIC BRAKING RESISTORS

Victor V. Kirilloff, Murrysville, Pa., assignor to Mosebach Manufacturing Company, Pittsburgh, Pa.

Filed July 9, 1976, Ser. No. 703,896
Int. Cl.² H02H 3/04
U.S. Cl. 361—89 **6 Claims**



1. A circuit fo- protecting a pair of dynamic brake resistors when either of two motors driving fans for cooling the resistors fails, comprising:

a. a sensing circuit means having an input coupled to terminals of each of the motors and an output coupled to the input through voltage dropping impedances so as to substantially reduce the electrical energy from the input to the output; and

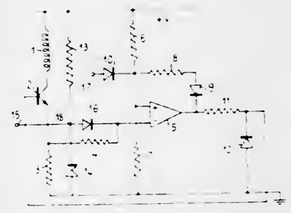
b. a switch means coupled to the output of the sensing circuit means, the switch means removes power to the dynamic brake resistors when the output from the sensing circuit reaches a certain level thereby protecting the resistors from overheating when there is a failure of either motor driving the cooling fans.

4,048,665

DRIVER CIRCUIT FOR PRINTER ELECTROMAGNET

Bruno Lia, and Giorgio Vigini, both of Milan, Italy, assignors to Honeywell Information Systems Italia, Milan, Italy

Filed Dec. 17, 1975, Ser. No. 641,859
Claims priority, application Italy, Dec. 20, 1974, 30809/74
Int. Cl.² H01H 47/32
U.S. Cl. 361—152 **8 Claims**



1. A driver circuit for supplying the winding of an electromagnet with a controlled current provided by an unregulated voltage source, comprising:

a switch connected in series with said winding;

a current detector coupled to detect the current flowing in said winding and to deliver a voltage signal related to the current flowing in said winding;

a reference circuit for generating a reference voltage whose level varies as a predetermined function of the voltage provided by said source; and

a controllable bistable device operable in either one of first and second stable states and transferrable from the one of said states in which it is operating to the other of said states upon receipt thereby of a respective trigger signal, said device delivering an output signal when said device is operating in said first state, said device being transferred to said first state upon receipt of an input command signal and being transferred to said second state when the level of said voltage signal exceeds the level of said reference voltage, said output signal enabling said switch to transfer current through said winding.

4,048,666

ELECTRIC SAFETY SWITCH CIRCUITRY

Yutaka Irie; Tomoji Murata, both of Toyokawa; Kenji Shibazaki, Aichi; Shunji Yamamoto, Shinshiro; Shigemitsu Shimizu, Toyokawa, and Yukio Tokura, Toyohashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 638,269, Dec. 5, 1975, abandoned. This application Apr. 15, 1976, Ser. No. 677,088
Claims priority, application Japan, Dec. 5, 1974, 49-140794; Dec. 25, 1974, 49-4482[U]
Int. Cl.² H01H 47/00
U.S. Cl. 361—189 **9 Claims**

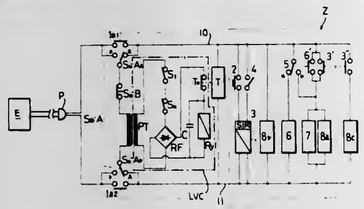
1. An electric safety switch circuit for use in an apparatus having at least one safety switch for detecting at least one abnormal condition of said apparatus, comprising:

a main electric power source for providing power to said electric circuit and said apparatus;

switching means connected between said power source and said apparatus;

means responsive to the voltage of said main electric power

source for transforming the voltage thereof to a lower voltage;
means for controlling said switching means to open or close the same;



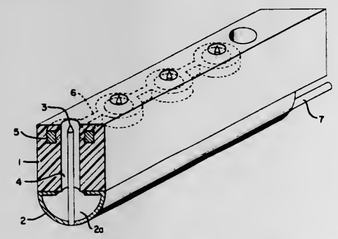
said at least one safety switch being connected to said means for transforming and said means for controlling and actuation of said at least one safety switch upon detection thereof of an abnormal condition actuates said means for controlling to open said switching means and disconnect said apparatus from said power source.

4,048,667

DEVICE FOR DISCHARGING STATIC ELECTRICITY

Hermann Bresnecke, Schwambstrasse 37, 61 Darmstadt, Germany

Filed Aug. 10, 1976, Ser. No. 713,237
Claims priority, application Germany, Aug. 13, 1975, 2536091
Int. Cl.² H05F *3/00*
U.S. Cl. 361—213 **15 Claims**



1. A device for discharging static electricity by means of an electric glow discharge comprising
a plurality of needle electrodes,
first means for supporting said needle electrodes in spaced parallel relationship,
a plurality of conductivity interconnected ring electrodes,
second means for supporting said ring electrodes so that each ring electrode is positioned in coaxial surrounding relationship to a respective needle electrode, and
means for effecting high voltage connection to said ring electrodes.

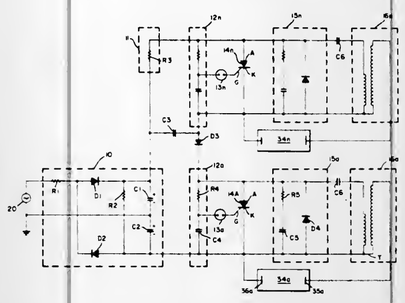
4,048,668

ELECTRICALLY DRIVEN HIGH VOLTAGE OZONATOR

John D. Von Bargen, Cypress, and Khalid U. Siddiqui, Westminster, both of Calif., assignors to Source Gas Analyzers, Inc., Garden Grove, Calif.

Filed May 9, 1975, Ser. No. 576,040
Int. Cl.² C01B *13/11*
U.S. Cl. 361—235 **10 Claims**

1. Apparatus for generating high concentrations of ozone in a high voltage ozonator driven by a solid state high voltage power supply, said apparatus comprising:
a. a corona generator comprising at least one ozonator cell including a high voltage electrode, a ground electrode spaced apart from said high voltage electrode and a layer of dielectric material between said electrodes, said layer being in contact with one of said electrodes and spaced a predetermined gap distance from the other said electrode, said cell being fabricated for a normal operating voltage range of 30,000 to 50,000 volts across said gap;
b. means for flowing an oxygen containing gas through said gap between said spaced apart electrodes; and
c. power supply means for establishing a potential difference in the range of 30,000 to 50,000 volts between said electrodes to establish a corona discharge therebetween to transform a portion of said oxygen into ozone, said power supply means comprising:
i. rectifier circuit means for rectifying current from an AC power source;



ii. solid state switching circuit means for interrupting said rectified current at a predetermined frequency;
iii. limiting impedance means for connecting said rectifier output to said solid state switching circuit means;
iv. timing circuit means and trigger component means for controlling the frequency of operation of said solid state switching circuit means; and
v. an auto-transformer of the automotive ignition coil type having its input winding connected by a coupling capacitor to said solid state switching circuit means and having its output connected across said electrodes of said ozonator cell to establish said potential difference therebetween, the capacitance of said cell forming a parallel tuned circuit with the output inductance of said auto-transformer.

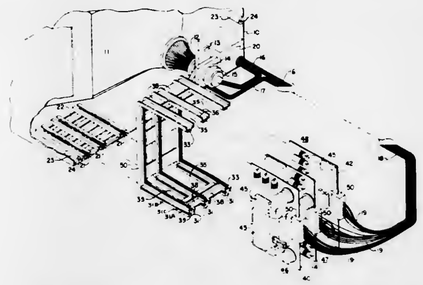
4,048,669

TELEVISION MODULE SUPPORT AND CARRIER

John W. Bowler, Arlington Heights; Kenneth E. Karner, Addison; Daniel I. Pittenger, Libertyville, and Donald A. Schwartz, Melrose Park, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 2, 1975, Ser. No. 618,987
Int. Cl.² H02B *1/02*
U.S. Cl. 361—391 **7 Claims**

1. For use in a television receiver having signal processing and display producing circuitry disposed on a plurality of printed circuit modules, cable means making electrical connections thereto, and a cabinet defining an enclosure and retaining means therein; module housing and transporting means comprising:
module support means, formed of nonconductive impact-absorbing material, defining a plurality of internal channels which accommodate said plurality of printed circuit modules and support them free of mechanical stresses either fully or partially inserted within said module support means while said cable means still maintain all said electrical connections and said module support means remain within said cabinet; said module support means, coacting with said retaining means to position and retain said module support means within said cabinet such that



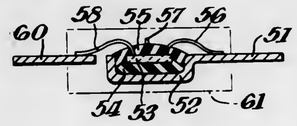
said module support means are removable from said cabinet, while still supporting said printed circuit modules, thereby serving as a transporting and storage carrier therefor.

4,048,670

STRESS-FREE HALL-CELL PACKAGE

Hubert Eysermans, Wichita Falls, Tex., assignor to Sprague Electric Company, North Adams, Mass.

Filed June 30, 1975, Ser. No. 591,684
Int. Cl.² H05K *1/04*
U.S. Cl. 361—421 **7 Claims**



1. A stress-free hall-cell package comprising:
a. a semiconductor chip having a hall-cell formed therein and lying in one plane, said chip having conductive terminal pads on a surface thereof for providing electrical access to said hall-cell;
b. at least three metal leads, an end portion of each of said leads lying in and defining another plane that is essentially parallel with said one plane;
c. a cup abutting at least one of said metal leads;
d. at least three metal wires each having one end connected to one of said terminal pads and another end connected to one of said leads near said end portion thereof;
e. an insulative elastomeric protective covering being contained in said cup, and completely except at said one end of said wires; and
f. an electrically insulating housing means for encapsulating and providing mechanical support to said cup and to said end portions of said leads.

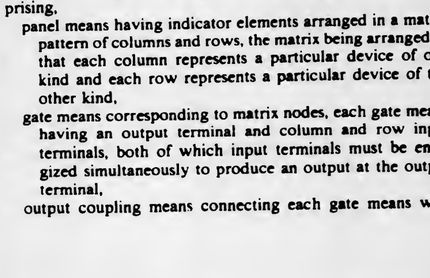
4,048,671

ADDRESS MATCH FOR DATA PROCESSING SYSTEM WITH VIRTUAL ADDRESSING

Robert William Callahan; Paul Eugene Kauffman, both of Endwell, and Matthew Joseph Mitchell, Jr., Endicott, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,400
Int. Cl.² G06F *9/06, 9/16, 13/00*
U.S. Cl. 364—200 **6 Claims**

1. Apparatus for detecting an address match in a data processing system having,
a store having a plurality of page frames and being accessible according to a first address having a page address portion and a word address portion, and
means for loading into a page frame of said store a page that is identified by a second address having a page address portion and a higher order bit portion, an address to be matched being uniquely identified by the combination of said second address and said word address portion of said first address,
wherein the improvement comprises,
means for holding the word portion of an address to be matched,
means connected to said means for holding the word portion of an address to be matched and connected to receive said word address portion of said first address for comparing the word portion of the address to be



matched and said word portion of said first address and for producing a word address match signal,
a register having a bit position for each of said page frames of said store, each bit position of said register being adapted to be set to identify any page frame containing the page in which the word to be matched is located,
means for identifying a page frame being accessed in said store, and
means connected to receive said word address match signal and connected to each bit position of said register and to said means for identifying a page frame being accessed in said store for signalling an address match in response to the coincidence of said word address match signal and an operation to access a page frame for which a bit in said register has been set.

4,048,672

SWITCH MATRIX CONTROL AND DISPLAY

Lewis J. Seiden, Tappan, N.Y.; William Landesberg, Norwalk, and Gladstone F. Young, Redding, both of Conn., assignors to T-Bar Incorporated, Wilton, Conn.

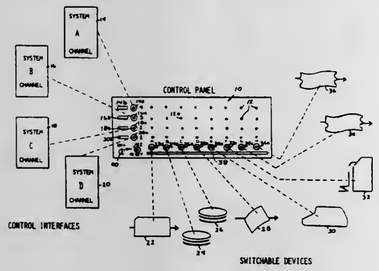
Filed Jan. 5, 1976, Ser. No. 646,580
Int. Cl.² G06F *3/00*
U.S. Cl. 364—200 **25 Claims**

1. A display and control system for a switching matrix in a data processing system for indicating and controlling device interconnection, each interconnecting node of the switching matrix including a plurality of switch elements operable together by coordinating actuator means to connect a selected data processing device to a selected peripheral device, comprising,
panel means having indicator elements arranged in a matrix pattern of columns and rows, the matrix being arranged so that each column represents a particular device of one kind and each row represents a particular device of the other kind,
gate means corresponding to matrix nodes, each gate means having an output terminal and column and row input terminals, both of which input terminals must be energized simultaneously to produce an output at the output terminal,
output coupling means connecting each gate means with

associated coordinating actuator means and responding to an output at the output terminal of the gate means to cause such actuator means to interconnect its devices,

a plurality of manually actuated control switches, one for each data processing device and one for each peripheral device, each coupled to the appropriate input terminal of each of the gate means in its column or row,

energizing means associated with each manually actuated



control switch whereby simultaneous manual manipulation of a selected pair of manually actuated control switches in a selected column and in a selected row will cause the gate means to generate an output causing interconnection of a specific device of one type with a specific device of another type, and circuit means responsive to the manual actuation of the control switches for activating that indicator element in the panel means representative of the devices interconnected thereby.

4,048,673

CPU - I/O BUS INTERFACE FOR A DATA PROCESSING SYSTEM

Gardner Cox Hendrie, Carlisle, Mass., and Harold Springer Crafts, Saratoga, Calif., assignors to Data General Corporation, Westboro, Mass.

Filed Feb. 27, 1976, Ser. No. 662,180
Int. Cl.² G06F *3/00*
U.S. Cl. 364—200 **10 Claims**

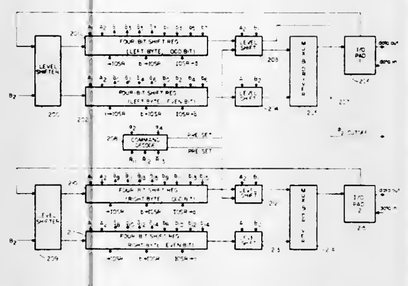
1. In a data processing system including (a) CPU with digital circuitry, (b) a main memory interfacing with said CPU, (c) I/O means for connecting between said CPU and peripheral devices, and (d) a clock source, interface means contained within said CPU for interfacing with said I/O means, said interface means comprising:

means for receiving pulses derived from said clock source and for deriving further pulses therefrom;

means for normally establishing an input mode of said interface means and responsive to signals from said CPU for establishing an output mode of said interface means;

a first I/O pad connected to said I/O means;

first shift register means for (1) serially receiving a first byte of a two byte data word from said first I/O pad responsive to certain of said further derived pulses and to the operation of said establishing means establishing said input mode and (2) serially generating said first byte of another two byte data word onto said first I/O pad responsive to other of said further derived pulses and to the operation of said establishing means establishing said output mode;



a second I/O pad connected to said I/O means;

second shift register means for (1) serially receiving the second byte of said two byte data word from said second I/O pad responsive to said certain of said further derived pulses and to the operation of said establishing means establishing said input mode and (2) serially generating said second byte of said another data word onto said second I/O pad responsive to said other of said further derived pulses and to the operation of said establishing means establishing said output mode; and

means for parallel transferring (1) said data word from said first and second shift register means to said digital circuitry and (2) said another data word from said digital circuitry to said first and second shift register means.

DESIGN PATENTS

GRANTED SEPTEMBER 13, 1977

ERRATA

For CLASS	See PATENT NO.
024–021	245,811
024–064	245,812

245,731
CHEST PROTECTOR FOR MOTORCYCLE RIDERS
Betty J. Bargsten, 1124 S. Lemon St., Apt. 11, Anaheim, Calif. 92805
Filed July 23, 1975, Ser. No. 598,392
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27



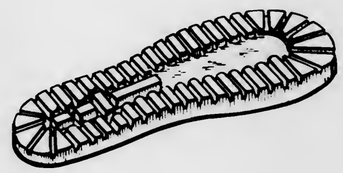
245,732
SHOE
Aubrey Askew, Southport, England, assignor to Dunlop Limited, London, England
Filed Nov. 12, 1975, Ser. No. 631,074
Claims priority, application United Kingdom, May 13, 1975, 971052/75
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



245,733
SHOE
Aubrey Askew, Southport, England, assignor to Dunlop Limited, London, England
Filed Nov. 12, 1975, Ser. No. 631,075
Claims priority, application United Kingdom, May 13, 1975, 971051/75
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



245,734
SHOE SOLE
Raymond Jacobs, New York, N.Y., assignor to Kalso Systemet, Inc., New York, N.Y.
Filed June 18, 1975, Ser. No. 587,953
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



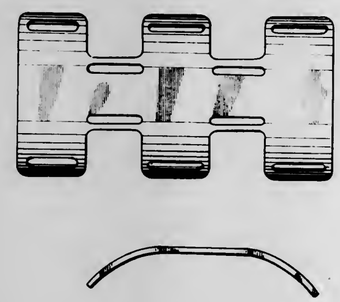
245,735
SANDAL SOLE
Tatsuo Fukuoka, No. 3, 3-Ban, 2-Chome, Shin-Minami-Fukushima, Tokushima, Japan
Filed Apr. 21, 1975, Ser. No. 569,959
Claims priority, application Japan, Dec. 26, 1974, 50-249; Dec. 26, 1974, 50-250
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



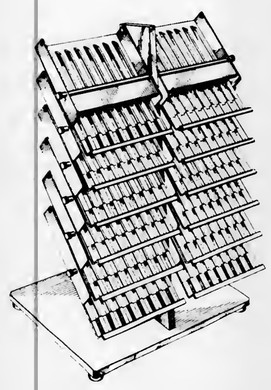
245,736
ATHLETIC SHOE SOLE
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 570,439, April 22, 1975, abandoned. This application Nov. 21, 1975, Ser. No. 634,128
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



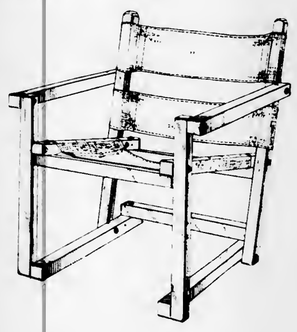
245,737
WRIST ATTACHABLE INSTRUMENT SUPPORT FOR A SCUBA DIVER OR THE LIKE
John F. Mayer, 420 River Road, Apt. D-6, Chatham, N.J. 07928
Filed Mar. 11, 1976, Ser. No. 665,887
Term of patent 3½ years
Int. Cl. D2—*99*
U.S. Cl. D2—400



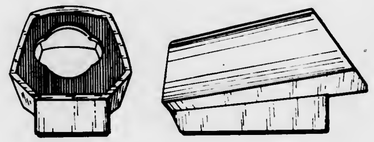
245,738
ELECTRONIC DIP DISPENSER
Lewis A. Latanzi, Bethel, Conn., assignor to Contact Systems, Inc., Danbury, Conn.
Filed Sept. 5, 1975, Ser. No. 610,552
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—24



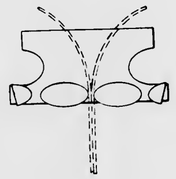
245,739
CHAIR
Victor J. Cook, Jr., New Orleans, La., assignor to Sud Model Corporation
Filed Mar. 10, 1976, Ser. No. 665,730
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



245,740
MAGNETICALLY MOUNTED SUPPORT FOR CIGARETTE LIGHTER
Herbert Richter, Pforzheim-Buchenbronn, Germany, assignor to Herbert Richter, Metallwaren-Apparatebau, Pforzheim-Buchenbronn, Germany
Filed Dec. 23, 1974, Ser. No. 536,931
Term of patent 14 years
Int. Cl. D6—*04;* D27—*05*
U.S. Cl. D6—85



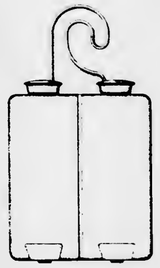
245,741
SKI HANGER
Bernard J. Putt, Star Route Box 169, Howard, Colo. 81233
Filed Jan. 28, 1976, Ser. No. 653,266
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—85



245,742
CALCULATOR SUPPORT STAND
Charles Wayne Sullivan, 3849 Dieckman Lane, Cincinnati, Ohio 45245
Division of Ser. No. 589,869, June 24, 1975. This application Oct. 15, 1976, Ser. No. 732,579
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85

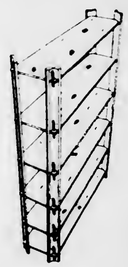


245,743
LIQUID DISPENSER
Patrick J. McManus, 6829 Gentry, North Hollywood, Calif. 91605
Filed Sept. 27, 1976, Ser. No. 727,214
Term of patent 14 years
Int. Cl. D23—*02;* D6—*04;* D9—*01*
U.S. Cl. D6—95

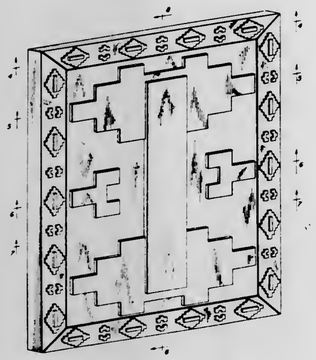




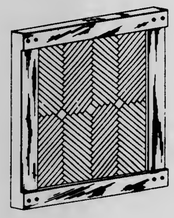
245,744
BOOKSHELF UNIT
Ronald A. Brooks, 2821 Hillegass, Berkeley, Calif. 94704
Filed Apr. 29, 1976, Ser. No. 681,397
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



245,745
DOOR PANEL
James J. Palka, 1522 E. Peachtree Drive, Arlington Heights, Ill. 60004
Filed May 14, 1976, Ser. No. 686,676
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—193



245,746
DOOR PANEL
James J. Palka, 1522 E. Peachtree Drive, Arlington Heights, Ill. 60004
Filed May 14, 1976, Ser. No. 686,677
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—193



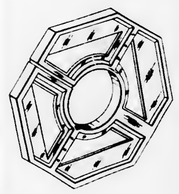
245,747
BORDER STABILIZER FOR USE IN THE CONSTRUCTION OF A BOTTOM TYPE MATTRESS
Minoru Ikeda, Kokubunji, Japan, assignor to France Bed Co. Ltd.
Continuation of Ser. No. 317,156, Dec. 21, 1972, abandoned.
This application Jan. 24, 1975, Ser. No. 543,926
Claims priority, application Japan, Sept. 5, 1972, 47-39173
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—201



245,748
GARMENT HANGER
Henry D. Ostroll, Jackson Heights, N.Y., assignor to J. C. Penney Company, Inc., New York, N.Y.
Filed May 13, 1976, Ser. No. 685,993
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—252



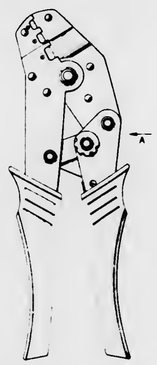
245,749
WARDROBE SYSTEMIZER DEVICE
Franklin H. Henry, 1431 Prentice Drive, Healdsburg, Calif. 95448
Filed Dec. 22, 1975, Ser. No. 643,151
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—257



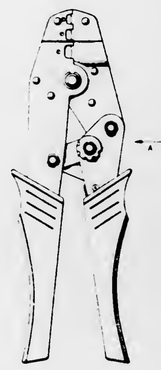
245,750
COMBINED GRATER AND CONDIMENT DISPENSER
Ewen M. Maclean, 88 Pleasant Blvd., Toronto, Canada
Filed Jan. 30, 1976, Ser. No. 636,680
Term of patent 7 years
Int. Cl. D7—*04, 06*
U.S. Cl. D7—47



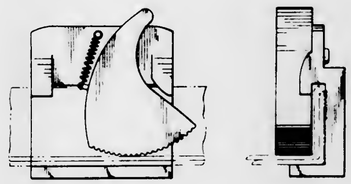
245,751
PAIR OF CRIMPING PLIERS
Hans Wiener, Taby, Sweden, assignor to Pressmaster AB, Stockholm, Sweden
Filed Mar. 4, 1976, Ser. No. 663,730
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—52



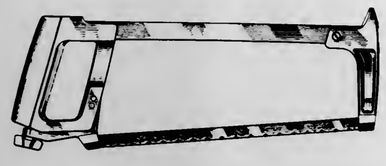
245,752
CRIMPING PLIERS
Hans Wiener, Taby, Sweden, assignor to Pressmaster AB, Stockholm, Sweden
Filed Mar. 4, 1976, Ser. No. 663,776
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—52



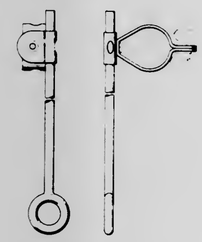
245,753
CHANNEL CLAMP
Anthony C. D'Atri, 7320 Ivandale Road, Independence, Ohio 44131
Filed July 2, 1976, Ser. No. 702,107
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—72



245,754
HACK SAW
Carl-Arne Breger, Malmo, Sweden, assignor to Sandvik Aktiebolag
Continuation-in-part of Ser. No. 382,656, July 26, 1973, abandoned. This application Sept. 8, 1975, Ser. No. 611,322
Claims priority, application Sweden, Jan. 29, 1973, 195/73
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—96



245,755
COMBINED BRACKET AND SUPPORTING ARM FOR HOLDING BALLOONS OR THE LIKE
Nathanial Henry Lewis, P.O. Box 20424, Los Angeles, Calif. 90006
Filed May 24, 1976, Ser. No. 689,670
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—349



245,756
ROLL BAR FOR RETRACTABLE AWNINGS
Donald S. McKee, Louisville, Colo., assignor to The Scott & Fetzer Company, Lakewood, Ohio
Filed Nov. 28, 1975, Ser. No. 635,798
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—376



245,757
CUTTER PIN FOR MOWER
Gerald C. Fisher, and Joseph E. Scanland, both of Savannah, Ga., assignors to Roper Corporation, Kankakee, Ill.
Filed July 30, 1976, Ser. No. 710,263
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—391



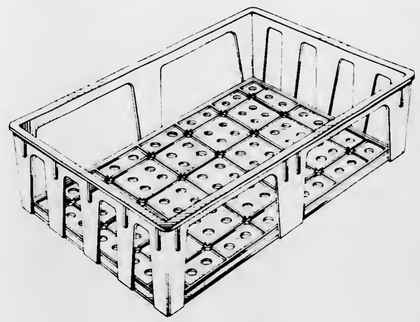
245,758
BOTTLE
John Pardo, Yonkers, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Dec. 12, 1975, Ser. No. 640,205
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—67



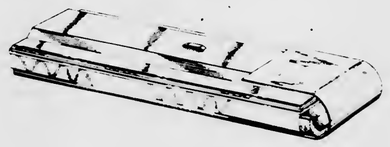
245,759
BOTTLE
John Pardo, Yonkers, N.Y., assignor to The Proctor & Gamble Company, Cincinnati, Ohio
Filed Dec. 12, 1975, Ser. No. 640,204
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—149



245,760
CASE FOR HOLDING CONTAINERS CARRYING BOTTLES
Theodor Box, 1108 Aileen Road, Brielle, N.J. 08730
Filed Jan. 22, 1976, Ser. No. 651,279
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—177



245,761
TONER POWDER SUPPLY CONTAINER
Gilmore N. Alseth, Richfield, and Richard D. Hipp, Jr., Harris, both of Minn., assignors to Minnesota Mining & Manufacturing Company
Filed Mar. 25, 1976, Ser. No. 670,450
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



245,762
HINGED DISPLAY BOX
Donald K. Takacs, Wheaton, Ill., assignor to Richardson-Merrell Inc., Wilton, Conn.
Filed Apr. 7, 1976, Ser. No. 674,414
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—235



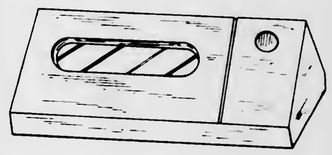
245,763
CARRIER BAG
Daniel A. Segura, Des Moines, Iowa, assignor to Great Plains Bag Corporation, Des Moines, Iowa
Filed Jan. 5, 1976, Ser. No. 646,431
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—249



245,764
WALL CLOCK
Donald H. Jorgenson, 204 McPhail Drive, and Larry A. Knigge, 317 E. Fourth St., both of Redwood Falls, Minn. 56283
Filed Nov. 5, 1975, Ser. No. 628,942
Term of patent 7 years
Int. Cl. D10—*01*
U.S. Cl. D10—9



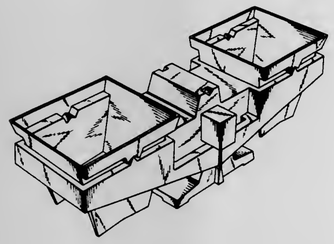
245,765
CLOCK
Yoshisaburo Yoshida, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jan. 22, 1976, Ser. No. 651,518
Claims priority, application Japan, July 29, 1975, 50-31535
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



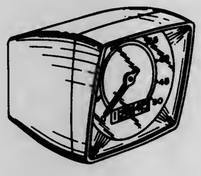
245,766
DIGITAL WRISTWATCH
Arthur Cruse, Dallas, Tex., assignor to E. Gluck Corporation, New York, N.Y.
Filed Aug. 18, 1975, Ser. No. 605,332
The portion of the term of this patent subsequent to Nov. 25, 1989, has been disclaimed.
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



245,767
SCALE
Earl D. Myers, 947 Crestwood Road, Westfield, N.J. 07090
Filed Apr. 22, 1976, Ser. No. 679,394
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—90



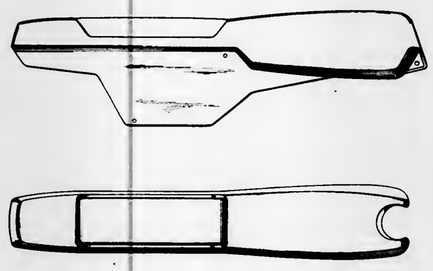
245,768
SPEEDOMETER
Howard J. Rasmussen, Fox River Grove, Ill., assignor to Stewart-Warner Corporation
Filed Dec. 18, 1975, Ser. No. 642,017
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—98



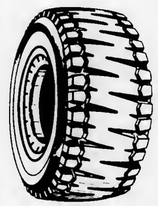
245,769
MAGNETIC MEDICAL NECKLACE
Masao Chihara, Matsudo, Japan, assignor to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 12, 1976, Ser. No. 675,781
Claims priority, application Japan, Oct. 16, 1975, 50-41590
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—13



245,770
COMBINED BICYCLE SEAT AND TANK
Keith E. Brightbill, Nashville, Tenn., assignor to The Murray Ohio Manufacturing Co., Brentwood, Tenn.
Filed July 14, 1976, Ser. No. 705,170
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—126



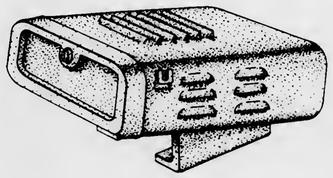
245,771
VEHICLE TIRE
Minoru Nakano, Tokorozawa, and Toshiro Tezuka, Higashi-Murayama, both of Japan, assignors to Bridgestone Tire Company Limited, Kyobashi, Japan
Filed Oct. 17, 1975, Ser. No. 623,479
Claims priority, application Japan, Apr. 17, 1975, 50-15040
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



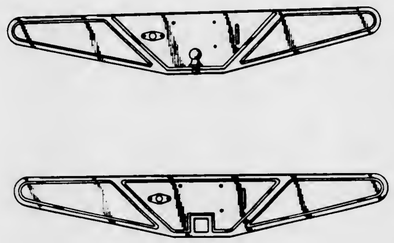
245,772
OVERHEAD CONSOLE FOR VEHICLES
Thomas L. Drafton, 3156 Santa Anita Ave., El Monte, Calif. 91733
Filed July 8, 1976, Ser. No. 703,634
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



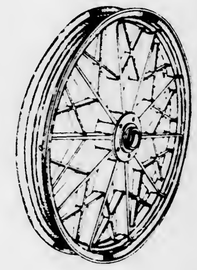
245,773
SECURITY BOX ADAPTED FOR MOUNTING WITHIN VEHICLES
Thomas R. Davis, 600 S. 45th St., Lincoln, Nebr. 68510
Filed Aug. 18, 1976, Ser. No. 715,476
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

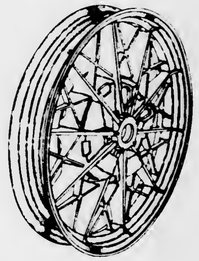


245,774
VEHICLE BUMPER
Carl Vern Norris, 1201 Soda Lake Road, Fallon, Nev. 89406
Filed Nov. 1, 1976, Ser. No. 737,409
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169



245,775
SPOKE WHEEL
Hans A. Muth, Hechendorf, Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Germany
Filed Sept. 17, 1976, Ser. No. 724,258
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205

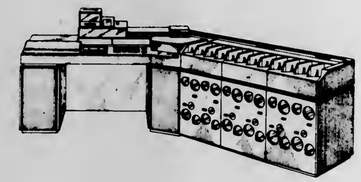




245,776
ONE-POINT STEREO MICROPHONE
Fred Jay Dellar, Sun Valley, Calif., assignor to Superscope, Inc., Chatsworth, Calif.
Filed Jan. 8, 1976, Ser. No. 647,445
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12



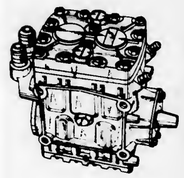
245,777
FINANCIAL PROOF MACHINE OR SIMILAR ARTICLE
Harley J. Shawen; Ralph D. Haney, both of Waterloo, Canada, and Jerry L. Kohli, Ithaca, N.Y., assignors to NCR Canada Ltd - NCR Canada Ltee
Division of Ser. No. 404,519, Oct. 9, 1973, Pat. No. Des. 238,282. This application June 11, 1975, Ser. No. 586,009
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—44



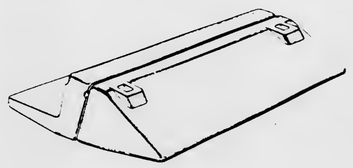
245,778
CITIZENS BAND ANTENNA
Frank F. Langner, 91 Willetts Drive, Boiling Spring Lakes, N.C. 28641
Filed June 21, 1976, Ser. No. 698,068
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—86



245,779
COMPRESSOR
Tetsuo Nobata, Nagoya, Japan, assignor to Kabushiki Kaisha Unicla, Nagoya, Japan
Filed Dec. 29, 1975, Ser. No. 645,299
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—9



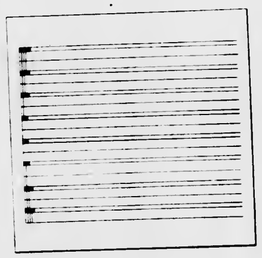
245,780
COMBINED ADAPTER AND CUTTER EDGE UNIT FOR EXCAVATING, DIGGING OR BUCKET LOADING SHOVEL
Sten Johan Dahlberg, Kariskoga; Jouko Kalevi Korpi, Degerfors, both of Sweden, and Ulf Robert Larsson, Brampton, Canada, assignors to AB Bofors, Bofors, Sweden
Filed Dec. 15, 1975, Ser. No. 641,101
Claims priority, application Sweden, June 19, 1975, 751269
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—32



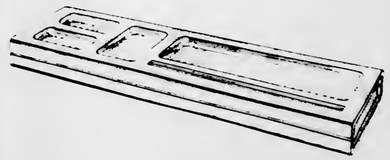
245,781
SAFETY SPECTACLES FRAME FRONT
Wayne W. Burkhardt, Spencer, Mass., and Robert R. Fischlein, Woodstock, Conn., assignors to American Optical Corporation, Southbridge, Mass.
Filed May 3, 1976, Ser. No. 682,439
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



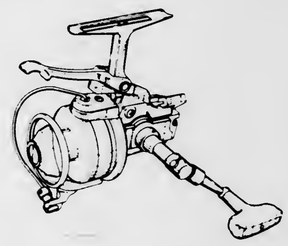
245,782
MUSIC SHEET
Wilbert G. Fritz, 305 N. Kenmore St., Arlington, Va. 22201
Filed Dec. 9, 1974, Ser. No. 530,997
Term of patent 14 years
Int. Cl. D19—*01*
U.S. Cl. D19—1



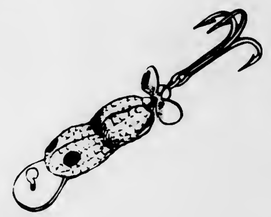
245,783
CONTAINER FOR WRITING AND STATIONERY ARTICLES
Walter Fieni, Paris, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France
Filed May 13, 1975, Ser. No. 576,952
Claims priority, application France, Nov. 21, 1974, 74.350
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75



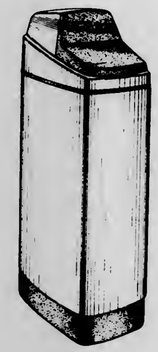
245,784
FISHING REEL
Kiyoshi Okada, Koganei, Japan, assignor to Daiwa Seiko, Inc., Higashi-kurume, Japan
Filed Sept. 13, 1976, Ser. No. 722,465
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



245,785
PEANUT-SHAPED FISHING LURE
Benjamin W. Price, P.O. Drawer 16875, Jacksonville, Fla. 32216
Filed Sept. 7, 1976, Ser. No. 720,893
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28



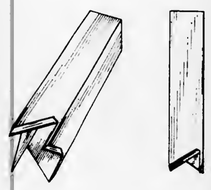
245,786
WATER SOFTENER CABINET
William J. Marsh, 1509 Rapids Drive, Racine, Wis. 53404
Filed July 28, 1976, Ser. No. 709,273
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



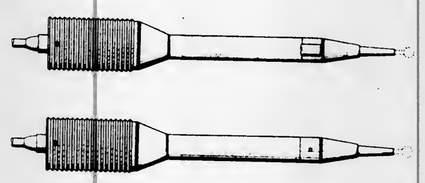
245,787
CONTAINER FOR DISSEMINATING INSECTICIDAL OR OTHER VAPORS
Charles R. Rhodes, Pleasant Hill, Calif., assignor to Shell Oil Company, Houston, Tex.
Filed May 7, 1976, Ser. No. 684,327
Term of patent 7 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



245,788
SURGICAL HAIR IMPLANTER
Robert P. Branch, 351 Alma Real Drive, Pacific Palisades, Calif. 90272, and Charles M. Monell, 104 Fremont Place, Los Angeles, Calif. 90005
Filed Oct. 29, 1976, Ser. No. 736,769
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26



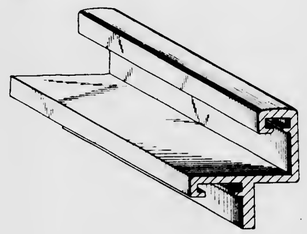
245,789
BONE DRILL
John J. Shea, and Harry Phillips, both of P.O. Box 4049, Memphis, Tenn. 38104
Filed Nov. 5, 1975, Ser. No. 628,941
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—28



245,790
PACIFIER
Paul K. Meeker, 412 Park, Kent, Ohio 44266, and Richard E. Cone, 249 Bowman Drive, Kent, Ohio 44240
Filed Sept. 2, 1976, Ser. No. 719,982
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—45



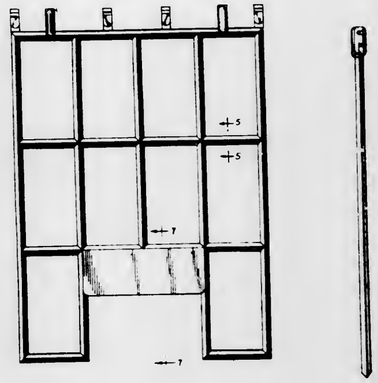
245,791
FRAME MOLDING
Greg Copeland, 114 Beach Terrace, Wayne, N.J. 07470
Filed June 1, 1976, Ser. No. 691,698
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



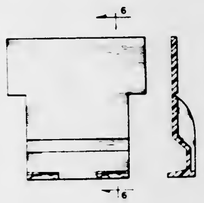
245,792
FENCE POST
Duayne D. Dougherty, 6807 N. 39th Ave., Phoenix, Ariz. 85019
Filed July 29, 1976, Ser. No. 709,768
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—77



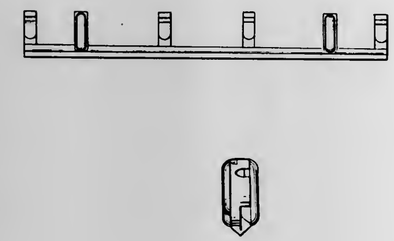
245,793
GATE FOR POULTRY CAGE
Donald L. DeMyer, c/o Cycle Systems Inc., 9290 Belding Road NE., Rockford, Mich. 49341
Filed July 6, 1976, Ser. No. 702,518
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2



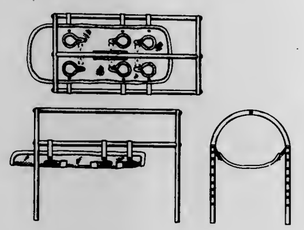
245,794
LATCH FOR POULTRY CAGE GATE
Donald L. DeMyer, c/o Cycle Systems Inc., 9290 Belding Road NE., Rockford, Mich. 49341
Filed July 7, 1976, Ser. No. 703,271
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2



245,795
HINGE FOR POULTRY CAGE GATE
Donald L. DeMyer, c/o Cycle Systems Inc., 9290 Belding Road NE., Rockford, Mich. 49341
Filed July 7, 1976, Ser. No. 703,272
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2



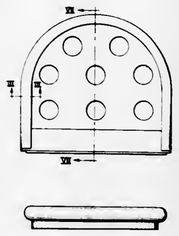
245,796
ANIMAL RESTRAINER
Norman C. Kaplan, 26556 Franklin Pointe, Southfield, Mich. 48034
Filed Sept. 27, 1976, Ser. No. 726,924
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—33



245,797
GOLF CLUB GRIP
Frank G. Hollendorfer, Akron, Ohio, assignor to Eaton Corporation
Filed Oct. 16, 1975, Ser. No. 623,215
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GS



245,798
GAME TARGET
Edmund F. Norden, 5157 Henry, Muskegon, Mich. 49441
Filed June 10, 1975, Ser. No. 585,617
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 NN



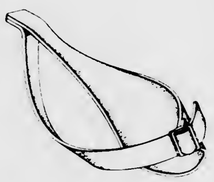
245,799
FOOTBALL PLAYER STANCE TRAINING DEVICE
Orley David Rogers, Farwell, Mich., assignor to Rogers Athletic Company, Farwell, Mich.
Filed Sept. 29, 1975, Ser. No. 617,297
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 R



245,800
ICE SKATE
Holger Bertil Ingvar Gustavsson, Nymilsgatan 5, 421 37 Vastra Frolunda, Sweden; Adolf Hensler, and Ferdinand Haizinger, both of Michael Gruberstr. 10, A 8580 Koflach, Austria
Filed May 10, 1976, Ser. No. 684,895
Term of patent 14 years
Int. Cl. D21—*08*
U.S. Cl. D34—14 B



245,801
ADJUSTABLE LOOP FOR A SKI POLE
Trygve Leljedahl, Lillehammer, Norway, assignor to Trygve Liljedahl Skistavfabrikk A/S
Filed Feb. 4, 1976, Ser. No. 655,247
Claims priority, application Sweden, Aug. 5, 1975, 1495/75
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—14 D



245,802
TOY BEAR
Richard E. Cone, 249 Bowman Drive, Kent, Ohio 44266
Filed May 26, 1976, Ser. No. 690,085
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B



245,803
TOY PELICAN
Richard E. Cone, 249 Bowman Drive, Kent, Ohio 44266
Filed May 26, 1976, Ser. No. 690,089
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B



245,804
TOY WHALE
Richard E. Cone, 249 Bowman Drive, Kent, Ohio 44266
Filed May 26, 1976, Ser. No. 690,087
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B



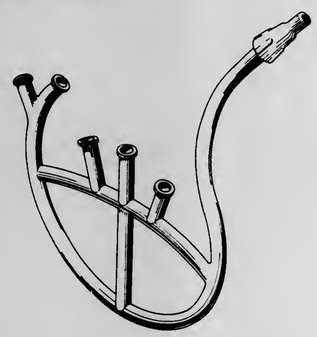
245,805
TOY SEAHORSE
Richard E. Cone, 249 Bowman Drive, Kent, Ohio 44266
Filed May 26, 1976, Ser. No. 690,086
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B



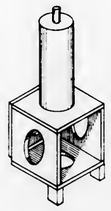
245,806
TOY DOLPHIN
Richard E. Cone, 249 Bowman Drive, Kent, Ohio 44266
Filed May 26, 1976, Ser. No. 690,083
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B



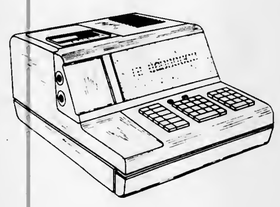
245,807
TOY WHISTLE
Duane Plank, 209 S. Vancouver, Kennewick, Wash. 99336
Filed Jan. 26, 1976, Ser. No. 652,629
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C



245,808
COMBINED END-TABLE AND LAMP PEDESTAL
James H. Stacey, 123 Cox St., Apt. No. 5, Auburn, Ala. 36830
Filed Mar. 8, 1976, Ser. No. 664,755
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 D



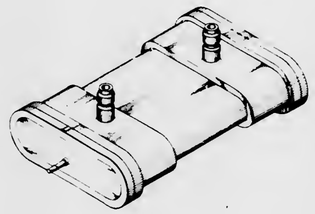
245,809
CASH REGISTER
Isao Kitai, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed July 23, 1975, Ser. No. 598,857
Claims priority, application Japan, Jan. 27, 1975, 50-3684
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D52—4 A



245,810
CASING FOR AN ELECTRONIC CALCULATOR
Leroy J. Lacelle, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Apr. 8, 1976, Ser. No. 674,801
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B



245,811
FILTER FOR HEMODIALYSIS AND BLOOD OXYGENATION
Paul W. Gics, Santa Ana, Calif., assignor to Gics Pharmaceuticals, Inc., Santa Ana, Calif.
Filed Sept. 17, 1975, Ser. No. 614,263
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—21



245,812
MEDICAL CORRECTIVE BODY BRACE
Ronald Tosoonian, 11891 Gladstone Drive, Santa Ana, Calif. 92705
Filed June 9, 1975, Ser. No. 585,106
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



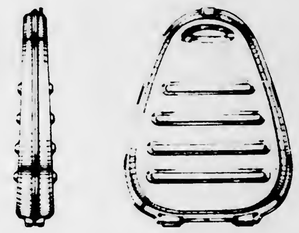
245,813
COMBINED TENNIS RACQUET COVER AND BALL HOLDER
Patricia Lynn Davis, P.O. Box 21801, San Jose, Calif. 95151
Filed Sept. 8, 1975, Ser. No. 611,352
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



245,814
HANDBAG
Barney F. Ross, 3726 Marine St., Apartment 1, Santa Ana, Calif. 92704
Filed Jan. 19, 1976, Ser. No. 650,501
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 C



245,815
LUGGAGE OR SIMILAR ARTICLE
Noel L. Dunnavan, 16409 35th Ave. Northeast, Apt. B, Arlington, Wash. 98223
Filed Nov. 10, 1975, Ser. No. 630,095
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 F



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF SEPTEMBER, 1977

NOTE —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See—*
Hoke, Jack B.; Graham, Richard; and Hoffman, Richard H., 4,047,821, Cl. 403-109.000.

A. B. Dick/Scott: *See—*
Gross, Frank C., 4,047,950, Cl. 96-1.0SD.

A. C. Nielsen Company: *See—*
Haselwood, Donald E.; Solar, Carl M.; and Thumm, Jeffrey R., 4,048,562, Cl. 325-31.000.

A/S Hymas: *See—*
Pabsdorff, Melvin, 4,047,486, Cl. 104-9.000.

Aarons, Raymond Joseph, to Monier Colourtile Pty. Ltd. Ridge cap holding clips. 4,047,353, Cl. 52-713.000.

Aarts, Franciscus Henricus Eduard: *See—*
Severijns, Adrianus Petrus; and Aarts, Franciscus Henricus Eduard, 4,047,394, Cl. 62-502.000.

AB Bofors: *See—*
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Lundin, Lars Olof, 4,047,467, Cl. 89-41.00H.

AB Jarnforadling: *See—*
Laurin, Arvid, 4,047,841, Cl. 416-140.000.

AB Svenska Flaktfabriken: *See—*
Knutsson, Filip; and Bergstrom, Lars, 4,047,907, Cl. 55-147.000.

AB Svenska Maskinverken: *See—*
Asplund, Frank Eskil William; and Engstrom, Axel Erik Konstantin, 4,047,559, Cl. 165-7.000.

AB Westin & Backlund: *See—*
Thyberg, Bertil Sven Johan; and Elmgren, Karl Arne Stig, 4,047,709, Cl. 269-22.000.

Abbott Laboratories: *See—*
Hillier, Edward Lawrence; Graham, Glen Henry; and Eichelberger, Warren Evan, 4,048,254, Cl. 260-859.00R.
Hillier, Edward Lawrence; Graham, Glen Henry; and Eichelberger, Warren Evan, 4,048,255, Cl. 260-859.00R.
Nara, Takashi; Okachi, Ryo; Yamamoto, Mitsuyoshi; Mori, Yasuki; Sato, Moriyuki; Sugimoto, Masahiro; and Shimizu, Yoshiaki, 4,048,015, Cl. 195-96.000.

Abell, Joseph L.: *See—*
Riendeau, William P.; Blevins, Robert R.; and Abell, Joseph L., 4,048,608, Cl. 337-74.000.

Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, to American Home Products Corporation. Alkyl derivatives of 4,5-dehydro PGF_{1}. 4,048,328, Cl. 424-305.000.

Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, to American Home Products Corporation. Alkyl derivatives of 4,5-dehydro PGE_{1} 4,048,329, Cl. 424-305.000.

Abt, Edgar John, to Motorola, Inc. Compact electrical fuze. 4,047,485, Cl. 102-80.000.

Accumulatorenwerk Hoppecke-Carl Zoellner & Sohn: *See—*
Lahme, Norbert Wilhelm; and Sassmannshausen, Gunter C., 4,048,387, Cl. 429-50.000.

Ackerman, Leonard Stanley. Variable speed device. 4,047,451, Cl. 74-665.00H.

Adams, Frank C.: *See—*
Cooper, Shannon L.; and Adams, Frank C., 4,047,951, Cl. 96-27.00R.

Adams, Guy; and Goldman, Scott D., to Solitron Devices, Inc. Crystal controlled oscillator circuit for illuminating electrodeless fluorescent lamp. 4,048,541, Cl. 315-248.000.

Adams, Guy Emery; and Pellegrin, Anna J., to Solitron Devices, Inc. Ignition system with gas discharge tube circuit. 4,047,513, Cl. 123-148.00E.

Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., to Boots Company Limited, The. Phenylalkanoic acids. 4,048,332, Cl. 424-317.000.

Adamson, Arthur P.: *See—*
Ravenhall, Richard; Salemme, Charles T.; and Adamson, Arthur P., 4,047,840, Cl. 416-135.000.

Adaniya, Takeshi; and Ohmura, Masaru, to Nippon Kokan Kabushiki Kaisha. Method for manufacturing an electro-galvanized steel sheet excellent in bare corrosion resistance and adaptability to chromating, and product thereof. 4,048,381, Cl. 428-632.000.

Addmaster Corporation: *See—*
Fuller, David W., 4,047,409, Cl. 70-356.000.

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Cieplik, Robert J.; and Czarnecki, Victor, 4,048,641, Cl. 354-10.000.
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Adelberg, Marvin. Clamp for regulating flow through plastic-tubing. 4,047,694, Cl. 251-6.000.

Adelmann, Siegfried; Margotte, Dieter; and Merten, Josef, to Bayer Aktiengesellschaft. Glass fiber-reinforced thermoplastic polycarbonate molding compositions with improved tough-elastic properties. 4,048,133, Cl. 260-37.0PC.

Adolph, Horst G., to United States of America, Navy. Acetals derived from negatively substituted aldehydes and polynitro- or halonitroethanols. 4,048,219, Cl. 560-156.000.

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Klancnik, John H., 4,047,779, Cl. 339-9.00A.

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Chronberg, Sten, 4,048,037, Cl. 204-180.00R.
Francois, Bernard; Vernois, Michel; and Franta, Emile. 4,048,420, Cl. 526-173.000.

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De Winter, Walter Frans; and Timmerman, Daniel Maurice, 4,047,957, Cl. 96-67.000.
Van Paesschen, August Jean; and Van Gossum, Lucien Janbaptist, 4,048,357, Cl. 427-387.000.

Aggarwal, Sundar Lal: *See—*
Hargis, Ivan Glen; Livigni, Russell Anthony; and Aggarwal, Sundar Lal, 4,048,427, Cl. 526-337.000.

Aguilar, Manuel, Jr., to Johns-Manville Corporation. Sheet material attaching device and wall arrangement using this device. 4,047,349, Cl. 52-551.000.

Aiken Industries, Inc.: *See—*
Riendeau, William P.; Blevins, Robert R.; and Abell, Joseph L., 4,048,608, Cl. 337-74.000.

Air Products and Chemicals, Inc.: *See—*
Uffner, Melville W., 4,048,086, Cl. 252-182.000.

Airco, Inc.: *See—*
Dorenbos, Frederick William, 4,047,624, Cl. 214-17.00B.
Hill, Russell J.; and Tsujimoto, Kazumi N., 4,048,462, Cl. 219-121.0EB.

Aitken, W. Sidney. Fitting and methods for making the same. 4,047,739, Cl. 285-21.000.

Ajax International Corporation: *See—*
Blevitt, Robert; and O'Brien, Miguel Eugene, 4,047,623, Cl. 214-17.00C.

Akimoto, Hiroshi: *See—*
Sugimoto, Keiichi; Nishijima, Koji; Hanaoka, Tadashi; Akimoto, Hiroshi; and Kakeya, Nobuharu, 4,048,158, Cl. 260-239.100.

Akopian, Nikolai Rubenovich: *See—*
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Svensson, Nils David, 4,047,670, Cl. 241-92.000.

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Jacobsson, Kurt Arne Gunnar, 4,047,675, Cl. 242-47.010.

Aktiebolaget Tudor: *See—*
Sundberg, Erik, 4,048,398, Cl. 429-140.000.

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Nedenskov, Poul; and Alster, Karol, 4,048,198, Cl. 260-347.400.

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Albert, Richard D. Selectable wavelength X-ray source, spectrometer and assay method. 4,048,496, Cl. 250-272.000.

Albertsen, Ove: *See—*
Trostmann, Erik; and Albertsen, Ove, 4,047,478, Cl. 99-450.100.

Albrecht, Konrad; Langeluddeke, Peter; Schumacher, Hans; and Schwerdtle, Friedhelm, to Hoechst Aktiengesellschaft. Herbicidal agents. 4,047,932, Cl. 71-108.000.

Alcan Aluminum Corporation: *See—*
Sutherland, James Gordon, 4,047,354, Cl. 52-729.000.

Alderete, William Eugene; Boyer, John Parke; Daugherty, Kenneth Earl; and Johnson, David Lee, to General Portland, Inc. Cement composition. 4,047,961, Cl. 106-89.000.

Alderman, Robert J. Roof system. 4,047,345, Cl. 52-404.000.

Alderman, Robert J. Chicken wire roof and method of insulation. 4,047,346, Cl. 52-407.000.

Alexeenko, Vladimir Iosifovich: *See—*
Dinzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Keszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 4,047,860, Cl. 425-4.00R.

Alfenaar, Marinus; and Van Gasse, Rene L. E., to Stamicarbon B.V. Process for making an electrochemical cell or battery, e.g. a fuel cell or fuel cell battery, and a cell or battery made by the process. 4,048,386, Cl. 429-38.000.

Alfred Gutmann Gesellschaft fur Maschinenbau: *See—*
Zeidler, Johannes; and Von Borcke, Bernd, 4,047,843, Cl. 416-185.000.

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Falkowski, Edward C.; and Ruppel, Carl E., 4,047,983, Cl. 148-105.000.
Wright, Roger N., 4,047,941, Cl. 75-126.00B.

Allen, Joseph C., to Texaco Inc. Oil recovery process utilizing air and superheated steam. 4,048,078, Cl. 252-8.55D.

Alliance Manufacturing Co., Inc., The: *See—*
Deming, Andrew F.; and Carli, Alvin J., 4,048,630, Cl. 340-274.00R.

Allis-Chalmers Corporation: *See—*
Harrer, Paul H.; and Langford, LeRoy, 4,047,638, Cl. 221-266.000.
Heian, Glenn A., 4,047,884, Cl. 432-21.000.
Mayo, Howard A., Jr.; and Swiecicki, Ignacy, 4,047,831, Cl. 415-1.000.
Mydels, John W., 4,047,823, Cl. 403-188.000.
Peterson, James F., 4,047,368, Cl. 56-202.000.
Stich, Frederick A., 4,048,554, Cl. 363-98.000.
Wagner, Robert L., 4,047,575, Cl. 172-311.000.

Allis, Robert F.; and Capaccio, Vincent A., to Xerox Corporation. Available light marginal illumination system. 4,047,811, Cl. 355-14.000.

Alster, Karol: *See—*
Nedenskov, Poul; and Alster, Karol, 4,048,198, Cl. 260-347.400.

Alvarado, Alfredo. Surgical stapler. 4,047,654, Cl. 227-19.000.

Amalberti, Jean Claude: *See—*
Lecart, Jean-Guy Pierre Denis; and Amalberti, Jean Claude, 4,047,450, Cl. 74-552.000.

AMAX Inc.: *See—*
Clark, George W.; and Dainty, Douglas H., 4,047,942, Cl. 75-133.500.

Amboss, Kurt: *See—*
Brewer, George R.; and Amboss, Kurt, 4,048,534, Cl. 313-293.000.

Amerace Corporation: *See—*
Smorzaniuk, Adam, 4,048,607, Cl. 337-53.000.

American Colloid Company: *See—*
Clem, Arthur G., 4,048,373, Cl. 428-454.000.

American Cyanamid Company: *See—*
Ando, Hiei; and Haacke, Gottfried, 4,048,372, Cl. 428-412.000.
Barber, William Austin; and Fetchin, John Allan, 4,048,226, Cl. 260-561.00N.
Casey, Donald James; and Epstein, Martin, 4,048,256, Cl. 260-860.000.
Hlavka, Joseph John; and Bitha, Panayota, 4,048,431, Cl. 536-17.000.
Perciaccante, Vincent Anthony; and Landi, Henry Patrick, 4,047,533, Cl. 128-335.500.
Remley, Kenneth Herald, 4,048,001, Cl. 156-331.000.
Saunders, Kenneth Worden, 4,048,114, Cl. 252-463.000.
Suen, Tzeng Jiueq; Begala, Arthur James, Jr.; and Grayson, Martin, 4,048,065, Cl. 210-58.000.

American Home Products Corporation: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,048,328, Cl. 424-305.000.
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,048,329, Cl. 424-305.000.

American Optical Corporation: *See—*
Park, Ernest D.; and Dianetti, Joseph C., 4,047,794, Cl. 350-54.000.

Ammann, Eugene O., to GTE Sylvania Incorporated. Laser apparatus for producing stimulated Raman scattering. 4,048,516, Cl. 307-88.300.

AMP Incorporated: *See—*
Carter, Clyde Thomas, 4,047,791, Cl. 339-260.000.
Forney, Edgar Wilmot, Jr.; and Hogendobler, Richard Shure, 4,047,788, Cl. 339-177.00R.
Yeager, Marvin Leo, 4,047,782, Cl. 339-75.0MP.
Zimmerman, Richard Henry, 4,048,438, Cl. 174-68.500.

Amsted Industries, Inc.: *See—*
Hirs, Gene, 4,048,068, Cl. 210-80.000.

Anderson, Brian; Dalton, Raymond Frederick; and Rowbotham, Philip Martin, to Imperial Chemical Industries Limited. 5-(2-Hydroxyphenyl)tetrazolyl compounds. 4,048,187, Cl. 260-308.00D.

Anderson, Conrad V., to Pako Corportion. Demand driven clutch. 4,047,445, Cl. 74-230.400.

Anderson, John Harland. Solar heating cell. 4,047,518, Cl. 126-271.000.

Ando, Akiko: *See—*
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, 4,048,155, Cl. 542-422.000.

Ando, Hiei; and Haacke, Gottfried, to American Cyanamid Company. Coating of cadmium stannate films onto plastic substrates. 4,048,372, Cl. 428-412.000.

Angehrn, Jorg August, to Dresser Industries, Inc. Method and apparatus for logging earth boreholes using self-contained logging instrument. 4,047,430, Cl. 73-151.000.

Anstey, Henry Dennis, to Deere & Company. Tractor-implement control system. 4,047,587, Cl. 180-53.00R.

Antennas for Communications, Inc.: *See—*
Hubbard, Howard H.; and Walsh, Thomas P., 4,047,287, Cl. 29-600.000.

Antonini, Eraldo: *See—*
Molteni, Luigi; Vercesi, Gian Piero; and Antonini, Eraldo, 4,048,305, Cl. 424-177.000.

Antonova, Tamara Nikolaevna: *See—*
Kondratenko, Maria Stefanova; Nachev, Lyubomir Todorov; Dedova, Petrushka Atanassova; and Antonova, Tamara Nikolaevna, 4,048,339, Cl. 426-39.000.

Antos, George J., to UOP Inc. Dehydrogenation method and nonacidic multimetallic catalytic composite for use therein. 4,048,246, Cl. 260-668.00D.

Antos, George J., to UOP Inc. Dehydrocyclization with an acidic multimetallic catalytic composite. 4,048,249, Cl. 260-673.500.

Aoyama, Kenneth M. Apparatus for facilitating the mechanical harvesting of tomatoes. 4,047,573, Cl. 171-14.000.

Aoyama, Syunichi: *See—*
Nakajima, Yasuo; Hayashi, Yoshimasa; Takagi, Yasuo; Sugihara, Kunihiko; and Aoyama, Syunichi, 4,047,510, Cl. 123-119.00A.

Appleman, William S., to Richmond Manufacturing Company, The. Portable earth boring machine. 4,047,578, Cl. 173-152.000.

Appleman, William S., to Richmond Manufacturing Company, The. Portable earth boring machine. 4,047,582, Cl. 175-122.000.

Applied Materials, Inc.: *See—*
McNeilly, Michael A.; and Benzing, Walter C., 4,047,496, Cl. 118-49.100.

Arai, Kenichiro: *See—*
Shindo, Takemasa; and Arai, Kenichiro, 4,048,470, Cl. 219-216.000.

Arai, Yoshi; Kimura, Kazuo; Sato, Hisato; Yamaki, Takasi; Morita, Katsuhiko; Ohzeki, Masanao; Takatsu, Haruyoshi; Fujita, Yutaka; and Tazume, Masayuki, to Dainippon Ink & Chemicals, Inc.; and Kawamura Institute of Chemical Research. Nematic liquid crystal composition. 4,048,089, Cl. 252-299.000.

Arakawa, Masatoshi; Ohno, Ryotaro; Ishikawa, Katuhiro; Yamahara, Noboru; and Matsui, Hisashi, to Japan Synthetic Rubber Co., Ltd. Carboxylic acid of cyclopentadiene derivative, salt thereof, or ester thereof and process for producing these compositions. 4,048,147, Cl. 260-67.0UA.

Aranzabal, Feliciano, to Feliciano Aranzabal Y Cia, S.A. Padlock. 4,047,407, Cl. 70-52.000.

Arbed - Acierles Reunies de Burbach-Eich-Dudelange S.A.: *See—*
Glaesener, Ernest, 4,047,701, Cl. 256-13.100.

Arbrook, Inc.: *See—*
Stockum, Glenn Francis, 4,047,251, Cl. 2-168.000.

ARCO Polymers, Inc.: *See—*
Spicuzza, John P., Jr.; and Sutej, Joseph M., 4,048,208, Cl. 264-45.300.
Spicuzza, John P., Jr., 4,048,272, Cl. 264-45.300.

Arita, Isao, to Tokyo Shibaura Electric Co., Ltd. Exposure computation system. 4,048,643, Cl. 354-51.000.

Arizona Chemical Company: *See—*
Wojcik, Ronald Thomas; and Ruckel, Erwin Richard, 4,048,095, Cl. 252-429.00R.

Armanini, Louis; and Johnson, Cordell E., to Mearl Corporation, The. Iron blue nacreous coated pigments. 4,047,969, Cl. 106-291.000.

Armco Steel Corporation: *See—*
Arnold, Jerry L.; and Douthett, Joseph A., 4,047,981, Cl. 148-16.000.

Armitage, Bernard J.: *See—*
Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., 4,048,332, Cl. 424-317.000.

Armstrong, Thomas M., to Chattanooga Glass Company. Apparatus for charging an electric glass furnace and method of completely distributing glass batch over the surface of molten glass in an electric glass furnace. 4,047,920, Cl. 65-335.000.

Arnaud, Henry, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Method and device for recirculating exhaust gases of internal combustion engines. 4,047,509, Cl. 123-119.00A.

Arnberg, B. Thomas. Method and apparatus for receiving solar energy. 4,047,517, Cl. 126-270.000.

Arnold, Bruce K.; and Moreno, Elias A., to International Telephone and Telegraph Corporation. Fiber optic connector. 4,047,797, Cl. 350-96.00C.

Arnold, Jerry L.; and Douthett, Joseph A., to Armco Steel Corporation. Internally nitrided ferritic stainless steel strip, sheet and fabricated products and method therefor. 4,047,981, Cl. 148-16.000.

ASA S.A.: *See—*
Venot, Jean, 4,047,374, Cl. 57-77.450.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Yokota, Takeshi; Suzuki, Nobuyuki; Sowa, Tsuneo; Sasaki, Yasuharu; and Ono, Yasutaka, 4,048,307, Cl. 424-180.000.

Asano, Kiro: *See—*
Saito, Tsuyoshi; and Asano, Kiro, 4,048,222, Cl. 260-514.00J.

ASEA Aktiebolag: *See—*
Hannerz, Kare, 4,048,090, Cl. 252-301.10R.

Asfour, Emil S. Method of making cigarettes and a cigarette made according thereto. 4,047,536, Cl. 131-140.00C.

Ashley, James R.: *See—*
Rast, Gustaf J., Jr.; Barley, Thomas A.; Hammond, Raiford L.; and Ashley, James R., 4,048,568, Cl. 325-363.000.

Asplund, Frank Eskil William; and Engstrom, Axel Erik Konstantin, to AB Svenska Maskinverken. Regenerative air preheater installation. 4,047,559, Cl. 165-7.000.

Asselin, George F., to UOP Inc. Aromatic extraction with solvent recovery and regeneration. 4,048,062, Cl. 208-321.000.

Aubert, Lucien Paul, to L'Oreal. Acellular planktonic product, method of preparing same and cosmetic composition containing the same. 4,048,308, Cl. 424-195.000.

Aulenbacher, Merle W., to International Enterprises, Inc. Method and apparatus for cutting and retrieving casing from a well bore. 4,047,568, Cl. 166-298.000.

Aulmann & Beckschulte: *See—*
Aulmann, Herbert; Braun, Ernst; and Braun, Gert, 4,047,673, Cl. 241-186.00R.

Aulmann, Herbert; Braun, Ernst; and Braun, Gert, to Aulmann & Beckschulte. Single-roll crusher. 4,047,673, Cl. 241-186.00R.

Auracher, Franz, to Siemens Aktiengesellschaft. Integrated optical modulator. 4,048,591, Cl. 332-7.510.

Auric Corporation: *See—*
Bick, Maurice; and DiMurro, Richard J., 4,048,043, Cl. 204-224.00R.

Aurora Equipment Company: *See—*
Evans, Robert J., 4,048,059, Cl. 108-155.000.

Auto Research Corporation: *See—*
Reeve, Paul H., 4,047,845, Cl. 417-251.000.

Automated Building Components, Inc.: *See—*
Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, 4,047,282, Cl. 29-432.000.

Automobiles Peugeot: *See—*
Arnaud, Henry, 4,047,509, Cl. 123-119.00A.
Burguburu, Philippe, 4,048,662, Cl. 361-31.000.
Leveque, Rene, 4,047,443, Cl. 74-199.000.

Avco Corporation: *See—*
Schramm, George R., 4,047,508, Cl. 123-41.600.

Avena, Salvatore; and Minarick, Joseph W., to Curtiss-Wright Corporation. Variable pitch mechanism for fan blades. 4,047,842, Cl. 416-152.000.

Axen, Rolf Erik Axel Verner; Porath, Jerker Olof; and Carlsson, Per Jan Erik, to Exploaterings Aktiebolaget T.B.F. Thiopolymers, their derivatives and methods for their preparation and use. 4,048,416, Cl. 526-9.000.

Axer, Heinrich; and Roth, Gerd, to G. Siempelkamp & Co. Apparatus making pressed board. 4,047,865, Cl. 425-80.000.

B. F. Goodrich Company, The: *See—*
Chasar, Dwight William, 4,048,140, Cl. 260-45.95C.
MacMullin, Robert Burns, 4,048,046, Cl. 204-266.000.
Starmer, Philip Hubert, 4,048,261, Cl. 260-888.000.
Thrower, Arthur J., 4,047,598, Cl. 188-71.100.

Babiec, John S., Jr.; Nakos, Steven T.; and Goldstein, Stephen L., to Olin Corporation. Polyurethane foam preparation using amid acetal catalyst. 4,048,107, Cl. 260-2.5AC.

Baer, Karl: *See—*
Voges, Dieter; Baer, Karl; Boudier, Juergen; Winderl, Siegfried; and Hoffmann, Herwig, 4,048,116, Cl. 252-470.000.

Bagli, Jehan F.: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,048,328, Cl. 424-305.000.
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,048,329, Cl. 424-305.000.

Bagryantsev, Gennady Ivanovich: *See—*
Volkov, Vladimir Vladimirovich; Bagryantsev, Gennady Ivanovich; Larionov, Igor Grigorievich; Neermolov, Alexandr Filippovich; and Leontievsky, Valery Georgievich, 4,047,672, Cl. 241-175.000.

Bailey, Cecil; Balchunas, Walter C.; and Zlupko, John E., to General Electric Company. Method of applying a fused silica coating to a substrate. 4,048,348, Cl. 427-34.000.

Bailey, Myrl Kennedy, Jr.; and Barlow, George J., to Honeywell Information Systems Inc. Diagnostic testing apparatus and method. 4,048,481, Cl. 235-153.0AK.

Bair, Lester E., to Garden Pro, Inc. Apparatus for trimming vegetation. 4,047,299, Cl. 30-276.000.

Baird-Atomic, Inc.: *See—*
Grenier, Raymond P., 4,048,501, Cl. 250-367.000.

Baird, William G., Jr.; Holbrook, Stanley E.; and Platt, Jeremy A., to W. R. Grace & Co. Method for preparing a film of vinylidene chloride polymer. 4,048,428, Cl. 526-343.000.

Bake, Earl A.; and Stephens, Leonard J., to Rockwell International Corporation. Method of assembling valves. 4,047,275, Cl. 29-157.10R.

Baker, David Clarkston, to Parke, Davis & Company. 9-(3,5-Di-O-acyl-β-D-arabinofuranosyl)adenine compounds and method for their production. 4,048,432, Cl. 536-26.000.

Baker, Glen O., Jr., to Ingersoll-Rand Company. Hydraulic-powered device. 4,047,595, Cl. 184-6.140.

Baker, Maurice W.; Kerry, John C.; Nichol, Kenneth J.; Marshall, John R.; Weighton, David M.; and Kozlik, Antonin, to Boots Company Limited, The. 1-Carbonamido imidazoles. 4,048,188, Cl. 548-341.000.

Bakos, Peter; Memis, Irving; and Rasile, John, to International Business Machines Corporation. Hermetic topsealant coating and process for its formation. 4,048,356, Cl. 427-379.000.

Balaz, Alexander, to Quaker Oats Company, The. Extrusion die with fibrillating air nozzle. 4,047,861, Cl. 425-7.000.

Balazsfai, Albert: *See—*
Dinzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevoloi Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Keszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 4,047,860, Cl. 425-4.00R.

Balchunas, Walter C.: *See—*
Bailey, Cecil; Balchunas, Walter C.; and Zlupko, John E., 4,048,348, Cl. 427-34.000.

Baldwin, Francis P.; Rae, James A.; and Ver Strate, Gary, to Exxon Research and Engineering Company. Method for preparing moisture curable polymers containing randomly distributed sites of conjugated olefinic unsaturation. 4,048,258, Cl. 260-879.000.

Baldwin, Jo. . J.; and Novello, Frederick C., to Merck & Co., Inc. 1,3,5-Trisubstituted-1,2,4-triazole compounds. 4,048,183, Cl. 260-296.00R.

Balthes Farm Equipment Manufacturing Limited: *See—*
Balthes, John; Balthes, Garry; and Palmer, William, 4,047,366, Cl. 56-63.000.

Balthes, Garry: *See—*
Balthes, John; Balthes, Garry; and Palmer, William, 4,047,366, Cl. 56-63.000.

Balthes, John; Balthes, Garry; and Palmer, William, to Balthes Farm Equipment Manufacturing Limited. Tobacco topping apparatus. 4,047,366, Cl. 56-63.000.

Balzers Patent und Beteiligungs-AG: *See—*
Daxinger, Helmut, 4,048,039, Cl. 204-192.00P.

Bamford, Kenneth; and Clowes, John Roger, to Dosco Overseas Engineering Limited. Gathering arms for a mining machine. 4,047,762, Cl. 299-64.000.

Banks, Holly, Jr. Sleep-inducing/interrupting audio system. 4,047,377, Cl. 58-152.00B.

Barber, William Austin; and Fetchin, John Allan, to American Cyanamid Company. Copper catalyst for hydration of nitriles to amides. 4,048,226, Cl. 260-561.00N.

Barbier, Daniel; Ittel, Jean-Michel; and Poujois, Robert, to Commissariat a l'Energie Atomique. Method and a device for eliminating the residual error voltage of an amplifier. 4,048,574, Cl. 330-9.000.

Barcus, Lester M.; and Berry, John F. Sonic transducer employing rigid radiating member. 4,048,45 ., Cl. 179-110.00A.

Barer, Sol J., to Celanese Corporation. Alkane diols as chemical pinching agents. 4,047,925, Cl. 71-78.000.

Barker, Noble G.: *See—*
Goloff, Alexander; Barker, Noble G.; and Staebler, Paul J., 4,047,855, Cl. 418-53.000.

Barley, Thomas A.: *See—*
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Barlow, George J.: *See—*
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Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
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Barnaba, Pierluigi, to Centro Sperimentale Metallurgico S.p.A. Process for the preparation of reducing gases. 4,048,091, Cl. 252-373.000.

Barnes-Hind Pharmaceuticals, Inc.: *See—*
Hramchenko, Jack; and Sibley, Murray J., 4,048,123, Cl. 252-545.000.
Sibley, Murray J.; Yung, Gordon H. K.; and Urrea, Petronio D., 4,048,122, Cl. 252-541.000.

Barnett, Charles J., to Eli Lilly and Company. Modification of methadone synthesis process step. 4,048,211, Cl. 260-465.00E.

Barnhart, Thomas F., to United States Steel Corporation. Process for direct-reduction of iron-ore employing nuclear reactor-powdered catalytic reformer. 4,047,935, Cl. 75-34.000.

Baron, Gerhard; Bierbach, Herbert; Hafke, Carl; and Zolzer, Karlheinz, to Metallgesellschaft Aktiengesellschaft. Feeder for coal-gasification reactor. 4,047,901, Cl. 48-86.00R.

Barrington, Burchus Q.: *See—*
Nix, George J.; Barrington, Burchus Q.; Farley, David L.; and Hortman, Norman G., 4,047,564, Cl. 166-72.000.

Bartelmuss, Heinrich. Method of making an abrasion-resistant plate. 4,047,993, Cl. 156-89.000.

Bartlett, Ivan Robert, to Varian Techtron Proprietary Limited. Adjustable slit mechanism. 4,047,808, Cl. 350-271.000.

Bartok, Mihaly: *See—*
Karpati, Egon; Szporny, Laszlo; Bartok, Mihaly; Czombos, Jozsef; Felfoldi, Karoly; Laszlavik, Marta; and Notheisz, Ferenc, 4,048,322, Cl. 424-283.000.

Bartram, Derrick: *See—*
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Bartrug, Norman G.; and McDaniel, Donald L., to PPG Industries, Inc. Method of testing glass fiber coating compositions. 4,047,429, Cl. 73-150.00R.

BASF Aktiengesellschaft: *See—*
Beck, Fritz; Francke, Diethard; Nohe, Heinz; Hannebaum, Heinz; and Stroezel, Manfred, 4,048,047, Cl. 204-270.000.
Broecker, Franz Josef; and Schwarzmann, Matthias, 4,048,196, Cl. 260-346.110.
Bruenemann, Hilmar; and Stoeckelmann, Guenter, 4,048,074, Cl. 210-323.00T.
Elser, Wolfgang; and Epple, Gerhard, 4,048,199, Cl. 260-380.000.
Frielingsdorf, Hans; Gruber, Wolfgang; and Mueller-Tamm, Heinz, 4,048,414, Cl. 526-106.000.
Haaf, Franz; Hatzmann, Guenter; Herrle, Karl; and Simak, Petr, 4,048,260, Cl. 260-884.000.
Loewenberg, Gustav; Hartmann, Hans-Joerg; Schaefer, Dieter; Motz, Herbert; and Jakusch, Helmut, 4,048,375, Cl. 428-474.000.
Mietzner, Franz Georg; Pfleger, Klaus; Gropper, Hans; Buechner, Oskar; Boettcher, Klaus; and Zacher, Wieland, 4,048,411, Cl. 526-64.000.
Voges, Dieter; Baer, Karl; Boudier, Juergen; Winderl, Siegfried; and Hoffmann, Herwig, 4,048,116, Cl. 252-470.000.
Weitz, Hans-Martin; Kahr, Kurt; and Fischer, Rolf, 4,048,165, Cl. 544-166.000.
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Bassendale, Derrick Arthur; and Bartram, Derrick, to FMC Corpora-

tion. Method and apparatus for filling containers. 4,047,546, Cl. 141-1.00R.
Battaglia, Jean M.: *See—*
Chen, James Ling; and Battaglia, Jean M., 4,048,309, Cl. 424-238.000.
Chen, James Ling; and Battaglia, Jean M., 4,048,310, Cl. 424-238.000.
Battelle Memorial Institute: *See—*
Clifford, John E., 4,048,383, Cl. 429-19.000.
Baumann, Ludwig G. Air bubbling mat for use in bathtubs for producing bubbling and full-foam baths. 4,048,266, Cl. 261-122.000.
Baxter Travenol Laboratories, Inc.: *See—*
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Bayer Aktiengesellschaft: *See—*
Adelmann, Siegfried; Margotte, Dieter; and Merten, Josef, 4,048,133, Cl. 260-37.0PC.
Bossert, Friedrich; and Vater, Wulf, 4,048,171, Cl. 260-256.40C.
Botta, Artur; and Rasp, Christian, 4,048,174, Cl. 260-283.0SY.
Bredereck, Hellmut; Kantlehner, Willi; Kugel, Wolfgang; Mohring, Edgar; and Roessler, Peter, 4,048,315, Cl. 424-249.000.
Kackstadter, Klaus; and Theidel, Hans, 4,047,887, Cl. 8-1.00W.
Lauer, Hubert; Schenk, Norbert; and Schwerdtel, Wulf, 4,048,242, Cl. 260-666.00A.
Meiser, Werner; Buchel, Karl Heinz; Kramer, Wolfgang; and Grewe, Ferdinand, 4,048,318, Cl. 424-269.000.
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Naumann, Klaus; Lurssen, Klaus; and Sasse, Klaus, 4,047,923, Cl. 71-76.000.
Sackmann, Gunter; Kolb, Gunter; and Muller, Friedhelm, 4,048,422, Cl. 526-203.000.
Schmidt, Robert R.; Eue, Ludwig; and Draber, Wilfried, 4,047,929, Cl. 71-93.000.
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Wolf, Gerhard Dieter; Bentz, Francis; and Nischk, Gunther, 4,048,221, Cl. 260-512.00C.
Beck, Charles I.; and Layton, Roger M., to G. D. Searle & Co. 3-O-Alkanoylglyceric acids. 4,048,202, Cl. 260-410.600.
Beck, Fritz; Francke, Diethard; Nohe, Heinz; Hannebaum, Heinz; and Stroezel, Manfred, to BASF Aktiengesellschaft. Electrochemical cell with bipolar electrodes. 4,048,047, Cl. 204-270.000.
Beecham Group Limited: *See—*
Brown, Allan Guildford; and Howarth, Thomas Trefor, 4,048,186, Cl. 260-307.0FA.
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Watts, Eric Alfred, 4,048,317, Cl. 424-267.000.
Beers, Charles James, to LDV Industries, Inc. Air drag reducer for motor freight vehicles. 4,047,747, Cl. 296-1.00S.
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Behmel, Klaus, to Vianova-Kunstharz, A.G. Coating compositions and process therefor. 4,048,252, Cl. 260-850.000.
Belke, William H.; Hafele, Joseph C.; Landen, Ernest W.; and Richards, Thomas J., to Caterpillar Tractor Co. Corpuscular energy beam produced microasperities. 4,047,984, Cl. 148-152.000.
Bell & Howell Company: *See—*
Miller, James A.; and Firkins, Morris L., 4,048,651, Cl. 358-8.000.
Bell, Richard L.; Desmond, John D.; and Hart, Joseph J., to Container Corporation of America. Composite package. 4,047,660, Cl. 206-620.000.
Bell Telephone Laboratories, Incorporated: *See—*
Bosik, Barry Sheldon, 4,048,551, Cl. 320-21.000.
Canniff, Ronald Jay; and Manfred, Mark Thomas, 4,048,448, Cl. 179-17.00E.
Crochiere, Ronald Eldon; Flanagan, James Loton; and Webber, Susan Anne, 4,048,443, Cl. 179-1.0SA.
DeNigris, Ernest Gerard; and Palette, Ralph John, 4,047,781, Cl. 339-17.00R.
McNees, Gary Keith, 4,048,451, Cl. 179-18.0AH.
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Oehring, Hans; and Rossomando, Philip Joseph, 4,048,452, Cl. 179-27.00D.
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Rupp, Louis William, Jr.; and Walsh, Walter Michael, Jr., 4,048,555, Cl. 324-.5MA.
Stone, Dale Eugene, 4,048,552, Cl. 336-25.000.
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Beloit Corporation: *See—*
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Belrico, Inc.: *See—*
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Belyaev, Mikhail Fedorovich: *See—*
Karpov, Valentin Mikhailovich; Santo, Vladimir Rezhevich; Yanovsky, Viktor Yakovlevich; Mikhailov, Anatoly Ivanovich; and Belyaev, Mikhail Fedorovich, 4,047,428, Cl. 73-141.00A.
Bendall, Wilfrid H. Torsionally resilient gear coupling. 4,047,395, Cl. 64-15.00B.
Bender, Lloyd F.; and Schmid, Rolyn A., to Bender Machine Works, Inc. Milking apparatus and method for operating same. 4,047,500, Cl. 119-14.110.
Bender, Lloyd F., to Bender Machine Works, Inc. Bellows type expansible chamber pump having separate biasing means. 4,047,851, Cl. 417-412.000.
Bender Machine Works, Inc.: *See—*
Bender, Lloyd F.; and Schmid, Rolyn A., 4,047,500, Cl. 119-14.110.
Bender, Lloyd F., 4,047,851, Cl. 417-412.000.
Bendix Corporation, The: *See—*
Orme, Myrl E.; and Vick, Ralph L., 4,047,540, Cl. 137-239.000.
Benjamin, Milton Lloyd; and Miles, Wilbur Nelson, to Erickson Tool Company. Adjustable floating reamer. 4,047,829, Cl. 408-169.000.
Bennett, Arthur A., Jr. Article dispensing apparatus for selectively dispensing articles. 4,047,635, Cl. 221-5.000.
Bennett, Charles; and Toledo, Emil, to United States of America, Navy. Apparatus for making a memory wire. 4,048,048, Cl. 204-279.000.
Bennett, James M. Emergency signalling device. 4,047,798, Cl. 350-97.000.
Bennett, John T. Drill having indexable replaceable insert tip. 4,047,826, Cl. 408-59.000.
Bennett, Moreland P.; and Hobbs, Albert M., Jr., to General Electric Company. Method of welding a cover to a container. 4,048,460, Cl. 219-91.000.
Bennett, Moreland P.; and Bowers, William L., to General Electric Company. Method of joining aluminum to aluminum. 4,048,463, Cl. 219-118.000.
Benoit, Orient, to New Bedford Wire & Iron Company. Gate hinge composition. 4,047,332, Cl. 49-236.000.
Bentley, Peter Hubert: *See—*
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Benvegno, George J.: *See—*
Davies, Ronald F.; and Benvegno, George J., 4,048,092, Cl. 252-412.000.
Benzing, Walter C.: *See—*
McNeilly, Michael A.; and Benzing, Walter C., 4,047,496, Cl. 118-49.100.
Beregi, Laszlo; Hugon, Pierre; Pascaud, Xavier; and Poignant, Jean-Claude, to Science Union et Cie. Disubstituted azabicycloalkanes. 4,048,321, Cl. 424-274.000.
Berg, Joseph A.: *See—*
Eames, Loren W.; Berg, Joseph A.; and McAllister, Thomas W., 4,047,757, Cl. 297-230.000.
Berg, Samuel Sidney; Jenkins, David Conwil; and Phillipson, Ronald Frederick, to May & Baker Limited. Treatment of helminth infections with substituted 1,2-bis(thioureido)benzene. 4,048,326, Cl. 424-300.000.
Berger Industries, Inc.: *See—*
Weintraub, Burton L.; and Buda, Salvatore, 4,047,743, Cl. 285-340.000.
Berges, David A., to SmithKline Corporation. 7-Acyl-3-(sulfonic acid and sulfamoyl substituted tetrazolyl thiomethyl)cephalosporins. 4,048,311, Cl. 424-246.000.
Bergmann, Rolf; Hoheisel, Klaus; Schafer, Helmut; and Unger, Manfred, to Hoechst Aktiengesellschaft. Leader of a carrier of information in the form of a web. 4,048,150, Cl. 260-75.00T.
Bergmeister, Eduard: *See—*
Stoll, Alois; and Bergmeister, Eduard, 4,048,192, Cl. 260-33.40R.
Bergstrom, Lars: *See—*
Knutsson, Filip; and Bergstrom, Lars, 4,047,907, Cl. 55-147.000.
Bergstrom, Torsten, to Formac International AB. Sound insulating panels. 4,047,337, Cl. 52-71.000.
Berke, Julius B. Hot dog bun baking pan. 4,047,477, Cl. 99-428.000.
Berkowitz, Lewis M.: *See—*
Epstein, Joseph; and Berkowitz, Lewis M., 4,048,022, Cl. 204-1.00T.
Berman, Allen, to United States of America, Army. Projectile fall-back prevention means. 4,047,466, Cl. 89-14.00R.
Bernard, Jean; Frossati, Giorgio; Guernet, Georges; Montier, Michel; Peccoud nee Toupillier, Louise; and Thoulouze, Daniel, to Commissariat a l'Energie Atomique. Measuring detector and a method of fabrication of said detector. 4,047,436, Cl. 73-362.0SC.
Bernard, Jean-Michel; Labboz, Lucien; and Vesque, Daniel. Trunk eircuit traffic analyzer. 4,048,450, Cl. 179-18.0EB.
Bernardi, James T. Frame structure. 4,047,341, Cl. 52-223.00R.
Berry, John F.: *See—*
Barcus, Lester M.; and Berry, John F., 4,048,454, Cl. 179-110.00A.
Berry Metal Company: *See—*
Chang, Yi-Chung, 4,047,936, Cl. 75-52.000.
Berson, Alain: *See—*
Kervizic, Jean; Deslandes, Claude; and Berson, Alain, 4,047,482, Cl. 102-19.200.
Berthelot, Guy, to Commissariat a l'Energie Atomique. Proportioning pump with pneumatic distributor. 4,047,850, Cl. 417-383.000.
Bertram, Jurgen; Brand, Wilhelm; and Schaeffer, Hans-Joachim, to Hermann Berstorff Maschinenbau GmbH. Continuously operable apparatus for the preparation and/or processing of synthetic plastics or rubber moulding compounds. 4,047,671, Cl. 241-66.000.
BFG Glassgroup: *See—*
Derner, Paul; Sonntag, Hans; and Stehl, Otto, 4,047,351, Cl. 52-616.000.
Biasotti, Joseph B.: *See—*
Lee, Gary D.; Vartanian, Paul F.; and Biasotti, Joseph B., 4,048,080, Cl. 252-51.540.
Bich, John R., to Texaco Inc. Seismic playback/monitor system. 4,048,635, Cl. 340-347.0DA.

Bick, Maurice; and DiMurro, Richard J., to Auric Corporation. Selective plating apparatus. 4,048,043, Cl. 204-224.00R.
Bierbach, Herbert: *See—*
Baron, Gerhard; Bierbach, Herbert; Hafke, Carl; and Zolzer, Karlheinz, 4,047,901, Cl. 48-86.00R.
Biffi, Egidio. Flying object. 4,047,323, Cl. 46-47.000.
Bihuniak, Peter P.; and Guile, Donald L., to Corning Glass Works. Method of enhancing the refractoriness of high purity fused silica. 4,047,966, Cl. 106-69.000.
Bio/Data Corporation: *See—*
Eichelberger, James W.; Kent, Frederick M.; and Sokol, Michael, 4,047,890, Cl. 23-230.00B.
Biondetti, Mario, to Escher Wyss Limited. Deflection compensating roll. 4,047,273, Cl. 29-116.0AD.
Bisbing, Robert H., to Southco, Inc. Quick action fastener. 4,047,266, Cl. 24-221.00R.
Bishop, Walton B., to United States of America, Navy. Secondary Radar/IFF anti-target splitting azimuth determiner. 4,048,636, Cl. 343-6.5LC.
Bissot, Thomas Charles, to Du Pont de Nemours, E. I., and Company. Surface impregnated catalyst. 4,048,096, Cl. 252-430.000.
Bitha, Panayota: *See—*
Hlavka, Joseph John; and Bitha, Panayota, 4,048,431, Cl. 536-17.000.
Black, James Whyte; Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Method of inhibiting histamine activity with quanidine compounds. 4,048,319, Cl. 424-269.000.
Black, Robin Michael, to John Wyeth & Brother Limited. Certain 2-substituted 4-phenylquinoline-4-ols. 4,048,177, Cl. 260-288.00R.
Blackburn, Tom L.; and Wisotzky, Otto G., to GTE Automatic Electric Laboratories Incorporated. Transistor amplifier stage with selectively adjustable gain control circuit. 4,048,576, Cl. 330-29.000.
Blaisdell, Ronald G.; Hough, Harold L.; and Levin, Robert E., to GTE Sylvania Incorporated. Protective ultraviolet-transmitting sleeve for fluorescent lamp. 4,048,537, Cl. 313-489.000.
Blake, June Arlene, executrix: *See—*
Blake, Ralph Kingsley, deceased, 4,047,956, Cl. 96-60.00R.
Blake, Ralph Kingsley, deceased (by Blake, June Arlene, executrix), to Du Pont de Nemours, E. I., and Company. Low coating weight silver halide element and process. 4,047,956, Cl. 96-60.00R.
Blakey, Rene C.; Riddell, Robert G.; Whittaker, John; and Wilson, John A., to Star Paper Limited. Cast coated paper and its production and compositions for it. 4,048,380, Cl. 428-511.000.
Blass, Jaroslav, to Kawasaki Motors Corporation U.S.A. Snowmobile engine mount. 4,047,588, Cl. 180-64.00R.
Bleckmann, Hans-Wilhelm, to ITT Industries, Inc. Digital phase-locked loop for speed measurement, in particular for use in antiskid control systems. 4,047,766, Cl. 303-97.000.
Bledsoe, Jerry L.; and Lund, Clarence A., to Motorola, Inc. Method for manufacturing a high-speed semiconductor device. 4,047,976, Cl. 148-1.500.
Blessing, Hubert, to Levi Strauss & Co. Pallet feeding apparatus. 4,047,622, Cl. 214-8.50A.
Blevins, Robert R.: *See—*
Riendeau, William P.; Blevins, Robert R.; and Abell, Joseph L., 4,048,608, Cl. 337-74.000.
Blevitt, Robert; and O'Brien, Miguel Eugene, to Ajax International Corporation. Module loading device. 4,047,623, Cl. 214-17.00C.
Blue Giant Equipment Corporation: *See—*
Ellis, Arthur S., 4,047,698, Cl. 254-2.00R.
Blytas, George C. Process for removal of metal compounds from hydrocarbons. 4,048,061, Cl. 208-251.00R.
Boa, Niels Halfdan: *See—*
Nielsen, Mogens B.; Boa, Niels Halfdan; and Jensen, Jimmy, 4,047,722, Cl. 279-19.500.
Bockstiegel, Gerd-Edzard; Neidhardt, Manfred; and Rehfeld, Gerhard, to Dynamit Nobel Aktiengesellschaft. Heating element composition and method for preparing tube fillings of high electrical resistance from fused magnesium oxide for tubular electric heating elements. 4,048,119, Cl. 252-521.000.
Bode, Wolfgang W.: *See—*
Hinson, David C.; Bode, Wolfgang W.; Fein, Michael E.; and Hoehn, H. Joseph, 4,048,533, Cl. 313-188.000.
Boehringer Ingelheim GmbH: *See—*
Maier, Roland; Woitun, Eberhard; Wetzel, Bernd; Reuter, Wolfgang; Goeth, Hanns; and Lechner, Uwe, 4,048,306, Cl. 424-180.000.
Boeing Company, The: *See—*
Foster, Gene B., 4,047,411, Cl. 72-7.000.
Hartel, Erwin H., 4,047,681, Cl. 244-102.0SS.
Kellogg, Richard Webster, 4,047,441, Cl. 74-52.000.
Boettcher, Klaus: *See—*
Mietzner, Franz Georg; Pfleger, Klaus; Gropper, Hans; Buechner, Oskar; Boettcher, Klaus; and Zacher, Wieland, 4,048,411, Cl. 526-64.000.
Boettcher, Stephen A.: *See—*
McNamara, David M.; and Boettcher, Stephen A., 4,047,639, Cl. 222-64.000.
McNamara, David M.; and Boettcher, Stephen A., 4,047,640, Cl. 222-64.000.
Bogri, Tibor: *See—*
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,048,328, Cl. 424-305.000.
Abraham, Nedumparambil A.; Bagli, Jehan F.; and Bogri, Tibor, 4,048,329, Cl. 424-305.000.
Bohn, Richard, to Transitron Electronic Corporation. Superintegrated V-groove isolated bipolar and VMOS transistors. 4,048,649, Cl. 357-43.000.
Boige, Jean, to L'Opochimie. Method of preparing enzyme cholic acids complex. 4,048,303, Cl. 424-94.000.
Bolcskei, Erno: *See—*
Dinzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Keszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 4,047,860, Cl. 425-4.00R.
Bolger, John C.: *See—*
Wisotzky, Reuben; and Bolger, John C., 4,048,269, Cl. 264-25.000.
Boliden AB: *See—*
Lagerstrom, Gosta Bertil; and Mattsson, Olof Arthur, 4,048,341, Cl. 426-69.000.
Bolli, Hans-Ulrich, to SIG Schweizerische Industrie-Gesellschaft. Apparatus for the transversal welding and severing of superposed webs. 4,048,003, Cl. 156-515.000.
Bollinger, Joseph M.: *See—*
Machleder, Warren H.; and Bollinger, Joseph M., 4,048,081, Cl. 252-51.50R.
Bond, Richard P. M.; Pryce, Robert J.; Raven, Clive A.; and Venis, Michael A. J., to Shell Oil Company. Wild oat herbicide mixture. 4,047,928, Cl. 71-88.000.
Bondarchuk, Walter W., Sr., to Lawrence Peska Assoc., Inc. Life saving apparatus. 4,047,257, Cl. 14-27.000.
Bonebreak, Robert L.: *See—*
Dale, C. Harold, Jr.; Howe, Spencer D.; Bonebreak, Robert L.; and Starkus, Charles J., 4,047,792, Cl. 350-6.000.
Boonthanoom, Niyom: *See—*
White, Martin; and Boonthanoom, Niyom, 4,048,349, Cl. 427-58.000.
Booth, Llewellyn D.: *See—*
Gurgiolo, Arthur E.; and Booth, Llewellyn D., 4,048,100, Cl. 260-2.5AJ.
Booth, Robert G. Protective helmet and face shield assembly therefor. 4,047,249, Cl. 2-10.000.
Boots Company Limited, The: *See—*
Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., 4,048,332, Cl. 424-317.000.
Baker, Maurice W.; Kerry, John C.; Nichol, Kenneth J.; Marshall, John R.; Weighton, David M.; and Kozlik, Antonin, 4,048,188, Cl. 548-341.000.
Boozalis, Theodore S.; Cragar, Darryl E.; Ivy, John B.; and Willis, Gordon G., to Dow Chemical Company, The. Process for preparing 1,1,1-trichloroethane. 4,048,241, Cl. 260-658.00R.
Bor-, Cipo-, Szormeipari Kutato Intezet: *See—*
Dinzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Keszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 4,047,860, Cl. 425-4.00R.
Borba, Paul A.; and Miller, Harry R. Grooming implement for horses. 4,047,504, Cl. 119-92.000.
Borg-Warner Corporation: *See—*
Fogelberg, Mark John; and Kelbel, Donald William, 4,047,601, Cl. 192-36.000.
Jeffrey, Joseph O., 4,047,444, Cl. 74-229.000.
Borisenko, Alexandr Ivanovich: *See—*
Borzyak, Jury Gordeevich; Borisenko, Alexandr Ivanovich; Tjufilin, German Mikhailovich; Rolik, Alexandr Ivanovich; and Yakovlev, Alexandr Ivanovich, 4,048,280, Cl. 264-102.000.
Bormann, Alan Richard, to Motorola, Inc. Low power MOS RAM address decode circuit. 4,048,629, Cl. 340-173.0CA.
Borsotti, Giampiero: *See—*
Ribaldone, Giuseppe; and Borsotti, Giampiero, 4,048,173, Cl. 260-272.000.
Borzyak, Jury Gordeevich; Borisenko, Alexandr Ivanovich; Tjufilin, German Mikhailovich; Rolik, Alexandr Ivanovich; and Yakovlev, Alexandr Ivanovich. Method of manufacturing electrotechnical articles. 4,048,280, Cl. 264-102.000.
Boschetti, Egisto; Moroux, Yvette Paule Nicole; and Tixier, Rene, to Produits Chimiques Ugine Kuhlmann. Dried rehydratable film containing agarose or gelose and process for preparing same. 4,048,377, Cl. 428-474.000.
Bosik, Barry Sheldon, to Bell Telephone Laboratories, Incorporated. Battery charging circuit. 4,048,551, Cl. 320-21.000.
Bossert, Friedrich; and Vater, Wulf, to Bayer Aktiengesellschaft. 1,4-Dihydropyridines. 4,048,171, Cl. 260-256.40C.
Bosshard, Ernst, to Sulzer Brothers Limited. Method and apparatus for treating flowable material. 4,048,504, Cl. 250-434.000.
Boswell, Donald D., to Hughes Aircraft Company. Method and apparatus for erasing scattering in storage-type liquid crystals by frequency sweeping. 4,048,628, Cl. 340-173.0LM.
Boter, Pieter Abraham, to U.S. Philips Corporation. Electrode for primary or secondary battery and method for producing such an electrode. 4,048,407, Cl. 429-217.000.
Botta, Artur; and Rasp, Christian, to Bayer Aktiengesellschaft. Process for preparing 1,2-fused-1,3-dinitrogen-heterocyclic compounds. 4,048,174, Cl. 260-283.0SY.
Bottorff, Elwin G.: *See—*
Postman, John R.; and Bottorff, Elwin G., 4,047,344, Cl. 52-390.000.
Bouchard, Robert Joseph; and Brixner, Lothar Heinrich, to Du Pont de Nemours, E. I., and Company. Dielectric powder compositions. 4,048,546, Cl. 361-321.000.

Boudier, Juergen: *See—*
Voges, Dieter; Baer, Karl; Boudier, Juergen; Winderl, Siegfried; and Hoffmann, Herwig. 4,048,116, Cl. 252-470.000.
Boulva, Paul. Panel assembly. 4,047,342, Cl. 52-239.000.
Bouton, John C., Jr.: *See—*
Hart, Donald J.; Bouton, John C., Jr.; and Poppel, Eugene H., 4,048,616, Cl. 340-146.3ED.
Bowden, Roy Dennis, to Imperial Chemical Industries Limited. Pyridyl-tetrahydropyrans and process for preparing same. 4,048,180, Cl. 260-297.00R.
Bowers, William L.: *See—*
Bennett, Moreland P.; and Bowers, William L., 4,048,463, Cl. 219-118.000.
Bowler, John W.; Karner, Kenneth E.; Pittenger, Daniel I.; and Schwartz, Donald A., to Zenith Radio Corporation. Television module support and carrier. 4,048,669, Cl. 361-391.000.
Boyce, William D., Il. Sea tent. 4,047,390, Cl. 61-69.00R.
Boyer, John Parke: *See—*
Alderete, William Eugene; Boyer, John Parke; Daugherty, Kenneth Earl; and Johnson, David Lee, 4,047,961, Cl. 106-89.000.
Brand, Wilhelm: *See—*
Bertram, Jurgen; Brand, Wilhelm; and Schaeffer, Hans-Joachim, 4,047,671, Cl. 241-66.000.
Branson Ultrasonics Corporation: *See—*
Mims, Bruce L., 4,047,657, Cl. 228-103.000.
Braun, Ernst: *See—*
Aulmann, Herbert; Braun, Ernst; and Braun, Gert, 4,047,673, Cl. 241-186.00R.
Braun, Gert: *See—*
Aulmann, Herbert; Braun, Ernst; and Braun, Gert, 4,047,673, Cl. 241-186.00R.
Brdr. Schur International A. S.: *See—*
Lister, Edward Alan; and Clarke, Graham Wilson, 4,047,362, Cl. 53-189.000.
Bredereck, Hellmut; Kantlehner, Willi; Kugel, Wolfgang; Mohring, Edgar; and Roessler, Peter, to Bayer Aktiengesellschaft. Preparation of new 1,3-identically substituted-triaz...e-2,4-diones. 4,048,315, Cl. 424-249.000.
Breedis, John F.: *See—*
Watson, W. Gary; and Breedis, John F., 4,047,980, Cl. 148-12.70C.
Brennecke, Hermann. Device for discharging static electricity. 4,048,667, Cl. 361-213.000.
Brennen, Michael B.: *See—*
Thompson, Francis T.; and Brennen, Michael B., 4,048,521, Cl. 307-291.000.
Breveteam S.A.: *See—*
Tesch, Gunter H., 4,047,327, Cl. 47-9.000.
Brewer, George R.; and Amboss, Kurt, to Hughes Aircraft Company. Radial flow electron gun. 4,048,534, Cl. 313-293.000.
Breznak, Robert A.; and Parker, James A., to Celanese Corporation. Splice for use during the thermal stabilization of a flat multifilament band of an acrylic fibrous material comprising at least two segments. 4,048,277, Cl. 264-83.000.
Bricon, Jean-Pierre Luc, to International Harvester Company. Convertible grab bucket. 4,047,313, Cl. 37-187.000.
Bridgestone Tire Company Limited: *See—*
Maeda, Muneyoshi; Watanabe, Shigeo; Takahashi, Hidenori; and Sogi, Toshiyuki, 4,047,552, Cl. 152-361.00R.
Brinjevec, Heinz J. Solar to electrical energy converting system. 4,047,385, Cl. 60-641.000.
Brissonneau et Lotz: *See—*
Havard, Jean Francois Pierre Marie; Gaschet, Michel Marceau; and Charonnat, Henri Marie Dominique, 4,048,547, Cl. 318-488.000.
British Ceca Company Limited, The: *See—*
Worrall, Michael John, 4,047,904, Cl. 55-18.000.
British Uralite Limited: *See—*
Kingsbury, Herbert William, 4,048,366, Cl. 428-215.000.
Brittan, John L. Digital grade averager. 4,048,484, Cl. 235-156.000.
Brixner, Lothar Heinrich: *See—*
Bouchard, Robert Joseph; and Brixner, Lothar Heinrich, 4,048,546, Cl. 361-321.000.
Bro, Per, to P. R. Mallory & Co. Inc. Electrophysichemical device. 4,048,404, Cl. 429-199.000.
Broadwell, James E.: *See—*
Witte, Arvel B.; Broadwell, James E.; and Hook, Dale L., 4,048,586, Cl. 331-94.50D.
Broan Manufacturing Co., Inc.: *See—*
Wolbrink, David W., 4,047,775, Cl. 312-211.000.
Brodsky, Larry: *See—*
Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, 4,047,282, Cl. 29-432.000.
Broecker, Franz Josef; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Manufacture of butanediol and/or tetrahydrofuran from maleic and/or succinic anhydride via γ- butyrolactone. 4,048,196, Cl. 260-346.110.
Brokmann, Manfred; Sanders, Kurt; Sanders, Dieter; and Westhoff, Hermann. Hook and cord connection. 4,047,824, Cl. 403-209.000.
Brookes, Neil Roger; Ray, Martin George; Cohen, Joseph David; and McCarey, Thomas Joseph, to General Electric Company. Transient air temperature sensing system. 4,047,379, Cl. 60-39.09D.
Brooks, Edward F., to TRW Inc. Continuous row average sampling method and apparatus for stationary source gas streams. 4,047,437, Cl. 73-421.50A.
Brotzmann, Karl: *See—*
Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans Georg, 4,047,707, Cl. 266-222.000.
Brown, Allan Guildford; and Howarth, Thomas Trefor, to Beecham Group Limited. Antibacterial substituted azetidinones. 4,048,186, Cl. 260-307.0FA.
Brown, David B.: *See—*
Pell, Kynric M.; and Brown, David B., 4,047,816, Cl. 356-152.000.
Brown, Marlene J. Sailing device. 4,047,492, Cl. 114-39.000.
Brown, Silas A., to Buckbee-Mears Company. Shadow mask with plurality of recessed regions extending across mask in two directions. 4,048,536, Cl. 313-403.000.
Brown, Thomas D.: *See—*
Mitchell, Earl R.; Brown, Thomas D.; and Post, Beverley C., 4,047,879, Cl. 431-183.000.
Browne Packaging, Inc.: *See—*
Pelzek, Victor J., 4,048,378, Cl. 428-483.000.
Browne, Peter. Modular merchandising. 4,047,615, Cl. 211-88.000.
Brownhill, Frank Denison, to Rolls-Royce (1971) Limited. Fan cowl translation lock. 4,047,682, Cl. 244-110.00B.
Bruel, Per Wilhelm; Schioler, Holger; and Jensen, Johannes Tejlgaard. Pipe joint for radiator element of thin material. 4,047,516, Cl. 126-270.000.
Bruenemann, Hilmar; and Stoeckelmann, Guenter, to BASF Aktiengesellschaft. Apparatus for separating solids from liquids or gas. 4,048,074, Cl. 210-323.00T.
Brumlik, George, to Ingrip Fasteners, Inc. Fasces fibers. 4,048,371, Cl. 428-375.000.
Brummett, Marshall G.; Heckman, Russell W.; Nickey, George A.; and Taylor, James E., to Owens-Illinois, Inc. Method of assembling plastic wrap on a glass container. 4,048,281, Cl. 264-230.000.
Brunold, Marcel; Hering, Klaus; Wicht, Paul; Vonlanthen, Christian; Kislig, Jurg; and Volker, Theodor, to Lonza Ltd. Process for the production of self-cross-linking lacquers. 4,048,130, Cl. 260-29.6NR.
Bubnick, Gerald Frank; and Urry, Lewis Frederick, to Union Carbide Corporation. Cathode or cathode collector arcuate bodies for use in various cell systems. 4,048,389, Cl. 429-101.000.
Buchel, Karl Heinz: *See—*
Meiser, Werner; Buchel, Karl Heinz; Kramer, Wolfgang; and Grewe, Ferdinand, 4,048,318, Cl. 424-269.000.
Buchs, Roland: *See—*
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Buck, George Sumner, Jr.; Weyker, Robert George; and Ward, Arthur Gerard, to Fiberlok, Inc. Polyester batt and method for producing such. 4,047,991, Cl. 156-62.600.
Buck, James R., to Buck Tool Company. Counterbalanced chuck. 4,047,723, Cl. 279-121.000.
Buck Tool Company: *See—*
Buck, James R., 4,047,723, Cl. 279-121.000.
Buckbee-Mears Company: *See—*
Brown, Silas A., 4,048,536, Cl. 313-403.000.
Buda, Salvatore: *See—*
Weintraub, Burton L.; and Buda, Salvatore, 4,047,743, Cl. 285-340.000.
Budd Company, The: *See—*
Germer, John A., 4,047,836, Cl. 416-39.000.
McCafferty, Gerald P., 4,047,655, Cl. 228-259.000.
Buechner, Oskar: *See—*
Mietzner, Franz Georg; Pfleger, Klaus; Gropper, Hans; Buechner, Oskar; Boettcher, Klaus; and Zacher, Wieland, 4,048,411, Cl. 526-64.000.
Buess, Kenneth G.; and Hefter, Murray, to Singer Company, The. Variable reluctance stepper motor. 4,048,531, Cl. 310-49.00R.
Bullat, Jean, to Carpano & Pons. Drive mechanism and application to a blind with vertical slats. 4,047,554, Cl. 160-168.00R.
Bunker Ramo Corporation: *See—*
Marz, Frank Hubert, 4,047,376, Cl. 58-23.00D.
Bunri Kogyo Kabushiki Kaisha: *See—*
Nazuka, Iwao, 4,047,609, Cl. 198-690.000.
Bureau de Recherches Geologiques et Minieres: *See—*
Cuvillier, Roger; and Cohen-Alloro, Richard, 4,048,069, Cl. 210-84.000.
Burguburu, Philippe, to Automobiles Peugeot. Device for avoiding accidents when closing a movable panel, for example the panel of an electrically controlled sliding roof. 4,048,662, Cl. 361-31.000.
Burk, Duane L., to Caterpillar Tractor Co. Track link pin bore - hydraulically prestretched. 4,047,277, Cl. 29-421.00R.
Burkhardt, Gisbert; and Hofmann, Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Conveyor-distributor apparatus for flat items. 4,047,712, Cl. 271-64.000.
Burkhart, William H. Food cooking machine. 4,048,473, Cl. 219-389.000.
Burkin, Jury Alexandrovich. Method of manufacturing 3-D memories. 4,047,288, Cl. 29-604.000.
Burnham, Peter B., to Harsco Corporation. Lip lock with release and counterbalance for dock board. 4,047,258, Cl. 14-71.300.
Burns, Michael E.; and Pracht, Hans J., to Procter & Gamble Company, The. Cellulose ethers having a low molecular weight and a high degree of methyl substitution. 4,048,433, Cl. 536-99.000.
Burow, Burghard, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Guide apparatus for deflecting a linear structure. 4,047,543, Cl. 138-155.000.
BUSS A.G.: *See—*
Koller, Hans, 4,047,700, Cl. 254-89.00H.
Bu..riss, A. T., to Eaton Corporation. Worm gear clamping apparatus. 4,047,268, Cl. 24-274.00R.

Bymun, Edwin N.: *See—*
Packer, Lester; and Bymun, Edwin N., 4,048,325, Cl. 424-298.000.
C. Reichert Optische Werke, AG: *See—*
Steinbatz, Alfred, 4,047,818, Cl. 356-189.000.
C.S.S. Container Storage Service Establishment: *See—*
Kok, Bob; and Krause, Erhardt, 4,047,893, Cl. 23-254.00E.
Cabezut, Joseph M., Jr.: *See—*
LeFebvre, Clarence A.; and Cabezut, Joseph M., Jr., 4,047,382, Cl. 60-252.000.
Cahn, Robert P.; and Siskin, Michael, to Exxon Research and Engineering Company. Autorefrigerated isomerization process. 4,048,251, Cl. 260-683.680.
Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., to Tribotech. Protected bearing mount assembly. 4,047,768, Cl. 308-72.000.
Calabek, Milan: *See—*
Sandera, Josef; Calabek, Milan; Cenek, Miroslav; Kalab, Frantisek; Koudelka, Vojtech; Kouril, Oldrich; Malik, Jiri; and Vanacek, Josef, 4,048,406, Cl. 429-209.000.
Caldarelli, Antonio. Fluids distributor for energized-fluid systems. 4,047,880, Cl. 431-208.000.
Caldwell, Bruce J., to Tejas Instrument Engineers, Inc. Ink pen cartridge and mounting arm for a recording instrument. 4,048,640, Cl. 346-140.00A.
Caliendo, Joseph L. Aerosol device with telescoping container parts. 4,047,645, Cl. 222-386.500.
Callahan, Robert William; Kauffman, Paul Eugene; and Mitchell, Matthew Joseph, Jr., to International Business Machines Corporation. Address match for data processing system with virtual addressing. 4,048,671, Cl. 364-200.000.
Calundann, Gordon W.; and Powers, Edward J., to Celanese Corporation. Rendering polybenzimidazole solid materials more resistant to darkening upon exposure to light. 4,048,139, Cl. 260-45.80N.
Campbell, Richard A.; Sparks, Richard A.; and Perry, Robert W., to United States of America, Army. Apparatus for detecting a stable microwave discrete frequency. 4,048,580, Cl. 331-1.00R.
Canada, Her Majesty the Queen in right of, as represented by the secretary of National Defence: *See—*
McAndless, John Madden, 4,047,505, Cl. 119-106.000.
Canadian Foremost Ltd.: *See—*
Saruwatari, Minoru, 4,047,384, Cl. 60-372.000.
Canadian Patents and Development Limited: *See—*
Mitchell, Earl R.; Brown, Thomas D.; and Post, Beverley C., 4,047,879, Cl. 431-183.000.
Nigrin, Jan. 4,048,583, Cl. 331-56.000.
Canniff, Ronald Jay; and Manfred, Mark Thomas, to Bell Telephone Laboratories, Incorporated. Multiparty telephone ringing. 4,048,448, Cl. 179-17.00E.
Canon Kabushiki Kaisha: *See—*
Sekimura, Nobuyuki, 4,047,805, Cl. 350-166.000.
Canron, Inc.: *See—*
Stewart, John Kenneth; and von Beckmann, Helmuth, 4,048,353, Cl. 427-291.000.
Cantor, Abraham: *See—*
Winicov, Murray A.; and Cantor, Abraham, 4,048,336, Cl. 424-334.000.
Canup, Robert E.; and McPeak, Earl W., Jr., to Texaco Inc. Electrical terminal connector. 4,047,783, Cl. 339-97.00R.
Capaccio, Vincent A.: *See—*
Allis, Robert F.; and Capaccio, Vincent A., 4,047,811, Cl. 355-14.000.
Carba S.A.: *See—*
Gabus, Jean-Claude, 4,048,439, Cl. 178-17.00C.
Carborundum Company, The: *See—*
Colvin, Floyd E.; and Luttrell, John E., 4,048,075, Cl. 210-484.000.
Cardenas, Carlos G., to SCM Corporation. Process for preparation of 1,4-haloallylic esters from dienes. 4,048,220, Cl. 560-237.000.
Carino, John W., to General Electric Company. Insulative header assembly with feed through terminals. 4,047,790, Cl. 339-220.00C.
Carl, Daniel E.: *See—*
Stumbar, James P.; Carl, Daniel E.; and Lee, Suh Y., 4,047,972, Cl. 134-2.000.
Carli, Alvin J.: *See—*
Deming, Andrew F.; and Carli, Alvin J., 4,048,630, Cl. 340-274.00R.
Carlson, Jerome A.: *See—*
Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., 4,047,768, Cl. 308-72.000.
Carlsson, David J.; Suprunchuk, Tony; and Wiles, David M. Photostabilization of polymers. 4,048,367, Cl. 428-220.000.
Carlsson, Per Jan Erik: *See—*
Axen, Rolf Erik Axel Verner; Porath, Jerker Olof; and Carlsson, Per Jan Erik, 4,048,416, Cl. 526-9.000.
Carlsson, Rolf Christer, to Telefonaktiebolaget L M Ericsson. Feed-forward amplifier. 4,048,579, Cl. 330-151.000.
Carlstrom, William L.: *See—*
Svoboda, Glenn R.; Suh, John T.; Carlstrom, William L.; and Maechtle, Gary L., 4,048,104, Cl. 260-2.5AN.
Carpano & Pons: *See—*
Bullat, Jean, 4,047,554, Cl. 160-168.00R.
Carrier Corporation: *See—*
Krick, Edward F.; and MacLeod, David E., 4,047,776, Cl. 312-245.000.
Carriera, Manuel. Starter for rope pull outboard motors. 4,047,440, Cl. 74-6.000.
Carson, John Robert, to McNeil Laboratories, Incorporated. Halo-substituted 1-loweralkyl-5-aroylpyrrole-2-acetic acid compounds. 4,048,191, Cl. 260-326.470.
Carson, Lansing M.; and Welter, Neil E., to Motorola Inc. Suppressed carrier automatic gain control circuitry. 4,048,566, Cl. 325-329.000.
Carter, Clyde Thomas, to AMP Incorporated. Low insertion force receptacle and cammed housing. 4,047,791, Cl. 339-260.000.
Carter, William C.: *See—*
Fordyce, Homer E.; and Carter, William C., 4,048,265, Cl. 261-111.000.
Casensky, Bohuslav: *See—*
Kralicek, Jaroslav; Kubanek, Vladimir; Kondelikova, Jaroslava; Casensky, Bohuslav; and Machacek, Jiri, 4,048,421, Cl. 526-177.000.
Casey, Donald James; and Epstein, Martin, to American Cyanamid Company. Normally-solid, bioabsorbable, hydrolyzable, polymeric reaction product. 4,048,256, Cl. 260-860.000.
Castillo, Adolfo: *See—*
Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, 4,047,282, Cl. 29-432.000.
Caterpillar Tractor Co.: *See—*
Belke, William H.; Hafele, Joseph C.; Landen, Ernest W.; and Richards, Thomas J., 4,047,984, Cl. 148-152.000.
Burk, Duane L., 4,047,277, Cl. 29-421.00R.
Earle, Michael, 4,048,459, Cl. 219-85.0BM.
Goloff, Alexander, 4,047,772, Cl. 308-237.00R.
Goloff, Alexander; Barker, Noble G.; and Staebler, Paul J., 4,047,855, Cl. 418-53.000.
Johnson, Lowell E.; Cobb, Raymond P.; Howard, Frank W., III; and Dietz, Dwayne D., 4,047,383, Cl. 60-354.000.
Kranc, Stanley J.; Wells, Alan W.; and Hackett, David E., 4,047,664, Cl. 239-120.000.
May, Czeslaw J.; and Piepho, Donald A., 4,047,542, Cl. 137-627.500.
Meisel, Thomas C., Jr., 4,047,626, Cl. 214-147.00G.
Stary, William Richard; and Shaw, David Merrill, 4,047,572, Cl. 169-62.000.
Stepe, Visvaldis A., 4,047,312, Cl. 37-141.00R.
Vaughn, Kennith E.; and Piper, Hugh V., 4,047,771, Cl. 308-237.00R.
Young, D. Craig; and Zadoks, Abraham L., 4,047,740, Cl. 285-47.000.
Cathey, Jimmy D. Table. 4,047,754, Cl. 297-157.000.
Caumartin, Francois; Raufast, Charles; and Havas, Laszlo, to Naphtachimie. Dry polymerization of olefins in reaction vessels arranged in series. 4,048,412, Cl. 526-65.000.
CCL Systems Limited: *See—*
Edwards, Hugh Jeremy Willis, 4,047,420, Cl. 72-416.000.
Cedrone, Nicholas J. Test contactor system for semiconductor device handling apparatus. 4,047,780, Cl. 339-17.0CF.
Cejka, Joseph B., to Ward Products Corporation. Antenna length indicator. 4,048,638, Cl. 343-894.000.
Celanese Corporation: *See—*
Barer, Sol J., 4,047,925, Cl. 71-78.000.
Breznak, Robert A.; and Parker, James A., 4,048,277, Cl. 264-83.000.
Calundann, Gordon W.; and Powers, Edward J., 4,048,139, Cl. 260-45.80N.
Keith, Charles Herbert, 4,047,862, Cl. 425-8.000.
Vanderspurt, Thomas H., 4,048,110, Cl. 252-443.000.
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Oscarson, John R.; and Routien, John B., to Pfizer Inc. Polycyclic ether antibiotic for combating insects. 4,048,304, Cl. 424-122.000.
Celotex Corporation, The: *See—*
Moss, Ernest K., 4,048,145, Cl. 260-57.00R.
Cenek, Miroslav: *See—*
Sandera, Josef; Calabek, Milan; Cenek, Miroslav; Kalab, Frantisek; Koudelka, Vojtech; Kouril, Oldrich; Malik, Jiri; and Vanacek, Josef, 4,048,406, Cl. 429-209.000.
Centro Sperimentale Metallurgico S.p.A.: *See—*
Barnaba, Pierluigi, 4,048,091, Cl. 252-373.000.
Cernia, Enrico; and Conti, Walter, to Snam Progetti S.P.A. Device for absorbing impact energy. 4,047,702, Cl. 256-13.100.
Chabardes, Pierre; Julia, Marc; and Menet, Albert, to Rhone-Poulenc S.A. Sulphones. 4,048,234, Cl. 260-607.0AR.
Chaintrier, Christian: *See—*
Chaintrier, Guy; and Chaintrier, Christian, 4,047,571, Cl. 169-60.000.
Chaintrier, Guy; and Chaintrier, Christian. Automatic fire extinguishing system for a building having central air conditioning. 4,047,571, Cl. 169-60.000.
Challeton, Didier; Coeure, Philippe; Jadot, Jean Pierre; and Peuzin, Jean Claude. Optical wave guide having distributed gyrotropy. 4,047,801, Cl. 350-96.0WG.
Champagne-Dye Works: *See—*
Dombrowski, Edward J., 4,047,405, Cl. 68-205.00R.
Chandler Evans Inc: *See—*
Sundberg, Jack Gunnar, 4,047,859, Cl. 418-232.000.
Chang, Edward H., to Fremont Industries, Inc. Low temperature metal cleaning composition. 4,048,121, Cl. 252-527.000.
Chang, Yi-Chung, to Berry Metal Company. Process for refining hot metal to steel. 4,047,936, Cl. 75-52.000.
Chappell Industries, Inc.: *See—*
Cleveland, John T.; Chappell, Walter L.; and Watts, John D., 4,047,695, Cl. 251-122.000.

Chappell, Walter L.: *See—*
Cleveland, John T.; Chappell, Walter L.; and Watts, John D., 4,047,695, Cl. 251-122.000.

Charles, Marvin: *See—*
Coughlin, Robert W.; and Charles, Marvin, 4,048,018, Cl. 195-115.000.

Charonnat, Henri Marie Dominique: *See—*
Havard, Jean Francois Pierre Marie; Gaschet, Michel Marceau; and Charonnat, Henri Marie Dominique, 4,048,547, Cl. 318-488.000.

Charransol, Pierre; Hauri, Jacques; and Danis, Roger, to Thomson-CSF. Arrangement for controlling a signal switching system and a method for using this arrangement. 4,048,482, Cl. 235-153.0AE.

Chasar, Dwight William, to B. F. Goodrich Company, The. Light resistant polyolefin compositions. 4,048,140, Cl. 260-45.95C.

Chase-Shawmut Company, The: *See—*
Knapp, Edward J., Jr., 4,048,609, Cl. 337-159.000.

Chattanooga Glass Company: *See—*
Armstrong, Thomas M., 4,047,920, Cl. 65-335.000.

Chatterji, Debajyoti; and Dubin, Robert R., to Electric Power Research Institute, Inc. Na/s cell reactant container with metal aluminide coating. 4,048,390, Cl. 429-102.000.

Chemed Corporation: *See—*
Cuisia, Dionisio Guerrero; and Hwa, Chih Ming, 4,048,066, Cl. 210-58.000.

Chemerda, John M.; and Gal, George, to Merck & Co., Inc. Process for resolving alanine, 3-fluoro and 2-deutero-3-fluoro-DL-alanine. 4,048,224, Cl. 260-534.00C.

Chemical Grout Company, Ltd.: *See—*
Yahiro, Teruo; and Yoshida, Hiroshi, 4,047,580, Cl. 175-67.000.

Chemical Systems, Inc.: *See—*
Kesting, Robert E., 4,048,271, Cl. 264-41.000.

Chemische Werke Huls Aktiengesellschaft: *See—*
Frese, Albert; Dittmann, Walter; and Kilian, Wolfgang, 4,048,419, Cl. 526-153.000.
Haag, Horst; Nordsiek, Karl-Heinz; Streck, Roland; and Zerpner, Dieter, 4,048,262, Cl. 260-889.000.
Ruckelshauss, Gerhard, 4,048,243, Cl. 260-668.00D.

Chemokomplex Vegyipari Gep-es Berendezes Export-Import Vallalat: *See—*
Szepesi, Karoly; Meszaros, Lajos; Majer, Janos; Zoldi, Jozsef; and Entzmann, Karl, 4,048,285, Cl. 423-132.000.

Chen, James Ling; and Battaglia, Jean M., to E. R. Squibb & Sons, Inc. Topical steroid ointment formulations. 4,048,309, Cl. 424-238.000.

Chen, James Ling; and Battaglia, Jean M., to E. R. Squibb & Sons, Inc. Topical steroid formulation in form of lotion or cream. 4,048,310, Cl. 424-238.000.

Chen, Thomas T., to Rockwell International Corporation. Planar magnetoresistance thin film probe for magnetic field alignment. 4,048,557, Cl. 324-46.000.

Cheng, Paul J., to Phillips Petroleum Company. Induced temperature gradient settling vessel. 4,048,063, Cl. 210-72.000.

Cheng, Paul J., to Phillips Petroleum Company. Filtering process and apparatus. 4,048,067, Cl. 210-73.00R.

Chernomordik, Evgeny Naumovich: *See—*
Kovin, Vladimir Mikhailovich; Mitenkov, Fedor Mikhailovich; Ovechkin, Alexandr Vasilievich; Pankratov, Vladimir Alexeevich; Savin, Nikolai Ivanovich; Ternikova, Tamara Alexandrovna; Filippov, Vladimir Jurievich; Khramov, Dmitry Alexandrovich; Chernomordik, Evgeny Naumovich; Shiryaev, Vladimir Ivanovich; Muzychuk, Vladimir Romanovich; and Savin, Alexandr Nikolaevich, 4,048,011, Cl. 176-40.000.

Chevet, Robert, to Saft-Societe des Accumulateurs Fixes et de Traction; and Compagnie Industrielle des Piles Electriques "CIPEL". Cell or battery state of discharge indicator. 4,048,388, Cl. 429-91.000.

Chevron Research Company: *See—*
Lawyer, Leon C., 4,048,612, Cl. 340-15.5CP.
Levine, Irving E., 4,048,343, Cl. 426-330.200.

Cheythey, Arthur W. Dental articulator. 4,047,302, Cl. 32-32.000.

Chicago Bridge & Iron Company: *See—*
Walker, James Donald; and Kline, Leslie F., 4,048,267, Cl. 261-122.000.

Chielens, Alain, to Fives-Cail Babcock. Apparatus for supporting a rotary body of large diameter. 4,047,769, Cl. 308-121.000.

Chierici, Osvaldo F., to Holland Company. Uncoupling device for rotary dump cars. 4,047,619, Cl. 213-166.000.

Childs, Jerry D.; and Love, Roosevelt, to Halliburton Company. Oil well cementing process. 4,047,567, Cl. 166-293.000.

Chillier-Duchatel, Nicole; and Verger, Bernard, to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie". Control system and apparatus for Redox type electrochemical cell. 4,048,384, Cl. 429-22.000.

Chin, Arthur Y.: *See—*
Epstein, James; and Chin, Arthur Y., 4,048,401, Cl. 429-171.000.

Chisum, Finis Lavell. Log product and improvements in machine to prepare logs for log houses. 4,047,350, Cl. 52-593.000.

Chloride Group Limited: *See—*
White, Charles Arthur John, 4,048,400, Cl. 429-160.000.

Chloride Silent Power Limited: *See—*
Tilley, Alec R.; and Hames, Michael D., 4,048,391, Cl. 429-104.000.

Chronberg, Sten, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method and machine for manufacturing a plate-like material made from agglomerated particles and in particular ceramic products obtained thereby. 4,048,037, Cl. 204-180.00R.

Chrysler France: *See—*
Lecart, Jean-Guy Pierre Denis; and Amalberti, Jean Claude, 4,047,450, Cl. 74-552.000.

Chu, Joseph Y. C.; and Gunther, Wolfgang H. H., to Xerox Corporation. Process for preparation of transparencies by selective decomposition of an organoselenium compound in a polymeric matrix. 4,047,947, Cl. 96-1.300.

Chuang, Ping-chien; and Plunkett, Joseph A., to Recognition Equipment Incorporated. Automated character recognition system. 4,048,615, Cl. 340-146.3AC.

Chuo Hatsujo Kogyo Co., Ltd.: *See—*
Takeuchi, Kazuaki, 4,047,683, Cl. 248-62.000.

Ciarniello, Giorgio; and De Lena, Oscar, to Societa Italiana Vetro Siv S.p.A. Automatic control system for a defogging circuit. 4,048,469, Cl. 219-203.000.

Ciba-Geigy Corporation: *See—*
Guglielmetti, Leonardo, 4,048,212, Cl. 260-465.00H.
Karrer, Friedrich, 4,048,235, Cl. 260-612.00R.
Karrer, Friedrich, 4,048,327, Cl. 424-305.000.
Porret, Daniel; and Habermeier, Jurgen, 4,048,170, Cl. 260-256.40E.
Rohr, Otto, 4,047,931, Cl. 71-107.000.
Rohr, Otto, 4,048,217, Cl. 560-20.000.
Shen, Kwan Ting; Gannon, John Allister; and Nelson, Robert Charles, 4,048,179, Cl. 260-29.40R.

Cieplik, Robert J.; and Czarnecki, Victor, to Addressograph Multigraph Corporation. Mechanism to open and close iris on lens. 4,048,641, Cl. 354-10.000.

cikalon-Vliesstoff-werke GmbH: *See—*
Lochner, Herbert, 4,047,269, Cl. 28-109.000.

Cities Service Company: *See—*
Greene, Marvin, 4,048,053, Cl. 208-8.000.

Citizen Watch Company Limited: *See—*
Nakajima, Fumio; Machida, Takayasu; and Yamada, Kenji, 4,048,548, Cl. 318-138.000.

Clampitt, Richard L.; and Hessert, James E., to Phillips Petroleum Company. Aqueous gels and uses thereof. 4,048,079, Cl. 252-8.55D.

Clark, George W.; and Dainty, Douglas H., to AMAX Inc. Thermite smelting of ferromolybdenum. 4,047,942, Cl. 75-133.500.

Clark, Ian Sidney Rex: *See—*
Larson, Jay Michael; Clark, Ian Sidney Rex; and Gibson, Robert Cameron, 4,047,933, Cl. 75-.5C.

Clark, William T., III. Biocompatible hemoperfusion system. 4,048,064, Cl. 210-23.00R.

Clarke, Graham Morley; and Fisher, George, to Ferranti Limited. Circuit arrangements for controlling detector signals in surface inspection systems. 4,048,510, Cl. 250-563.000.

Clarke, Graham Wilson: *See—*
Lister, Edward Alan; and Clarke, Graham Wilson, 4,047,362, Cl. 53-189.000.

Clay, Warren C., to Thermo Electron Corporation. Pneumatic pulsator pumping system with pulsator fluid venting valve. 4,047,849, Cl. 417-384.000.

Clayton, John Peter; and Bentley, Peter Hubert, to Beecham Group Limited. Penicillins. 4,048,320, Cl. 424-271.000.

Clearwater Systems Inc.: *See—*
Moeglich, Karl, 4,048,028, Cl. 204-97.000.

Clem, Arthur G., to American Colloid Company. Water barrier panel. 4,048,373, Cl. 428-454.000.

Cleveland, John T.; Chappell, Walter L.; and Watts, John D., to Chappell Industries, Inc. Adjustable choke. 4,047,695, Cl. 251-122.000.

Clifford, John E., to Battelle Memorial Institute. Combination cell. 4,048,383, Cl. 429-19.000.

Close, Leo R., to Israel, Mrs. Lawrence. Mechanism for releasing device attaching an anti-theft monitor to merchandise. 4,047,410, Cl. 70-401.000.

Clowes, John Roger: *See—*
Bamford, Kenneth; and Clowes, John Roger, 4,047,762, Cl. 299-64.000.

Cobb, Raymond L., to Phillips Petroleum Company. Isomerization of the cis, trans isomers of 1,2,5,6-tetrasubstituted-1,5-cyclooctadienes to the corresponding cis, cis-isomers. 4,048,209, Cl. 260-464.000.

Cobb, Raymond P.: *See—*
Johnson, Lowell E.; Cobb, Raymond P.; Howard, Frank W., III; and Dietz, Dwayne D., 4,047,383, Cl. 60-354.000.

Cochran, Michael J.; and Grant, Charles P., Jr., to Texas Instruments Incorporated. Calculator system having multi-function memory instruction register. 4,048,624, Cl. 364-200.000.

Coe, Noel N.: *See—*
Saeman, Walter C.; and Coe, Noel N., 4,048,351, Cl. 427-213.000.

Coen Company, Inc.: *See—*
Voorheis, Temple S.; and White, James H., 4,047,489, Cl. 110-15.000.

Coeure, Philippe: *See—*
Challeton, Didier; Coeure, Philippe; Jadot, Jean Pierre; and Peuzin, Jean Claude, 4,047,801, Cl. 350-96.0WG.

Cogan, Frederick Thomas: *See—*
Gumb, Beverly William; Kuhfus, Gerd; and Cogan, Frederick Thomas, 4,047,787, Cl. 339-154.00A.

Cohen-Alloro, Richard: *See—*
Cuvillier, Roger; and Cohen-Alloro, Richard, 4,048,069, Cl. 210-84.000.

Cohen, Joseph David: *See—*
Brookes, Neil Roger; Ray, Martin George; Cohen, Joseph David; and McCarey, Thomas Joseph, 4,047,379, Cl. 60-39.09D.

Coldren, Chester P., to Eaton Corporation. Tension indicator. 4,047,463, Cl. 85-62.000.

Cole, Edward L.; Hess, Howard V.; and Wong, James, Jr., to Texaco Inc. Upgrading of solid fuels. 4,047,898, Cl. 44-1.00G.

Cole, Lewis C., to United States of America, Army. Fuze with bimetallic spring delay module. 4,047,484, Cl. 102-76.00P.

Colella, Donald F.; and Kaiser, Carl, to SmithKline Corporation. α-aminomethyl-4-hydroxy-3-methylsulfonyl benzyl alcohols. 4,048,229, Cl. 260-570.600.

Coleman, William R.; and Duffey, Thomas E., to Riviana Foods Inc. Aqueous pesticidal solutions containing polyethylene glycol. 4,048,302, Cl. 424-78.000.

Colgate-Palmolive Company: *See—*
Douglass, Miriam Lois, 4,048,181, Cl. 260-294.80G.
Gerecht, John Fred, 4,048,338, Cl. 424-358.000.
Karami, Hamzeh, 4,047,528, Cl. 128-287.000.
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Karami, Hamzeh, 4,047,531, Cl. 128-290.00R.
Tomlinson, Kenneth; and Duff, Edward John, 4,048,300, Cl. 424-52.000.

Collins, Russell Bancroft: *See—*
Crane, Warren Joseph; Collins, Russell Bancroft; and Crane, Charles Warren, 4,047,415, Cl. 72-125.000.

Colonial Metals, Inc.: *See—*
Davies, Ronald F.; and Benvegno, George J., 4,048,092, Cl. 252-412.000.

Colvin, Floyd E.; and Luttrell, John E., to Carborundum Company, The. Filter cartridge. 4,048,075, Cl. 210-484.000.

Combustion Engineering, Inc.: *See—*
Schuetz, Adolph August, 4,047,891, Cl. 23-230.00A.

Commissariat a l'Energie Atomique: *See—*
Barbier, Daniel; Ittel, Jean-Michel; and Poujois, Robert, 4,048,574, Cl. 330-9.000.
Bernard, Jean; Frossati, Giorgio; Guernet, Georges; Montier, Michel; Peccoud nee Toupillier, Louise; and Thoulouze, Daniel, 4,047,436, Cl. 73-362.0SC.
Berthelot, Guy, 4,047,850, Cl. 417-383.000.
Heyraud, Jacques, 4,047,886, Cl. 432-128.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
Waters, Percy Lloyd, 4,047,883, Cl. 432-14.000.

Compagnie Industrielle des Piles Electriques "CIPEL": *See—*
Chevet, Robert, 4,048,388, Cl. 429-91.000.

Compair Industrial Limited: *See—*
Poole, Eric John, 4,047,848, Cl. 417-374.000.

Comstock & Wescott, Inc.: *See—*
Rice, Richard E., 4,047,876, Cl. 431-7.000.

Condea Chemie GmbH: *See—*
Wassermann, Martin; and Meyer, Arnold, 4,048,295, Cl. 423-626.000.

Condon, Michael E.: *See—*
Hauck, Frederic P.; Condon, Michael E.; and Fox, Rita T., 4,048,231, Cl. 260-570.700.

Conklin, Robert M.; and Human, Arthur T., to Holmes Protection Inc. Coding system for an alarm system and the like. 4,048,621, Cl. 340-168.00B.

Connelly, Robert Frederick. Method of oxidizing or bleaching a contaminant in a non-aqueous fluid. 4,048,240, Cl. 260-652.00P.

Consolidated Freightways, Inc.: *See—*
Markland, R. Donald, 4,047,912, Cl. 55-406.000.

Consupak, Inc.: *See—*
Farrell, John Jerome, 4,047,873, Cl. 425-523.000.

Container Corporation of America: *See—*
Bell, Richard L.; Desmond, John D.; and Hart, Joseph J., 4,047,660, Cl. 206-620.000.

Container Graphics Corporation: *See—*
Saunders, Philip G., 4,047,481, Cl. 101-376.000.

Contemporary, Inc.: *See—*
Kanzelberger, James C., 4,047,996, Cl. 156-220.000.

Conti, Walter: *See—*
Cernia, Enrico; and Conti, Walter, 4,047,702, Cl. 256-13.100.

Cook, Edward H., Jr.: *See—*
Eng, Jeffrey D.; Cook, Edward H., Jr.; and Figueras, Wilfredo E., 4,048,045, Cl. 204-263.000.

Cooper, David J.; Hoover, John R. E.; and Weisbach, Jerry A., to SmithKline Corporation. Mercaptopseudotrisaccharides. 4,048,430, Cl. 536-17.000.

Cooper, Robin D. G.; and Spry, Douglas O., to Eli Lilly and Company. 4(Formylthio)-azetidin-2-ones and ozonization process therefor. 4,048,157, Cl. 260-239.00A.

Cooper, Shannon L.; and Adams, Frank C., to Hart Schaffner & Marx. Marker making methods for cutting fabric patterns. 4,047,951, Cl. 96-27.00R.

Copeland Concrete Products, Inc.: *See—*
Copeland, William Leo, 4,047,962, Cl. 106-90.000.

Copeland, William Leo, to Copeland Concrete Products, Inc. Construction composition. 4,047,962, Cl. 106-90.000.

Copperloy Corporation: *See—*
Miles, Ray P., 4,047,734, Cl. 280-486.000.

Coppola, Richard M.: *See—*
Schrank, Martin P.; and Coppola, Richard M., 4,048,347, Cl. 427-10.000.

Corderman, Sidney A.: *See—*
Evans, Ronald C.; and Corderman, Sidney A., 4,048,573, Cl. 330-2.000.

Cornell, Martin C., III: *See—*
Doorakian, George A.; Schmidt, Dennis L.; and Cornell, Martin C., III, 4,048,141, Cl. 260-47.0EC.

Corning Glass Works: *See—*
Bihuniak, Peter P.; and Guile, Donald L., 4,047,966, Cl. 106-69.000.
Reade, Richard F., 4,047,960, Cl. 106-39.800.

Corporation of Gonzaga University, The: *See—*
Kelleher, Raymond L.; Shirk, Ivan A.; and O'Leary, Timothy J., deceased, 4,048,287, Cl. 423-242.000.

Cotterrell, Graham Paul, to Imperial Chemical Industries Limited. Carbonylmethylpyrimidin-6-yl phosphates and phosphorothionates. 4,048,172, Cl. 260-256.50R.

Coughlin, Robert W.; and Charles, Marvin. Method of carrying out enzyme catalyzed reactions. 4,048,018, Cl. 195-115.000.

Counsell, Raymond E.; and Yu, Terry Ta-Jen, to University of Michigan, The Regents of the. Novel quaternary ammonium salts, compositions and methods for their use. 4,048,297, Cl. 424-1.000.

Coupe, Edward Gordon, to Dosco Overseas Engineering Limited. Mining machine. 4,047,761, Cl. 299-64.000.

Courtenay, John Henry; and Wardell, Martin Bernard Peter, to Foseco Trading A.G. Refractory heat-insulating materials. 4,048,134, Cl. 260-38.000.

Cox, Howard W., to Mission Marketing Corporation of Arizona. Ventilating damper assembly. 4,047,475, Cl. 98-116.000.

Cox Instrument Division Lynch Corporation: *See—*
Dabanian, Karnig H., 4,047,433, Cl. 73-194.00C.

Cox, John T.; Garber, Michael B.; Jasper, Marilyn A.; and LoVecchio, Paul, to United States of America, Army. Lead-tin-telluride photodetector array. 4,048,535, Cl. 313-367.000.

CPC International Inc.: *See—*
Gibbons, John P.; and Wondolowski, Lawrence, 4,048,126, Cl. 260-17.200.
Gibbons, John P.; and Wondolowski, Lawrence, 4,048,127, Cl. 260-17.200.

Crafts, Harold Springer: *See—*
Hendrie, Gardner Cox; and Crafts, Harold Springer, 4,048,673, Cl. 364-200.000.

Cragar, Darryl E.: *See—*
Boozalis, Theodore S.; Cragar, Darryl E.; Ivy, John B.; and Willis, Gordon G., 4,048,241, Cl. 260-658.00R.

Craighead, Bobby L.: *See—*
Pearre, Stephen G.; and Craighead, Bobby L., 4,048,076, Cl. 210-528.000.

Crandall, Richard E.; and Morgan, Denny E., to Kinney Safety Systems, Inc. Central station to addressed point communication system. 4,048,620, Cl. 340-163.000.

Crane, Charles Warren: *See—*
Crane, Warren Joseph; Collins, Russell Bancroft; and Crane, Charles Warren, 4,047,415, Cl. 72-125.000.

Crane, Warren Joseph; Collins, Russell Bancroft; and Crane, Charles Warren. Apparatus for shaping the end of a hollow tube. 4,047,415, Cl. 72-125.000.

Crankshaw, John H., to Dynetics, Inc. Synchronizing coupling. 4,047,602, Cl. 192-53.00F.

Crickmer, Charles D., to Otis Engineering Corporation. Well tool. 4,047,565, Cl. 166-217.000.

Crist, Eugene A.: *See—*
Kehl, Donald K.; and Crist, Eugene A., 4,047,328, Cl. 47-59.000.

Crochiere, Ronald Eldon; Flanagan, James Loton; and Webber, Susan Anne, to Bell Telephone Laboratories, Incorporated. Digital speech communication system for minimizing quantizing noise. 4,048,443, Cl. 179-1.0SA.

Croft, George Thomas, to Addressograph Multigraph Corporation. Duplicating process utilizing ion modulating means as the image generating source. 4,047,946, Cl. 96-1.00R.

Cross, Frances: *See—*
Cross, Howard, 4,047,799, Cl. 350-97.000.

Cross, Howard, to Cross, Frances. Multi-color hand signal. 4,047,799, Cl. 350-97.000.

Crossley, Roger: *See—*
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,048,175, Cl. 260-283.00S.

Crouse, Jere W.: *See—*
Dahl, Carl B.; and Crouse, Jere W., 4,047,676, Cl. 242-66.000.

Crowder, Charles H.: *See—*
Hale, Ferrell Daniel; and Crowder, Charles H., 4,048,368, Cl. 428-235.000.

Crown Cork & Seal Company, Inc.: *See—*
Wright, George W., 4,047,613, Cl. 209-74.00M.

Croyle, Jack V., to Dart Industries Inc. Spout with snap acting cover and drain hole. 4,047,648, Cl. 222-498.000.

Csaki, Julius A., to Hewlett-Packard Company. Apparatus for converting CRT cathodes. 4,047,778, Cl. 316-18.000.

CSELT - Centro Studi e Laboratori Telecommunicazioni S.p.A.: *See—*
Dogliotti, Renato; Mazzei, Umberto; and Mengali, Umberto, 4,048,572, Cl. 329-104.000.

Cuisia, Dionisio Guerrero; and Hwa, Chih Ming, to Chemed Corporation. Method of inhibiting scale. 4,048,066, Cl. 210-58.000.

Cullen, Walter P.: *See—*
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Oscarson, John R.; and Routien, John B., 4,048,304, Cl. 424-122.000.

Culver, Irven H.; and Szymber, Oleg, to Belrico, Inc. Dual rate bias spring for antibacklashing gears. 4,047,447, Cl. 74-409.000.

Cummings, Robert E.: *See—*
Johns, Eddie D.; Cummings, Robert E.; and Pearl, Edgar W., 4,047,408, Cl. 70-129.000.

Cunningham, Van Buren, II: *See*—
Duncan, William Palmer, 4,047,319, Cl. 43-44.870.
Curcio, Joseph John, to Paoli High Fidelity Consultants Inc. Electronic filter with active elements. 4,048,523, Cl. 307-297.000.
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, to John Wyeth & Brother Limited. Tetrahydroquinoline derivatives. 4,048,175, Cl. 260-283.00S.
Curtiss-Wright Corporation: *See*—
Avena, Salvatore; and Minarick, Joseph W., 4,047,842, Cl. 416-152.000.
Cuvillier, Roger; and Cohen-Alloro, Richard, to Bureau de Recherches Geologiques et Minieres. Small surface liquid decantation apparatus and process for making same. 4,048,069, Cl. 210-84.000.
Czarnecki, Victor: *See*—
Cieplik, Robert J.; and Czarnecki, Victor, 4,048,641, Cl. 354-10.000.
Czerny, Thomas: *See*—
Sauer, Hans; and Czerny, Thomas, 4,048,472, Cl. 219-388.000.
Czombos, Jozsef: *See*—
Karpati, Egon; Szporny, Laszlo; Bartok, Mihaly; Czombos, Jozsef; Felfoldi, Karoly; Laszlavik, Marta; and Notheisz, Ferenc, 4,048,322, Cl. 424-283.000.
Dabanian, Karnig H., to Cox Instrument Division Lynch Corporation. Modular vortex flowmeter. 4,047,433, Cl. 73-194.00C.
Dahl, Carl B.; and Crouse, Jere W., to Beloit Corporation. Winder vibration dampener. 4,047,676, Cl. 242-66.000.
Dai Nippon Toryo Kabushiki Kaisha: *See*—
Yaguchi, Masachika; Jinnai, Toshio; Shirotsuka, Mikio; and Totani, Kazuo, 4,047,803, Cl. 350-160.0LC.
Yaguchi, Mashachika; and Nakamura, Kenji, 4,048,088, Cl. 252-299.000.
Daicel Ltd.: *See*—
Nakamachi, Akio; and Maruo, Zenichi, 4,048,101, Cl. 260-2.50E.
Daidotokushuko-Kabushikikaisha: *See*—
Hiratake, Susumu; and Matsui, Mitsuhiro, 4,048,436, Cl. 13-2.00P.
Dainippon Ink & Chemicals, Inc.: *See*—
Arai, Yoshi; Kimura, Kazuo; Sato, Hisato; Yamaki, Takasi; Morita, Katsuhiko; Ohzeki, Masanao; Takatsu, Haruyoshi; Fujita, Yutaka; and Tazume, Masayuki, 4,048,089, Cl. 252-299.000.
Dainty, Douglas H.: *See*—
Clark, George W.; and Dainty, Douglas H., 4,047,942, Cl. 75-133.500.
Dale, C. Harold, Jr.; Howe, Spencer D.; Bonebreak, Robert L.; and Starkus, Charles J., to Hughes Aircraft Company. Torque while turn-around scan mirror assembly. 4,047,792, Cl. 350-6.000.
Dalton, Raymond Frederick: *See*—
Anderson, Brian; Dalton, Raymond Frederick; and Rowbotham, Philip Martin, 4,048,187, Cl. 260-308.00D.
Daly, Richard T. Bee-hive scale. 4,047,584, Cl. 177-1.000.
Dammeyer, Bruce, to Teco, Inc. Actuating system for transportable articulated booms having raisable platforms. 4,047,593, Cl. 182-2.000.
Dampocrete Incorporated: *See*—
Majidzadeh, Kamran; and Guirguis, Hani R., 4,047,967, Cl. 106-90.000.
Damratowski, Harold E., to Triad Fastner Corporation. Air-powered, self-feeding screw driving tool. 4,047,611, Cl. 206-347.000.
Daniel, Walter Lee. Wood burning furnace. 4,047,515, Cl. 126-110.00R.
Daniels, Roger D.; and Snover, John A., to Dow Chemical Company, The. Crystallizing solution and method of preparation thereof. 4,048,087, Cl. 252-188.000.
Danis, Roger: *See*—
Charransol, Pierre; Hauri, Jacques; and Danis, Roger, 4,048,482, Cl. 235-153.0AE.
Danova, Verginia Ilieva: *See*—
Nenov, Dimiter Panayotov; and Danova, Verginia Ilieva, 4,048,025, Cl. 204-56.00R.
Dansk Styreteknik A/S: *See*—
Trostmann, Erik; and Albertsen, Ove, 4,047,478, Cl. 99-450.100.
Daoust, Ralph R.; and Daoust, Timothy N., to Front Discharge Mixer, Inc. Apparatus for controlling the flow of concrete from a mixer. 4,047,604, Cl. 193-10.000.
Daoust, Timothy N.: *See*—
Daoust, Ralph R.; and Daoust, Timothy N., 4,047,604, Cl. 193-10.000.
Darby, Paul L.: *See*—
Weill, Paul B.; and Darby, Paul L., 4,047,988, Cl. 149-74.000.
Darmstadt, Robert M. Pneumatic load-supporting structures. 4,047,335, Cl. 52-2.000.
Dart Industries Inc.: *See*—
Croyle, Jack V., 4,047,648, Cl. 222-498.000.
Trombly, Edgar F., 4,047,633, Cl. 220-9.00R.
Data General Corporation: *See*—
Gruner, Ronald H., 4,048,623, Cl. 364-900.000.
Hendrie, Gardner Cox; and Crafts, Harold Springer, 4,048,673, Cl. 364-200.000.
Daugherty, Kenneth Earl: *See*—
Alderete, William Eugene; Boyer, John Parke; Daugherty, Kenneth Earl; and Johnson, David Lee, 4,047,961, Cl. 106-89.000.
David, Donald J.; and Tucker, Huel C., to United States of America, Army. Electronic system for providing specificity in an electrochemical analytical device. 4,048,041, Cl. 204-195.00R.
Davies, Ronald F.; and Benvegno, George J., to Colonial Metals, Inc. Catalytic mixture and method of use therefor. 4,048,092, Cl. 252-412.000.
Davis, Royston H., to Shell Oil Company. Transcyanohydrination. 4,048,210, Cl. 260-465.00F.
Davlantes, George N. Pet access door panel. 4,047,331, Cl. 49-171.000.
Dawson, Kenneth Harold: *See*—
Seaborn, Paul Edward; and Dawson, Kenneth Harold, 4,047,544, Cl. 140-105.000.
Daxinger, Helmut, to Balzers Patent und Beteiligungs-AG. Method of producing a light transmitting absorbing coating on substrates. 4,048,039, Cl. 204-192.00P.
Day, James L.: *See*—
Whaley, Robert L.; and Day, James L., 4,047,748, Cl. 296-35.00A.
Dayco Corporation: *See*—
Speer, Billy L., 4,047,446, Cl. 74-234.000.
DeAngelis, Gloria J., to Raymond Lee Organization, Inc., The, a part interest. Volley tennis game. 4,047,717, Cl. 273-95.00H.
Decker, Bert J. Horizontal windmill. 4,047,833, Cl. 415-2.000.
Decroix, Paul Marcel Edmond, to Societe d'Equipements Divers Pour la Population Civile et l'Aviation Sedpa. Triangular-wing glider. 4,047,679, Cl. 244-16.000.
Dedova, Petrushka Atanassova: *See*—
Kondratenko, Maria Stefanova; Nachev, Lyubomir Todorov; Dedova, Petrushka Atanassova; and Antonova, Tamara Nikolaevna, 4,048,339, Cl. 426-39.000.
Deere & Company: *See*—
Anstey, Henry Dennis, 4,047,587, Cl. 180-53.00R.
Roach, Maurice P.; and Strudthoff, Stanley L., 4,048,556, Cl. 324-40.000.
de Gaston, Alexis Neal. X-ray beam perpendicular finder. 4,048,507, Cl. 250-491.000.
Deijs, Phillip: *See*—
Hookings, Paul H.; Wade, Harry C.; and Deijs, Phillip, 4,047,419, Cl. 72-370.000.
Deininger, Warren L. Pill and capsule counter. 4,047,620, Cl. 214-1.00C.
Delalande S.A.: *See*—
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,048,164, Cl. 544-121.000.
Delaney, Francis Alfred, to Sinanan Enterprises Limited. Liquid dispensing containers with cutter for preventing refilling. 4,047,641, Cl. 222-80.000.
De Lena, Oscar: *See*—
Ciarniello, Giorgio; and De Lena, Oscar, 4,048,469, Cl. 219-203.000.
Delmar Chemicals Limited: *See*—
Kubela, Rudolph; and Do Nascimento, Jose Maria, 4,048,314, Cl. 424-248.550.
Delre, Anthony, Jr. Drafting board with adjustable straight-edge assembly. 4,047,304, Cl. 33-80.000.
Deming, Andrew F.; and Carli, Alvin J., to Alliance Manufacturing Co., Inc., The. Door operator with automatic control of auxiliary circuit. 4,048,630, Cl. 340-274.00R.
DeNigris, Ernest Gerard; and Palette, Ralph John, to Bell Telephone Laboratories, Incorporated. Printed wiring board handle having viewable option connectors. 4,047,781, Cl. 339-17.00R.
Dennison, James Clifford; and Ottesen, Hjalmar Holmboe, to International Business Machines Corporation. Record track following and seeking. 4,048,660, Cl. 360-77.000.
Dennison Manufacturing Company: *See*—
Paradis, Joseph R., 4,047,545, Cl. 140-123.600.
Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of imidazo [4,5-b]pyridines. 4,048,182, Cl. 260-295.50B.
DePirro, Mario Louis. Post footing form holder and stabilizer system. 4,047,356, Cl. 52-749.000.
Derner, Paul; Sonntag, Hans; and Stehl, Otto, to BFG Glassgroup. Light transmitting panel. 4,047,351, Cl. 52-616.000.
deRosset, Armand J.: *See*—
Neuzil, Richard W.; and deRosset, Armand J., 4,048,205, Cl. 260-428.000.
de Ruggieri, Pietro; and Sighinolfi, Orazio, to Farmila Farmaceutici. Tetrahydropyranyl ethers of estrogens. 4,048,159, Cl. 260-239.55R.
DeSantis, Raymond P., to Wolverine Aluminum Corporation. Apparatus for producing spherical articles. 4,047,864, Cl. 425-78.000.
Deschamps, Andre: *See*—
Renault, Philippe; Deschamps, Andre; Franckowiak, Sigismond; and Dezael, Claude, 4,048,293, Cl. 423-574.00L.
Designeers Midwest: *See*—
Albers, Norbert C., 4,047,276, Cl. 29-222.000.
Deslandes, Claude: *See*—
Kervizic, Jean; Deslandes, Claude; and Berson, Alain, 4,047,482, Cl. 102-19.200.
Desmond, John D.: *See*—
Bell, Richard L.; Desmond, John D.; and Hart, Joseph J., 4,047,660, Cl. 206-620.000.
Deuterium Corporation: *See*—
Spevack, Jerome S., 4,047,905, Cl. 55-37.000.
Deutsch, Bennett; and Deutsch, Maria E. Mop and dusting device. 4,047,260, Cl. 15-147.00A.
Deutsch, Maria E.: *See*—
Deutsch, Bennett; and Deutsch, Maria E., 4,047,260, Cl. 15-147.00A.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Koberstein, Edgar; and Lakatos, Eduard, 4,048,098, Cl. 252-432.000.
Koberstein, Edgar; Muller, Klaus; and Theissen, Ferdinand, 4,048,232, Cl. 260-601.00R.
Prescher, Gunter; and Schreyer, Gerd, 4,048,225, Cl. 260-536.000.

Deutsche Texaco Aktiengesellschaft: *See*—
Wegner, Hans-Georg; and Kunert, Maximilian, 4,048,055, Cl. 208-25.000.
DeWeese, Harry R.; and Smith, Gary L. Water hydrant diffuser. 4,047,668, Cl. 239-500.000.
De Winter, Walter Frans; and Timmerman, Daniel Maurice, to AGFA-GEVAERT N.V. Process of hardening protein-containing photographic layers with a mixture of a carboxyl group-activating, low molecular weight compound and a carboxyl group-activating polymer. 4,047,957, Cl. 96-67.000.
Dezael, Claude: *See*—
Renault, Philippe; Deschamps, Andre; Franckowiak, Sigismond; and Dezael, Claude, 4,048,293, Cl. 423-574.00L.
Diamantides, Nick D. Universal impedance power apparatus. 4,048,602, Cl. 335-222.000.
Dianetti, Joseph C.: *See*—
Park, Ernest D.; and Dianetti, Joseph C., 4,047,794, Cl. 350-54.000.
Diax Corporation: *See*—
Kreuzer, Lloyd B., 4,048,499, Cl. 250-344.000.
DiBease, Paul J., to Raymond Lee Organization, Inc., The, a part interest. Bicycle reflector device. 4,047,800, Cl. 350-99.000.
Dickey-john Corporation: *See*—
Marsh, Norman F.; and Eng, William T., 4,047,434, Cl. 73-304.00R.
Dickinson, Timothy E.: *See*—
Phillips, Jack L.; and Dickinson, Timothy E., 4,047,532, Cl. 128-303.00R.
Dieringer, Andrew M.; and Sheperd, Ervin M., to Rexnord Inc. Method for removing ties under railroad track. 4,047,280, Cl. 29-427.000.
Dietrich, Bernhard, to Schaltbau Gesellschaft MBH. Contact system for relays, particularly power relays. 4,048,600, Cl. 335-128.000.
Dietz, Dwayne D.: *See*—
Johnson, Lowell E.; Cobb, Raymond P.; Howard, Frank W., III; and Dietz, Dwayne D., 4,047,383, Cl. 60-354.000.
Digital Data Inc.: *See*—
Forman, Aubry S., Jr.; Schultz, Charles A., Jr.; and Vice, William E., 4,048,619, Cl. 340-154.000.
Di Maio, Anthony E.; and Todisco, Joseph G., to Marson Corporation. Method of setting blind rivets. 4,047,281, Cl. 29-429.000.
Dimcheva, Zlatka Petkova: *See*—
Galabov, Angel Simeonov; Shindarov, Lubomir Mihaylov; Vassilev, Georgi Nikolov; Vassileva, Ragka Taneva; Dimcheva, Zlatka Petkova; Stoycheva, Dushka Staneva; and Velichkova, Emilia Hristova, 4,048,333, Cl. 424-322.000.
DiMurro, Richard J.: *See*—
Bick, Maurice; and DiMurro, Richard J., 4,048,043, Cl. 204-224.00R.
Dinzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Keszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, to Bor-, Cipo-, Szormeipari Kutato Intezet; and Vseojuzny Nauchno-Issledovatelsky Institut Plenochnykh Materialov I Iskusstvennoi Kozhi. Press mold for producing microcellular shaped pieces of dimensional accuracy, particularly shoe soles. 4,047,860, Cl. 425-4.00R.
Director-General of the Agency of Industrial Science and Technology: *See*—
Kusakabe, Masao; Fuziwara, Shuzo; and Shiino, Kazuo, 4,047,987, Cl. 149-37.000.
Dittmann, Walter: *See*—
Frese, Albert; Dittmann, Walter; and Kilian, Wolfgang, 4,048,419, Cl. 526-153.000.
Diz, Angel. Sugarcane planting device. 4,047,631, Cl. 214-519.000.
Dlugos, Daniel F., to Pitney-Bowes, Inc. Scale optical detector with spring constant variation compensator. 4,047,585, Cl. 177-210.00R.
Dlugos, Daniel F., to Pitney-Bowes, Inc. Zero load adjustment apparatus for spring weighing scale. 4,047,586, Cl. 177-210.00R.
Do Nascimento, Jose Maria: *See*—
Kubela, Rudolph; and Do Nascimento, Jose Maria, 4,048,314, Cl. 424-248.550.
Dobberpuhl, Daniel W., to General Electric Company. Integrated crystal oscillator circuit with few external components. 4,048,590, Cl. 331-116.00R.
Dr. L. Zambeletti S.p.A.: *See*—
Molteni, Luigi; Vercesi, Gian Piero; and Antonini, Eraldo, 4,048,305, Cl. 424-177.000.
Dodswoth, Edward: *See*—
McGeehin, Robert; and Dodswoth, Edward, 4,047,634, Cl. 220-270.000.
Dogliotti, Renato; Mazzei, Umberto; and Mengali, Umberto, to CSELT - Centro Studi e Laboratori Telecommunicazioni S.p.A. Adaptive correction of phase errors in noncoherent demodulation of carrier asymmetrically modulated with digital signals. 4,048,572, Cl. 329-104.000.
Dombrowski, Edward J., to Champagne-Dye Works. Apparatus for applying dye liquor to knit/deknit tubular rolls. 4,047,405, Cl. 68-205.00R.
Domingos, John M. Sportsman's multipurpose utility pouch. 4,047,650, Cl. 224-2.00B.
Donald, Robert C., Jr.: *See*—
Ward, Phillip W.; Donald, Robert C., Jr.; and Leerskov, Arthur E., Jr., 4,047,591, Cl. 181-119.000.
Donath, Jeno: *See*—
Dinzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Keszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 4,047,860, Cl. 425-4.00R.
Doorakian, George A.; Schmidt, Dennis L.; and Cornell, Martin C., III, to Dow Chemical Company, The. Latent catalysts for promoting reaction of epoxides with phenols and/or carboxylic acids. 4,048,141, Cl. 260-47.0EC.
Dorenbos, Frederick William, to Airco, Inc. Workpiece handling system for vacuum processing. 4,047,624, Cl. 214-17.00B.
Dorn, Peter; and Foucher, Walter D., Jr., to Texaco Inc. Motor fuel composition. 4,047,900, Cl. 44-68.000.
Dornier GmbH: *See*—
Krojer, Hubert, 4,047,911, Cl. 55-306.000.
Dosco Overseas Engineering Limited: *See*—
Bamford, Kenneth; and Clowes, John Roger, 4,047,762, Cl. 299-64.000.
Coupe, Edward Gordon, 4,047,761, Cl. 299-64.000.
Douglas, Walter M., to UOP Inc. Sulfonated metal phthalocyanine catalyst. 4,048,097, Cl. 252-431.00N.
Douglass, Miriam Lois, to Colgate-Palmolive Company. Derivatives of mercaptopyridine-1-oxide. 4,048,181, Cl. 260-294.80G.
Douthett, Joseph A.: *See*—
Arnold, Jerry L.; and Douthett, Joseph A., 4,047,981, Cl. 148-16.000.
Dow Chemical Company, The: *See*—
Boozalis, Theodore S.; Cragar, Darryl E.; Ivy, John B.; and Willis, Gordon G., 4,048,241, Cl. 260-658.00R.
Daniels, Roger D.; and Snover, John A., 4,048,087, Cl. 252-188.000.
Doorakian, George A.; Schmidt, Dennis L.; and Cornell, Martin C., III, 4,048,141, Cl. 260-47.0EC.
Gurgiolo, Arthur E.; and Booth, Llewellyn D., 4,048,100, Cl. 260-2.5AJ.
Lee, John Malcolm, 4,048,283, Cl. 423-92.000.
McMaster, Elmer L.; Grenley, Dallas G.; and Prueter, Elton D., 4,048,000, Cl. 156-304.000.
Mixan, Craig E.; and Pews, R. Garth, 4,048,213, Cl. 260-465.00F.
Paul, Albertha M.; and Moppett, Charles E., 4,048,166, Cl. 544-215.000.
Paul, Albertha M.; and Moppett, Charles E., 4,048,167, Cl. 544-215.000.
Quock, Billy; Kelley, Don Howard; and Warneke, Sehon Lester, 4,048,102, Cl. 260-2.5AM.
Shah, Dhiren N., 4,047,866, Cl. 425-107.000.
Sinke, Gerard C.; Langhorst, Martin A.; and May, James A., Sr., 4,048,288, Cl. 423-267.000.
Valle-Riestra, J. Frank, 4,048,007, Cl. 162-57.000.
Wolfe, David L.; and Sexton, Arthur R., 4,048,237, Cl. 260-615.00B.
Downs Surgical Limited: *See*—
Hall, John Emmett, 4,047,523, Cl. 128-69.000.
Hall, John Emmett, 4,047,524, Cl. 128-69.000.
Doya, Masaharu: *See*—
Yoshinaka, Shigeo; Uchiyama, Seiji; and Doya, Masaharu, 4,048,033, Cl. 204-158.0HA.
Draber, Wilfried: *See*—
Schmidt, Robert R.; Eue, Ludwig; and Draber, Wilfried, 4,047,929, Cl. 71-93.000.
Drabowitch, Serge, to Thomson-CSF. Arrangement for extracting divergence-measuring modes from a corrugated guide and tracking antenna incorporating same. 4,048,592, Cl. 333-6.000.
Drayrer, Colin James: *See*—
George, Brian Victor; and Drayrer, Colin James, 4,048,012, Cl. 176-60.000.
Dresser Industries, Inc.: *See*—
Angehrn, Jorg August, 4,047,430, Cl. 73-151.000.
Dyer, Norman Dean, 4,047,583, Cl. 175-410.000.
Drico Industrial Corporation: *See*—
Hansen, Elwood F.; Goldberg, Arnold; Zenzie, Henry; and Giroward, Kermit, 4,047,914, Cl. 55-488.000.
Druge, Gerard; and Troccaz, Roger, to Societe Nouvelle de Roulements. Bearing race rolling device. 4,047,414, Cl. 72-91.000.
DSO "Mlechna Promishlenost": *See*—
Kondratenko, Maria Stefanova; Nachev, Lyubomir Todorov; Dedova, Petrushka Atanassova; and Antonova, Tamara Nikolaevna, 4,048,339, Cl. 426-39.000.
Dual Gebruder Steidinger: *See*—
Hermann, Hans, 4,047,721, Cl. 274-9.00A.
Dubell, Robert L.: *See*—
Green, Robert C.; and Dubell, Robert L., 4,048,054, Cl. 208-8.000.
Dubin, Robert R.: *See*—
Chatterji, Debajyoti; and Dubin, Robert R., 4,048,390, Cl. 429-102.000.
Duckworth, Grover G., Jr.: *See*—
Paterson, James G. T.; Watkins, Charles W.; and Duckworth, Grover G., Jr., 4,047,271, Cl. 28-220.000.
Ducon Company, Inc., The: *See*—
Krockta, Harry, 4,047,910, Cl. 55-235.000.
Duff, Edward John: *See*—
Tomlinson, Kenneth; and Duff, Edward John, 4,048,300, Cl. 424-52.000.
Duffey, Thomas E.: *See*—
Coleman, William R.; and Duffey, Thomas E., 4,048,302, Cl. 424-78.000.
Duke, Jimmy R.: *See*—
Miller, Walter E., Jr.; Duke, Jimmy R.; and Sitton, Robert L., 4,047,678, Cl. 244-3.160.

Duke, John A. Well cementing method and apparatus. 4,047,566, Cl. 166-285.000.

Duncan, William Palmer, to Cunningham, Van Buren, II, a part interest. Fishing device. 4,047,319, Cl. 43-44.870.

Dunlop Limited: *See—*
Moring, Peter Lothar Ernst; and Raines, Kenneth William John, 4,048,362, Cl. 428-36.000.

Du Pont de Nemours, E. I., and Company: *See—*
Bissot, Thomas Charles, 4,048,096, Cl. 252-430.000.
Blake, Ralph Kingsley, deceased, 4,047,956, Cl. 96-60.00R.
Bouchard, Robert Joseph; and Brixner, Lothar Heinrich, 4,048,546, Cl. 361-321.000.
Eastman, Ernest Francis, 4,048,128, Cl. 260-22.00R.
Green, Ralph V., 4,048,292, Cl. 423-415.00A.
Jones, Frank N., 4,048,207, Cl. 260-448.80R.
Lee, Jerald Dana, 4,048,493, Cl. 250-205.000.
Morgan, Paul Winthrop, 4,048,148, Cl. 260-72.500.
Vassiliou, Eustathios, 4,047,480, Cl. 101-123.000.
Zimmerman, Joseph, 4,048,279, Cl. 264-184.000.

Durant, Graham John: *See—*
Black, James Whyte; Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,048,319, Cl. 424-269.000.

Durr-Dental KG.: *See—*
Hofmann, Hans-Joachim, 4,047,909, Cl. 55-184.000.

Dyakov, Valery Mikhailovich: *See—*
Voronkov, Mikhail Grigorievich; and Dyakov, Valery Mikhailovich, 4,048,206, Cl. 260-448.80R.

Dyckerhoff Zementwerke AG: *See—*
zurStrassen, Heinrich; and Rauschenfels, Eberhard, 4,047,968, Cl. 106-281.00R.

Dyer, Norman Dean, to Dresser Industries, Inc. Earth boring cutting element retention system. 4,047,583, Cl. 175-410.000.

Dynacast International Limited: *See—*
Gutai, Ferenc, 4,047,669, Cl. 239-540.000.

Dynamic Instrument Corporation: *See—*
Gietzen, James J., 4,047,786, Cl. 339-154.00A.

Dynamit Nobel Aktiengesellschaft: *See—*
Bockstiegel, Gerd-Edzard; Neidhardt, Manfred; and Rehfeld, Gerhard, 4,048,119, Cl. 252-521.000.
Kotzsch, Hans-Joachim; Seiler, Claus-Dietrich; and Vahlensick, Hans-Joachim, 4,048,374, Cl. 428-457.000.

Dynetics, Inc.: *See—*
Crankshaw, John H., 4,047,602, Cl. 192-53.00F.

Dyno Industrier A.S.: *See—*
Ostern, Sverre Ludvik, 4,047,989, Cl. 149-109.600.

E. I Du Pont de Nemours and Company: *See—*
Langsdorf, William P., Jr., 4,048,156, Cl. 260-239.00A.

E M I Limited: *See—*
Hounsfield, Godfrey Newbold, 4,048,505, Cl. 250-445.00T.

E. R. Squibb & Sons, Inc.: *See—*
Chen, James Ling; and Battaglia, Jean M., 4,048,309, Cl. 424-238.000.
Chen, James Ling; and Battaglia, Jean M., 4,048,310, Cl. 424-238.000.
Denzel, Theodor; and Hoehn, Hans, 4,048,182, Cl. 260-295.50B.
Hauck, Frederic P.; Condon, Michael E.; and Fox, Rita T., 4,048,231, Cl. 260-570.700.
Hoehn, Hans, 4,048,184, Cl. 260-296.00H.

Eames, Loren W.; Berg, Joseph A.; and McAllister, Thomas W. Seating structures with flexible backs. 4,047,757, Cl. 297-230.000.

Earle, Michael, to Caterpillar Tractor Co. Method of and means for making a metalic bond to powdered metal parts. 4,048,459, Cl. 219-85.0BM.

Eason, Celvie L. Leak detector for engine chambers. 4,047,423, Cl. 73-49.800.

Eastman, Ernest Francis, to Du Pont de Nemours, E. I., and Company. Thermally stabilized segmented copolyester adhesive. 4,048,128, Cl. 260-22.00R.

Eastman Kodak Company: *See—*
Pfaff, Maurice Edgar, 4,047,952, Cl. 96-29.00R.
Pfaff, Maurice Edgar, 4,047,953, Cl. 96-29.00D.
Rossi, Louis J.; and Regan, Michael T., 4,047,944, Cl. 96-1.200.
Watkins, Joseph Albert, 4,048,004, Cl. 156-580.100.
Williams, David Alan; Sperber, Karl; and Stoutz, Calvin Owen, 4,047,992, Cl. 156-73.100.
Wilson, John Charles, 4,048,146, Cl. 260-63.0UY.

Eaton Corporation: *See—*
Buttriss, A. T., 4,047,268, Cl. 24-274.00R.
Coldren, Chester P., 4,047,463, Cl. 85-62.000.

Eddy, Robert Truman, to Reliance Electric Company. Belt conveyor drive mechanism. 4,047,452, Cl. 74-752.00C.

Edwards, Hugh Jeremy Willis, to CCL Systems Limited. Press for swaging metal sleeves. 4,047,420, Cl. 72-416.000.

Ehrlund, Ake. Ticket dispensing assembly for dispensing tickets from a flexible strip. 4,047,652, Cl. 225-54.000.

Eibl, Volker, to Sachs-Systemtechnik GmbH. Electrolytic purification of aqueous liquids in the presence of silver ions. 4,048,032, Cl. 204-151.000.

Eibl, Volker; and Reis, August, to Sachs-Systemtechnik GmbH. Water-purifying apparatus. 4,048,044, Cl. 204-257.000.

Eibofner, Eugen, to Kaltenbach & Voigt. Dental handpiece. 4,047,301, Cl. 32-27.000.

Eichelberger, James W.; Kent, Frederick M.; and Sokol, Michael, to Bio/Data Corporation. Method and apparatus for determining deficiencies in enzymatic reactors particularly clotting factor levels in blood plasmas. 4,047,890, Cl. 23-230.00B.

Eichelberger, Warren Evan: *See—*
Hillier, Edward Lawrence; Graham, Glen Henry; and Eichelberger, Warren Evan, 4,048,254, Cl. 260-859.00R.
Hillier, Edward Lawrence; Graham, Glen Henry; and Eichelberger, Warren Evan, 4,048,255, Cl. 260-859.00R.

Eiland, P. Frank: *See—*
Spanel, Abram N.; Eiland, P. Frank; and Jacobs, David R., 4,047,491, Cl. 112-79.00A.

Eischens, Richard G.: *See—*
Grunstad, Jerome A.; and Eischens, Richard G., 4,047,637, Cl. 221-265.000.

Eisenberg, Hans Jochen. Scaffold and platform adaptable for assembly and disassembly. 4,047,594, Cl. 182-153.000.

Eisenwerk-Gesellschaft Maximilianshutte mbH: *See—*
Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans Georg, 4,047,707, Cl. 266-222.000.

Electric Power Research Institute, Inc.: *See—*
Chatterji, Debajyoti; and Dubin, Robert R., 4,048,390, Cl. 429-102.000.

Electrochem, Inc.: *See—*
Lala, Arun, 4,048,408, Cl. 429-229.000.

Elektra Tailfingen Ammann & Cie: *See—*
Groth, Otto, 4,048,599, Cl. 335-20.000.

El-Ghatta, Hussain; and Forrer, Johann Karl, to Inventa AG fur Forschung und Patentverwertung. Process for preparing hydroxylammonium salts. 4,048,291, Cl. 423-387.000.

Eli Lilly and Company: *See—*
Barnett, Charles J., 4,048,211, Cl. 260-465.00E.
Cooper, Robin D. G.; and Spry, Douglas O., 4,048,157, Cl. 260-239.00A.
Koppel, Gary A., 4,048,160, Cl. 544-21.000.
Koppel, Gary A., 4,048,163, Cl. 544-21.000.
Kukolja, Stjepan; and Murphy, Charles F., 4,048,162, Cl. 544-22.000.
Lacefield, William B., 4,048,312, Cl. 424-248.560.
Ludwig, Nelson Henry, 4,048,268, Cl. 264-15.000.
Lunn, William H. W.; and Mason, Edward V., 4,048,161, Cl. 544-27.000.

Elkhart Products Corporation: *See—*
Holmgren, Marvin E., 4,047,412, Cl. 72-58.000.

Ellis, Arthur S., to Blue Giant Equipment Corporation. Pallet truck automatic lift. 4,047,698, Cl. 254-2.00R.

Ellis, Darwin V., to Schlumberger Technology Corporation. Doubly-compensated dual-detector density logging apparatus. 4,048,495, Cl. 250-264.000.

Elmgren, Karl Arne Stig: *See—*
Thyberg, Bertil Sven Johan; and Elmgren, Karl Arne Stig, 4,047,709, Cl. 269-22.000.

Elser, Wolfgang; and Epple, Gerhard, to BASF Aktiengesellschaft. Production of aminonitrodihydroxyanthraquinones by partial reduction dinitrodihydroxyanthraquinones. 4,048,199, Cl. 260-380.000.

Emerson Electric Co.: *See—*
Kieffer, Vernon E., 4,047,293, Cl. 29-736.000.
Stahlhut, Leo G.; and Garnett, Willard R., 4,047,336, Cl. 52-28.000.

EMI Limited: *See—*
Taylor, Stanley, 4,048,503, Cl. 250-385.000.

Emmerich, Werner S., to Westinghouse Electric Corporation. Vacuum switch contact materials. 4,048,117, Cl. 252-513.000.

Emmett, John Colin: *See—*
Black, James Whyte; Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,048,319, Cl. 424-269.000.

Encor Limited: *See—*
Hurtig, Carl R., 4,047,462, Cl. 85-3.00R.

Eng, Jeffrey D.; Cook, Edward H., Jr.; and Figueras, Wilfredo E., to Hooker Chemicals & Plastics Corporation. Lengthening anode life in electrolytic cell having molded body. 4,048,045, Cl. 204-263.000.

Eng, William T.: *See—*
Marsh, Norman F.; and Eng, William T., 4,047,434, Cl. 73-304.00R.

Engeler, William E.: *See—*
Goldberg, Howard S.; and Engeler, William E., 4,048,525, Cl. 307-353.000.

Engelhard Minerals & Chemicals Corporation: *See—*
Flanagan, Paul, 4,047,877, Cl. 431-8.000.
Horton, Norman H.; and Smith, John L., 4,048,284, Cl. 423-112.000.
Isaac, Peter A. H.; and Oulton, T. Dixon, 4,047,738, Cl. 282-27.500.

Engelhardt, Edward L., to Merck & Co., Inc. 3-Dimethylsulfamoyl-5-[amino(alkyl or alkylidene)]-5H-dibenzo [a,d]cycloheptenes. 4,048,223, Cl. 260-556.0AR.

Engelhardt, Friedrich; Hille, Martin; and Ulmschneider, Dieter, to Hoechst Aktiengesellschaft. Aqueous clay base mud for deep drilling. 4,048,077, Cl. 252-8.50C.

Engstrom, Axel Erik Konstantin: *See—*
Asplund, Frank Eskil William; and Engstrom, Axel Erik Konstantin, 4,047,559, Cl. 165-7.000.

Enomoto, Hirobumi, to Fuji Photo Film Co., Ltd. Photographic color densitometer check plate. 4,047,817, Cl. 356-175.000.

Entzmann, Karl: *See—*
Szepesi, Karoly; Meszaros, Lajos; Majer, Janos; Zoldi, Jozsef; and Entzmann, Karl, 4,048,285, Cl. 423-132.000.

Environmental Elements Corporation: *See—*
Pearre, Stephen G.; and Craighead, Bobby L., 4,048,076, Cl. 210-528.000.

Epple, Gerhard: *See—*
Elser, Wolfgang; and Epple, Gerhard, 4,048,199, Cl. 260-380.000.

Epsilon Lambda Electronics Corporation: *See—*
Knox, Robert M.; and Toulios, Peter P., 4,048,589, Cl. 331-107.00R.

Epstein, James; and Chin, Arthur Y., to GTE Laboratories Incorporated. Hermetically sealed primary electrochemical cell and a method for its production. 4,048,401, Cl. 429-171.000.

Epstein, Joseph; and Berkowitz, Lewis M., to United States of America, Army. Simulant compound and method for testing an agent alarm. 4,048,022, Cl. 204-1.00T.

Epstein, Martin: *See—*
Casey, Donald James; and Epstein, Martin, 4,048,256, Cl. 260-860.000.

Erickson, John W., to Kobe, Inc. Multistage, downhole, turbo-powered intensifier for drilling petroleum wells. 4,047,581, Cl. 175-95.000.

Erickson Tool Company: *See—*
Benjamin, Milton Lloyd; and Miles, Wilbur Nelson, 4,047,829, Cl. 408-169.000.

Ernest Leitz GmbH: *See—*
Hartmann, Horst, 4,048,492, Cl. 250-201.000.

Ervin Industries, Inc.: *See—*
Kuehn, Udo, 4,047,334, Cl. 51-422.000.

ESB Incorporated: *See—*
Megahed, El Sayed, 4,048,405, Cl. 429-206.000.

Eschenauer, Paul R.; and Main, George, to Republic Steel Corporation. Heat recuperator and shroud for radiant tube burner. 4,047,881, Cl. 431-215.000.

Eschenfelder, Gunther; and Schultz, Rudiger, to Kraftwerk Union Aktiengesellschaft. Control rod drive for nuclear reactors. 4,048,010, Cl. 176-36.00R.

Escher Wyss Limited: *See—*
Biondetti, Mario, 4,047,273, Cl. 29-116.0AD.
Lehmann, Rolf, 4,047,274, Cl. 29-121.400.

Eskeli, Michael. Dual rotor heat exchanger. 4,047,392, Cl. 62-402.000.

Etat Francais: *See—*
Kervizic, Jean; Deslandes, Claude; and Berson, Alain, 4,047,482, Cl. 102-19.200.

Ettenberg, Michael; and Lockwood, Harry Francis, to RCA Corporation. Electroluminescent semiconductor device having a restricted current flow. 4,048,627, Cl. 357-17.000.

Eue, Ludwig: *See—*
Schmidt, Robert R.; Eue, Ludwig; and Draber, Wilfried, 4,047,929, Cl. 71-93.000.

Evans, Robert J., to Aurora Equipment Company. Pallet rack and decking combination. 4,048,059, Cl. 108-155.000.

Evans, Ronald C.; and Corderman, Sidney A., to McIntosh Laboratory, Incorporated. Amplifier improvements for limiting clipping. 4,048,573, Cl. 330-2.000.

Eve, Norman C. Rake. 4,047,370, Cl. 56-377.000.

Everbrite Electric Signs, Inc.: *See—*
Slack, Roger A.; and Michel, Gerald W., 4,047,314, Cl. 40-28.00C.

Exploaterings Aktiebolaget T.B.F.: *See—*
Axen, Rolf Erik Axel Verner; Porath, Jerker Olof; and Carlsson, Per Jan Erik, 4,048,416, Cl. 526-9.000.

Exxon Research and Engineering Company: *See—*
Baldwin, Francis P.; Rae, James A.; and Ver Strate, Gary, 4,048,258, Cl. 260-879.000.
Cahn, Robert P.; and Siskin, Michael, 4,048,251, Cl. 260-683.680.
Green, Robert C.; and Dubell, Robert L., 4,048,054, Cl. 208-8.000.
Harding, John W.; and Keller, James P., 4,048,364, Cl. 428-113.000.
Kuntz, Irving, 4,048,425, Cl. 526-245.000.
Riley, Kenneth L., 4,048,060, Cl. 208-210.000.
VanAuken, Richard L., 4,047,731, Cl. 280-281.00B.

Eymard, Pierre: *See—*
Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; and Werbenec, Jean-Pierre, 4,048,334, Cl. 424-325.000.

Eysermans, Hubert, to Sprague Electric Company. Stress-free hall-cell package. 4,048,670, Cl. 361-421.000.

F. J. Littell Machine Company: *See—*
Johnson, Kenneth C., 4,047,416, Cl. 72-183.000.

Fabbian, Bruno. Gypsum dust diluents for use in pesticides and fertilizing products. 4,048,337, Cl. 424-357.000.

Fahey, Darryl R.: *See—*
Gardner, Lloyd E.; Fahey, Darryl R.; and Mahan, John E., 4,048,238, Cl. 260-618.00R.

Fairchild Industries, Inc.: *See—*
Smith, Gordon A.; and Talcott, James M., 4,047,339, Cl. 52-108.000.

Faiz, Robert L.: *See—*
Ferris, Donald L.; and Faiz, Robert L., 4,047,838, Cl. 416-115.000.

Falbe, Jurgen; and Hahn, Heinz-Dieter, to Ruhrchemie Aktiengesellschaft. Process for preparing a synthesis gas suitable as starting material for the oxo-synthesis. 4,048,233, Cl. 260-604.0HF.

Falkowski, Edward C.; and Ruppel, Carl E., to Allegheny Ludlum Industries, Inc. Process for producing soft magnetic material. 4,047,983, Cl. 148-105.000.

Falterman, Charles W.; and Sbrocca, Dino A., to United States of America, Navy. Plastic bonded explosive composition. 4,047,990, Cl. 149-19.200.

Fangmeier, Ralf; and Goeke, Alfons, to Kieserling & Albrecht. Combined drawing and straightening machine for metallic tubes or rods. 4,047,418, Cl. 72-278.000.

Farley, David L.: *See—*
Nix, George J.; Barrington, Burchus Q.; Farley, David L.; and Hortman, Norman G., 4,047,564, Cl. 166-72.000.

Farmila Farmaceutici: *See—*
de Ruggieri, Pietro; and Sighinolfi, Orazio, 4,048,159, Cl. 260-239.55R.

Farrell, John Jerome, to Consupak, Inc. Apparatus for making multilayered blow molded articles. 4,047,873, Cl. 425-523.000.

Fassbinder, Hans Georg: *See—*
Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans Georg, 4,047,707, Cl. 266-222.000.

Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., to Delalande S.A. N'-substituted derivatives of 4'-(N-piperazinylmethyl)spiro dibenzocycloheptadi- (or tri-) ene-5,2'-dioxolane(1',3'). 4,048,164, Cl. 544-121.000.

Feather Safety Razor Company, Ltd.: *See—*
Ishida, Minoru; and Ozeki, Shigeru, 4,047,296, Cl. 30-41.000.

Fecker, Josef; and Memminger, Gustav, to Gustav Memminger Verfahrenstechnik fur die Maschenindustrie, Firma. Yarn guide finger for positive yarn supply apparatus. 4,047,398, Cl. 66-132.00R.

Fein, Michael E.: *See—*
Hinson, David C.; Bode, Wolfgang W.; Fein, Michael E.; and Hoehn, H. Joseph, 4,048,533, Cl. 313-188.000.

Feldstein, Nathan. Method of preparation and use of novel electroless plating catalysts. 4,048,354, Cl. 427-304.000.

Felfoldi, Karoly: *See—*
Karpati, Egon; Szporny, Laszlo; Bartok, Mihaly; Czombos, Jozsef; Felfoldi, Karoly; Laszlavik, Marta; and Notheisz, Ferenc, 4,048,322, Cl. 424-283.000.

Feliciano Aranzabal Y Cia, S.A.: *See—*
Aranzabal, Feliciano, 4,047,407, Cl. 70-52.000.

Fengler, Werner H. High-wear-resistant composite machine element. 4,048,382, Cl. 428-651.000.

Ferch, Rudolf, to Fischer Gesellschaft m.b.H. Ski having a patterned top covering. 4,047,735, Cl. 280-610.000.

Ferranti Limited: *See—*
Clarke, Graham Morley; and Fisher, George, 4,048,510, Cl. 250-563.000.

Ferris, Donald L.; and Faiz, Robert L., to United Technologies Corporation. Blade pitch control mechanism for helicopters. 4,047,838, Cl. 416-115.000.

Ferris, Donald Leroy; and Noehren, William Lawrence, to United Technologies Corporation. Torque reacting means for the hubs of cross beam rotors. 4,047,839, Cl. 416-134.00A.

Fertilizantes Fosfatados Mexicanos, S.A.: *See—*
Pierres, Sergio Ortega, 4,048,289, Cl. 423-317.000.

Fetchin, John Allan: *See—*
Barber, William Austin; and Fetchin, John Allan, 4,048,226, Cl. 260-561.00N.

Fett, Darrell L., to Honeywell Information Systems Inc. Memory device. 4,048,626, Cl. 340-173.00R.

Fiberlok, Inc.: *See—*
Buck, George Sumner, Jr.; Weyker, Robert George; and Ward, Arthur Gerard, 4,047,991, Cl. 156-62.600.

Fiedler, Mark A.; and Hart, Darrell M., to Riff Rite, Inc. Drumstick. 4,047,460, Cl. 84-422.00S.

Fielding, Ivor R.: *See—*
Keske, Robert G.; Poppe, Wassily W.; and Fielding, Ivor R., 4,048,131, Cl. 260-33.20R.

Figueras, Wilfredo E.: *See—*
Eng, Jeffrey D.; Cook, Edward H., Jr.; and Figueras, Wilfredo E., 4,048,045, Cl. 204-263.000

Filippov, Vladimir Jurievich: *See—*
Kovin, Vladimir Mikhailovich; Mitenkov, Fedor Mikhailovich; Ovechkin, Alexandr Vasilievich; Pankratov, Vladimir Alexeevich; Savin, Nikolai Ivanovich; Ternikova, Tamara Alexandrovna; Filippov, Vladimir Jurievich; Khramov, Dmitry Alexandrovich; Chernomordik, Evgeny Naumovich; Shiryaev, Vladimir Ivanovich; Muzychuk, Vladimir Romanovich; and Savin, Alexandr Nikolaevich, 4,048,011, Cl. 176-40.000.

Fink, August A., Jr.; and Mackisoc, Noel J., to Fink, August A., Jr. Automatic cassette reproducing apparatus. 4,048,659, Cl. 360-72.000.

Firkins, Morris L.: *See—*
Miller, James A.; and Firkins, Morris L., 4,048,651, Cl. 358-8.000.

Firmenich S.A.: *See—*
Rautenstrauch, Valentin, 4,048,120, Cl. 252-522.000.

Fischer, Arno. Rotary piston engine. 4,047,857, Cl. 418-153.000.

Fischer Gesellschaft m.b.H.: *See—*
Ferch, Rudolf, 4,047,735, Cl. 280-610.000.

Fischer, Rolf: *See—*
Weitz, Hans-Martin; Kahr, Kurt; and Fischer, Rolf, 4,048,165, Cl. 544-166.000.

Fisher, George: *See—*
Clarke, Graham Morley; and Fisher, George, 4,048,510, Cl. 250-563.000.

Fives-Cail Babcock: *See—*
Chielens, Alain, 4,047,769, Cl. 308-121.000.

Flanagan, James Loton: *See—*
Crochiere, Ronald Eldon; Flanagan, James Loton; and Webber, Susan Anne, 4,048,443, Cl. 179-1.0SA.

Flanagan, Paul, to Engelhard Minerals & Chemicals Corporation. Combustion method and apparatus. 4,047,877, Cl. 431-8.000.

Fletcher, Wade D.; and Rowe, E. Riley, to Sonoco Products Company. Assembly system for container flexible end closures. 4,047,473, Cl. 93-36.00B.

Flint, Alan G., to GCA Corporation. Mask plate handling method. 4,047,627, Cl. 214-152.000.

Flores, Jose. Portable variable intensity signalling flashlight. 4,048,631, Cl. 340-321.000.

FMC Corporation: *See—*
Bassendale, Derrick Arthur; and Bartram, Derrick, 4,047,546, Cl. 141-1.00R.

Fogelberg, Mark John; and Kelbel, Donald William, to Borg-Warner Corporation. Automatic four-wheel drive transfer case. 4,047,601, Cl. 192-36.000.

Foote, Daniel J., to Master Lock Company. Anti-rap mounting for permutation lock elements. 4,047,406, Cl. 70-25.000.

Ford Motor Company: *See—*
Heintz, Walter K.; and Lingscheit, James N., 4,048,393, Cl. 429-104.000.
Hough, Jerome F.; and Hamburg, Douglas R., 4,047,512, Cl. 123-122.00E.
Ludwig, Frank A., 4,048,394, Cl. 429-104.000.

Fordyce, Homer E.; and Carter, William C., to Marley Company, The. Deicing apparatus for water cooling towers including slotted distribution basin and selectively actuatable valve mechanism. 4,048,265, Cl. 261-111.000.

Foreman, Calvin I. Implement for levelling levees. 4,047,574, Cl. 172-178.000.

Forgo, Eric J.: *See—*
Magoveny, George S.; and Forgo, Eric J., 4,047,834, Cl. 415-3.000.

FORM-PLAST GmbH: *See—*
Winter, Wilhelm; and Held, Artur, 4,047,690, Cl. 249-66.00A.

Formac International AB: *See—*
Bergstrom, Torsten, 4,047,337, Cl. 52-71.000.

Forman, Aubry S., Jr.; Schultz, Charles A., Jr.; and Vice, William E., to Digital Data Inc. Secure two channel SCA broadcasting system. 4,048,619, Cl. 340-154.000.

Formhals, Bruce I.: *See—*
Muskovac, Nicholas G.; and Formhals, Bruce I., 4,048,520, Cl. 307-252.00Q.

Forney, Edgar Wilmot, Jr.; and Hogendobler, Richard Shure, to AMP Incorporated. Port hole coaxial connector. 4,047,788, Cl. 339-177.00R.

Forrer, Johann Karl: *See—*
El-Ghatta, Hussain; and Forrer, Johann Karl, 4,048,291, Cl. 423-387.000.

Forrest, Lew. Piano key button alignment tool. 4,047,461, Cl. 84-458.000.

Forsythe, Alan K.; and Green, Charles J., to Red Dot Corporation. Pressure switch with plural axes pivoted conduction plate. 4,048,455, Cl. 200-81.400.

Foseco Trading A.G.: *See—*
Courtenay, John Henry; and Wardell, Martin Bernard Peter, 4,048,134, Cl. 260-38.000.

Foster, Gene B., to Boeing Company, The. Numerically controlled pyramid roll forming machine. 4,047,411, Cl. 72-7.000.

Foucher, Walter D., Jr.: *See—*
Dorn, Peter; and Foucher, Walter D., Jr., 4,047,900, Cl. 44-68.000.

Foust, Robert K. Slide assembly. 4,047,767, Cl. 308-3.600.

Fowler, William B.: *See—*
Vander Arend, Peter C.; and Fowler, William B., 4,048,437, Cl. 174-15.00S.

Fox Pool Corporation: *See—*
Witte, Donald H.; and Weir, Donald H., 4,047,340, Cl. 52-169.700.

Fox, Rita T.: *See—*
Hauck, Frederic P.; Condon, Michael E.; and Fox, Rita T., 4,048,231, Cl. 260-570.700.

Francis, John Frederick, to Gillette Company, The. Shaving unit dispenser container. 4,047,295, Cl. 30-40.200.

Francke, Diethard: *See—*
Beck, Fritz; Francke, Diethard; Nohe, Heinz; Hannebaum, Heinz; and Stroezel, Manfred, 4,048,047, Cl. 204-270.000.

Franckowiak, Sigismond: *See—*
Renault, Philippe; Deschamps, Andre; Franckowiak, Sigismond; and Dezael, Claude, 4,048,293, Cl. 423-574.00L.

Francois, Bernard; Vernois, Michel; and Franta, Emile, to Agence Nationale de Valorisation de la Recherche (ANVAR). Polymerizations catalyzed by very finely divided lithium. 4,048,420, Cl. 526-173.000.

Franta, Emile: *See—*
Francois, Bernard; Vernois, Michel; and Franta, Emile, 4,048,420, Cl. 526-173.000.

Frede Hilmar Drostholm: *See—*
Hansen, Torben Christen; and Ringsholt, Thomas, 4,048,276, Cl. 264-79.000.

Fredriksson, Lars Evert; Jacobson, Gunnar; and Olsson, Olof Bertil, to AB Bofors. Umbilical cord breaker. 4,047,464, Cl. 89-1.811.

Freeman Chemical Corporation: *See—*
Svoboda, Glenn R.; Suh, John T.; Carlstrom, William L.; and Maechtle, Gary L., 4,048,104, Cl. 260-2.5AN.

Freitag, Dieter: *See—*
Tresper, Erhard; Neuray, Dieter; and Freitag, Dieter, 4,048,200, Cl. 260-395.000.

Fremont Industries, Inc.: *See—*
Chang, Edward H., 4,048,121, Cl. 252-527.000.

Frese, Albert; Dittmann, Walter; and Kilian, Wolfgang, to Chemische Werke Huls Aktiengesellschaft. Process for the production of partially crystalline polybutene-1. 4,048,419, Cl. 526-153.000.

Fried, John H.; and Harrison, Ian T., to Syntex Corporation. Compositions containing 2-(6'-substituted-2'-naphthyl)acetic acid esters used for treating inflammation, pain or pyrexia. 4,048,330, Cl. 424-308.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Kruger, Heinrich, 4,047,830, Cl. 408-239.00A.

Frielingsdorf, Hans; Gruber, Wolfgang; and Mueller-Tamm, Heinz, to BASF Aktiengesellschaft. Manufacture of olefin polymers. 4,048,414, Cl. 526-106.000.

Fritz, Jacques; Roux, Paul; and Neel, Jean, to Rhone-Poulenc Industries. Water-soluble sulfonated polyesters. 4,048,149, Cl. 260-75.00S.

Fritzsche, Gerhard, to Gesellschaft fur Kernforschung m.b.H. Method of measuring the oil consumption of internal combustion engines. 4,048,497, Cl. 250-303.000.

Frondorf, William A., to SCM Corporation. Process for heating condensate. 4,047,386, Cl. 60-654.000.

Front Discharge Mixer, Inc.: *See—*
Daoust, Ralph R.; and Daoust, Timothy N., 4,047,604, Cl. 193-10.000.

Frossati, Giorgio: *See—*
Bernard, Jean; Frossati, Giorgio; Guernet, Georges; Montier, Michel; Peccoud nee Toupillier, Louise; and Thoulouze, Daniel, 4,047,436, Cl. 73-362.0SC.

Frost, Robert F., to United States of America, Army. Rectifier controlled circuit. 4,048,513, Cl. 307-28.000.

Frost, Robert Walter; and Morris, Anne Winnifred, to R. W. Frost Limited. Knitting braids. 4,047,399, Cl. 66-149.00R.

Frueauff, Harry D., Jr. Method of forming a product of two different metals. 4,047,658, Cl. 228-115.000.

Fuji Photo Film Co., Ltd.: *See—*
Enomoto, Hirobumi, 4,047,817, Cl. 356-175.000.
Gale, Preston Lee; and Stafford, Warren Jess, 4,048,464, Cl. 219-121.0LM.
Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ogawa, Akira, 4,047,964, Cl. 96-126.000.
Ooba, Seiichi; and Hirayama, Shinichi, 4,048,253, Cl. 260-858.000.
Yoneyama, Masakazu; Usami, Toshimasa; Ino, Shiyoichi; Sata, Yoshiteru; and Yamamoto, Nobuo, 4,047,958, Cl. 96-87.00R.

Fuji Photo Optical Co., Ltd.: *See—*
Numata, Saburo, 4,048,644, Cl. 354-60.00L.

Fujii, Shinichi: *See—*
Matsushita, Kunichi; Sakurada, Hikaru; Onuma, Kazuhiko; and Fujii, Shinichi, 4,048,112, Cl. 252-461.000.

Fujisaki, Yoshinori: *See—*
Matsuda, Yoshio; and Fujisaki, Yoshinori, 4,047,402, Cl. 66-195.000.

Fujita, Yutaka: *See—*
Arai, Yoshi; Kimura, Kazuo; Sato, Hisato; Yamaki, Takasi; Morita, Katsuhiko; Ohzeki, Masanao; Takatsu, Haruyoshi; Fujita, Yutaka; and Tazume, Masayuki, 4,048,089, Cl. 252-299.000.

Fujitok Co., Ltd.: *See—*
Yanagida, Hiroaki; and Ohashi, Tsuneo, 4,047,971, Cl. 134-2.000.

Fujitsu Limited: *See—*
Ishii, Atsushi; Oikawa, Kiyoshi; Suzuki, Tadaaki; Morita, Tetsuro; and Iizuka, Yoshio, 4,048,656, Cl. 358-261.
Sagawa, Masato; Sakai, Takeaki; Sasaki, Tatsuji; and Henmi, Zenzo, 4,047,982, Cl. 148-101.000.

Fukushima, Masami: *See—*
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, 4,048,155, Cl. 542-422.000.

Fuller, David W., to Addmaster Corporation. Key controlled lock. 4,047,409, Cl. 70-356.000.

Fuller, Edward N., to Phillips Petroleum Company. Liquid chromatographic analysis for styrene-butadiene monomers. 4,047,892, Cl. 23-232.00C.

Furutsuka, Takashi: *See—*
Ogawa, Masaki; Furutsuka, Takashi; and Ishikawa, Masaoki, 4,048,646, Cl. 357-15.000.

Fussell, Theodore John, Jr., to Neptune Eastech, Inc. Bluff body flowmeter including shield-channel arrangement. 4,047,432, Cl. 73-194.0VS.

Fuziwara, Shuzo: *See—*
Kusakabe, Masao; Fuziwara, Shuzo; and Shiino, Kazuo, 4,047,987, Cl. 149-37.000.

G.A.O. Gesellschaft fur Automation und Organisation mbH: *See—*
Haberstroh, Markus, 4,047,472, Cl. 93-93.00D.

G. D. Searle & Co.: *See—*
Beck, Charles I.; and Layton, Roger M., 4,048,202, Cl. 260-410.600.

G. Siempelkamp & Co.: *See—*
Axer, Heinrich; and Roth, Gerd, 4,047,865, Cl. 425-80.000.

Gabot Corporation: *See—*
Lee, Kam Bor, 4,048,290, Cl. 423-336.000.

Gabus, Jean-Claude, to Carba S.A. Control device of a teletypewriter to be used by invalids. 4,048,439, Cl. 178-17.00C.

Gaertner, Van R.; and Hamm, Philip C., to Monsanto Company. N-(2-hydroxyalkyl) derivatives of N-phosphonomethylglycine and the herbicidal use thereof. 4,047,927, Cl. 71-86.000.

Gal, George: *See—*
Chemerda, John M.; and Gal, George, 4,048,224, Cl. 260-534.00C.

Galabov, Angel Simeonov; Shindarov, Lubomir Mihaylov; Vassilev, Georgi Nikolov; Vassileva, Ragka Taneva; Dimcheva, Zlatka Petkova; Stoycheva, Dushka Staneva; and Velichkova, Emilia Hristova, to Medizinska Akademia. Method for treating a picorna virus infection. 4,048,333, Cl. 424-322.000.

Galdal, Jon S. Game including novel board and play pieces. 4,047,720, Cl. 273-130.00R.

Gale, Preston Lee; and Stafford, Warren Jess, to Fuji Photo Film Co., Ltd. Method of and means for cutting hose for high pressure hydraulic systems. 4,048,464, Cl. 219-121.0LM.

Galinke, Joachim: *See—*
Wegemund, Bernd; and Galinke, Joachim, 4,048,259, Cl. 260-881.000.

Galluzzo, Vincent. Recuperative heating system. 4,047,490, Cl. 110-56.000.

Ganellin, Charon Robin: *See—*
Black, James Whyte; Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,048,319, Cl. 424-269.000.

Gannon, John Allister: *See—*
Shen, Kwan Ting; Gannon, John Allister; and Nelson, Robert Charles, 4,048,179, Cl. 260-29.40R.

Garber, Michael B.: *See—*
Cox, John T.; Garber, Michael B.; Jasper, Marilyn A.; and LoVecchio, Paul, 4,048,535, Cl. 313-367.000.

Garden Pro, Inc.: *See—*
Bair, Lester E., 4,047,299, Cl. 30-276.000.

Gardner, Lloyd E.; Fahey, Darryl R.; and Mahan, John E., to Phillips Petroleum Company. Promoted liquid phase oxidation of alkyl aromatic compounds. 4,048,238, Cl. 260-618.00R.

Garnett, Willard R.: *See—*
Stahlhut, Leo G.; and Garnett, Willard R., 4,047,336, Cl. 52-28.000.

Garoutte, Kurt F., to Honeywell Inc. Crimp seal using polyphenylene sulfide plastic with an aluminum terminal pan. 4,048,392, Cl. 429-105.000.

Garrett Corporation, The: *See—*
Jansen, Harvey B., 4,047,589, Cl. 180-108.000.

Garwood, William E.; Jacob, Solomon M.; Kuo, James C.; and Wise, John J., to Mobil Oil Corporation. Conversion of natural gas to gasoline and LPG. 4,048,250, Cl. 260-683.430.

Gary, Wardell; and Lange, Emroy W., to Westinghouse Electric Corporation. Solid state break-before-make base module and associated contact elements. 4,048,522, Cl. 307-293.000.

Gaschet, Michel Marceau: *See—*
Havard, Jean Francois Pierre Marie; Gaschet, Michel Marceau; and Charonnat, Henri Marie Dominique, 4,048,547, Cl. 318-488.000.

Gasser, Rupert Josef; and Watercutter, Steven N., to Societe d'Assistance Technique Pour Produits Nestle S.A. Preparation of tea extracts. 4,048,344, Cl. 426-385.000.

GCA Corporation: *See—*
Flint, Alan G., 4,047,627, Cl. 214-152.000.

General Electric Company: *See—*
Bailey, Cecil; Balchunas, Walter C.; and Zlupko, John E., 4,048,348, Cl. 427-34.000.
Bennett, Moreland P.; and Hobbs, Albert M., Jr., 4,048,460, Cl. 219-91.000.
Bennett, Moreland P.; and Bowers, William L., 4,048,463, Cl. 219-118.000.
Brookes, Neil Roger; Ray, Martin George; Cohen, Joseph David; and McCarey, Thomas Joseph, 4,047,379, Cl. 60-39.09D.
Carino, John W., 4,047,790, Cl. 339-220.00C.
Dobberpuhl, Daniel W., 4,048,590, Cl. 331-116.00R.
Goldberg, Howard S.; and Engeler, William E., 4,048,525, Cl. 307-353.000.
Harris, Samuel C., Jr.; and Surber, William A., 4,048,625, Cl. 364-900.000.
Hay, Allan S.; and White, Dwain M., 4,048,143, Cl. 260-47.0ET.
Jaster, Heinz; and Staub, Fred W., 4,047,561, Cl. 165-32.000.
Johnson, Donald S.; and Williams, Frank J., III, 4,048,190, Cl. 260-326.00N.
Kewley, Norman E., 4,048,487, Cl. 240-1.300.
Liu, Yung S., 4,048,515, Cl. 307-88.300.
Noeske, Heinz Otto, 4,048,456, Cl. 200-148.00A.
Owen, Daniel V.; and Knoble, David W., 4,048,543, Cl. 315-205.000.
Pomeroy, Bruce D.; and Kosky, Philip G., 4,048,529, Cl. 310-54.000.
Smith, William Edward, 4,048,239, Cl. 260-624.00C.
Staub, Fred W.; and Jaster, Heinz, 4,048,603, Cl. 336-57.000.
Takeoshi, Tohru, 4,048,142, Cl. 260-47.0CP.
Walker, Loren H.; and Kornrumpf, William P., 4,048,539, Cl. 315-176.000.

General Foods Corporation: *See—*
Haas, Gerhard Julius; and Herman, Edwin Bernard, 4,048,342, Cl. 426-129.000.
Katz, Saul Norman, 4,048,345, Cl. 426-432.000.

General Motors Corporation: *See—*
Hanson, Robert S.; and Rigg, Ralph R., 4,047,393, Cl. 62-428.000.
McQuinn, Ted M., 4,047,454, Cl. 74-868.000.
Williams, Jerry K.; and Landmesser, Franklin D., 4,047,732, Cl. 280-287.000.

General Portland, Inc.: *See—*
Alderete, William Eugene; Boyer, John Parke; Daugherty, Kenneth Earl; and Johnson, David Lee, 4,047,961, Cl. 106-89.000.

General Tire & Rubber Company, The: *See—*
Gormish, Kenneth J.; Hofelt, Clarence, Jr.; Lavecchia, Silvano Anthony; and Ripley, Clarence Arthur, Jr., 4,047,338, Cl. 51-106.00R.
Hargis, Ivan Glen; Livigni, Russell Anthony; and Aggarwal, Sundar Lal, 4,048,427, Cl. 526-337.000.

Geode Industries, Inc.: *See—*
Smith, Edward Earl, 4,047,343, Cl. 51-313.000.

Geometric Data Corporation: *See—*
Hart, Donald J.; Bouton, John C., Jr.; and Poppel, Eugene H., 4,048,616, Cl. 340-146.3ED.

George, Brian Victor; and Drayrer, Colin James, to Nuclear Power Company (Whetstone Limited). Nuclear power installations. 4,048,012, Cl. 176-60.000.

George, Edwin Francis: *See—*
Parry, Keith Peter; and George, Edwin Francis, 4,047,924, Cl. 71-76.000.

Gerecht, John Fred, to Colgate-Palmolive Company. Aqueous cosmetic composition containing amine oxides. 4,048,338, Cl. 424-358.000.

Gerhardt, Hans-Joachim: *See—*
Kramer, Carl; and Gerhardt, Hans-Joachim, 4,047,521, Cl. 128-2.080.

Gerlach, Robert L.; and Palmberg, Paul W., to Physical Electronics Industries, Inc. Scanning auger microprobe with variable axial aperture. 4,048,498, Cl. 250-305.000.

Germer, John A., to Budd Company, The. Phase change means for a power driven device, such as a fan. 4,047,836, Cl. 416-39.000.

Gesellschaft fur Kernforschung m.b.H.: *See—*
Fritzsche, Gerhard, 4,048,497, Cl. 250-303.000.

Gesellschaft fur Molekularbiologische Forschung mbH: *See—*
Wagner, Fritz; and Sahm, Hermann, 4,048,013, Cl. 195-49.000.

Ghisler, Walter, to L.M. Ericsson Pty. Ltd. Method for through connection check in digital data system. 4,048,445, Cl. 179-15.0BF.

Giampapa, Vincent C. Phonostethoscope conversion unit for amplification and clarification of corporeal sounds. 4,048,444, Cl. 179-1.0ST.

Giannetti, Carlo. Light operated target shooting systems. 4,048,489, Cl. 240-6.410.

Gibbons, John P.; and Wondolowski, Lawrence, to CPC International Inc. Process for producing carbohydrate-phenol condensation resins. 4,048,126, Cl. 260-17.200.

Gibbons, John P.; and Wondolowski, Lawrence, to CPC International Inc. Carbohydrate-based condensation resin. 4,048,127, Cl. 260-17.200.

Gibson, Robert Cameron: *See—*
Larson, Jay Michael; Clark, Ian Sidney Rex; and Gibson, Robert Cameron, 4,047,933, Cl. 75-.50C.

Gietzen, James J., to Dynamic Instrument Corporation. Electrical connector. 4,047,786, Cl. 339-154.00A.

Gillette Company, The: *See—*
Francis, John Frederick, 4,047,295, Cl. 30-40.200.

Gilliland, James L.; and Kendrick, Frank B., to Joy Manufacturing Comapny. Mining machine with cutter drum having internal drive motors. 4,047,763, Cl. 299-76.000.

Giroward, Kermit: *See—*
Hansen, Elwood F.; Goldberg, Arnold; Zenzie, Henry; and Giroward, Kermit, 4,047,914, Cl. 55-488.000.

Gjessing, Einar Tandberg. Friction type ergometer apparatus. 4,047,715, Cl. 272-132.000.

Glaesel, Gottfried, to Hego Electric GmbH. Electrical distributor blocks. 4,047,789, Cl. 339-198.00H.

Glaesener, Ernest, to Arbed - Acierles Reunies de Burbach-Eich-Dudelange S.A. End assembly for roadway guard rail. 4,047,701, Cl. 256-13.100.

Glang, Reinhard; and Raider, Stanley Irwin, to International Business Machines Corporation. Semiconductor device having reduced surface leakage and methods of manufacture. 4,048,350, Cl. 427-93.000.

Glass, John P.: *See—*
Hollander, Edward F., Jr., 4,048,396, Cl. 429-116.000.

Glass Medic, Inc.: *See—*
McCluskey, Douglas; and Kelchner, Harley E., 4,047,863, Cl. 425-13.000.

Gleeson, Thomas Paul, Jr. Transceiver test device. 4,048,564, Cl. 325-67.000.

Glory Kogyo Kabushiki Kaisha: *See—*
Murakami, Yasuo; Ushio, Masatoshi; and Matono, Hirokuni, 4,047,364, Cl. 53-389.000.
Ono, Masato; and Nakamura, Minoru, 4,047,361, Cl. 53-212.000.

Gloskey, Carl R.; and Littman, Stanley, to M&T Chemicals Inc. Preparation of stannic oxide. 4,048,294, Cl. 423-618.000.

Goeke, Alfons: *See—*
Fangmeier, Ralf; and Goeke, Alfons, 4,047,418, Cl. 72-278.000.

Goeth, Hanns: *See—*
Maier, Roland; Woitun, Eberhard; Wetzel, Bernd; Reuter, Wolfgang; Goeth, Hanns; and Lechner, Uwe, 4,048,306, Cl. 424-180.000.

Goldberg, Arnold: *See—*
Hansen, Elwood F.; Goldberg, Arnold; Zenzie, Henry; and Giroward, Kermit, 4,047,914, Cl. 55-488.000.

Goldberg, Howard S.; and Engeler, William E., to General Electric Company. Output circuit for charge transfer transversal filter. 4,048,525, Cl. 307-353.000.

Goldberg, Paul R., to Smith Kline Instruments, Inc. Apparatus for measuring optical density with stray light compensation. 4,047,819, Cl. 356-205.000.

Goldman, Scott D.: *See—*
Adams, Guy; and Goldman, Scott D., 4,048,541, Cl. 315-248.000.

Goldstein, Stephen L.: *See—*
Babiec, John S., Jr.; Nakos, Steven T.; and Goldstein, Stephen L., 4,048,107, Cl. 260-2.5AC.

Goloff, Alexander, to Caterpillar Tractor Co. Bearing constructions. 4,047,772, Cl. 308-237.00R.

Goloff, Alexander; Barker, Noble G.; and Staebler, Paul J., to Caterpillar Tractor Co. Rotary mechanism with improved cooling. 4,047,855, Cl. 418-53.000.

Goodman, Clark. Method and apparatus for detecting metal failures in situ. 4,048,558, Cl. 324-57.00R.

Goodrich, George E.: *See—*
Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., 4,047,768, Cl. 308-72.000.

Goodyear Tire & Rubber Company, The: *See—*
Mowdood, Syed K., 4,048,227, Cl. 260-562.00P.
Throckmorton, Morford C., 4,048,418, Cl. 526-138.000.

Gordon, Maxwell; and Lafferty, John J., to Smith Kline & French

Laboratories. Novel N-allyl and N-propargyl benzmorphan derivatives. 4,048,178, Cl. 260-293.540.

Gordon, Melvin T., Jr. Heavy duty stanchion. 4,047,502, Cl. 119-29.000.

Gormish, Kenneth J.; Hofelt, Clarence, Jr.; Lavecchia, Silvano Anthony; and Ripley, Clarence Arthur, Jr., to General Tire & Rubber Company, The. Method and apparatus for reducing lateral force variations and overturning moment variations in pneumatic tires. 4,047,338, Cl. 51-106.00R.

Goscimski, Januariusz: *See*—
Ratajczyk, Eugeniusz; Goscimski, Januariusz; and Jedrzejewski, Adam, 4,047,305, Cl. 33-172.00R.

Gottlieb Eppinger: *See*—
Nurk, Siegfried, 4,047,401, Cl. 66-187.000.

Gould, Inc.: *See*—
Jacobs, Philip C., Jr., 4,048,610, Cl. 337-165.000.

Graham, Glen Henry: *See*—
Hillier, Edward Lawrence; Graham, Glen Henry; and Eichelberger, Warren Evan, 4,048,254, Cl. 260-859.00R.
Hillier, Edward Lawrence; Graham, Glen Henry; and Eichelberger, Warren Evan, 4,048,255, Cl. 260-859.00R.

Graham, Joseph, to Minnesota Mining and Manufacturing Company. Composition based on phenolic resin, polyisocyanate, and petroleum oil. 4,048,103, Cl. 260-2.50B.

Graham, Richard: *See*—
Hoke, Jack B.; Graham, Richard; and Hoffman, Richard H., 4,047,821, Cl. 403-109.000.

Grange, Raymond A.; and Miller, Robert L., to United States Steel Corporation. Heat treatment for improving the toughness of high manganese steels. 4,047,979, Cl. 148-12.00R.

Grant, Charles P., Jr.: *See*—
Cochran, Michael J.; and Grant, Charles P., Jr., 4,048,624, Cl. 364-200.000.

Grant, Willson Barrat David. Gravity roller conveyors. 4,047,625, Cl. 214-95.00R.

Gray Tool Company: *See*—
McGee, John K., 4,047,697, Cl. 251-328.000.

Grayson, Martin: *See*—
Suen, Tzeng Jiueq; Begala, Arthur James, Jr.; and Grayson, Martin, 4,048,065, Cl. 210-58.000.

Green, Charles J.: *See*—
Forsythe, Alan K.; and Green, Charles J., 4,048,455, Cl. 200-81.400.

Green, Ralph V., to Du Pont de Nemours, E. I., and Company. CO purification process. 4,048,292, Cl. 423-415.00A.

Green, Robert C.; and Dubell, Robert L., to Exxon Research and Engineering Company. Liquefaction of coal. 4,048,054, Cl. 208-8.000.

Greenberger, Joseph Irwin, to Wean United, Inc. Method and apparatus for symmetrically cooling heated workpieces. 4,047,985, Cl. 148-153.000.

Greene, Marvin, to Cities Service Company. Upgrading solid fuel-derived tars produced by short residence time low pressure hydropyrolysis. 4,048,053, Cl. 208-8.000.

Greenwald, Richard B., to Polaroid Corporation. Sulfinyl-sulfonyl alkane silver halide solvents. 4,047,954, Cl. 96-29.00R.

Greenwald, Richard B., to Polaroid Corporation. (Dialkylamino)alkyloxosulfonium alkanesulfonylmethylide silver halide solvent. 4,047,955, Cl. 96-29.00R.

Greenwood, Stewart H.: *See*—
McCullough, Edward E.; Greenwood, Stewart H.; Sherard, Hoyt, Jr.; McDonald, Richard D.; Hirschi, Ronald G.; and Randall, Alfred R., 4,047,667, Cl. 239-265.350.

Gregg Engineering Corporation: *See*—
Gregoire, Clyde G.; Hartman, James A.; and Gregoire, Milton J., 4,047,711, Cl. 270-86.000.

Gregoire, Clyde G.; Hartman, James A.; and Gregoire, Milton J., to Gregg Engineering Corporation. Adjustable mounting for paper plow. 4,047,711, Cl. 270-86.000.

Gregoire, Milton J.: *See*—
Gregoire, Clyde G.; Hartman, James A.; and Gregoire, Milton J., 4,047,711, Cl. 270-86.000.

Gregory, Clifton, to Marvel Specialty Company. Apparatus for handling hosiery. 4,047,649, Cl. 223-43.000.

Greinacher, Ekkehard, to Th. Goldschmidt AG. Process for the enrichment of europium chloride. 4,048,026, Cl. 204-61.000.

Grendahl, Bernard Elden, to UOP Inc. Load distributing track fitting. 4,047,689, Cl. 248-503.100.

Grenier, Raymond P., to Baird-Atomic, Inc. Method and apparatus for determining the condition of a biological specimen. 4,048,501, Cl. 250-367.000.

Grenley, Dallas G.: *See*—
McMaster, Elmer L.; Grenley, Dallas G.; and Prueter, Elton D., 4,048,000, Cl. 156-304.000.

Gretz, Charles, to Nutrilite Products, Inc. Box with child resistant closure. 4,048,051, Cl. 206-1.500.

Grewe, Ferdinand: *See*—
Meiser, Werner; Buchel, Karl Heinz; Kramer, Wolfgang; and Grewe, Ferdinand, 4,048,318, Cl. 424-269.000.

Grobler, Johannes Hermanus. Apparatus for impregnating constructional elements. 4,047,497, Cl. 118-50.000.

Gronebaum, Theo, to Heinrich Kuper, Firma. Device for packaging an object in foil. 4,047,359, Cl. 53-64.000.

Gropper, Hans: *See*—
Mietzner, Franz Georg; Pfleger, Klaus; Gropper, Hans; Buechner, Oskar; Boettcher, Klaus; and Zacher, Wieland, 4,048,411, Cl. 526-64.000.

Gross, Frank C., to A. B. Dick/Scott. Method for developing an electrostatic latent image on an electrophotographic film. 4,047,950, Cl. 96-1.0SD.

Grossbach, Alfred. Seat belt system for motor cars. 4,047,737, Cl. 280-745.000.

Groth, Otto, to Elektra Tailfingen Ammann & Cie. Electric switching device. 4,048,599, Cl. 335-20.000.

Gruber, Wolfgang: *See*—
Frielingsdorf, Hans; Gruber, Wolfgang; and Mueller-Tamm, Heinz, 4,048,414, Cl. 526-106.000.

Gruner, Ronald H., to Data General Corporation. Data processing system. 4,048,623, Cl. 364-900.000.

Grunstad, Jerome A.; and Eischens, Richard G., to Minnesota Mining and Manufacturing Company. Paper clip dispenser. 4,047,637, Cl. 221-265.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
Blackburn, Tom L.; and Wisotzky, Otto G., 4,048,576, Cl. 330-29.000.

GTE Laboratories Incorporated: *See*—
Epstein, James; and Chin, Arthur Y., 4,048,401, Cl. 429-171.000.

GTE Sylvania Incorporated: *See*—
Ammann, Eugene O., 4,048,516, Cl. 307-88.300.
Blaisdell, Ronald G.; Hough, Harold L.; and Levin, Robert E., 4,048,537, Cl. 313-489.000.
Jayne, Max Leroy, 4,047,785, Cl. 339-99.00R.
Rollason, Peter H.; and Williams, James M., 4,047,424, Cl. 73-52.000.
Schrank, Martin P.; and Coppola, Richard M., 4,048,347, Cl. 427-10.000.
Shaffer, Paul C., 4,047,292, Cl. 29-630.00R.

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Guernet, Georges: *See*—
Bernard, Jean; Frossati, Giorgio; Guernet, Georges; Montier, Michel; Peccoud nee Toupillier, Louise; and Thoulouze, Daniel, 4,047,436, Cl. 73-362.0SC.

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Guibert, Gaetan. Device for keeping live chinchilla. 4,047,501, Cl. 119-17.000.

Guile, Donald L.: *See*—
Bihuniak, Peter P.; and Guile, Donald L., 4,047,966, Cl. 106-69.000.

Guirguis, Hani R.: *See*—
Majidzadeh, Kamran; and Guirguis, Hani R., 4,047,967, Cl. 106-90.000.

Gumb, Beverly William; Kuhfus, Gerd; and Cogan, Frederick Thomas, to Northern Telecom Limited. Extension cords for plug-in telephones. 4,047,787, Cl. 339-154.00A.

Gunther, Wolfgang H. H.: *See*—
Chu, Joseph Y. C.; and Gunther, Wolfgang H. H., 4,047,947, Cl. 96-1.300.

Gurgiolo, Arthur E.; and Booth, Llewellyn D., to Dow Chemical Company, The. Polyhalogenated polyols and foamed polyurethanes prepared from them. 4,048,100, Cl. 260-2.5AJ.

Gustafsson, Inge Charlen. Barrier for mopeds and bicycles. 4,047,330, Cl. 49-42.000.

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Fecker, Josef; and Memminger, Gustav, 4,047,398, Cl. 66-132.00R.

Gutai, Ferenc, to Dynacast International Limited. Gas nozzles for gas using appliances. 4,047,669, Cl. 239-540.000.

Gutridge, Jack E.; Marsh, Ronald W.; and Newbury, Grant M., to Pullman Incorporated. Table arrangement for railway passenger car compartments. 4,047,488, Cl. 105-315.000.

Guzzardo, George Paul, to Pennwalt Corporation. Nonionic water emulsions of tris(2,3-dibromopropyl)phosphate. 4,047,959, Cl. 106-2.000.

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Nielsen, Mogens B.; Boa, Niels Halfdan; and Jensen, Jimmy, 4,047,722, Cl. 279-19.500.

Haacke, Gottfried: *See*—
Ando, Hiei; and Haacke, Gottfried, 4,048,372, Cl. 428-412.000.

Haaf, Franz; Hatzmann, Guenter; Herrle, Karl; and Simak, Petr, to BASF Aktiengesellschaft. Thermoplastic compositions with improved processing properties. 4,048,260, Cl. 260-884.000.

Haag, Horst; Nordsiek, Karl-Heinz; Streck, Roland; and Zerpner, Dieter, to Chemische Werke Huls Aktiengesellschaft. Polydodecenamers as reinforcing resins for elastomers. 4,048,262, Cl. 260-889.000.

Haas, Ernst: *See*—
Martin, Joachim; Haas, Ernst; and Schnoeller, Manfred, 4,048,508, Cl. 250-492.00A.

Haas, Gerhard Julius; and Herman, Edwin Bernard, to General Foods Corporation. Pet food preservation. 4,048,342, Cl. 426-129.000.

Habermeier, Jurgen: *See*—
Porret, Daniel; and Habermeier, Jurgen, 4,048,170, Cl. 260-256.40E.

Haberstroh, Markus, to G.A.O. Gesellschaft fur Automation und Organisation mbH. Apparatus for optically marking predetermined positions in a stack of documents. 4,047,472, Cl. 93-93.00D.

Hackett, David E.: *See*—
Kranc, Stanley J.; Wells, Alan W.; and Hackett, David E., 4,047,664, Cl. 239-120.000.

Hafele, Joseph C.: *See*—
Belke, William H.; Hafele, Joseph C.; Landen, Ernest W.; and Richards, Thomas J., 4,047,984, Cl. 148-152.000.

Haferkamp, Dirk; Hodzic, Alija; Paetz, Eike; and Stach, Heinrich, to Hochtemperatur-Reaktorbau GmbH. Pipe connection for compensation of thermal motion. 4,047,742, Cl. 285-187.000.

Haferl, Peter Eduard, to RCA Corporation. Switched vertical deflection system. 4,048,544, Cl. 315-408.000.

Haffner, Gert: *See*—
Lange, Fritz-Walter; Haffner, Gert; and Muller, Jens, 4,048,169, Cl. 260-251.00R.

Hafke, Carl: *See*—
Baron, Gerhard; Bierbach, Herbert; Hafke, Carl; and Zolzer, Karlheinz, 4,047,901, Cl. 48-86.00R.

Hafner, Emanuel R.; and Nenadal, Zdenek, to Hasler AG. Data transmission system. 4,048,446, Cl. 179-15.0AL.

Hagedorn, Floyd T.: *See*—
Oelke, Waldemar W.; and Hagedorn, Floyd T., 4,047,919, Cl. 65-273.000.

Hahn, Heinz-Dieter: *See*—
Falbe, Jurgen; and Hahn, Heinz-Dieter, 4,048,233, Cl. 260-604.0HF.

Hair, George R.: *See*—
Heffernan, William; Hair, George R.; and Nielsen, John G., 4,047,358, Cl. 53-30.00R.

Hajos, Zoltan George, to Hoffmann-La Roche Inc. Process of synthesizing substituted indanones. 4,048,195, Cl. 260-345.90S.

Hakodate Seimo Sengu Co., Ltd.: *See*—
Maruyama, Jiro, 4,047,316, Cl. 43-7.000.

Hale, Ferrell Daniel; and Crowder, Charles H., to West Point Pepperell, Inc. Laminated substrate for an offset printing blanket. 4,048,368, Cl. 428-235.000.

Hall, Daryl Mattew: *See*—
Holladay, Mark; and Hall, Daryl Mattew, 4,047,727, Cl. 280-87.04A.

Hall, John Emmett, to Downs Surgical Limited. Surgical sacral anchor implant. 4,047,523, Cl. 128-69.000.

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Hall, Lester W., to Raymond Lee Organization, Inc., The, a part interest. Disk guide. 4,047,458, Cl. 83-439.000.

Hallerback, Stig Lennart; and Lachonius, Leif, to SKF Industrial Trading and Development Company, B.V. Stator aggregate for rotating electric machines. 4,048,527, Cl. 310-43.000.

Halliburton Company: *See*—
Childs, Jerry D.; and Love, Roosevelt, 4,047,567, Cl. 166-293.000.
Nix, George J.; Barrington, Burchus Q.; Farley, David L.; and Hortman, Norman G., 4,047,564, Cl. 166-72.000.

Hamasu, Mituyoshi. Mattress construction. 4,047,254, Cl. 5-345.00R.

Hamburg, Douglas R.: *See*—
Hough, Jerome F.; and Hamburg, Douglas R., 4,047,512, Cl. 123-122.00E.

Hamel GmbH Zwirnmaschinen: *See*—
Horstmann, Aloys; and Veltel, Reinhardt, 4,047,372, Cl. 57-34.00R.

Hames, Michael D.: *See*—
Tilley, Alec R.; and Hames, Michael D., 4,048,391, Cl. 429-104.000.

Hamm, Philip C.: *See*—
Gaertner, Van R.; and Hamm, Philip C., 4,047,927, Cl. 71-86.000.

Hammond, Raiford L.: *See*—
Rast, Gustaf J., Jr.; Barley, Thomas A.; Hammond, Raiford L.; and Ashley, James R., 4,048,568, Cl. 325-363.000.

Hanaoka, Tadashi: *See*—
Sugimoto, Keiichi; Nishijima, Koji; Hanaoka, Tadashi; Akimoto, Hiroshi; and Kakeya, Nobuharu, 4,048,158, Cl. 260-239.100.

Handy, Richard L.; and Hoover, James M., to Iowa State University Research Foundation, Inc. Testing device for measuring lateral pressure induced on a material by a vertical applied pressure. 4,047,425, Cl. 73-94.000.

Hanes Corporation: *See*—
King, J. Frank; and Sloan, Donald A., 4,047,272, Cl. 29-2.190.

Hannebaum, Heinz: *See*—
Beck, Fritz; Francke, Diethard; Nohe, Heinz; Hannebaum, Heinz; and Stroezel, Manfred, 4,048,047, Cl. 204-270.000.

Hannerz, Kare, to ASEA Aktiebolag. Reactor fuel in the form of mixed oxide particles and a method for manufacturing such mixed oxide particles. 4,048,090, Cl. 252-301.10R.

Hanning-Kunststoffe Robert Hanning: *See*—
Hanning, Michael, 4,047,774, Cl. 312-231.000.

Hanning, Michael, to Hanning-Kunststoffe Robert Hanning. Student work table. 4,047,774, Cl. 312-231.000.

Hanoka, Jack Isaac, to Integrated Display Systems, Inc. Epitaxial film formation of a light emitting diode and the product thereof. 4,047,986, Cl. 148-171.000.

Hansen, Elwood F.; Goldberg, Arnold; Zenzie, Henry; and Giroward, Kermit, to Drico Industrial Corporation. Internally supported multistage sleeve filter. 4,047,914, Cl. 55-488.000.

Hansen, Torben Christen; and Ringsholt, Thomas, to Frede Hilmar Drostholm. Structural building components and method for production on the basis of laterite. 4,048,276, Cl. 264-79.000.

Hanslik, Wilhelm, to Krauss-Maffei Aktiengesellschaft. Extruder with dual tapered screws. 4,047,705, Cl. 259-192.000.

Hanson, Robert S.; and Rigg, Ralph R., to General Motors Corporation. Refrigerator forced air condenser filter. 4,047,393, Cl. 62-428.000.

Hanson, Ronald P., to Ideal Industries, Inc. Precision small wire stripper. 4,047,297, Cl. 30-90.100.

Harari, Eliyahou, to Hughes Aircraft Company. Process for fabricating non-volatile field effect semiconductor memory structure utilizing implanted ions to induce trapping states. 4,047,974, Cl. 148-1.500.

Harbulak, Edward Paul; and Lash, Ronald J., to M&T Chemicals Inc. Stripping of electroplated nickel-iron alloys. 4,048,006, Cl. 156-664.000.

Harding, John W.; and Keller, James P., to Exxon Research and Engineering Company. Post-drawn, melt-blown webs. 4,048,364, Cl. 428-113.000.

Hargis, Ivan Glen; Livigni, Russell Anthony; and Aggarwal, Sundar Lal, to General Tire & Rubber Company, The. Preparation of solution polymers. 4,048,427, Cl. 526-337.000.

Harrer, Paul H.; and Langford, LeRoy, to Allis-Chalmers Corporation. Seed disc for an air planter. 4,047,638, Cl. 221-266.000.

Harris, Samuel C., Jr.; and Surber, William A., to General Electric Company. Buffered print control system using FIFO memory. 4,048,625, Cl. 364-900.000.

Harris, Walter R., to Westinghouse Electric Corporation. Flux corrective control apparatus for motor drives. 4,048,550, Cl. 318-356.000.

Harrison, Ian T.: *See*—
Fried, John H.; and Harrison, Ian T., 4,048,330, Cl. 424-308.000.

Harsco Corporation: *See*—
Burnham, Peter B., 4,047,258, Cl. 14-71.300.

Harshaw Chemical Company, The: *See*—
Shaw, Glen A., 4,047,537, Cl. 132-7.000.

Hart, Bernard Eaton. Jet or spray producing apparatus. 4,047,666, Cl. 239-251.000.

Hart, Darrell M.: *See*—
Fiedler, Mark A.; and Hart, Darrell M., 4,047,460, Cl. 84-422.00S.

Hart, Donald J.; Bouton, John C., Jr.; and Poppel, Eugene H., to Geometric Data Corporation. Pattern recognition system with keyboard entry for adaptive sensitivity. 4,048,616, Cl. 340-146.3ED.

Hart, Joseph J.: *See*—
Bell, Richard L.; Desmond, John D.; and Hart, Joseph J., 4,047,660, Cl. 206-620.000.

Hart Schaffner & Marx: *See*—
Cooper, Shannon L.; and Adams, Frank C., 4,047,951, Cl. 96-27.00R.

Hartel, Erwin H., to Boeing Company, The. Apparatus for shortening the strut of a pivotally retractable aircraft landing gear during gear retraction. 4,047,681, Cl. 244-102.0SS.

Hartman, James A.: *See*—
Gregoire, Clyde G.; Hartman, James A.; and Gregoire, Milton J., 4,047,711, Cl. 270-86.000.

Hartmann, Hans-Joerg: *See*—
Loewenberg, Gustav; Hartmann, Hans-Joerg; Schaefer, Dieter; Motz, Herbert; and Jakusch, Helmut, 4,048,375, Cl. 428-474.000.

Hartmann, Horst, to Ernest Leitz GmbH. Method and apparatus for automatic focusing an optical system with a scanning grating. 4,048,492, Cl. 250-201.000.

Hasara, Bernard. Bridge construction method. 4,047,256, Cl. 14-1.000.

Haselwood, Donald E.; Solar, Carl M.; and Thumm, Jeffrey R., to A. C. Nielsen Company. Monitoring system for voltage tunable receivers and converters utilizing voltage comparison techniques. 4,048,562, Cl. 325-31.000.

Hashizume, Hiroyuki: *See*—
Komamura, Seiji; and Hashizume, Hiroyuki, 4,047,846, Cl. 417-300.000.

Hasler AG: *See*—
Hafner, Emanuel R.; and Nenadal, Zdenek, 4,048,446, Cl. 179-15.0AL.

Hatzmann, Guenter: *See*—
Haaf, Franz; Hatzmann, Guenter; Herrle, Karl; and Simak, Petr, 4,048,260, Cl. 260-884.000.

Hauck, Frederic P.; Condon, Michael E.; and Fox, Rita T., to E. R. Squibb & Sons, Inc. 4-[3-(Substituted amino)-2-hydroxypropoxy]-5,6,7,8-tetrahydro-1,6,7-naphthalenetriols. 4,048,231, Cl. 260-570.700.

Hauer, Werner: *See*—
Hochradel, Ernest; and Hauer, Werner, 4,047,677, Cl. 243-19.000.

Hauman, Dewey H., Jr., to Xerox Corporation. Rotating wick oil dispensing system. 4,047,885, Cl. 432-60.000.

Hauri, Jacques: *See*—
Charransol, Pierre; Hauri, Jacques; and Danis, Roger, 4,048,482, Cl. 235-153.0AE.

Hauser, Raimund: *See*—
Pammer, Gottfried; and Kvasnicka, Rudolf, 4,047,442, Cl. 74-194.000.

Haussuehl, Siegfried; and Recker, Kurt, to Siemens Aktiengesellschaft. Pyroelectric non-linear optical component. 4,048,514, Cl. 307-88.300.

Havard, Jean Francois Pierre Marie; Gaschet, Michel Marceau; and Charonnat, Henri Marie Dominique, to Brissonneau et Lotz. Torque responsive device. 4,048,547, Cl. 318-488.000.

Havas, Laszlo: *See*—
Caumartin, Francois; Raufast, Charles; and Havas, Laszlo, 4,048,412, Cl. 526-65.000.

Havens, Allan R. Method of loading and stacking bales. 4,047,628, Cl. 214-152.000.

Hawrylenko, Alexander, to Infors AG. Shaking machine comprising at least supports for the treated matter. 4,047,704, Cl. 259-1.00R.

Hay, Allan S.; and White, Dwain M., to General Electric Company. Process for capping polyphenylene oxide. 4,048,143, Cl. 260-47.0ET.

Hayashi, Hideo: *See*—
Tsuchiya, Shozo; Hayashi, Hideo; and Oshima, Akio, 4,048,132, Cl. 260-33.6UA.

Hayashi, Takashi, to Tanno Senshoku Kogyo Co., Ltd. Printed fabric washing apparatus. 4,047,404, Cl. 68-152.000.

Hayashi, Yoshimasa: *See*—
Nakajima, Yasuo; Hayashi, Yoshimasa; Takagi, Yasuo; Sugihara, Kunihiko; and Aoyama, Syunichi, 4,047,510, Cl. 123-119.00A.

Hayes, John C., to UOP Inc. Hydrocarbon conversion with an acidic trimetallic catalytic composite. 4,048,099, Cl. 252-441.000.

Hayes, John C., to UOP Inc. Dehydrogenation method using sulfided nonacidic multimetallic catalyst. 4,048,244, Cl. 260-668.00D.

Hayes, John C.: *See—*
Pollitzer, Ernest L.; and Hayes, John C., 4,048,245, Cl. 260-668.00D.

Hazard, Robert E., to Polytop Corporation. Safety dispensing closure with movable retainer. 4,047,643, Cl. 222-153.000.

Heckman, Russell W.: *See—*
Brummett, Marshall G.; Heckman, Russell W.; Nickey, George A.; and Taylor, James E., 4,048,281, Cl. 264-230.000.

Heffernan, Robert J., to United States of America, Navy. Combustion system using dilute hydrogen peroxide. 4,047,380, Cl. 60-39.46R.

Heffernan, William; Hair, George R.; and Nielsen, John G., to International Inpak Inc. Method for forming article-holding display packages. 4,047,358, Cl. 53-30.00R.

Hefter, Murray: *See—*
Buess, Kenneth G.; and Hefter, Murray, 4,048,531, Cl. 310-49.00R.

Hego Electric GmbH: *See—*
Glaesel, Gottfried, 4,047,789, Cl. 339-198.00H.

Hehl, Karl. Die closing unit for injection molding machine. 4,047,871, Cl. 425-450.100.

Heian, Glenn A., to Allis-Chalmers Corporation. Means and method for processing cement raw materials containing fuel of high volatile content. 4,047,884, Cl. 432-21.000.

Heider, Dieter: *See—*
Stotzel, Lothar; and Heider, Dieter, 4,047,621, Cl. 214-6.0DS.

Heimbach, Paul: *See—*
Wilke, Gunther; and Heimbach, Paul, 4,048,214, Cl. 560-128.000.

Heinrich Kuper, Firma: *See—*
Gronebaum, Theo, 4,047,359, Cl. 53-64.000.

Heintz, Walter K.; and Lingscheit, James N., to Ford Motor Company. Alkali metal battery structure. 4,048,393, Cl. 429-104.000.

Heithoff, Robert B., to PPG Industries, Inc. Water cooled glass stirrer. 4,047,918, Cl. 65-179.000.

Heitmann, Glenn Alvin, to Johns-Manville Corporation. Elastomeric materials reinforced with small diameter glass fibers. 4,048,137, Cl. 260-42.150.

Held, Artur: *See—*
Winter, Wilhelm; and Held, Artur, 4,047,690, Cl. 249-66.00A.

Helix Technology Corporation: *See—*
Rose, Lawrence J., 4,048,073, Cl. 210-284.000.

Hendrie, Gardner Cox; and Crafts, Harold Springer, to Data General Corporation. CPU - I/O bus interface for a data processing system. 4,048,673, Cl. 364-200.000.

Hendriks, Adrianus A. M.; and Van Daelen, Henri-Jean G. M. Gas discharge character display tube with apertured mica plate. 4,048,538, Cl. 313-519.000.

Hendry, Seth T., to Raymond Lee Organization, Inc., The, a part interest. Method of identifying a check signer. 4,048,618, Cl. 340-146.30E.

Henkel & Cie GmbH: *See—*
Wegemund, Bernd; and Galinke, Joachim, 4,048,259, Cl. 260-881.000.

Henmi, Zenzo: *See—*
Sagawa, Masato; Sakai, Takeaki; Sasaki, Tatsuji; and Henmi, Zenzo, 4,047,982, Cl. 148-101.000.

Hentrich, Josef: *See—*
Schaffernicht, Klaus; Hentrich, Josef; Klein, Herbert; and Kuckenburg, Karl-Heinz, 4,047,915, Cl. 65-106.000.

Henzi, Beat, to Sandoz Ltd. Cationic dyes containing an optionally substituted bicyclic or polycyclic aryloxyalkyl group. 4,048,151, Cl. 260-156.000.

Hercules Incorporated: *See—*
Holt, William Gilbert, 4,047,329, Cl. 47-66.000.
Simpson, David A., 4,047,963, Cl. 96-115.00R.

Hering, Klaus: *See—*
Brunold, Marcel; Hering, Klaus; Wicht, Paul; Vonlanthen, Christian; Kislig, Jurg; and Volker, Theodor, 4,048,130, Cl. 260-29.6NR.

Herman, Edwin Bernard: *See—*
Haas, Gerhard Julius; and Herman, Edwin Bernard, 4,048,342, Cl. 426-129.000.

Hermann Berstorff Maschinenbau GmbH: *See—*
Bertram, Jurgen; Brand, Wilhelm; and Schaeffer, Hans-Joachim, 4,047,671, Cl. 241-66.000.

Hermann, Hans, to Dual Gebruder Steidinger. Drive device with belt and stepped speed pulley. 4,047,721, Cl. 274-9.00A.

Hermans, Johny C., to s.a. Texaco Belgium n.v. Novel polyureas prepared by reaction of a diamine with a diisocyanate or a diisothiocyanate. 4,048,106, Cl. 260-2.5AV.

Hermes, Julius, to Martin Processing, Inc. Process for the rapid, continuous and waterless dyeing of textile and plastic materials. 4,047,889, Cl. 8-93.000.

Heron, John R.: *See—*
Rechtsteiner, Steve A.; Nelson, Philip E.; and Heron, John R., 4,047,547, Cl. 141-1.000.

Herrle, Karl: *See—*
Haaf, Franz; Hatzmann, Guenter; Herrle, Karl; and Simak, Petr, 4,048,260, Cl. 260-884.000.

Heslam, Robin Snell, to Lever Bros. Co. Preparation of detergent compositions. 4,048,085, Cl. 252-102.000.

Hess, Howard V.: *See—*
Cole, Edward L.; Hess, Howard V.; and Wong, James, Jr., 4,047,898, Cl. 44-1.00G.

Hesse, Wolfgang; Ritz, Jurgen; and Teschner, Eckart, to Hoechst Aktiengesellschaft. Process for the production of abrasives. 4,047,903, Cl. 51-298.00R.

Hessert, James E.: *See—*
Clampitt, Richard L.; and Hessert, James E., 4,048,079, Cl. 252-8.55D.

Hevesi, Laszlo: *See—*
Krief, Alain; and Hevesi, Laszlo, 4,048,215, Cl. 560-124.000.

Hewlett-Packard Company: *See—*
Csaki, Julius A., 4,047,778, Cl. 316-18.000.
Shinn, Charles E., II, 4,048,577, Cl. 330-30.00D.

Heymes, Pierre Rene; and Pelzer, Rudolf, to Saint-Gobain Industries. Apparatus for the manufacture of plastics film by casting on a floating glass ribbon. 4,047,917, Cl. 65-146.000.

Heyraud, Jacques, to Commissariat a l'Energie Atomique. Furnace for the continuous sintering of pellets of ceramic nuclear fuel material. 4,047,886, Cl. 432-128.000.

Higuchi, Yositaka: *See—*
Takahashi, Kihei; and Higuchi, Yositaka, 4,047,264, Cl. 24-205.11R.

Hill, David George: *See—*
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,048,175, Cl. 260-283.00S.

Hill, Russell J.; and Tsujimoto, Kazumi N., to Airco, Inc. Compact rotary evaporation source. 4,048,462, Cl. 219-121.0EB.

Hille, Martin: *See—*
Engelhardt, Friedrich; Hille, Martin; and Ulmschneider, Dieter, 4,048,077, Cl. 252-8.50C.

Hillier, Edward Lawrence; Graham, Glen Henry; and Eichelberger, Warren Evan, to Abbott Laboratories. Blend of thermoplastic polymers with block radial butadiene-styrene polymers. 4,048,254, Cl. 260-859.00R.

Hillier, Edward Lawrence; Graham, Glen Henry; and Eichelberger, Warren Evan, to Abbott Laboratories. Blend of thermoelastic polymers with block radial polymers used as pharmaceutical sealing and resealing materials. 4,048,255, Cl. 260-859.00R.

Hillman, Ernest C. Child-proof container for medicines and the like. 4,048,050, Cl. 206-1.500.

Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ogawa, Akira, to Fuji Photo Film Co., Ltd. Spectrally sensitized silver halide photographic emulsion. 4,047,964, Cl. 96-126.000.

Hinooka, Nobuya: *See—*
Sakayori, Seigo; Kuro, Tomoyosi; Morita, Kazuyuki; Hinooka, Nobuya; Niimi, Hirozi; and Komatsu, Kensuke, 4,048,355, Cl. 427-375.000.

Hinson, David C.; Bode, Wolfgang W.; Fein, Michael E.; and Hoehn, H. Joseph, to Owens-Illinois, Inc. Phosphor overcoat. 4,048,533, Cl. 313-188.000.

Hiratake, Susumu; and Matsui, Mitsuhiro, to Daidotokushuko-Kabushikikaisha. Heat treating. 4,048,436, Cl. 13-2.00P.

Hirayama, Shinichi: *See—*
Ooba, Seiichi; and Hirayama, Shinichi, 4,048,253, Cl. 260-858.000.

Hirosawa, Katsu: *See—*
Tamura, Yukio; Hirosawa, Katsu; and Ogaki, Koji, 4,047,387, Cl. 61-13.000.

Hirs, Gene, to Amsted Industries, Inc. Method of and apparatus for filtering. 4,048,068, Cl. 210-80.000.

Hirschi, Ronald G.: *See—*
McCullough, Edward E.; Greenwood, Stewart H.; Sherard, Hoyt, Jr.; McDonald, Richard D.; Hirschi, Ronald G.; and Randall, Alfred R., 4,047,667, Cl. 239-265.350.

Hitachi Cable, Ltd.: *See—*
Obinata, Tatsuichi; Wada, Kaname; Ogibayashi, Shigeaki; and Mihara, Hironobu, 4,047,556, Cl. 164-57.000.

Hitachi Chemical Company, Ltd.: *See—*
Urakawa, Masaharu; and Sumiyama, Hiroshi, 4,048,014, Cl. 195-66.00B.

Hitachi, Ltd.: *See—*
Ihara, Takashi, 4,048,582, Cl. 331-16.000.
Kimura, Hiroshi, 4,048,578, Cl. 330-31.000.
Murasawa, Kengo, 4,048,585, Cl. 331-94.50C.

Hlavka, Joseph John; and Bitha, Panayota, to American Cyanamid Company. Alkylated derivatives of antibiotic BM123y. 4,048,431, Cl. 536-17.000.

Hoashi, Kenzo; and Inaba, Nobuaki, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic circuit for steering control in articulate vehicles. 4,047,590, Cl. 180-139.000.

Hobbs, Albert M., Jr.: *See—*
Bennett, Moreland P.; and Hobbs, Albert M., Jr., 4,048,460, Cl. 219-91.000.

Hobo, Nobuhito: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; and Hobo, Nobuhito, 4,047,507, Cl. 123-32.0Ea.

Hochradel, Ernest; and Hauer, Werner. Transmit and receive terminal for single tube pneumatic carrier system. 4,047,677, Cl. 243-19.000.

Hochtemperatur-Reaktorbau GmbH: *See—*
Haferkamp, Dirk; Hodzic, Alija; Paetz, Eike; and Stach, Heinrich, 4,047,742, Cl. 285-187.000.

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Haferkamp, Dirk; Hodzic, Alija; Paetz, Eike; and Stach, Heinrich, 4,047,742, Cl. 285-187.000.

Hoechst Aktiengesellschaft: *See—*
Albrecht, Konrad; Langeluddeke, Peter; Schumacher, Hans; and Schwerdtle, Friedhelm, 4,047,932, Cl. 71-108.000.
Bergmann, Rolf; Hoheisel, Klaus; Schafer, Helmut; and Unger, Manfred, 4,048,150, Cl. 260-75.00T.

Engelhardt, Friedrich; Hille, Martin; and Ulmschneider, Dieter, 4,048,077, Cl. 252-8.50C.

Hesse, Wolfgang; Ritz, Jurgen; and Teschner, Eckart, 4,047,903, Cl. 51-298.00R.

Ribka, Joachim; Rieper, Wolfgang; and Schwerin, Siegfried, 4,048,152, Cl. 260-176.000.

von der Eltz, Hans-Ulrich, 4,047,403, Cl. 68-5.00E.

Hoechst Atiengesellschaft: *See—*
Pintschovius, Ulrich; Schinzel, Erich; and Rosch, Gunter, 4,048,185, Cl. 260-307.00D.

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Hoefer, Stanton A., 4,048,049, Cl. 204-299.00R.

Hoefer, Stanton A., to Hoefer Scientific Instruments. Tube gel electrophoresis device. 4,048,049, Cl. 204-299.00R.

Hoehn, H. Joseph: *See—*
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Hoehn, Hans, to E. R. Squibb & Sons, Inc. 6-Phenyl-2H-pyrazolo[3,4-b]pyridines. 4,048,184, Cl. 260-296.00H.

Hoehn, Hans: *See—*
Denzel, Theodor; and Hoehn, Hans, 4,048,182, Cl. 260-295.50B.

Hoerner Waldorf Corporation: *See—*
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Hofelt, Clarence, Jr.: *See—*
Gormish, Kenneth J.; Hofelt, Clarence, Jr.; Lavecchia, Silvano Anthony; and Ripley, Clarence Arthur, Jr., 4,047,338, Cl. 51-106.00R.

Hoffman, Ralph M. Rotary steam engine. 4,047,856, Cl. 418-61.00A.

Hoffman, Richard H.: *See—*
Hoke, Jack B.; Graham, Richard; and Hoffman, Richard H., 4,047,821, Cl. 403-109.000.

Hoffmann, Herwig: *See—*
Voges, Dieter; Baer, Karl; Boudier, Juergen; Winderl, Siegfried; and Hoffmann, Herwig, 4,048,116, Cl. 252-470.000.

Hoffmann, Kurt; Meusburger, Guenther; and Wotruba, Gottfried, to Siemens Aktiengesellschaft. Regenerator circuit for CCD elements. 4,048,519, Cl. 307-221.00D.

Hoffmann-La Roche Inc.: *See—*
Hajos, Zoltan George, 4,048,195, Cl. 260-345.90S.

Hofmann, Dieter: *See—*
Burkhardt, Gisbert; and Hofmann, Dieter, 4,047,712, Cl. 271-64.000.

Hofmann, Hans-Joachim, to Durr-Dental KG. Valve system particularly for apparatus for producing dry compressed air. 4,047,909, Cl. 55-184.000.

Hofmann, Judson A., to Zenith Radio Corporation. Variable speed horizontal automatic phase control. 4,048,655, Cl. 358-148.000.

Hogan, James W., to Xerox Corporation. Document belt with imperforate bands. 4,047,812, Cl. 355-76.000.

Hogan, Lawrence Howard: *See—*
McElwain, John Christee; and Hogan, Lawrence Howard, 4,047,396, Cl. 64-17.00A.

Hoge, A. Russell; and Myers, Robert A., to Monsanto Company. Process for refrigerator construction. 4,048,274, Cl. 264-46.500.

Hogendobler, Richard Shure: *See—*
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Hoheisel, Klaus: *See—*
Bergmann, Rolf; Hoheisel, Klaus; Schafer, Helmut; and Unger, Manfred, 4,048,150, Cl. 260-75.00T.

Hoke, Jack B.; Graham, Richard; and Hoffman, Richard H., to A. B. Chance Company. Break-resistant telescoping tool. 4,047,821, Cl. 403-109.000.

Holbrook, Stanley E.: *See—*
Baird, William G., Jr.; Holbrook, Stanley E.; and Platt, Jeremy A., 4,048,428, Cl. 526-343.000.

Holladay, Mark; and Hall, Daryl Mattew. Skateboard roller wheel assembly. 4,047,727, Cl. 280-87.04A.

Holland Company: *See—*
Chierici, Osvaldo F., 4,047,619, Cl. 213-166.000.

Hollander, Edward F., Jr., to Glass, John P. Battery package. 4,048,396, Cl. 429-116.000.

Hollingsworth Solderless Terminal Company: *See—*
Trank, Robert D., 4,047,784, Cl. 339-98.000.

Holme, Bent Melchior Karlsen, to Pedershaab Maskinfabrik A/S. Supporting ring for use in the casting of concrete pipes. 4,047,693, Cl. 249-187.00R.

Holmes Protection Inc.: *See—*
Conklin, Robert M.; and Human, Arthur T., 4,048,621, Cl. 340-168.00B.

Holmgren, Marvin E., to Elkhart Products Corporation. Method of making a pipe fitting and product. 4,047,412, Cl. 72-58.000.

Holt, Jeremy Bruce: *See—*
Pryce-Jones, Alan, 4,048,273, Cl. 264-46.500.

Holt, William Gilbert, to Hercules Incorporated. Dual purpose container. 4,047,329, Cl. 47-66.000.

Holub, James Stephen: *See—*
Keisling, Nelson Woodrow, 4,047,322, Cl. 46-1.00R.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Maruyama, Iwao; and Kanai, Shigeo, 4,047,426, Cl. 73-118.000.
Takahashi, Noriyuki; and Miura, Kimio, 4,047,728, Cl. 180-141.000.

Honeywell Inc.: *See—*
Garoutte, Kurt F., 4,048,392, Cl. 429-105.000.

Honeywell Information Systems Inc.: *See—*
Bailey, Myrl Kennedy, Jr.; and Barlow, George J., 4,048,481, Cl. 235-153.0AK.
Fett, Darrell L., 4,048,626, Cl. 340-173.00R.

Honeywell Information Systems Italia: *See—*
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Kotthoff, Winfried; and Wiedenroth, Wolfgang, 4,047,558, Cl. 164-309.000.

Hook, Dale L.: *See—*
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Hooker Chemicals & Plastics Corporation: *See—*
Eng, Jeffrey D.; Cook, Edward H., Jr.; and Figueras, Wilfredo E., 4,048,045, Cl. 204-263.000.
Quinn, Edward J., 4,048,042, Cl. 204-206.000.

Hookings, Paul H.; Wade, Harry C.; and Deijs, Phillip, to Steel Company of Canada, Limited, The. Method and apparatus for expanding spiralweld pipe. 4,047,419, Cl. 72-370.000.

Hoover, James M.: *See—*
Handy, Richard L.; and Hoover, James M., 4,047,425, Cl. 73-94.000.

Hoover, John R. E.: *See—*
Cooper, David J.; Hoover, John R. E.; and Weisbach, Jerry A., 4,048,430, Cl. 536-17.000.

Hoover, William H. Armor structure formed from plastic laminates. 4,048,365, Cl. 428-215.000.

Hopkin, William, to Metallurgical Processes Limited; and I.S.C. Smelting Limited of London. Solvent extraction of copper with dilution of the organic phase. 4,048,282, Cl. 423-24.000.

Hopkins, P. Donald: *See—*
Menzl, Roland L.; and Hopkins, P. Donald, 4,048,094, Cl. 252-414.000.

Horgan, Anthony M., to Xerox Corporation. Composite layered imaging member for electrophotography. 4,047,948, Cl. 96-1.50R.

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Hornung, Arthur Charles. High efficiency propeller. 4,047,835, Cl. 416-23.000.

Horstmann, Aloys; and Veltel, Reinhardt, to Hamel GmbH Zwirnmaschinen. Pneumatic threader for twisting apparatus. 4,047,372, Cl. 57-34.00R.

Hortman, Norman G.: *See—*
Nix, George J.; Barrington, Burchus Q.; Farley, David L.; and Hortman, Norman G., 4,047,564, Cl. 166-72.000.

Horton, Norman H.; and Smith, John L., to Engelhard Minerals & Chemicals Corporation. Method and system for ion-exchanging particles. 4,048,284, Cl. 423-112.000.

Hosler, Klaus: *See—*
Tax, Hans; and Hosler, Klaus, 4,047,617, Cl. 212-39.0MS.

Houdaille Industries, Inc.: *See—*
Zalis, Albert A., 4,047,858, Cl. 418-201.000.

Hougen, Everett D. Accessory support plates for a magnet base drill. 4,047,827, Cl. 408-76.000.

Hough, Harold L.: *See—*
Blaisdell, Ronald G.; Hough, Harold L.; and Levin, Robert E., 4,048,537, Cl. 313-489.000.

Hough, Jerome F.; and Hamburg, Douglas R., to Ford Motor Company. Electric fuel vaporizer. 4,047,512, Cl. 123-122.00E.

Hounsfield, Godfrey Newbold, to E M I Limited. Radiography. 4,048,505, Cl. 250-445.00T.

Howard, Frank W., III: *See—*
Johnson, Lowell E.; Cobb, Raymond P.; Howard, Frank W., III; and Dietz, Dwayne D., 4,047,383, Cl. 60-354.000.

Howarth, Thomas Trefor: *See—*
Brown, Allan Guildford; and Howarth, Thomas Trefor, 4,048,186, Cl. 260-307.0FA.

Howe, Spencer D.: *See—*
Dale, C. Harold, Jr.; Howe, Spencer D.; Bonebreak, Robert L.; and Starkus, Charles J., 4,047,792, Cl. 350-6.000.

Howlett, James W., to Howlett Machine Works. Method for coupling axially aligned tunnel sections and apparatus therefor. 4,047,388, Cl. 61-45.00R.

Howlett Machine Works: *See—*
Howlett, James W., 4,047,388, Cl. 61-45.00R.

Hramchenko, Jack; and Sibley, Murray J., to Barnes-Hind Pharmaceuticals, Inc. Abradant skin cleanser. 4,048,123, Cl. 252-545.000.

Hubbard, Howard H.; and Walsh, Thomas P., to Antennas for Communications, Inc. Method for forming a high frequency antenna. 4,047,287, Cl. 29-600.000.

Huckaby, Leonard. Hydraulic unloading and circulating device. 4,047,853, Cl. 417-434.000.

Hueber, Alfred; and Buchs, Roland, to Motoren- und Turbinen-Union Munchen GmbH. Turbine wheel having internally cooled rim and rated breaking points. 4,047,837, Cl. 416-95.000.

Hughes Aircraft Company: *See—*
Boswell, Donald D., 4,048,628, Cl. 340-173.0LM.
Brewer, George R.; and Amboss, Kurt, 4,048,534, Cl. 313-293.000.
Dale, C. Harold, Jr.; Howe, Spencer D.; Bonebreak, Robert L.; and Starkus, Charles J., 4,047,792, Cl. 350-6.000.
Harari, Eliyahou, 4,047,974, Cl. 148-1.500.
Weglein, Rolf D., 4,048,594, Cl. 333-72.000.

Hughes, Richard Swart; and Wilcox, Howard A., to United States of America, Navy. Optical integrated circuit laser beam scanner. 4,047,795, Cl. 350-96.00C.

Hughes, Robert D.: *See—*
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Hugon, Pierre: *See—*
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Human, Arthur T.: *See—*
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Hungerford, Daniel Comstock. Weight control calculator. 4,048,477, Cl. 235-88.00R.
Hurtig, Carl R., to Encor Limited. Toggle bolt. 4,047,462, Cl. 85-3.00R.
Hwa, Chih Ming: *See—*
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Kehl, Donald K.; and Crist, Eugene A., 4,047,328, Cl. 47-59.000.
I.S.C. Smelting Limited of London: *See—*
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ICI Australia Limited: *See—*
Pollard, Leslie John; and Stewart, Donald Fergusson, 4,047,934, Cl. 75-29.000.
Ide, Fumio; and Kodama, Tsuneo, to Mitsubishi Rayon Co., Ltd. Photopolymerizable composition. 4,048,035, Cl. 204-159.150.
Ideal Industries, Inc.: *See—*
Hanson, Ronald P., 4,047,297, Cl. 30-90.100.
Igarashi, Shigemi: *See—*
Iida, Yozo; Kawahara, Yasuhito; and Igarashi, Shigemi, 4,048,540, Cl. 315-241.00P.
Ihara, Takashi, to Hitachi, Ltd. Phase locked loop synthesizer. 4,048,582, Cl. 331-16.000.
Iida, Yozo; Kawahara, Yasuhito; and Igarashi, Shigemi, to Nippon Kogaku K.K.; and Sato Koki K.K. Electronic flash unit serving both as transmitter of a remote control and flash unit for flash photography. 4,048,540, Cl. 315-241.00P.
Iizuka, Yoshio: *See—*
Ishii, Atsushi; Oikawa, Kiyoshi; Suzuki, Tadaaki; Morita, Tetsuro; and Iizuka, Yoshio, 4,048,656, Cl. 358-261.
Illinois Tool Works Inc.: *See—*
Zirk, Robert Louis, Sr., 4,048,458, Cl. 219-10.790.
Imperial Chemical Industries Limited: *See—*
Anderson, Brian; Dalton, Raymond Frederick; and Rowbotham, Philip Martin, 4,048,187, Cl. 260-308.00D.
Bowden, Roy Dennis, 4,048,180, Cl. 260-297.00R.
Cotterrell, Graham Paul, 4,048,172, Cl. 260-256.50R.
Parry, Keith Peter; and George, Edwin Francis, 4,047,924, Cl. 71-76.000.
Roesler, Frank Cornelius, 4,048,017, Cl. 195-109.000.
Wadden, Dhafir Yusuf, 4,048,216, Cl. 260-465.300.
Inaba, Nobuaki: *See—*
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Industrie Pirelli S.p.A.: *See—*
Mezzanotte, Mario, 4,047,551, Cl. 152-354.000.
Infors AG: *See—*
Hawrylenko, Alexander, 4,047,704, Cl. 259-1.00R.
Ingersoll-Rand Company: *See—*
Baker, Glen O., Jr., 4,047,595, Cl. 184-6.140.
Ingram, Woodrow Hayes, II, to Monsanto Company. Anti-migratory additive for emulsified phenolic resin systems containing a proteinaceous colloid. 4,048,125, Cl. 260-7.000.
Ingrip Fasteners, Inc.: *See—*
Brumlik, George, 4,048,371, Cl. 428-375.000.
Ino, Shiyoichi: *See—*
Yoneyama, Masakazu; Usami, Toshimasa; Ino, Shiyoichi; Sata, Yoshiteru; and Yamamoto, Nobuo, 4,047,958, Cl. 96-87.00R.
Insituform (Pipes & Structures) Ltd.: *See—*
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Intalite International N.V.: *See—*
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Hanoka, Jack Isaac, 4,047,986, Cl. 148-171.000.
Intel Corporation: *See—*
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Interdye Technology Corporation: *See—*
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International Business Machines Corporation: *See—*
Bakos, Peter; Memis, Irving; and Rasile, John, 4,048,356, Cl. 427-379.000.
Callahan, Robert William; Kauffman, Paul Eugene; and Mitchell, Matthew Joseph, Jr., 4,048,671, Cl. 364-200.000.
Dennison, James Clifford; and Ottesen, Hjalmar Holmboe, 4,048,660, Cl. 360-77.000.
Glang, Reinhard; and Raider, Stanley Irwin, 4,048,350, Cl. 427-93.000.
Nussbaumer, Henri J., 4,048,485, Cl. 235-156.000.
Vinal, Albert Watson, 4,048,648, Cl. 357-27.000.
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International Enterprises, Inc.: *See—*
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International Flavors & Fragrances Inc.: *See—*
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,048,201, Cl. 260-410.000.
International Harvester Company: *See—*
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International Inpak Inc.: *See—*
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International Lead Zinc Research Organization, Inc.: *See—*
Patel, Direj Vallabhbhai; and Ward, John Joseph Bernard, 4,048,024, Cl. 204-55.00R.
International Nickel Company, Inc., The: *See—*
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International Telephone and Telegraph Corporation: *See—*
Arnold, Bruce K.; and Moreno, Elias A., 4,047,797, Cl. 350-96.00C.
Kao, Charles Kuen; and Wolfgang, Lozure Gene, 4,047,796, Cl. 350-96.00C.
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Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Yamamoto, Shunji; Shimizu, Shigemitsu; and Tokura, Yukio, to Minolta Camera Kabushiki Kaisha. Electric safety switch circuitry. 4,048,666, Cl. 361-189.000.
Isaac, Peter A. H.; and Oulton, T. Dixon, to Engelhard Minerals & Chemicals Corporation. Record sheets sensitized with reduced charge montmorillonite pigment. 4,047,738, Cl. 282-27.500.
Ishida, Minoru; and Ozeki, Shigeru, to Feather Safety Razor Company, Ltd. Two-edge shaving blade unit having anti-clogging means. 4,047,296, Cl. 30-41.000.
Ishii Atsushi; Oikawa, Kiyoshi; Suzuki, Tadaaki; Morita, Tetsuro; and Iizuka, Yoshio, to Fujitsu Limited. Facsimile data compression method. 4,048,656, Cl. 358-261.
Ishii, Noboru: *See—*
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Ishikawa, Atsuo; Tsubaki, Hidemi; Takahata, Hitoshi; Iwata, Riso; and Shinohara, Yonesaku, to Nippon Zeon Co. Ltd. Pressure sensitive adhesive. 4,048,124, Cl. 260-5.000.
Ishikawa, Atsuo; Tsubaki, Hidemi; Takahata, Hitoshi; Iwata, Riso; and Shinohara, Yonesaku, to Nippon Zeon Co. Ltd. Novel hydrocarbon resins and process for preparation thereof. 4,048,424, Cl. 526-237.000.
Ishikawa, Katuhiro: *See—*
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Itatani, Hiroshi; Kashima, Mikito; Matsuda, Masaoki; Yoshimoto, Hataaki; and Yamamoto, Hiroyuki, to UBE Industries, Ltd. 2,3,3',4'-Biphenyltetracarboxylic acid dianhydride. 4,048,197, Cl. 260-346.300.
Ito, Hajime; Yamanaka, Teruo; and Ozeki, Osamu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Alarm system for emergency braking. 4,048,613, Cl. 340-53.000.
ITT Industries, Inc.: *See—*
Bleckmann, Hans-Wilhelm, 4,047,766, Cl. 303-97.000.
Ittel, Jean-Michel: *See—*
Barbier, Daniel; Ittel, Jean-Michel; and Poujois, Robert, 4,048,574, Cl. 330-9.000.
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Iwaki Co., Ltd.: *See—*
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Ishikawa, Atsuo; Tsubaki, Hidemi; Takahata, Hitoshi; Iwata, Riso; and Shinohara, Yonesaku, 4,048,424, Cl. 526-237.000.
Izawa, Takeshi. Device for interconnecting curtain rods. 4,047,262, Cl. 16-96.00D.
Izumi, Masahiko. Koji making method. 4,048,340, Cl. 426-46.000.
J. Bobst & Fils S.A.: *See—*
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Jacob, Solomon M.: *See—*
Garwood, William E.; Jacob, Solomon M.; Kuo, James C.; and Wise, John J., 4,048,250, Cl. 260-683.430.
Jacobs, David R.: *See—*
Spanel, Abram N.; Eiland, P. Frank; and Jacobs, David R., 4,047,491, Cl. 112-79.00A.
Jacobs, Philip C., Jr., to Gould, Inc. Electric protective device and process of manufacturing the same. 4,048,610, Cl. 337-165.000.
Jacobson, Charles L., to Xerox Corporation. Frequency doubler. 4,048,571, Cl. 328-20.000.

Jacobson, Gunnar: *See—*
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Jacobsson, Kurt Arne Gunnar, to Aktiebolaget IRO. Thread storing and feeding device. 4,047,675, Cl. 242-47.010.
Jacomini, Omar J., to Westinghouse Electric Corporation. Radar system for detecting slowly moving targets. 4,048,637, Cl. 343-7.700.
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Jakusch, Helmut: *See—*
Loewenberg, Gustav; Hartmann, Hans-Joerg; Schaefer, Dieter; Motz, Herbert; and Jakusch, Helmut, 4,048,375, Cl. 428-474.000.
Janecek, George. Pet waste disposal device. 4,047,499, Cl. 119-1.000.
Janne, Jouko. Machine for forming a Bismarck chain. 4,047,378, Cl. 59-20.000.
Jansen, Harvey B., to Garrett Corporation, The. Method and apparatus for closed loop acceleration control for vehicles. 4,047,589, Cl. 180-108.000.
Japan Jewel Company Limited: *See—*
Shibanai, Ichiro; and Tanabe, Shoji, 4,048,359, Cl. 428-1.000.
Japan Medical Supply Co., Ltd.: *See—*
Kurata, Motoji, 4,047,563, Cl. 165-158.000.
Japan Synthetic Rubber Co., Ltd.: *See—*
Arakawa, Masatoshi; Ohno, Ryotaro; Ishikawa, Katuhiro; Yamahara, Noboru; and Matsui, Hisashi, 4,048,147, Cl. 260-67.0UA.
Jarowenko, Wadym: *See—*
Rutenberg, Morton W.; Jarowenko, Wadym; and Tessler, Martin M., 4,048,435, Cl. 536-106.000.
Jasper, Marilyn A.: *See—*
Cox, John T.; Garber, Michael B.; Jasper, Marilyn A.; and Lo-Vecchio, Paul, 4,048,535, Cl. 313-367.000.
Jaster, Heinz; and Staub, Fred W., to General Electric Company. Cooling liquid de-gassing system. 4,047,561, Cl. 165-32.000.
Jaster, Heinz: *See—*
Staub, Fred W.; and Jaster, Heinz, 4,048,603, Cl. 336-57.000.
Jayne, Max Leroy, to GTE Sylvania Incorporated. Electrical connector, assembly, and contact. 4,047,785, Cl. 339-99.00R.
Jedrzejewski, Adam: *See—*
Ratajczyk, Eugeniusz; Goscimski, Januariusz; and Jedrzejewski, Adam, 4,047,305, Cl. 33-172.00R.
Jeffrey, Joseph O., to Borg-Warner Corporation. Synchronous belt and pulley drive. 4,047,444, Cl. 74-229.000.
Jenaer Glaswerk, Schott & Gen.: *See—*
Kriege, Wolfgang, 4,048,486, Cl. 240-1.00R.
Jenkins, David Conwil: *See—*
Berg, Samuel Sidney; Jenkins, David Conwil; and Phillipson, Ronald Frederick, 4,048,326, Cl. 424-300.000.
Jensen, Jimmy: *See—*
Nielsen, Mogens B.; Boa, Niels Halfdan; and Jensen, Jimmy, 4,047,722, Cl. 279-19.500.
Jensen, Johannes Tejlgaard: *See—*
Bruel, Per Wilhelm; Schioler, Holger; and Jensen, Johannes Tejlgaard, 4,047,516, Cl. 126-270.000.
Jidai, Eiki; Ono, Hiroshi; and Shibayama, Kyoichi, to Mitsubishi Denki Kabushiki Kaisha. Water-dispersion varnish for electrodeposition. 4,048,379, Cl. 428-500.000.
Jinnai, Toshio: *See—*
Yaguchi, Masachika; Jinnai, Toshio; Shirotsuka, Mikio; and Totani, Kazuo, 4,047,803, Cl. 350-160.0LC.
Johann Wolf Gesellschaft m.b.H. KG.: *See—*
Wolf, Johann, 4,047,691, Cl. 249-97.000.
John, Heinz, to Lindauer Dornier Gesellschaft mbH. Apparatus for separating objects. 4,047,270, Cl. 28-205.000.
John Wyeth & Brother Limited: *See—*
Black, Robin Michael, 4,048,177, Cl. 260-288.00R.
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,048,175, Cl. 260-283.00S.
Johns, Eddie D.; Cummings, Robert E.; and Pearl, Edgar W. Lock mechanism. 4,047,408, Cl. 70-129.000.
Johns-Manville Corporation: *See—*
Aguilar, Manuel, Jr., 4,047,349, Cl. 52-551.000.
Heitmann, Glenn Alvin, 4,048,137, Cl. 260-42.150.
McSweeney, Diarmuid Justin, 4,047,348, Cl. 52-484.000.
Miga, Christian John, 4,048,138, Cl. 260-42.370.
Oser, Nathan; and Niedzinski, Edmund John, 4,047,417, Cl. 72-185.000.
Johnson, Charles E. Method for controlling allergens. 4,048,369, Cl. 428-262.000.
Johnson Controls, Inc.: *See—*
Matthews, Russell Byron, 4,047,878, Cl. 431-22.000.
Johnson, Cordell E.: *See—*
Armanini, Louis; and Johnson, Cordell E., 4,047,969, Cl. 106-291.000.
Johnson, David Lee: *See—*
Alderete, William Eugene; Boyer, John Parke; Daugherty, Kenneth Earl; and Johnson, David Lee, 4,047,961, Cl. 106-89.000.
Johnson, Donald S.; and Williams, Frank J., III, to General Electric Company. Preparation of bisphenol-A bisimides. 4,048,190, Cl. 260-326.00N.
Johnson, Edgar A.; and Myers, Bruce L., to Singer Company, The. Broad band microwave receiver gain calibrator. 4,048,567, Cl. 325-363.000.
Johnson, Kenneth C., to F. J. Littell Machine Company. Uncoiling and straightening apparatus for strip material. 4,047,416, Cl. 72-183.000.
Johnson, Lowell E.; Cobb, Raymond P.; Howard, Frank W., III; and Dietz, Dwayne D., to Caterpillar Tractor Co. Torque converter with variable stator. 4,047,383, Cl. 60-354.000.
Johnston, John W.: *See—*
Sieber, Charles W.; Knutson, Richard K.; and Johnston, John W., 4,047,592, Cl. 181-142.000.
Johrde, Paul S.: *See—*
Zona, Michael R.; Ruffing, Charles R.; and Johrde, Paul S., 4,047,867, Cl. 425-117.000.
Jonda, Wolfgang, to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung. Low-weight dent-resistant structure and method for production thereof. 4,048,360, Cl. 428-35.000.
Jones, Frank N., to Du Pont de Nemours, E. I., and Company. Polymeric materials with silane end groups. 4,048,207, Cl. 260-448.80R.
Joy Manufacturing Comapny: *See—*
Gilliland, James L.; and Kendrick, Frank B., 4,047,763, Cl. 299-76.000.
Julia, Marc: *See—*
Chabardes, Pierre; Julia, Marc; and Menet, Albert, 4,048,234, Cl. 260-607.0AR.
Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, to Automated Building Components, Inc. Method of joining wooden members. 4,047,282, Cl. 29-432.000.
Jursa, Stephen J. D.: *See—*
Reese, Thomas J.; Mortimer, James R.; Tobin, Melvin W.; and Jursa, Stephen J. D., 4,047,916, Cl. 65-106.000.
Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
Voigt, Hermann Uwe, 4,048,129, Cl. 260-23.00H.
Kabushiki Kaisha Daini Seikosha: *See—*
Miwa, Akihoro; and Misono, Shigemi, 4,048,478, Cl. 235-92.00T.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Hoashi, Kenzo; and Inaba, Nobuaki, 4,047,590, Cl. 180-139.000.
Tamura, Yukio; Hirosawa, Katsu; and Ogaki, Koji, 4,047,387, Cl. 61-13.000.
Kabushiki Kaisha Suwa Seikosha: *See—*
Shindo, Takemasa; and Arai, Kenichiro, 4,048,470, Cl. 219-216.000.
Kachik, Robert H.: *See—*
Pignocco, Arthur J.; and Kachik, Robert H., 4,048,352, Cl. 427-234.000.
Kackstadter, Klaus; and Theidel, Hans, to Bayer Aktiengesellschaft. Whitening of polyester fibers. 4,047,887, Cl. 8-1.00W.
Kahlhofer, Reiner: *See—*
Lorenz, Horst; Koch, Rolf Eckart; and Kahlhofer, Reiner, 4,047,470, Cl. 90-15.00R.
Kahr, Kurt: *See—*
Weitz, Hans-Martin; Kahr, Kurt; and Fischer, Rolf, 4,048,165, Cl. 544-166.000.
Kaiser, Carl: *See—*
Colella, Donald F.; and Kaiser, Carl, 4,048,229, Cl. 260-570.600.
Kajima Corporation: *See—*
Yahiro, Teruo; and Yoshida, Hiroshi, 4,047,580, Cl. 175-67.000.
Kakeya, Nobuharu: *See—*
Sugimoto, Keiichi; Nishijima, Koji; Hanaoka, Tadashi; Akimoto, Hiroshi; and Kakeya, Nobuharu, 4,048,158, Cl. 260-239.100.
Kalab, Frantisek: *See—*
Sandera, Josef; Calabek, Milan; Cenek, Miroslav; Kalab, Frantisek; Koudelka, Vojtech; Kouril, Oldrich; Malik, Jiri; and Vanacek, Josef, 4,048,406, Cl. 429-209.000.
Kaltenbach & Voigt: *See—*
Eibofner, Eugen, 4,047,301, Cl. 32-27.000.
Kamatics Corporation: *See—*
Orkin, Stanley S.; and Nagy, Edward John, 4,048,370, Cl. 428-323.000.
Kamp, Heinz, to W. Schlafhorst & Co. Device for adjusting a retrograde rotary motion in a coil. 4,047,674, Cl. 242-18.0DD.
Kanai, Shigeo: *See—*
Maruyama, Iwao; and Kanai, Shigeo, 4,047,426, Cl. 73-118.000.
Kaniut, Herbert M. Swingtail for spacecraft and for fast aircraft. 4,047,680, Cl. 244-87.000.
Kantlehner, Willi: *See—*
Bredereck, Hellmut; Kantlehner, Willi; Kugel, Wolfgang; Mohring, Edgar; and Roessler, Peter, 4,048,315, Cl. 424-249.000.
Kanzelberger, James C., to Contemporary, Inc. Plastic plates adapted to be imprinted and methods of manufacturing and imprinting on plastic plates. 4,047,996, Cl. 156-220.000.
Kao, Charles Kuen; and Wolfgang, Lozure Gene, to International Telephone and Telegraph Corporation. Precision optical fiber connector. 4,047,796, Cl. 350-96.00C.
Kapaan, Hendrikus Jan: *See—*
Korenhof, Abraham; and Kapaan, Hendrikus Jan, 4,047,770, Cl. 308-191.000.
Karami, Hamzeh, to Colgate-Palmolive Company. Disposable diaper with retaining and securing fastener. 4,047,528, Cl. 128-287.000.
Karami, Hamzeh, to Colgate-Palmolive Company. Disposable diaper with unitary tape fastener. 4,047,529, Cl. 128-287.000.
Karami, Hamzeh, to Colgate-Palmolive Company. Disposable diaper with fastener retained end barrier. 4,047,530, Cl. 128-287.000.
Karami, Hamzeh, to Colgate-Palmolive Company. Absorbent article with differential pad. 4,047,531, Cl. 128-290.00R.
Karl Schmidt GmbH: *See—*
Noack, Wolfgang-Hermann, 4,047,471, Cl. 92-187.000.
Karlsson, Hugo. Device on pressing piston. 4,047,872, Cl. 425-469.000.
Karner, Kenneth E.: *See—*
Bowler, John W.; Karner, Kenneth E.; Pittenger, Daniel I.; and Schwartz, Donald A., 4,048,669, Cl. 361-391.000.

Karpati, Egon; Szporny, Laszlo; Bartok, Mihaly; Czombos, Jozsef; Felfoldi, Karoly; Laszlavik, Marta; and Notheisz, Ferenc, to Richter Gedeon Vegyeszeti Gyar Rt. Bronchially effective xanthene-9-carboxylates. 4,048,322, Cl. 424-283.000.

Karpov, Valentin Mikhailovich; Santo, Vladimir Rezhevich; Yanovsky, Viktor Yakovlevich; Mikhailov, Anatoly Ivanovich; and Belyaev, Mikhail Fedorovich. Force measuring transducer with frequency output signal. 4,047,428, Cl. 73-141.00A.

Karrer, Friedrich, to Ciba-Geigy Corporation. Propenyloxy benzene compounds. 4,048,235, Cl. 260-612.00R.

Karrer, Friedrich, to Ciba-Geigy Corporation. (4-Phenoxyphenoxy)alkyl cyclopropanecarboxylates. 4,048,327, Cl. 424-305.000.

Karst, Karl A.; and Sowman, Harold G., to Minnesota Mining and Manufacturing Company. Non-frangible alumina-silica fibers. 4,047,965, Cl. 106-65.000.

Kashima, Mikito: *See*—
Itatani, Hiroshi; Kashima, Mikito; Matsuda, Masaoki; Yoshimoto, Hataaki; and Yamamoto, Hiroyuki, 4,048,197, Cl. 260-346.300.

Katayama, Shigenari: *See*—
Yamamoto, Michihiro; Katayama, Shigenari; Koshiba, Masao; and Yamamoto, Hisao, 4,048,168, Cl. 260-251.0QB.

Kato, Osamu: *See*—
Tanaka, Hiroshi; and Kato, Osamu, 4,047,897, Cl. 428-539.500.

Katz, Saul Norman, to General Foods Corporation. Coffee percolation process. 4,048,345, Cl. 426-432.000.

Kauffman, Paul Eugene: *See*—
Callahan, Robert William; Kauffman, Paul Eugene; and Mitchell, Matthew Joseph, Jr., 4,048,671, Cl. 364-200.000.

Kaufman, George A., Jr., to Superior Electric Company, The. Electric motor with plastic encapsulated stator. 4,048,530, Cl. 310-89.000.

Kawahara, Yasuhito: *See*—
Iida, Yozo; Kawahara, Yasuhito; and Igarashi, Shigemi, 4,048,540, Cl. 315-241.00P.

Kawamura Institute of Chemical Research: *See*—
Arai, Yoshi; Kimura, Kazuo; Sato, Hisato; Yamaki, Takasi; Morita, Katsuhiko; Ohzeki, Masanao; Takatsu, Haruyoshi; Fujita, Yutaka; and Tazume, Masayuki, 4,048,089, Cl. 252-299.000.

Kawasaki Motors Corporation U.S.A.: *See*—
Blass, Jaroslav, 4,047,588, Cl. 180-64.00R.

Kawazoe, Michio. Coupling device in a stroboscope holder with a removable bracket. 4,048,488, Cl. 240-1.300.

Kayabakogyokabushikikaisha: *See*—
Komamura, Seiji; and Hashizume, Hiroyuki, 4,047,846, Cl. 417-300.000.

Keats, Albert Brian, to United Kingdom Atomic Energy Authority. Data handling systems. 4,048,483, Cl. 235-153.00A.

Keeling and Walker, Limited: *See*—
Morriss, Harry Augustus; and Williamson, John Peter Hugh, 4,047,970, Cl. 106-299.000.

Kehl, Donald K.; and Crist, Eugene A., to Hygroponics, Inc. Greenhouse. 4,047,328, Cl. 47-59.000.

Keisling, Nelson Woodrow, to Holub, James Stephen; and LaSalle, Robert James, part interest to each. Amusement device of pictorial display. 4,047,322, Cl. 46-1.00R.

Keith, Charles Herbert, to Celanese Corporation. Cellulose ester fibrillar structure. 4,047,862, Cl. 425-8.000.

Keith, John L., to Rockwell International Corporation. Temperature measuring apparatus. 4,047,435, Cl. 73-362.0SC.

Kelbel, Donald William: *See*—
Fogelberg, Mark John; and Kelbel, Donald William, 4,047,601, Cl. 192-36.000.

Kelchner, Harley E.: *See*—
McCluskey, Douglas; and Kelchner, Harley E., 4,047,863, Cl. 425-13.000.

Kelleher, Raymond L.; Shirk, Ivan A.; and O'Leary, Timothy J., deceased, to Corporation of Gonzaga University, The. Sulfur recovery method. 4,048,287, Cl. 423-242.000.

Keller, James P.: *See*—
Harding, John W.; and Keller, James P., 4,048,364, Cl. 428-113.000.

Kelley, Charles S. Automatic grab bucket with pressure responsive solenoid control. 4,047,311, Cl. 37-54.000.

Kelley, Don Howard: *See*—
Quock, Billy; Kelley, Don Howard; and Warneke, Sehon Lester, 4,048,102, Cl. 260-2.5AM.

Kellogg, Richard Webster, to Boeing Company, The. Mechanical counterbalance assembly. 4,047,441, Cl. 74-52.000.

Kelly, Robert C., to Upjohn Company, The. Process for bicyclic lactone dials. 4,048,193, Cl. 260-343.30R.

Kelsen, Arthur F. Oral syringe. 4,047,527, Cl. 128-229.000.

Kendrick, Frank B.: *See*—
Gilliland, James L.; and Kendrick, Frank B., 4,047,763, Cl. 299-76.000.

Kennecott Copper Corporation: *See*—
Rappas, Alkis S.; and Pemsler, J. Paul, 4,047,940, Cl. 75-108.000.

Kent, Frederick M.: *See*—
Eichelberger, James W.; Kent, Frederick M.; and Sokol, Michael, 4,047,890, Cl. 23-230.00B.

Kerr, Michael W., to Shell Oil Company. Method of sterilizing male anthers. 4,047,930, Cl. 71-95.000.

Kerry, John C.: *See*—
Baker, Maurice W.; Kerry, John C.; Nichol, Kenneth J.; Marshall, John R.; Weighton, David M.; and Kozlik, Antonin, 4,048,188, Cl. 548-341.000.

Kervizic, Jean; Deslandes, Claude; and Berson, Alain, to Etat Francais. Electronic igniter circuit for detonating an electric primer. 4,047,482, Cl. 102-19.200.

Keske, Robert G.; Poppe, Wassily W.; and Fielding, Ivor R., to Standard Oil Company (Indiana). Polyoxyethylene alkyl ether additives in impact resistant compositions of polypropylene. 4,048,131, Cl. 260-33.20R.

Kesting, Robert E., to Chemical Systems, Inc. Dry process for forming polycarbonate membranes. 4,048,271, Cl. 264-41.000.

Keszei, Jeno: *See*—
Dinzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Keszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 4,047,860, Cl. 425-4.00R.

Kewley, Norman E., to General Electric Company. Last-flash indicator switch in photoflash array. 4,048,487, Cl. 240-1.300.

Khramov, Dmitry Alexandrovich: *See*—
Kovin, Vladimir Mikhailovich; Mitenkov, Fedor Mikhailovich; Ovechkin, Alexandr Vasilievich; Pankratov, Vladimir Alexeevich; Savin, Nikolai Ivanovich; Ternikova, Tamara Alexandrovna; Filippov, Vladimir Jurievich; Khramov, Dmitry Alexandrovich; Chernomordik, Evgeny Naumovich; Shiryaev, Vladimir Ivanovich; Muzychuk, Vladimir Romanovich; and Savin, Alexandr Nikolaevich, 4,048,011, Cl. 176-40.000.

Kiefer, James E. Flotation hiking harness. 4,047,255, Cl. 9-337.000.

Kieffer, Vernon E., to Emerson Electric Co. Oscillating blade winding insertion device. 4,047,293, Cl. 29-736.000.

Kienzle, Jean Andre Paul, to Pechiney Ugine Kuhlmann. Lipophilic phthalocyanines. 4,048,189, Cl. 260-314.500.

Kieserling & Albrecht: *See*—
Fangmeier, Ralf; and Goeke, Alfons, 4,047,418, Cl. 72-278.000.

Kilian, Wolfgang: *See*—
Frese, Albert; Dittmann, Walter; and Kilian, Wolfgang, 4,048,419, Cl. 526-153.000.

Kimberly-Clark Corporation: *See*—
Thomaschefsky, Susan N.; and Sprangers, Ann, 4,047,534, Cl. 128-461.000.

Kimura, Hiroshi, to Hitachi, Ltd. R.F. amplifier circuit. 4,048,578, Cl. 330-31.000.

Kimura, Kazuo: *See*—
Arai, Yoshi; Kimura, Kazuo; Sato, Hisato; Yamaki, Takasi; Morita, Katsuhiko; Ohzeki, Masanao; Takatsu, Haruyoshi; Fujita, Yutaka; and Tazume, Masayuki, 4,048,089, Cl. 252-299.000.

King, J. Frank; and Sloan, Donald A., to Hanes Corporation. Machine for continuous bias cutting of tubular fabric. 4,047,272, Cl. 29-2.190.

Kingsbury, Herbert William, to British Uralite Limited. Noise control materials. 4,048,366, Cl. 428-215.000.

Kinney Safety Systems, Inc.: *See*—
Crandall, Richard E.; and Morgan, Denny E., 4,048,620, Cl. 340-163.000.

Kirilloff, Victor V., to Mosebach Manufacturing Company. Protective circuit for dynamic braking resistors. 4,048,664, Cl. 361-89.000.

Kislig, Jurg: *See*—
Brunold, Marcel; Hering, Klaus; Wicht, Paul; Vonlanthen, Christian; Kislig, Jurg; and Volker, Theodor, 4,048,130, Cl. 260-29.6NR.

Kita, Nobuyuki: *See*—
Okano, Yukio; Kita, Nobuyuki; and Uesugi, Kyozo, 4,047,807, Cl. 350-266.000.

Kitajima, Yukio: *See*—
Yoshida, Katsuyoshi; and Kitajima, Yukio, 4,047,977, Cl. 148-6.200.

Kiwi Coders Corporation: *See*—
McKay, James G., deceased; and McKay, Allen J., executor, 4,047,479, Cl. 101-36.000.

Klaiber, Erich Manfred: *See*—
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,048,201, Cl. 260-410.000.

Klancnik, John H., to Afco Products Incorporated. Antenna couplings. 4,047,779, Cl. 339-9.00A.

Kleer-Vu Industries, Inc.: *See*—
Osher, Benjamin B., 4,047,315, Cl. 40-102.000.

Klein, Bernard, to Tension Envelope Corporation. Print envelope. 4,047,661, Cl. 229-70.000.

Klein, Darrel J. Spare tire hoist and support. 4,047,629, Cl. 214-451.000.

Klein, Herbert: *See*—
Schaffernicht, Klaus; Hentrich, Josef; Klein, Herbert; and Kuckenburg, Karl-Heinz, 4,047,915, Cl. 65-106.000.

Kline, Leslie F.: *See*—
Walker, James Donald; and Kline, Leslie F., 4,048,267, Cl. 261-122.000.

Knapp, Edward J., Jr., to Chase-Shawmut Company, The. Lattice structure for electric fuses comprising fusible elements and insulating supports therefor. 4,048,609, Cl. 337-159.000.

Knifton, John F., to Texaco Inc. Processes for regenerating dispersions of ligand-stabilized, palladium(II) halide complexes used in carbonylation catalysts. 4,048,093, Cl. 252-414.000.

Knight, Stanley Paul; and Molinari, Thomas Edward, to RCA Corporation. Planar printed circuit board arrangement useful in the UHF portion of a television tuner. 4,048,597, Cl. 334-15.000.

Knight, Stanley Paul, to RCA Corporation. UHF tuning circuit utilizing a varactor diode. 4,048,598, Cl. 334-15.000.

Knoble, David W.: *See*—
Owen, Daniel V.; and Knoble, David W., 4,048,543, Cl. 315-205.000.

Knollmueller, Karl O., to Olin Corporation. Functional fluid systems containing alkoxysilanol cluster compounds. 4,048,083, Cl. 252-78.300.

Knollmueller, Karl O., to Olin Corporation. Functional fluid systems containing alkoxysilane cluster compounds. 4,048,084, Cl. 252-78.300.

Knorr, William L., to Studco, Inc. Shaftwall. 4,047,355, Cl. 52-738.000.

Knox, Betty C.; and Schneider, Sally W. Page keeper. 4,047,688, Cl. 248-451.000.

Knox, Robert M.; and Toulios, Peter P., to Epsilon Lambda Electronics Corporation. Receiver module and components thereof. 4,048,589, Cl. 331-107.00R.

Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans Georg, to Eisenwerk-Gesellschaft Maximilianshutte mbH. Process and converter for refining liquid metals. 4,047,707, Cl. 266-222.000.

Knuth, Kurt E., to Teletype Corporation. Method and apparatus for synchronizing a facsimile transmission. 4,048,657, Cl. 358-285.000.

Knutson, Richard K.: *See*—
Sieber, Charles W.; Knutson, Richard K.; and Johnston, John W., 4,047,592, Cl. 181-142.000.

Knutsson, Filip; and Bergstrom, Lars, to AB Svenska Flaktfabriken. Dust separator apparatus. 4,047,907, Cl. 55-147.000.

Kobayashi, Haruhiko, to Nippon Gakki Seizo Kabushiki Kaisha. Adjustable tilter device used for holding objects such as musical instruments. 4,047,684, Cl. 248-122.000.

Kobayashi, Nobuki: *See*—
Kobayashi, Sadao; Ozawa, Hiroshi; and Kobayashi, Nobuki, 4,048,136, Cl. 260-42.140.

Kobayashi, Sadao; Ozawa, Hiroshi; and Kobayashi, Nobuki, to Mitsui Toatsu Kagaku Kabushiki Kaisha (Mitsui Toatsu Chem., Inc.). Metallic tone powder coating composition. 4,048,136, Cl. 260-42.140.

Kobe, Inc.: *See*—
Erickson, John W., 4,047,581, Cl. 175-95.000.

Koberstein, Edgar; and Lakatos, Eduard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Catalyst for purification of exhaust gases and processes for its production and use. 4,048,098, Cl. 252-432.000.

Koberstein, Edgar; Muller, Klaus; and Theissen, Ferdinand, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Process for the production of 3-methylmercaptopropionaldehyde. 4,048,232, Cl. 260-601.00R.

Koch, Kenneth W.: *See*—
May, Walter R.; Zetlmeisl, Michael J.; and Koch, Kenneth W., 4,047,875, Cl. 431-3.000.

Koch, Rolf Eckart: *See*—
Lorenz, Horst; Koch, Rolf Eckart; and Kahlhofer, Reiner, 4,047,470, Cl. 90-15.00R.

Kodama, Tsuneo: *See*—
Ide, Fumio; and Kodama, Tsuneo, 4,048,035, Cl. 204-159.150.

Kohn, Armand. Fungicidal composition and method. 4,048,324, Cl. 424-294.000.

Koike, Shyouichi, to Nissan Motor Company, Limited. Roof rail weatherstrip for motor vehicle. 4,047,751, Cl. 296-146.000.

Kok, Bob; and Krause, Erhardt, to C.S.S. Container Storage Service Establishment. Apparatus for measuring the alcohol content in human breath. 4,047,893, Cl. 23-254.00E.

Kokeisl, Walter. Device for bundling skis together in pairs. 4,047,726, Cl. 280-11.37A.

Kolarik, Stanislav: *See*—
Skrabak, Michal; Vavrik, Ernest; Kolarik, Stanislav; and Mazak, Milos, 4,048,008, Cl. 162-104.000.

Kolb, Gunter: *See*—
Sackmann, Gunter; Kolb, Gunter; and Muller, Friedhelm, 4,048,422, Cl. 526-203.000.

Kolb, William A.; and Vignovich, Pete, to United States Steel Corporation. Method for controlling the operation of a steel refining converter. 4,047,937, Cl. 75-59.000.

Koller, Hans, to BUSS A.G. Apparatus for making tanks from plates. 4,047,700, Cl. 254-89.00H.

Kolm, Eric A.; and Trottier, Robert R., to Signal Science Systems, Inc. Light-activated remote control unit. 4,048,596, Cl. 334-8.000.

Komamura, Seiji; and Hashizume, Hiroyuki, to Kayabakogyokabushikikaisha. Power-steering pump. 4,047,846, Cl. 417-300.000.

Komatsu, Kensuke: *See*—
Sakayori, Seigo; Kuro, Tomoyosi; Morita, Kazuyuki; Hinooka, Nobuya; Niimi, Hirozi; and Komatsu, Kensuke, 4,048,355, Cl. 427-375.000.

Komatsu, Shigeyoshi. Process for mending clothes. 4,047,994, Cl. 156-98.000.

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Kondratenko, Maria Stefanova; Nachev, Lyubomir Todorov; Dedova, Petrushka Atanassova; and Antonova, Tamara Nikolaevna, to DSO "Miechna Promishlenost". Preparation of cheese with a microbial milk coagulating enzyme. 4,048,339, Cl. 426-39.000.

Koo, James T., to Intel Corporation. MOS buffer circuit. 4,048,518, Cl. 307-214.000.

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Koppel, Gary A., to Eli Lilly and Company. Process for preparation of 7-alkoxy-3-bromomethylcephems. 4,048,160, Cl. 544-21.000.

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Koppers Company, Inc.: *See*—
Romovacek, George R., 4,048,020, Cl. 196-132.000.
Romovacek, George R., 4,048,056, Cl. 208-41.000.

Korenhof, Abraham; and Kapaan, Hendrikus Jan, to SKF Industrial Trading and Development Company, B.V. Hub bearing unit assembly. 4,047,770, Cl. 308-191.000.

Kornrumpf, William P.: *See*—
Walker, Loren H.; and Kornrumpf, William P., 4,048,539, Cl. 315-176.000.

Koscinski, Daniel P., to Towmotor Corporation. Compact seat suspension for lift truck. 4,047,759, Cl. 297-346.000.

Koshiba, Masao: *See*—
Yamamoto, Michihiro; Katayama, Shigenari; Koshiba, Masao; and Yamamoto, Hisao, 4,048,168, Cl. 260-251.0QB.

Kosky, Philip G.: *See*—
Pomeroy, Bruce D.; and Kosky, Philip G., 4,048,529, Cl. 310-54.000.

Kotila, Wayne. Tire changing device. 4,047,553, Cl. 157-1.240.

Kotthoff, Winfried; and Wiedenroth, Wolfgang, to Honsel Werke Aktiengesellschaft. Metering device for metal casting machines, particularly low pressure casting machines. 4,047,558, Cl. 164-309.000.

Kotzsch, Hans-Joachim; Seiler, Claus-Dietrich; and Vahlensick, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Functional organophosphonic acid esters as preservative adhesion promoting agents and coating for metals. 4,048,374, Cl. 428-457.000.

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Sandera, Josef; Calabek, Milan; Cenek, Miroslav; Kalab, Frantisek; Koudelka, Vojtech; Kouril, Oldrich; Malik, Jiri; and Vanacek, Josef, 4,048,406, Cl. 429-209.000.

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Kovin, Vladimir Mikhailovich; Mitenkov, Fedor Mikhailovich; Ovechkin, Alexandr Vasilievich; Pankratov, Vladimir Alexeevich; Savin, Nikolai Ivanovich; Ternikova, Tamara Alexandrovna; Filippov, Vladimir Jurievich; Khramov, Dmitry Alexandrovich; Chernomordik, Evgeny Naumovich; Shiryaev, Vladimir Ivanovich; Muzychuk, Vladimir Romanovich; and Savin, Alexandr Nikolaevich. Fast nuclear reactor. 4,048,011, Cl. 176-40.000.

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Baker, Maurice W.; Kerry, John C.; Nichol, Kenneth J.; Marshall, John R.; Weighton, David M.; and Kozlik, Antonin, 4,048,188, Cl. 548-341.000.

Kraft, Gerald A.: *See*—
Spiers, Steven F.; Lewis, Howard M.; Kraft, Gerald A.; and Pasquine, Arthur R., 4,047,421, Cl. 73-1.00R.

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Eschenfelder, Gunther; and Schultz, Rudiger, 4,048,010, Cl. 176-36.00R.
Kuter, Heinrich; and Krieger, Gerhard, 4,048,532, Cl. 310-68.00D.
Scholz, Manfred, 4,047,456, Cl. 81-57.380.

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Krall, Heribert A.; and Maag, Helmut, to Technica-Guss GmbH. Strand milling method. 4,047,468, Cl. 90-11.00C.

Kramer, Carl; and Gerhardt, Hans-Joachim. Rate-of-flow meter, particularly for diagnostic spirometry. 4,047,521, Cl. 128-2.080.

Kramer, Wolfgang: *See*—
Meiser, Werner; Buchel, Karl Heinz; Kramer, Wolfgang; and Grewe, Ferdinand, 4,048,318, Cl. 424-269.000.

Kramm, David E.: *See*—
Morgan, Charles R.; and Kramm, David E., 4,048,218, Cl. 560-147.000.

Kranc, Stanley J.; Wells, Alan W.; and Hackett, David E., to Caterpillar Tractor Co. Accumulator type injection valve including a dump valve for fast response. 4,047,664, Cl. 239-120.000.

Krause, Erhardt: *See*—
Kok, Bob; and Krause, Erhardt, 4,047,893, Cl. 23-254.00E.

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Hanslik, Wilhelm, 4,047,705, Cl. 259-192.000.

Krenz, Joseph H., to Sun Metal Products, Inc. Releasable latch assembly. 4,047,745, Cl. 292-302.000.

Kreuzer, Lloyd B., to Diax Corporation. Infrared absorption spectroscopy of liquids employing a thermal detector. 4,048,499, Cl. 250-344.000.

Krick, Edward F.; and MacLeod, David E., to Carrier Corporation. Cabinet construction. 4,047,776, Cl. 312-245.000.

Krief, Alain; and Hevesi, Laszlo, to Roussel Ulcaf. Process for preparation of trans-chrysanthemates. 4,048,215, Cl. 560-124.000.

Kriege, Wolfgang, to Jenaer Glaswerk, Schott & Gen. Lighting device for fiber-optic systems. 4,048,486, Cl. 240-1.00R.

Krieger, Gerhard: *See*—
Kuter, Heinrich; and Krieger, Gerhard, 4,048,532, Cl. 310-68.00D.

Krockta, Harry, to Ducon Company, Inc., The. Apparatus for collecting fine particles. 4,047,910, Cl. 55-235.000.

Krojer, Hubert, to Dornier GmbH. Air intake with deflecting device against foreign objects impinging in the initial direction of air flow at engine nacelles. 4,047,911, Cl. 55-306.000.

Kronenberg, Marvin Lee, to Union Carbide Corporation. Non-aqueous cell having a cathode of lead monoxide-coated lead dioxide particles. 4,048,402, Cl. 429-194.000.

Kronenberg, Marvin Lee, to Union Carbide Corporation. Non-aqueous lead dioxide cell having a unipotential discharge voltage. 4,048,403, Cl. 429-194.000.

Kruger, Heinrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Drilling tool. 4,047,830, Cl. 408-239.00A.

Kruka, Vitold R., to Shell Oil Company. Method for establishing

core-flow in water-in-oil emulsions or dispersions. 4,047,539, Cl. 137-13.000.

Kubanek, Vladimir: *See—*
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Kubela, Rudolph; and Do Nascimento, Jose Maria, to Delmar Chemicals Limited. Morpholino containing 4-arylpiperidine derivatives. 4,048,314, Cl. 424-248.550.

Kubo, Kenzi: *See—*
Nagai, Shigeki; Iwata, Fumio; and Kubo, Kenzi, 4,048,236, Cl. 260-613.00D.

Kubota, Ltd.: *See—*
Morita, Yasuji, 4,047,882, Cl. 432-9.000.

Kuckenburg, Karl-Heinz: *See—*
Schaffernicht, Klaus; Hentrich, Josef; Klein, Herbert; and Kuckenburg, Karl-Heinz, 4,047,915, Cl. 65-106.000.

Kuczynski, Robert A.: *See—*
Kuczynski, Walter J.; and Kuczynski, Robert A., 4,048,611, Cl. 337-380.000.

Kuczynski, Walter J.; and Kuczynski, Robert A. Thermal switch. 4,048,611, Cl. 337-380.000.

Kudo, Kazuo; and Mizutani, Takashi, to Toppan Printing Co., Ltd. Multilayer parison extrusion molding machine for blow molding. 4,047,868, Cl. 425-133.100.

Kuehn, Udo, to Ervin Industries, Inc. Blast cleaning machine. 4,047,334, Cl. 51-422.000.

Kuester, Donald A., to J. I. Case Company. Crane construction and method of operation. 4,047,618, Cl. 212-58.00R.

Kugel, Wolfgang: *See—*
Bredereck, Hellmut; Kantlehner, Willi; Kugel, Wolfgang; Mohring, Edgar; and Roessler, Peter, 4,048,315, Cl. 424-249.000.

Kuhfus, Gerd: *See—*
Gumb, Beverly William; Kuhfus, Gerd; and Cogan, Frederick Thomas, 4,047,787, Cl. 339-154.00A.

Kuhl, Dieter, to Siemens Aktiengesellschaft. Removing carbon dioxide from the air. 4,047,894, Cl. 23-284.000.

Kukolja, Stjepan; and Murphy, Charles F., to Eli Lilly and Company. Process for preparing 3-hydroxy cephalosporins. 4,048,162, Cl. 544-22.000.

Kulessa, Gerhard; and Mommertz, Elmar, to Schering Aktiengesellschaft. Inhalator for agglomeratable pulverulent solids. 4,047,525, Cl. 128-208.000.

Kunert, Maximilian: *See—*
Wegner, Hans-Georg; and Kunert, Maximilian, 4,048,055, Cl. 208-25.000.

Kunkle, Albert C., to J. M. Huber Corporation. Electroflocculation cell. 4,048,038, Cl. 204-180.00R.

Kuntz, Irving, to Exxon Research and Engineering Company. Alternating elastomeric interpolymers. 4,048,425, Cl. 526-245.000.

Kunze, Dieter, to Siemens Aktiengesellschaft. Method and apparatus for connecting individual light waveguides. 4,047,283, Cl. 29-466.000.

Kuo, James C.: *See—*
Garwood, William E.; Jacob, Solomon M.; Kuo, James C.; and Wise, John J., 4,048,250, Cl. 260-683.430.

Kurata, Motoji, to Japan Medical Supply Co., Ltd. Heat exchanger for artificial heart and lung devices. 4,047,563, Cl. 165-158.000.

Kurata, Yoshio. Method of manufacturing hammer. 4,047,278, Cl. 29-424.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Saito, Tsuyoshi; and Asano, Kiro, 4,048,222, Cl. 260-514.00J.
Yoshikawa, Shinsuke; Terasaki, Syuuzi; and Sasaki, Tohru, 4,047,998, Cl. 156-275.000.

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Sakayori, Seigo; Kuro, Tomoyosi; Morita, Kazuyuki; Hinooka, Nobuya; Niimi, Hirozi; and Komatsu, Kensuke, 4,048,355, Cl. 427-375.000.

Kusakabe, Masao; Fuziwara, Shuzo; and Shiino, Kazuo, to Director-General of the Agency of Industrial Science and Technology. Underwater blasting explosives. 4,047,987, Cl. 149-37.000.

Kushner, Ben: *See—*
Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, 4,047,282, Cl. 29-432.000.

Kuspert, John C.: *See—*
Snellman, Donald L.; Kuspert, John C.; and Saunders, Arthur G., 4,047,713, Cl. 271-221.000.

Kuter, Heinrich; and Krieger, Gerhard, to Kraftwerk Union Aktiengesellschaft. Rotating rectifier assembly. 4,048,532, Cl. 310-68.00D.

Kvasnicka, Rudolf: *See—*
Pammer, Gottfried; and Kvasnicka, Rudolf, 4,047,442, Cl. 74-194.000.

L.M. Ericsson Pty. Ltd.: *See—*
Ghisler, Walter, 4,048,445, Cl. 179-15.0BF.

Labaz: *See—*
Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; and Werbenec, Jean-Pierre, 4,048,334, Cl. 424-325.000.

Labboz, Lucien: *See—*
Bernard, Jean-Michel; Labboz, Lucien; and Vesque, Daniel, 4,048,450, Cl. 179-18.0EB.

Lacefield, William B., to Eli Lilly and Company. 2,4-Diaminoquinazolines as antithrombotic agents. 4,048,312, Cl. 424-248.560.

Lachonius, Leif: *See—*
Hallerback, Stig Lennart; and Lachonius, Leif, 4,048,527, Cl. 310-43.000.

Lafferty, John J.: *See—*
Gordon, Maxwell; and Lafferty, John J., 4,048,178, Cl. 260-293.540.

Laflamme, Daniel. Electronic keyboard display device. 4,048,634, Cl. 340-337.000.

Lagerstrom, Gosta Bertil; and Mattsson, Olof Arthur, to Boliden AB. Process and an apparatus for increasing the feed value of lignocellulosic materials. 4,048,341, Cl. 426-69.000.

Lahme, Norbert Wilhelm; and Sassmannshausen, Gunter C., to Accumulatorenwerk Hoppecke-Carl Zoellner & Sohn. Substance and device for the absorption of catalyst poisoning gases out of the oxyhydrogen gas produced by lead-acid storage batteries. 4,048,387, Cl. 429-50.000.

Lai, San-Cheng, to Rockwell International Corporation. Lithium electrode for electrical energy storage device. 4,048,395, Cl. 429-112.000.

Lakatos, Eduard: *See—*
Koberstein, Edgar; and Lakatos, Eduard, 4,048,098, Cl. 252-432.000.

Lala, Arun, to Electrochem, Inc. Zinc electrode for alkaline reserve batteries. 4,048,408, Cl. 429-229.000.

Laliberte, Shirley P. Crochet needle with cutting means. 4,047,397, Cl. 66-118.000.

Lamarque, Gabriel, to Vereinigte Edelstahlwerke AG. (VEW). Method of and apparatus for positioning consumable electrodes in an electroslag remelting bath. 4,047,555, Cl. 164-52.000.

Lambitz, Robert H.; and Zeffero, Robert J., to Zefflamb Industries, Inc. Cargo box liner for pick-up trucks. 4,047,749, Cl. 296-39.00R.

Landen, Ernest W.: *See—*
Belke, William H.; Hafele, Joseph C.; Landen, Ernest W.; and Richards, Thomas J., 4,047,984, Cl. 148-152.000.

Landesberg, William: *See—*
Seiden, Lewis J.; Landesberg, William; and Young, Gladstone F., 4,048,672, Cl. 364-200.000.

Landi, Henry Patrick: *See—*
Perciaccante, Vincent Anthony; and Landi, Henry Patrick, 4,047,533, Cl. 128-335.500.

Landis, Phillip S.: *See—*
Nnadi, John C.; and Landis, Phillip S., 4,048,082, Cl. 252-51.50A.

Landmesser, Franklin D.: *See—*
Williams, Jerry K.; and Landmesser, Franklin D., 4,047,732, Cl. 280-287.000.

Lang, John M., to Xerox Corporation. Polygon scanner with an annular lip. 4,047,793, Cl. 350-7.000.

Lang, Pierre, to J. Bobst & Fils S.A. Apparatus for separating and stacking blanks of a die cut sheet. 4,047,474, Cl. 93-36.00A.

Lange, Emroy W.: *See—*
Gary, Wardell; and Lange, Emroy W., 4,048,522, Cl. 307-293.000.

Lange, Fritz-Walter; Haffner, Gert; and Muller, Jens, to MEDITEST Institut fur medizinisch pharmazeutische Untersuchungen GmbH. 1,3-Bis-(β-ethylhexyl)-5-nitro-5-methyl-hexahydropyrimidine-naphthalene-1,5-disulphonate. 4,048,169, Cl. 260-251.00R.

Langeluddeke, Peter: *See—*
Albrecht, Konrad; Langeluddeke, Peter; Schumacher, Hans; and Schwerdtle, Friedhelm, 4,047,932, Cl. 71-108.000.

Langer, Roger L.; and Marlor, Alan J., to Minnesota Mining and Manufacturing Company. Offset laminated intumescent mounting mat. 4,048,363, Cl. 428-77.000.

Langford, LeRoy: *See—*
Harrer, Paul H.; and Langford, LeRoy, 4,047,638, Cl. 221-266.000.

Langhorst, Martin A.: *See—*
Sinke, Gerard C.; Langhorst, Martin A.; and May, James A., Sr., 4,048,288, Cl. 423-267.000.

Langsdorf, William P., Jr., to E. I Du Pont de Nemours and Company. Carbamoylphosphonates. 4,048,156, Cl. 260-239.00A.

Larionov, Igor Grigorievich: *See—*
Volkov, Vladimir Vladimirovich; Bagryantsev, Gennady Ivanovich; Larionov, Igor Grigorievich; Neermolov, Alexandr Filippovich; and Leontievsky, Valery Georgievich, 4,047,672, Cl. 241-175.000.

Larson, Jay Michael; Clark, Ian Sidney Rex; and Gibson, Robert Cameron, to International Nickel Company, Inc., The. Porosity reduction in inert-gas atomized powders. 4,047,933, Cl. 75-.50C.

LaSalle, Robert James: *See—*
Keisling, Nelson Woodrow, 4,047,322, Cl. 46-1.00R.

Lash, Ronald J.: *See—*
Harbulak, Edward Paul; and Lash, Ronald J., 4,048,006, Cl. 156-664.000.

Laszlavik, Marta: *See—*
Karpati, Egon; Szporny, Laszlo; Bartok, Mihaly; Czombos, Jozsef; Felfoldi, Karoly; Laszlavik, Marta; and Notheisz, Ferenc, 4,048,322, Cl. 424-283.000.

Lauer, Hubert; Schenk, Norbert; and Schwerdtel, Wulf, to Bayer Aktiengesellschaft. Process for the production of cyclopentene from dicyclopentadiene. 4,048,242, Cl. 260-666.00A.

Laugesen, Ronald C.; and Shieu, Mark Shin-Dong, to National Semiconductor Corporation. MOS voltage level detecting and indicating apparatus. 4,048,524, Cl. 307-304.000.

Laurin, Arvid, to AB Jarnforadling. Propeller blading for a self-adjusting propeller for boats. 4,047,841, Cl. 416-140.000.

Lavecchia, Silvano Anthony: *See—*
Gormish, Kenneth J.; Hofelt, Clarence, Jr.; Lavecchia, Silvano Anthony; and Ripley, Clarence Arthur, Jr., 4,047,338, Cl. 51-106.00R.

Lawrence Peska Assoc., Inc.: *See—*
Bondarchuk, Walter W., Sr., 4,047,257, Cl. 14-27.000.

Lawrence Peska Associates, Inc.: *See—*
Pieters, Eli, 4,047,802, Cl. 350-97.000.

Lawter, Ray L.; Shooter, Kenneth L.; and Wills, David C., to NCR Corporation. Card reader. 4,048,476, Cl. 235-61.11D.

Lawyer, Leon C., to Chevron Research Company. Exploration system for cross-steering and stacking seismic data using a sawtooth traverse of shot points centrally spaced between at least a pair of linear detector spreads. 4,048,612, Cl. 340-15.5CP.

Layton, Roger M.: *See—*
Beck, Charles I.; and Layton, Roger M., 4,048,202, Cl. 260-410.600.

LDV Industries, Inc.: *See—*
Beers, Charles James, 4,047,747, Cl. 296-1.00S.

Leach Corporation: *See—*
Schuessler, John C.; and Tapp, David J., 4,048,601, Cl. 335-193.000.

Leal-Diaz, Jaime. Hoses for irrigation by dripping and the like and the process to manufacture the same. 4,047,995, Cl. 156-203.000.

Lebedev, Alexandr Valerievich: *See—*
Minaev, Alexandr Ivanovich; Lebedev, Alexandr Valerievich; and Mogilev, Artur Viktorovich, 4,047,360, Cl. 53-122.000.

Lecart, Jean-Guy Pierre Denis; and Amalberti, Jean Claude, to Chrysler France. Safety steering-wheels for automotive vehicles. 4,047,450, Cl. 74-552.000.

Lechner, Uwe: *See—*
Maier, Roland; Woitun, Eberhard; Wetzel, Bernd; Reuter, Wolfgang; Goeth, Hanns; and Lechner, Uwe, 4,048,306, Cl. 424-180.000.

Lee, Edward J.; and Vavra, Frank, to United States Steel Corporation. Detachable lip ring for steelmaking converter. 4,047,708, Cl. 266-243.000.

Lee, Gary D.; Vartanian, Paul F.; and Biasotti, Joseph B., to Texaco Inc. Lubricating oil composition. 4,048,080, Cl. 252-51.540.

Lee, Jerald Dana, to Du Pont de Nemours, E. I., and Company. Light-sensitive control for colored light projector. 4,048,493, Cl. 250-205.000.

Lee, John Malcolm, to Dow Chemical Company, The. Removal of heavy metals from aqueous solutions. 4,048,283, Cl. 423-92.000.

Lee, Kam Bor, to Gabot Corporation. Process for the production of finely-divided metal and metalloid oxides. 4,048,290, Cl. 423-336.000.

Lee, Kwan-Hua, to University of California, The Regents of the. C20 and C22 acids to promote wound healing. 4,048,204, Cl. 260-413.000.

Lee, Marion D. Bait dispenser. 4,047,320, Cl. 43-55.000.

Lee, Suh Y.: *See—*
Stumbar, James P.; Carl, Daniel E.; and Lee, Suh Y., 4,047,972, Cl. 134-2.000.

Lee, Yoon C., to Monsanto Company. Rubber modified fire retardant polymer compositions. 4,048,263, Cl. 260-890.000.

Leerskov, Arthur E., Jr.: *See—*
Ward, Phillip W.; Donald, Robert C., Jr.; and Leerskov, Arthur E., Jr., 4,047,591, Cl. 181-119.000.

LeFebvre, Clarence A.; and Cabezut, Joseph M., Jr., to United States of America, Army. Thrust management control propulsion system. 4,047,382, Cl. 60-252.000.

Lehmann, Oskar. Fitting for an article of furniture. 4,047,822, Cl. 403-187.000.

Lehmann, Rolf, to Escher Wyss Limited. Support for continuously cast hot metal components. 4,047,274, Cl. 29-121.400.

Lemke, Winfred R., to Square D Company. Solid state overload relay transformer circuit. 4,048,663, Cl. 361-75.000.

Leontievsky, Valery Georgievich: *See—*
Volkov, Vladimir Vladimirovich; Bagryantsev, Gennady Ivanovich; Larionov, Igor Grigorievich; Neermolov, Alexandr Filippovich; and Leontievsky, Valery Georgievich, 4,047,672, Cl. 241-175.000.

Lessner, David L.: *See—*
Soodak, Charles; Lessner, David L.; and Macemon, James H., 4,047,820, Cl. 356-244.000.

Lester, Thomas J., to Lester Tire Company, The. Composite motorcycle wheel construction. 4,047,764, Cl. 301-6.00V.

Lester Tire Company, The: *See—*
Lester, Thomas J., 4,047,764, Cl. 301-6.00V.

Leutner, Bernd: *See—*
Wurmb, Rolf; Leutner, Bernd; Seydl, Wolfgang; Schlimper, Hans-Ulrich; and Sterzel, Hans-Josef, 4,048,135, Cl. 260-40.00R.

Leutwyler, Roy: *See—*
Jureit, John Calvin; Castillo, Adolfo; Leutwyler, Roy; Brodsky, Larry; and Kushner, Ben, 4,047,282, Cl. 29-432.000.

Leveque, Rene, to Automobiles Peugeot. Speed variator having friction elements. 4,047,443, Cl. 74-199.000.

Lever Bros. Co.: *See—*
Heslam, Robin Snell, 4,048,085, Cl. 252-102.000.

Levi Strauss & Co.: *See—*
Blessing, Hubert, 4,047,622, Cl. 214-8.50A.

Levin, Robert E.: *See—*
Blaisdell, Ronald G.; Hough, Harold L.; and Levin, Robert E., 4,048,537, Cl. 313-489.000.

Levine, Irving E., to Chevron Research Company. Methoxymethane sterilization method. 4,048,343, Cl. 426-330.200.

Lewis, Alan Y.: *See—*
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Lewis, Howard M.: *See—*
Spiers, Steven F.; Lewis, Howard M.; Kraft, Gerald A.; and Pasquine, Arthur R., 4,047,421, Cl. 73-1.00R.

Lewis, Richard C. Dispenser for granular material. 4,047,647, Cl. 222-480.000.

Lia, Bruno; and Vigini, Giorgio, to Honeywell Information Systems Italia. Driver circuit for printer electromagnet. 4,048,665, Cl. 361-152.000.

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Oelke, Waldemar W.; and Hagedorn, Floyd T., 4,047,919, Cl. 65-273.000.

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Burkhardt, Gisbert; and Hofmann, Dieter, 4,047,712, Cl. 271-64.000.
Schaffernicht, Klaus; Hentrich, Josef; Klein, Herbert; and Kuckenburg, Karl-Heinz, 4,047,915, Cl. 65-106.000.
Sedlacek, Herbert, 4,047,815, Cl. 356-104.000.

Liebermann, Benno E. Apparatus for cooking food articles. 4,047,476, Cl. 99-325.000.

Liebig, William J.; and Rodriguez-M, German, to Meadox Medicals, Inc. Double-velour synthetic vascular graft. 4,047,252, Cl. 3-1.400.

Liesting, Bernardus G. Device for taking pieces of material stuck to a substrate wound on a reel. 4,048,494, Cl. 250-223.00R.

Lindauer Dornier Gesellschaft mbH.: *See—*
John, Heinz, 4,047,270, Cl. 28-205.000.

Lindblad, Oskar Lennart. Device in connection with locks for safety belts. 4,047,267, Cl. 24-230.0AL.

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Rossmaier, Viktor, deceased, 4,048,286, Cl. 423-242.000.

Lingscheit, James N.: *See—*
Heintz, Walter K.; and Lingscheit, James N., 4,048,393, Cl. 429-104.000.

List, Hans. Device for the arrangement, alignment and correctly positioned feed of articles in particular having elongated shape. 4,047,636, Cl. 221-161.000.

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Hargis, Ivan Glen; Livigni, Russell Anthony; and Aggarwal, Sundar Lal, 4,048,427, Cl. 526-337.000.

Lo, Mei-Kuo; and Sheppard. Erwin, to S. C. Johnson & Son, Inc. Child-safe aerosol actuator. 4,047,646, Cl. 222-402.130.

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Lochner, Herbert, to cikalon-Vliesstoff-werke GmbH. Method and apparatus for producing ornamentally patterned, needled, nonwoven pile fabrics. 4,047,269, Cl. 28-109.000.

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Ettenberg, Michael; and Lockwood, Harry Francis, 4,048,627, Cl. 357-17.000.

Loewenberg, Gustav; Hartmann, Hans-Joerg; Schaefer, Dieter; Motz, Herbert; and Jakusch, Helmut, to BASF Aktiengesellschaft. Magnetic recording media of improved mechanical resistance. 4,048,375, Cl. 428-474.000.

Lohmann, Larry John, to Owens-Illinois, Inc. Novel packaging and supporting means for flat glass panels. 4,047,612, Cl. 206-454.000.

Lonza Ltd.: *See—*
Brunold, Marcel; Hering, Klaus; Wicht, Paul; Vonlanthen, Christian; Kislig, Jurg; and Volker, Theodor, 4,048,130, Cl. 260-29.6NR.

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Lotis, Leonard L. Body washing apparatus. 4,047,259, Cl. 15-104.920.

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Childs, Jerry D.; and Love, Roosevelt, 4,047,567, Cl. 166-293.000.

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Cox, John T.; Garber, Michael B.; Jasper, Marilyn A.; and LoVecchio, Paul, 4,048,535, Cl. 313-367.000.

Lu, Chin H., to Xerox Corporation. Method of developing electrostatic latent images with conductive liquid developer. 4,047,943, Cl. 96-1.0LY.

Lucchesi, Benedict R., to University of Michigan, The Regents of the. Method of inhibiting myocardial ischemia in mammals using quaternary salts. 4,048,335, Cl. 424-329.000.

Ludwig, Frank A., to Ford Motor Company. Secondary battery or cell with vitreous carbon coated graphite current collector. 4,048,394, Cl. 429-104.000

Ludwig, George, to Tom McGuane Industries, Inc. Butterfly valve. 4,047,696, Cl. 251-308.000.

Ludwig, Nelson Henry, to Eli Lilly and Company. Stabilization method. 4,048,268, Cl. 264-15.000.
Lund, Clarence A.: *See—*
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Lundahl, Robert O., to Raymond Lee Organization, Inc., The. Rollable walk guide. 4,047,825, Cl. 404-70.000.
Lundin, Lars Olof, to AB Bofors. Device for generating oil pressure for an artillery piece or a corresponding unit. 4,047,467, Cl. 89-41.00H.
Lunn, William H. W.; and Mason, Edward V., to Eli Lilly and Company. 7-[α-(Benzimidazol-2-ylcarbonylamino)-arylacetamido]e-phalosporins. 4,048,161, Cl. 544-27.000.
Lurssen, Klaus: *See—*
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Luttrell, John E.: *See—*
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Lyberg, Bertil, to Telefonaktiebolaget L M Ericsson. Oscillator frequency control loop. 4,048,581, Cl. 331-1.00A.
Lyssy, Georges H. Process for measuring permeability to gas of walls and/or closure of three-dimensional encasing elements. 4,047,422, Cl. 73-38.000.
M&T Chemicals Inc.: *See—*
Gloskey, Carl R.; and Littman, Stanley, 4,048,294, Cl. 423-618.000.
Harbulak, Edward Paul; and Lash, Ronald J., 4,048,006, Cl. 156-664.000.
Maag, Helmut: *See—*
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Machleder, Warren H.; and Bollinger, Joseph M., to Rohm and Haas Company. Multipurpose fuel additive. 4,048,081, Cl. 252-51.50R.
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MacLeay, Ronald Edward; and Sheppard, Chester Stephen, to Pennwalt Corporation. Process for polymerizing unsaturated monomers and unsaturated polyester resins employing unsymmetrical tertiary-aliphatic azoalkanes. 4,048,423, Cl. 526-209.000.
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MacMullin, Robert Burns, to B. F. Goodrich Company, The. Electrolytic cell design. 4,048,046, Cl. 204-266.000.
Madden, Thomas Harry; and Reash, Clair Wilbur, to Union Carbide Corporation. Cathode ray tube processing. 4,048,545, Cl. 316-2.000.
Maechtle, Gary L.: *See—*
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Maeda Industries, Ltd.: *See—*
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Maeda, Muneyoshi; Watanabe, Shigeo; Takahashi, Hidenori; and Sogi, Toshiyuki, to Bridgestone Tire Company Limited. Pneumatic radial tire for heavy load vehicles. 4,047,552, Cl. 152-361.00R.
Magoveny, George S.; and Forgo, Eric J., to Windsunwatt, Inc. Horizontal multidirectional turbine windmill. 4,047,834, Cl. 415-3.000.
Magyar Vagon- es Gepgyar: *See—*
Toth, Laszlo; Schirhuber, Janos; Prepost, Kalman; and Tassi, Andras, 4,048,466, Cl. 219-121.0EM.
Mahan, John E.: *See—*
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Maier, Roland; Woitun, Eberhard; Wetzel, Bernd; Reuter, Wolfgang; Goeth, Hanns; and Lechner, Uwe, to Boehringer Ingelheim GmbH. Aldehyde-erythromycylamine condensation products. 4,048,306, Cl. 424-180.000.
Main, George: *See—*
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Majidzadeh, Kamran; and Guirguis, Hani R., to Dampocrete Incorporated. Concrete composition. 4,047,967, Cl. 106-90.000.
Makely, Joseph E. Core drill. 4,047,828, Cl. 408-145.000.
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Mannila, Fred E.: *See—*
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Mannila, Richard S.; Mannila, Fred E.; and Mannila, Donald A. Stereophonic sound adaptor for simulating sound movement. 4,048,442, Cl. 179-1.0GP.
Manz, August Frederick, to Union Carbide Corporation. Method and torch for sustaining multiple coaxial arcs. 4,048,465, Cl. 219-121.00R.
Mapp, Alan L. Attractor element for fishing lure. 4,047,318, Cl. 43-42.240.
Margotte, Dieter: *See—*
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Markland, R. Donald, to Consolidated Freightways, Inc. Turbocharger and air cleaner device. 4,047,912, Cl. 55-406.000.
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Marsh, Norman F.; and Eng, William T., to Dickey-john Corporation. Bin depth monitor. 4,047,434, Cl. 73-304.00R.
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Martin, Joachim; Haas, Ernst; and Schnoeller, Manfred, to Siemens Aktiengesellschaft. Apparatus for doping a semiconductor crystalline rod. 4,048,508, Cl. 250-492.00A.
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Maruta, Rikio, to Nippon Electric Company, Limited. PCM-TASI signal transmission system. 4,048,447, Cl. 179-15.0AS.
Maruyama, Iwao; and Kanai, Shigeo, to Honda Giken Kogyo Kabushiki Kaisha. Sonic nozzle apparatus in a carburetor flow testing machine. 4,047,426, Cl. 73-118.000.
Maruyama, Jiro, to Hakodate Seimo Sengu Co., Ltd. Knotted fishing net. 4,047,316, Cl. 43-7.000.
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Matsushita, Kunichi; Sakurada, Hikaru; Onuma, Kazuhiko; and Fujii, Shinichi, to Mitsubishi Chemical Industries Ltd. Catalyst for selective reduction of nitrogen oxides. 4,048,112, Cl. 252-461.000.
Matsuzawa, Norio; Oi, Hidesaburo; Nishimura, Hiroshi; Wada, Shigeru; and Sasaki, Juntaro, to Mitsui Petrochemical Industries Ltd.

Process for polymerization of olefins and catalyst composition therefor. 4,048,415, Cl. 526-119.000.
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Maule, Clemente. D.C. arc welder with solid state components. 4,048,468, Cl. 219-135.000.
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May, Czeslaw J.; and Piepho, Donald A., to Caterpillar Tractor Co. Bypass valve. 4,047,542, Cl. 137-627.500.
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May, Walter R.; Zetlmeisl, Michael J.; and Koch, Kenneth W., to Petrolite Corporation. Inhibition of corrosion in fuels with Mg/Si/Mn combinations. 4,047,875, Cl. 431-3.000.
Mayfield, Windel O.; Thomerson, Clarence T.; and Waldrop, Tom C., to Regal Tool & Rubber Co., Inc. Grout seal. 4,047,391, Cl. 61-94.000.
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McCafferty, Gerald P., to Budd Company, The. Liquid level control means and method. 4,047,655, Cl. 228-259.000.
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McCollum, Samuel C., to Sangamo Electric Company. Split core current transformer having an interleaved joint and hinge structure. 4,048,605, Cl. 336-176.000.
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McGee, John K., to Gray Tool Company. Valve seat-to-seat connection for easy installation and removal of seat. 4,047,697, Cl. 251-328.000.
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McNamara, David M.; and Boettcher, Stephen A., to Speedfam Corporation. Abrasive slurry regulator assembly. 4,047,639, Cl. 222-64.000.
McNamara, David M.; and Boettcher, Stephen A., to Speedfam Corporation. Abrasive slurry regulator assembly. 4,047,640, Cl. 222-64.000.
McNeary, Richard C., to Raymond Lee Organization, Inc., The, a part interest. Lockable gas tank cap device. 4,047,744, Cl. 292-171.000.
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McSweeney, Diarmuid Justin, to Johns-Manville Corporation. Ceiling support grid system. 4,047,348, Cl. 52-484.000.
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Megahed, El Sayed, to ESB Incorporated. High drain rate, primary alkaline cell having a divalent silver oxide/monovalent silver oxide depolarizer blend coated with a layer of silver. 4,048,405, Cl. 429-206.000.
Meisel, Thomas C., Jr., to Caterpillar Tractor Co. Clamshell bucket for wheel loader. 4,047,626, Cl. 214-147.00G.
Meiser, Werner; Buchel, Karl Heinz; Kramer, Wolfgang; and Grewe, Ferdinand, to Bayer Aktiengesellschaft. 1-Substituted-1,2,4-triazole fungicides. 4,048,318, Cl. 424-269.000.
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Nnadi, John C.; and Landis, Phillip S., 4,048,082, Cl. 252-51.50A.
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Moynihan, William N. Spray control system. 4,047,665, Cl. 239-124.000.
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Mulvany, R. F., Jr. Apparatus for forming plastic articles. 4,047,869, Cl. 425-143.000.
Munk, Michael E. Sprinkler system for existing buildings. 4,047,570, Cl. 169-16.000.
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Nakagome, Keisuke; and Suzuki, Toshiharu, to Nitto Electric Industrial Co., Ltd. Process for producing a laminated metallic sheet. 4,048,005, Cl. 156-630.000.
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Sato, Moriyuki; Sugimoto, Masahiro; and Shimizu, Yoshiaki, to Abbott Laboratories. Fortimicin C and process for production thereof. 4,048,015, Cl. 195-96.000.
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Nelson, Norman A., to Upjohn Company, The. 6α-Methoxy-4α-hydroxy-2β-hydroxymethyl-3α-tetrahydropyranacetic acid 4α γ-lactone ethers and acylates. 4,048,194, Cl. 260-343.600.
Nelson, Philip E.: *See*—
Rechtsteiner, Steve A.; Nelson, Philip E.; and Heron, John R., 4,047,547, Cl. 141-1.000.
Nelson, Robert Charles: *See*—
Shen, Kwan Ting; Gannon, John Allister; and Nelson, Robert Charles, 4,048,179, Cl. 260-29.40R.
Nenadal, Zdenek: *See*—
Hafner, Emanuel R.; and Nenadal, Zdenek, 4,048,446, Cl. 179-15.0AL.
Nenov, Dimiter Panayotov; and Danova, Verginia Ilieva, to VMEI "LENIN" — NIS Research Institution. Electrolytic process for silver oxidation. 4,048,025, Cl. 204-56.00R.
Neotechnic Engineering Limited: *See*—
Wilmot, Kenneth, 4,047,503, Cl. 119-75.000.
Neptune Eastech, Inc.: *See*—
Fussell, Theodore John, Jr., 4,047,432, Cl. 73-194.0VS.
Nett, Louis A. Ventilating apparatus. 4,047,519, Cl. 126-299.00D.
Neuray, Dieter: *See*—
Tresper, Erhard; Neuray, Dieter; and Freitag, Dieter, 4,048,200, Cl. 260-395.000.
Neuzil, Richard W.; and deRosset, Armand J., to UOP Inc. Process for separating an ester of a monoethanoid fatty acid. 4,048,205, Cl. 260-428.000.
Neuzil, Richard W.: *See*—
Rosback, Donald H.; and Neuzil, Richard W., 4,048,111, Cl. 252-455.00Z.
New Bedford Wire & Iron Company: *See*—
Benoit, Orient, 4,047,332, Cl. 49-236.000.
Newbury, Grant M.: *See*—
Gutridge, Jack E.; Marsh, Ronald W.; and Newbury, Grant M., 4,047,488, Cl. 105-315.000.
Ney, David Marshall, to Yoshida Kogyo Kabushiki Kaisha. Chair construction and method of assembling the same. 4,047,756, Cl. 297-219.000.
NGK Spark Plug Co., Ltd.: *See*—
Tanaka, Hiroshi; and Kato, Osamu, 4,047,897, Cl. 428-539.500.
Nichol, Kenneth J.: *See*—
Baker, Maurice W.; Kerry, John C.; Nichol, Kenneth J.; Marshall, John R.; Weighton, David M.; and Kozlik, Antonin, 4,048,188, Cl. 548-341.000.
Nicholson, John S.: *See*—
Adams, Stewart S.; Armitage, Bernard J.; and Nicholson, John S., 4,048,332, Cl. 424-317.000.
Nickey, George A.: *See*—
Brummett, Marshall G.; Heckman, Russell W.; Nickey, George A.; and Taylor, James E., 4,048,281, Cl. 264-230.000.
Niedzinski, Edmund John: *See*—
Oser, Nathan; and Niedzinski, Edmund John, 4,047,417, Cl. 72-185.000.
Nielsen, John G.: *See*—
Heffernan, William; Hair, George R.; and Nielsen, John G., 4,047,358, Cl. 53-30.00R.
Nielsen, Mogens B.; Boa, Niels Halfdan; and Jensen, Jimmy, to H. Reinholdt A/S, Hammer drilling devices. 4,047,722, Cl. 279-19.500.
Niggemann, Johannes: *See*—
Mues, Volker; and Niggemann, Johannes, 4,047,921, Cl. 71-11.000.
Nigrin, Jan, to Canadian Patents and Development Limited. Locked hybrid junction power combiner. 4,048,583, Cl. 331-56.000.
Niimi, Hirozi: *See*—
Sakayori, Seigo; Kuro, Tomoyosi; Morita, Kazuyuki; Hinooka, Nobuya; Niimi, Hirozi; and Komatsu, Kensuke, 4,048,355, Cl. 427-375.000.
Nilson, Billy Nils. Spraying device. 4,047,642, Cl. 222-94.000.
Nippon Electric Company, Limited: *See*—
Maruta, Rikio, 4,048,447, Cl. 179-15.0AS.
Ogawa, Masaki; Furutsuka, Takashi; and Ishikawa, Masaoki, 4,048,646, Cl. 357-15.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Kobayashi, Haruhiko, 4,047,684, Cl. 248-122.000.
Nippon Kogaku K.K.: *See*—
Iida, Yozo; Kawahara, Yasuhito; and Igarashi, Shigemi, 4,048,540, Cl. 315-241.00P.
Nippon Kokan Kabushiki Kaisha: *See*—
Adaniya, Takeshi; and Ohmura, Masaru, 4,048,381, Cl. 428-632.000.
Nippon Oil Company Ltd.: *See*—
Tsuchiya, Shozo; Hayashi, Hideo; and Oshima, Akio, 4,048,132, Cl. 260-33.6UA.
Nippon Steel Corporation: *See*—
Obinata, Tatsuichi; Wada, Kaname; Ogibayashi, Shigeaki; and Mihara, Hironobu, 4,047,556, Cl. 164-57.000.
Yoshida, Katsuyoshi; and Kitajima, Yukio, 4,047,977, Cl. 148-6.200.
Nippon Zeon Co. Ltd.: *See*—
Ishikawa, Atsuo; Tsubaki, Hidemi; Takahata, Hitoshi; Iwata, Riso; and Shinohara, Yonesaku, 4,048,124, Cl. 260-5.000.
Ishikawa, Atsuo; Tsubaki, Hidemi; Takahata, Hitoshi; Iwata, Riso; and Shinohara, Yonesaku, 4,048,424, Cl. 526-237.000.
Nippondenso Co., Ltd.: *See*—
Noguchi, Masaaki; Sumiyoshi, Masaharu; and Hobo, Nobuhito, 4,047,507, Cl. 123-32.0Ea.
Nischk, Gunther: *See*—
Wolf, Gerhard Dieter; Bentz, Francis; and Nischk, Gunther, 4,048,221, Cl. 260-512.00C.
Nishijima, Koji: *See*—
Sugimoto, Keiichi; Nishijima, Koji; Hanaoka, Tadashi; Akimoto, Hiroshi; and Kakeya, Nobuharu, 4,048,158, Cl. 260-239.100.
Nishimura, Hiroshi: *See*—
Matsuzawa, Norio; Oi, Hidesaburo; Nishimura, Hiroshi; Wada, Shigeru; and Sasaki, Juntaro, 4,048,415, Cl. 526-119.000.
Nissan Motor Company, Limited: *See*—
Koike, Shyouichi, 4,047,751, Cl. 296-146.000.
Nakajima, Yasuo; Hayashi, Yoshimasa; Takagi, Yasuo; Sugihara, Kunihiko; and Aoyama, Syunichi, 4,047,510, Cl. 123-119.00A.
Niswender, Gordon Dean, to Rohm and Haas Company. Solid phase double-antibody radioimmunoassay procedure. 4,048,298, Cl. 424-1.500.
Nitto Electric Industrial Co., Ltd.: *See*—
Nakagome, Keisuke; and Suzuki, Toshiharu, 4,048,005, Cl. 156-630.000.
Nix, George J.; Barrington, Burchus Q.; Farley, David L.; and Hortman, Norman G., to Halliburton Company. Weight and pressure operated well testing apparatus and its method of operation. 4,047,564, Cl. 166-72.000.
Nnadi, John C.; and Landis, Phillip S., to Mobil Oil Corporation. Organic lubricating compositions containing esters of benzotriazole. 4,048,082, Cl. 252-51.50A.
Noack, Wolfgang-Hermann, to Karl Schmidt GmbH. Locking means for piston pin. 4,047,471, Cl. 92-187.000.
Noehren, William Lawrence: *See*—
Ferris, Donald Leroy; and Noehren, William Lawrence, 4,047,839, Cl. 416-134.00A.
Noel, Stephane, to Solvay & Cie. Process for preventing build-up in polymerization reactors. 4,048,417, Cl. 526-62.000.
Noeske, Heinz Otto, to General Electric Company. Puffer-type gas-blast circuit breaker. 4,048,456, Cl. 200-148.00A.
Noguchi, Masaaki; Sumiyoshi, Masaharu; and Hobo, Nobuhito, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel economizing system. 4,047,507, Cl. 123-32.0Ea.
Nohe, Heinz: *See*—
Beck, Fritz; Francke, Diethard; Nohe, Heinz; Hannebaum, Heinz; and Stroezel, Manfred, 4,048,047, Cl. 204-270.000.
Noranda Mines Limited: *See*—
Morrison, Bernard H., 4,047,939, Cl. 75-99.000.
Nordsiek, Karl-Heinz: *See*—
Haag, Horst; Nordsiek, Karl-Heinz; Streck, Roland; and Zerpner, Dieter, 4,048,262, Cl. 260-889.000.
Norfin, Inc.: *See*—
Snellman, Donald L.; Kuspert, John C.; and Saunders, Arthur G., 4,047,713, Cl. 271-221.000.
Norman, Bill. Contoured wrist support. 4,047,250, Cl. 2-161.00A.

Northern Telecom Limited: *See*—
Gumb, Beverly William; Kuhfus, Gerd; and Cogan, Frederick Thomas, 4,047,787, Cl. 339-154.00A.
Pickar, Kenneth Arnold, 4,048,647, Cl. 357-22.000.
Notheisz, Ferenc: *See*—
Karpati, Egon; Szporny, Laszlo; Bartok, Mihaly; Czombos, Jozsef; Felfoldi, Karoly; Laszlavik, Marta; and Notheisz, Ferenc, 4,048,322, Cl. 424-283.000.
Novello, Frederick C.: *See*—
Baldwin, John J.; and Novello, Frederick C., 4,048,183, Cl. 260-296.00R.
Nuclear Power Company (Whetstone Limited): *See*—
George, Brian Victor; and Drayrer, Colin James, 4,048,012, Cl. 176-60.000.
Numata, Saburo, to Fuji Photo Optical Co., Ltd. Warning device for a camera. 4,048,644, Cl. 354-60.00L.
Numberger, Christian Konrad. Installation for producing green malt from barley and/or for storing and continuously dispensing green malt. 4,048,019, Cl. 195-129.000.
Nurk, Siegfried, to Gottlieb Eppinger. Method for forming a closed toe. 4,047,401, Cl. 66-187.000.
Nussbaumer, Henri J., to International Business Machines Corporation. Digital filter generating a discrete convolution function. 4,048,485, Cl. 235-156.000.
Nutrilite Products, Inc.: *See*—
Gretz, Charles, 4,048,051, Cl. 206-1.500.
Obinata, Tatsuichi; Wada, Kaname; Ogibayashi, Shigeaki; and Mihara, Hironobu, to Nippon Steel Corporation; and Hitachi Cable, Ltd. Continuous casting method. 4,047,556, Cl. 164-57.000.
O'Brian, Edward D., to Polytop Corporation. Child resistant dispensing closures. 4,047,495, Cl. 215-224.000.
O'Brien, Miguel Eugene: *See*—
Blevitt, Robert; and O'Brien, Miguel Eugene, 4,047,623, Cl. 214-17.00C.
Occidental Oil Shale, Inc.: *See*—
Ridley, Richard D., 4,047,760, Cl. 299-2.000.
O'Connor, Alton J.; and Schrinel, Thomas L., to Walbro Corporation. In-line pump construction. 4,047,852, Cl. 417-415.000.
Oda Gosen Kogyo Kabushiki Kaisha: *See*—
Takai, Isao, 4,047,373, Cl. 57-77.400.
Oehring, Hans; and Rossomando, Philip Joseph, to Bell Telephone Laboratories, Incorporated. Automatic call distribution system. 4,048,452, Cl. 179-27.00D.
Oelke, Waldemar W.; and Hagedorn, Floyd T., to Libbey-Owens-Ford Company. Apparatus for press bending relatively thin glass sheets. 4,047,919, Cl. 65-273.000.
Ogaki, Koji: *See*—
Tamura, Yukio; Hirosawa, Katsu; and Ogaki, Koji, 4,047,387, Cl. 61-13.000.
Ogawa, Akira: *See*—
Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ogawa, Akira, 4,047,964, Cl. 96-126.000.
Ogawa, Masaki; Furutsuka, Takashi; and Ishikawa, Masaoki, to Nippon Electric Company, Limited. Dual-gate Schottky barrier gate fet having an intermediate electrode and a method of making same. 4,048,646, Cl. 357-15.000.
Ogibayashi, Shigeaki: *See*—
Obinata, Tatsuichi; Wada, Kaname; Ogibayashi, Shigeaki; and Mihara, Hironobu, 4,047,556, Cl. 164-57.000.
O'Hara, Mark J., to UOP Inc. Hydrodesulfurization catalyst and method of preparation. 4,048,115, Cl. 252-465.000.
Ohashi, Tsuneo: *See*—
Yanagida, Hiroaki; and Ohashi, Tsuneo, 4,047,971, Cl. 134-2.000.
Ohmura, Masaru: *See*—
Adaniya, Takeshi; and Ohmura, Masaru, 4,048,381, Cl. 428-632.000.
Ohno, Ryotaro: *See*—
Arakawa, Masatoshi; Ohno, Ryotaro; Ishikawa, Katuhiro; Yamahara, Noboru; and Matsui, Hisashi, 4,048,147, Cl. 260-67.0UA.
Ohzeki, Masanao: *See*—
Arai, Yoshi; Kimura, Kazuo; Sato, Hisato; Yamaki, Takasi; Morita, Katsuhiko; Ohzeki, Masanao; Takatsu, Haruyoshi; Fujita, Yutaka; and Tazume, Masayuki, 4,048,089, Cl. 252-299.000.
Oi, Hidesaburo: *See*—
Matsuzawa, Norio; Oi, Hidesaburo; Nishimura, Hiroshi; Wada, Shigeru; and Sasaki, Juntaro, 4,048,415, Cl. 526-119.000.
Oikawa, Kiyoshi: *See*—
Ishii, Atsushi; Oikawa, Kiyoshi; Suzuki, Tadaaki; Morita, Tetsuro; and Iizuka, Yoshio, 4,048,656, Cl. 358-261.
Oikawa, Kunihiro, to Iwaki Co., Ltd. Magnetically driven centrifugal pump. 4,047,847, Cl. 417-370.000.
Okachi, Ryo: *See*—
Nara, Takashi; Okachi, Ryo; Yamamoto, Mitsuyoshi; Mori, Yasuki; Sato, Moriyuki; Sugimoto, Masahiro; and Shimizu, Yoshiaki, 4,048,015, Cl. 195-96.000.
Okamoto, Tsuneo: *See*—
Murakami, Heiichiro; and Okamoto, Tsuneo, 4,047,906, Cl. 55-79.000.
Okano, Yukio; Kita, Nobuyuki; and Uesugi, Kyozo, to Minolta Camera Kabushiki Kaisha. Diaphragm device. 4,047,807, Cl. 350-266.000.
Okumura, Sosuke, to Yutaka Denki Saisakusho. Dust collector for dental technician. 4,047,913, Cl. 55-418.000.
Okura, Masaatsu; Ota, Kazutoshi; and Otomi, Sadayuki, to Mitsubishi Denki Kabushiki Kaisha. Guide device for elevator. 4,047,597, Cl. 187-95.000.
O'Leary, Timothy J., deceased: *See*—
Kelleher, Raymond L.; Shirk, Ivan A.; and O'Leary, Timothy J., deceased, 4,048,287, Cl. 423-242.000.
Olesen, Ole V. Method and apparatus for timing intravenous liquid drip rate. 4,048,474, Cl. 235-151.340.
Olin Corporation: *See*—
Babiec, John S., Jr.; Nakos, Steven T.; and Goldstein, Stephen L., 4,048,107, Cl. 260-2.5AC.
Knollmueller, Karl O., 4,048,083, Cl. 252-78.300.
Knollmueller, Karl O., 4,048,084, Cl. 252-78.300.
Parikh, Prakash D.; and Shapiro, Eugene, 4,047,978, Cl. 148-11.50C.
Saeman, Walter C.; and Coe, Noel N., 4,048,351, Cl. 427-213.000.
Watson, W. Gary; and Breedis, John F., 4,047,980, Cl. 148-12.70C.
Olsson, Olof Bertil: *See*—
Fredriksson, Lars Evert; Jacobson, Gunnar; and Olsson, Olof Bertil, 4,047,464, Cl. 89-1.811.
Olympus Optical Company, Ltd.: *See*—
Satoh, Ken, 4,048,549, Cl. 318-345.00F.
Omron Tateisi Electronics Company: *See*—
Yoshida, Shinya, 4,048,475, Cl. 235-61.70B.
Ono, Hiroshi: *See*—
Jidai, Eiki; Ono, Hiroshi; and Shibayama, Kyoichi, 4,048,379, Cl. 428-500.000.
Ono, Masato; and Nakamura, Minoru, to Glory Kogyo Kabushiki Kaisha. Wrapping paper supplying device in coin wrapping apparatus. 4,047,361, Cl. 53-212.000.
Ono, Yasutaka: *See*—
Yokota, Takeshi; Suzuki, Nobuyuki; Sowa, Tsuneo; Sasaki, Yasuharu; and Ono, Yasutaka, 4,048,307, Cl. 424-180.000.
Onuma, Kazuhiko: *See*—
Matsushita, Kunichi; Sakurada, Hikaru; Onuma, Kazuhiko; and Fujii, Shinichi, 4,048,112, Cl. 252-461.000.
Ooba, Seiichi; and Hirayama, Shinichi, to Fuji Photo Film Co., Ltd. Adhesive coatings from ether-type polyester, urethane elastomer, and polyisocyanate. 4,048,253, Cl. 260-858.000.
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, to Multinorm, B.V. Mowing device. 4,047,369, Cl. 56-295.000.
Orkin, Stanley S.; and Nagy, Edward John, to Kamatics Corporation. Shaped bearing member. 4,048,370, Cl. 428-323.000.
Orme, Myrl E.; and Vick, Ralph L., to Bendix Corporation, The. Multi-path valve structure having extended life and backwashing capability. 4,047,540, Cl. 137-239.000.
Osborne, Eugene F., to United States of America, Navy. Carrier-modulated coherency monitoring system. 4,048,563, Cl. 325-58.000.
Oscarson, John R.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Oscarson, John R.; and Routien, John B., 4,048,304, Cl. 424-122.000.
Oser, Nathan; and Niedzinski, Edmund John, to Johns-Manville Corporation. Deeply embossed sheet product and method and apparatus for the production thereof. 4,047,417, Cl. 72-185.000.
Osher, Benjamin B., to Kleer-Vu Industries, Inc. Holder for photos and the like. 4,047,315, Cl. 40-102.000.
Oshima, Akio: *See*—
Tsuchiya, Shozo; Hayashi, Hideo; and Oshima, Akio, 4,048,132, Cl. 260-33.6UA.
Ostern, Sverre Ludvik, to Dyno Industrier A.S. Method for the recovery of blasting oil from effluents from the production of nitroglycerine-containing explosives. 4,047,989, Cl. 149-109.600.
Ota, Kazutoshi: *See*—
Okura, Masaatsu; Ota, Kazutoshi; and Otomi, Sadayuki, 4,047,597, Cl. 187-95.000.
Otis Engineering Corporation: *See*—
Crickmer, Charles D., 4,047,565, Cl. 166-217.000.
Otomi, Sadayuki: *See*—
Okura, Masaatsu; Ota, Kazutoshi; and Otomi, Sadayuki, 4,047,597, Cl. 187-95.000.
Ott, Hubert, to Mannesmann Aktiengesellschaft. Head for needle printer. 4,047,606, Cl. 197-1.00R.
Otte, Hubert Josef; and Roosman, Gosta. Bore hole probe. 4,047,306, Cl. 33-314.000.
Ottesen, Hjalmar Holmboe: *See*—
Dennison, James Clifford; and Ottesen, Hjalmar Holmboe, 4,048,660, Cl. 360-77.000.
Otto Bihler Maschinenfabrik GmbH & Co. KG: *See*—
Kopf, Johann, 4,048,461, Cl. 219-104.000.
Otto, Lucy A., to United States of America, Health, Education and Welfare. Identification of non-fermentative gram-negative bacteria. 4,048,016, Cl. 195-100.000.
Oulton, T. Dixon: *See*—
Isaac, Peter A. H.; and Oulton, T. Dixon, 4,047,738, Cl. 282-27.500.
Ours, Frank M. Electrically heated spreader assembly having a detachable blade. 4,048,471, Cl. 219-228.000.
Ovechkin, Alexandr Vasilievich: *See*—
Kovin, Vladimir Mikhailovich; Mitenkov, Fedor Mikhailovich; Ovechkin, Alexandr Vasilievich; Pankratov, Vladimir Alexeevich; Savin, Nikolai Ivanovich; Ternikova, Tamara Alexandrovna; Filippov, Vladimir Jurievich; Khramov, Dmitry Alexandrovich; Chernomordik, Evgeny Naumovich; Shiryaev, Vladimir Ivanovich; Muzychuk, Vladimir Romanovich; and Savin, Alexandr Nikolaevich, 4,048,011, Cl. 176-40.000.
Owen, Daniel V.; and Knoble, David W., to General Electric Company. Discharge lamp operating circuit. 4,048,543, Cl. 315-205.000.
Owens-Illinois, Inc.: *See*—
Brummett, Marshall G.; Heckman, Russell W.; Nickey, George A.; and Taylor, James E., 4,048,281, Cl. 264-230.000.
Hinson, David C.; Bode, Wolfgang W.; Fein, Michael E.; and Hoehn, H. Joseph, 4,048,533, Cl. 313-188.000.
Lohmann, Larry John, 4,047,612, Cl. 206-454.000

Taylor, Lynn J.; and Tobias, John W., 4,048,410, Cl. 526-22.000.
Oxy Metal Industries Corporation: *See*—
Stevens, Peter, 4,048,023, Cl. 204-44.000.
Ozaki, Nobuo, to Maeda Industries, Ltd. Multi-speed bicycle free wheel assembly. 4,047,603, Cl. 192-64.000.
Ozawa, Hiroshi: *See*—
Kobayashi, Sadao; Ozawa, Hiroshi; and Kobayashi, Nobuki, 4,048,136, Cl. 260-42.140.
Ozeki, Osamu: *See*—
Ito, Hajime; Yamanaka, Teruo; and Ozeki, Osamu, 4,048,613, Cl. 340-53.000.
Ozeki, Shigeru: *See*—
Ishida, Minoru; and Ozeki, Shigeru, 4,047,296, Cl. 30-41.000.
P. R. Mallory & Co. Inc.: *See*—
Bro, Per, 4,048,404, Cl. 429-199.000.
Pabsdorff, Melvin, to A/S Hymas. Excavator blade for replacing railroad sleepers. 4,047,486, Cl. 104-9.000.
Packard, Keith A.: *See*—
Wilcox, Glade; and Packard, Keith A., 4,048,561, Cl. 325-22.000.
Packer, Lester; and Bymun, Edwin N., to United States of America, Energy Research and Development Administration. Low toxicity method of inhibiting sickling of sickle erythrocytes. 4,048,325, Cl. 424-298.000.
Paetz, Eike: *See*—
Haferkamp, Dirk; Hodzic, Alija; Paetz, Eike; and Stach, Heinrich, 4,047,742, Cl. 285-187.000.
Pako Corportion: *See*—
Anderson, Conrad V., 4,047,445, Cl. 74-230.400.
Palette, Ralph John: *See*—
DeNigris, Ernest Gerard; and Palette, Ralph John, 4,047,781, Cl. 339-17.00R.
Palmberg, Paul W.: *See*—
Gerlach, Robert L.; and Palmberg, Paul W., 4,048,498, Cl. 250-305.000.
Palmer, William: *See*—
Balthes, John; Balthes, Garry; and Palmer, William, 4,047,366, Cl. 56-63.000.
Pammer, Gottfried; and Kvasnicka, Rudolf, to Vockenhuber, Karl; and Hauser, Raimund. Apparatus for adjusting the rotational speed of a drive mechanism. 4,047,442, Cl. 74-194.000.
Pandel-Bradford, Inc.: *See*—
Wisotzky, Reuben; and Bolger, John C., 4,048,269, Cl. 264-25.000.
Panicci, Richard L.: *See*—
McDonald, Quentin H.; and Panicci, Richard L., 4,047,755, Cl. 297-216.000.
Pankratov, Vladimir Alexeevich: *See*—
Kovin, Vladimir Mikhailovich; Mitenkov, Fedor Mikhailovich; Ovechkin, Alexandr Vasilievich; Pankratov, Vladimir Alexeevich; Savin, Nikolai Ivanovich; Ternikova, Tamara Alexandrovna; Filippov, Vladimir Jurievich; Khramov, Dmitry Alexandrovich; Chernomordik, Evgeny Naumovich; Shiryaev, Vladimir Ivanovich; Muzychuk, Vladimir Romanovich; and Savin, Alexandr Nikolaevich, 4,048,011, Cl. 176-40.000.
Pannier, Karl A., Jr.: *See*—
Reynolds, Gordon S.; Pannier, Karl A., Jr.; and Sorenson, James L., 4,047,526, Cl. 128-214.00R.
Panoz, David M. Motorcycle frame. 4,047,730, Cl. 280-281.0LP.
Paoli High Fidelity Consultants Inc.: *See*—
Curcio, Joseph John, 4,048,523, Cl. 307-297.000.
Papantoniou, Christos, to L'Oreal. Hair dye composition containing a cationic resin. 4,047,888, Cl. 8-10.200.
Papantoniou, Christos, to L'Oreal. Shampoo composition containing a detergent and a graft cationic copolymer. 4,048,301, Cl. 424-70.000.
Paper, Calmenson & Co.: *See*—
Tronvold, Harlan C., 4,047,706, Cl. 266-49.000.
Paradis, Joseph R., to Dennison Manufacturing Company. Installation tool. 4,047,545, Cl. 140-123.600.
Pardo, Pierre; and Pruvot, Francois C., to SOFERMO. Robot head. 4,047,448, Cl. 74-417.000.
Parikh, Prakash D.; and Shapiro, Eugene, to Olin Corporation. Processing copper base alloys. 4,047,978, Cl. 148-11.50C.
Park, Ernest D.; and Dianetti, Joseph C., to American Optical Corporation. Optical relay for a microscope and a back aperture viewer therefor. 4,047,794, Cl. 350-54.000.
Parke, Davis & Company: *See*—
Baker, David Clarkston, 4,048,432, Cl. 536-26.000.
Parker, James A.: *See*—
Breznak, Robert A.; and Parker, James A., 4,048,277, Cl. 264-83.000.
Parkes, Alvin G., to Raymond Lee Organization, Inc., The, a part interest. Fifth wheel carrier hoist. 4,047,733, Cl. 280-402.000.
Parry, Keith Peter; and George, Edwin Francis, to Imperial Chemical Industries Limited. Regulating plant growth. 4,047,924, Cl. 71-76.000.
Pascaud, Xavier: *See*—
Beregi, Laszlo; Hugon, Pierre; Pascaud, Xavier; and Poignant, Jean-Claude, 4,048,321, Cl. 424-274.000.
Vincent, Michel; Remond, Georges; Pascaud, Xavier; and Poignant, Jean-Claude, 4,048,313, Cl. 424-248.500.
Pasquine, Arthur R.: *See*—
Spiers, Steven F.; Lewis, Howard M.; Kraft, Gerald A.; and Pasquine, Arthur R., 4,047,421, Cl. 73-1.00R.
Patel, Direj Vallabhbhai; and Ward, John Joseph Bernard, to International Lead Zinc Research Organization, Inc. Bright levelling zinc plating. 4,048,024, Cl. 204-55.00R.
Paterson, James G. T.; Watkins, Charles W.; and Duckworth, Grover G., Jr., to Interdye Technology Corporation. Method for space dyeing yarn. 4,047,271, Cl. 28-220.000.
Paul, Albertha M.; and Moppett, Charles E., to Dow Chemical Company, The. 3-Carboalkoxy (or phenoxy) and 3-thiocarbo-(3-chloro-2-propenyl)-1,3,5,7-tetraazabicyclo(3.3.1)nonane and preparation. 4,048,166, Cl. 544-215.000.
Paul, Albertha M.; and Moppett, Charles E., to Dow Chemical Company, The. N,N-disubstituted derivatives of 3-carboxamide or 3-(thiocarboxamide-7-(3-chloro-2-propenyl)-1,3,5,7-tetraazabicyclo(3.3.1-)nonane and preparation II. 4,048,167, Cl. 544-215.000.
Pearl, Edgar W.: *See*—
Johns, Eddie D.; Cummings, Robert E.; and Pearl, Edgar W., 4,047,408, Cl. 70-129.000.
Pearre, Stephen G.; and Craighead, Bobby L., to Environmental Elements Corporation. Center column drive arrangement for circular clarifiers. 4,048,076, Cl. 210-528.000.
Peccoud nee Toupillier, Louise: *See*—
Bernard, Jean; Frossati, Giorgio; Guernet, Georges; Montier, Michel; Peccoud nee Toupillier, Louise; and Thoulouze, Daniel, 4,047,436, Cl. 73-362.0SC.
Pechiney Ugine Kuhlmann: *See*—
Kienzle, Jean Andre Paul, 4,048,189, Cl. 260-314.500.
Peck, Richard John; and Tong, Shih Yung, to Bell Telephone Laboratories, Incorporated. Asynchronous-to-synchronous data concentration system. 4,048,440, Cl. 178-69.100.
Pedershaab Maskinfabrik A/S: *See*—
Holme, Bent Melchior Karlsen, 4,047,693, Cl. 249-187.00R.
Pell, Kynric M.; and Brown, David B., to United States of America, Army. Attitude determination using two transmitter/receiver stations and skewed reflectors. 4,047,816, Cl. 356-152.000.
Pellegrin, Anna J.: *See*—
Adams, Guy Emery; and Pellegrin, Anna J., 4,047,513, Cl. 123-148.00E.
Pelzek, Victor J., to Browne Packaging, Inc. Adhesive laminated packaging materials. 4,048,378, Cl. 428-483.000.
Pelzer, Rudolf: *See*—
Heymes, Pierre Rene; and Pelzer, Rudolf, 4,047,917, Cl. 65-146.000.
Pemsler, J. Paul: *See*—
Rappas, Alkis S.; and Pemsler, J. Paul, 4,047,940, Cl. 75-108.000.
Penn, Laurence Richard. Metering piston pump with piston-carried distributor for viscous fluid. 4,047,854, Cl. 417-489.000.
Penn, Nathar W. Composition for antagonizing the narcotic effects of barbiturate addiction and withdrawal effects, and for treatment of barbiturate poisoning. 4,048,316, Cl. 424-251.000.
Pennwalt Corporation: *See*—
Guzzardo, George Paul, 4,047,959, Cl. 106-2.000.
MacLeay, Ronald Edward; and Sheppard, Chester Stephen, 4,048,423, Cl. 526-209.000.
Perciaccante, Vincent Anthony; and Landi, Henry Patrick, to American Cyanamid Company. Absorbable surgical sutures coated with polyoxyethylene-polyoxypropylene copolymer lubricant. 4,047,533, Cl. 128-335.500.
Perry, Robert W.: *See*—
Campbell, Richard A.; Sparks, Richard A.; and Perry, Robert W., 4,048,580, Cl. 331-1.00R.
Pertriaux, Jean-Pierre Felix, to Pont-A-Mousson S.A. Composite reinforced pipe union. 4,047,741, Cl. 285-55.000.
Petersen, Richard D.; and Mieville, Rodney L., to Standard Oil Company (Indiana). Methods to be used in reforming processes employing multi-metallic catalysts. 4,048,058, Cl. 208-138.000.
Peterson, James F., to Allis-Chalmers Corporation. Attachment for collecting mower discharge in a plurality of bags. 4,047,368, Cl. 56-202.000.
Petrolite Corporation: *See*—
May, Walter R.; Zetlmeisl, Michael J.; and Koch, Kenneth W., 4,047,875, Cl. 431-3.000.
Redmore, Derek, 4,048,264, Cl. 260-929.000.
Unmuth, George E., 4,048,376, Cl. 428-461.000.
Petterson, Tor H. Device and method for unclogging drains. 4,047,253, Cl. 4-255.000.
Pettit, Ernest E., to Sell, W. Leon; Pettit, Ernest E.; and Sell, R. Don. Upgrading current distribution insulators. 4,047,279, Cl. 29-426.000.
Peuzin, Jean Claude: *See*—
Challeton, Didier; Coeure, Philippe; Jadot, Jean Pierre; and Peuzin, Jean Claude, 4,047,801, Cl. 350-96.0WG.
Pews, R. Garth: *See*—
Mixan, Craig E.; and Pews, R. Garth, 4,048,213, Cl. 260-465.00F.
Pfaff, Maurice Edgar, to Eastman Kodak Company. Imagewise soluble silver salt intensification of diffusion transfer silver images. 4,047,952, Cl. 96-29.00R.
Pfaff, Maurice Edgar, to Eastman Kodak Company. Color diffusion transfer employing silver salt transfer reversal and 4-thiohydantoine. 4,047,953, Cl. 96-29.00D.
Pfeifer, Raymond; and Ringger, Roger. Knockdown put-together article of furniture. 4,047,777, Cl. 312-263.000.
Pfister, Gustav R.; and Williams, David J., to Xerox Corporation. Xeroprinting master and process. 4,047,945, Cl. 96-1.00R.
Pfister, William H., to Pfister, William R. Fish lure. 4,047,317, Cl. 43-42.060.
Pfister, William R.: *See*—
Pfister, William H., 4,047,317, Cl. 43-42.060.
Pfizer Inc.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Moppett, Charles E.; Oscarson, John R.; and Routien, John B., 4,048,304, Cl. 424-122.000.

Pfleger, Klaus: *See*—
Mietzner, Franz Georg; Pfleger, Klaus; Gropper, Hans; Buechner, Oskar; Boettcher, Klaus; and Zacher, Wieland, 4,048,411, Cl. 526-64.000.
Philip Morris Incorporated: *See*—
Spiers, Steven F.; Lewis, Howard M.; Kraft, Gerald A.; and Pasquine, Arthur R., 4,047,421, Cl. 73-1.00R.
Philip, Thomas. Purification of lutein-fatty acid esters from plant materials. 4,048,203, Cl. 260-412.800.
Philippar, Donald T. Combination sheath and rigid handle for knife blades and the like. 4,047,298, Cl. 30-153.000.
Phillips, Jack L.; and Dickinson, Timothy E. Vacuum forcep and method of using same. 4,047,532, Cl. 128-303.00R.
Phillips Petroleum Company: *See*—
Cheng, Paul J., 4,048,063, Cl. 210-72.000.
Cheng, Paul J., 4,048,067, Cl. 210-73.00R.
Clampitt, Richard L.; and Hessert, James E., 4,048,079, Cl. 252-8.55D.
Cobb, Raymond L., 4,048,209, Cl. 260-464.000.
Fuller, Edward N., 4,047,892, Cl. 23-232.00C.
Gardner, Lloyd E.; Fahey, Darryl R.; and Mahan, John E., 4,048,238, Cl. 260-618.00R.
Solomon, Paul W., 4,048,426, Cl. 526-334.000.
Vanderveen, John W., 4,047,896, Cl. 23-314.000.
Phillipson, Ronald Frederick: *See*—
Berg, Samuel Sidney; Jenkins, David Conwil; and Phillipson, Ronald Frederick, 4,048,326, Cl. 424-300.000.
Physical Electronics Industries, Inc.: *See*—
Gerlach, Robert L.; and Palmberg, Paul W., 4,048,498, Cl. 250-305.000.
Pickar, Kenneth Arnold, to Northern Telecom Limited. Solid state disconnect device. 4,048,647, Cl. 357-22.000.
Piepho, Donald A.: *See*—
May, Czeslaw J.; and Piepho, Donald A., 4,047,542, Cl. 137-627.500.
Pierres, Sergio Ortega, to Fertilizantes Fosfatados Mexicanos, S.A. Stabilization of wet-process phosphoric acid. 4,048,289, Cl. 423-317.000.
Pieters, Eli, to Lawrence Peska Associates, Inc., a part interest. Reflecting device. 4,047,802, Cl. 350-97.000.
Pigerol, Charles; Eymard, Pierre; Vernieres, Jean-Claude; and Werbenec, Jean-Pierre, to Labaz. Active derivatives of methylamino in therapeutic compositions and methods of use. 4,048,334, Cl. 424-325.000.
Pignocco, Arthur J.; and Kachik, Robert H., to United States Steel Corporation. Method of producing a refractory lining in a cylinder or tube. 4,048,352, Cl. 427-234.000.
Pinchock, Donald E., to Metcom Products Company. Truck assembly for a skate-like device. 4,047,725, Cl. 280-11.280.
Pintschovius, Ulrich; Schinzel, Erich; and Rosch, Gunter, to Hoechst Atiengesellschaft. Benzoxazole derivatives, process for their preparation and their use as optical brighteners. 4,048,185, Cl. 260-307.00D.
Piper, Hugh V.: *See*—
Vaughn, Kennith E.; and Piper, Hugh V., 4,047,771, Cl. 308-237.00R.
Pitney-Bowes, Inc.: *See*—
Dlugos, Daniel F., 4,047,585, Cl. 177-210.00R.
Dlugos, Daniel F., 4,047,586, Cl. 177-210.00R.
Muller, Henry J., 4,047,453, Cl. 74-813.00R.
Pittenger, Daniel I.: *See*—
Bowler, John W.; Karner, Kenneth E.; Pittenger, Daniel I.; and Schwartz, Donald A., 4,048,669, Cl. 361-391.000.
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, to International Flavors & Fragrances Inc. Novel enol esters. 4,048,201, Cl. 260-410.000.
Pittinger, Charles B., Sr. Method and apparatus for sharpening end of filament in vegetation filament-trimmer. 4,047,455, Cl. 76-82.100.
Platt, Jeremy A.: *See*—
Baird, William G., Jr.; Holbrook, Stanley E.; and Platt, Jeremy A., 4,048,428, Cl. 526-343.000.
Plaxico, Robert E.: *See*—
Stout, James T.; and Plaxico, Robert E., 4,047,610, Cl. 206-187.000.
Plech, John, Jr. Peg game with spinner-type timer. 4,047,716, Cl. 273-1.00R.
Plugge, Jerome R. Hydrotherapeutic apparatus. 4,047,522, Cl. 128-66.000.
Plunkett, Joseph A.: *See*—
Chuang, Ping-chien; and Plunkett, Joseph A., 4,048,615, Cl. 340-146.3AC.
Poignant, Jean-Claude: *See*—
Beregi, Laszlo; Hugon, Pierre; Pascaud, Xavier; and Poignant, Jean-Claude, 4,048,321, Cl. 424-274.000.
Vincent, Michel; Remond, Georges; Pascaud, Xavier; and Poignant, Jean-Claude, 4,048,313, Cl. 424-248.500.
Polaroid Corporation: *See*—
Greenwald, Richard B., 4,047,954, Cl. 96-29.00R.
Greenwald, Richard B., 4,047,955, Cl. 96-29.00R.
Stephens, Robert K., 4,047,804, Cl. 350-164.000.
Wolff, Otto E., 4,047,289, Cl. 29-623.400.
Politechnika Warszawska: *See*—
Ratajczyk, Eugeniusz; Goscimski, Januariusz; and Jedrzejewski, Adam, 4,047,305, Cl. 33-172.00R.
Pollard, Leslie John; and Stewart, Donald Fergusson, to ICI Australia Limited. Beneficiation of the non-ferrous metal values of oxide-containing materials. 4,047,934, Cl. 75-29.000.
Pollitzer, Ernest L.; and Hayes, John C., to UOP Inc. Dehydrogenation method and nonacidic multimetallic catalytic composite for use therein. 4,048,245, Cl. 260-668.00D.
Polytechnic Institute of New York: *See*—
Sforza, Pasquale M., 4,047,832, Cl. 415-1.000.
Polytop Corporation: *See*—
Hazard, Robert E., 4,047,643, Cl. 222-153.000.
O'Brian, Edward D., 4,047,495, Cl. 215-224.000.
Pomeroy, Bruce D.; and Kosky, Philip G., to General Electric Company. Flow control device for superconductive rotor refrigerant. 4,048,529, Cl. 310-54.000.
Pont-A-Mousson S.A.: *See*—
Pertriaux, Jean-Pierre Felix, 4,047,741, Cl. 285-55.000.
Poole, Eric John, to Compair Industrial Limited. Centrifugal compressors. 4,047,848, Cl. 417-374.000.
Pope & Talbot, Inc.: *See*—
Postman, John R.; and Bottorff, Elwin G., 4,047,344, Cl. 52-390.000.
Popov, Valentin Alexeevich. Globoid worm gearing and method of making globoid worm thereof. 4,047,449, Cl. 74-458.000.
Poppe, Wassily W.: *See*—
Keske, Robert G.; Poppe, Wassily W.; and Fielding, Ivor R., 4,048,131, Cl. 260-33.20R.
Poppel, Eugene H.: *See*—
Hart, Donald J.; Bouton, John C., Jr.; and Poppel, Eugene H., 4,048,616, Cl. 340-146.3ED.
Porath, Jerker Olof: *See*—
Axen, Rolf Erik Axel Verner; Porath, Jerker Olof; and Carlsson, Per Jan Erik, 4,048,416, Cl. 526-9.000.
Porret, Daniel; and Habermeier, Jurgen, to Ciba-Geigy Corporation. Dialkoxyphosphonoalkyl derivatives of dihydrouracils. 4,048,170, Cl. 260-256.40E.
Porter, David Edward. Mounting bracket for radios in vehicles. 4,047,686, Cl. 248-203.000.
Post, Beverley C.: *See*—
Mitchell, Earl R.; Brown, Thomas D.; and Post, Beverley C., 4,047,879, Cl. 431-183.000.
Postman, John R.; and Bottorff, Elwin G., to Pope & Talbot, Inc. Wood veneer wall covering. 4,047,344, Cl. 52-390.000.
Potomac Applied Mechanics, Inc.: *See*—
Stubbings, James Henry, 4,047,457, Cl. 83-71.000.
Poujois, Robert: *See*—
Barbier, Daniel; Ittel, Jean-Michel; and Poujois, Robert, 4,048,574, Cl. 330-9.000.
Powell, Justin Christopher, to Texaco Inc. Method for preparing a lactone reaction product. 4,047,899, Cl. 44-63.000.
Powell, Truman W. Push pull type exercising device. 4,047,714, Cl. 272-116.000.
Powers, Edward J.: *See*—
Calundann, Gordon W.; and Powers, Edward J., 4,048,139, Cl. 260-45.80N.
PPG Industries, Inc.: *See*—
Bartrug, Norman G.; and McDaniel, Donald L., 4,047,429, Cl. 73-150.00R.
Heithoff, Robert B., 4,047,918, Cl. 65-179.000.
Prucnal, Paul J., 4,048,036, Cl. 204-159.230.
Reese, Thomas J.; Mortimer, James R.; Tobin, Melvin W.; and Jursa, Stephen J. D., 4,047,916, Cl. 65-106.000.
Tsai, Yih-Wan, 4,047,560, Cl. 165-9.300.
Pracht, Hans J.: *See*—
Burns, Michael E.; and Pracht, Hans J., 4,048,433, Cl. 536-99.000.
Prazska akumulatorka, narodni podnik: *See*—
Sandera, Josef; Calabek, Milan; Cenek, Miroslav; Kalab, Frantisek; Koudelka, Vojtech; Kouril, Oldrich; Malik, Jiri; and Vanacek, Josef, 4,048,406, Cl. 429-209.000.
Prepost, Kalman: *See*—
Toth, Laszlo; Schirhuber, Janos; Prepost, Kalman; and Tassi, Andras, 4,048,466, Cl. 219-121.0EM.
Prescher, Gunter; and Schreyer, Gerd, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of pure racemic acid and mesotartaric acid. 4,048,225, Cl. 260-536.000.
Prive, Leonel. Vehicle suspension. 4,047,736, Cl. 280-683.000.
Procter & Gamble Company, The: *See*—
Burns, Michael E.; and Pracht, Hans J., 4,048,433, Cl. 536-99.000.
Produits Chimiques Ugine Kuhlmann: *See*—
Boschetti, Egisto; Moroux, Yvette Paule Nicole; and Tixier, Rene, 4,048,377, Cl. 428-474.000.
Propp, Carl F. Oil and waste water reception facility and process. 4,048,070, Cl. 210-85.000.
Prucnal, Paul J., to PPG Industries, Inc. Process for producing films of low gloss by exposure to ultraviolet light. 4,048,036, Cl. 204-159.230.
Prueter, Elton D.: *See*—
McMaster, Elmer L.; Grenley, Dallas G.; and Prueter, Elton D., 4,048,000, Cl. 156-304.000.
Pruvot, Francois C.: *See*—
Pardo, Pierre; and Pruvot, Francois C., 4,047,448, Cl. 74-417.000.
Pryce-Jones, Alan, to Holt, Jeremy Bruce, a part interest. Method of making a structural element. 4,048,273, Cl. 264-46.500.
Pryce, Robert J.: *See*—
Bond, Richard P. M.; Pryce, Robert J.; Raven, Clive A.; and Venis, Michael A. J., 4,047,928, Cl. 71-88.000.
Puel, Jean-Pierre, to Realist, Inc. Hand held microfiche viewer. 4,047,806, Cl. 350-236.000.
Pullman Incorporated: *See*—
Gutridge, Jack E.; Marsh, Ronald W.; and Newbury, Grant M., 4,047,488, Cl. 105-315.000.
Murphy, James R., 4,048,057, Cl. 208-89.000.

Whaley, Robert L.; and Day, James L., 4,047,748, Cl. 296-35.00A.

Quaker Oats Company, The: *See—*
Balaz, Alexander, 4,047,861, Cl. 425-7.000.

Quigley, James R., to TRW Inc. Wire terminating tool. 4,047,294, Cl. 29-749.000.

Quigley, Richard J.: *See—*
Reynolds, Clarke; and Quigley, Richard J., 4,047,663, Cl. 238-304.000.

Quinn, Edward J., to Hooker Chemicals & Plastics Corporation. Apparatus for electroplating plastic insulating cable sheaths. 4,048,042, Cl. 204-206.000.

Quinn, William T., III. Snap action frame for facial identification system. 4,047,307, Cl. 35-28.000.

Quock, Billy; Kelley, Don Howard; and Warneke, Sehon Lester, to Dow Chemical Company, The. Process for preparing flexible polyurethane foams. 4,048,102, Cl. 260-2.5AM.

R. W. Frost Limited: *See—*
Frost, Robert Walter; and Morris, Anne Winnifred, 4,047,399, Cl. 66-149.00R.

Radek, John R., to Ready Metal Manufacturing Company. Bicycle rack. 4,047,614, Cl. 211-20.000.

Radowski, Stanley P. Animal waste removing device. 4,047,746, Cl. 294-55.000.

Rae, James A.: *See—*
Baldwin, Francis P.; Rae, James A.; and Ver Strate, Gary, 4,048,258, Cl. 260-879.000.

Raider, Stanley Irwin: *See—*
Glang, Reinhard; and Raider, Stanley Irwin, 4,048,350, Cl. 427-93.000.

Raines, Kenneth William John: *See—*
Moring, Peter Lothar Ernst; and Raines, Kenneth William John, 4,048,362, Cl. 428-36.000.

Randall, Alfred R.: *See—*
McCullough, Edward E.; Greenwood, Stewart H.; Sherard, Hoyt, Jr.; McDonald, Richard D.; Hirschi, Ronald G.; and Randall, Alfred R., 4,047,667, Cl. 239-265.350.

Rappas, Alkis S.; and Pemsler, J. Paul, to Kennecott Copper Corporation. Separation and recovery of copper metal from ammoniacal solutions. 4,047,940, Cl. 75-108.000.

Rasile, John: *See—*
Bakos, Peter; Memis, Irving; and Rasile, John, 4,048,356, Cl. 427-379.000.

Rasp, Christian: *See—*
Botta, Artur; and Rasp, Christian, 4,048,174, Cl. 260-283.0SY.

Rast, Gustaf J., Jr.; Barley, Thomas A.; Hammond, Raiford L.; and Ashley, James R., to United States of America, Army. Wide operating frequency range superheterodyne FM noise analyzer. 4,048,568, Cl. 325-363.000.

Ratajczyk, Eugeniusz; Goscimski, Januariusz; and Jedrzejewski, Adam, to Politechnika Warszawska. Link mechanism of a mechanical transducer, especially of a toothed amplifying gauge. 4,047,305, Cl. 33-172.00R.

Ratelle, Clement; and Rouillard, Pierre, to Ratelle, Clement. Log barking and cleaning machine. 4,047,549, Cl. 144-208.00D.

Rathbone, Ronald; and Rydval, Peter, to Siemens Aktiengesellschaft. Logic element. 4,048,517, Cl. 307-213.000.

Rattmann, Rudolf: *See—*
Soldner, Richard Ernst; and Rattmann, Rudolf, 4,047,520, Cl. 128-2.00V.

Rau, Willy; and Taus, Christian, to Maschinenfabrik Rau OHG. Cultivator wheel for agricultural machines. 4,047,576, Cl. 172-540.000.

Raufast, Charles: *See—*
Caumartin, Francois; Raufast, Charles; and Havas, Laszlo, 4,048,412, Cl. 526-65.000.

Rauschenfels, Eberhard: *See—*
zurStrassen, Heinrich; and Rauschenfels, Eberhard, 4,047,968, Cl. 106-281.00R.

Rautenstrauch, Valentin, to Firmenich S.A. Method of improving, enhancing or modifying perfume using cyclobutane derivatives. 4,048,120, Cl. 252-522.000.

Raven, Clive A.: *See—*
Bond, Richard P. M.; Pryce, Robert J.; Raven, Clive A.; and Venis, Michael A. J., 4,047,928, Cl. 71-88.000.

Ravenhall, Richard; Salemme, Charles T.; and Adamson, Arthur P., to United States of America, National Aeronautics and Space Administration. Impact absorbing blade mounts for variable pitch blades. 4,047,840, Cl. 416-135.000.

Ray, Martin George: *See—*
Brookes, Neil Roger; Ray, Martin George; Cohen, Joseph David; and McCarey, Thomas Joseph, 4,047,379, Cl. 60-39.09D.

Raymond, Fernand. Powder fluidizer with feed for constant powder level. 4,047,644, Cl. 222-193.000.

Raymond Lee Organization, Inc., The: *See—*
DeAngelis, Gloria J., 4,047,717, Cl. 273-95.00H.
DiBease, Paul J., 4,047,800, Cl. 350-99.000.
Hall, Lester W., 4,047,458, Cl. 83-439.000.
Hendry, Seth T., 4,048,618, Cl. 340-146.30E.
Lundahl, Robert O., 4,047,825, Cl. 404-70.000.
McNeary, Richard C., 4,047,744, Cl. 292-171.000.
Parkes, Alvin G., 4,047,733, Cl. 280-402.000.
Rice, Loyal E., Sr., 4,048,565, Cl. 325-114.000.
Sajkovic, Miriam D., 4,047,719, Cl. 273-130.00R.

Raynaud, Guy M.: *See—*
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RCA Corporation: *See—*
Ettenberg, Michael; and Lockwood, Harry Francis, 4,048,627, Cl. 357-17.000.
Haferl, Peter Eduard, 4,048,544, Cl. 315-408.000.
Knight, Stanley Paul; and Molinari, Thomas Edward, 4,048,597, Cl. 334-15.000.
Knight, Stanley Paul, 4,048,598, Cl. 334-15.000.

Reade, Richard F., to Corning Glass Works. Refractory partially crystalline materials with good visible transparency. 4,047,960, Cl. 106-39.800.

Ready Metal Manufacturing Company: *See—*
Radek, John R., 4,047,614, Cl. 211-20.000.

Realist, Inc.: *See—*
Puel, Jean-Pierre, 4,047,806, Cl. 350-236.000.

Reams, Donald J., to NBK Corporation. Diazo emulsion processor. 4,048,645, Cl. 354-300.000.

Reash, Clair Wilbur: *See—*
Madden, Thomas Harry; and Reash, Clair Wilbur, 4,048,545, Cl. 316-2.000.

Rechtsteiner, Steve A.; Nelson, Philip E.; and Heron, John R. Method of filling, sampling and sealing an aseptic tank. 4,047,547, Cl. 141-1.000.

Recker, Kurt: *See—*
Haussuehl, Siegfried; and Recker, Kurt, 4,048,514, Cl. 307-88.300.

Recognition Equipment Incorporated: *See—*
Chuang, Ping-chien; and Plunkett, Joseph A., 4,048,615, Cl. 340-146.3AC.
Neff, Marion W., 4,048,617, Cl. 340-146.3SY.

Red Dot Corporation: *See—*
Forsythe, Alan K.; and Green, Charles J., 4,048,455, Cl. 200-81.400.

Redifon Limited: *See—*
Spooner, Archer Michael, 4,048,653, Cl. 358-104.000.

Redmore, Derek, to Petrolite Corporation. Polymeric phosphoramides. 4,048,264, Cl. 260-929.000.

Reese, Thomas J.; Mortimer, James R.; Tobin, Melvin W.; and Jursa, Stephen J. D., to PPG Industries, Inc. Method and apparatus for bending glass sheets to double V-bends. 4,047,916, Cl. 65-106.000.

Reeve, Paul H., to Auto Research Corporation. Cyclic pump. 4,047,845, Cl. 417-251.000.

Regal Tool & Rubber Co., Inc.: *See—*
Mayfield, Windel O.; Thomerson, Clarence T.; and Waldrop, Tom C., 4,047,391, Cl. 61-94.000.

Regan, Michael T.: *See—*
Rossi, Louis J.; and Regan, Michael T., 4,047,944, Cl. 96-1.200.

Regie Nationale des Usines Renault: *See—*
Arnaud, Henry, 4,047,509, Cl. 123-119.00A.
Rivere, Jean-Pierre, 4,048,479, Cl. 235-150.210.

Regnaut, Bernard, to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie". Cross-feed fuel cell battery with filter press type structure of cylindrical cross-section. 4,048,385, Cl. 429-34.000.

Rehfeld, Gerhard: *See—*
Bockstiegel, Gerd-Edzard; Neidhardt, Manfred; and Rehfeld, Gerhard, 4,048,119, Cl. 252-521.000.

Reis, August: *See—*
Eibl, Volker; and Reis, August, 4,048,044, Cl. 204-257.000.

Reliance Electric Company: *See—*
Eddy, Robert Truman, 4,047,452, Cl. 74-752.00C.

Remley, Kenneth Herald, to American Cyanamid Company. Polyurethane textile adhesive. 4,048,001, Cl. 156-331.000.

Remond, Georges: *See—*
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Renault, Philippe; Deschamps, Andre; Franckowiak, Sigismond; and Dezael, Claude, to Institut Francais du Petrole. Process for purifying a sulfur dioxide containing gas. 4,048,293, Cl. 423-574.00L.

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Eschenauer, Paul R.; and Main, George, 4,047,881, Cl. 431-215.000.

Reuter, Wolfgang: *See—*
Maier, Roland; Woitun, Eberhard; Wetzel, Bernd; Reuter, Wolfgang; Goeth, Hanns; and Lechner, Uwe, 4,048,306, Cl. 424-180.000.

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Rheinstahl AG: *See—*
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Rhone-Poulenc S.A.: *See—*
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Ribka, Joachim; Rieper, Wolfgang; and Schwerin, Siegfried, to Hoechst Aktiengesellschaft. Modified form of disazo pigment CI 20040. 4,048,152, Cl. 260-176.000.

Rice, Loyal E., Sr., to Raymond Lee Organization, Inc., The, a part interest. Location indicating device. 4,048,565, Cl. 325-114.000.

Rice, Richard E., to Comstock & Wescott, Inc. Catalytic fuel combustion apparatus and method. 4,047,876, Cl. 431-7.000.

Richard Rath Packaging Machinery, Inc.: *See—*
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Richards, Thomas J.: *See—*
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Richardson-Merrell Inc.: *See—*
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Richmond Manufacturing Company, The: *See—*
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Appleman, William S., 4,047,582, Cl. 175-122.000.

Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Karpati, Egon; Szporny, Laszlo; Bartok, Mihaly; Czombos, Jozsef; Felfoldi, Karoly; Laszlavik, Marta; and Notheisz, Ferenc, 4,048,322, Cl. 424-283.000.

Riddell, Robert G.: *See—*
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Ridley, Richard D., to Occidental Oil Shale, Inc. In situ recovery of shale oil. 4,047,760, Cl. 299-2.000.

Riegelman, Harry M., to Rusco Industries, Inc. Snap-in keeper for sliding windows, doors and the like. 4,047,333, Cl. 49-450.000.

Riendeau, William P.; Blevins, Robert R.; and Abell, Joseph L., to Aiken Industries, Inc. Circuit breaker. 4,048,608, Cl. 337-74.000.

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Riff Rite, Inc.: *See—*
Fiedler, Mark A.; and Hart, Darrell M., 4,047,460, Cl. 84-422.00S.

Rigg, Ralph R.: *See—*
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Ringger, Roger: *See—*
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Risse, Roger Paul Pierre, to Societe Lyonnaise des Applications Catalytiques S.A. Catalytic combustion mass. 4,048,113, Cl. 252-462.000.

Rite Autotronics Corporation: *See—*
Schwartz, Edwin L., 4,048,560, Cl. 324-115.000.

Ritz, Jurgen: *See—*
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Rivere, Jean-Pierre, to Regie Nationale des Usines Renault. Optimum air/fuel mixture computer for internal combustion engines. 4,048,479, Cl. 235-150.210.

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Roach, Maurice P.; and Strudthoff, Stanley L., to Deere & Company. Method for evaluating electrode consumption rate. 4,048,556, Cl. 324-40.000.

Robinson, Thomas C., to Searle Cardio-Pulmonary Systems Inc. Blood pumping system. 4,047,844, Cl. 417-3.000.

Robyn International, Inc.: *See—*
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Rockwell International Corporation: *See—*
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Rohr, Eduard. Deck chair. 4,047,752, Cl. 297-19.000.

Rohr, Otto, to Ciba-Geigy Corporation. Process for the control of plant metabolism. 4,047,931, Cl. 71-107.000.

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Rollason, Peter H.; and Williams, James M., to GTE Sylvania Incorporated. Apparatus for non-destructive leak testing of primary electrochemical cells. 4,047,424, Cl. 73-52.000.

Rolls-Royce (1971) Limited: *See—*
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Romovacek, George R., to Koppers Company, Inc. Method and apparatus for the control of pitch operation. 4,048,020, Cl. 196-132.000.

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Rosback, Donald H.; and Neuzil, Richard W., to UOP Inc. Method for manufacturing an adsorbent useful for olefin separation. 4,048,111, Cl. 252-455.00Z.

Rosch, Gunter: *See—*
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Rose, Lawrence J., to Helix Technology Corporation. Filter bed assembly. 4,048,073, Cl. 210-284.000.

Rosenvold, Leo. Golf practice swing apparatus. 4,047,605, Cl. 194-1.00R.

Rossi, Louis J.; and Regan, Michael T., to Eastman Kodak Company. Electrophoretic migration imaging process with neutral density bisazo pigments. 4,047,944, Cl. 96-1.200.

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Rossomando, Philip Joseph: *See—*
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Roth, Gerd: *See—*
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Rouillard, Pierre: *See—*
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Rousseau, Victor. Electrically powered vehicle and feed cart. 4,047,599, Cl. 191-12.20A.

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Rowbotham, Philip Martin: *See—*
Anderson, Brian; Dalton, Raymond Frederick; and Rowbotham, Philip Martin, 4,048,187, Cl. 260-308.00D.

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Royko, Patricia Diane. Information demonstration device. 4,047,309, Cl. 35-60.000.

Ruckel, Erwin Richard: *See—*
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Ruckelshauss, Gerhard, to Chemische Werke Huls Aktiengesellschaft. Method for the production of ethylbenzene. 4,048,243, Cl. 260-668.00D.

Rueppel, Melvin L., to Monsanto Company. Treatment of sugarcane with N-(perfluoroacyl)-N-phosphonomethyl glycine. 4,047,926, Cl. 71-86.000.

Ruffing, Charles R.: *See—*
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Ruhrchemie Aktiengesellschaft: *See—*
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Rupp, Louis William, Jr.; and Walsh, Walter Michael, Jr., to Bell Telephone Laboratories, Incorporated. Spin resonance spectrometer and magnet structure. 4,048,555, Cl. 324-.5MA.

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Russell, Anthony William: *See—*
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Rydval, Peter: *See—*
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Ryu, Ji-Yong, to UOP Inc. Oligomerization process and catalyst therefor. 4,048,108, Cl. 252-442.000.

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Ryu, Ji-Yong, to UOP Inc. Process for the conversion of aromatic hydrocarbons. 4,048,247, Cl. 260-671.00P.

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Rzeszewski, Theodore S., to Motorola, Inc. Automatic hue control system. 4,048,652, Cl. 358-28.000.
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Sackmann, Gunter; Kolb, Gunter; and Muller, Friedhelm, to Bayer Aktiengesellschaft. Production of copolymer powders from maleic anhydride and 1-olefins. 4,048,422, Cl. 526-203.000.
Saeda, Shigeru: *See*—
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Saft-Societe des Accumulateurs Fixes et de Traction: *See*—
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Samide, Frank Richard, to Towmotor Corporation. Overhead guard-battery ballast. 4,047,750, Cl. 296-107.000.
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Satoh, Ken, to Olympus Optical Company, Ltd. Circuit for eliminating current noises from d.c. motor. 4,048,549, Cl. 318-345.00F.
Sauer, Hans; and Czerny, Thomas, to Varta Batterie Aktiengesellschaft. Vibratory spiral conveyor chute and a resistance heating element. 4,048,472, Cl. 219-388.000.
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Scherrer, Robert A., to Riker Laboratories, Inc. Antimicrobial (2-nitro-3-benzofuranyl)-benzoic acids. 4,048,323, Cl. 424-285.000.
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Schmidt, Robert R., Eue, Ludwig; and Draber, Wilfried, to Bayer Aktiengesellschaft. Synergistic herbicidal compositions. 4,047,929, Cl. 71-93.000.
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Martin, Joachim; Haas, Ernst; and Schnoeller, Manfred, 4,048,508, Cl. 250-492.00A.
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Scholz, William A., to Standun, Inc. Packaging wrapper. 4,047,550, Cl. 150-52.00R.
Schramm, George R., to Avco Corporation. Cooling air distribution system for reciprocating aircraft engines. 4,047,508, Cl. 123-41.600.
Schramm, Inc.: *See*—
McCullough, J. Robert, 4,048,072, Cl. 210-220.000.
Schrank, Martin P.; and Coppola, Richard M., to GTE Sylvania Incorporated. Method of coating lamp envelope with heat reflecting filter. 4,048,347, Cl. 427-10.000.
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Prescher, Gunter; and Schreyer, Gerd, 4,048,225, Cl. 260-536.000.
Schrinel, Thomas L.: *See*—
O'Connor, Alton J.; and Schrinel, Thomas L., 4,047,852, Cl. 417-415.000.
Schuessler, John C.; and Tapp, David J., to Leach Corporation. Switch mounting assembly for an electromagnetic relay. 4,048,601, Cl. 335-193.000.
Schuetz, Adolph August, to Combustion Engineering, Inc. Density control system. 4,047,891, Cl. 23-230.00A.
Schultz, Charles A., Jr.: *See*—
Forman, Aubry S., Jr.; Schultz, Charles A., Jr.; and Vice, William E., 4,048,619, Cl. 340-154.000.
Schultz, Rudiger: *See*—
Eschenfelder, Gunther; and Schultz, Rudiger, 4,048,010, Cl. 176-36.00R.
Schumacher, Hans: *See*—
Albrecht, Konrad; Langeluddeke, Peter; Schumacher, Hans; and Schwerdtle, Friedhelm, 4,047,932, Cl. 71-108.000.
Schwan, Thomas J., to Morton-Norwich Products, Inc. 2-(3-Methyl-4-phenyl-1,2,3,4-tetrahydro-2-isoquinolyl)-acetamidoxime dihydrochloride. 4,048,176, Cl. 260-286.00R.
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Bowler, John W.; Karner, Kenneth E.; Pittenger, Daniel I.; and Schwartz, Donald A., 4,048,669, Cl. 361-391.000.
Schwartz, Edwin L., to Rite Autotronics Corporation. Electrical meter apparatus. 4,048,560, Cl. 324-115.000.
Schwartz, Henry D. Clinical testing apparatus. 4,048,040, Cl. 204-195.00R.
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Broecker, Franz Josef; and Schwarzmann, Matthias, 4,048,196, Cl. 260-346.110.
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Ribka, Joachim; Rieper, Wolfgang; and Schwerin, Siegfried, 4,048,152, Cl. 260-176.000.
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Beregi, Laszlo; Hugon, Pierre; Pascaud, Xavier; and Poignant, Jean-Claude, 4,048,321, Cl. 424-274.000.
Vincent, Michel; Remond, Georges; Pascaud, Xavier; and Poignant, Jean-Claude, 4,048,313, Cl. 424-248.500.
SCM Corporation: *See*—
Cardenas, Carlos G., 4,048,220, Cl. 560-237.000.
Frondorf, William A., 4,047,386, Cl. 60-654.000.
Stevenson, Donald R., 4,048,257, Cl. 260-862.000.
Wilkens, James B., 4,048,413, Cl. 526-66.000.
Scott, Albert Rockwood. Means for steering jet driven water craft. 4,047,494, Cl. 115-12.00R.
Seaborn, Paul Edward; and Dawson, Kenneth Harold, to Mead Corporation, The. Wire forming apparatus. 4,047,544, Cl. 140-105.000.
Seabrook, Terence Dale. Clothes drier latch. 4,047,616, Cl. 211-183.000.
Searle Cardio-Pulmonary Systems Inc.: *See*—
Robinson, Thomas C., 4,047,844, Cl. 417-3.000.
Sedlacek, Herbert, to Licentia Patent-Verwaltungs-G.m.b.H. Measurement of standard visual range. 4,047,815, Cl. 356-104.000.
Seidel, Gustave. Telephone handset support device. 4,048,453, Cl. 179-156.00R.
Seiden, Lewis J.; Landesberg, William; and Young, Gladstone F., to T-Bar Incorporated. Switch matrix control and display. 4,048,672, Cl. 364-200.000.
Seiko Koki Kabushiki Kaisha: *See*—
Saito, Takeo; and Seki, Youichi, 4,048,642, Cl. 354-23.00D.
Seiler, Claus-Dietrich: *See*—
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Seitzer, Walter H., to Suntech, Inc. Manufacture of hydrogen. 4,048,029, Cl. 204-129.000.
Sekhar, Neel C., to Upjohn Company, The. Process of treatment. 4,048,331, Cl. 424-317.000.
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Sekimura, Nobuyuki, to Canon Kabushiki Kaisha. Ripple-free dichroic mirrors. 4,047,805, Cl. 350-166.000.
Sekine, Teruaki. Liquid quantitative dispensing apparatus. 4,047,438, Cl. 73-423.00A.
Sell, R. Don: *See*—
Pettit, Ernest E., 4,047,279, Cl. 29-426.000.
Sell, W. Leon: *See*—
Pettit, Ernest E., 4,047,279, Cl. 29-426.000.
Seltenreich, Gyozo: *See*—
Dinzburg, Boris Nisonovich; Smetkin, Jury Alexandrovich; Alexeenko, Vladimir Iosifovich; Mikhailov, Vsevolod Andreevich; Lorant, Ivan; Seltenreich, Gyozo; Keszei, Jeno; Marton, Gyorgy; Balazsfai, Albert; Donath, Jeno; and Bolcskei, Erno, 4,047,860, Cl. 425-4.00R
Semany, Joseph G. File cabinet securement structure. 4,047,773, Cl. 312-111.000.
Senderoff, Seymour, to Union Carbide Corporation. Process for producing electrolytic MnO_2 from molten manganese nitrate hexahydrate. 4,048,027, Cl. 204-61.000.
Serratto, Angelo. Terminal unit for the outlet of conditioned air in a centralized conditioning system. 4,047,662, Cl. 236-49.000.
Severijns, Adrianus Petrus, and Aarts, Franciscus Henricus Eduard, to U.S. Philips Corporation. ^3He-^4He dilution refrigerating machine. 4,047,394, Cl. 62-502.000.
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Wolfe, David L.; and Sexton, Arthur R., 4,048,237, Cl. 260-615.00B.
Seydl, Wolfgang. *See*—
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Sforza, Pasquale M., to Polytechnic Institute of New York. Fluid flow energy conversion systems. 4,047,832, Cl. 415-1.000.
Shaffer, Paul C., to GTE Sylvania Incorporated. Process for forming an electrically insulating seal between a metal lead and a metal cover. 4,047,292, Cl. 29-630.00R.
Shaffer, Robert H. Collapsible utility cart. 4,047,724, Cl. 280-5.220.
Shah, Dhiren N., to Dow Chemical Company, The. Automatic self-lubricating rotary tablet press. 4,047,866, Cl. 425-107.000.
Shanks, Ian Alexander, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Liquid crystal devices. 4,048,358, Cl. 428-1.000.
Shapiro, Eugene: *See*—
Parikh, Prakash D., and Shapiro, Eugene, 4,047,978, Cl. 148-11.50C.
Shaw, David Merrill: *See*—
Stary, William Richard; and Shaw, David Merrill, 4,047,572, Cl. 169-62.000.
Shaw, Glen A., to Harshaw Chemical Company, The. Process for grooming hair with a hair grooming aid containing fibrillatable polytetrafluoroethylene resin 4,047,537, Cl. 132-7.000.
Shell Oil Company: *See*—
Bond, Richard P. M.; Pryce, Robert J.; Raven, Clive A., and Venis, Michael A. J., 4,047,928, Cl. 71-88.000.
Davis, Royston H., 4,048,210, Cl. 260-465.00F.
Kerr, Michael W., 4,047,930, Cl. 71-95.000.
Kruka, Vitold R., 4,047,539, Cl. 137-13.000.
Shen, Kwan Ting; Gannon, John Allister; and Nelson, Robert Charles, to Ciba-Geigy Corporation. Process for preparing water-dilutable, heat-curing coating compositions. 4,048,179, Cl. 260-29.40R.
Sheperd, Ervin M.: *See*—
Dieringer, Andrew M.; and Sheperd, Ervin M., 4,047,280, Cl. 29-427.000.
Sheppard, Chester Stephen: *See*—
MacLeay, Ronald Edward; and Sheppard, Chester Stephen, 4,048,423, Cl. 526-209.000.
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McCullough, Edward E.; Greenwood, Stewart H.; Sherard, Hoyt, Jr.; McDonald, Richard D. Hirschi, Ronald G.; and Randall, Alfred R., 4,047,667, Cl. 239-265.350.
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Jidai, Eiki; Ono, Hiroshi, and Shibayama, Kyoichi, 4,048,379, Cl. 428-500.000

Shibazaki, Kenji: *See—*
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Shieu, Mark Shin-Dong: *See—*
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Shiino, Kazuo: *See—*
Kusakabe, Masao; Fuziwara, Shuzo; and Shiino, Kazuo, 4,047,987, Cl. 149-37.000.

Shimizu, Shigemitsu: *See—*
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Shimizu, Yoshiaki: *See—*
Nara, Takashi; Okachi, Ryo; Yamamoto, Mitsuyoshi; Mori, Yasuki; Sato, Moriyuki; Sugimoto, Masahiro; and Shimizu, Yoshiaki, 4,048,015, Cl. 195-96.000.

Shindarov, Lubomir Mihaylov: *See—*
Galabov, Angel Simeonov; Shindarov, Lubomir Mihaylov; Vassilev, Georgi Nikolov; Vassileva, Ragka Taneva; Dimcheva, Zlatka Petkova; Stoycheva, Dushka Staneva; and Velichkova, Emilia Hristova, 4,048,333, Cl. 424-322.000.

Shindo, Takemasa; and Arai, Kenichiro, to Shinshu Seiki Kabushiki Kaisha; and Kabushiki Kaisha Suwa Seikosha. Exothermic printing head. 4,048,470, Cl. 219-216.000.

Shinn, Charles E., II, to Hewlett-Packard Company. Resistor-controlled circuit for improving bandwidth of current gain cells. 4,048,577, Cl. 330-30.00D.

Shinoda, Hajime: *See—*
Tanaka, Yoshinori; Shinoda, Hajime; and Narahara, Hisaaki, 4,048,650, Cl. 358-1.000.

Shinohara, Yonesaku: *See—*
Ishikawa, Atsuo; Tsubaki, Hidemi; Takahata, Hitoshi; Iwata, Riso; and Shinohara, Yonesaku, 4,048,124, Cl. 260-5.000.
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Shinshu Seiki Kabushiki Kaisha: *See—*
Shindo, Takemasa; and Arai, Kenichiro, 4,048,470, Cl. 219-216.000.

Shiota, Toshiaki: *See—*
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Shirk, Ivan A.: *See—*
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Shirotsuka, Mikio: *See—*
Yaguchi, Masachika; Jinnai, Toshio; Shirotsuka, Mikio; and Totani, Kazuo, 4,047,803, Cl. 350-160.0LC.

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Kovin, Vladimir Mikhailovich; Mitenkov, Fedor Mikhailovich; Ovechkin, Alexandr Vasilievich; Pankratov, Vladimir Alexeevich; Savin, Nikolai Ivanovich; Ternikova, Tamara Alexandrovna; Filippov, Vladimir Jurievich; Khramov, Dmitry Alexandrovich; Chernomordik, Evgeny Naumovich; Shiryaev, Vladimir Ivanovich; Muzychuk, Vladimir Romanovich; and Savin, Alexandr Nikolaevich, 4,048,011, Cl. 176-40.000.

Shoffner, James P., to UOP Inc. Substituted cyanamidic compounds. 4,048,228, Cl. 260-566.00R.

Shooter, Kenneth L.: *See—*
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Showa Denko K.K.: *See—*
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Shumway, Harry J. Low tire pressure warning device. 4,048,614, Cl. 340-58.000.

Shuster, Edward J.: *See—*
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,048,201, Cl. 260-410.000.

Sibley, Murray J.; Yung, Gordon H. K.; and Urrea, Petronio D., to Barnes-Hind Pharmaceuticals, Inc. Cleaning agents for contact lenses. 4,048,122, Cl. 252-541.000.

Sibley, Murray J.: *See—*
Hramchenko, Jack; and Sibley, Murray J., 4,048,123, Cl. 252-545.000.

Siddiqui, Khalid U.: *See—*
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Sieber, Adolf, to Sulzer Brothers Limited. Gamma-irradiation treatment apparatus. 4,048,509, Cl. 250-522.000.

Sieber, Charles W.; Knutson, Richard K.; and Johnston, John W., to United States of America, Navy. Self-driven underwater noisemaking device. 4,047,592, Cl. 181-142.000.

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Auracher, Franz, 4,048,591, Cl. 332-7.510.
Gudden, Friedrich; and Weiss, Herbert, 4,048,502, Cl. 250-370.000.
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Kuhl, Dieter, 4,047,894, Cl. 23-284.000.
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Lob, Udo; and Scheidel, Fritz, 4,047,286, Cl. 29-578.000.
Martin, Joachim; Haas, Ernst; and Schnoeller, Manfred, 4,048,508, Cl. 250-492.00A.
Natebusch, Roderich, 4,048,449, Cl. 179-18.0BC.
Rathbone, Ronald; and Rydval, Peter, 4,048,517, Cl. 307-213.000.
Schierer, Gunter, 4,048,553, Cl. 363-57.000.
Soldner, Richard Ernst; and Rattmann, Rudolf, 4,047,520, Cl. 128-2.00V.
Weitze, Artur; and Sapunarow, Michail, 4,047,290, Cl. 29-625.000.
Widmann, Dietrich, 4,047,975, Cl. 148-1.500.

Siempelkamp Giesserei KG: *See—*
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SIG Schweizerische Industrie-Gesellschaft: *See—*
Bolli, Hans-Ulrich, 4,048,003, Cl. 156-515.000.

Sighinolfi, Orazio: *See—*
de Ruggieri, Pietro; and Sighinolfi, Orazio, 4,048,159, Cl. 260-239.55R.

Signal Science Systems, Inc.: *See—*
Kolm, Eric A.; and Trottier, Robert R., 4,048,596, Cl. 334-8.000.

Sill, Arthur D.; and Sweet, Francis W., to Richardson-Merrell Inc. Aminoacetyl-acenaphthenes. 4,048,230, Cl. 260-570.50C.

Simak, Petr: *See—*
Haaf, Franz; Hatzmann, Guenter; Herrle, Karl; and Simak, Petr, 4,048,260, Cl. 260-884.000.

Simpson, David A., to Hercules Incorporated. Photopolymer compositions. 4,047,963, Cl. 96-115.00R.

Sinanan Enterprises Limited: *See—*
Delaney, Francis Alfred, 4,047,641, Cl. 222-80.000.

Sinclair, Brett Jason: *See—*
Ziofsky, Henry; and Sinclair, Brett Jason, 4,047,303, Cl. 32-40.00R.

Singer Company, The: *See—*
Buess, Kenneth G.; and Hefter, Murray, 4,048,531, Cl. 310-49.00R.
Johnson, Edgar A.; and Myers, Bruce L., 4,048,567, Cl. 325-363.000.

Sinke, Gerard C.; Langhorst, Martin A.; and May, James A., Sr., to Dow Chemical Company, The. Method for preventing evaporation-condensation caking of sodium chloride at high temperatures. 4,048,288, Cl. 423-267.000.

Siskin, Michael: *See—*
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Sitton, Robert L.: *See—*
Miller, Walter E., Jr.; Duke, Jimmy R.; and Sitton, Robert L., 4,047,678, Cl. 244-3.160.

SKF Industrial Trading and Development Company, B.V.: *See—*
Hallerback, Stig Lennart; and Lachonius, Leif, 4,048,527, Cl. 310-43.000.
Korenhof, Abraham; and Kapaan, Hendrikus Jan, 4,047,770, Cl. 308-191.000.

Skrabak, Michal; Vavrik, Ernest; Kolarik, Stanislav; and Mazak, Milos, to Slovenska Vysoka Skola Technicka. Method of and apparatus for forming sheets of fibrous material between converging sieves. 4,048,008, Cl. 162-104.000.

Slack, Roger A.; and Michel, Gerald W., to Everbrite Electric Signs, Inc. Display device with sliding back plates. 4,047,314, Cl. 40-28.00C.

Sloan, Donald A.: *See—*
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Smaldone, Fulvio. Automatic podiatric control molder. 4,047,870, Cl. 425-151.000.

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Smith, Edward Earl, to Geode Industries, Inc. Method of vibratory polishing of stones and the like. 4,047,343, Cl. 51-313.000.

Smith, Gary L.: *See—*
DeWeese, Harry R.; and Smith, Gary L., 4,047,668, Cl. 239-500.000.

Smith, Gordon A.; and Talcott, James M., to Fairchild Industries, Inc. High load extendible structure. 4,047,339, Cl. 52-108.000.

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Smith, John L.: *See—*
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Smith Kline & French Laboratories: *See—*
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Smith Kline & French Laboratories Limited: *See—*
Black, James Whyte; Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,048,319, Cl. 424-269.000.

Smith Kline Instruments, Inc.: *See—*
Goldberg, Paul R., 4,047,819, Cl. 356-205.000.

Smith, Thomas Eric, to Rolls-Royce (1971) Limited. Gas turbine engine power plants for aircraft. 4,047,381, Cl. 60-226.00A.

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Berges, David A., 4,048,311, Cl. 424-246.000.
Colella, Donald F.; and Kaiser, Carl, 4,048,229, Cl. 260-570.600.
Cooper, David J.; Hoover, John R. E.; and Weisbach, Jerry A., 4,048,430, Cl. 536-17.000.

Smorzaniuk, Adam, to Amerace Corporation. Circuit breaker. 4,048,607, Cl. 337-53.000.

Snam Progetti S.P.A.: *See—*
Cernia, Enrico; and Conti, Walter, 4,047,702, Cl. 256-13.100.

Snellman, Donald L.; Kuspert, John C.; and Saunders, Arthur G., to Norfin, Inc. Sheet jogger. 4,047,713, Cl. 271-221.000.

Snover, John A.: *See—*
Daniels, Roger D.; and Snover, John A., 4,048,087, Cl. 252-188.000.

Societa Italiana Vetro Siv S.p.A.: *See—*
Ciarniello, Giorgio; and De Lena, Oscar, 4,048,469, Cl. 219-203.000.

s.a. Texaco Belgium n.v.: *See—*
Hermans, Johny C., 4,048,106, Cl. 260-2.5AV.
Van Neste, Walter, 4,047,922, Cl. 71-28.000.

Societe d'Assistance Technique Pour Produits Nestle S.A.: *See—*
Gasser, Rupert Josef; and Watercutter, Steven N., 4,048,344, Cl. 426-385.000.

Societe d'Equipements Divers Pour la Population Civile et l'Aviation Sedpa: *See—*
Decroix, Paul Marcel Edmond, 4,047,679, Cl. 244-16.000.

Societe France-Americaine de Constructions Atomiques-Framatome: *See—*
Weilbacher, Jean-Claude, 4,048,009, Cl. 176-19.00R.

Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie": *See—*
Chillier-Duchatel, Nicole; and Verger, Bernard, 4,048,384, Cl. 429-22.000.
Regnaut, Bernard, 4,048,385, Cl. 429-34.000.

Societe Lyonnaise des Applications Catalytiques S.A.: *See—*
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Societe Nouvelle de Roulements: *See—*
Druge, Gerard; and Troccaz, Roger, 4,047,414, Cl. 72-91.000.

SOFERMO: *See—*
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Sogi, Toshiyuki: *See—*
Maeda, Muneyoshi; Watanabe, Shigeo; Takahashi, Hidenori; and Sogi, Toshiyuki, 4,047,552, Cl. 152-361.00R.

Sokol, Michael: *See—*
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Solar, Carl M.: *See—*
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Soldner, Richard Ernst; and Rattmann, Rudolf, to Siemens Aktiengesellschaft. Ultrasonic imaging apparatus operating according to the impulse-echo technique. 4,047,520, Cl. 128-2.00V.

Solitron Devices, Inc.: *See—*
Adams, Guy; and Goldman, Scott D., 4,048,541, Cl. 315-248.000.
Adams, Guy Emery; and Pellegrin, Anna J., 4,047,513, Cl. 123-148.00E.

Solomon, Paul W., to Phillips Petroleum Company. Crosslinking in emulsion polymerization. 4,048,426, Cl. 526-334.000.

Solvay & Cie.: *See—*
Noel, Stephane, 4,048,417, Cl. 526-62.000.

Sonntag, Hans: *See—*
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Sonoco Products Company: *See—*
Fletcher, Wade D.; and Rowe, E. Riley, 4,047,473, Cl. 93-36.00B.

Sony Corporation: *See—*
Tanaka, Yoshinori; Shinoda, Hajime; and Narahara, Hisaaki, 4,048,650, Cl. 358-1.000.
Yamatani, Wataru, 4,048,569, Cl. 325-414.000.

Soodak, Charles; Lessner, David L.; and Macemon, James H., to Baxter Travenol Laboratories, Inc. Constant temperature, multiple sample, rotary changer. 4,047,820, Cl. 356-244.000.

Sorenson, James L.: *See—*
Reynolds, Gordon S.; Pannier, Karl A., Jr.; and Sorenson, James L., 4,047,526, Cl. 128-214.00R.

Sorenson Research Co., Inc.: *See—*
Reynolds, Gordon S.; Pannier, Karl A., Jr.; and Sorenson, James L., 4,047,526, Cl. 128-214.00R.

Source Gas Analyzers, Inc.: *See—*
Von Bargen, John D.; and Siddiqui, Khalid U., 4,048,668, Cl. 361-235.000.

Southco, Inc.: *See—*
Bisbing, Robert H., 4,047,266, Cl. 24-221.00R.

Sowa, Tsuneo: *See—*
Yokota, Takeshi; Suzuki, Nobuyuki; Sowa, Tsuneo; Sasaki, Yasuharu; and Ono, Yasutaka, 4,048,307, Cl. 424-180.000.

Sowman, Harold G.: *See—*
Karst, Karl A.; and Sowman, Harold G., 4,047,965, Cl. 106-65.000.

Spadea, Gregorio, to National Semiconductor Corporation. Self-aligned CMOS process for bulk silicon and insulating substrate device. 4,047,284, Cl. 29-571.000.

Spadea, Gregorio, to National Semiconductor Corporation. Self-aligned CMOS for bulk silicon and insulating substrate device. 4,047,285, Cl. 29-571.000.

Spanel, Abram N.; Eiland, P. Frank; and Jacobs, David R., to Spanel, Abram N. Multi-color tufting machine. 4,047,491, Cl. 112-79.00A.

Sparks, Richard A.: *See—*
Campbell, Richard A.; Sparks, Richard A.; and Perry, Robert W., 4,048,580, Cl. 331-1.00R.

Speakman, Edwin L., to Standard Brands Incorporated. Method for preparing an acid modified oxidized hydroxyalkyl starch. 4,048,434, Cl. 536-105.000.

Speedfam Corporation: *See—*
McNamara, David M.; and Boettcher, Stephen A., 4,047,639, Cl. 222-64.000.
McNamara, David M.; and Boettcher, Stephen A., 4,047,640, Cl. 222-64.000.

Speer, Billy L., to Dayco Corporation. Endless power transmission belt. 4,047,446, Cl. 74-234.000.

Spence-Bate, Harry Arthur Hele. Auto editors. 4,047,813, Cl. 355-95.000.

Spence, John R., to Rockwell International Corporation. Drive circuit for a display. 4,048,632, Cl. 340-324.00R.

Sperber, Karl: *See—*
Williams, David Alan; Sperber, Karl; and Stoutz, Calvin Owen, 4,047,992, Cl. 156-73.100.

Spevack, Jerome S., to Deuterium Corporation. Method for enrichment by dual temperature exchange. 4,047,905, Cl. 55-37.000.

Spicuzza, John P., Jr.; and Sutej, Joseph M., to ARCO Polymers, Inc. Method for preparing improved expanded polystyrene sheet. 4,048,208, Cl. 264-45.300.

Spicuzza, John P., Jr., to ARCO Polymers, Inc. Method for preparing improved expanded polystyrene sheet. 4,048,272, Cl. 264-45.300.

Spiers, Steven F.; Lewis, Howard M.; Kraft, Gerald A.; and Pasquine, Arthur R., to Philip Morris Incorporated. Apparatus for calibrating cigarette inspection device. 4,047,421, Cl. 73-1.00R.

Spinner, Georg. Method of reshaping tubular conductor sheath. 4,047,291, Cl. 29-628.000.

Spooner, Archer Michael, to Redifon Limited. Visual display apparatus. 4,048,653, Cl. 358-104.000.

Sprague Electric Company: *See—*
Eysermans, Hubert, 4,048,670, Cl. 361-421.000.

Sprangers, Ann: *See—*
Thomaschefsky, Susan N.; and Sprangers, Ann, 4,047,534, Cl. 128-461.000.

Spry, Douglas O.: *See—*
Cooper, Robin D. G.; and Spry, Douglas O., 4,048,157, Cl. 260-239.00A.

Square D Company: *See—*
Lemke, Winfred R., 4,048,663, Cl. 361-75.000.

Staar, S.A.: *See—*
Staar, Theophiel Clement Jozef Lodewijk, 4,048,661, Cl. 360-130.000.

Staar, Theophiel Clement Jozef Lodewijk, to Staar, S.A. Device for guiding and winding magnetic tape in recording and/or reproducing apparatus. 4,048,661, Cl. 360-130.000

Stach, Heinrich: *See—*
Haferkamp, Dirk; Hodzic, Alija; Paetz, Eike, and Stach, Heinrich, 4,047,742, Cl. 285-187.000.

Staebler, Paul J.: *See—*
Goloff, Alexander; Barker, Noble G.; and Staebler, Paul J., 4,047,855, Cl. 418-53.000.

Stafford, Warren Jess: *See—*
Gale, Preston Lee; and Stafford, Warren Jess, 4,048,464, Cl. 219-121.0LM.

Stahlecker, Fritz, to Stahlecker, Hans; and Stahlecker, Fritz. Spinning machine facility with a plurality of open end spinning machines and at least one servicing instrument. 4,047,371, Cl. 57-34.00R.

Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,047,371, Cl. 57-34.00R.

Stahlhut, Leo G.; and Garnett, Willard R., to Emerson Electric Co. Lighting system. 4,047,336, Cl. 52-28.000.

Stamicarbon B.V.: *See—*
Alfenaar, Marinus; and Van Gasse, Rene L. E., 4,048,386, Cl. 429-38.000.
van den Berg, Cornelis E.P.V.; and Vroomans, Hubertus J., 4,048,429, Cl. 528-497.000.

Standard Brands Incorporated: *See—*
Speakman, Edwin L., 4,048,434, Cl. 536-105.000.

Standard Oil Company: *See—*
Steigelmann, Edward F.; and Hughes, Robert D., 4,047,908, Cl. 55-158.000.

Standard Oil Company (Indiana): *See—*
Keske, Robert G.; Poppe, Wassily W.; and Fielding, Ivor R., 4,048,131, Cl. 260-33.20R.
Menzl, Roland L.; and Hopkins, P. Donald, 4,048,094, Cl. 252-414.000.
Petersen, Richard D.; and Mieville, Rodney L., 4,048,058, Cl. 208-138.000.
Stephens, James R., 4,048,144, Cl. 260-47.0CP.

Standun, Inc.: *See—*
Scholz, William A., 4,047,550, Cl. 150-52.00R.

Star Paper Limited: *See—*
Blakey, Rene C.; Riddell, Robert G.; Whittaker, John; and Wilson, John A., 4,048,380, Cl. 428-511.000.

Starkus, Charles J.: *See—*
Dale, C. Harold, Jr.; Howe, Spencer D.; Bonebreak, Robert L.; and Starkus, Charles J., 4,047,792, Cl. 350-6.000.

Starmer, Philip Hubert, to B. F. Goodrich Company, The. Vulcanizable compositions of a halogen-containing polymer and a diene-nitrile rubber having active halogen cure sites. 4,048,261, Cl. 260-888.000.

Starr, Michael T. Film retriever. 4,047,653, Cl. 226-92.000.

Stary, William Richard; and Shaw, David Merrill, to Caterpillar Tractor Co. Vehicle fire suppression access port. 4,047,572, Cl. 169-62.000.

Staub, Fred W.; and Jaster, Heinz, to General Electric Company. Vaporization cooled transformer. 4,048,603, Cl. 336-57.000.

Staub, Fred W.: *See—*
Jaster, Heinz; and Staub, Fred W., 4,047,561, Cl. 165-32.000.

Steel Company of Canada, Limited, The: *See—*
Hookings, Paul H.; Wade, Harry C.; and Deijs, Phillip, 4,047,419, Cl. 72-370.000.

Stegmeier, William J. Disposable mold form and method of molding. 4,048,270, Cl. 264-34.000.

Stehl, Otto: *See*—
Derner, Paul; Sonntag, Hans; and Stehl, Otto, 4,047,351, Cl. 52-616.000.

Steigelmann, Edward F.; and Hughes, Robert D., to Standard Oil Company. Gas separation membrane. 4,047,908, Cl. 55-158.000.

Steinbatz, Alfred, to C. Reichert Optische Werke, AG. Filter regulator for microspectrophotometer. 4,047,818, Cl. 356-189.000.

Stepe, Visvaldis A., to Caterpillar Tractor Co. Corner tooth assembly. 4,047,312, Cl. 37-141.00R.

Stephens, James R., to Standard Oil Company (Indiana). Preparation of solid polymers from aromatic primary diamine and acyl halide of trimellitic anhydride. 4,048,144, Cl. 260-47.0CP.

Stephens, Leonard J.: *See*—
Bake, Earl A.; and Stephens, Leonard J., 4,047,275, Cl. 29-157.10R.

Stephens, Robert K., to Polaroid Corporation. Anti-reflection coatings for photographic bases. 4,047,804, Cl. 350-164.000.

Sterzel, Hans-Josef: *See*—
Wurmb, Rolf; Leutner, Bernd; Seydl, Wolfgang; Schlimper, Hans-Ulrich; and Sterzel, Hans-Josef, 4,048,135, Cl. 260-40.00R.

Stevens, Peter, to Oxy Metal Industries Corporation. Electrodeposition of gold-palladium alloys. 4,048,023, Cl. 204-44.000.

Stevenson, Donald R., to SCM Corporation. Pigmentable low shrink thermosetting polyesters. 4,048,257, Cl. 260-862.000.

Stewart, Donald Fergusson: *See*—
Pollard, Leslie John; and Stewart, Donald Fergusson, 4,047,934, Cl. 75-29.000.

Stewart, John Kenneth; and von Beckmann, Helmuth, to Canron, Inc. Method of drilling and injecting perservative fluid into railway ties. 4,048,353, Cl. 427-291.000.

Stich, Frederick A., to Allis-Chalmers Corporation. Variable frequency, variable voltage power supply. 4,048,554, Cl. 363-98.000.

Stockum, Glenn Francis, to Arbrook, Inc. Glove and form and method for making same. 4,047,251, Cl. 2-168.000.

Stoeckelmann, Guenter: *See*—
Bruenemann, Hilmar; and Stoeckelmann, Guenter, 4,048,074, Cl. 210-323.00T.

Stoll, Alois; and Bergmeister, Eduard, to Wacker-Chemie GmbH. Water-dilutable tetrapolymers of vinyl acetate, maleic diesters, crotonic acid and hydrophilic unsaturated copolymerizable esters. 4,048,192, Cl. 260-33.40R.

Stoller Chemical Company, Inc.: *See*—
Stoller, Jerry H., 4,048,346, Cl. 426-583.000.

Stoller, Jerry H., to Stoller Chemical Company, Inc. Method of stabilizing lactose compositions. 4,048,346, Cl. 426-583.000.

Stone, Dale Eugene, to Bell Telephone Laboratories, Incorporated. Digitally regulated inverter. 4,048,552, Cl. 336-25.000.

Stotzel, Lothar; and Heider, Dieter. Stacking apparatus for ferrous sheets. 4,047,621, Cl. 214-6.0DS.

Stout, James T.; and Plaxico, Robert E., to Mead Corporation, The. Article carrier. 4,047,610, Cl. 206-187.000.

Stoutz, Calvin Owen: *See*—
Williams, David Alan; Sperber, Karl; and Stoutz, Calvin Owen, 4,047,992, Cl. 156-73.100.

Stoycheva, Dushka Staneva: *See*—
Galabov, Angel Simeonov; Shindarov, Lubomir Mihaylov; Vassilev, Georgi Nikolov; Vassileva, Ragka Taneva; Dimcheva, Zlatka Petkova; Stoycheva, Dushka Staneva; and Velichkova, Emilia Hristova, 4,048,333, Cl. 424-322.000.

Streck, Roland: *See*—
Haag, Horst; Nordsiek, Karl-Heinz; Streck, Roland; and Zerpner, Dieter, 4,048,262, Cl. 260-889.000.

Stroezel, Manfred: *See*—
Beck, Fritz; Francke, Diethard; Nohe, Heinz; Hannebaum, Heinz; and Stroezel, Manfred, 4,048,047, Cl. 204-270.000.

Strudthoff, Stanley L.: *See*—
Roach, Maurice P.; and Strudthoff, Stanley L., 4,048,556, Cl. 324-40.000.

Stubbings, James Henry, to Potomac Applied Mechanics, Inc. Sheet metal cutting. 4,047,457, Cl. 83-71.000.

Studco, Inc.: *See*—
Knorr, William L., 4,047,355, Cl. 52-738.000.

Studiengesellschaft Kohle m.b.H.: *See*—
Wilke, Gunther; and Heimbach, Paul, 4,048,214, Cl. 560-128.000.

Stumbar, James P.; Carl, Daniel E.; and Lee, Suh Y., to Westinghouse Electric Corporation. Method for thermally de-sooting heat transfer surfaces. 4,047,972, Cl. 134-2.000.

Sudo, Michio. Method for manufacturing a flattened cylindrical film consisting of layers of thermoplastic resin stretched lengthwise and crosswise. 4,047,997, Cl. 156-229.000.

Suen, Tzeng Jiueq; Begala, Arthur James, Jr.; and Grayson, Martin, to American Cyanamid Company. Control of corrosion and scale in circulating water systems by means of partial esters of polyfunctional organic acids. 4,048,065, Cl. 210-58.000.

Suggs, Charles W. Automatic leaf spreader for a tobacco harvester. 4,047,365, Cl. 56-27.500.

Sugihara, Kunihiko: *See*—
Nakajima, Yasuo; Hayashi, Yoshimasa; Takagi, Yasuo; Sugihara, Kunihiko; and Aoyama, Syunichi, 4,047,510, Cl. 123-119.00A.

Sugimoto, Keiichi; Nishijima, Koji; Hanaoka, Tadashi; Akimoto, Hiroshi; and Kakeya, Nobuharu, to Takeda Chemical Industries, Ltd. d-α-Isobutylsulfobenzylpenicillin hemi-solvate crystals. 4,048,158, Cl. 260-239.100.

Sugimoto, Masahiro: *See*—
Nara, Takashi; Okachi, Ryo; Yamamoto, Mitsuyoshi; Mori, Yasuki; Sato, Moriyuki; Sugimoto, Masahiro; and Shimizu, Yoshiaki, 4,048,015, Cl. 195-96.000.

Sugita, Yasunori; and Itagaki, Yasuhiko, to Mitsui Toatsu Chemicals, Incorporated. Article made of propylene-ethylene copolymer. 4,048,409, Cl. 526-5.000.

Suh, John T.: *See*—
Svoboda, Glenn R.; Suh, John T.; Carlstrom, William L.; and Maechtle, Gary L., 4,048,104, Cl. 260-2.5AN.

Sulzer Brothers Limited: *See*—
Bosshard, Ernst, 4,048,504, Cl. 250-434.000.
Sieber, Adolf, 4,048,509, Cl. 250-522.000.
Weber, Max, 4,047,506, Cl. 122-32.000.
Weber, Max, 4,047,562, Cl. 165-111.000.

Sumi, Yasuaki, to Sanyo Electric Co., Ltd.; and Tottori Sanyo Electric Co., Ltd. Multiple-band digital frequency synthesizer receiver. 4,048,570, Cl. 325-459.000.

Sumitomo Chemical Company, Limited: *See*—
Usamoto, Teruyoshi; Miyawaki, Kenji; Shiota, Toshiaki; Takeuchi, Hideki; and Tadokoro, Yoshio, 4,048,275, Cl. 264-54.000.
Yamamoto, Michihiro; Katayama, Shigenari; Koshiba, Masao; and Yamamoto, Hisao, 4,048,168, Cl. 260-251.0QB.

Sumiyama, Hiroshi: *See*—
Urakawa, Masaharu; and Sumiyama, Hiroshi, 4,048,014, Cl. 195-66.00B.

Sumiyoshi, Masaharu: *See*—
Noguchi, Masaaki; Sumiyoshi, Masaharu; and Hobo, Nobuhito, 4,047,507, Cl. 123-32.0Ea.

Sun Metal Products, Inc.: *See*—
Krenz, Joseph H., 4,047,745, Cl. 292-302.000.

Sun Oil Company of Pennsylvania: *See*—
Wagner, Walter D., 4,047,548, Cl. 141-52.000.

Sundberg, Erik, to Aktiebolaget Tudor. Battery electrode sheaths. 4,048,398, Cl. 429-140.000.

Sundberg, Jack Gunnar, to Chandler Evans Inc. Axial vane pump with non-rotating vanes. 4,047,859, Cl. 418-232.000.

Sunoo, Hyeng P. Fatigue relieving foot appliance. 4,047,310, Cl. 36-11.500.

Suntech, Inc.: *See*—
Seitzer, Walter H., 4,048,029, Cl. 204-129.000.

Superior Electric Company, The: *See*—
Kaufman, George A., Jr., 4,048,530, Cl. 310-89.000.

Suprunchuk, Tony: *See*—
Carlsson, David J.; Suprunchuk, Tony; and Wiles, David M., 4,048,367, Cl. 428-220.000.

Surber, William A.: *See*—
Harris, Samuel C., Jr.; and Surber, William A., 4,048,625, Cl. 364-900.000.

Sutej, Joseph M.: *See*—
Spicuzza, John P., Jr.; and Sutej, Joseph M., 4,048,208, Cl. 264-45.300.

Sutherland, James Gordon, to Alcan Aluminum Corporation. Composite beam structure. 4,047,354, Cl. 52-729.000.

Suzaka, Yukinori; and Saeda, Shigeru, to Showa Denko K.K. Antistatic organic liquid composition. 4,048,118, Cl. 252-518.000.

Suzuki, Nobuyuki: *See*—
Yokota, Takeshi; Suzuki, Nobuyuki; Sowa, Tsuneo; Sasaki, Yasuharu; and Ono, Yasutaka, 4,048,307, Cl. 424-180.000.

Suzuki, Tadaaki: *See*—
Ishii, Atsushi; Oikawa, Kiyoshi; Suzuki, Tadaaki; Morita, Tetsuro; and Iizuka, Yoshio, 4,048,656, Cl. 358-261.

Suzuki, Toshiharu: *See*—
Nakagome, Keisuke; and Suzuki, Toshiharu, 4,048,005, Cl. 156-630.000.

Svensson, Nils David, to Aktiebolaget Iggesunds Bruk. Knife device for a chopper. 4,047,670, Cl. 241-92.000.

Svoboda, Glenn R.; Suh, John T.; Carlstrom, William L.; and Maechtle, Gary L., to Freeman Chemical Corporation. Polyisocyanate prepolymers from scrap polyester and polyurethane foam products obtained therefrom. 4,048,104, Cl. 260-2.5AN.

Sweeney, John L., Jr. Method and apparatus for repairing damaged materials particularly suited to repairing knit or polyester materials. 4,047,300, Cl. 30-358.000.

Sweet, Francis W.: *See*—
Sill, Arthur D.; and Sweet, Francis W., 4,048,230, Cl. 260-570.5QC.

Sweet, Lavern E. Bridging clip for truss joists. 4,047,352, Cl. 52-693.000.

Swiecicki, Ignacy: *See*—
Mayo, Howard A., Jr.; and Swiecicki, Ignacy, 4,047,831, Cl. 415-1.000.

Swin, Richard E., Sr. Apparatus for molding dynamically balanced fans. 4,047,692, Cl. 249-142.000.

Swiss Aluminium Ltd.: *See*—
Maitland, Alexander, 4,047,600, Cl. 191-29.00R.

Syntex Corporation: *See*—
Fried, John H.; and Harrison, Ian T., 4,048,330, Cl. 424-308.000.

Szekely, Andrew Geza, to Union Carbide Corporation. Process for refining molten metal. 4,047,938, Cl. 75-67.00A.

Szepesi, Karoly; Meszaros, Lajos; Majer, Janos; Zoldi, Jozsef; and Entzmann, Karl, to Chemokomplex Vegyipari Gep-es Berendezes Export-Import Vallalat; and Tatabanyai Szenbanyak. Process for the extraction of alumina from minerals, rocks and industrial by-products. 4,048,285, Cl. 423-132.000.

Szporny, Laszlo: *See*—
Karpati, Egon; Szporny, Laszlo; Bartok, Mihaly; Czombos, Jozsef; Felfoldi, Karoly; Laszlavik, Marta; and Notheisz, Ferenc, 4,048,322, Cl. 424-283.000.

Szymber, Oleg: *See*—
Culver, Irven H.; and Szymber, Oleg, 4,047,447, Cl. 74-409.000.

T-Bar Incorporated: *See*—
Seiden, Lewis J.; Landesberg, William; and Young, Gladstone F., 4,048,672, Cl. 364-200.000.

T. Y. Lin International: *See*—
Yang, Yue-Chyou, 4,047,389, Cl. 61-59.000.

Tadokoro, Yoshio: *See*—
Usamoto, Teruyoshi; Miyawaki, Kenji; Shiota, Toshiaki; Takeuchi, Hideki; and Tadokoro, Yoshio, 4,048,275, Cl. 264-54.000.

Tagirov, Kurban Magomedovich; and Akopian, Nikolai Rubenovich. Method of successively opening-out and treating productive formations. 4,047,569, Cl. 166-308.000.

Taiyo Kaken Company, Ltd.: *See*—
Murakami, Heiichiro; and Okamoto, Tsuneo, 4,047,906, Cl. 55-79.000.

Takagi, Kazumi, to Takagi Sangyo Kabushiki Kaisha. Perfect fuel gasification device for use in combination with a combustion apparatus of internal combustion engine. 4,047,511, Cl. 123-122.00G.

Takagi Sangyo Kabushiki Kaisha: *See*—
Takagi, Kazumi, 4,047,511, Cl. 123-122.00G.

Takagi, Yasuo: *See*—
Nakajima, Yasuo; Hayashi, Yoshimasa; Takagi, Yasuo; Sugihara, Kunihiko; and Aoyama, Syunichi, 4,047,510, Cl. 123-119.00A.

Takahashi, Hidenori: *See*—
Maeda, Muneyoshi; Watanabe, Shigeo; Takahashi, Hidenori; and Sogi, Toshiyuki, 4,047,552, Cl. 152-361.00R.

Takahashi, Kihei; and Higuchi, Yositaka, to Yoshida Kogyo Kabushiki Kaisha. Separable slide fastener. 4,047,264, Cl. 24-205.11R.

Takahashi, Noriyuki; and Miura, Kimio, to Honda Giken Kogyo Kabushiki Kaisha. Correction device in a power steering apparatus for vehicles. 4,047,728, Cl. 180-141.000.

Takahata, Hitoshi: *See*—
Ishikawa, Atsuo; Tsubaki, Hidemi; Takahata, Hitoshi; Iwata, Riso; and Shinohara, Yonesaku, 4,048,124, Cl. 260-5.000.
Ishikawa, Atsuo; Tsubaki, Hidemi; Takahata, Hitoshi; Iwata, Riso; and Shinohara, Yonesaku, 4,048,424, Cl. 526-237.000.

Takai, Isao, to Oda Gosen Kogyo Kabushiki Kaisha. False-twisting method and apparatus for producing crimped filament yarns. 4,047,373, Cl. 57-77.400.

Takamoto, Hiromitsu; Yamamoto, Kiyoshi; Taneda, Nobuo; Matsubayashi, Toru; and Yamashita, Gentaro, to Teijin Limited. Method of purifying crude 2,6-naphthalenedicarboxylic acid dimethyl ester. 4,048,021, Cl. 203-91.000.

Takatsu, Haruyoshi: *See*—
Arai, Yoshi; Kimura, Kazuo; Sato, Hisato; Yamaki, Takasi; Morita, Katsuhiko; Ohzeki, Masanao; Takatsu, Haruyoshi; Fujita, Yutaka; and Tazume, Masayuki, 4,048,089, Cl. 252-299.000.

Takeda Chemical Industries, Ltd.: *See*—
Sugimoto, Keiichi; Nishijima, Koji; Hanaoka, Tadashi; Akimoto, Hiroshi; and Kakeya, Nobuharu, 4,048,158, Cl. 260-239.100.

Takei, Haruo: *See*—
Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ogawa, Akira, 4,047,964, Cl. 96-126.000.

Takeoshi, Tohru, to General Electric Company. Polyetherimides. 4,048,142, Cl. 260-47.0CP.

Takeuchi, Hideki: *See*—
Usamoto, Teruyoshi; Miyawaki, Kenji; Shiota, Toshiaki; Takeuchi, Hideki; and Tadokoro, Yoshio, 4,048,275, Cl. 264-54.000.

Takeuchi, Kazuaki, to Chuo Hatsujo Kogyo Co., Ltd. Pipe hanger. 4,047,683, Cl. 248-62.000.

Talcott, James M.: *See*—
Smith, Gordon A.; and Talcott, James M., 4,047,339, Cl. 52-108.000.

Tamura, Yukio; Hirosawa, Katsu; and Ogaki, Koji, to Kabushiki Kaisha Komatsu Seisakusho. Method of forming a subterranean water barrier and a plow for use therewith. 4,047,387, Cl. 61-13.000.

Tanabe, Shoji: *See*—
Shibanai, Ichiro; and Tanabe, Shoji, 4,048,359, Cl. 428-1.000.

Tanaka, Hiroshi; and Kato, Osamu, to NGK Spark Plug Co., Ltd. Sintered alloy for cutting tools. 4,047,897, Cl. 428-539.500.

Tanaka, Yoshinori; Shinoda, Hajime; and Narahara, Hisaaki, to Sony Corporation. Still color television signal recording and reproducing apparatus. 4,048,650, Cl. 358-1.000.

Taneda, Nobuo: *See*—
Takamoto, Hiromitsu; Yamamoto, Kiyoshi; Taneda, Nobuo; Matsubayashi, Toru; and Yamashita, Gentaro, 4,048,021, Cl. 203-91.000.

Tanno Senshoku Kogyo Co., Ltd.: *See*—
Hayashi, Takashi, 4,047,404, Cl. 68-152.000.

Tapp, David J.: *See*—
Schuessler, John C.; and Tapp, David J., 4,048,601, Cl. 335-193.000.

Tassi, Andras: *See*—
Toth, Laszlo; Schirhuber, Janos; Prepost, Kalman; and Tassi, Andras, 4,048,466, Cl. 219-121.0EM.

Tatabanyai Szenbanyak: *See*—
Szepesi, Karoly; Meszaros, Lajos; Majer, Janos; Zoldi, Jozsef; and Entzmann, Karl, 4,048,285, Cl. 423-132.000.

Taus, Christian: *See*—
Rau, Willy; and Taus, Christian, 4,047,576, Cl. 172-540.000.

Tax, Hans; and Hosler, Klaus, to Tax, Hans. Luffing crane with overload protection mechanism. 4,047,617, Cl. 212-39.0MS.

Taylor, Allen L., to Minnesota Mining and Manufacturing Company. Kinetic sensor employing polymeric piezoelectric material. 4,048,526, Cl. 310-329.000.

Taylor, James E.: *See*—
Brummett, Marshall G.; Heckman, Russell W.; Nickey, George A.; and Taylor, James E., 4,048,281, Cl. 264-230.000.

Taylor, Lynn J.; and Tobias, John W., to Owens-Illinois, Inc. Environmentally degradable polymer compositions. 4,048,410, Cl. 526-22.000.

Taylor, Stanley, to EMI Limited. Radiography with noble gas containing detector cells. 4,048,503, Cl. 250-385.000.

Tazume, Masayuki: *See*—
Arai, Yoshi; Kimura, Kazuo; Sato, Hisato; Yamaki, Takasi; Morita, Katsuhiko; Ohzeki, Masanao; Takatsu, Haruyoshi; Fujita, Yutaka; and Tazume, Masayuki, 4,048,089, Cl. 252-299.000.

TDK Electronics Co., Ltd.: *See*—
Nakagawa, Shiro, 4,048,658, Cl. 360-9.000.

Technica-Guss GmbH: *See*—
Krall, Heribert A.; and Maag, Helmut, 4,047,468, Cl. 90-11.00C.

Teco, Inc.: *See*—
Dammeyer, Bruce, 4,047,593, Cl. 182-2.000.

Teijin Limited: *See*—
Takamoto, Hiromitsu; Yamamoto, Kiyoshi; Taneda, Nobuo; Matsubayashi, Toru; and Yamashita, Gentaro, 4,048,021, Cl. 203-91.000.

Tejas Instrument Engineers, Inc.: *See*—
Caldwell, Bruce J., 4,048,640, Cl. 346-140.00A.

Telefonaktiebolaget L M Ericsson: *See*—
Carlsson, Rolf Christer, 4,048,579, Cl. 330-151.000.
Lyberg, Bertil, 4,048,581, Cl. 331-1.00A.

Telesonics, Inc.: *See*—
Wegner, Carl R., 4,048,654, Cl. 358-144.000.

Teletype Corporation: *See*—
Knuth, Kurt E., 4,048,657, Cl. 358-285.000.

Tension Envelope Corporation: *See*—
Klein, Bernard, 4,047,661, Cl. 229-70.000.

Terasaki, Syuuzi: *See*—
Yoshikawa, Shinsuke; Terasaki, Syuuzi; and Sasaki, Tohru, 4,047,998, Cl. 156-275.000.

Ternikova, Tamara Alexandrovna: *See*—
Kovin, Vladimir Mikhailovich; Mitenkov, Fedor Mikhailovich; Ovechkin, Alexandr Vasilievich; Pankratov, Vladimir Alexeevich; Savin, Nikolai Ivanovich; Ternikova, Tamara Alexandrovna; Filippov, Vladimir Jurievich; Khramov, Dmitry Alexandrovich; Chernomordik, Evgeny Naumovich; Shiryaev, Vladimir Ivanovich; Muzychuk, Vladimir Romanovich; and Savin, Alexandr Nikolaevich, 4,048,011, Cl. 176-40.000.

Terzaghi, Giovanni, to Mecondor S.p.A. Double wall multitube bags for enclosing the active material of positive plates in electric lead batteries. 4,048,399, Cl. 429-141.000.

Tesch, Gunter H., to Breveteam S.A. Ground covering material. 4,047,327, Cl. 47-9.000.

Teschner, Eckart: *See*—
Hesse, Wolfgang; Ritz, Jurgen; and Teschner, Eckart, 4,047,903, Cl. 51-298.00R.

Tessler, Martin M.: *See*—
Rutenberg, Morton W.; Jarowenko, Wadym; and Tessler, Martin M., 4,048,435, Cl. 536-106.000.

Tex-Trans, Inc.: *See*—
Ulrich, Bernhard, Jr., 4,047,765, Cl. 303-24.00F.

Texaco Inc.: *See*—
Allen, Joseph C., 4,048,078, Cl. 252-8.55D.
Bich, John R., 4,048,635, Cl. 340-347.0DA.
Canup, Robert E.; and McPeak, Earl W., Jr., 4,047,783, Cl. 339-97.00R.
Cole, Edward L.; Hess, Howard V.; and Wong, James, Jr., 4,047,898, Cl. 44-1.00G.
Dorn, Peter; and Foucher, Walter D., Jr., 4,047,900, Cl. 44-68.000.
Knifton, John F., 4,048,093, Cl. 252-414.000.
Lee, Gary D.; Vartanian, Paul F.; and Biasotti, Joseph B., 4,048,080, Cl. 252-51.540.
Powell, Justin Christopher, 4,047,899, Cl. 44-63.000.

Texas Instruments Incorporated: *See*—
Cochran, Michael J.; and Grant, Charles P., Jr., 4,048,624, Cl. 364-200.000.
Ward, Phillip W.; Donald, Robert C., Jr.; and Leerskov, Arthur E., Jr., 4,047,591, Cl. 181-119.000.

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Tietze, Kenneth V., 4,047,263, Cl. 16-125.000.

Th. Goldschmidt AG: *See*—
Greinacher, Ekkehard, 4,048,026, Cl. 204-61.000.

Th. Kieserling & Albrecht: *See*—
Lorenz, Horst; Koch, Rolf Eckart; and Kahlhofer, Reiner, 4,047,470, Cl. 90-15.00R.

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Kackstadter, Klaus; and Theidel, Hans, 4,047,887, Cl. 8-1.00W.

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Thiokol Corporation: *See*—
McCullough, Edward E.; Greenwood, Stewart H.; Sherard, Hoyt, Jr.; McDonald, Richard D.; Hirschi, Ronald G.; and Randall, Alfred R., 4,047,667, Cl. 239-265.350.

Thomas, Janine M.: *See*—
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,048,164, Cl. 544-121.000.

Thomaschefsky, Susan N.; and Sprangers, Ann, to Kimberly-Clark Corporation. Nursing pad. 4,047,534, Cl. 128-461.000.

Thomerson, Clarence T.: *See*—
Mayfield, Windel O.; Thomerson, Clarence T.; and Waldrop, Tom C., 4,047,391, Cl. 61-94.000.
Thompson, Francis T.; and Brennen, Michael B., to Westinghouse Electric Corporation. Flip-flop with false triggering prevention circuit. 4,048,521, Cl. 307-291.000.
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Charransol, Pierre; Hauri, Jacques; and Danis, Roger, 4,048,482, Cl. 235-153.0AE.
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Thorneburg Hosiery Mill, Inc.: *See*—
Thorneburg, James L., 4,047,400, Cl. 66-171.000.
Thorneburg, James L., to Thorneburg Hosiery Mill, Inc. Moisture absorbent band. 4,047,400, Cl. 66-171.000.
Thorning, Lloyd Carl. Animal trap. 4,047,321, Cl. 43-78.000.
Thorud, Richard A., to Toro Company, The. Rotary mower bagging apparatus. 4,047,367, Cl. 56-202.000.
Thoulouze, Daniel: *See*—
Bernard, Jean; Frossati, Giorgio; Guernet, Georges; Montier, Michel; Peccoud nee Toupillier, Louise; and Thoulouze, Daniel, 4,047,436, Cl. 73-362.0SC.
Throckmorton, Morford C., to Goodyear Tire & Rubber Company, The. Method of polymerization of conjugated diolefins using iron catalysts and nitrogen ligands. 4,048,418, Cl. 526-138.000.
Thrower, Arthur J., to B. F. Goodrich Company, The. Caliper brake torque plate. 4,047,598, Cl. 188-71.100.
Thumm, Jeffrey R.: *See*—
Haselwood, Donald E.; Solar, Carl M.; and Thumm, Jeffrey R., 4,048,562, Cl. 325-31.000.
Thyberg, Bertil Sven Johan; and Elmgren, Karl Arne Stig, to AB Westin & Backlund. Clamping device for work pieces of irregular shape. 4,047,709, Cl. 269-22.000.
Tibbs, Robert C. Vascular contact rotating and stationary abrading electrode devices for electric weed killing. 4,047,326, Cl. 47-1.300.
Tibbs, Robert C., II. Discharge controlling plow sweep. 4,047,577, Cl. 172-730.000.
Tietze, Kenneth V., to Textile Trim, Inc. Soft-feel handle and method of making same. 4,047,263, Cl. 16-125.000.
Tilley, Alec R.; and Hames, Michael D., to Chloride Silent Power Limited. Alkali metal-sulphur cells. 4,048,391, Cl. 429-104.000.
Timmerman, Daniel Maurice: *See*—
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Sakayori, Seigo; Kuro, Tomoyosi; Morita, Kazuyuki; Hinooka, Nobuya; Niimi, Hirozi; and Komatsu, Kensuke, 4,048,355, Cl. 427-375.000.
Tobias, John W.: *See*—
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Reese, Thomas J.; Mortimer, James R.; Tobin, Melvin W.; and Jursa, Stephen J. D., 4,047,916, Cl. 65-106.000.
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Di Maio, Anthony E.; and Todisco, Joseph G., 4,047,281, Cl. 29-429.000.
Tokura, Yukio: *See*—
Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Yamamoto, Shunji; Shimizu, Shigemitsu; and Tokura, Yukio, 4,048,666, Cl. 361-189.000.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Arita, Isao, 4,048,643, Cl. 354-51.000.
Miura, Hiroshi, 4,048,542, Cl. 315-39.710.
Sano, Shunichi, 4,048,633, Cl. 340-324.00M.
Tolaas, William M., to Hoerner Waldorf Corporation. Recloseable carton. 4,048,052, Cl. 206-625.000.
Toledo, Emil: *See*—
Bennett, Charles; and Toledo, Emil, 4,048,048, Cl. 204-279.000.
Tom McGuane Industries, Inc.: *See*—
Ludwig, George, 4,047,696, Cl. 251-308.000.
Tomlinson, Kenneth; and Duff, Edward John, to Colgate-Palmolive Company. Dental preparation containing materials having calcium and phosphate components. 4,048,300, Cl. 424-52.000.
Tomy Kogyo Co., Inc.: *See*—
Yamazaki, Tomio, 4,047,325, Cl. 46-106.000.
Tong, Shih Yung: *See*—
Peck, Richard John; and Tong, Shih Yung, 4,048,440, Cl. 178-69.100.
Toppan Printing Co., Ltd.: *See*—
Kudo, Kazuo; and Mizutani, Takashi, 4,047,868, Cl. 425-133.100.
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Thorud, Richard A., 4,047,367, Cl. 56-202.000.
Totani, Kazuo: *See*—
Yaguchi, Masachika; Jinnai, Toshio; Shirotsuka, Mikio; and Totani, Kazuo, 4,047,803, Cl. 350-160.0LC.
Toth, Laszlo; Schirhuber, Janos; Prepost, Kalman; and Tassi, Andras, to Magyar Vagon- es Gepgyar. Method of manufacturing axle housings with hollow axles. 4,048,466, Cl. 219-121.0EM.
Tottori Sanyo Electric Co., Ltd.: *See*—
Sumi, Yasuaki, 4,048,570, Cl. 325-459.000.
Toulios, Peter P.: *See*—
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Towmotor Corporation: *See*—
Koscinski, Daniel P., 4,047,759, Cl. 297-346.000.
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Toyo Kogyo Co., Ltd.: *See*—
Morishita, Tsuyoshi; Miyake, Kenji; Ishii, Noboru; Wakigara, Toshikazu; and Ueda, Naoji, 4,047,514, Cl. 125-40.000.
Toyoda-Koki Kabushiki-Kaisha: *See*—
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Ito, Hajime; Yamanaka, Teruo; and Ozeki, Osamu, 4,048,613, Cl. 340-53.000.
Noguchi, Masaaki; Sumiyoshi, Masaharu; and Hobo, Nobuhito, 4,047,507, Cl. 123-32.0Ea.
Tragesser, Charles W., to Westinghouse Electric Corporation. Circuit-interrupter grid structure for an oil-break circuit interrupter. 4,048,457, Cl. 200-150.00R.
Trank, Robert D., to Hollingsworth Solderless Terminal Company. Tap splice connector. 4,047,784, Cl. 339-98.000.
Trans-Sonics, Incorporated: *See*—
Westcott, Vernon C., 4,047,814, Cl. 356-38.000.
Transitron Electronic Corporation: *See*—
Bohn, Richard, 4,048,649, Cl. 357-43.000.
Tresper, Erhard; Neuray, Dieter; and Freitag, Dieter, to Bayer Aktiengesellschaft. 1,1,2-Tris-(o/p-hydroxyphenyl)-1-phenyl-ethanes. 4,048,200, Cl. 260-395.000.
Triad Fastner Corporation: *See*—
Damratowski, Harold E., 4,047,611, Cl. 206-347.000.
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Trombly, Edgar F., to Dart Industries Inc. Ice container. 4,047,633, Cl. 220-9.00R.
Tronvold, Harlan C., to Paper, Calmenson & Co. Torch cutting system with automated work support mechanism. 4,047,706, Cl. 266-49.000.
Trostmann, Erik; and Albertsen, Ove, to Dansk Styreteknik A/S. Apparatus for the production of rolled food products. 4,047,478, Cl. 99-450.100.
Trottier, Robert R.: *See*—
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Troue, Harden Henry, to Union Carbide Corporation. Apparatus for delivering relatively cold UV to a substrate. 4,048,490, Cl. 240-41.35D.
TRW Inc.: *See*—
Brooks, Edward F., 4,047,437, Cl. 73-421.50A.
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Witte, Arvel B.; Broadwell, James E.; and Hook, Dale L., 4,048,586, Cl. 331-94.50D.
Tsai, Yih-Wan, to PPG Industries, Inc. Regenerator flow control. 4,047,560, Cl. 165-9.300.
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Ishikawa, Atsuo; Tsubaki, Hidemi; Takahata, Hitoshi; Iwata, Riso; and Shinohara, Yonesaku, 4,048,424, Cl. 526-237.000.
Tsuchiya, Shozo; Hayashi, Hideo; and Oshima, Akio, to Nippon Oil Company Ltd. Printing ink composition. 4,048,132, Cl. 260-33.6UA.
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Tucker, Huel C.: *See*—
David, Donald J.; and Tucker, Huel C., 4,048,041, Cl. 204-195.00R.
Turin, Michel J.: *See*—
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,048,164, Cl. 544-121.000.
Turner, Kathleen Harding. Vertically adjustable support. 4,047,687, Cl. 248-318.000.
UBE Industries, Ltd.: *See*—
Itatani, Hiroshi; Kashima, Mikito; Matsuda, Masaoki; Yoshimoto, Hataaki; and Yamamoto, Hiroyuki, 4,048,197, Cl. 260-346.300.
Nagai, Shigeki; Iwata, Fumio; and Kubo, Kenzi, 4,048,236, Cl. 260-613.00D.
Uchida Sharyo Co., Ltd.: *See*—
Uchida, Suekichi, 4,047,753, Cl. 297-32.000.
Uchida, Suekichi, to Uchida Sharyo Co., Ltd. Foldable chair with rocking means. 4,047,753, Cl. 297-32.000.
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Yoshinaka, Shigeo; Uchiyama, Seiji; and Doya, Masaharu, 4,048,033, Cl. 204-158.0HA.
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Uffner, Melville W., to Air Products and Chemicals, Inc. Cobaltic accelerators with group II metal oxides and hydroxides. 4,048,086, Cl. 252-182.000.
Ulmer, Richard Walter, to Motorola, Inc. Input protection circuit for CMOS oscillator. 4,048,584, Cl. 331-62.000.
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Engelhardt, Friedrich; Hille, Martin; and Ulmschneider, Dieter, 4,048,077, Cl. 252-8.50C.

Ulrich, Bernhard, Jr., to Tex-Trans, Inc. Hydraulic power transmission and braking system for vehicles. 4,047,765, Cl. 303-24.00F.
Unger, Manfred: *See*—
Bergmann, Rolf; Hoheisel, Klaus; Schafer, Helmut; and Unger, Manfred, 4,048,150, Cl. 260-75.00T.
Union Carbide Corporation: *See*—
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Kronenberg, Marvin Lee, 4,048,402, Cl. 429-194.000.
Kronenberg, Marvin Lee, 4,048,403, Cl. 429-194.000.
Madden, Thomas Harry; and Reash, Clair Wilbur, 4,048,545, Cl. 316-2.000.
Manz, August Frederick, 4,048,465, Cl. 219-121.00R.
Senderoff, Seymour, 4,048,027, Cl. 204-61.000.
Szekely, Andrew Geza, 4,047,938, Cl. 75-67.00A.
Troue, Harden Henry, 4,048,490, Cl. 240-41.35D.
United Kingdom Atomic Energy Authority: *See*—
Keats, Albert Brian, 4,048,483, Cl. 235-153.00A.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Shanks, Ian Alexander, 4,048,358, Cl. 428-1.000.
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Berman, Allen, 4,047,466, Cl. 89-14.00R.
Campbell, Richard A.; Sparks, Richard A.; and Perry, Robert W., 4,048,580, Cl. 331-1.00R.
Cole, Lewis C., 4,047,484, Cl. 102-76.00P.
Cox, John T.; Garber, Michael B.; Jasper, Marilyn A.; and LoVecchio, Paul, 4,048,535, Cl. 313-367.000.
David, Donald J.; and Tucker, Huel C., 4,048,041, Cl. 204-195.00R.
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Frost, Robert F., 4,048,513, Cl. 307-28.000.
LeFebvre, Clarence A.; and Cabezut, Joseph M., Jr., 4,047,382, Cl. 60-252.000.
Miller, Walter E., Jr.; Duke, Jimmy R.; and Sitton, Robert L., 4,047,678, Cl. 244-3.160.
Pell, Kynric M.; and Brown, David B., 4,047,816, Cl. 356-152.000.
Rast, Gustaf J., Jr.; Barley, Thomas A.; Hammond, Raiford L.; and Ashley, James R., 4,048,568, Cl. 325-363.000.
Williams, Nathan P., 4,047,483, Cl. 102-70.20A.
Wohlford, William P., 4,047,465, Cl. 89-8.000.
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Vander Arend, Peter C.; and Fowler, William B., 4,048,437, Cl. 174-15.00S.
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Otto, Lucy A., 4,048,016, Cl. 195-100.000.
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Ravenhall, Richard; Salemme, Charles T.; and Adamson, Arthur P., 4,047,840, Cl. 416-135.000.
Navy: *See*—
Adolph, Horst G., 4,048,219, Cl. 560-156.000.
Bennett, Charles; and Toledo, Emil, 4,048,048, Cl. 204-279.000.
Bishop, Walton B., 4,048,636, Cl. 343-6.5LC.
Falterman, Charles W.; and Sbrocca, Dino A., 4,047,990, Cl. 149-19.200.
Heffernan, Robert J., 4,047,380, Cl. 60-39.46R.
Hughes, Richard Swart; and Wilcox, Howard A., 4,047,795, Cl. 350-96.00C.
Moore, Kenneth L., 4,048,500, Cl. 250-350.000.
Osborne, Eugene F., 4,048,563, Cl. 325-58.000.
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Weill, Paul B.; and Darby, Paul L., 4,047,988, Cl. 149-74.000.
U.S. Philips Corporation: *See*—
Boter, Pieter Abraham, 4,048,407, Cl. 429-217.000.
Severijns, Adrianus Petrus; and Aarts, Franciscus Henricus Eduard, 4,047,394, Cl. 62-502.000.
United States Steel Corporation: *See*—
Barnhart, Thomas F., 4,047,935, Cl. 75-34.000.
Grange, Raymond A.; and Miller, Robert L., 4,047,979, Cl. 148-12.00R.
Kolb, William A.; and Vignovich, Pete, 4,047,937, Cl. 75-59.000.
Lee, Edward J.; and Vavra, Frank, 4,047,708, Cl. 266-243.000.
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United Technologies Corporation: *See*—
Ferris, Donald L.; and Faiz, Robert L., 4,047,838, Cl. 416-115.000.
Ferris, Donald Leroy; and Noehren, William Lawrence, 4,047,839, Cl. 416-134.00A.
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Miller, Imrich M., 4,048,606, Cl. 336-198.000.
University of California, The Regents of the: *See*—
Lee, Kwan-Hua, 4,048,204, Cl. 260-413.000.
University of Michigan, The Regents of the: *See*—
Counsell, Raymond E.; and Yu, Terry Ta-Jen, 4,048,297, Cl. 424-1.000.
Lucchesi, Benedict R., 4,048,335, Cl. 424-329.000.
Unmuth, George E., to Petrolite Corporation. Laminating compositions and uses. 4,048,376, Cl. 428-461.000.
UOP Inc.: *See*—
Antos, George J., 4,048,246, Cl. 260-668.00D.
Antos, George J., 4,048,249, Cl. 260-673.500.
Asselin, George F., 4,048,062, Cl. 208-321.000.
Douglas, Walter M., 4,048,097, Cl. 252-431.00N.
Grendahl, Bernard Elden, 4,047,689, Cl. 248-503.100.
Hayes, John C., 4,048,099, Cl. 252-441.000.
Hayes, John C., 4,048,244, Cl. 260-668.00D.
Martan, Michael, 4,048,034, Cl. 204-159.230.
Neuzil, Richard W.; and deRosset, Armand J., 4,048,205, Cl. 260-428.000.
O'Hara, Mark J., 4,048,115, Cl. 252-465.000.
Pollitzer, Ernest L.; and Hayes, John C., 4,048,245, Cl. 260-668.00D.
Rosback, Donald H.; and Neuzil, Richard W., 4,048,111, Cl. 252-455.00Z.
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Ryu, Ji-Yong, 4,048,109, Cl. 252-442.000.
Ryu, Ji-Yong, 4,048,247, Cl. 260-671.00P.
Ryu, Ji-Yong, 4,048,248, Cl. 260-671.00P.
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Urban, Peter, 4,047,895, Cl. 23-288.00F.
Updegrave, William J. Versatile intraoral radiographic film positioning system. 4,048,506, Cl. 250-479.000.
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Nelson, Norman A., 4,048,194, Cl. 260-343.600.
Sekhar, Neel C., 4,048,331, Cl. 424-317.000.
Urakawa, Masaharu; and Sumiyama, Hiroshi, to Hitachi Chemical Company, Ltd. Method for obtaining urokinase. 4,048,014, Cl. 195-66.00B.
Urban, Peter, to UOP Inc. Apparatus for the purification of engine exhaust gases without oxidation of entrained SO_2 4,047,895, Cl. 23-288.00F.
Urrea, Petronio D.: *See*—
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Usamoto, Teruyoshi; Miyawaki, Kenji; Shiota, Toshiaki; Takeuchi, Hideki; and Tadokoro, Yoshio, to Sumitomo Chemical Company, Limited. Cross-linking and foaming injection molding process for ethylenic polymers. 4,048,275, Cl. 264-54.000.
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Valanti, Pentti Antero. Method and apparatus for purifying emulsions and contaminated water with electolysis. 4,048,031, Cl. 204-149.000.
Vale, Christopher R., to Westinghouse Electric Corporation. Information extraction for Doppler radar. 4,048,595, Cl. 333-72.000.
Valle-Riestra, J. Frank, to Dow Chemical Company, The. Method of removing solvent residues from aqueous paper pulps. 4,048,007, Cl. 162-57.000.
Vallet, Francisco Arjona. Magnetic core. 4,048,604, Cl. 336-83.000.
Valyi, Emery I. Apparatus for the preparation of parisons. 4,047,874, Cl. 425-523.000.
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Van Assche, Daniel, to Sandoz Ltd. Azo dyes having an optionally substituted 1-azo-3-nitro-4-arylaminophenyl nucleus. 4,048,153, Cl. 260-193.000.
VanAuken, Richard L., to Exxon Research and Engineering Company. Bicycle frame. 4,047,731, Cl. 280-281.00B.
Van Daelen, Henri-Jean G. M.: *See*—
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Voigt, Hermann Uwe, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Preparing thermo-plastic or elastomeric materials for cross-linking of grafted silane. 4,048,129, Cl. 260-23.00H.
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Williams, Jerry K.; and Landmesser, Franklin D., to General Motors Corporation. Cambering vehicle with hydraulic stabilizer and equalizer. 4,047,732, Cl. 280-287.000.
Williams, John K., to Xerox Corporation. Recovery of selenium and selenium alloys by hydraulic lathing. 4,047,973, Cl. 134-10.000.
Williams, Nathan P., to United States of America, Army. Initiator for use in laser beam ignition of solid propellants. 4,047,483, Cl. 102-70.20A.
Williamson, John Peter Hugh: *See—*
Morriss, Harry Augustus; and Williamson, John Peter Hugh, 4,047,970, Cl. 106-299.000.
Willis, Gordon G.: *See—*
Boozalis, Theodore S.; Cragar, Darryl E.; Ivy, John B.; and Willis, Gordon G., 4,048,241, Cl. 260-658.00R.
Wills, David C.: *See—*
Lawter, Ray L.; Shooter, Kenneth L.; and Wills, David C., 4,048,476, Cl. 235-61.11D.
Wilmot, Kenneth, to Neotechnic Engineering Limited. Drinking stations for poultry and the like. 4,047,503, Cl. 119-75.000.
Wilser, Walter T.: *See—*
Zublin, Kurt E.; and Wilser, Walter T., 4,048,588, Cl. 331-96.000.
Wilson, John. Framing form and clamp. 4,047,710, Cl. 269-42.000.
Wilson, John A.: *See—*
Blakey, Rene C.; Riddell, Robert G.; Whittaker, John; and Wilson, John A., 4,048,380, Cl. 428-511.000.
Wilson, John Charles, to Eastman Kodak Company. Radiation sensitive polymers of oxygen-substituted maleimides and elements containing same. 4,048,146, Cl. 260-63.0UY.
Wilson, Joseph Townsend, III: *See—*
Walsh, James Calvin; Wilson, Joseph Townsend, III; and Wolfe, Bruce Allen, 4,048,639, Cl. 346-75.000.
Wimmer, Peter. Method of and apparatus for improving smoking properties of tobacco products. 4,047,535, Cl. 131-23.00R.
Winderl, Siegfried: *See—*
Voges, Dieter; Baer, Karl; Boudier, Juergen; Winderl, Siegfried; and Hoffmann, Herwig, 4,048,116, Cl. 252-470.000.
Windsunwatt, Inc.: *See—*
Magoveny, George S.; and Forgo, Eric J., 4,047,834, Cl. 415-3.000.
Winicov, Murray A.; and Cantor, Abraham, to West Chemical Products, Incorporated. Means for killing bacterial spores with glutaraldehyde sporicidal compositions. 4,048,336, Cl. 424-334.000.
Winkler, Charles L., to Westinghouse Electric Corporation. Elevator system. 4,047,596, Cl. 187-29.00R.
Winter, Wilhelm; and Held, Artur, to FORM-PLAST GmbH. Mold for concrete test cube. 4,047,690, Cl. 249-66.00A.
Wisdom, Gerald F. Apparatus for lowering a trailer to the ground. 4,047,699, Cl. 254-86.00H.
Wise, John J.: *See—*
Garwood, William E.; Jacob, Solomon M.; Kuo, James C.; and Wise, John J., 4,048,250, Cl. 260-683.430.
Wisotzky, Otto G.: *See—*
Blackburn, Tom L.; and Wisotzky, Otto G., 4,048,576, Cl. 330-29.000.
Wisotzky, Reuben; and Bolger, John C., to Pandel-Bradford, Inc. Embossed suede material and method of preparing same. 4,048,269, Cl. 264-25.000.
Witte, Arvel B.; Broadwell, James E.; and Hook, Dale L., to TRW Inc. Chemical laser with mixing enhancement device for power improvement. 4,048,586, Cl. 331-94.50D.
Witte, Donald H.; and Weir, Donald H., to Fox Pool Corporation. Swimming pool modular constructure. 4,047,340, Cl. 52-169.700.
WkS-Schweisstechnik Willy Kalnbach, Firma: *See—*
Wertli, Josef; and Matter, Paul, 4,048,467, Cl. 219-131.00R.
Wohlford, William P., to United States of America, Army. Telescoped explosive driver. 4,047,465, Cl. 89-8.000.
Woitun, Eberhard: *See—*
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Wojcik, Ronald Thomas; and Ruckel, Erwin Richard, to Arizona Chemical Company. Antimony halide catalyst system. 4,048,095, Cl. 252-429.00R.
Wolbrink, David W., to Broan Manufacturing Co., Inc. Deodorizer for trash compactors. 4,047,775, Cl. 312-211.000.
Wolf, Gerhard Dieter; Bentz, Francis; and Nischk, Gunther, to Bayer Aktiengesellschaft. Diols containing sulphonic acid groups based on dihydroxy alkenes. 4,048,221, Cl. 260-512.00C.
Wolf, Johann, to Johann Wolf Gesellschaft m.b.H. KG. Fixture for use in the formation of a discharge opening of a fodder silo. 4,047,691, Cl. 249-97.000.
Wolfangel, Robert George, to Mallinckrodt, Inc. Radiopharmaceutical scanning agents. 4,048,296, Cl. 424-1.000.
Wolfe, Bruce Allen: *See—*
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Wolfe, David L.; and Sexton, Arthur R., to Dow Chemical Company, The. Process for the dealkylation of t-butyl and t-amyl ethers on polymeric backbones. 4,048,237, Cl. 260-615.00B.
Wolff, Otto E., to Polaroid Corporation. Method for forming a slurry battery cell. 4,047,289, Cl. 29-623.400.
Wolfgang, Lozure Gene: *See—*
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Gibbons, John P.; and Wondolowski, Lawrence, 4,048,127, Cl. 260-17.200.
Wong, James, Jr.: *See—*
Cole, Edward L.; Hess, Howard V.; and Wong, James, Jr., 4,047,898, Cl. 44-1.00G.
Wood, Eric, to Insituform (Pipes & Structures) Ltd. System for generating power from wave motions of the sea. 4,048,512, Cl. 290-53.000.
Wood, Laurier A. Apparatus and method for repeatable transfers of liquid deposits. 4,047,498, Cl. 118-243.000.
Worrall, Michael John, to British Ceca Company Limited, The. Control systems for adsorber units. 4,047,904, Cl. 55-18.000.
Wotruba, Gottfried: *See—*
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Wright, George W., to Crown Cork & Seal Company, Inc. Means and method for inspecting in-process aerosol container closures. 4,047,613, Cl. 209-74.00M.
Wright, James H. Electroslag remelting apparatus for rebuilding grouser bars. 4,047,557, Cl. 164-252.000.
Wright, Roger N., to Allegheny Ludlum Industries, Inc. Duplex ferrit IC-martensitic stainless steel. 4,047,941, Cl. 75-126.00B.
Wulff, Allan. Darkroom timer. 4,047,375, Cl. 58-21.130.
Wurmb, Rolf; Leutner, Bernd; Seydl, Wolfgang; Schlimper, Hans-Ulrich; and Sterzel, Hans-Josef, to BASF Aktiengesellschaft. Polyester molding compositions of reduced flammability. 4,048,135, Cl. 260-40.00R.
Wyss, Samuel G. Towing mechanism for a ski lift. 4,047,487, Cl. 104-173.0ST.
Xerox Corporation: *See—*
Allis, Robert F.; and Capaccio, Vincent A., 4,047,811, Cl. 355-14.000.
Chu, Joseph Y. C.; and Gunther, Wolfgang H. H., 4,047,947, Cl. 96-1.300.
Hauman, Dewey H., Jr., 4,047,885, Cl. 432-60.000.
Hogan, James W., 4,047,812, Cl. 355-76.000.
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Pfister, Gustav R.; and Williams, David J., 4,047,945, Cl. 96-1.00R.
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Yaguchi, Masachika; Jinnai, Toshio; Shirotsuka, Mikio; and Totani, Kazuo, to Dai Nippon Toryo Kabushiki Kaisha. Nematic liquid crystal compositions. 4,047,803, Cl. 350-160.0LC.
Yaguchi, Mashachika; and Nakamura, Kenji, to Dai Nippon Toryo Kabushiki Kaisha. Nematic liquid crystal compositions. 4,048,088, Cl. 252-299.000.
Yahiro, Teruo; and Yoshida, Hiroshi, to Chemical Grout Company, Ltd.; and Kajima Corporation. High-velocity jet digging method. 4,047,580, Cl. 175-67.000.
Yakovlev, Alexandr Ivanovich: *See—*
Borzyak, Jury Gordeevich; Borisenko, Alexandr Ivanovich; Tjufilin, German Mikhailovich; Rolik, Alexandr Ivanovich; and Yakovlev, Alexandr Ivanovich, 4,048,280, Cl. 264-102.000.
Yamada, Kenji: *See—*
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Yamada, Yoshio; and Wada, Yoneji. Liquid filtering device. 4,048,071, Cl. 210-90.000.
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Yamamoto, Hisao: *See—*
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Yamamoto, Kiyoshi: *See—*
Takamoto, Hiromitsu; Yamamoto, Kiyoshi; Taneda, Nobuo; Matsubayashi, Toru; and Yamashita, Gentaro, 4,048,021, Cl. 203-91.000.
Yamamoto, Michihiro; Katayama, Shigenari; Koshiba, Masao; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Process for preparing 1-polyhaloalkyl-3,4-dihydro-2-(1H)-quinazolinones. 4,048,168, Cl. 260-251.0QB.
Yamamoto, Mitsuyoshi: *See—*
Nara, Takashi; Okachi, Ryo; Yamamoto, Mitsuyoshi; Mori, Yasuki; Sato, Moriyuki; Sugimoto, Masahiro; and Shimizu, Yoshiaki, 4,048,015, Cl. 195-96.000.
Yamamoto, Nobuo: *See—*
Yoneyama, Masakazu; Usami, Toshimasa; Ino, Shiyoichi; Sata, Yoshiteru; and Yamamoto, Nobuo, 4,047,958, Cl. 96-87.00R.
Yamamoto, Shunji: *See—*
Irie, Yutaka; Murata, Tomoji; Shibazaki, Kenji; Yamamoto, Shunji; Shimizu, Shigemitsu; and Tokura, Yukio, 4,048,666, Cl. 361-189.000.
Yamanaka, Teruo: *See—*
Ito, Hajime; Yamanaka, Teruo; and Ozeki, Osamu, 4,048,613, Cl. 340-53.000.
Yamashita, Gentaro: *See—*
Takamoto, Hiromitsu; Yamamoto, Kiyoshi; Taneda, Nobuo; Matsubayashi, Toru; and Yamashita, Gentaro, 4,048,021, Cl. 203-91.000.
Yamatani, Wataru, to Sony Corporation. Receiver automatic gain control system. 4,048,569, Cl. 325-414.000.
Yamazaki, Tomio, to Tomy Kogyo Co., Inc. Baton twirling figure. 4,047,325, Cl. 46-106.000.
Yanagida, Hiroaki; and Ohashi, Tsuneo, to Fujitok Co., Ltd. Method for treating a glass surface. 4,047,971, Cl. 134-2.000.
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, to Sankyo Company Limited. Process for preparing 7 α-alkoxycephalosporin derivatives. 4,048,155, Cl. 542-422.000.
Yang, Yue-Chyou, to T. Y. Lin International. Precast concrete pile, and cofferdams. 4,047,389, Cl. 61-59.000.
Yanovsky, Viktor Yakovlevich: *See—*
Karpov, Valentin Mikhailovich; Santo, Vladimir Rezhevich; Yanovsky, Viktor Yakovlevich; Mikhailov, Anatoly Ivanovich; and Belyaev, Mikhail Fedorovich, 4,047,428, Cl. 73-141.00A.
Yeager, Marvin Leo, to AMP Incorporated. Rotary cam low insertion force connector with top actuation. 4,047,782, Cl. 339-75.0MP.
Yokota, Takeshi; Suzuki, Nobuyuki; Sowa, Tsuneo; Sasaki, Yasuharu; and Ono, Yasutaka, to Asahi Kasei Kogyo Kabushiki Kaisha. Cyclic adenosine monophosphate 8-substituted derivatives. 4,048,307, Cl. 424-180.000.
Yomogida, Toshihiko, to Toyoda-Koki Kabushiki-Kaisha. Programmable sequence controller. 4,048,622, Cl. 364-900.000.
Yoneyama, Masakazu; Usami, Toshimasa; Ino, Shiyoichi; Sata, Yoshiteru; and Yamamoto, Nobuo, to Fuji Photo Film Co., Ltd. Photographic sensitive materials. 4,047,958, Cl. 96-87.00R.
Yoshida, Hiroshi: *See—*
Yahiro, Teruo; and Yoshida, Hiroshi, 4,047,580, Cl. 175-67.000.
Yoshida, Katsuyoshi; and Kitajima, Yukio, to Nippon Steel Corporation. Method of continuous galvanizing steel strip on partial or one side. 4,047,977, Cl. 148-6.200.
Yoshida Kogyo Kabushiki Kaisha: *See—*
Matsuda, Yoshio, 4,047,265, Cl. 24-205.16C.
Matsuda, Yoshio; and Fujisaki, Yoshinori, 4,047,402, Cl. 66-195.000.
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Takahashi, Kihei; and Higuchi, Yositaka, 4,047,264, Cl. 24-205.11R.
Yoshida, Shinya, to Omron Tateisi Electronics Company. Apparatus for checking the user of a card in card-actuated machines. 4,048,475, Cl. 235-61.70B.
Yoshikawa, Shinsuke; Terasaki, Syuuzi; and Sasaki, Tohru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method of polarizing a thermoplastic resin film. 4,047,998, Cl. 156-275.000.
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Yoshinaka, Shigeo; Uchiyama, Seiji; and Doya, Masaharu, to Mitsubishi Gas Chemical Company, Inc. Process for preparing perchloromethylbenzene. 4,048,033, Cl. 204-158.0HA.
Young, Charles Edwin, to Bell Telephone Laboratories, Incorporated. Error control for digital multipoint circuits. 4,048,441, Cl. 178-73.000.
Young, D. Craig; and Zadoks, Abraham L., to Caterpillar Tractor Co. Internally insulated bellows assembly. 4,047,740, Cl. 285-47.000.
Young, Gladstone F.: *See—*
Seiden, Lewis J.; Landesberg, William; and Young, Gladstone F., 4,048,672, Cl. 364-200.000.
Young, Sheldon E., to Vibro/Dynamics Corporation. Load-sensing and adjusting method for operable machines. 4,047,427, Cl. 73-141.00A.
Young, Wilbur E. Tiltable and extensible trailer. 4,047,630, Cl. 214-506.000.
Yu, Terry Ta-Jen: *See—*
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Yung, Gordon H. K.: *See—*
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Zacher, Wieland: *See—*
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Zalis, Albert A., to Houdaille Industries, Inc. Stuffing box for high density screw pump and pump incorporating same. 4,047,858, Cl. 418-201.000.
Zeffero, Robert J.: *See—*
Lambitz, Robert H.; and Zeffero, Robert J., 4,047,749, Cl. 296-39.00R.
Zefflamb Industries, Inc.: *See—*
Lambitz, Robert H.; and Zeffero, Robert J., 4,047,749, Cl. 296-39.00R.
Zeidler, Johannes; and Von Borcke, Bernd, to Alfred Gutmann Gesellschaft fur Maschinenbau. Centrifugal impeller for sandblasting installations. 4,047,843, Cl. 416-185.000.
Zenith Radio Corporation: *See—*
Bowler, John W.; Karner, Kenneth E.; Pittenger, Daniel I.; and Schwartz, Donald A., 4,048,669, Cl. 361-391.000.
Hofmann, Judson A., 4,048,655, Cl. 358-148.000.
Zenzie, Henry: *See—*
Hansen, Elwood F.; Goldberg, Arnold; Zenzie, Henry; and Giroward, Kermit, 4,047,914, Cl. 55-488.000.
Zerpner, Dieter: *See—*
Haag, Horst; Nordsiek, Karl-Heinz; Streck, Roland; and Zerpner, Dieter, 4,048,262, Cl. 260-889.000.
Zetlmeisl, Michael J.: *See—*
May, Walter R.; Zetlmeisl, Michael J.; and Koch, Kenneth W., 4,047,875, Cl. 431-3.000.
Zillman, Jack H. Electrical component for providing integrated inductive-capacitive networks. 4,048,593, Cl. 333-70.00R.
Zimmerman, Joseph, to Du Pont de Nemours, E. I., and Company. Washing process for inorganic acid containing polyamide fibers. 4,048,279, Cl. 264-184.000.
Zimmerman, Richard Henry, to AMP Incorporated. Conductor patterned substrate providing stress release during direct attachment of integrated circuit chips. 4,048,438, Cl. 174-68.500.
Ziofsky, Henry; and Sinclair, Brett Jason. Guide for setting up artificial teeth. 4,047,303, Cl. 32-40.00R.
Zirk, Robert Louis, Sr., to Illinois Tool Works Inc. Induction heating core structure and method of heating. 4,048,458, Cl. 219-10.790.
Zlupko, John E.: *See—*
Bailey, Cecil; Balchunas, Walter C.; and Zlupko, John E., 4,048,348, Cl. 427-34.000.
Zoldi, Jozsef: *See—*
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Baron, Gerhard; Bierbach, Herbert; Hafke, Carl; and Zolzer, Karlheinz, 4,047,901, Cl. 48-86.00R.
Zona, Michael R.; Ruffing, Charles R.; and Johrde, Paul S., to Westinghouse Electric Corporation. Casting assembly for stator coils. 4,047,867, Cl. 425-117.000.
Zublin, Kurt E.; and Wilser, Walter T., to Watkins-Johnson Company. Yig-tuned bulk semiconductor oscillator. 4,048,588, Cl. 331-96.000.
Zuccatti, Joyce L. Spectacles having adjustable temples. 4,047,809, Cl. 351-118.000.
zurStrassen, Heinrich; and Rauschenfels, Eberhard, to Dyckerhoff Zementwerke AG. Method for the production of synthetic wollastonite materials. 4,047,968, Cl. 106-281.00R.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF SEPTEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aker, John L.; Geist, Donald L.; Kittle, Freddie R.; and Berry, Fred M., to Kustom Electronics, Inc. Method and apparatus for digitally measuring speed. Re. 29,401, Cl. 343-8.000.

Amerace Corporation: *See—*
Heenan, Sidney A., Re. 29,396, Cl. 204-281.000.

Anderson Company, The: *See—*
Moorhead, John P.; and Stratton, Donald W., Re. 29,392, Cl. 15-250.420.

Bald, Robert E.: *See—*
Swanson, Harold V.; and Bald, Robert E., Re. 29,394, Cl. 277-229.000.

Becker, Reinhard, to Deere & Company. Apparatus for separating and/or counting individual elements of a plurality. Re. 29,393, Cl. 221-211.000.

Berry, Fred M.: *See—*
Aker, John L.; Geist, Donald L.; Kittle, Freddie R.; and Berry, Fred M., Re. 29,401, Cl. 343-8.000.

Deere & Company: *See—*
Becker, Reinhard, Re. 29,393, Cl. 221-211.000.

Elektriska Svetsningsaktiebolaget: *See—*
Ericsson, Rolf, Re. 29,400, Cl. 219-135.000.

Ericsson, Rolf, to Elektriska Svetsningsaktiebolaget. Direct current power supply for manual arc welding. Re. 29,400, Cl. 219-135.000.

Geist, Donald L.: *See—*
Aker, John L.; Geist, Donald L.; Kittle, Freddie R.; and Berry, Fred M., Re. 29,401, Cl. 343-8.000.

Heenan, Sidney A., to Amerace Corporation. Pin having nonaligned cube axis and pin axis and bundle of such pins. Re. 29,396, Cl. 204-281.000.

Inoue, Kiyoshi. Servosystem for electrical machining processes. Re. 29,398, Cl. 219-69.00G.

Inoue, Kiyoshi. Servosystem for gap electrical machining processes (especially electroerosion). Re. 29,399, Cl. 219-69.00G.

Interpace Corporation: *See—*
Swanson, Harold V.; and Bald, Robert E., Re. 29,394, Cl. 277-229.000.

Kittle, Freddie R.: *See—*
Aker, John L.; Geist, Donald L.; Kittle, Freddie R.; and Berry, Fred M., Re. 29,401, Cl. 343-8.000.

Kustom Electronics, Inc.: *See—*
Aker, John L.; Geist, Donald L.; Kittle, Freddie R.; and Berry, Fred M., Re. 29,401, Cl. 343-8.000.

Moorhead, John P.; and Stratton, Donald W., to Anderson Company, The. Windshield wiper blade structure. Re. 29,392, Cl. 15-250.420.

Nippon Electric Company, Limited: *See—*
Yonezu, Hiroo, Re. 29,395, Cl. 148-175.000.

Stratton, Donald W.: *See—*
Moorhead, John P.; and Stratton, Donald W., Re. 29,392, Cl. 15-250.420.

Swanson, Harold V.; and Bald, Robert E., to Interpace Corporation. Corrosion protective band for underground pipe joints with metal parts. Re. 29,394, Cl. 277-229.000.

Yamazaki, Masahiko. Separating apparatus. Re. 29,397, Cl. 210-316.000.

Yonezu, Hiroo, to Nippon Electric Company, Limited. Method of fabricating a double heterostructure injection laser utilizing a stripe-shaped region. Re. 29,395, Cl. 148-175.000.

LIST OF PLANT PATENTEES

Duffett, William E.: *See—*
Jessel, Walter H., Jr.; and Duffett, William E., 4,104, Cl. 74.000.

Grob, Adolf, to Mikkelsens, Inc. Kalanchoe plant. 4,101, 9-13-77, Cl. 68.000.

Grob, Adolf, to Mikkelsens, Inc. Kalanchoe plant. 4,102, 9-13-77, Cl. 68.000.

Grob, Adolf, to Mikkelsens, Inc. Kalanchoe plant. 4,103, 9-13-77, Cl. 68.000.

Jessel, Walter H., Jr.; and Duffett, William E., to Yoder Brothers, Inc. Chrysanthemum plant. 4,104, 9-13-77, Cl. 74.000.

Jorgensen, Sigvart, to Patterson's Flowers, Inc. Chrysanthemum plant. 4,105, 9-13-77, Cl. 76.000.

Mikkelsens, Inc.: *See—*
Grob, Adolf, 4,101, Cl. 68.000.
Grob, Adolf, 4,102, Cl. 68.000.
Grob, Adolf, 4,103, Cl. 68.000.

Patterson's Flowers, Inc.: *See—*
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Yoder Brothers, Inc.: *See—*
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LIST OF DESIGN PATENTEES

AB Bofors: *See—*
Dahlberg, Sten Johan; Korpi, Jouko Kalevi; and Larsson, Ulf Robert, 245,780, Cl. D15-32.000.

Alseth, Gilmore N.; and Hipp, Richard D., Jr., to Minnesota Mining & Manufacturing Company. Toner powder supply container. 245,761, 9-13-77, Cl. D9-224.000.

American Optical Corporation: *See—*
Burkhardt, Wayne W.; and Fischlein, Robert R., 245,781, Cl. D16-65.000.

Askew, Aubrey, to Dunlop Limited. Shoe. 245,732, 9-13-77, Cl. D2-310.000.

Askew, Aubrey, to Dunlop Limited. Shoe. 245,733, 9-13-77, Cl. D2-310.000.

Bargsten, Betty J. Chest protector for motorcycle riders. 245,731, 9-13-77, Cl. D2-27.000.

Bayerische Motoren Werke Aktiengesellschaft: *See—*
Muth, Hans A., 245,775, Cl. D12-205.000.

Box, Theodor. Case for holding containers carrying bottles. 245,760, 9-13-77, Cl. D9-177.000.

Branch, Robert P.; and Monell, Charles M. Surgical hair implanter. 245,788, 9-13-77, Cl. D24-26.000.

Breger, Carl-Arne, to Sandvik Aktiebolag. Hack saw. 245,754, 9-13-77, Cl. D8-96.000.

Bridgestone Tire Company Limited: *See—*
Nakano, Minoru; and Tezuka, Toshiro, 245,771, Cl. D12-146.000.

Brightbill, Keith E., to Murray Ohio Manufacturing Co., The. Combined bicycle seat and tank. 245,770, 9-13-77, Cl. D12-126.000.

Brooks, Ronald A. Bookshelf unit. 245,744, 9-13-77, Cl. D6-186.000.

Burkhardt, Wayne W.; and Fischlein, Robert R., to American Optical Corporation. Safety spectacles frame front. 245,781, 9-13-77, Cl. D16-65.000.

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106 4,047,505

CLASS 122
32 4,047,506

CLASS 123
32 Ea 4,047,507
41.6 4,047,508
119 A 4,047,509
4,047,510
122 E 4,047,512
122 G 4,047,511
148 E 4,047,513

CLASS 125
40 4,047,514

CLASS 126
110 R 4,047,515
270 4,047,516
4,047,517
271 4,047,518
299 D 4,047,519

CLASS 128
2 V 4,047,520
2.08 4,047,521
66 4,047,522
69 4,047,523
4,047,524
208 4,047,525
214 R 4,047,526
229 4,047,527
287 4,047,528
4,047,529
4,047,530
290 R 4,047,531
303 R 4,047,532
335.5 4,047,533
461 4,047,534

CLASS 131
23 R 4,047,535
140 C 4,047,536

CLASS 132
7 4,047,537

CLASS 133
4 R 4,047,538

CLASS 134
2 4,047,971
4,047,972
10 4,047,973

CLASS 137
13 4,047,539
239 4,047,540
564.5 4,047,541
627.5 4,047,542

CLASS 138
155 4,047,543

CLASS 140
105 4,047,544
123.6 4,047,545

CLASS 141
1 4,047,547
1 R 4,047,546
52 4,047,548

CLASS 144
208 D 4,047,549

CLASS 148
1 5 4,047,974
4,047,975
4,047,976
6 2 4,047,977

11.5 C 4,047,978
12 R 4,047,979
12.7 C 4,047,980
16 4,047,981
101 4,047,982
105 4,047,983
152 4,047,984
153 4,047,985
171 4,047,986
175 Re.29,395

CLASS 149

19.2 4,047,990
37 4,047,987
74 4,047,988
109.6 4,047,989

CLASS 150

52 R 4,047,550

CLASS 152

354 4,047,551
361 R 4,047,552

CLASS 156

62.6 4,047,991
73.1 4,047,992
89 4,047,993
98 4,047,994
203 4,047,995
220 4,047,996
229 4,047,997
275 4,047,998
280 4,047,999
304 4,048,000
331 4,048,001
403 4,048,002
515 4,048,003
580.1 4,048,004
630 4,048,005
664 4,048,006

CLASS 157

1.24 4,047,553

CLASS 160

168 R 4,047,554

CLASS 162

57 4,048,007
104 4,048,008

CLASS 164

52 4,047,555
57 4,047,556
252 4,047,557
309 4,047,558

CLASS 165

7 4,047,559
9.3 4,047,560
32 4,047,561
111 4,047,562
158 4,047,563

CLASS 166

72 4,047,564
217 4,047,565
285 4,047,566
293 4,047,567
298 4,047,568
308 4,047,569

CLASS 169

16 4,047,570
60 4,047,571
62 4,047,572

CLASS 171

14 4,047,573

CLASS 172

178 4,047,574
311 4,047,575
540 4,047,576
730 4,047,577

CLASS 173

152 4,047,578

CLASS 174

15 S 4,048,437
68.5 4,048,438

CLASS 175

7 4,047,579
67 4,047,580
95 4,047,581
122 4,047,582
410 4,047,583

CLASS 176

19 R 4,048,009
36 R 4,048,010
40 4,048,011
60 4,048,012

CLASS 177

1 4,047,584
210 R 4,047,585
4,047,586

CLASS 178

17 C 4,048,439
69.1 4,048,440
73 4,048,441

CLASS 179

1 GP 4,048,442
1 SA 4,048,443
1 ST 4,048,444
15 AL 4,048,446
15 AS 4,048,447
15 BF 4,048,445
17 E 4,048,448
18 AH 4,048,451
18 BC 4,048,449
18 EB 4,048,450
27 D 4,048,452
110 A 4,048,454
156 R 4,048,453

CLASS 180

53 R 4,047,587
64 R 4,047,588
108 4,047,589
139 4,047,590
141 4,047,728

CLASS 181

119 4,047,591
142 4,047,592

CLASS 182

2 4,047,593
153 4,047,594

CLASS 184

6.14 4,047,595

CLASS 187

29 R 4,047,596
95 4,047,597

CLASS 188

71.1 4,047,598

CLASS 191

12.2 A 4,047,599
29 R 4,047,600

CLASS 192

36 4,047,601
53 F 4,047,602
64 4,047,603

CLASS 193

10 4,047,604

CLASS 194

1 R 4,047,605

CLASS 195

49 4,048,013
66 B 4,048,014
96 4,048,015
100 4,048,016
109 4,048,017
115 4,048,018
129 4,048,019

CLASS 196

132 4,048,020

CLASS 197

1 R 4,047,606
151 4,047,607
4,047,608

CLASS 198

690 4,047,609

CLASS 200

81.4 4,048,455
148 A 4,048,456
150 R 4,048,457

CLASS 203

91 4,048,021

CLASS 204

1 T 4,048,022
44 4,048,023
55 R 4,048,024
56 R 4,048,025
61 4,048,026
4,048,027
97 4,048,028
129 4,048,029
149 4,048,030
4,048,031
151 4,048,032
158 HA 4,048,033
159.15 4,048,035
159.23 4,048,034
4,048,036
180 R 4,048,037
4,048,038
192 P 4,048,039
195 R 4,048,040
4,048,041
206 4,048,042
224 R 4,048,043
257 4,048,044
263 4,048,045
266 4,048,046
270 4,048,047
279 4,048,048
281 Re.29,396
299 R 4,048,049

CLASS 206

1.5 4,048,050
4,048,051
187 4,047,610
347 4,047,611
454 4,047,612
620 4,047,660
625 4,048,052

CLASS 208

8 4,048,053
4,048,054
25 4,048,055
41 4,048,056
89 4,048,057
138 4,048,058
210 4,048,060
251 R 4,048,061
321 4,048,062

CLASS 209

74 M 4,047,613

CLASS 210

23 R 4,048,064
58 4,048,065
4,048,066
72 4,048,063
73 R 4,048,067
80 4,048,068
84 4,048,069
85 4,048,070
90 4,048,071
220 4,048,072
284 4,048,073
316 Re.29,397
323 T 4,048,074
484 4,048,075
528 4,048,076

CLASS 211

20 4,047,614
88 4,047,615
183 4,047,616

CLASS 212

39 MS 4,047,617
58 R 4,047,618

CLASS 213

166 4,047,619

CLASS 214

1 C 4,047,620
6 DS 4,047,621
8.5 A 4,047,622
17 B 4,047,624
17 C 4,047,623
95 R 4,047,625
147 G 4,047,626
152 4,047,627
4,047,628
451 4,047,629
506 4,047,630
519 4,047,631

CLASS 215

224 4,047,495

CLASS 219

10.79 4,048,458
69 G Re.29,398
Re.29,399
85 BM 4,048,459
91 4,048,460
104 4,048,461
118 4,048,463
121 EB 4,048,462
121 EM 4,048,466
121 LM 4,048,464
121 R 4,048,465
131 R 4,048,467
135 Re.29,400
4,048,468
203 4,048,469
216 4,048,470
228 4,048,471
388 4,048,472
389 4,048,473

CLASS 220

3 4,047,632
9 R 4,047,633
270 4,047,634

CLASS 221

5 4,047,635
161 4,047,636
211 Re.29,393
265 4,047,637
266 4,047,638

CLASS 222

64 4,047,639
4,047,640
80 4,047,641
94 4,047,642
153 4,047,643
193 4,047,644
386.5 4,047,645
402.13 4,047,646
480 4,047,647
498 4,047,648

CLASS 223

43 4,047,649

CLASS 224

2 B 4,047,650
4 D 4,047,651

CLASS 225

54 4,047,652

CLASS 226

92 4,047,653

CLASS 227

19 4,047,654

CLASS 228

27 4,047,656
103 4,047,657
115 4,047,658
119 4,047,659
259 4,047,655

CLASS 229

70 4,047,661

CLASS 235

61.11 D 4,048,476
61.7 B 4,048,475
88 R 4,048,477
92 T 4,048,478
150.21 4,048,479
151.34 4,048,474
152 4,048,480
153 A 4,048,483
153 AE 4,048,482
153 AK 4,048,481
156 4,048,484
4,048,485

CLASS 236

49 4,047,662

CLASS 238

304 4,047,663

CLASS 239

120 4,047,664
124 4,047,665
251 4,047,666
265.35 4,047,667
500 4,047,668
540 4,047,669

CLASS 240

1 R 4,048,486
1.3 4,048,487
4,048,488
6.41 4,048,489
41.35 D 4,048,490
78 H 4,048,491

CLASS 241

66 4,047,671
92 4,047,670
175 4,047,672
186 R 4,047,673

CLASS 242

18 DD 4,047,674
47.01 4,047,675
66 4,047,676

CLASS 243

19 4,047,677

CLASS 244

3.16 4,047,678
16 4,047,679
87 4,047,680
102 SS 4,047,681
110 B 4,047,682

CLASS 248

62 4,047,683
122 4,047,684
158 4,047,685
203 4,047,686
318 4,047,687
451 4,047,688
503.1 4,047,689

CLASS 249

66 A 4,047,690
97 4,047,691
142 4,047,692
187 R 4,047,693

CLASS 250

201 4,048,492
205 4,048,493
223 R 4,048,494
264 4,048,495
272 4,048,496
303 4,048,497
305 4,048,498
344 4,048,499
350 4,048,500
367 4,048,501
370 4,048,502
385 4,048,503
434 4,048,504
445 T 4,048,505
479 4,048,506
491 4,048,507
492 A 4,048,508
522 4,048,509
563 4,048,510

CLASS 251

6 4,047,694
122 4,047,695
308 4,047,696
328 4,047,697

CLASS 252

8.5 C 4,048,077
8.55 D 4,048,078
4,048,079
51.5 A 4,048,082
51.5 R 4,048,081
51.54 4,048,080
78.3 4,048,083
4,048,084
102 4,048,085
182 4,048,086
188 4,048,087
299 4,048,088
4,048,089
301.1 R 4,048,090
373 4,048,091
412 4,048,092
414 4,048,093
4,048,094
429 R 4,048,095
430 4,048,096
431 N 4,048,097
432 4,048,098
441 4,048,099
442 4,048,108
4,048,109
443 4,048,110
455 Z 4,048,111
461 4,048,112
462 4,048,113
463 4,048,114
465 4,048,115
470 4,048,116
513 4,048,117
518 4,048,118
521 4,048,119
522 4,048,120
527 4,048,121
541 4,048,122
545 4,048,123

CLASS 254

2 R 4,047,698
86 H 4,047,699
89 H 4,047,700

CLASS 256

13.1 4,047,701
4,047,702
68 4,047,703

CLASS 259

1 R 4,047,704
192 4,047,705

CLASS 260

2.5 AC 4,048,105
4,048,107
2.5 AJ 4,048,100
2.5 AM 4,048,102
2.5 AN 4,048,104
2.5 AV 4,048,106
2.5 B 4,048,103
2.5 E 4,048,101
5 4,048,124
7 4,048,125
17.2 4,048,126
4,048,127
22 R 4,048,128
23 H 4,048,129
29.4 R 4,048,179
29.6 NR 4,048,130
33.2 R 4,048,131
33.4 R 4,048,192
33.6 UA 4,048,132
37 PC 4,048,133
38 4,048,134
40 R 4,048,135
42.14 4,048,136
42.15 4,048,137
42.37 4,048,138
45.8 N 4,048,139
45.95 C 4,048,140
47 CP 4,048,142
4,048,144
47 EC 4,048,141
47 ET 4,048,143
57 R 4,048,145
63 UY 4,048,146
67 UA 4,048,147
72.5 4,048,148
75 S 4,048,149
75 T 4,048,150
156 4,048,151
176 4,048,152
193 4,048,153
205 4,048,154
239 A 4,048,156
4,048,157
239.1 4,048,158
239.55 R 4,048,159
251 QB 4,048,168
251 R 4,048,169
256.4 C 4,048,171
256.4 E 4,048,170
256.5 R 4,048,172
272 4,048,173
283 S 4,048,175
283 SY 4,048,174
286 R 4,048,176
288 R 4,048,177
293.54 4,048,178
294.8 G 4,048,181
295.5 B 4,048,182
296 H 4,048,184
296 R 4,048,183
297 R 4,048,180
307 D 4,048,185
307 FA 4,048,186
308 D 4,048,187
314.5 4,048,189
326 N 4,048,190
326.47 4,048,191
343.3 R 4,048,193
343.6 4,048,194
345.9 S 4,048,195
346.11 4,048,196
346.3 4,048,197
347.4 4,048,198
380 4,048,199
395 4,048,200
410 4,048,201
410.6 4,048,202
412.8 4,048,203
413 4,048,204
428 4,048,205
448.8 R 4,048,206
4,048,207
464 4,048,209
465 E 4,048,211
465 F 4,048,210
4,048,213
465 H 4,048,212
465.3 4,048,216
512 C 4,048,221
514 J 4,048,222
534 C 4,048,224
536 4,048,225
556 AR 4,048,223
561 N 4,048,226
562 P 4,048,227
566 R 4,048,228
570.5 C 4,048,230
570.6 4,048,229
570.7 4,048,231
601 R 4,048,232
604 HF 4,048,233
607 AR 4,048,234
612 R 4,048,235
613 D 4,048,236
615 B 4,048,237
618 R 4,048,238
624 C 4,048,239
652 P 4,048,240
658 R 4,048,241
666 A 4,048,242
668 D 4,048,243
4,048,244
4,048,245
4,048,246
671 P 4,048,247
4,048,248
673.5 4,048,249
683.43 4,048,250
683.68 4,048,251
850 4,048,252
858 4,048,253

859 R 4,048,254
4,048,255
860 4,048,256
862 4,048,257
879 4,048,258
881 4,048,259
884 4,048,260
888 4,048,261
889 4,048,262
890 4,048,263
929 4,048,264

CLASS 261

111 4,048,265
122 4,048,266
4,048,267

CLASS 264

15 4,048,268
25 4,048,269
34 4,048,270
41 4,048,271
45.3 4,048,208
4,048,272
46.5 4,048,273
4,048,274
54 4,048,275
79 4,048,276
83 4,048,277
102 4,048,280
135 4,048,278
184 4,048,279
230 4,048,281

CLASS 266

49 4,047,706
222 4,047,707
243 4,047,708

CLASS 269

22 4,047,709
42 4,047,710

CLASS 270

86 4,047,711

CLASS 271

64 4,047,712
221 4,047,713

CLASS 272

116 4,047,714
132 4,047,715

CLASS 273

1 R 4,047,716
95 H 4,047,717
98 4,047,718
130 R 4,047,719
4,047,720

CLASS 274

9 A 4,047,721

CLASS 277

229 Re.29,394

CLASS 279

19.5 4,047,722
121 4,047,723

CLASS 280

5.22 4,047,724
11.28 4,047,725
11.37 A 4,047,726
87.04 A 4,047,727
267 4,047,729
281 B 4,047,731
281 LP 4,047,730
287 4,047,732
402 4,047,733
486 4,047,734
610 4,047,735
683 4,047,736
745 4,047,737

CLASS 282

27.5 4,047,738

CLASS 285

21 4,047,739
47 4,047,740
55 4,047,741
187 4,047,742
340 4,047,743

CLASS 290

1 R 4,048,511
53 4,048,512

CLASS 292

171 4,047,744
302 4,047,745

CLASS 294

55 4,047,746

CLASS 296

1 S 4,047,747
35 A 4,047,748
39 R 4,047,749
107 4,047,750
146 4,047,751

CLASS 297

19 4,047,752
32 4,047,753
157 4,047,754
216 4,047,755
219 4,047,756
230 4,047,757
284 4,047,758
346 4,047,759

CLASS 299

2 4,047,760
64 4,047,761
4,047,762
76 4,047,763

CLASS 301

6 V 4,047,764

CLASS 303

24 F 4,047,765
97 4,047,766

CLASS 307

28 4,048,513
88.3 4,048,514
4,048,515
4,048,516
213 4,048,517
214 4,048,518
221 D 4,048,519
252 Q 4,048,520
291 4,048,521
293 4,048,522
297 4,048,523
304 4,048,524
353 4,048,525

CLASS 308

3.6 4,047,767
72 4,047,768
121 4,047,769
191 4,047,770
237 R 4,047,771
4,047,772

CLASS 310

43 4,048,527
49 R 4,048,531
54 4,048,528
4,048,529
68 D 4,048,532
89 4,048,530
329 4,048,526

CLASS 312

111 4,047,773
211 4,047,775
231 4,047,774
245 4,047,776
263 4,047,777

CLASS 313

188 4,048,533
293 4,048,534
367 4,048,535
403 4,048,536
489 4,048,537
519 4,048,538

CLASS 315

39.71 4,048,542
176 4,048,539
205 4,048,543
241 P 4,048,540
248 4,048,541
408 4,048,544

CLASS 316

2 4,048,545
18 4,047,778

CLASS 318

138 4,048,548
345 F 4,048,549
356 4,048,550
488 4,048,547

CLASS 320

21 4,048,551

CLASS 324

5 MA 4,048,555
40 4,048,556
46 4,048,557
57 R 4,048,558
57 SS 4,048,559
115 4,048,560

CLASS 325

22 4,048,561
31 4,048,562
58 4,048,563
67 4,048,564
114 4,048,565
329 4,048,566
363 4,048,567
4,048,568
414 4,048,569
459 4,048,570

CLASS 328

20 4,048,571

CLASS 329

104 4,048,572

CLASS 330

2 4,048,573
9 4,048,574
22 4,048,575
29 4,048,576
30 D 4,048,577
31 4,048,578
151 4,048,579

CLASS 331

1 A 4,048,581
1 R 4,048,580
16 4,048,582
56 4,048,583
62 4,048,584
94.5 C 4,048,585
94.5 D 4,048,586
94.5 G 4,048,587
96 4,048,588
107 R 4,048,589
116 R 4,048,590

CLASS 332

7.51 4,048,591

CLASS 333

6 4,048,592
70 R 4,048,593
72 4,048,594
4,048,595

CLASS 334

8 4,048,596
15 4,048,597
4,048,598

CLASS 335

20 4,048,599
128 4,048,600
193 4,048,601
222 4,048,602

CLASS 336

25 4,048,552
57 4,048,603
83 4,048,604
176 4,048,605
198 4,048,606

CLASS 337

53 4,048,607
74 4,048,608
159 4,048,609
165 4,048,610
380 4,048,611

CLASS 339

9 A 4,047,779
17 CF 4,047,780
17 R 4,047,781
75 MP 4,047,782
97 R 4,047,783
98 4,047,784
99 R 4,047,785
154 A 4,047,786
4,047,787
177 R 4,047,788
198 H 4,047,789
220 C 4,047,790
260 4,047,791

CLASS 340

15.5 CP 4,048,612
53 4,048,613
58 4,048,614
146.3 AC 4,048,615
146.3 E 4,048,618
146.3 ED 4,048,616
146.3 SY 4,048,617
154 4,048,619
163 4,048,620
168 B 4,048,621
173 CA 4,048,629
173 LM 4,048,628
173 R 4,048,626
274 R 4,048,630
321 4,048,631
324 M 4,048,633
324 R 4,048,632
337 4,048,634
347 DA 4,048,635

CLASS 343

6.5 LC 4,048,636
7 7 4,048,637
8 Re.29,401
894 4,048,638

CLASS 346

75 4,048,639
140 A 4,048,640

CLASS 350

6 4,047,792
7 4,047,793
54 4,047,794
96 C 4,047,795
4,047,796
96 WG 4,047,801
97 4,047,798
4,047,799
4,047,802
99 4,047,800
160 LC 4,047,803
164 4,047,804
166 4,047,805
236 4,047,806
266 4,047,807
271 4,047,808

CLASS 351

118 4,047,809

CLASS 354

10 4,048,641
23 D 4,048,642
51 4,048,643
60 L 4,048,644
300 4,048,645

CLASS 355

3 R 4,047,810
14 4,047,811
76 4,047,812
95 4,047,813

CLASS 356

38 4,047,814
104 4,047,815
152 4,047,816
175 4,047,817
189 4,047,818
205 4,047,819
244 4,047,820

CLASS 357

15 4,048,646
17 4,048,627
22 4,048,647
27 4,048,648
43 4,048,649

CLASS 358

1 4,048,650
8 4,048,651
28 4,048,652
104 4,048,653
144 4,048,654
148 4,048,655
174 4,048,656
285 4,048,657

CLASS 360

9 4,048,658
72 4,048,659
77 4,048,660
130 4,048,661

CLASS 361

31 4,048,662
75 4,048,663
89 4,048,664
152 4,048,665
189 4,048,666
213 4,048,667
235 4,048,668
321 4,048,546
391 4,048,669
421 4,048,670

CLASS 363

57 4,048,553
98 4,048,554

CLASS 364

200 4,048,624
4,048,671
4,048,672
4,048,673
900 4,048,622
4,048,623
4,048,625

CLASS 403

109 4,047,821
187 4,047,822
188 4,047,823
209 4,047,824

CLASS 404

70 4,047,825

CLASS 408

59 4,047,826
76 4,047,827
145 4,047,828
169 4,047,829
239 A 4,047,830

CLASS 415

1 4,047,831
4,047,832
2 4,047,833
3 4,047,834

CLASS 416

23 4,047,835
39 4,047,836
95 4,047,837
115 4,047,838
134 A 4,047,839
135 4,047,840
140 4,047,841
152 4,047,842
185 4,047,843

CLASS 417

3 4,047,844
251 4,047,845
300 4,047,846
370 4,047,847
374 4,047,848
383 4,047,850
384 4,047,849
412 4,047,851
415 4,047,852
434 4,047,853
489 4,047,854

CLASS 418

53 4,047,855
61 A 4,047,856
153 4,047,857
201 4,047,858
232 4,047,859

CLASS 423

24 4,048,282
92 4,048,283
112 4,048,284
132 4,048,285
242 4,048,286
4,048,287
267 4,048,288
317 4,048,289
336 4,048,290
387 4,048,291
415 A 4,048,292
574 L 4,048,293
618 4,048,294
626 4,048,295

CLASS 424

1 4,048,296
4,048,297
1 5 4,048,298
49 4,048,299
52 4,048,300
70 4,048,301
78 4,048,302
94 4,048,303
122 4,048,304
177 4,048,305
180 4,048,306
4,048,307
195 4,048,308
238 4,048,309
4,048,310
4,048,311
248 5 4,048,313
248 55 4,048,314
248 56 4,048,312
249 4,048,315
251 4,048,316
267 4,048,317
269 4,048,318
4,048,319
271 4,048,320
274 4,048,321
283 4,048,322
285 4,048,323
294 4,048,324
298 4,048,325
300 4,048,326
305 4,048,327
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308 4,048,330
317 4,048,331
4,048,332
322 4,048,333
325 4,048,334
329 4,048,335
334 4,048,336
357 4,048,337
358 4,048,338

CLASS 425

4 R 4,047,860
7 4,047,861
8 4,047,862
13 4,047,863
78 4,047,864
80 4,047,865
107 4,047,866
117 4,047,867
133.1 4,047,868
143 4,047,869
151 4,047,870
450.1 4,047,871
469 4,047,872
523 4,047,873
4,047,874

CLASS 426

39 4,048,339
46 4,048,340
69 4,048,341
129 4,048,342
330.2 4,048,343
385 4,048,344
432 4,048,345
583 4,048,346

CLASS 427

10 4,048,347
34 4,048,348
58 4,048,349
93 4,048,350
213 4,048,351
234 4,048,352
291 4,048,353
304 4,048,354
375 4,048,355
379 4,048,356
387 4,048,357

CLASS 428

1 4,048,358
4,048,359
35 4,048,360
4,048,361
36 4,048,362
77 4,048,363
113 4,048,364
215 4,048,365
4,048,366
220 4,048,367
235 4,048,368
262 4,048,369
323 4,048,370
375 4,048,371
412 4,048,372
454 4,048,373
457 4,048,374
461 4,048,376
474 4,048,375
4,048,377
483 4,048,378
500 4,048,379
511 4,048,380
539.5 4,047,897
632 4,048,381
651 4,048,382

CLASS 429

19 4,048,383
22 4,048,384
34 4,048,385
38 4,048,386
50 4,048,387
91 4,048,388
101 4,048,389
102 4,048,390
104 4,048,391
4,048,393
4,048,394
105 4,048,392
112 4,048,395
116 4,048,396
131 4,048,397
140 4,048,398
141 4,048,399
160 4,048,400
171 4,048,401
194 4,048,402
4,048,403
4,048,404
206 4,048,405
209 4,048,406
217 4,048,407
229 4,048,408

CLASS 431

3 4,047,875
7 4,047,876
8 4,047,877
22 4,047,878
183 4,047,879
208 4,047,880
215 4,047,881

CLASS 432

9 4,047,882
14 4,047,883

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21	4,047,884	65	4,048,412	237	4,048,424		4,048,431		4,048,163		CLASS 548
60	4,047,885	66	4,048,413	245	4,048,425	26	4,048,432			341	4,048,188
128	4,047,886	106	4,048,414	334	4,048,426	99	4,048,433	22	4,048,162		CLASS 560
	CLASS 526	119	4,048,415	337	4,048,427	105	4,048,434	27	4,048,161	20	4,048,217
5	4,048,409	138	4,048,418	343	4,048,428	106	4,048,435	121	4,048,164	124	4,048,215
9	4,048,416	153	4,048,419		CLASS 528		CLASS 542	166	4,048,165	128	4,048,214
22	4,048,410	173	4,048,420	497	4,048,429	422	4,048,155	215	4,048,166	147	4,048,218
62	4,048,417	177	4,048,421		CLASS 536		CLASS 544		4,048,167	156	4,048,219
64	4,048,411	203	4,048,422							237	4,048,220
		209	4,048,423	17	4,048,430	21	4,048,160				

CLASSIFICATION OF DESIGNS

D2—	27	245,731		245,746		177	245,760		169	245,774	D24—	21	245,811
	310	245,732	201	245,747		224	245,761		205	245,775		26	245,788
		245,733	252	245,748		235	245,762	D14—	12	245,776		28	245,789
	320	245,734	257	245,749		249	245,763		44	245,777		45	245,790
		245,735	D7— 47	245,750	D10—	9	245,764		86	245,778		64	245,812
		245,736	D8— 52	245,751		15	245,765	D15—	9	245,779	D25—	74	245,791
	400	245,737		245,752		38	245,766		32	245,780		77	245,792
D6—	24	245,738	72	245,753		90	245,767	D16—	65	245,781	D30—	2	245,793
	69	245,739	96	245,754		98	245,768	D19—	1	245,782			245,794
	85	245,740	349	245,755	D11—	13	245,769		75	245,783			245,795
		245,741	376	245,756	D12—	126	245,770	D22—	25	245,784		33	245,796
		245,742	391	245,757		146	245,771		28	245,785	D34—	5 GS	245,797
	95	245,743	D9— 67	245,758		155	245,772	D23—	3	245,786		5 NN	245,798
	186	245,744	149	245,759			245,773		150	245,787		5 R	245,799
	193	245,745											

D24—	21	245,811		14 B	245,800								
	26	245,788		14 D	245,801								
	28	245,789		15 B	245,802								
	45	245,790			245,803								
	64	245,812			245,804								
D25—	74	245,791			245,805								
	77	245,792			245,806								
D30—	2	245,793		15 C	245,807								
		245,794	D48—	20 D	245,808								
		245,795	D52—	4 A	245,809								
	33	245,796	D64—	11 B	245,810								
D34—	5 GS	245,797	D87—	1 R	245,813								
	5 NN	245,798		3 C	245,814								
	5 R	245,799		5 F	245,815								

CLASSIFICATION OF PLANTS

P.—	68	4,101		4,102		4,103	74	4,104	76	4,105	

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PATENTS

1 :	4,047,318		4,047,624		4,048,557		4,048,256		4,047,434		4,048,246		
	4,047,483		4,047,627		4,048,558		4,048,294		4,047,479		4,048,247		
	4,048,368		4,047,635		4,048,560		4,048,304		4,047,499		4,048,248		
	4,048,568		4,047,650		4,048,565		4,048,351		4,047,528		4,048,249		
4 :	4,047,475		4,047,663		4,048,567		4,048,370		4,047,529		4,048,267		
	4,047,485		4,047,668		4,048,576		4,048,372		4,047,530		4,048,373		
	4,047,589		4,047,688		4,048,577		4,048,530		4,047,531		4,048,452		
	4,047,626		4,047,694		4,048,586		4,048,614		4,047,542		4,048,458		
	4,047,976		4,047,703		4,048,588		4,048,659		4,047,572		4,048,459		
	4,048,203		4,047,724		4,048,593	01 :	4,047,678		4,047,614		4,048,464		
	4,048,566		4,047,727		4,048,594	10 :	4,047,480		4,047,619		4,048,589		
	4,048,575		4,047,739		4,048,601		4,047,963		4,047,620		4,048,605		
	4,048,626		4,047,757		4,048,628		4,048,096		4,047,639		4,048,652		
	4,048,629		4,047,758		4,048,632		4,048,128		4,047,640		4,048,654		
5 :	4,047,515		4,047,768		4,048,645		4,048,156		4,047,647		4,048,655		
	4,047,744		4,047,792		4,048,651		4,048,279		4,047,664		4,048,657		
6 :	Re.29,392		4,047,795		4,048,668		4,048,546		4,047,665		4,048,669		
	4,047,249		4,047,797	8 :	4,047,517	12 :	4,047,260		4,047,676	18 :	4,047,370		
	4,047,250		4,047,819		4,047,699		4,047,282		4,047,692		4,047,412		
	4,047,253		4,047,844		4,047,760		4,047,304		4,047,711		4,047,452		
	4,047,255		4,047,869		4,047,778		4,047,328		4,047,730		4,047,454		
	4,047,284		4,047,912		4,047,835		4,047,345		4,047,740		4,047,488		
	4,047,285		4,047,974		4,048,073		4,047,346		4,047,746		4,047,575		
	4,047,302		4,047,990		4,048,137		4,047,423		4,047,771		4,047,593		
	4,047,308		4,048,007		4,048,138		4,047,631		4,047,772		4,047,601		
	4,047,310		4,048,016		4,048,298		4,047,651		4,047,777		4,047,604		
	4,047,331		4,048,040		4,048,369		4,047,658		4,047,779		4,047,638		
	4,047,333		4,048,049		4,048,612		4,047,714		4,047,855		4,047,656		
	4,047,347		4,048,050		4,048,660		4,047,747		4,047,861		4,047,708		
	4,047,352		4,048,051	9 :	4,047,395		4,047,784		4,047,870		4,047,745		
	4,047,382		4,048,122		4,047,397		4,048,145		4,047,895		4,047,767		
	4,047,388		4,048,123		4,047,453		4,048,220		4,047,908		4,047,823		
	4,047,389		4,048,204		4,047,492		4,048,284		4,047,951		4,047,866		
	4,047,409		4,048,270		4,047,585		4,048,302		4,047,984		4,047,878		
	4,047,410		4,048,271		4,047,586		4,048,477		4,047,996		4,048,058		
	4,047,437		4,048,325		4,047,607		4,048,506		4,048,034		4,048,075		
	4,047,440		4,048,330		4,047,608		4,048,562		4,048,059		4,048,094		
	4,047,447		4,048,343		4,047,657	13 :	4,047,261		4,048,062		4,048,144		
	4,047,458		4,048,365		4,047,689		4,047,349		4,048,066		4,048,157		
	4,047,461		4,048,395		4,047,798		4,047,610		4,048,097		4,048,160		
	4,047,477		4,048,454		4,047,834		4,047,686		4,048,099		4,048,161		
	4,047,489		4,048,462		4,047,838		4,048,038		4,048,108		4,048,162		
	4,047,495		4,048,473		4,047,839	16 :	4,048,618		4,048,109		4,048,163		
	4,047,496		4,048,489		4,047,859	17 :	Re.29,396		4,048,111		4,048,211		
	4,047,527		4,048,491		4,047,891		4,047,277		4,048,115		4,048,268		
	4,047,532		4,048,496		4,047,978		4,047,294		4,048,126		4,048,299		
	4,047,540		4,048,499		4,047,980		4,047,297		4,048,127		4,048,312		
	4,047,544		4,048,500		4,048,065		4,047,311		4,048,131		4,048,490		
	4,047,550		4,048,507		4,048,083		4,047,312		4,048,202	19 :	4,047,343		
	4,047,557		4,048,516		4,048,084		4,047,356		4,048,205		4,047,425		
	4,047,573		4,048,518		4,048,095		4,047,383		4,048,228		4,047,431		
	4,047,581		4,048,524		4,048,107		4,047,416		4,048,244		4,047,465		
	4,047,623		4,048,534		4,048,226		4,047,427		4,048,245		4,047,587		

4,048,434	4,047,902	4,048,054	4,048,004	4,048,433	4,048,664
4,048,556	4,048,000	4,048,082	4,048,028	4,048,476	44 : 4,047,380
20 : Re.29,401	4,048,002	4,048,110	4,048,042	4,048,487	4,047,643
21 : 4,047,476	4,048,006	4,048,139	4,048,046	4,048,533	4,047,648
4,048,207	4,048,068	4,048,179	4,048,080	4,048,545	4,047,988
22 : 4,047,320	4,048,087	4,048,181	4,048,093	4,048,602	45 : 4,047,473
4,047,574	4,048,193	4,048,195	4,048,142	4,048,619	4,047,790
4,047,754	4,048,194	4,048,201	4,048,143	4,048,630	4,048,353
4,047,962	4,048,213	4,048,224	4,048,146	4,048,649	46 : 4,047,298
4,048,060	4,048,237	4,048,231	4,048,176	40 : 4,047,350	47 : 4,047,271
4,048,064	4,048,288	4,048,250	4,048,190	4,047,567	4,047,920
24 : 4,047,339	4,048,297	4,048,251	4,048,239	4,047,853	4,047,991
4,047,377	4,048,331	4,048,258	4,048,336	4,047,892	48 : 4,047,251
4,047,457	4,048,335	4,048,277	4,048,345	4,047,896	4,047,256
4,047,490	4,048,382	4,048,309	4,048,356	4,048,063	4,047,299
4,047,522	4,048,393	4,048,310	4,048,361	4,048,067	4,047,391
4,047,820	4,048,394	4,048,316	4,048,390	4,048,079	4,047,392
4,048,022	4,048,410	4,048,338	4,048,423	4,048,209	4,047,430
4,048,076	4,048,432	4,048,342	4,048,431	4,048,238	4,047,435
4,048,092	4,048,484	4,048,354	4,048,515	4,048,376	4,047,455
4,048,218	4,048,561	4,048,371	4,048,525	4,048,426	4,047,539
4,048,219	27 : 4,047,367	4,048,425	4,048,529	41 : 4,047,344	4,047,565
4,048,474	4,047,445	4,048,435	4,048,539	4,047,355	4,047,566
4,048,513	4,047,460	4,048,440	4,048,541	4,047,408	4,047,568
4,048,520	4,047,518	4,048,441	4,048,550	4,047,979	4,047,583
4,048,563	4,047,553	4,048,443	4,048,571	4,048,070	4,047,591
4,048,595	4,047,588	4,048,444	4,048,573	4,048,442	4,047,622
4,048,608	4,047,629	4,048,448	4,048,590	42 : 4,047,266	4,047,687
4,048,636	4,047,637	4,048,451	4,048,603	4,047,275	4,047,695
4,048,637	4,047,706	4,048,453	4,048,621	4,047,340	4,047,697
25 : 4,047,281	4,047,856	4,048,456	4,048,631	4,047,386	4,047,765
4,047,287	4,047,965	4,048,465	4,048,639	4,047,429	4,047,793
4,047,289	4,048,052	4,048,531	4,048,671	4,047,508	4,047,918
4,047,329	4,048,103	4,048,551	4,048,672	4,047,548	4,047,961
4,047,332	4,048,121	4,048,552	37 : 4,047,272	4,047,560	4,047,999
4,047,379	4,048,323	4,048,597	4,047,365	4,047,596	4,048,057
4,047,415	4,048,498	4,048,598	4,047,400	4,047,602	4,048,061
4,047,462	4,048,526	4,048,606	4,047,405	4,047,654	4,048,078
4,047,498	4,048,536	4,048,607	4,047,502	4,047,655	4,048,100
4,047,504	28 : 4,047,326	4,048,611	4,047,649	4,047,660	4,048,102
4,047,523	4,047,577	4,048,627	4,047,862	4,047,725	4,048,241
4,047,524	29 : 4,047,279	4,048,638	4,048,178	4,047,733	4,048,283
4,047,545	4,047,293	4,048,641	4,048,460	4,047,763	4,048,346
4,047,653	4,047,336	36 : 4,047,257	4,048,463	4,047,782	4,048,364
4,047,719	4,047,446	4,047,259	4,048,543	4,047,785	4,048,584
4,047,780	4,047,661	4,047,292	4,048,648	4,047,788	4,048,615
4,047,814	4,047,821	4,047,303	38 : 4,047,605	4,047,791	4,048,617
4,047,849	4,047,875	4,047,315	39 : 4,047,258	4,047,826	4,048,624
4,047,858	4,047,926	4,047,357	4,047,268	4,047,831	4,048,635
4,047,876	4,047,927	4,047,363	4,047,276	4,047,836	4,048,670
4,047,940	4,048,264	4,047,424	4,047,338	4,047,863	49 : 4,047,526
4,047,950	4,048,265	4,047,444	4,047,348	4,047,867	4,047,667
4,047,954	4,048,296	4,047,451	4,047,393	4,047,916	51 : 4,047,375
4,047,955	4,048,564	4,047,533	4,047,463	4,047,935	4,047,421
4,048,048	30 : 4,047,710	4,047,538	4,047,481	4,047,936	4,047,592
4,048,125	31 : 4,047,611	4,047,561	4,047,537	4,047,937	4,047,729
4,048,141	33 : 4,047,413	4,047,570	4,047,547	4,047,959	4,047,796
4,048,166	4,047,804	4,047,584	4,047,578	4,047,972	4,047,809
4,048,167	4,048,105	4,047,645	4,047,582	4,047,983	4,047,889
4,048,263	34 : Re.29,394	4,047,717	4,047,598	4,047,985	4,048,350
4,048,269	4,047,252	4,047,718	4,047,612	4,048,018	4,048,535
4,048,274	4,047,307	4,047,743	4,047,630	4,048,020	4,048,625
4,048,290	4,047,309	4,047,755	4,047,659	4,048,029	53 : 4,047,300
4,048,347	4,047,317	4,047,776	4,047,716	4,048,036	4,047,441
4,048,401	4,047,319	4,047,783	4,047,734	4,048,056	4,047,595
4,048,404	4,047,335	4,047,786	4,047,748	4,048,072	4,047,681
4,048,428	4,047,358	4,047,794	4,047,750	4,048,081	4,047,685
4,048,481	4,047,417	4,047,799	4,047,759	4,048,086	4,047,713
4,048,501	4,047,432	4,047,802	4,047,764	4,048,117	4,048,287
4,048,537	4,047,466	4,047,810	4,047,828	4,048,148	4,048,455
4,048,559	4,047,484	4,047,811	4,047,829	4,048,183	54 : 4,048,292
4,048,580	4,047,491	4,047,812	4,047,840	4,048,191	4,048,471
4,048,596	4,047,493	4,047,832	4,047,881	4,048,208	55 : 4,047,280
4,048,609	4,047,513	4,047,833	4,047,919	4,048,223	4,047,314
4,048,610	4,047,613	4,047,874	4,047,946	4,048,229	4,047,322
4,048,620	4,047,677	4,047,885	4,047,967	4,048,272	4,047,368
4,048,623	4,047,720	4,047,898	4,047,981	4,048,311	4,047,376
4,048,673	4,047,731	4,047,899	4,048,027	4,048,348	4,047,406
26 : 4,047,263	4,047,738	4,047,900	4,048,041	4,048,352	4,047,411
4,047,334	4,047,781	4,047,905	4,048,140	4,048,392	4,047,500
4,047,341	4,047,800	4,047,910	4,048,227	4,048,396	4,047,519
4,047,396	4,047,842	4,047,933	4,048,230	4,048,398	4,047,534
4,047,433	4,047,845	4,047,938	4,048,254	4,048,430	4,047,618
4,047,512	4,047,873	4,047,941	4,048,255	4,048,437	4,047,646
4,047,628	4,047,877	4,047,943	4,048,257	4,048,438	4,047,775
4,047,633	4,047,880	4,047,944	4,048,261	4,048,457	4,047,851
4,047,696	4,047,890	4,047,945	4,048,281	4,048,493	4,047,884
4,047,723	4,047,914	4,047,947	4,048,344	4,048,521	4,048,104
4,047,732	4,047,925	4,047,948	4,048,383	4,048,522	4,048,363
4,047,749	4,047,956	4,047,949	4,048,389	4,048,523	4,048,378
4,047,773	4,047,986	4,047,960	4,048,402	4,048,528	4,048,405
4,047,825	4,048,001	4,047,966	4,048,403	4,048,555	4,048,554
4,047,827	4,048,023	4,047,969	4,048,413	4,048,587	4,048,663
4,047,852	4,048,043	4,047,973	4,048,418	4,048,616	56 : 4,047,816
4,047,864	4,048,053	4,047,992	4,048,427	4,048,640	

1 : 245,808	245,811	245,746	245,799	245,748	245,804
4 : 245,792	245,812	245,762	27 : 245,761	245,758	245,805
6 : 245,731	245,813	245,768	245,764	245,759	245,806
245,743	245,814	19 : 245,763	31 : 245,773	37 : 245,778	47 : 245,770
245,744	8 : 245,741	22 : 245,739	32 : 245,774	39 : 245,742	245,789
245,749	245,756	25 : 245,781	34 : 245,737	245,753	48 : 245,766
245,755	245,810	26 : 245,793	245,760	245,790	51 : 245,782
245,772	9 : 245,738	245,794	245,767	245,797	53 : 245,807
245,776	12 : 245,785	245,795	245,791	245,802	245,815
245,787	13 : 245,757	245,796	245,734	245,803	55 : 245,786
245,788	17 : 245,745	245,798	36 : 245,734		

PLANT PATENTS

37 : 4,105	39 : 4,104				

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September 20, 1977 Volume 962 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Priority Claims Based on Inventors' Certificates

Pursuant to the provisions of 35 U.S.C. 119, last paragraph (as amended July 28, 1972), 37 CFR 1.55(c) requires that when an applicant wishes to claim a right of priority on the basis of an application for an inventor's certificate, ". . . the applicant or his attorney or agent, when submitting a claim for such right . . . shall include an affidavit or declaration including a specific statement that, upon an investigation, he has satisfied himself that to the best of his knowledge the applicant, when filing his application for the inventor's certificate, had the option to file an application either for a patent or for an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority."

As such, it has been and remains the position of the Patent and Trademark Office that, in accordance with 35 U.S.C. 119, applications for inventors' certificates shall give rise to a right of priority only when the country in which they are filed gives to applicants, at their discretion, the right to apply, on the same invention, either for a patent or for an inventor's certificate. The affidavit or declaration specified under 37 CFR 1.55(c) is only required for the purpose of ascertaining whether, in the country where the application for an inventor's certificate originated, this option generally existed for applicants with respect to the particular subject matter of the invention involved. The requirements of 35 U.S.C. 119 and 37 CFR 1.55(c) are not intended, however, to probe into the eligibility of the particular applicant to exercise the option in the particular priority application involved.

It is recognized that certain countries that grant inventors' certificates also provide by law that their own nationals who are employed in state enterprises may only receive inventors' certificates and not patents on inventions made in connection with their employment. This will not impair their right to be granted priority in the United States based on the filing of the inventor's certificate.

Accordingly, affidavits or declarations filed pursuant to 37 CFR 1.55(c) need only show that in the country in which the original inventor's certificate was filed, applicants generally have the right to apply at their own option either for a patent or an inventor's certificate as to the particular subject matter of the invention.

C. MARSHALL DANN,
Aug. 17, 1977. *Commissioner of Patents and Trademarks.*

Requirements for Priority Documents, Priority Based on Application for Industrial Design

In the Federal Republic of Germany, an application for protection of an industrial design may be accompanied by either a model or a drawing. It is understood that German residents file such applications with their local judicial authority ("Amtsgericht") rather than with the German Patent Office in Munich.

Questions have been raised in this connection as to:

(1) What sort of priority document under 35 U.S.C. 119 is required when the original filing has comprised a model rather than a drawing, and

(2) Whether it is necessary where the original filing was with a local judicial authority to obtain also a certificate from the national patent office.

As to the first question, the Patent and Trademark Office will receive under 35 U.S.C. 119, as evidence of an earlier filed design application which included the deposit of a model, drawings or acceptable photographs of the deposited model faithfully reproducing the design embodied therein together with other required information, certified by an official of the court or office with which the application was originally filed.

No additional certification by the national patent office will be required. Article 4D(3) of the Paris Convention refers to certification ". . . by the authority which received such application . . ." so the reference in 35 U.S.C. 119 to "patent office" will be construed to extend also to the authority in charge of the design register.

Aug. 15, 1977. C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 244,495, Re. S.N. 816,098, Filed July 15, 1977, Cl. D6/01, CHAIR OR SIMILAR ARTICLE, Warren D. Petersen, Owner of Record: *Burd, Inc., Howell Division, Saint Charles, Ill.,* Attorney or Agent: Benjamin H. Sherman, et al., Ex. Gp.: 290

3,552,120, Re. S.N. 806,312, Filed June 13, 1977, Cl. 60/525, STIRLING CYCLE TYPE THERMAL DEVICE, William T. Beale, Owner of Record: *Research Corporation, New York, N.Y.,* Attorney or Agent: Harold L. Stowell, Ex. Gp.: 341

3,639,659, Re. S.N. 820,417, Filed Aug. 1, 1977, Cl. 260/78 L, CONTINUOUS EXTRACTION OF GRANULAR POLYAMIDES, Werner Nieswandt, et al., Owner of Record: *Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany,* Attorney or Agent: Herbert B. Keil, et al., Ex. Gp.: 143

3,839,428, Re. S.N. 818,346, Filed July 22, 1977, Cl. 260/514 R, PROCESS FOR PREPARATION OF ORGANIC CARBOXYLIC ACIDS, Nobuo Isogai, Owner of Record: *Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan,* Attorney or Agent: John E. Lind, et al., Ex. Gp.: 127

3,893,775, Re. S.N. 817,654, Filed July 21, 1977, Cl. 403/225, RESILIENT BUSHING WITH LONG FATIGUE LIFE, David L. Sievers, et al., Owner of Record: *The General Tire & Rubber Company, Akron, Ohio,* Attorney or Agent: Frank C. Rote, Jr., et al., Ex. Gp.: 353

3,895,753, Re. S.N. 817,944, Filed July 22, 1977, Cl. 227/67, FASTENER ATTACHMENT SYSTEM NEEDLE CONSTRUCTIONS, Arnold R. Bone, Owner of Record: *Dennison Manufacturing Company, Framingham, Mass.,* Attorney or Agent: George E. Kersey, Ex. Gp.: 325

3,895,888, Re. S.N. 817,177, Filed July 20, 1977, Cl. 418/61 B, HYDROSTATIC CONTROL UNIT, Maurice Paul Roberts, Owner of Record: *TRW Inc., Cleveland, Ohio,* Attorney or Agent: J. Herman Yount, Jr., et al., Ex. Gp.: 343

3,896,150, Re. S.N. 817,164, Filed July 20, 1977, Cl. 260/340.7, 2,6,10-TRIMETHYLDODECA-2,6,11-TRIEN-10-OL-1 AL,2,6-DIMETHYL-2,6-UNDECADIEN-10-ON-1-AL AND THEIR ACETALS AND PROCESSES FOR THEIR PRODUCTION, Werner Hoffmann, Owner of Record: *Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany,* Attorney or Agent: Herbert B. Keil, et al., Ex. Gp.: 124

3,922,441, Re. S.N. 818,407, Filed July 25, 1977, Cl. 428/446, LITHOGRAPHIC PRINTING PLATE AND METHOD OF MAKING THE SAME, Michael J. Shaw, Owner of Record: *Allied Paper Incorporated, Kalamazoo, Mich.,* Attorney or Agent: Richard H. Thomas, et al., Ex. Gp.: 164

3,924,131, Re. S.N. 819,629, Filed July 27, 1977, Cl. 250/360, METHOD OF AND APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION, Godfrey Newbold Hounsfield, Owner of Record: *EMI Limited, Hayes, Middlesex, England,* Attorney or Agent: Ivan S. Kavrokov, et al., Ex. Gp.: 256

3,937,865, Re. S.N. 818,058, Filed July 22, 1977, Cl. 428/413, REINFORCED PLASTICS CARRIER FOR PRINTED CIRCUITS, Hendrik Jongetjes, Owner of Record: *Koninklijke Papierfabrieken Van Gelder Zonen N.V., Amsterdam, Netherlands,* Attorney or Agent: Charles E. Brown, et al., Ex. Gp.: 164

3,959,310, Re. S.N. 817,868, Filed July 20, 1977, Cl. 260/326.9, CATIONIC DYESTUFFS, Alfred Brack, Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Allan R. Plumley, et al., Ex. Gp.: 122

3,977,119, Re. S.N. 800,002, Filed May 24, 1977, Cl. 46/12, COLLAPSIBLE PLAYHOUSE MADE FOR TWO EQUAL PARTS, Donald C. Nelson, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 333

3,994,305, Re. S.N. 820,359, Filed July 29, 1977, Cl. 131/7, SELF-LIGHTING CIGARETTE HAVING A PROTECTIVE CAP, Lloyd M. Hughes, Owner of Record: *Lloyd M. Hughes Enterprises, Inc., Chicago, Ill.,* Attorney or Agent: James P. Hume, et al., Ex. Gp.: 335

3,997,817, Re. S.N. 817,974, Filed July 22, 1977, Cl. 361/213, DEVICE FOR NEUTRALIZING THE CHARGE ON STATICALLY-CHARGED SURFACES, Philip Edward Secker, Owner of Record: *Inventor,* Attorney or Agent: Jack C. Berenzweig, et al., Ex. Gp.: 212

4,015,383, Re. S.N. 818,244, Filed July 22, 1977, Cl. 52/224, CONCRETE TANK OF PRECAST CONCRETE PANELS WITH PRETENSIONING BEAM MEANS, Francis X. Crowley, Owner of Record: *Inventor,* Attorney or Agent: William W. Rymer, Ex. Gp.: 354

4,026,272, Re. S.N. 820,583, Filed Aug. 1, 1977, Cl. 126/271, SOLAR COLLECTOR, Edward W. Bottum, Owner of Record: *Inventor,* Attorney or Agent: Edward A. Craig, Ex. Gp.: 344

PATENT NOTICES

Certificates of Correction for the Week of Sept. 20, 1977

Re. 29,133	4,014,728	4,026,458	4,030,790
3,448,088	4,014,879	4,026,767	4,030,827
3,637,809	4,015,045	4,026,773	4,031,086
3,697,585	4,015,163	4,026,839	4,031,093
3,738,377	4,015,402	4,027,016	4,031,148
3,758,008	4,015,464	4,027,042	4,031,175
3,839,484	4,015,511	4,027,213	4,031,176
3,921,091	4,015,953	4,027,270	4,031,183
3,944,527	4,016,219	4,027,401	4,031,260
3,944,812	4,016,520	4,027,446	4,031,325
3,946,265	4,016,639	4,027,521	4,031,382
3,956,202	4,016,811	4,027,624	4,031,386
3,956,686	4,016,958	4,027,628	4,031,405
3,958,677	4,017,476	4,027,780	4,031,574
3,963,548	4,017,694	4,027,809	4,031,608
3,969,703	4,018,162	4,027,867	4,031,678
3,987,949	4,018,771	4,027,990	4,031,731
3,990,184	4,019,548	4,028,133	4,031,770
3,990,362	4,019,657	4,028,282	4,031,815
3,991,585	4,019,725	4,028,295	4,031,922
3,991,705	4,020,068	4,028,324	4,031,970
3,993,814	4,020,458	4,028,396	4,032,019
3,995,061	4,020,876	4,028,422	4,032,046
3,996,263	4,021,191	4,028,460	4,032,091
3,996,412	4,021,224	4,028,507	4,032,094
3,996,562	4,021,437	4,028,528	4,032,109
3,998,743	4,021,667	4,028,595	4,032,119
4,000,986	4,022,099	4,028,596	4,032,136
4,001,044	4,022,116	4,028,611	4,032,141
4,001,656	4,022,180	4,028,637	4,032,207
4,002,536	4,022,247	4,029,110	4,032,284
4,003,998	4,022,473	4,029,441	4,032,428
4,004,725	4,022,684	4,029,454	4,032,493
4,005,035	4,022,958	4,029,539	4,032,582
4,005,049	4,022,995	4,029,549	4,032,591
4,006,063	4,023,435	4,029,568	4,032,616
4,006,395	4,023,444	4,029,632	4,032,653
4,007,813	4,023,489	4,029,675	4,032,765
4,009,163	4,023,504	4,029,716	4,032,769
4,009,198	4,023,795	4,029,789	4,032,830
4,009,801	4,023,955	4,029,813	4,032,893
4,010,151	4,024,462	4,029,942	4,032,984
4,010,993	4,025,063	4,030,024	4,033,369
4,011,886	4,025,067	4,030,121	4,033,687
4,011,922	4,025,291	4,030,131	4,033,714
4,012,166	4,025,354	4,030,160	4,033,976
4,013,339	4,025,360	4,030,199	4,033,984
4,013,790	4,025,382	4,030,390	4,034,026
4,014,096	4,025,458	4,030,456	4,034,149
4,014,135	4,025,598	4,030,541	4,034,177
4,014,433	4,025,643	4,030,662	4,034,388
4,014,454	4,025,813	4,030,671	4,034,878
4,014,568	4,026,428	4,030,756	

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,576,540, D. G. Fair, H. L. Beaverstad and C. F. Erikson, PLURAL MACHINE TOOL AND PART HANDLING CONTROL SYSTEM, Interference No. 98,192, decided Apr. 4, 1977, claims 2 and 7.

Patent No. 3,576,540, D. G. Fair, H. L. Beaverstad and C. F. Erikson, PLURAL MACHINE TOOL AND PART HANDLING CONTROL SYSTEM, Interference No. 98,193, decided Apr. 4, 1977, claims 6, 11, 12, 15 and 16.

Patent No. 3,700,706, S. A. Butter, SELECTIVE CARBONYLATION OF OLEFINICALLY UNSATURATED HYDROCARBONS USING PALLADIUMPHOSPHINE CATALYSTS PROMOTED WITH TIN SALTS, Interference No. 98,553, decided Feb. 11, 1976, claims 1, 2, 3, 4, 6, 7, 8 and 9.

Patent No. 3,702,441, K. R. Thrower, FREQUENCY SYNTHESIZING SYSTEM, Interference No. 98,445, decided July 25, 1977, claims 1, 2, 3, 4, 5 and 6.

Patent No. 3,705,131, V. V. Korshak, M. E. Volpin, V. A. Sergeev, V. K. Shitikov and I.S. Kolomnikov, POLYMERS OF POLYPHENYLENE TYPE AND METHOD OF PRODUCING THE SAME, Interference No. 98,756, decided June 16, 1977, claims 1, 2, 5, 6, 7 and 8.

Patent No. 3,814,970, J. P. Reboul, GAS-DISCHARGE DISPLAY PANELS, Interference No. 99,468, decided May 11, 1977, claims 1, 2, 3 and 4.

Patent No. 3,825,583, A. A. Hussain and J. E. Truelove, ESTER OF 3-HYDROXY-α-[(METHYLAMINO)METHYL] BENZYL ALCOHOL, Interference No. 98,929, decided May 24, 1977, claims 1 and 2.

Patent No. 3,834,672, R. T. Hawley and R. S. Hollyer, DRILL STRING HEAVE COMPENSATOR AND LATCHING APPARATUS, Interfernece No. 99,427, decided May 10, 1977, claim 1.

Patent No. 3,838,635, A. L. Hardy, COMPACTOR WITH RAM MEANS HAVING AN AUTOMATICALLY MOVABLE RAM HEAD, Interference No. 98,968, decided Feb. 28, 1977, claims 1, 2, 4, 5 and 6.

Patent No. 3,839,017, E. G. Schempp, APPARATUS AND METHOD FOR CONVERTING IMPURE FERROUS METAL TO STEEL, Interference No. 99,282, decided June 16, 1977, claims 1, 2, 4, 5, 7 and 8.

Patent No. 3,855,947, J. M. Henley and E. C. Thordsen, BASE CONSTRUCTION HAVING SELF-LEVELLING CAPABILITY, Interference No. 99,056, decided Mar. 28, 1977, claims 1, 2 and 3.

Patent No. 3,876,821, J. P. Pringle, INJECTION MOLDED ELECTRICAL BOX, Interference No. 99,485, decided May 19, 1977, claim 1.

Patent No. 3,886,251, H. Sekiguchi and K. Sadamitsu, METHOD FOR FORMING POLYOXADIAZOLE SERIES RESIN SOLUTION INTO SHAPED ARTICLES, Interference No. 99,472, decided May 17, 1977, claim 1.

Patent No. 3,891,032, G. H. Tausch and R. E. Pringle, APPARATUS FOR INSTALLING AND REMOVING FLOW CONTROL DEVICES, Interference No. 99,475, decided June 23, 1977, claims 1, 4, 5, 6 and 7.

Patent No. 3,903,890, F. K. Mesek and V. L. Repke, DISPOSABLE DIAPER OF SIMPLE CONSTRUCTION, Interference No. 99,302, decided June 29, 1977, claims 1, 4, 5, 6, 7, 8, 9, 11, 13 and 14.

Patent No. 3,904,634, G. Arcari, L. Bernardi, A. Glasser and B. Patelli, BROMOERGOLINES AND PROCESS FOR PREPARING THE SAME, Interference No. 99,385, decided June 14, 1977, claims 3, 4 and 11.

Patent No. 3,912,964, M. Kouyama, K. Nakada, T. Odaka, and Akio Miyamoto, MULTI-DIGIT DISPLAY APPARATUS, Interference No. 99,374, decided May 25, 1977, claim 1.

Patent No. 3,914,022, R. A. Kashnow, QUASI-HOMEOTROPIC TWISTED NEMATIC LIQUID CRYSTAL DEVICE, Interference No. 99,389, decided June 16, 1977, claims 1, 2, 3 and 6.

Disclaimers

3,396,920.—*Harold A. Rosen*, Santa Monica, and *Donald D. Williams*, Inglewood, Calif. APPARATUS FOR CHANGING THE ORIENTATION AND VELOCITY OF A SPINNING BODY TRAVERSING A PATH. Patent dated Aug. 13, 1968. Disclaimer filed Apr. 19, 1977, by the assignee, *National Aeronautics and Space Administration*.

Hereby enters this disclaimer to all claims of said patent.

3,954,177.—*Clifford C. Faust*, Riverside, Ill. CONTAINER PACKAGE HAVING INTEGRAL MEANS FOR CARRYING. Patent dated May 4, 1976. Disclaimer filed Aug. 3, 1977, by the assignee, *Union Carbide Corporation*.

The term of this patent subsequent to Apr. 6, 1993 has been disclaimed.

3,998,087.—*John P. Schumacher* and *William F. Hollenbeck*, Louisville, Ohio. PRESS SLIDE WITH EXTENDABLE AND RETRACTABLE TOOL SUPPORT. Patent dated Dec. 21, 1976. Disclaimer filed Aug. 5, 1977, by the assignee, *Gulf & Western Manufacturing Company*.

Hereby enters this disclaimer to claim 11 of said patent.

4,041,689.—*Patrick Joseph Duncan*, Hendersonville, Tenn. and *Francis Edward Scrivener, Jr.*, Chester, Va. MULTILOBAL POLYSTER YARN. Patent dated Aug. 16, 1977. Disclaimer filed Aug. 1, 1977, by the assignee, *E. I. du Pont de Nemours and Company*.

The term of this patent subsequent to Sept. 19, 1989 has been disclaimed.

Disclaimer and Dedication

3,885,174.—*George A. Schoenfelder*, Naperville, Ill. X-T FLEXTURE PIEZOELECTRIC DEVICE. Patent dated May 20, 1975. Disclaimer and dedication filed Aug. 8, 1977, by the assignee, *Motorola, Inc.*

Hereby enters this disclaimer and dedicates to the Public claims 1, 2, 3, 4, 5 and 6 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 2, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-23-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-3-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials: Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-19-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food: Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-12-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-14-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-29-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	4-14-70
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during July 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,943,327 to 2,947,000, inclusive

Plant Patents..... Numbers 1,957 to 1,962, inclusive

REISSUES

SEPTEMBER 20, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,402

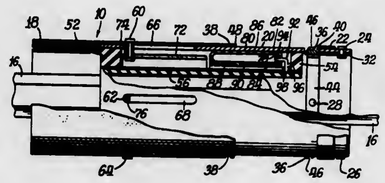
VIBRATION ISOLATING GRIP FOR PNEUMATIC HAND TOOLS

Daniel Bronson Shotwell, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Original No. 3,916,478, dated Nov. 4, 1975, Ser. No. 470,203, May 15, 1974. Application for reissue Sept. 20, 1976, Ser. No. 724,435

Int. Cl.[2] **A47J** *45/08;* **B25G** *1/12*

U.S. Cl. 16—116 R **23 Claims**



2. [The combination of claim **1** in which] *A vibration isolating and heat insulating hand grip for a power driven, manually manipulated impact tool which has a shank that mounts in a chuck, said grip comprising, in combination:*

a rigid, tubular shell of non-porous material which is adapted to surround a tool shank and is open at both ends;

a compliant, non-porous sleeve within said shell, said sleeve being open at both ends and being large enough that a tool shank extends loosely therethrough, said sleeve having only its end portions blended to the end portions of the shell, and said sheil and sleeve defining an inflatable annular chamber;

a cylindrical vibration damping and heat insulating housing surrounding the shell, the dimensions of said housing being such that it may be readily gripped by a human hand;

means operatively associated with said shell for inflating said chamber so the compliant sleeve firmly grips the tool shank, and for deflating said chamber to release said compliant sleeve from the tool shank; and

the means for inflating and deflating the annular chamber [comprises] *comprising* a deformable bladder in the housing, a passage connecting the bladder with the annular chamber, and manually operable means for manipulating the bladder to move fluid back and forth between the bladder and the chamber.

Re. 29,403

QUARTZ CRYSTAL WRIST WATCH

Satoshi Yamazaki, Owa Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

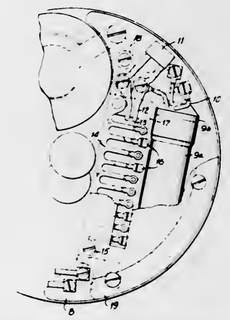
Original No. 3,902,312, dated Sept. 2, 1975, Ser. No. 457,009, Apr. 1, 1974. Continuation-in-part of Ser. No. 166,501, July 27, 1971, Pat. No. 3,800,523. Application for reissue Aug. 3, 1976, Ser. No. 711,176

Claims priority, application Japan, July 27, 1970, 45-65035; Sept. 10, 1970, 45-78803

Int. Cl.[2] **G04C** *3/00;* **G04B** *29/02*

U.S. Cl. 58—23 D **6 Claims**

1. In a quartz crystal wrist watch, the improvement which comprises a quartz crystal time standard oscillator means for providing a high frequency time standard signal, a dividing circuit for providing low frequency time [signals] *signal* in response to said time standard [signals] *signal* from said time standard oscillator means, a stepping motor being driven in response to the low frequency timing signals applied by said dividing circuit, said stepping motor including a driving coil, a yoke formed of high permeability materials disposed through said driving coil and formed with spaced ends defining poles lying in the same plane as said driving coil and a rotor disposed in the gap between said poles and lying in the same plane as said driving coil; battery power means coupled to said time standard oscillator means, dividing circuit and driving coil for energizing same; a support plate; said driving coil, battery



power means and quartz crystal time standard oscillator means being supported on peripheral regions of said plate out of overlapping relation with each other and with said rotor; a bridge member; and a gear train mechanically coupled to said rotor to be driven thereby, said rotor and at least the portion of said gear train coupled thereto being supported by said bridge member and said plate at a central region of said plate.

Re. 29,404

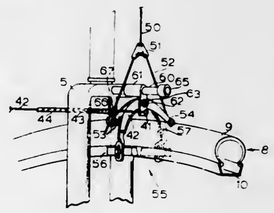
BRAKING SYSTEM

Bertram G. Blevens, Louisville, Ky., assignor to The Huffman Manufacturing Company, Miamisburg, Ohio

Original No. 3,842,946, dated Oct. 22, 1974, Ser. No. 343,890, Mar. 22, 1973. Application for reissue Oct. 12, 1976, Ser. No. 731,564

Int. Cl.[2] **B62L** *1/12, 3/08*

U.S. Cl. 188—24 **6 Claims**



1. For use with a bicycle, including a frame and wheel forks, wheels rotatably mounted in said wheel forks and means for imparting rotation to said wheels for propelling the bicycle, the combination therewith of an improved braking system, which comprises:

A. brakes mounted near the periphery of each of said wheels for application of braking effort to the peripheral portion of each of said wheels:

B. means for applying effort to a first brake:

C. the improvement of motion transmission means for translating vehicular momentum to linear movement for application of effort to the other of said brakes, comprising:

1. a movable mounting means for said first brake;

a. said mounting means comprising a sliding mechanism including:

1. a supporting structure for said sliding mechanism *having an elongated portion which extends transverse to the axis of rotation of a first one of said wheels* fixedly mounted to the frame of said bicycle *adjacent said first one of said wheels thereof*, and,

2. a mounting member slidably mounted thereon, said mounting member being movable *only* in the direction *along said elongated portion transverse to the axis* of rotation of said *first one of said* wheels in response to the motion of said *first one of said* wheels and the braking effort of the brake in engagement [with one of said wheels] *therewith*;

3. the further improvement in which said supporting structure is a post and said mounting member is a sleeve slidably mounted thereon, and;

2. linkage means in operative relation with said movable mounting member and said other brake for transmitting motion from said movable mounting member to said other brake and for application of brake engaging effort to said other brake.

Re. 29,405

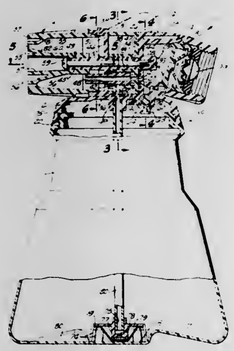
SPRAY APPARATUS

Rudolph M. Gunzel, Jr., San Marino; Donald R. James, West Covina, and Tony Radecki, Altadena, all of Calif., assignors to Meiko, Incorporated, Los Angeles, Calif.

Original No. 3,940,069, dated Feb. 24, 1976, Ser. No. 510,764, Sept. 30, 1974. Continuation-in-part of Ser. No. 408,175, Oct. 19, 1973, abandoned. Application for reissue Apr. 2, 1976, Ser. No. 673,309

Int. Cl.[2] **B05B** *7/04, 7/30, 1/16*

U.S. Cl. 239—318 **26 Claims**



1. Apparatus for mixing a liquid with pressurized water and providing a spray thereof, comprising:

an open-topped container for receiving a quantity of said liquid;

a cap carried by said container including means for connecting the cap to a supply of pressurized water with a water inlet opening in communication with said pressurized water and further having a port communicating with the container interior;

a cylindrical body rotatably mounted on said cap including first and second passages extending through said body, arranged to be individually aligned with said water inlet opening at respective different positions of rotation, said body having walls defining first and second openings interconnecting the respective first and second passages to the body exterior and so located as to align with the port in said cap when the respective passage is aligned with the water inlet opening;

a nozzle interconnected with said cylindrical body for ejecting a spray; and

a single, open-ended, hollow tube carried by said cap having one open end interconnected with said port in said cap and the other open end extending into said container, said tube other end terminating in means having an opening for receiving liquid from the container and said opening in said means having a lesser sectional area than that of the tube one open end or that of the port in said cap.

Re. 29,406

DOCUMENT ORIGINAL HANDLING SYSTEM

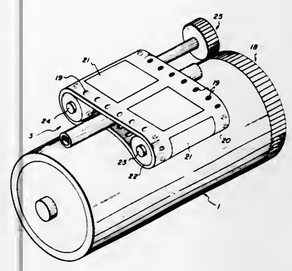
David Athelton Walker-Arnott, Bletchley, England, assignor to Xerox Corporation, Stamford, Conn.

Original No. 3,953,122, dated Apr. 27, 1976, Ser. No. 526,560, Nov. 25, 1974. Application for reissue July 16, 1976, Ser. No. 706,029

Claims priority, application United Kingdom, Dec. 21, 1973, 59528/73

Int. Cl.[2] **G03G** *15/00*

U.S. Cl. 355—12 **21 Claims**



1. In a reproducing machine including means for forming an image of information on an original and means for transporting said original past said imaging means the improvement wherein, said transport means comprises:

a strip member having a plurality of original receiving pockets and means for moving said member past said imaging means with said pockets arranged to present said originals to said imaging means for forming said image.

Re. 29,407

SURFACE EXPOSURE DEVICE FOR COPYING APPARATUS

Masaya Ogawa, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Original No. 3,825,339, dated July 23, 1974, Ser. No. 341,782, Mar. 15, 1973. Application for reissue May 19, 1976, Ser. No. 688,073

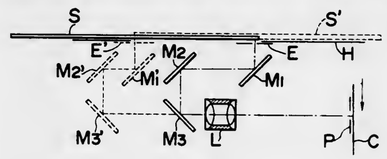
Claims priority, application Japan, Mar. 29, 1972, 47-31389

Int. Cl.[2] **G03B** *27/48, 27/50, 27/70*

U.S. Cl. 355—51 **7 Claims**

1. A device for the optical exposure of an original on copying material which is movably arranged, comprising a housing structure; a support surface horizontally slidably provided in one housing wall and made of transparent material, the original being arranged on the support surface; an exposure plate provided in the housing structure spaced from the support surface and over which the copying material is moved; exposure means arranged between the support surface and the exposure

plate and including a lens assembly arranged in the housing structure in position to transmit rays of light carrying an image of the original towards the copying material through the exposure plate; a reflector arrangement located between the lens assembly and the support surface and including a plurality of mirrors divided into first and second groups, the two groups being conjointly displaceable and the first group being movable reciprocally in the direction opposed to the direction of travel of the support surface; guide means arranged in the housing for guiding the groups of mirrors for conjoint movement parallel to the direction of travel of the support surface; and control means connected to the first and second groups of mirrors and the support surface and operable, upon movement of the mirrors, to modify a first ray path between one mirror of the first group and at least one mirror of the second group in a manner equal and opposite to the modification of a second ray



path between at least one mirror of the second group and said lens assembly, whereby an image ray extending between the support surface and [one mirror] said lens assembly, produced on exposure of the original, always follows a path of constant length regardless of the position of a mirror with respect to the original, said control means also operable, upon said movement of the mirrors, to move the support surface in the opposite direction to the direction of travel of any of said first and second groups, said support surface, said first and second groups and said copying material satisfying the following relationships.

$$Vp = Vo + .\ Va$$

$Vb = \frac{1}{2} \cdot Va$ wherein Vp is a velocity of transference of the copying material, Vo and Va are velocities of movement of the support surface and the first group, respectively, and Vb is a velocity of movement of the second group.

Re. 29,408

PROCESS FOR TREATING ARTICLES OF MANUFACTURE TO ELIMINATE SUPERFLUOUS PROJECTIONS

Henry C. Geen, Brooklyn, and Edwin E. Rice, Ann Arbor, both of Mich., assignors to Chemotronics International, Inc., Ann Arbor, Mich.

Original No. 3,475,229, dated Oct. 28, 1969, Ser. No. 723,052, Apr. 22, 1968. Continuation-in-part of Ser. No. 643,890, June 6, 1967, abandoned. Application for reissue Sept. 25, 1975, Ser. No. 616,605

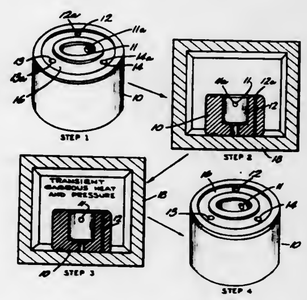
Int. Cl.[2] **B23K** *27/00*

U.S. Cl. 148—9 R **23 Claims**

1. The process for the elimination of superfluous thin cross-section [surface projections including] unwanted burrs [and], *flashings, surface irregularities or* sharp edges on an article of manufacture with a much thicker cross-section, the [projections] *superfluities* being produced as the result of shaping or fabricating which forms the article of manufacture, which comprises:

(a) providing a sealed and confined space surrounding the [superfluous surface projections] *superfluities* to be eliminated on the article of manufacture such that there are open spaces within the sealed and confined space surrounding the [superfluous projections] *superfluities* to be eliminated; and

(b) generating a transient thermal energy release in a gaseous medium *within the sealed and and confined open space* thereby producing transient elevated gaseous temperatures in the open spaces within the sealed and confined space, sufficient thermal energy being generated to ther-



mally eliminate the [superfluous projections] *superfluities* without damage to the article of manufacture *and without material alteration of the dimensions and configuration of the article of manufacture.*

Re. 29,409

PHENOXARSINE COMPOUNDS INCORPORATED INTO RESINS WITH PHENOLS

Charles C. Yeager, Andover, Mass., assignor to Ventron Corporation, Beverly, Mass.

Original No. 3,288,674, dated Nov. 29, 1966, Ser. No. 440,013, Mar. 15, 1965. Application for reissue Mar. 22, 1976, Ser. No. 668,951

Int. Cl.[2] **A61K** *31/10, 31/74, 31/285*

U.S. Cl. 424—78 **10 Claims**

1. A method of incorporating microbicidal amounts of phenoxarsine compounds into vinyl resin material which comprises dissolving a phenoxarsine compound selected from the group consisting of 10-halophenoxasines, alkyl substituted 10-halophenoxarsines, halogen substituted 10-halophenoxarsines and derivatives of phenoxarsines wherein said derivatives are selected from the group consisting of 10,10'-oxybis phenoxarsine, 10-thiocyanato phenoxarsine and 10,10'-thiobis phenoxarsine, in a solvent selected from the group consisting of phenol, alkyl phenols, chlorinated phenols, amino phenols, dihydric phenols, aliphatic alcohols having 5 to 12 carbon atoms and monocarbocyclic acids having 5 to 12 carbon atoms, admixing said solvent solution with said vinyl resin material and processing said admixture to desired solid physical form.]

Re. 29,410

PROCESS FOR MANUFACTURING OF DEODORIZING AIR FILTERS

Toshio Yoshino, Nishinomiya, Japan, assignor to C. Weinberger & Co., Ltd., Osaka, Japan

Original No. 3,857,732, dated Dec. 31, 1974, Ser. No. 123,798, May 24, 1971. Application for reissue Sept. 5, 1975, Ser. No. 610,819

Claims priority, application Japan, May 23, 1970, 45-44204

Int. Cl.[2] **B32B** *27/12;* **C09D** *3/76*

U.S. Cl. 427—390 R **7 Claims**

1. Process for manufacturing a deodorizing gas filter which comprises dissolving polyvinyl alcohol in water; adding to said solution at least one substance which is an amphoteric ion exchange resin, activated carbon or coconut shell charcoal, thereby forming a pasty mass; adding to said pasty mass glyoxal in the amount in excess of that which would be sufficient to acetalize the polyvinyl alcohol, and a small amount of acid for the acetal formation; impregnating the resulting composition into a non-woven textile fabric gas filter; and heating said impregnated filter at about 70°–100° C for 30 minutes to 2

hours, thereby converting said polyvinyl alcohol to polyvinylacetal.

7. Process as claimed in claim 1, wherein said non-woven textile fabric gas filter utilizes the fibers of at least one of nylon, cotton or other conventional synthetic or natural materials including foamed resinous materials.

Re. 29,411

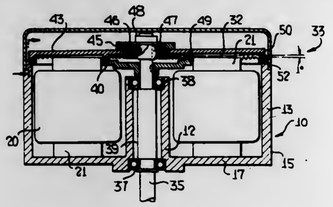
HARMONIC DRIVE FOR DIGITAL STEP MOTOR

Harold R. Newell, South Newbury, N.H., assignor to Mesur-Matic Electronics Corporation, Salem, Mass.

Original No. 3,644,764, dated Feb. 22, 1972, Ser. No. 664,331, Aug. 30, 1967. Continuation-in-part of Ser. No. 627,410, March 31, 1967. Application for reissue Jan. 13, 1976, Ser. No. 648,693

Int. Cl.[2] H02K *7/06*

U.S. Cl. 310—49 R **10 Claims**



1. A motion transmitting system, comprising a pair of cooperating gears having confronting frictional surfaces projecting from normally spaced generally parallel planes, electronmagnetic means for selectively deflecting sequential points of one of said gears toward and away from the other to produce sequential engagement of said frictional surfaces at instantaneously limited regions of said gears, said gears having mutually different configurations adapted to provide continued digital rotations of said one gear responsive to said deflections, a shaft, and universal joint means coupling one of said gears to said shaft, said universal joint means being arranged for wholly free axial and pivotal movement *over at least a predetermined range of movement* without radial movement relative to said axis, wherein each of said frictional surfaces comprise teeth, and wherein said frictional contact is achieved by engagement of said teeth, said different configurations being produced by different numbers of teeth on said gears, wherein said cooperating gears are annular, lying along a common axis, the teeth thereof projecting from normally uncurved confronting surfaces thereof, said electromagnetic means including a magnetically permeable armature coupled to said one gear, and electromagnetic actuators disposed in circular array about said common axis, each of said actuators effective when energized to produce an electromagnetic field exerting deflecting forces on said armature and therefore on said one gear coupled thereto, wherein said armature comprises a rigid circular plate, said ring gear fastened to a planar surface thereof adjacent the periphery of said plate, a shaft extending along said axis and through said plate, normally perpendicular thereto, said plate retained on said shaft to permit relative rotation and limited angular orientation therebetween from the normally perpendicular relationship.

PLANT PATENTS

GRANTED SEPTEMBER 20, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,106

NECTARINE TREE

Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed July 28, 1976, Ser. No. 709,613

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree as illustrated and described which bears medium, clingstone, fruit having yellow flesh; characterized by ripening approximately 10 days earlier than the Zee Gold (U.S. Plant Pat. No. 3,087), and further characterized in comparison with other varieties by early maturing fruit of uniform size with a high degree of red skin color and good long distance shipping quality.

4,107

NECTARINE TREE

Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed July 28, 1976, Ser. No. 709,614

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, bearing large, yellow flesh, clingstone fruit approximately the same maturity season as Late Le Grand Nectarine (U.S. Plant Pat. No. 1,035), but being an improvement over other nectarines in this maturity season by producing fruit with a higher degree of red skin color. The nectarine tree is further characterized for heavy production, regular bearing of large firm high colored fruit, with long distance shipping quality.

4,108

PEACH TREE

Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed July 28, 1976, Ser. No. 709,615

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of peach tree bearing large, yellow flesh, clingstone peaches with a high degree of exterior red color, characterized as to novelty when compared to its seed parent, Royal Gold, (U.S. Plant Pat. No. 2,663) by having fruit of larger size, a higher degree of red color and a greater distribution of uniform fruit throughout the tree.

4,109

PEACH TREE

Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Sept. 1, 1976, Ser. No. 719,667

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, as illustrated and described, which bears large, yellow flesh, clingstone fruit of early maturity. The fruit is further characterized in comparison with other early maturing varieties, by having greater firmness and a higher degree of red color, with excellent shipping quality.

4,110

NECTARINE TREE

Chris Floyd Zaiger, 537 Rosemore Ave., Modesto, Calif. 95351

Filed Sept. 1, 1976, Ser. No. 719,668

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree as illustrated and described, characterized by its early maturity of medium size, yellow fleshed, clingstone fruit. The skin of the fruit having a yellow ground color being nearly overspread completely with red and further characterized a vigorous, large tree of regular bearing early nectarines ripening 4 to 5 days before Red June (U.S. Plant No. 2,044).

PATENTS

GRANTED SEPTEMBER 20, 1977

ERRATA

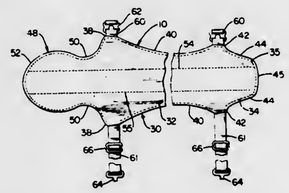
For CLASS	See PATENT NO.
280–011.37 K	4,048,700
222–448	4,049,144
225–094	4,049,171
206–611	4,049,190
292–307 R	4,049,313
428–539.5	4,049,380
029–157.1 R	4,049,389
062–002	4,049,407
062–197	4,049,410
429–193	4,049,468
250–233	4,049,644
542–426	4,049,647
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542–400	4,049,649
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544–021	4,049,651
544–054	4,049,652
544–150	4,049,653
544–221	4,049,654
424–248.5	4,049,655
548–342	4,049,671
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560–127	4,049,698
560–105	4,049,699
560–105	4,049,700
560–130	4,049,701
261–062	4,049,758
358–185	4,049,907
260–002.5 AC	4,049,931
363–059	4,050,004
363–059	4,050,005
363–098	4,050,006
363–087	4,050,007
335–038	4,050,039
364–200	4,050,058
364–200	4,050,059
364–200	4,050,060

PATENTS

GRANTED SEPTEMBER 20, 1977

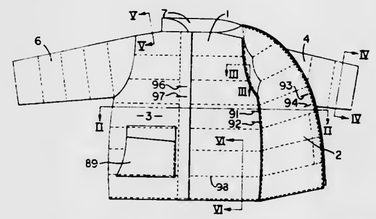
GENERAL AND MECHANICAL

4,048,674
ARM GUARD FOR ARCHERS
John C. Chesnick, 4070 Marshall, Wheatridge, Colo. 80033
Filed Jan. 22, 1976, Ser. No. 651,229
Int. Cl.[2] A41D *13/08*
U.S. Cl. 2—16 **8 Claims**



1. An arm guard for archers comprising an elongated forearm cover portion having fastener means adapted to be drawn together around the forearm of the wearer so that said forearm cover portion conformably surrounds the inner side of the wearer's forearm, an elbow covering forming a longitudinal continuation of said forearm cover portion, said elbow covering adapted to overlay and conform to the configuration of the inner side of the elbow joint when the arm of the wearer is straightened, said elbow covering being unattached to the arm of the wearer so as to be free to allow movement of said main forearm portion when the arm is flexed or twisted, said elbow covering being of relatively shallow concave configuration and having an external, rounded peripheral edge.

4,048,675
JACKET CONSTRUCTION
Donald C. Griffin, Englewood, Colo., assignor to Plain Brown Wrapper, Inc., Englewood, Colo.
Filed Jan. 12, 1976, Ser. No. 648,246
Int. Cl.[2] A41D *1/00*
U.S. Cl. 2—93 **12 Claims**



1. In an outdoor jacket, such as a ski jacekt, of the down-filled type, the combination comprising:

a plurality of panels each comprising superposed inner and outer sheets, the peripheral edge strips of said inner sheet and outer sheet being folded under through substantially 180° to edge each sheet with a U-section, outwardly convex fold, the folded under edge strips of said inner sheet and outer sheet lying sandwiched between said sheets of said panel and face-to-face with each other and forming substantially a UU-shaped cross section edge zone for said panel;

a first stitch line substantially parallel to the panel edge, said first stitch line passing through the two thicknesses defined by said folded under face-to-face edge strips near said folds thereof and closing said panel edges to form a down-proof envelope;

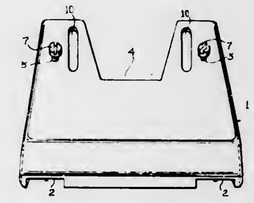
a downlike material within said envelopes and distributed substantially uniformly throughout each of said envelopes;

a second stitch line through the four-sheet thickness of said UU-shaped cross section envelope edge zone and spaced from the panel edge by said first stitch line;

a pair of said panels being fixed together in edge-to-edge relation with the adjacent UU-section edge zones of said panel pair each being turned through about 90° from the plane of their respective panel to extend toward the interior of the jacket, with the outer sheets of said panels abutting in said edge zones and forming an eight thickness, substantially UUUU-cross section panel pair joinder zone;

a third stitch line securing said pair of panels together in said edge-to-edge relation, said third stitch line being spaced close inboard from said UUUU-cross section zone free of contact with said folded under edge strips and passing through only one half the sheet thicknesses of each UUU-U-cross section zone, the first, second and third stitch lines each penetrating a different combination of said peripheral edge strips and sheet portions bound thereby.

4,048,676
COVERING PIECE FOR A WATER CLOSET ASSEMBLY
Cyril James Brookes, Campbelltown, Australia, assignor to Reed Building Products, Pty. Limited, Elizabeth, Australia
Filed Oct. 8, 1976, Ser. No. 730,824
Int. Cl.[2] A47K *17/00*
U.S. Cl. 4—1 **10 Claims**



1. A cover-piece between a freestanding toilet bowl and an independent wall-supported flush tank providing a cover therebetween comprising

a. a cover plate supporting bracket attached to the wall below the independent wall-supported flush tank,

b. a cover plate adapted to be supported by said bracket,

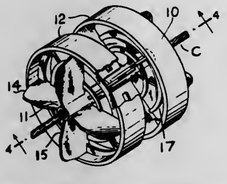
c. means for connecting said cover plate to said bracket for slidable adjustment thereover relative to the freestanding toilet bowl, and

d. means to clamp said cover plate upon said bracket in a predetermined position between the freestanding toilet bowl and the independent wall-supported flush tank.

4,048,677
TURBULENCE INHIBITORS
Anton J. Kajlich, 228 106th Place, NE., Bellevue, Wash. 98004
Filed June 2, 1975, Ser. No. 582,896
Int. Cl.[2] E04H *3/16, 3/18;* **B63B** *21/52*
U.S. Cl. 4—172 **10 Claims**

1. A turbulence inhibiting device adapted to be assembled as one of a plurality of such devices in axial alignment with one another to provide a turbulence inhibiting lane, said device comprising:

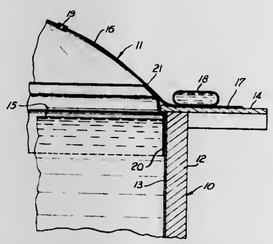
a. a central hub having a longitudinal axis
b. an annular band postioned generally concentrically around said hub with ends of said hub extending axially beyond circumferential edge portions of said band,
c. a plurality of generally planer vanes extending radially from said hub to said band, the plane of each of said vanes being substantially aligned with said longitudinal axis, said vanes projecting axially beyond said hub so as to be able to engage vanes of an adjacent device and limit relative rotation between such adjacent devices,



d. said hub, band and vanes defining substantially open space within said band for substantially free flow of water therethrough,

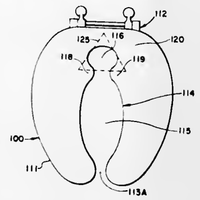
whereby with a plurality of such devices arranged in axial alignment, adjacent bands provide openings therebetween for flow of water through said openings, said vanes and said bands define axially aligned passageway means for flow of water axially within the aligned devices, and vanes of proximate devices overlap one another so that with proximate devices rotating relative to one another, engagement of proximate vanes limits such relative rotation to arcuate increments of travel between proximate vanes.

4,048,678
INFLATABLE COVER FOR A SWIMMING POOL
Joseph Chillino, 15 Clark Road, Stoney Point, N.Y. 10980
Filed Nov. 5, 1975, Ser. No. 629,084
Int. Cl.² E04H *3/16, 3/18;* **F16L** *22/02*
U.S. Cl. 4—172.12 **1 Claim**



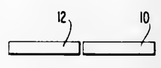
1. A device for use in a swimming pool having interconnected side walls enclosing a closed area, said pool containing water to a depth to substantially cover the side walls and a deck extending above the side walls and connected with the top rim of all the side walls, comprising a pool cover having a curved dome extending above the entire area of the pool, side sheets integral with said dome and extending around the entire area of the pool, said side sheets being located upon said deck, means holding said side sheets upon said deck, and an inner skirt connected with the inner surfaces of said dome adjacent the pool edge and extending around the entire rim area of the pool, said skirt depending from said side sheets and engaging the inner surfaces of all said side walls along the outer surfaces of the skirt and extending substantially into the water depth of the pool.

4,048,679
TOILET SEAT
Wayne A. Garnett, 1810 Oliver Ave. North, Minneapolis, Minn. 55411
Continuation of Ser. No. 486,447, July 8, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,274
Int. Cl.² A47K *13/00*
U.S. Cl. 4—237 **4 Claims**



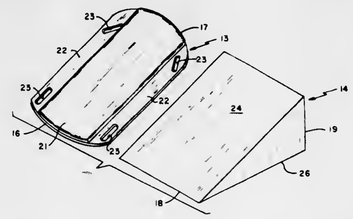
1. A toilet seat comprising: base means defining a narrow, elongate central opening; said base means having side members and a rear member connected to the side members, a pair of mutually opposed support members connected to said side members, said support members projected transversely inward of said central opening and located rearwardly in said opening dividing the opening into a forward opening and a rear opening, said support members being laterally spaced from each other providing an open passage between the forward opening and rear opening and having a width substantially smaller than the width of either the forward or rear openings, said rear member having an upper surface portion adapted to engage and support the base of the spine of a person seated on the seat, each of said support members having an upper surface portion adapted to engage and support an ischium of the person, said upper surface portion of the rear member and the upper surface portions of the support members being located at the corners of a generally triangular outline, said upper surface portions of the support members being inclined inwardly and downwardly in substantially the same elevation and said upper surface portion of the rear member being located in substantially the same elevation of the upper surfaces portions of the support members whereby the base of the spine and the ischia of the person evenly and concurrently engage the upper surface portions of the rear member and the upper surface portions of the support members, said upper surface portions of said support members being transversely spaced about 3 inches apart, and said upper surface portion of the rear member and each of said upper surface portions of the support members is spaced about 5 inches apart.

4,048,680
SOFA BED AND LINKAGE MECHANISM
Walter Clark Rogers, Jr., Denton, N.C., assignor to Royal Development Company, Inc., High Point, N.C.
Filed Sept. 14, 1976, Ser. No. 723,159
Int. Cl.² A47C *17/10, 17/14*
U.S. Cl. 5—37 R **14 Claims**



1. A sofa bed comprising in combination a base, a seat, and a back, first linkage means interconnecting the back and seat mounting them relative to the base for movement relative to each other between a sofa position wherein the seat extends generally in a horizontal plane and the back extends generally in upright position from the rear of the seat, and a bed position wherein the back and seat extend in coplanar horizontal relationship, and second linkage means including a link fixed to the seat to be movable therewith for actuating the first linkage means to move the sofa bed between said sofa and bed positions upon initial raising of a forward portion of the seat, and wherein said first linkage means includes a seat link fixed to the seat to be movable therewith, a back link fixed to the back to be movable therewith, a seat mounting link having an upper end portion pivotally connected to the seat link and a lower end portion pivotally mounted to the base, a back mounting link having an upper end portion pivotally connected to the back link and a lower end portion pivotally mounted to the base, and wherein said second linkage means includes a control linkage having one end portion pivoted to said seat link and another end portion pivoted to said seat mounting link whereby the seat link must be raised relative to the base to actuate the control linkage to permit the sofa bed to be moved to either the sofa or bed position.

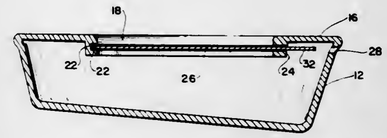
4,048,681
PATIENT LIFT BOARD
Evelyn Mae Baulch, and John Alan Baulch, both of 3314 Glendora Drive, San Mateo, Calif. 94403
Filed Sept. 15, 1976, Ser. No. 723,517
Int. Cl.² A61G *7/08, 1/00;* **A47G** *21/00, 9/00*
U.S. Cl. 5—81 R **5 Claims**



1. Apparatus for use in positioning a patient confined to a bed including bed coverings on the upper surface thereof, comprising a rigid board, one end on said rigid board being configured to extend across the width of the patient's back in a position proximate to the bottom of the patient's spine, an opposing end on said rigid board being configured to extend to a position behind the patient's head, a first side on said rigid board having a smooth surface without protrusions therefrom, said first side thereby being adapted for slidable contact with the bed coverings, a second side on said rigid board, padding attached to said second side so that the patient's back is rigidly supported throughout the entire back area during patient movement and the patient's back and head are cushioned from said rigid board, and means for manual engagement on said rigid board at said one end and opposing end, so that the patient may be placed atop said padding and thereafter may be moved by an unassisted attendant in sliding fashion laterally and longitudinally atop the bed coverings as well as in elevation on the bed while simultaneously supporting the patient's back.

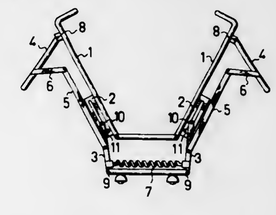
4,048,682
BED PAN
Pattie Smith, 252 Highwood Ave., Ridgewood, N.J. 07410
Filed Oct. 13, 1976, Ser. No. 732,007
Int. Cl.² A61G *7/04, 9/00*
U.S. Cl. 5—91 **3 Claims**

1. An improved bed pan comprising an elliptically shaped vessel including a continuous vessel forming sidewall, a bottom wall, and a top wall, said top wall having a recess therein through which waste material may be deposited into said vessel in the usual fashion by a user thereof, a downwardly turned lip in said top wall defining said recess therein, said lip being spaced from said sidewall so that said recess is spaced from said sidewall and said top wall extends between said recess and said sidewall, a plate member underlying said mouth



of said recess, said plate member being slidably mounted in said lip, and means for slidably mounting said plate member in said lip of said vessel so as to permit reciprocable sliding movement thereof for opening and closing said recess.

4,048,683
SPACE-SAVING FOLDING BED
Tiyung Chen, No. 33, She-tzu 9th Street, Shihlin District, Taipei, China
Filed Dec. 2, 1974, Ser. No. 528,718
Int. Cl.² A47C *19/12*
U.S. Cl. 5—180 **5 Claims**

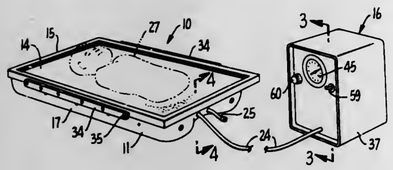


1. In a space saving folding bed having a middle frame section supported by a plurality of generally U-shaped rotatable legs, each of said legs comprised of a horizontal portion with generally vertical extending portions pivotally connected to each end of said horizontal portion, said extending portion terminating in an upper end, said bed having frame end portions movable between a horizontal and vertical position, each of said end portions being pivotally connected to said middle frame section, said improvement comprising;
spring means for biasing each of said vertically extending portions of said rotatable legs, towards each other in said horizontal and vertical positions; and
connecting means for allowing a slidable connection, in a direction parallel to said frame end portions, between said upper end of said U-shaped legs and said frame end portion and for permitting said frame end portion and said middle frame section to be slidably lowered to said horizontal portion of said generally U-shaped legs when said frame end portions are in a near vertical position.

4,048,684
INFANT WATERBED
Anneliese F. Korner; Robert L. Piziali, and Orval T. Ellsworth, all of Palo Alto, Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.
Filed Dec. 10, 1975, Ser. No. 639,288
Int. Cl.² A47C *27/08;* **A61G** *7/04*
U.S. Cl. 5—370 **3 Claims**

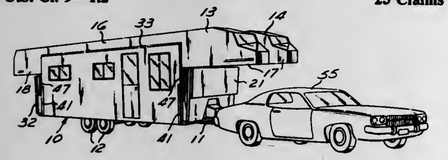
1. An infant waterbed comprising:
a. a tray that has a recess;
b. a flexible mattress that sits in the recess of the tray for holding a fluid medium capable of supporting an infant;
c. a first bladder that sits in the recess in contact with the mattress;

d. a second bladder that is inflated with a predetermined volume of fluid in its normal state;
e. a conduit interconnecting the first bladder and the second bladder;
f. means for compressing the second bladder intermittently and randomly at a predetermined average frequency



whereby the fluid is forced from the second bladder through the conduit into the first bladder when the second bladder is compressed; and
g. means for forcing the fluid from the first bladder back through the conduit into the second bladder when the second bladder is not compressed.

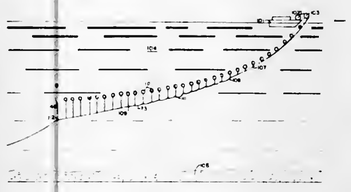
4,048,685
TRAILABLE HOUSEBOAT
William A. Gail, 7212 Natalie Blvd., Northfield, Ohio 44067
Filed Feb. 12, 1976, Ser. No. 653,381
Int. Cl.[2] B63C *13/00*
U.S. Cl. 9—1.2 **25 Claims**



1. A trailable boat comprising a main body including a cabin and road wheels, a pair of pontoons mounted on said body for movement between a raised road position along the roof of said cabin and a lowered water position adjacent to opposite sides of said cabin, said pontoons extending beyond the ends of said cabin and having end portions of a first depth, said pontoons in said water position operating to float said main body with said wheels substantially out of the water and the floor of said cabin substantially above the water while the end portions of said pontoons provide an upper deck surface substantially above the water, said pontoons providing a central portion of reduced depth proportioned to fit over said cabin whereby said pontoons in said road position extend above said roof by a height substantially less than first depth, said end portions projecting below the level of said roof by a distance at least substantially equal to the depth of said central portion when said pontoons are in said road position.

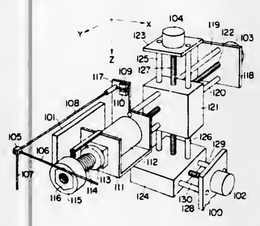
4,048,686
BUOYANCY DEVICE AND METHOD
Sigmund Ege, Oslo, Norway, assignor to Kløften & Kløften A/S, Oslo, Norway
Filed July 9, 1976, Ser. No. 704,017
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—8 R **12 Claims**

1. A buoyancy device for at least partially supporting a submerged article comprising:
A. walls defining a submersible chamber,
B. a substantial volume of gas enclosed in said chamber,
C. access means to the lower portion of said chamber for water surrounding said buoyancy device, said water rising within said chamber and compressing said gas with increasing submergence of said buoyancy device,
D. a supply of flexible line supported by said buoyancy device, one end of said line being supportingly fastened to said submerged article,



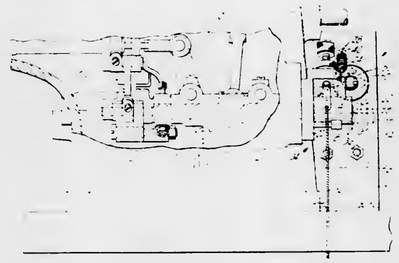
E. means within said chamber gripping and paying out said line thereby changing the distance between said buoyancy device and said article,
F. means braking said paying out means, and
G. means controlling said braking means, said controlling means being responsive to the level of the water within said chamber.

4,048,687
AUTOMATIC ASSEMBLY APPARATUS FOR BOLTS AND NUTS
Kanji Kato, Kokubunji; Tatsuo Goto, Tokyo, and Tadao Inoyama, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Dec. 2, 1975, Ser. No. 636,840
Claims priority, application Japan, Dec. 4, 1974, 49-138394
Int. Cl.[2] B23P *19/08*; B23Q *17/18*
U.S. Cl. 10—155 R **28 Claims**



1. An automatic assembling apparatus comprising:
first means for holding a first object, which is screwed on a second object supported by a holder;
second means coupled with said first means, said second means being movable in an axial direction and in a rotating direction with respect to a center axis of said second means, and said second means being capable of inclination with respect to the center axis thereof;
third means for detecting the displacement of said second means;
fourth means for driving said first means to screw said first object on said second object; and
fifth means for controlling said fourth means, said fifth means receiving signals from said third means;
wherein sixth means are included for detecting a position of said second object and seventh means are included for moving said first means within a plane at right angles with respect to the center axis of said first means, said seventh means being controlled by said fifth means, to which signals from said sixth means are supplied.

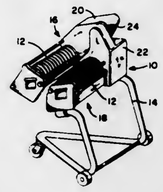
4,048,688
CONTROL MECHANISM FOR EDGE FOLDING MACHINES
Ivan Percy Crouch, Leicester, England, assignor to USM Corporation, Boston, Mass.
Filed Oct. 4, 1976, Ser. No. 729,011
Claims priority, application United Kingdom, Oct. 4, 1975, 40698/75
Int. Cl.[2] A43D *11/00*; B05C *3/02*
U.S. Cl. 12—55.1 **4 Claims**



2. Edge folding machine for progressively folding over a marginal portion of a workpiece, comprising folding instrumentalities movable at an operating locality of the machine, workpiece feeding means for feeding a workpiece step-by-step through the operating locality, a feed control device by which the feed length of each feed movement of the workpiece feeding means can be varied, said device including a feed control shaft which is operatively connected with a workpiece feeding means and rotation of which is effective to cause the feed length to be varied as aforesaid, and setting means for setting maximum and minimum lengths to the rotation of said shaft, and thus to the feed length variation, the machine also comprising a reciprocatory slitting knife mechanism, operable in timed relation with the operation of the workpiece feeding means, for slitting the marginal portion of the workpiece fed by the workpiece feeding means as aforesaid, and an actuator by which the slitting knife mechanism can be brought into operation, characterized by the provision of a lever (**26**) mounted on the feed control shaft (**12**), a lever (**36**) connected to the lever (**26**) by means of a telescopic link (**34**), said lever (**36**) providing a surface (**62**) engageable by an abutment (**60**) carried by a fixed-stroke actuator (**54, 58**), whereby said fixed-stroke actuator (**54, 58**) is operable when the first-mentioned actuator is operated to bring the slitting knife mechanism into operation, and further wherein the first-mentioned lever (**26**) is also movable, together with the feed control shaft (**12**), independently of the fixed-stroke actuator (**54, 58**).

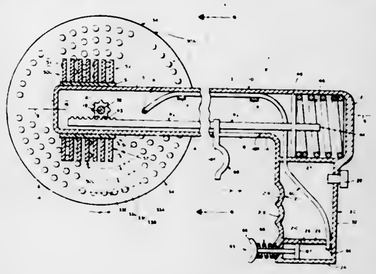
4,048,689
MEAT CLEANING MACHINE
Anthony L. Fullenkamp, Fort Loramie, and Herman F. Russell, Dayton, both of Ohio, assignors to Hobart Corporation, Troy, Ohio
Filed Feb. 19, 1976, Ser. No. 659,473
Int. Cl.[2] A22C *17/08*
U.S. Cl. 15—3.17 **8 Claims**

1. In a meat handling machine having a centrally open meat driving cylinder including a plurality of axially aligned and spaced meat driving rings each having outwardly projecting teeth, means for driving said cylinder about the axis thereof and meat cleaning means positioned within said cylinder to clean the surface of a piece of meat engaged by said teeth, the improvement comprising:
a. a ring supporting framework consisting of:
i. a pair of opposed, one piece, centrally open end frames positioned axially outwardly of said rings, and
ii. means interconnecting said end frames, extending axially of said cylinder and positioned solely outside the periphery thereof,
b. each of said end frames including at least three seats angularly spaced about said axis of said cylinder with the seats on one end frame aligned with those on the other end frame to form at least three sets of aligned seats,



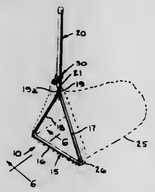
c. at least one of said sets of seats being positioned on an opposite side of said axis of said cylinder from the others of said sets of seats, and
d. at least three ring support members, each having the ends thereof received and mounted in said end frames with said ring support members having portions engaging inwardly disposed surfaces of said meat driving rings in supporting relationship thereto.

4,048,690
TWIN-BRUSHES ROTARY TOOTHBRUSH
Alan Wolfson, 10340 Fieldcrest Court, Omaha, Nebr. 68114
Filed May 27, 1976, Ser. No. 690,607
Int. Cl.[2] A46B *13/08*
U.S. Cl. 15—22 R **12 Claims**



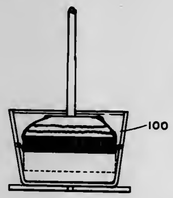
1. A twin-brushes rotary toothbrush comprising:
A. a horizontally longitudinally extending elongate tubular barrel having a fore-end and a rear-end, and longitudinally horizontally extending elongate topside and bottomside;
B. handle means at the barrel rearward portion;
C. a pair of transversely separated upright rotary brushes, each of said brushes comprising an upright support rotatably secured to the barrel forward portion with a common axle means lying along a horizontal transverse-axis whereby the two brushes are rotatable in co-angular unison about said transverse-axis, each of said rotary brushes comprising an array of horizontal bristles extending transversely inwardly from the brush upright support toward the barrel, the free-ends of the bristles lying along an upright imaginary-plane located proximally outwardly said barrel; and
D. bi-directional powering means for imparting coangular rotation to the rotary brushes in pulsating alternating angular directions about said horizontal transverse-axis, said bi-directional powering means extending along said barrel.

4,048,691
TRASH SACK SUPPORT
Glen C. Spangler, 13645 Reeveston Road, Houston, Tex. 77039
Filed Apr. 12, 1976, Ser. No. 675,850
Int. Cl.² A47L *13/52*; A47F *13/06*
U.S. Cl. 15—257.1 **9 Claims**



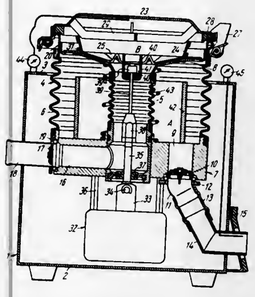
1. An arrangement for supporting a sack to receive articles comprising:
   a. generally triangular shaped frame means with which the open end of a sack may be overlapped;
   b. handle means engaged with said frame means so that one side of said frame means can be positioned on a surface to enable articles on the surface to be moved into the opened end of the sack; and
   c. means adjustably carried on said handle means for engaging the overlapped sack end to retain the sack in position on said frame means, said means adjustably carried on said handle including
      1. a member slideably positioned on said handle means;
      2. projection means extending from said member including a segment extending longitudinally of said handle means; and
      3. a friction surface means on said projection means with which the overlapped sack end may be engaged to aid in retaining the sack in open position on said frame means.

4,048,692
COMBINED DUST PAN AND BROOM HOLDER
D. A. Coffey, 13613 Occidental Ave. South, Seattle, Wash. 98168
Filed Aug. 23, 1976, Ser. No. 716,759
Int. Cl.² A47L *13/52*
U.S. Cl. 15—257.2 **8 Claims**



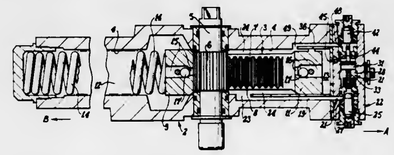
1. A claimed dust pan and broom holder comprising:
   a. a receptacle having a pan portion with upwardly and outwardly sloping side walls, and an upstanding rear wall connected to said side walls; a top panel flexible along an axis from front to back and secured in part to said pan portion, disposed in a plane generally parallel to the pan, said top panel terminating its non-secured portion in a terminal portion removably engageable with one of said upstanding side walls of the pan to form an enclosure which is open at the front;
   b. a crosswire retainer rotatably secured on one end at the forward end of one side of said top panel, the other end thereof being engageable with either of a pair of apertures on the other side of said top panel, moveable;
   c. a handle means movable from a stowable to a grippable position, secured to the external side of said rear wall of said pan and adopted such that the receptacle can be stored in a vertical position resting on said handle means when said handle means is in the stowable position.

4,048,693
APPARATUS FOR REGENERATION OF FILTERS FOR ANTIDUST RESPIRATORS
Iosif Maxovich Axelrod, ulitsa Vatutina, 21, kv. 35; Anton Savvich Alengoz, ulitsa Artema, 108, kv. 27; Viktor Nikolaevich Luchko, ulitsa Pavla Popovicha, 29, kv. 8; Valentin Alexandrovich Mukhin, ulitsa Levitskogo, 27, kv. 6; Ignat Leontievich Nikolenko, ulitsa Pokrysheva, 5, and Igor Alexandrovich Potapenko, prospekt Vatutina, 3, kv. 11, all of Donetsk, U.S.S.R.
Filed Jan. 29, 1975, Ser. No. 545,312
Int. Cl.² A47L *5/38*
U.S. Cl. 15—310 **5 Claims**



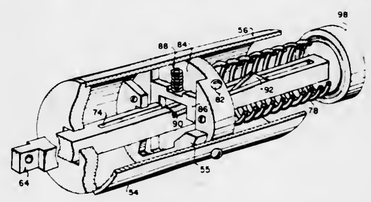
1. An apparatus for regeneration of filters for antidust respirators comprising: a hollow casing; two coaxially mounted bellows with common end walls and a vibratory drive forming a driven pump; one of the end walls of said bellows being rigidly fixed in said casing; said bellows comprising an inner bellows and an outer bellows with a space therebetween; a first passage for admitting air from the outside of said casing to said space between said bellows, and a second passage for discharging air from the internal space of said inner bellows to the outside of said casing, said passages passing through said one end wall; a one-way valve mounted in said first passage for admitting air thereto; the other end wall of said bellows being mounted in said casing and connected to said vibratory drive for reciprocation axially of said bellows; an adapter with a cover attached thereto being also attached to said other end wall, said adapter and said cover defining a filter receiving space therebetween for mounting a filter to be regenerated; first means communicating the internal space of said inner bellows with said filter receiving space; second means communicating the space between said bellows with said filter receiving space; and a non-return valve mounted in said second passage for eliminating an idle stroke of the bellows; said filter to be regenerated having a clean side and a soiled side; said vibratory device being connected to said other end wall for moving said bellows to blow air through said filter in a direction from said filter receiving space to the interior space of said inner bellows, said filter being mounted in said filter receiving space, the clean side of said filter being at the upstream side of the blown air and the soiled side of said filter being at the downstream side of said filter

4,048,694
HYDRAULIC DOOR CLOSER WITH ADJUSTABLE TIME DELAY DAMPENER
Donald John Newman, South Oakleigh, and Gerald Francis Dunphy, Glen Waverley, both of Australia, assignors to Ogden Industries Pty. Limited, Australia
Filed Mar. 1, 1976, Ser. No. 662,368
Claims priority, application Australia, Mar. 7, 1975, 0826/75
Int. Cl.² E05F *3/10, 3/12*
U.S. Cl. 16—52 **14 Claims**



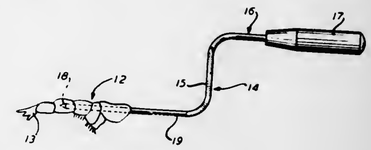
1. A door closer including; a hollow body; a body piston slidably mounted in said body and dividing the interior thereof into a damping chamber and a reservoir chamber, the respective volumes of which vary with axial movement of said body piston relative to said body; first biasing means urging said body piston in a direction to reduce the volume of said damping chamber; escape means through which fluid can be bled from said damping chamber to permit said body piston to move in said direction, including an escape conduit and a compartment having an inlet which communicates with said damping chamber through said escape conduit so as to receive said fluid therefrom, at least in some positions of said body piston relative to said damping chamber, and an escape port through which said fluid received from said damping chamber can be discharged; closure means controlling opening and closing of said escape port and being mounted within said compartment for movement between a rest position and an escape port opening position, said positions being spaced apart and said escape port being maintained closing while said closure means travels between said positions; and second biasing means urging said closure means into said rest position; said closure means being responsive to the pressure of fluid received through said inlet to move towards said escape port opening position against said second biasing means, when said pressure exceeds the influence of said second biasing means on said closure means; whereby a time delay occurs in the opening of said escape port while said closure means moves between said rest position and said escape port opening position.

4,048,695
DOOR CHECK AND CLOSURE DEVICE
Otto H. Juilfs, and Donald R. Juilfs, both of 19701 Lassen St., Chatsworth, Calif. 91311
Filed Nov. 20, 1975, Ser. No. 633,819
Int. Cl.² E05F *3/00*
U.S. Cl. 16—65 **3 Claims**



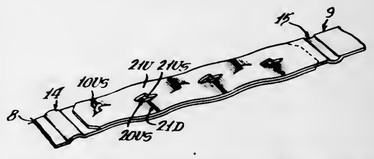
1. A door closure device comprising a cylindrical shell, a spring disposed within said shell, a piston rod adapted to interact with said spring for resisting the opening of a door and for causing closing of a door, a slot disposed longitudinally in said rod, a plate fixedly mounted in said shell against which one end of the spring rests, a slot cut into said plate, a key within said slot which is adapted to engage a niche in said rod to hold a door in an open position, a rotatable cam rotatably mounted within the slot in the rod adapted to allow the key to override the niche in said rod to allow a door to close.

4,048,696
SHRIMP SHELLER
Joseph Maschio, Rutherford, N.J., assignor to Master Machine & Manufacturing Co., Belleville, N.J.
Filed July 1, 1976, Ser. No. 701,880
Int. Cl.² A22C *29/02*
U.S. Cl. 17—69 **4 Claims**



1. A shrimp sheller device comprising
   a. a first portion of a device defining a probe having a generally uniform cross-sectional area from one end to the other, dimensioned to be inserted into the body of a shrimp toward the tail, between the shell and the flesh,
   b. a second portion of the device extending generally perpendicular to the first portion,
   c. an integral sharp edge on the second portion of the device facing toward the first portion, and generally perpendicular thereto,
   d. a third portion of the device defining a handle extending from the second portion in the opposite direction to the first portion and disposed in general parallelism to the first portion.

4,048,697
SEALLESS STRAP END ALIGNMENT AND CONNECTION MEANS
William F. Duenser, Mount Prospect, Ill., assignor to Signode Corporation, Glenview, Ill.
Filed Apr. 26, 1976, Ser. No. 680,166
Int. Cl.² B65D *63/02*
U.S. Cl. 24—20 EE **6 Claims**



1. A sealless strap connection between overlapped lengths of strap which comprises an array of longitudinally spaced joints, each joint comprising lengthwise protuberances presenting opposed non-interlocking shoulders each having a transverse face displaced from the respective planes of said overlapped lengths of strap and lengthwise protuberances presenting opposed interlocking overlapping shoulders each having a transverse face displaced from the respective planes of said overlapped lengths of strap shaped to interlock with each other, at least one of said protuberances of said array on one of said lengths of strap having, behind the transverse face of one of

said interlocking overlapping shoulders, a laterally extending projection presenting an anti-disengagement shoulder facing the end of said strap length containing it, said anti-disengagement shoulder extending beyond an edge of a superposed protuberance and lying between said superposed protuberance and an adjacent portion of the strap length containing said superposed protuberance, said anti-disengagement shoulder further being substantially perpendicular to the side edges of the strap length and substantially parallel to the face of said one interlocking overlapping shoulder to inhibit separation and unlocking of said joints.

4,048,698

SEMIPERMANENTLY LOCKABLE SLIDER

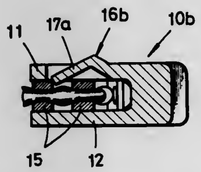
Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Dec. 17, 1975, Ser. No. 641,423

Claims priority, application Japan, Dec. 21, 1974, 49-155898[U]

Int. Cl.² A44G *19/30*

U.S. Cl. 24—205.14 R **1 Claim**



1. In a slider movable along interlockable rows of fastener elements of a slide fastener for closing the latter, wherein the slider includes a pair of upper and lower wings, a neck portion interconnecting the wings at their front ends to define a generally Y-shaped guide channel between the wings for guiding the interlockable rows of fastener elements therethrough, said upper wind including an aperture therethrough and a device for locking the slider in a closed position on the rows of fastener elements, said device consisting of a resilient locking pawl formed substantially integral with one of the wings of the slider and connected to an end edge of said aperture and having a distal end portion directed toward the rear end of said slider, said locking pawl being disposed centrally of said one wing and rearwardly of the neck portion, said locking pawl extending upwardly from its connection to said upper wing a slight amount having its distal end portion positioned at an acute angle to said one wing and intruding through said aperture into the guide channel to permit the distal end tip of said locking pawl to lockingly engage at least one fastener element within the guide channel in the closed position of the slider so as to lock the latter against movement in the fastener opening direction, said locking pawl being independently bendable relative to said one wing from a release configuration out of engagement with said fastener element within the guide channel to a fixed locking position of engagement with said fastener element, said distal end tip of the locking pawl being disposed for resilient engagement with said fastener elements and for sliding over said fastener elements during the fastener closing movement of the slider, when in said locking position the major portion of said locking pawl being disposed below the outward surface of said one wing to shield said locking pawl against movement toward said release configuration by forces acting above said outward surface of said one wing.

4,048,699

SLIDER FOR SLIDE FASTENER

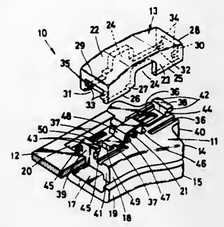
Yoshihiro Kanzaka, Nyuzen, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Dec. 31, 1975, Ser. No. 645,837

Claims priority, application Japan, Jan. 15, 1975, 50-6782

Int. Cl.² A44G *19/30*

U.S. Cl. 24—205.14 R **4 Claims**



1. A slider for a slide fastener comprising: a slider body including an upper and a lower shield and having a front and a rear end, said shields being connected together by a neck portion at the front end, said upper shield having a plurality of grooves therein extending longitudinally of the slider body; a pull tab having at one end a pintle pivotally connected to said upper shield; a pair of first engaging means provided at the front and rear ends lying along the longitudinal axis of said slider, respectively of said upper shield; a yoke of a caplike shape mounted on said upper shield and having an upper portion, a pair of longitudinal side walls and a pair of front and rear end walls, said side walls having cut-away recesses through which said pintle extends and providing separated bottom edges engageable in said grooves; and a pair of second engaging means provided at the front and rear end walls respectively, of said yoke and interfitting with said first engaging means, said yoke and upper shield being integrally bonded together along their respective engaging surfaces, said first engaging means including upwardly extending projections having laterally and outwardly extending members, said second engaging means also including laterally extending members that engage said laterally extending members of the first engaging means to establish a given positional relation between the yoke and upper shield, said laterally extending members of said first and second engaging means being located in spaced-apart relation to said longitudinally extending grooves.

4,048,700

CLAMP MEANS AND SUPPORT FOR SKIS, IN COMBINATION

Joseph N. Browne, c/o Esso Europe Inc., 5 Hanover Sq., London WIROHQ, England

Filed Oct. 12, 1976, Ser. No. 731,124

Int. Cl.² B60R *9/12*

U.S. Cl. 280—11.37 K **6 Claims**

1. In combination:

A. a pair of skis, and

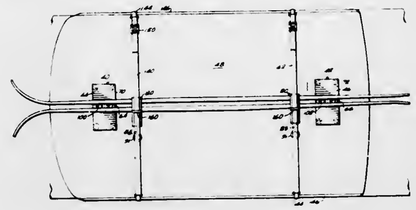
B. a support means for the skis for use as a car top ski carrier and as a work holder for holding the skis during a sharpening operation and during bottom repair of the same, comprising:

said pair of skis including, a first ski and a second ski, each ski having a congruent bottom with opposite longitudinally extending edge zones and said edge zones comprising metallic bottom edges,

said support means comprising a first and a second support, each including a rigid support base with a top surface having a planar zone and each support base having a bottom surface including downwardly extending friction means to engage a support surface, and each of said first in

means being of an overall height sized to locate the planar zone of the top surface at a predetermined common height above said support surface,

each of said supports including an upstanding portion extending medially of the planar zone and each upstanding portion having a top surface and including a first and a second vertical main side surface parallel to one another and at right angles to the planar zone and of an overall height which is less than the minimum distance between the longitudinally extending edges of the skis when the skis are in confronting relation with their respective bottom surfaces being mirror images of one another,



friction means on the top surface of each of said upstanding portions to engage a ski during bottom repair of same, and

U-shaped clamp means for clamping said upstanding portion between each of said pair of skis, each of said clamp means including a first leg and a second leg in spaced relation to one another joined by a base zone; said base zones of said clamp means each including an inside surface and an outside surface, and the outside surface includes a loop portion defining a pass through opening and strap means are included extending through the opening and having outwardly extending ends and hook means on the outwardly extending ends adopted to engage a gutter about the roof of an automobile.

4,048,701

DEFLECTION COMPENSATING ROLL

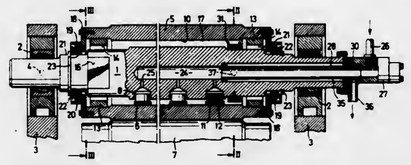
Ignazio Marchioro, Schio, Italy, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Nov. 3, 1976, Ser. No. 738,442

Claims priority, application Switzerland, Nov. 4, 1975, 14182/75

Int. Cl.² B21B *13/02*

U.S. Cl. 29—116 AD **22 Claims**



1. A deflection compensating roll which comprises a stationary support beam, a roll shell rotatably mounted about and defining with said beam an intermediate space therebetween, and at least one hydrostatic support element engaged between said beam and said shell for exerting a force against the interior of said shell, the end portion of each support element facing the interior of said shell having at least one fluid receiving recess formed therein and communicating with said intermediate space, said beam having an internal longitudinally extending chamber and means for sealing a first region of said chamber from a second region thereof, said first region of said chamber communicating with each fluid receiving recess and defining a conduit for supplying pressure fluid thereto, said second region of said chamber communicating with said intermediate space and defining a conduit for discharging from said intermediate space fluid flowing thereto from said recess.

4,048,702

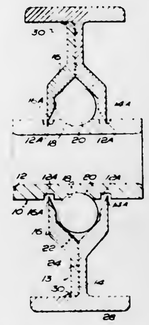
BALL BEARINGS

David Morris Garnett, Starra Cottage, Great Ouseburn, York, Yorkshire, England

Filed Apr. 6, 1976, Ser. No. 674,260

Int. Cl.² B21D *53/10*; B21K *1/02*

U.S. Cl. 29—148.4 A **5 Claims**



1. A method of constructing a ball bearing device which is composed of an inner race, ball bearings, and an outer race composed of two separate sections of plastics material, which method comprises:

a. snapping a first section of said outer race into a retained operative position around said inner race so that said first section can rotate freely about said inner race,

b. disposing said first section of said outer race in a generally horizontal plane and depositing in said horizontally disposed first section a plurality of balls so that said balls engage the race surfaces of said inner race and said first section of said outer race,

c. snapping the other outer race section into retained operative position around said inner race so that said other outer race section can rotate freely on said inner race, and thereby trapping said plurality of balls in a cavity jointly defined by said two sections of the outer race,

d. securing said two sectins of said outer race firmly together so that said two sections of said outer section are firmly in contact with the balls and free of contact with said inner race.

4,048,703

COLLAR SLEEVES AND PROCESS AND TOOL FOR THE MANUFACTURE THEREOF

Dieter Lehnhart, Mainz (Rhine), Germany, assignor to Glyco-Metall-Werke Daelen & Loos GmbH, Wiesbaden-Schierstein, Germany

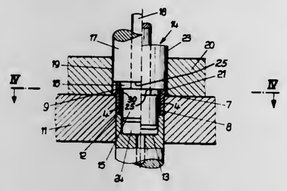
Filed Feb. 14, 1975, Ser. No. 549,953

Int. Cl.² B21D *53/10*

U.S. Cl. 29—149.5 DP **5 Claims**

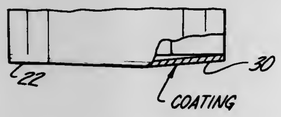
1. A process for the manufacture of a collar sleeve consisting essentially of a relatively hard substrate having an inner surface coating of relatively softer bearing material, said process comprising the steps of preparing a cylindrical sleeve of said substrate having an inner surface coating (4) of bearing material except in a cylindrical region (6) at one end where the collar is to be formed; placing the said prepared sleeve in a radially confining cylindrical die recess (12) with the other end in axial abutment with a first die part (13) and with the said one end projecting above the recess into a coaxial cylindrical die bore (19) of larger diameter than said recess, providing another die part (14) extending through said die bore into said recess, said

other die part having a first cylindrical section (16) fitting slidably within said one end region of the sleeve and a second cylindrical section (15) extending through the remainder of said sleeve and an axially facing surface (25) above said sections in abutment with said one end of the sleeve; relatively axially moving said die parts together with upsetting pressure



to shorten said sleeve and said coating simultaneously in the axial direction to calibrate the said sleeve and said coating between said confining die recess and said second cylindrical section of the other die part and to simultaneously increase in radial thickness said one sleeve end region within said coaxial die bore to form an integral radially thickened collar (7) on said one sleeve end.

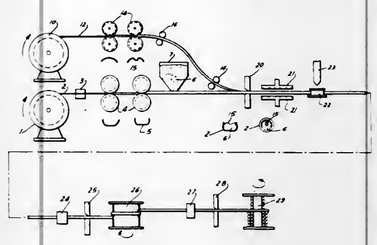
4,048,704
METHOD FOR REBUILDING PINSETTER PULLEY ASSEMBLIES
Albert R. Trudeau, 545 Meadowdale, Ferndale, Mich. 48220
Filed June 11, 1976, Ser. No. 695,067
Int. Cl.² B23P *7/00*
U.S. Cl. 29—401 R **17 Claims**



1. A method of rebuilding pinsetter pulley assemblies of the type having a compound pulley face consisting of a convex surface and a flat surface, and having a worn convex surface only, said method including the steps of removing said worn convex surface, machining a new tapered surface in place of said convex surface, applying a heat resistant enamel coating to said tapered surface and curing said coating.

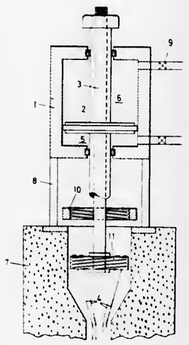
4,048,705
METHOD OF MAKING SOLDERING WIRE CONSTITUTED BY A CORE OF POWDER AND A METALLIC TUBE ENCLOSING THE CORE
Jacques Blanpain, Gentbrugge, and Leon Delehouzee, Wondelgem, both of Belgium, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED, Luxembourg, Luxembourg
Filed Apr. 29, 1975, Ser. No. 572,636
Claims priority, application France, May 22, 1974, 74.17830
Int. Cl.² B22F *3/24*
U.S. Cl. 29—420 **12 Claims**

1. A process of manufacturing a soldering wire constituted by a core of soldering powder and a tubular metallic member enclosing the core, said process comprising the steps of forming from a metal band an open channel of substantially U-shaped profile having a pair of lateral flanks with upper end edges extending longitudinally of the channel; introducing into the channel a stream of soldering powder to substantially fill the channel with a loose strand of said powder; covering the loose strand of powder introduced into the preformed channel by a sheath which surrounds at least part of the powder and which abuts with curved borders thereof against inner faces of said flanks to hold the powder at the bottom of the channel and to keep it away from said end edges of said flanks; closing said



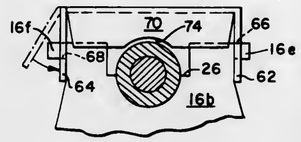
channel by bringing said end edges in abutment with each other; and permanently connecting said end edges to each other.

4,048,706
METHOD OF ELIMINATING AND UNEVEN STRESS DISTRIBUTION IN AN ELONGATED REINFORCED MEMBER
Birger Ludvigson, Sodra Vagen 38, Goteborg, Sweden (41256)
Filed Feb. 3, 1976, Ser. No. 654,988
Claims priority, application Sweden, Feb. 4, 1975, 7501229
Int. Cl.² E21B *19/00*
U.S. Cl. 29—452 **13 Claims**



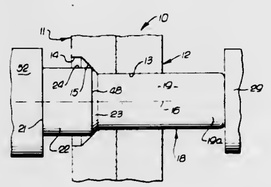
1. A method of eliminating an uneven stress distribution in an elongated reinforcing member in a concrete structure caused by tensioning said member against a frictional resistance, comprising
a. imposing about the desired amount of tensioning upon the member, and
b. thereafter suddenly subjecting the member to a measured amount of strain force change.

4,048,707
KEEPER FOR IDLER ROLLS
Ralph W. Coutant, Ridgewood, N.J., assignor to Litton Systems, Inc., Passaic, N.J.
Division of Ser. No. 446,009, Feb. 25, 1974, Pat. No. 3,934,711.
This application Oct. 8, 1975, Ser. No. 620,771
Int. Cl.² B21D *39/00*
U.S. Cl. 29—509 **6 Claims**



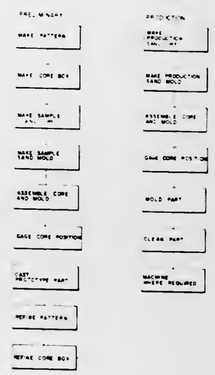
1. The method of securing an end of an idler roll in place in an idler roll support bracket comprising the steps of:
a. providing an idler roll support bracket with at least one upwardly extending opening sized to receive the end of an idler roll, and having a bottom surface upon which an idler roll end can be supported;
b. forming the idler roll support bracket with keeper support means raised above the level of said bottom surface and to each side of said idler roll support opening;
c. fabricating a keeper as a unitary member with a body and at least one leg from malleable metal that can take a set but so as to lock any significant resilience characteristics, said body of said keeper being sized to span said keeper support means;
d. forming said leg and said support bracket with mutually co-operating lock means such that upon bending of said leg to a position at a predetermined angle with respect to said body said lock means secures said bracket and keeper together; and
e. bending said leg to said predetermined angle to lock said keeper and bracket together to secure an idler roll, when an end thereof is disposed in said opening, in place in said support bracket.

4,048,708
RIVETING METHOD EXPANDING A WORK COUNTERBORE
Franklin S. Briles, 1301 Dolphin, Corona del Mar, Calif. 92625
Filed May 17, 1976, Ser. No. 687,165
Int. Cl.² B21D *39/00;* **B23P** *11/00*
U.S. Cl. 29—509 **10 Claims**



1. In the method of securing a rivet slug to work containing a bore, a substantially cylindrical first counterbore that opens to one side of the work, and a second counterbore which is frusto-conical and tapers forwardly between the first counterbore and the bore, the steps that include,
a. inserting the slug to extend within the bore and counterbores, and
b. deforming the slug axially and radially to fill the bore and counterbores and to permanently expand the first counterbore, said deformation being carried out to radially expand that portion of the slug within the first counterbore to substantially greater extent than that portion of the slug within said bore,
c. the slug prior to said deformation having a shoulder axially facing the second counterbore, and said insertion step being carried out to locate said shoulder against the second counterbore, and to locate opposite ends of the slug projecting outwardly from opposite sides of the work, prior to said deformation.

4,048,709
METHOD OF CASTING
Howard H. Deem, Cincinnati, Ohio, assignor to Conval-Penn, Inc., McKeesport, Pa.
Filed Oct. 18, 1976, Ser. No. 733,201
Int. Cl.² B22C *9/02;* **B22D** *47/02*
U.S. Cl. 29—527.6 **6 Claims**



1. The method of sand casting a part having a smooth flat surface positioned within a predetermined tolerance, said method comprising the steps of:
1. making a pattern incorporating a shrink factor, said pattern being dimensioned to a lesser tolerance than said predetermined tolerance;
2. making a core box, said core box incorporating a shrink factor, said core box being dimensioned to a lesser tolerance than said predetermined tolerance;
3. making a sample core using said core box, said core being made of sand of predetermined characteristics and being made under regulated time and temperature conditions;
4. making a sample mold using said pattern, said mold being made of sand of predetermined characteristics and being made under regulated time and pressure conditions;
5. assembling said sample core within said sand mold and accurately positioning said core, gauging said core to determine that it is properly positioned within said mold;
6. pouring metal into said mold at a predetermined temperature to cast a prototype part and allowing said metal to cool for at least a predetermined time;
7. comparing the dimensions of said prototype part with the desired dimensions thereof;
8. modifying said core box and said pattern in any areas where the dimensions of said prototype part differ from the desired dimensions thereof;
9. producing production sand cores from said modified core box using sand having substantially the same characteristics utilized to produce the sample core and utilizing the same time and temperature conditions;
10. producing production sand molds using said modified pattern, said molds being made from sand having the same

characteristics utilized in producing the sample mold and utilizing the same time and pressure conditions;

11. assembling said production cores within said production molds and accurately positioning said cores within said molds, gauging said cores to determine that they are properly positioned to cast a production part;

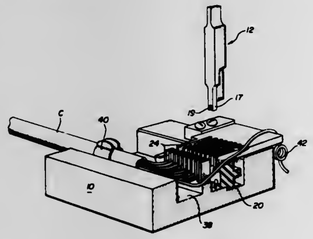
12. pouring metal into said mold at substantially the same temperature as used to cast the sample part and removing said production part from said mold after said predetermined cooling time.

4,048,710

CONDUCTOR TERMINATING APPARATUS

John Peter Nijman, West Hill, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Nov. 4, 1976, Ser. No. 738,645
Int. Cl.² H01R *43/04*
U.S. Cl. 29—566.4 **20 Claims**



1. Apparatus for terminating conductors in the contacts of an electrical connector, said connector having a plurality of contacts arranged therein in at least one row, said apparatus comprising:

a base having means for holding said connector in conductor receiving position;

a stationary comb element having comb teeth defining first conductor receiving slots alignable with said contacts of said connector;

a retractable comb element movable between open and closed positions and having comb teeth defining second conductor receiving slots alignable with said contacts of said connector, said retractable comb element in the closed position forming in cooperation with said stationary comb element a cross generally transverse to said conductor receiving slots;

stationary shear means positioned within each said second conductor receiving slot; and

an insertion tool having a transverse guide portion for sliding within said cross slot and longitudinal blade means for inserting a conductor threaded through said comb elements into one of said contacts, said blade means also having an edge which cooperates with said stationary shear means to trim the conductor immediately prior to insertion into a contact of said connector.

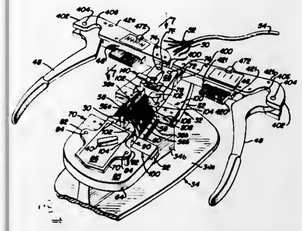
4,048,711

WIRE INSERTION APPARATUS

Freidrich A. Haller, Chicago, Ill., assignor to TRW Inc., Elk Grove Village, Ill.

Filed Feb. 13, 1975, Ser. No. 549,714
Int. Cl.² H01R *43/04*
U.S. Cl. 29—566.3 **27 Claims**

1. Apparatus for terminating wires in terminals of a connector, comprising a frame, connector carriage means on said frame for supporting such a connector, means for aligning wires with such terminals of a connector supported on said connector carriage means, and insertion means comprising a first member mounted on said frame for pivotal movement into insertion engagement with a connector supported on said connector carriage means and including insertion rams for forcing aligned wires from said aligning means into said terminals of such a connector upon such engagement, said connector carriage means comprising first and second side members



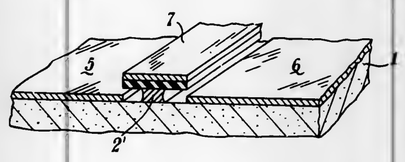
and a connector support member, all of said first and second side members and said connector support member being laterally translatable on said frame, generally parallel to the direction of and in response to said movement of said first member at insertion, within predetermined limits.

4,048,712

PROCESSES FOR MANUFACTURING SEMICONDUCTOR DEVICES

Marina Buiatti, Rome, Italy, assignor to SELENIA-Industrie Elettroniche Associate S.p.A., Italy

Filed Dec. 1, 1975, Ser. No. 636,468
Claims priority, application Italy, Aug. 8, 1975, 50889/75
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **4 Claims**



1. A process of manufacturing a field effect transistor having a Schottky barrier gate electrode, comprising the steps of

providing a substrate of semiconductor material,

depositing on the exposed surface of said substrate a first metal layer, a part of which will form the Schottky junction gate electrode,

applying on said metal layer a strip of photo-resist having a width greater than the final width of said gate electrode and corresponding to the desired spacing between two ohmic contacts of said field effect transistor,

chemically etching said first metal layer to obtain a desired underetching with respect to said photo-resist strip,

applying a second metal layer to said substrate by an evaporation process to form said ohmic contacts, the edges of said contacts being defined with precision by the edges of said resist strip,

and removing said photo-resist strip from said gate electrode and alloying said ohmic contacts.

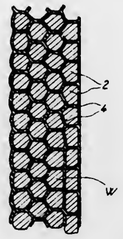
4,048,713

METHOD OF MAKING COMPACT ELECTRIC COILS

Mogens Hvass, Damagerveg 5, Stilling 8660 Skanderborg, Denmark

Filed June 9, 1975, Ser. No. 584,862
Int. Cl.² H01F *41/04*; H04R *31/00*
U.S. Cl. 29—594 **8 Claims**

1. A method of producing compact electric coils having a high space factor, such as voice coils for loudspeakers, whereby the coil is wound in winding layers of insulated wire of round cross sectional shape, characterized in that the method comprises the steps of arranging a coil on a mandrel filling out the coil, subjecting the mandrel and coil to a differ-



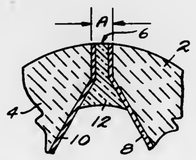
ential thermal treatment to cause, without a counter pressure being exerted on the wire, a radial compression of the wire until the wire in each winding layer becomes deformed at surface portions thereof so as to be pressed substantially flat against the surfaces of the adjoining wire portions of the adjacent winding layers.

4,048,714

GLASS BONDING OF MANGANESE-ZINC FERRITE

Robert L. Huntt, 25007 Woodfield Road, Damascus, Md. 20750

Continuation of Ser. No. 586,345, June 12, 1975, abandoned. This application June 21, 1976, Ser. No. 697,842
Int. Cl.² G11B *5/42*
U.S. Cl. 29—603 **9 Claims**



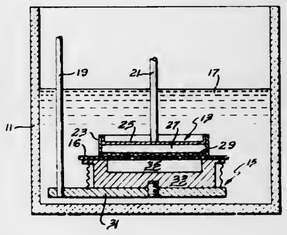
1. A process for increasing the wear resistance of a magnetic recording/reproducing head, said head comprising a core of magnetic hot-pressed manganese-zinc ferrite material having opposing pole faces defining at least one gap, while also minimizing or eliminating reaction between the manganese-zinc ferrite pole faces and a glass bonding composition applied thereto, said process comprising first forming a layer of chromium on the pole faces by R.F. sputtering the chromium thereon, each chromium layer being of a thickness of at least 25% of the width of said gap, and thereafter glass bonding the resulting chromium layers together by applying a high lead glass bonding composition at least 3 microinches thick to the area of the gap and firing the glass bonding agent at a temperatuer of no greater than about 700° C to adhere to chromium layers together with the glass bonding agent.

4,048,715

METHOD OF PREPARING POROUS, ACTIVE MATERIAL FOR USE IN ELECTRODES OF SECONDARY ELECTROCHEMICAL CELLS

Donald R. Vissers, Naperville; Paul A. Nelson, Wheaton; Thomas D. Kaun, Lisle, and Zygmunt Tomczuk, Palos Hills, all of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 27, 1976, Ser. No. 652,696
Int. Cl.² H01M *6/00*
U.S. Cl. 29—623.5 **3 Claims**



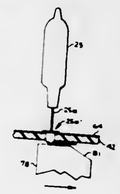
1. In a method of preparing an electrode for use in a secondary electrochemical cell wherein solid particulate active material selected from the group of transition metal sulfides consisting of sulfides of iron, cobalt, nickel and copper is vibratorily loaded into an electrically conductive, foamed-solid substrate, the improvement in controlling the loading of said substrate comprising blending said particulate active material with thermosetting carbonaceous material and solid volatile to form a paste; heating said paste to a temperature sufficient to transform said volatile to vapor and to cure said thermosetting carbonaceous material into a porous solid matrix; comminuting said matrix into porous particles of carbonaceous material containing embedded active material; and vibratorily loading said particles into said electrically conductive foamed-solid substrate for use as an electrode within a secondary electrochemical cell.

4,048,716

METHOD OF MAKING ELECTRICAL CONNECTIONS

Roger F. Jehlicka, Highland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

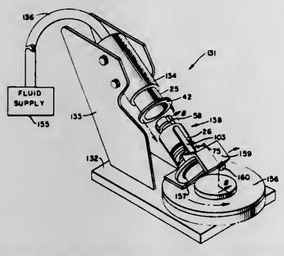
Filed Apr. 9, 1976, Ser. No. 675,106
Int. Cl.² H01R *43/04, 9/14, 9/20*
U.S. Cl. 29—628 **12 Claims**



1. A method of connecting an elongated electrical conductive member to a conductor carried by an electrically insulative member, comprising the steps of providing an opening through said insulative member at said conductor, placing an eyelet through said opening so as to make contact with said connector and so that the shank of the eyelet extends from the insulative member, inserting said elongated conductive member into said eyelet, and bending the entire end region of the

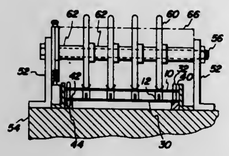
extending shank of the eyelet sufficiently sideways so as to hold the conductive member and secure the eyelet in position.

4,048,717
APPARATUS FOR ASSEMBLING AN ENCAPSULATED WET MOTOR CIRCULATOR
Leonard A. Piette, Warwick, R.I., assignor to Unipas, Inc., Warwick, R.I.
Division of Ser. No. 681,736, April 29, 1976, Pat. No. 4,023,261. This application Oct. 19, 1976, Ser. No. 733,758
Int. Cl.² H02K *15/14*
U.S. Cl. 29—732 **4 Claims**



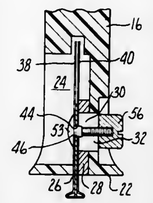
1. An apparatus for assembling a subcombination of components for use in a circulator, said subcombination comprising at least a sleeve, a rotor secured to a shaft, a first bearing support member and a second bearing support member, each of said bearing support members including support bearings for receiving said shaft, the apparatus comprising:
means for retaining a curing fixture which in turn supports said rotor and said first and said second bearing support members about said shaft and said rotor in a linear array on an axis; and
means for ejecting said sleeve upon command, said ejecting means including means for retaining said sleeve in alignment with said axis so that upon command said sleeve is forceably ejected onto said component subassembly.

4,048,718
PIN CRIMPING APPARATUS AND PRODUCT THEREFROM
Everett Arthur Rote, Clay Canyon Camp, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Nov. 26, 1975, Ser. No. 635,549
Int. Cl.² H05K *1/10, 3/30*
U.S. Cl. 29—739 **2 Claims**



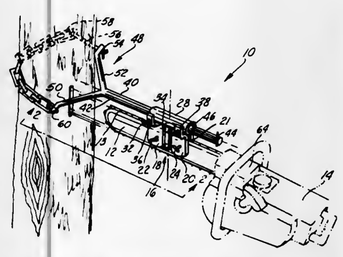
1. A machine for crimping pins of card holders extending through apertures in a printed circuit mother board including:
movable support means for supporting the mother board with the pins, through apertures in the mother board, of a card holder extending upwardly in vertical rows,
crimping wheels operatively positioned with the support means to contact the pins and outwardly deform the card holder pins when they are moved into contact and past said wheels, and
means to move said support means and supported mother boards past said wheels so that when the mother boards and pins means are contacted by and moved past said crimp wheels they will be deformed outwardly to render the pins and card holders relatively secure for presentation to a solder wave.

4,048,719
CARTON OPENER
Mary Kay Thompson, 6740 Commerce Road, Orchard Lake, Mich. 48033
Filed Feb. 17, 1976, Ser. No. 658,679
Int. Cl.² B67B *7/30*; B26B *5/00*
U.S. Cl. 30—2 **6 Claims**



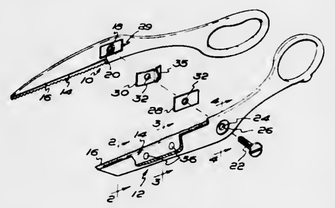
1. A hand-held device for opening cartons comprising:
a handle having a lower flat surface,
a cutting blade secured to said handle and extending outwardly and downwardly from said flat surface, said cutting blade having a forwardly facing cutting edge and a lower, outwardly extending edge, wherein said cutting edge is adapted to cut a carton as said handle is moved in a forward direction,
a guard secured across the lower, outwardly extending edge of said cutting blade and substantially perpendicular thereto, said guard including a portion extending forwardly of said cutting edge and forming a slot between said lower flat surface of said handle and said forwardly extending portion of said guard,
a pair of facing and vertically elongated plate portions, said plate portions being secured at their lower ends to said guard and adapted to lockingly receive the cutting blade therebetween, said plate portions being slidably received through a longitudinal slot formed in the bottom surface of said handle, and
means for simultaneously vertically adjustably locking said cutting blade and said plate portions to said handle and for varying the width of said slot.

4,048,720
CHAIN SAW GUIDE APPARATUS
Charles J. Wheeler, 2346 Haines, Madison, Ohio 44057
Filed Mar. 29, 1976, Ser. No. 671,281
Int. Cl.² B27B *17/02*
U.S. Cl. 30—166 A **16 Claims**



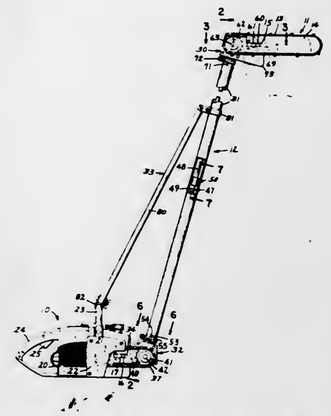
1. A guide apparatus attachment for guiding movement of a portable hand-held chain saw having a bar having a chain guide surface extending around the edge thereof which defines a plane and a pair of planer parallel side surfaces disposed parallel to and one on each side of said plane in which the chain guide surface extends, the guide apparatus being adapted to guide movement of the chain saw in a direction substantially parallel to the longitudinal axis of the bar of the saw through a member disposed contiguous to the guide apparatus attachment comprising a guide member disposable contiguous to a member to be cut and having a guide surface thereon disposed substantially parallel to the axis of a hole to be cut in the member by the chain saw and substantially parallel to the longitudinal axis of the bar of the chain saw, said guide member and guide surface being disposed in the plane defined by the chain guide surface on the bar of the saw, guide means engaging said guide surface, said guide surface guiding relative movement of said guide member and said guide means in a direction substantially parallel to the longitudinal axis of the bar of the chain saw and support means rigidly supportable by the bar of the chain saw for supporting said guide means in engagement with said guide surface of said guide member to enable said guide member to guide movement of said guide means and the chain saw in a direction parallel to said guide surface to enable the chain saw to cut a hole in the member disposed contiguous to said guide member wherein the hole has an axis substantially parallel to the longitudinal axis of the bar of the chain saw and substantially parallel to said guide surface.

4,048,721
SCISSORS
Brennand Gunson, Sheffield, England, assignor to Russell (Shears) Limited, Rawmarsh, near Rotherham, England
Filed Sept. 10, 1976, Ser. No. 721,939
Int. Cl.² B26B *13/02*
U.S. Cl. 30—254 **5 Claims**



1. A pair of scissors having a pair of pivotally connected blades; each blade being made of a moulded plastics material with an integrally moulded-in metal cutting element so that only the marginal edge portions of said cutting elements are visible, the marginal edge portion of each cutting element being angled out of the plane of the remainder of such element and the depth of the angled portion decreasing from the extreme end of the blade to a point at which it runs out in the region of the pivot connecting the blades, the angled portion of each cutting element being an angle of up to 90° to the plane containing the remainder of the cutting element; the metal cutting elements each being provided with at least one aperture for the flow of moulding material therethrough; the moulded material having flowed through said apertures of the cutting elements during the molding step to unite the moulded parts of the blades on opposite sides of the cutting elements by bridges of molded plastics material integral therewith and to thereby form blades of substantially sandwich construction.

4,048,722
CHAIN SAW ATTACHMENT
Byron W. Howard, Hot Springs, Mont. 59845
Filed June 28, 1976, Ser. No. 700,178
Int. Cl.² B27B *17/08*
U.S. Cl. 30—386 **2 Claims**



1. In combination with a chain saw, having a power unit including a first driving sprocket wheel, a cutter head including an endless cutter chain for directly engaging said first driving sprocket wheel, and means removably mounting said cutter head on said power unit so that said cutter chain extends from said power unit in a predetermined direction,
a rigid elongated interconnecting power train for interposition between said power unit and said cutter head to provide an extended working position for said cutter head relative to said power unit, said power train comprising an elongated rigid tubular member;
a power shaft in two longitudinally separable parts traversing said tubular member and carried in bearings in the ends thereof for rotating therein about an axis;
means at one end of said tubular member for connecting said tubular member to said power unit for drive and support thereby, including a first housing configured for supportive connection to said power unit instead of said cutter head, means connecting said first housing to said tubular member and preventing relative rotation therebetween about the axis of said power shaft, a first stub shaft projecting from said first housing in a direction orthogonal to said axis and carried in bearings in said first housing, a driving connection in said first housing from said first stub shaft to said power shaft, a driven sprocket wheel carried on said first stub shaft outside said first housing for alignment with said first driving sprocket wheel, and an endless driving chain for conducting power from said first driving sprocket wheel to said first driven sprocket wheel;
means at the other end of said cutter head for connecting said tubular member to said cutter head for drive and support thereof instead of said power unit, including a second housing configured for supportive connection of said cutter head, means connecting said second housing to said tubular member and preventing relative rotation therebetween about said axis of said power shaft, a second stub shaft projecting from said second housing in a direction orthogonal to said axis and carried in bearings in said second housing, a driving connection in said second housing from said power shaft to said second stub shaft, and a second driving sprocket wheel carried on said second stub shaft outside said second housing for alignment with said cutter chain, said first and second housing being so oriented with respect to

said tubular member that when said interconnecting power train is interposed between said power unit and said cutter head, said endless cutter chain has the same general direction as said endless drive chain, and said axis of said power shaft is skewed at large acute angles with respect thereto, said second housing further including a nose located beside said cutter chain in the extended working position of said cutter head and having a surface substantially orthogonal to said tubular member and extending laterally beyond said cutting chain for a portion of the length thereof for cooperation with said tubular member to comprise a rest for supporting said power train on a branch to be cut, while said cutter chain is in operation, without causing cutting of the branch;

and rigid brace means connected at one end at an acute angle to said tubular member near said second housing, and adapted for rigid connection to said power unit at a location displaced from the connection thereto of said first housing, for maintaining the orientation of said interconnecting power train with respect to said power unit.

4,048,723

DENTAL EXPLORER

Palle Thorup, 20, Odensevej, 5750 Ringe, Denmark

Filed Sept. 15, 1975, Ser. No. 613,293

Claims priority, application United Kingdom, Sept. 14, 1974, 40139/74; Denmark, Aug. 20, 1975, 3744/75

Int. Cl.² A61C *3/00*

U.S. Cl. 32—40 R **12 Claims**



1. In a dental explorer assembly for use in dentistry, the explorer including a handle or butt portion and a generally tapered explorer portion terminating in a point which is to be brought into contact with surfaces of teeth of a patient, the improvement comprising a passage having a first orifice and a second orifice, said passage extending at least partially through said handle or butt portion with said first orifice spaced from and directed toward said point for directing a stream of compressed air onto surface of a tooth adjacent said point to blow away chips and maintain this surface dry; a compressed-air source; a light and flexible connection connected between said second orifice of said passage and said compressed air source for feeding compressed air to said passage; at least one valve arranged in said handle or butt portion between said compressed-air source and said first orifice for selectively allowing compressed air to flow through said passage under control of one using the assembly, said valve including a valve seat arranged in axial symmetry in said handle or butt portion and having (1) an axial bore and generally concave seat surface and (2) a valve body in axial position when said valve is closed and having a convex valve surface whose convexity is greater than concavity of said seat surface of said valve seat; means for resiliently urging said valve surface against said seat surface; and finger-operable means for causing displacement of said valve body away from its axial closed position.

4,048,724

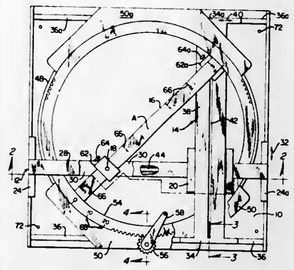
ELLIPSOGRAPH

Paul H. Keuver, 8357 Woodlawn, San Gabriel, Calif. 91775

Filed Apr. 12, 1976, Ser. No. 675,928

Int. Cl.² B43L *11/04*

U.S. Cl. 33—31 **9 Claims**



1. An ellipsograph comprising;

a. a support member adapted to be disposed adjacent a surface on which an ellipse is to be generated,

b. a crank pin actuating member and means for supporting same on the support member for rotation about a fixed axis, said actuating member defining a rotatable reference axis intersecting the fixed axis normal thereto,

c. first and second rotatable crank pins and means for individually adjusting same to desired fixed positions along said reference axis of the actuating member,

d. a first slide member and means for slideably connecting same to the support member for rectilinear movement relative thereto,

e. means for operatively connecting said first crank pin to said first slide member for rectilinear movement therealong, the construction being such that rotation of said first crank pin translates rectilinear movement to said first slide member,

f. a second slide member and means for slideably connecting same to the support member for rectilinear movement relative thereto but in a direction normal to the direction of movement of the first slide member,

g. means for operatively connecting said second crankpin to said second slide member for rectilinear movement therealong, the construction being such that rotation of said second crankpin translates rectilinear movement to said second slide member, and

h. an ellipse generating member and means for operatively connecting same to said first and second slide members for slideable rectilinear movement relative to both, the construction being such that the combined rectilinear movements of the first and second slide members is resolved into elliptical motion imparted to the ellipse generating member.

4,048,725

FEED INDEX DEVICE IN UNIVERSAL PARALLEL RULER OR THE LIKE

Masao Koenuma, and Yoshitaka Gibu, both of Tokyo, Japan, assignors to Asahi Seimitsu Kabu Shiki Kaisha, Oizumi, Japan

Filed Feb. 5, 1976, Ser. No. 655,599

Int. Cl.² B43L *13/24*

U.S. Cl. 33—81 **11 Claims**

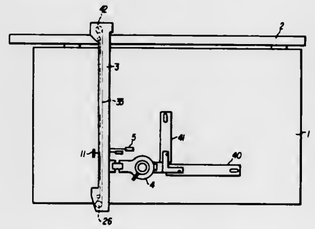
1. A straightedge movement control mechanism for use in a universal parallel ruler or the like to provide incremental movement of a straightedge over a drawing surface, said mechanism comprising:

a track means for guiding a straightedge;

a movable carriage plate including said straight-edge, said carriage plate being mounted on, and movable along, said track means;

a control member mounted on said track means for reciprocal motion between an initial position and an end position;

a linkage means coupled between said movable carriage plate and said control member for transmitting movement of said movable carriage plate along said track to said control member to thereby move said control member from said initial position to said end position, said linkage means including a clutch mechanism for disengaging said linkage means to allow said control member to move independently of said movable carriage plate back to said initial position;



a stop member mounted on said track means located at one of said initial and end positions to stop the movement of said control member thereat;

an adjustable means located at the other of said initial and end positions to stop the movement of said control member thereat; and,

operating means linked to said movable carriage plate for allowing movement of said movable carriage plate and linked to said clutch mechanism for engaging said clutch mechanism when said operating means is activated to move said carriage plate and said coupled control member from said initial position to said end position, but disengaging said clutch mechanism when said operating means is deactivated.

4,048,726

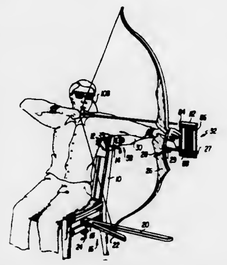
APPARATUS FOR SIGHTING A PROJECTILE FIRING WEAPON

Albert W. LeFebvre, 11½ Wilmington Road, Lake Placid, N.Y. 12946

Filed Dec. 10, 1975, Ser. No. 639,530

Int. Cl.² G08B *21/00*

U.S. Cl. 33—180 R **10 Claims**



1. Apparatus for sighting a manually supported projectile firing weapon at a target comprising:

a support element fixed with respect to said target;

first means mounted on said support element for producing a first signal sensible to a person using said weapon when said weapon is oriented for firing at a pre-selected elevation;

second means mounted on said support element for producing a second signal sensible to a person using said weapon when said weapon is oriented for firing at a pre-selected azimuth;

third means mounted on said weapon for acutating said first means and said second means when said weapon is oriented at said pre-selected elevation and azimuth for firing at said target,

whereby the user of said weapon is alerted by said signals that said weapon is in position for firing its projectile at said target.

4,048,727

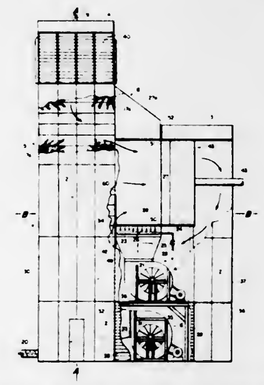
RECIRCULATING GRAIN DRYER

Walter Y. Botkins, Leawood, Kans., assignor to Berico Industries, Inc., Shawnee Mission, Kans.

Filed Apr. 14, 1976, Ser. No. 677,053

Int. Cl.² F26B *7/00*

U.S. Cl. 34—13 **17 Claims**



1. A process for drying granular material comprising:

a. feeding a moisture-ladened material to a heating zone and drying same therein by contact with a heating gas that is passed through the heating zone and into a gas flow space open to the atmosphere, and passing a portion of said heating gas to the atmosphere from said gas flow space without passing through said heating zone,

b. thereafter feeding the heated granular material into a cooling zone and cooling same therein by contact with a cooling gas that is passed through the cooling zone into said gas flow space,

c. supplying said cooling gas to the cooling zone at a pressure greater than atmospheric pressure,

d. mixing said heating gas and cooling gas within said gas flow space after passage through said respective zones, and

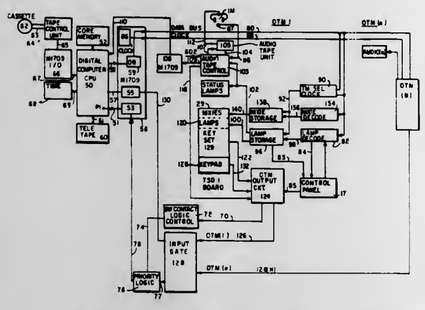
e. feeding said mixed heating and cooling gases through said heating zone.

4,048,728

TRAINING SYSTEM FOR TELEPHONE SWITCHBOARD OPERATORS USING COMPUTER CENTRAL PROCESSING UNIT

George F. Nason, III, Indialantic, and Walter W. Winter, Melbourne, both of Fla., assignors to Systex, Inc., Melbourne, Fla.

Continuation of Ser. No. 396,620, Sept. 12, 1973, abandoned.
This application Dec. 3, 1975, Ser. No. 637,136
Int. Cl.² G09B *9/00*
U.S. Cl. 35—8 A **33 Claims**



17. A method of training a telephone switchboard trainee with a training board having a visual display means and keys arranged in a pattern similar to the telephone switchboard for which training is required comprising the steps of providing a stored program in a computer which indicate the different switchboard conditions to be displayed for successive steps of a plurality of simulated telephone calls and the steps to be performed in response to the display of the different conditions, generating and transmitting a digital word requesting service from the computer, transmitting a word from the computer to the board requesting identity of the telephone call desired, generating and transmitting a further digital word from the board to identify the one of the telephone calls desired, transmitting digital words to the training board from the computer indicating the condition to be displayed for one of the steps in such telephone call, decoding the received digital word at the training board, enabling the visual display means at the training board to present the visual display identified by the digital words, providing a digital words which identifies the keyed and audio responses performed by the trainee for such display and comparing said digital word with the digital word identified in program as the word to be provided by the trainee, changing the visual display on said board in accordance with the key response by the trainee whenever the proper key and audio response are performed, and resetting the visual display on the board to a predetermined earlier display condition whenever the comparison indicates an error in a required key or audio response by the trainee.

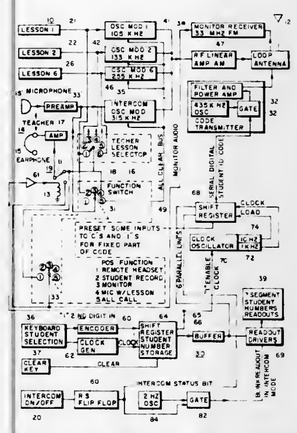
21. In a training device for use in the training of a trainee in the operation of a telephone switchboard, at least one training position including visual display means and a set of keys, source means including means for providing coded words for said position to simulate the conditions for successive steps of a call, data means for transmitting said coded words to said one position, decoder means in said one position for detecting and decoding the words input thereto from said data means, means at said one position for controlling the presentation of the visual display which is identified by the words which are decoded by its decoding means, words format means responsive to the operation of one of said key means by a trainee to generate an output word which identifies the operated one of said keys, voice detection means for detecting audio responses of the trainee and for providing a signal to said word format means to effect generation of an output word with detection of a voice reponse by the trainee, decision means in said source means for comparing each word which identifies the operated key with the key response required by a preselected program and for verifying the receipt of the voice response, and input means for inputting said words which identify the operated one of the keys and the voice response to said decision means in overlapping time periods and sequences.

4,048,729

ELECTRICAL TEACHING SYSTEM

Harry G. Derks, Holland, Mich., assignor to Fleetwood Furniture Company, Zeeland, Mich.

Filed Mar. 11, 1976, Ser. No. 666,076
Int. Cl.² G09B *5/04*
U.S. Cl. 35—8 A **17 Claims**



1. A wireless electrical teaching system comprising:

a central console including lesson source means for providing electrical signals representative of a lesson including audio information to be transmitted, transmitter means coupled to said lesson source means for transmitting said electrical signals, said transmitting means including an antenna for the wireless transmission of said electrical signals; code generating means for selectively providing a plurality of serial binary codes, each code uniquely associated with a predetermined student transceiver, means coupled to said code generating means for transmitting on a single frequency and selected code, first receiver means for receiving on a single frequency audio modulated electrical signals transmitted by a student transceiver; and

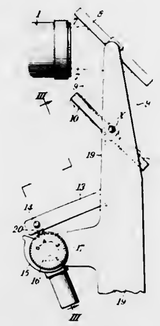
a plurality of student transceivers each including student receiver means for receiving said electrical signals from said lesson source means and said selected code, student transmitter means for transmitting audio information from a student employing one of said transceivers on a frequency to be received by said first receiver means of said central console, and decoder means coupled to said student receiver means and responsive to a predetermined code to actuate said student transmitter means such that an instructor can monitor information generated by a student by actuating said code generating means to effect transmission of a code associated with a selected student.

4,048,730

LIGHT BEAM DEFLECTION MEANS PARTICULARLY FOR RANGE COMPENSATION IN WEAPONS TRAINING AIDS

Michael John Edwards, Godalming, England, assignor to RFD Systems Engineering Limited, Great Britain

Filed Dec. 11, 1975, Ser. No. 639,919
Claims priority, application United Kingdom, June 24, 1975, 26784/75
Int. Cl.² F41G *3/26*
U.S. Cl. 35—25 **7 Claims**



2. In a gunnery training aid comprising a projector and means for moving a film through the projector, a screen onto which a beam of light emanating from the projector may be projected to form a moving image serving as a target at an apparent range, and synchronizing means for stopping movement of the film through the projector when a bullet is fired from a gun at the moving image, the improvement comprising light beam deflection means in the projector for altering the angle of inclination of the beam to a selected value which compensates for the drop in trajectory of the bullet which would have occurred at the apparent range, the light beam deflection means comprising a pivotally mounted mirror positioned to reflect the beam of light, a cam movable to a position dependent upon the selected inclination, a cam follower engageable with the cam, linkage means interconnecting the cam follower and the mirror, and a stop movable under the control of the synchronizing means between an operative extended position in which the stop acts to retain the mirror in a datum position irrespective of the position of the cam corresponding to a datum inclination of the beam, and a retracted position in which the cam follower engages the cam in such a manner that the mirror occupies a pivotal position which reflects the beam of light at the selected inclination, the stop occupying the operative position during the projection of the moving image onto the screen and being moved to the retracted position on stopping movement of the film through the projector.

4,048,731

EDUCATIONAL GAME APPARATUS

Anastasia Baguioro, c/o Lady Minto Hospital, Box 4000, 8th St., Cochrane, Ontario, Canada

Filed Aug. 24, 1976, Ser. No. 717,218
Int. Cl.² G09B *19/00*; A63F *7/02*
U.S. Cl. 35—30 **5 Claims**

1. Educational game apparatus comprising:

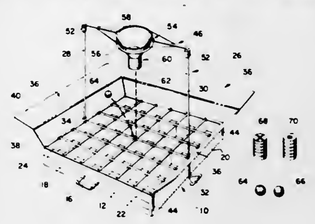
a gameboard provided with a square array of adjacent squares on one surface thereof, each adjacent square being distinguished from another;

a box including a slot in the front surface thereof slidably receiving said gameboard, in a substantially horizontal plane, said box having a plurality of criss-crossed upright partitions forming square holes positioned above each of the squares on said gameboard;

a funnel;

means supporting said funnel on said box above the intersection of the central ones of said partitions;

a pair of balls each of which corresponds to one of the distinguished adjacent squares on said gameboard adapted to be thrown through said funnel to bounce along the



upper edges of said partitions and come to rest in one of said square holes above one of the squares of said gameboard; and

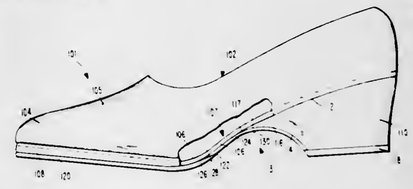
a disc having a marking corresponding to either of said balls adapted to be positioned on the gameboard on the square on which said corresponding ball comes to rest.

4,048,732

SHOE AND METHOD OF MAKING THE SAME

Nathan Stix, Cincinnati, Ohio, assignor to The United States Shoe Corporation, Cincinnati, Ohio

Filed Mar. 11, 1976, Ser. No. 665,832
Int. Cl.² A43B *21/00*; A43D *9/00*
U.S. Cl. 36—34 B **8 Claims**



1. An improved shoe construction having a forepart of slip last construction and having a waist portion and a heel portion of cement construction, said waist portion being without reinforcement to provide substantial flexibility between the forepart and heel portions of the shoe, the improvement comprising:

a shoe upper;

a substantially flexible insole extending the length of the shoe and secured to said upper;

a wedge heel attached to the rear portion of said insole, said wedge heel having a tapering forward portion extending along at least a part of the central portion of said insole to provide support for the waist portion of said shoe;

an outsole underlying the forepart of the shoe and attached to the forward portion of said insole;

a wedge tunnel cover attached to the front face of said wedge heel and extending forwardly therefrom to cover the waist portion of said insole between said heel and said outsole, said outsole covering the front edge of said wedge tunnel cover; and

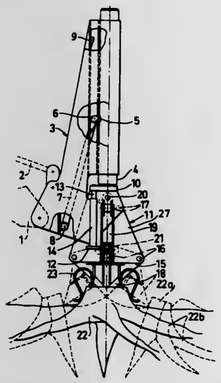
means securing said outsole to said tunnel cover and to said insole and for securing said tunnel cover to said forward portion of said wedge heel and said insole to provide a flexible shoe which provides adequate foot support without utilizing a stiff shank or shank reinforcement.

4,048,733

DEVICE FOR USE IN REMOVAL OF STUMPS

Erik Torsten Forslund, Alfta, Sweden, assignor to Ostbergs Fabriks AB, Alfta, Sweden

Filed Sept. 30, 1976, Ser. No. 728,286
Claims priority, application Sweden, Oct. 1, 1975, 7511007
Int. Cl.[2] A01B *13/00*
U.S. Cl. 37—2 R 7 Claims



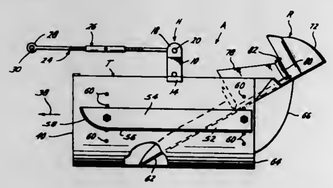
1. A device for use in removal of tree stumps, comprising a vehicle-carried crane arm, a vertically extending frame supported at the end of said crane arm, a split head mounted at the lower end of said frme for limited vertical movement, chopping blades mounted at said split head and movable between a collected and radially spread position, and energy storer, as a ram, guided in the frame, first means for raising said energy storer to a starting point for, when released, producing an impact on said split head so as to sink said blades into the centre portion of the tree stump, and second means for spreading said blades to effect a breaking-up of said stump into separate portions which easily are individually removable in a direction substantially following the extension of the roots.

4,048,734

DITCH DIGGING APPARATUS

Erwin D. Carpenter, Rte. 1, Box 423, Alvin, Tex. 77511

Filed Apr. 28, 1976, Ser. No: 681,053
Int. Cl.[2] E02F *5/02*
U.S. Cl. 37—98 1 Claim



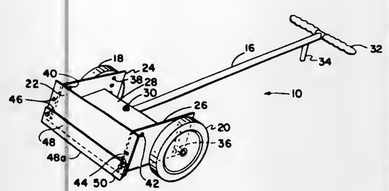
1. An excavating implement adapted to be pulled by a vehicle, comprising:
- cutting trough means for cutting through soil;
- soil removing means mounted with and extending into said trough means for receiving soil from said trough means and forming a passageway for soil to pass laterally beyond said trough means;
- hitch means mounted with said trough means for connecting said trough means to a vehicle;
- depth control means for controlling the depth at which said cutting trough means cuts through soil comprising skid means mounted with said cutting trough means for supporting said cutting trough means at a desired depth in the soil;
- mounting means for mounting said skid means with said cutting trough means in any of a plurality of selected positions to control the depth in the soil at which said skid means supports said cutting trough means;
- said soil removing means forming a first passageway for soil to pass laterally beyond a first side of said cutting trough means and a second passageway for soil to pass laterally beyond a second side of said cutting trough means;
- diverting means mounted with said soil removing means for alternatively diverting soil to said first passageway, to said second passageway, and to both first and second passageways;
- said diverting means comprising a baffle plate pivotally mounted with said soil removing means for movement between a first position blocking said second passageway, a second position blocking said first passageway, and a third position blocking neither said first passageway nor said second passageway; and
- the cutting trough means comprising trough means having a substantially U-shaped cross-sectional configuration and cutting edge attachment means mounted with the forward edge of said trough means for cutting through soil.

4,048,735

MULTI-PURPOSE LABOR-SAVER WHEELED TOOL

Fred Brunty, Rte. 1, Box 403-140, Bluefield, W. Va. 24701

Filed Feb. 3, 1976, Ser. No. 654,860
Int. Cl.[2] E02H *5/02*; B62D *51/04*
U.S. Cl. 37—130 14 Claims



1. A multi-purpose wheeled tool comprising: a body having: a laterally spaced pair of side plates, a rearwardly extending center plate fixed between the side plates, a generally upright front plate fixed transversely across and in front of the center-plate and side plates, a pair of wheels, means for rotatively mounting each wheel rearwardly in a respective side plate in height adjustable relation thereto, a handle, means fixing the handle in straight relation along and rearwardly protrusive from, the center plate, a plurality of accessory members for use in turn in material working and the like in combination with the body, and means including plural laterally spaced attachment means for detachably attaching in turn the plurality of accessor members to the body.

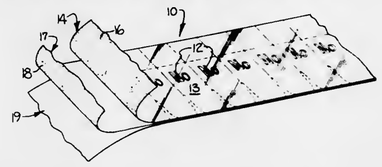
4,048,736

LAMINATED COMPOSITE SHEET PACKAGING MATERIAL

Howard H. Castleman, Charlotte, and Henry G. Stewart, Harrisburg, both of N.C., assignors to Package Products Company, Inc., Charlotte, N.C.

Filed Feb. 11, 1975, Ser. No. 548,895
Int. Cl.[2] A44C *3/00*
U.S. Cl. 40—2 R 19 Claims

1. A substantially opaque printed heat sealable composite sheet material suitable for use as a packaging material and characterized by versatility of graphic design and color selection, said sheet material comprising, in combination:
- a front film of a transparent heat resistant polymer,
- a layer of printing underlying said front film and visible on the outer surface of the film,
- a rear film of pigmented polymer of a predetermined color having a readily heat sealable outer surface, and



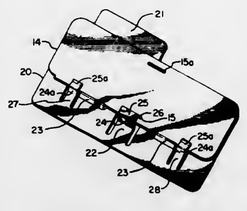
- an intermediate film of a pigmented polymer tightly bonded to the inner surface of said front film and to the inner surface of said rear film and serving to increase the opacity of the sheet material and to enhance the brightness and purity of color of said layer of printing.

4,048,737

DUAL IDENTIFICATION CARD AND IDENTIFICATION CARD HOLDER

Clifton Eugene McDermott, 1778 Oakridge Drive, Salt Lake City, Utah 84106

Filed Feb. 12, 1975, Ser. No. 549,163
Int. Cl.[2] G09F *11/02*
U.S. Cl. 40—2.2 7 Claims



1. A duel identification card having a generally rectangular shape and containing:
- similarly spaced indentations on either side of said card between the top and bottom thereof;
- a score line running from one indentation to the other dividing the card into an upper section and a lower identification section;
- a generally vertical notch in the top of said card offset from the horizontal center and extending to and encompassing a portion of said score line dividing the upper section into an upper identification section and a tab section.

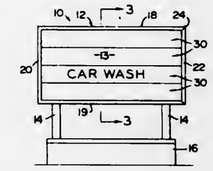
4,048,738

DISPLAY SIGN AND REPLACEABLE MESSAGE

Edward R. McHenry, 2935 Hammon Drive, Youngstown, Ohio 44511

Filed July 26, 1976, Ser. No. 708,542
Int. Cl.[2] G09F *3/18*
U.S. Cl. 40—16 4 Claims

1. A sign comprising a frame means enclosing an accessible center area and having a frame section movable to expose an edge of said center area,
- a plurality of flattened tubular vertically aligned transparent indicia carriers filling said center area, said indicia carriers each including a vertically extending and protruding rib at one vertical margin thereof, which rib extends longitudinally of said indicia carrier, and a vertically extending recess extending longitudinally of the carrier at the other vertical margin thereof and open at such vertical margin thereof to engage and interlock with the rib of an adjacent one of said indicia carriers, said ribs and recesses of adjacent ones of said indicia carriers being slidably interlocked with each other, and



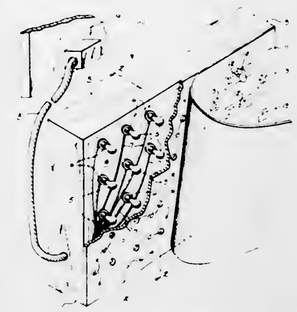
- indicia plates slidably received in and positioned by the walls of at least one indicia carrier, said indicia plates being visible through a front wall of said indicia carriers.

4,048,739

VISUAL DISPLAY WITH BACKLIGHTING

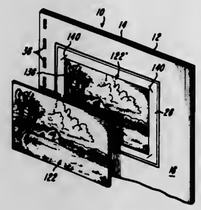
Lawrence M. Benton, Jr., 1727 N. 34th St., Milwaukee, Wis. 53208

Filed Aug. 14, 1975, Ser. No. 604,848
Int. Cl.[2] G09F *13/10*
U.S. Cl. 40—106.1 3 Claims



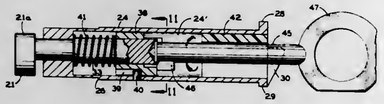
1. A visual display device comprising, in combination:
- a. a frame comprising a generally enclosed substantially sealed box,
- b. a plurality of forwardly extending spaced light emitting members disposed within said box,
- c. means to selectively actuate said members,
- d. said box including a support wall disposed forwardly of said light emitting members,
- e. a display surface disposed on the front of said support wall and co-extensive therewith and with said surface comprising a removable flexible light transmissive imperforate membrane having a plurality of discrete spaced display indicia portions thereon,
- f. a plurality of light transmitting apertures disposed on said support wall directly forwardly of said light emitting members and behind and in registry with said display indicia so that when said light emitting members are selectively actuated said apertures will controllably transmit the light therefrom to form a spot on said display membrane to illuminate only the indicia portion with which the respective lit member corresponds,
- g. and means for creating a membrane holding negative air pressure at said light transmission apertures to removably secure said membrane to the front face of said support wall.

4,048,740
POST CARD FOLIO
Donald J. Zitzelberger, and Dorothy A. Zitzelberger, both of 7440 E. 42nd St., Tucson, Ariz. 85730
Continuation-in-part of Ser. No. 405,674, Oct. 11, 1973, abandoned. This application July 9, 1975, Ser. No. 594,443
Int. Cl.[2] G09F *1/10*
U.S. Cl. 40—158 R **23 Claims**



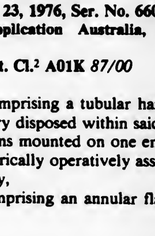
1. A folio, including overlying and underlying pictorial representations on respective outer and inner sheet portions, said inner sheet portion having the character of an insert provided with permanent pictorial representations on each of its opposite faces, said outer sheet portion being in two parts with each part beig applied to a respective face of said insert and each having at least one detachable pictorial representation thereon to superpose over respective permanent representations on said insert, the overlying pictorial representations facing outwardly for visible selection and the underlying pictorial representations facing in the same direction to be exposed by removal of respective overlying pictorial representations, said latter representations being detachably comprised in respective parts of said outer sheet portion and in a detached form having separate utility, said underlying pictorial representations being integrated into said inner sheet portion to remain as a permanent part of the folio and providing a record of detached representations.

4,048,741
ROTATION-PREVENTING LOCK ASSEMBLY
Daniel J. Chiodo, 14730 Harris Place, Miami Lakes, and Charles S. Alvarez, 5735 N.W. 14th Ave., Hialeah, both of Fla.
Filed July 29, 1976, Ser. No. 709,657
Int. Cl.[2] F41C *27/00*
U.S. Cl. 42—1 LP **15 Claims**



1. A safety lock assembly for a gun having a rotatable cylinder, said lock assembly comprising:
a lock housing shaped and dimensioned for slidable insertion into a chamber of the cylinder;
an eccentric lock located at the front end of said lock housing and coupled to the latter for insertion in unison with the lock housing into said cylinder chamber to a position in front of the cylinder, said eccentric lock being rotatably adjustable between a retracted position in which it is disposed completely within the peripheral outline of said lock housing and a locking position in which it projects transversely beyond the peripheral outline of said lock housing
a. for engagement laterally against the body of the gun to prevent rotation of the cylinder, and
b. for engagement longitudinally against the front of the cylinder to prevent withdrawal of the lock housing therefrom;
and key-operated means in said lock housing accessible by a key inserted into the back end of the lock housing and operable by the key to turn the eccentric lock between said retracted and locking positions.

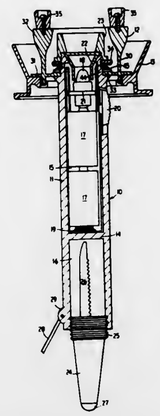
4,048,742
MINNOW DIPPER WITH AUTOMATIC PARTITIONING ACCESS DOOR
Andrew J. Clingan, 2402 Phillips Lane, Texarkana, Tex. 75501
Filed Nov. 11, 1976, Ser. No. 740,906
Int. Cl.[2] A01K *97/04*
U.S. Cl. 43—4 **3 Claims**



1. A minnow dipper comprising:
a normally enclosed cup in the form of a hollow inverted triangular prism;
the rectangular rear wall of said cup having an intermediate access opening extending between the sides of the cup and a first array of spaced downwardly extending teeth along the lower margin;
the rectangular front panel being attached to an substantially covering the forward face of the cup and having a second array of spaced downwardly directed teeth along the lower margin in spatially adjacent registration with said first array of teeth;
a door disposed to normally close said access opening, hinge means suspending said door from the superjacent body portion and buoyant means fixed to said door;
said door including a closure portion and a partitioning wall portion extending forwardly into the cup enclosure from the lower margin of said closure portion and dividing the cup enclosure to define an upper chamber and a smaller lower chamber;
said buoyant means being effective to open said door concurrently with the immersion of said cup in water when said cup is disposed in a predetermined angular relationship with a vertical plane; and
a manipulative handle extending outwardly from the upper margin of said rear wall.

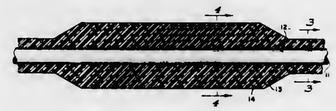
4,048,743
HAND CASTER
Richard Lapinski, Fairfield West, Australia, assignor to Catuma Pty. Limited, Fairfield, Australia
Filed Feb. 23, 1976, Ser. No. 660,389
Claims priority, application Australia, Apr. 23, 1975, 80490/75
Int. Cl.[2] A01K *87/00*
U.S. Cl. 43—17.5 **9 Claims**

1. A hand caster comprising a tubular handle, having two ends at least one battery disposed within said handle,
a light emitting means mounted on one end of said tubular handle being electrically operatively associated with said at least one battery,
abutment means comprising an annular flange on said one end of said tubular handle coaxially surrounding said light emitting means,



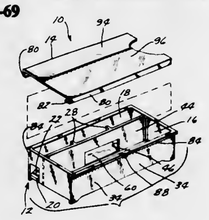
a casting head rotatably coaxially mounted on said annular flange, and engagement means adjustably frictionally holding said casting head on said annular flange.

4,048,744
FLY FISHING LINE
Leon Chandler, Homer, N.Y., assignor to Cortland Line Company, Cortland, N.Y.
Filed Feb. 9, 1976, Ser. No. 656,499
Int. Cl.[2] A01K *91/00*
U.S. Cl. 43—17.5 **4 Claims**



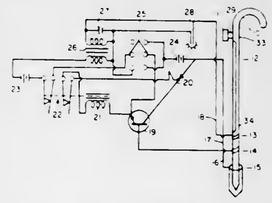
1. A fly fishing line having a section of said line near the end tip with a greater buoyancy than the remainder of said line, said section having a surface of a highly visible material, said section and said surface material being integral with said fly fishing line.

4,048,745
RODENT TRAP
Marvin A. Morford, 1815 Ashworth Road, West Des Moines, Iowa 50265
Filed Dec. 29, 1975, Ser. No. 644,579
Int. Cl.[2] A01M *23/04*
U.S. Cl. 43—69 **13 Claims**



1. A rodent trap comprising,
a housing having a passageway extending between opposite ends of said housing and a holding compartment in side-by-side adjacent relationship to said passageway, said compartment having an access opening for communication with said passageway,
said passageway including access openings at opposite ends and ramps extending inwardly and upwardly from said opposite ends and terminating at a trap door,
said trap door being pivotal downwardly placing said passageway in communication with said holding compartment access opening whereby a rodent stepping onto said trap door is dropped downwardly to a position for entry into said storage compartment through said access opening,
said housing including a slidable lid extending over said passageway and holding compartment, said lid having an opaque portion over said passageway whereby light cannot enter said passageway through said lid, and
cooperating slide fastening means on said housing and lid of such a configuration that the lid can only be positioned on said housing in one way with said opaque portion over said passageway.

4,048,746
ELECTRONIC RODENT EXTERMINATOR
Joseph R. Dye, 25885 Stanford, Hemet, Calif. 92343
Filed Apr. 14, 1976, Ser. No. 676,979
Int. Cl.[2] A01M *19/00*
U.S. Cl. 43—98 **1 Claim**

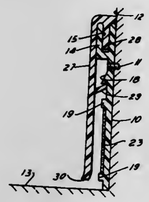


1. An electronic rodent exterminator comprising:
a carrier member having an elongated body formed from wood and provided at one end with a curved handle;
a metellic touch control ring, a high voltage electrode, and
a grounded metal sleeve mounted in spaced relation on the end portion of said carrier member opposite said handle end; electrical control means housed in said container and electrically connected to said control ring, electrode and sleeve; and electrical control means including first circuit means electrically connecting said grounded sleeve and said touch control ring through a pair of transistors,
a relay, a battery and a switch for locating a burrow and second circuit means electrically connecting said grounded sleeve and high voltage electrode through a transformer a condenser, a battery and a switch for electrocuting a rodent.

4,048,747
BASEBOARD TRAP FOR CRAWLING INSECTS
Francis V. Shanahan, Valley Stream, and Herman H. Feller, Brooklyn, both of N.Y., assignors to Stick-M-All, Inc., Valley Stream, N.Y.
Filed Aug. 12, 1976, Ser. No. 713,779
Int. Cl.[2] A01M *1/14*
U.S. Cl. 43—114 **8 Claims**

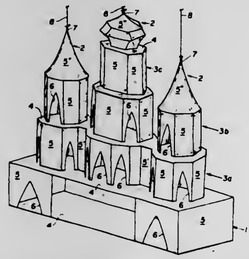
1. A baseboard trap for crawling insects, comprising:
a. a flat elongated base,
b. means for securing said base along the bottom of a wall at the juncture between the wall and floor of a room,

c. a strip of tape bearing a pressure-sensitive adhesive on its exposed face on said base, said strip extending along substantially the entire length of said base, and



d. an elongated cover extending along but spaced from said base, said cover concealing said tape, and the lower edge of said cover being spaced fron the room floor to provide access for crawling insects to said base and tape.

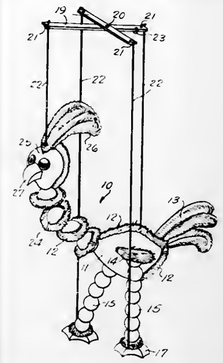
4,048,748
COLLAPSIBLE DOLL HOUSE
Patti Glazer, 3101 Cummings Lane, Chevy Chase, Md. 20015
Filed July 19, 1976, Ser. No. 706,825
Int. Cl.² A63H *33/00*
U.S. Cl. 46—12 **6 Claims**



1. A collapsible multi-level doll house including a ground level and a roof level, each but the roof level comprising a substantially rigid stiffening member defining a horizontal plane, a floor in said plane, and collapsible walls of pliable sheet material having a lower end attached to the floor and an upper end attached to the floor of the next higher level, the collapsible walls and floors defining rooms, the roof level comprising a substantially rigid stiffening member definging a horizontal plane, a floor in said plane, and collapsible walls of pliable sheet material having a lower end attached to the floor of the roof level, the upper ends of the collapsible walls of the roof level meeting at an apex, and suspension means attached to the apex of the collapsible walls of the roof level, release of the suspension means causing the walls to collapse between the floors whereby the floors of the doll house are stacked in adjoining relationship, with the collapsed pliable sheet material walls flattened therebetween.

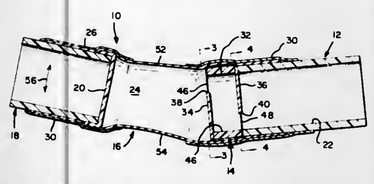
4,048,749
MARIONETTE BIRD
Carl Edward Zitting, and George Fredrick Zitting, both of P.O. Box 1767, Wenatchee, Wash. 98801
Filed June 16, 1976, Ser. No. 696,554
Int. Cl.² A63H *11/00*
U.S. Cl. 46—126 **5 Claims**

1. A manually operable bird puppet, comprising
a generally spheroid body,
an elongated flexible neck attached to said body and having a plurality of generally spheroid balls slidably carried on a flexible forwardly extending string,
a head having eyes and a beak slidably and rotatably carried on said flexible forwardly extending string with said balls between said body and said head and with said string being longer than the aggregate diameters of said balls and said head,
a pair of flexible legs secured at one end to said body and terminating at their distal ends in weighted feet,



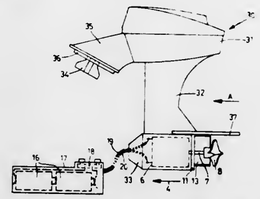
a cross-shaped control device having a crossbar and a longitudinal bar attached at its forward end to the end of said flexible forwardly extending string remote from said body,
a rear string secured to said body and the rear end of said longitudinal bar and shorter than said forwardly extending string,
and a pair of side strings secured between the ends of said crossbar and said feet, said side strings having a length sufficient to cause appreciable slack in said flexible legs when said control device is elevated.

4,048,750
GAME CALL WITH TWO-DIAPHRAGM SOUNDER
Gilbert H. Wolfe, 412 W. 15th St., New Cumberland, Pa. 17070
Filed Mar. 26, 1976, Ser. No. 670,629
Int. Cl.² G10K *9/20*
U.S. Cl. 46—180 **25 Claims**



1. A game call including a sound chamber, a handle joining the sound chamber and having a horn in communication with the sound chamber, a bellows, means joining the bellows and the sound chamber to force air through the sound chamber upon collapse and extension of the bellows, a weight secured to the bellows away from the sound chamber to facilitate collapse of the bellows upon movement of the handle, the sound chamber including an interior volume, a first wall with an opening therein communicating with the bellows and a second wall spaced from said first wall and having an opening therein communicating with the horn, a first flexible diaphragm normally closing said first opening and a second flexible diaphragm normally closing said second opening, each diaphragm including a taut edge flexible to permit movement of air into and out of the sound chamber upon movement of the bellows.

4,048,751
REMOTELY STEERED TOY BOAT
Karl-Heinz Muller-Seidel, Zirndorf, and Klaus Muller-Seidel, Weiherhof, both of Germany, assignors to Firma Michael Seidel, GmbH. & Co. KG, Zirndorf, Germany
Filed Apr. 12, 1976, Ser. No. 675,868
Claims priority, application Germany, Apr. 18, 1975, 2517262; June 6, 1975, 2525252
Int. Cl.² A63H *23/04*
U.S. Cl. 46—250 **18 Claims**



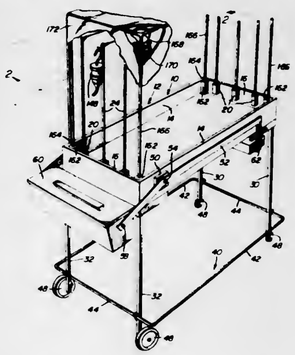
1. A drive for a remotely steerable toy boat comprising:
a reversible motor;
a propeller shaft;
a propeller disposed below the waterline, mounted on said shaft and adapted to be driven by said reversible motor; and
means on said boat for causing turbulent water to exert an unbalanced laterally-directed force on said boat when said motor rotates in the reverse direction, whereby said boat may be turned, said means including a stationary deflector shield disposed below said waterline and laterally of the propeller.

4,048,752
SUPPORTS
Howard Anderson, Accord, N.Y. 12404
Filed Nov. 24, 1975, Ser. No. 634,335
Int. Cl.² A01G *17/14*
U.S. Cl. 47—47 **4 Claims**



1. A multisectional plant support and base adapted to be employed in a generally vertical orientation, said multisectional support comprising: a plurality of support members, each said member comprising a tubular hub and a support component surrounding and fixed to said hub, the hub component of each said member including a first, upwardly extending tubular member and a second, downwardly extending member having its upper end extending into and fixed to the lower end of the upwardly extending member, said downwardly extending member also having an external diameter which is substantially equal to the internal diameter of the upwardly extending member, each of said upwardly extending tubular members being identical to each other and each of said downwardly extending members being identical to each other, a lowermost one of said support members being said base for said multisectional support, whereby said support members can be telescopically mounted and supported one above the other onto said lowermost support member with the lower end of the upwardly extending tubular hub member of each but said lowermost support member engageable with the upper end of the corresponding tubular member of the support member therebeneath to thereby vertically space apart the support components of the support members by distances determined by the lengths of said upwardly extending tubular hub members.

4,048,753
HYDROPONIC GARDEN STRUCTURE
David B. Roberts, Jr., 211 4th Place, SW., and Joseph L. Wells, 10366 Antilles Drive, both of Largo, Fla. 33540
Filed Feb. 19, 1976, Ser. No. 659,551
Int. Cl.² A01G *31/00*
U.S. Cl. 47—59 **8 Claims**



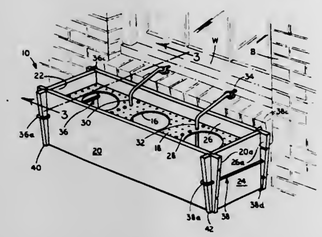
1. In combination, a horizontal tray, a liquid nutrient reservoir adapted to receive a predetermined amount of liquid nutrient therein, a support means supporting said reservoir in counterbalanced fashion for vertical shifting relative to said tray between an upper position elevated relative to said tray and a lowered position depressed relative to said tray, said support means, when said predetermined amount of liquid nutrient is disposed in said reservoir, being slightly overbalanced to cause said support means to shift said reservoir, by gravity, toward said depressed position, drain means communicating the lower portions of the interior of said tray and reservoir for draining of said nutrient from said reservoir into said tray upon movement of the reservoir to said upper position and return drainage of said nutrient from said tray into said reservoir upon subsequent movement of said reservoir to said depressed position, said support means including a counterbalance body counterbalancing said reservoir, said counterbalance body comprising a liquid tank including second drain means operative to drain said tank at a slower rate than said reservoir may drain into said tray, when said reservoir is in said elevated position, and weighting liquid supply means operative to supply weighting liquid to said tank at a rate slower than the rate at which liquid may drain therefrom through said second drain means.

4,048,754

WINDOW BOX PLANTER WITH TOOL-FREE QUICK SET-UP AND HANGING ADJUSTMENT

Leon E. Laux, 900 Fairway Drive, Towson, Md. 21204

Filed July 8, 1976, Ser. No. 703,538
Int. Cl.² A01G 9/02
U.S. Cl. 47—68 **13 Claims**



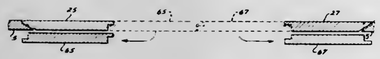
1. In a window box having front, back and end walls, plant holding means, and hanging and standoff means, the improvement comprising: at least one of the end walls and plant holding means being between the front and back walls for securance thereto, a member proximate each end of the window box extending horizontally thereacross, means for wedging one end of a said member for supportively drawing the front and back walls toward each other and thereby effecting said securance, the means for wedging including said member having a shank extending through the front and back walls, a wedge, means at the first end of the shank for engagement by the wedge, and mean at the second end of the shank for preventing the shank from being drawn through.

4,048,755

FULL LENGTH DOOR ARRANGEMENT FOR RAILWAY HOUSE CAR

Norbert S. Wolak, and Thomas J. Wolak, both of Cicero, Ill., assignors to Evans Products Company, Portland, Oreg.

Filed June 14, 1976, Ser. No. 695,382
Int. Cl.² E05D 15/10
U.S. Cl. 49—130 **28 Claims**



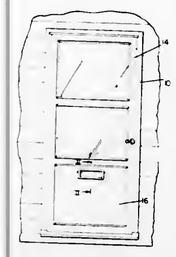
1. In a wall having a horizontally elongated rectangular opening, a pair of parallel horizontal tracks on the wall beneath said opening, a pair of end doors mounted in spaced apart relation on one of said tracks for sliding movement lengthwise of said wall, door stops on the wall adjacent the ends of said opening each wedgingly engageable with the adjacent end of one of said end doors to limit its movement lengthwise of the opening and to force the adjacent margin of the respective end door against the wall, center door structure mounted on said other track for movement transversely of the wall into and cut of a closed position in the space between said end doors and longitudinally of the car parallel to said end doors, said center door structure having vertical marginal portions overlyingly engageable with adjacent vertical marginal portions of said end doors when in the closed position for holding the adjacent marginal portions of said end doors against the wall.

4,048,756

AIR RELIEF MECHANISM

James R. Lawrence, Brazil, Ind., assignor to Raymond Lee Organization, Inc., a part interest

Filed July 16, 1976, Ser. No. 706,112
Int. Cl.² E06B 7/28
U.S. Cl. 49—171 **3 Claims**



1. An air relief mechanism for use in an opening in a storm door disposed in hinged relationship in the outer side of a casing around a door opening containing an inner door disposed in hinged relationship within the casing, said mechanism comprising:

an open inner rectangular frame disposed on the inside surface of the storm door and sealed into the periphery of said opening;

a screen disposed in said inner frame and filling the opening therein;

an open outer rectangular frame disposed on outside surface of the storm door and sealed into said opening, said outer frame having a slot disposed outside the storm door; and

a flap pivotally disposed in said outer frame between the inner frame and said slot, said flap being biased into a normal first vertical position at which said opening and said slot are isolated from each other,, said flap responding to an air pressure differential developed when one of said doors is moved from open to closed position while the other door is in the closed position to momentarily assume a second inclined position at which said opening and said slot communicate with each other and said differential is quickly reduced to zero.

4,048,757

SYSTEM FOR METERING ABRASIVE MATERIALS

James Michael Kubus, Buffalo, N.Y.; Ray Bruce Seese, Conroe, and Bela Lee Watson, San Leon, both of Tex., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,670
Int. Cl.² B24C 3/32
U.S. Cl. 51—436 **3 Claims**

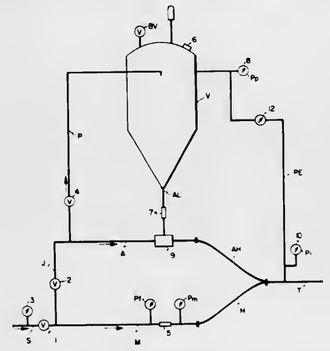
1. A system for metering abrasive material into a flowing gas stream which abrasive laden gas stream is to be used to clean the interior of a pipeline,

a gas supply line communicating with a source of gas and branching into the main gas line communicating with the pipeline to be cleaned and jet gas line; said jet gas line containing a flow control valve and branching downstream of said flow control valve into a pot gas line and an abrasive gas line; said pot gas line communicating with the top of an abrasive vessel and having a valve for controlling the pressure in the top of said abrasive vessel, a mixing chamber located in said abrasive gas line and communicating with the bottom of said abrasive vessel, a metering orifice between said mixing chamber and the bottom of said vessel to assist in the metering of abrasive flow from said vessel; a gas flow orifice located in the main gas line between the source of gas and the pipeline to be cleaned; a pressure indicating line connected from the top of said vessel to a point adjacent the inlet in of said pipeline and containing a pot pressure gage adjacent the top of said vessel and a pipeline pressure gage adjacent the inlet to said pipeline and pressure differential gage therebetween for reading the difference in the dynamic pressure at the pot pressure gage and the inlet pressure gage.

3. Method for metering abrasive materials in a pipeline cleaning process wherein an abrasive laden gas stream is used to clean the interior of said pipeline. comprising

providing a main gas stream from a source of gas to a pipeline to be cleaned;

regulating the flow of siad main gas stream to provide the desired flow rate to be injected with said pipeline;



diverting some gas flow from the main gas stream to a mixing chamber and to the top of a vessel containing abrasive materials to be entrained in a gas stream;

metering said abrasive materials from the bottom of said vessel into said mixing chamber;

entraining said metered abrasive material in said gas flow through said mixing chamber;

controlling the pressure in the top of said vessel until the difference in the pressure in the vessel and the pressures at the pipeline to be cleaned is zero and then

combining the abrasive entrained gas flow with the main gas stream and injecting said combined streams into the pipeline to be cleaned.

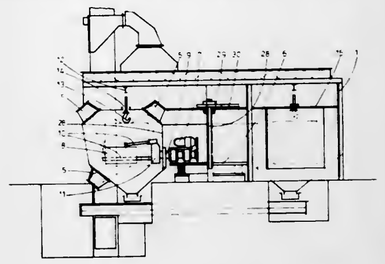
4,048,758

SAND-BLASTING MACHINE FOR CASTINGS

Martin Weis, Ettlingen, and Adolf Scholz, Karlsruhe, both of Germany, assignors to Badische Maschinenfabrik GmbH, Germany

Filed July 14, 1976, Ser. No. 705,244
Claims priority, application Germany, July 23, 1975, 2532837
Int. Cl.² B24C 3/00
U.S. Cl. 51—416 **15 Claims**

1. A machine for blasting castings as workpieces, the machine comprising: a plurality of working stations including one or more blasting stations, said working stations being arranged in a cabin such that the workpieces pass through these stations in succession, wherein at least the part of the cabin for the blasting stations is constructed in arcuate form, a turntable disposed centrally with respect to the arcuate cabin part, workpiece carriers which are capable of rotating about horizontal axes being mounted on said turntable, and extending outwardly from the turntable through the inner boundary wall of the arcuate cabin through a horizontal slot, and an overhead conveyor positioned above the arcuate cabin part which extends



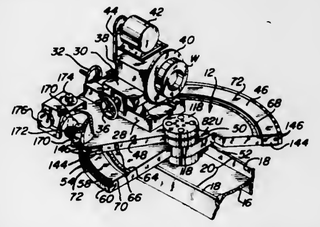
along a corresponding arcuate course and has workpiece reception hooks extending through a slot in the roof of the cabin.

4,048,759

TURNTABLE SUPPORT STRUCTURE FOR RADIUS MILLS AND THE LIKE

Robert H. Christon, 1293 S. Race St., Denver, Colo. 80210

Filed Nov. 10, 1976, Ser. No. 740,413
Int. Cl.² B24B 5/00, 41/02
U.S. Cl. 51—97 R **16 Claims**



1. In a contour grinding machine of the type having an elongated bed, a tool-carrying carriage movable longitudinally of said bed, a horizontally-disposed bedplate resting in fixed position upon said bed in the path of the tool-carrying carriage, a turntable mounted atop the bedplate for relative movement along the surface thereof about a vertical axis, and a second carriage for carrying a workpiece mounted stop the turntable for movement therewith about said vertical axis as well as independent movement relative thereto and to the tool-carrying carriage, the improved turntable support subassembly which comprises: a pair of pads depending from the underside of the turntable in spaced relation to one another and to said vertical axis of turntable movement positioned and adapted to slide along the upturned surface of the bedplate; a pivot pin located at the vertical axis of turntable movement cooperating with the pads to define a three-point turntable support, said pivot pin including a stem portion journalled for rotation in the bedplate about said axis of turntable movement and a ball atop said stem portion having a spherical surface whose center lies on said axis; a bearing-receiving cavity in the underside of the turntable positioned and sized to loosely receive the pivot pin ball; an upper socket bearing segment having the underside thereof shaped to receive the top of the pivot pin ball for limited universal movement; first adjustment means mounting the upper socket bearing segment within said bearing-receiving cavity for vertical adjustment along said axis of turntable movement, said upper socket bearing segment and first adjustment means cooperating with one another upon actuation of the latter to raise and lower the portion of the turntable resting on the pivot pin relative to those portions supported on the pads; a lower socket bearing segment apertured and shaped to loosely receive the stem portion of the pivot pin and journal

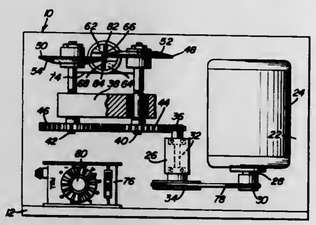
the underside of the pivot pin ball for limited universal movement when placed thereagainst; and, second adjustment means mounted the lower socket bearing segment within said bearing-receiving cavity for independent vertical adjustment along said axis of turntable movement, said second adjustment means being operative upon actuation in a manner to raise the lower bearing segment into contact with the underside of the pivot pin ball to complete the socket therefor and retain said turntable for limited tiltable movement effective to accommodate unevenness in the bedplate surface over which the pads slide.

4,048,760

SCISSORS SHARPENER

Fred R. Gangelhoff, 1691 Lake Ave., Largo, Fla. 33540

Filed July 15, 1976, Ser. No. 705,562
Int. Cl.² B24B 3/52
U.S. Cl. 51—116 **9 Claims**



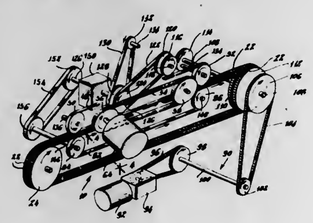
1. Scissors sharpener including a pair of slightly peripherally overlapped and axially spaced grinding members, means journaling said grinding members for rotation about generally parallel axes of rotation, said rotary grinding members including remote axial faces having outer peripheral oppositely bevelled portions, rotary torque input means drivingly connected to said grinding members for driving the latter in opposite directions, means defining oppositely facing bearing surface portions on opposite sides of a first plane normal to said axes and disposed between the overlapped portions of said grinding members, said bearing surface portions being disposed substantially in a second plane containing said axes and lying substantially in a third plane normal to said first and second planes and generally bisecting the peripherally overlapped portions of said grinding members.

4,048,761

PAPER STICK POINTING APPARATUS

Edward D. Cottrell, Cattaraugus, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Filed July 9, 1976, Ser. No. 703,971
Int. Cl.² B24B 3/60, 21/02
U.S. Cl. 51—138 **2 Claims**



1. An apparatus for forming a substantially conical point on a cylindrical workpiece comprising, a combination:

a. endless carrier means for transporting individual ones of said cylindrical work pieces to a pointing station with one end of said work piece projecting beyond a lateral edge of said carrier means, said endless carrier including a pair of chains each chain of said chain pair having a plurality of identical inner and outer links disposed in an overlapping portion relationship forming opposite parallel edges of each said chain, said overlapping chain portions being pivotally connected to each other, each said link being provided with a centrally disposed upright portion, adjacent link upright portions forming a pocket for receiving one of said work pieces therein;

b. hopper means cooperating with said carrier means for supplying individual work pieces to each said carrier means pockets;

c. a pair of endless belts, one of said belt pair being disposed below said work pieces, said pair of endless belts being disposed between said chains of said chain pair, said upper belt having a lower run in contact with said work pieces and said lower belt having an upper run in contact with said work pieces, said upper and lower runs moving in opposite directions for rotating said work pieces; and

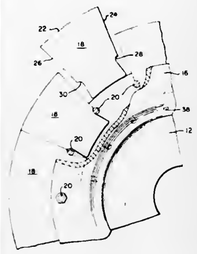
d. abrasive means at said pointing station for contact with the end of said rotating work piece for grinding said end into a conical point.

4,048,762

SEGMENTED GRINDING WHEEL

James G. Bair, Jr., Wexford, Pa., assignor to Fox Grinders, Inc., Pittsburgh, Pa.

Filed Aug. 9, 1976, Ser. No. 712,968
Int. Cl.² B24D 5/06
U.S. Cl. 51—206.5 **1 Claim**



1. A grinding wheel comprising:

a. a cylindrical wheel adapted to be rotated about its axis, the wheel having a peripheral channel of truncated pyramidal cross section formed at the periphery by opposing sides of the wheel and a base;

b. a plurality of bolts passing through the sides of the wheel and traversing the channel intermediate its top and bottom whereby the sides of the channel are held against axial separation, the bolts are spaced apart equally about the wheel;

c. a plurality of uniform grinding segments of generally truncated pyramidal cross section inserted into the channel, each segment having an outer edge which engages a work piece when grinding and a bottom area opposite the outer edge which is inserted within the channel between the sides of the channel, each segment has a pair of opposite side faces, each segment has a pair of opposed side edges with each having a radius in the bottom area, each radius is adjacent to one bolt and a pair of adjacent segments are adjacent to the same bolt;

d. a radially movable wedge at each segment inserted between at least one face of one segment and one side of the channel; and

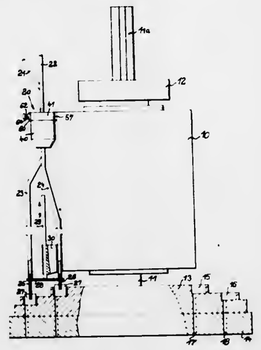
e. means for radially moving said wedge from a locking position engaging the segment between the other side of the channel and the wedge and a release in which the segment is released.

4,048,763

METHOD FOR SURFACE-, PLANE-PARALLEL-, AND PLAIN LAPPING

Jos M. Janssen, Mettmann, Germany, assignor to JMJ Werkzeugmaschinen GmbH fuer Feinbearbeitung, Mettmann, Germany

Division of Ser. No. 605,156, Aug. 15, 1975, Pat. No. 3,978,621.
This application Feb. 19, 1976, Ser. No. 659,578
Claims priority, application Germany, Aug. 27, 1974, 2440978
Int. Cl.² B24B 1/00
U.S. Cl. 51—281 SF **5 Claims**



1. A method for surface lapping, plane-parallel lapping and plain lapping of workpieces with a lapping abrasive, comprising the steps of

feeding a definite quantity of a lapping abrasive on a work piece in at least two radially spaced apart and operatively separated circular paths on the work piece which paths, respectively, are concentric to one another and have different diameters,

feeding the lapping abrasive separately in different dosed quantities in each of said at least two paths, respectively, and

machining said work piece with said lapping abrasive in said at least two radially spaced apart and operatively separated paths and in said differently dosed quantities, respectively, into a surface finished, plane-parallel finished and plain finished work piece, respectively.

4,048,764

METHOD FOR MICRO-FINISH MACHINING OF COMPOUND, CIRCULAR ARC-SHAPED PROFILED SURFACES IN ANNULAR WORKPIECES

H. Günter Schmitz, Wermelskirchen, Germany, assignor to Supfina Maschinenfabrik Hentzen KG, Remscheid, Germany

Division of Ser. No. 493,467, July 31, 1974, Pat. No. 3,959,928.
This application Mar. 12, 1976, Ser. No. 666,408
Claims priority, application Germany, Aug. 6, 1973, 2339726
Int. Cl.² B24B 1/00
U.S. Cl. 51—291 **5 Claims**

1. In a method for micro-finish machining of circular arc-shaped profiled surface in annular workpieces in two phases utilizing an apparatus including: means, mounting the workpiece to the apparatus; a honing tool; means mounting the honing tool for pivotal movement about an axis, which is perpendicular to the longitudinal axis of the mounted workpiece; means for displacing the honing tool mounting means and consequently the honing tool in a direction parallel to the longitudinal axis of the mounted workpiece; means for pressing the honing tool against the profiled surface to be machined, the improvement in the method comprising the steps of:

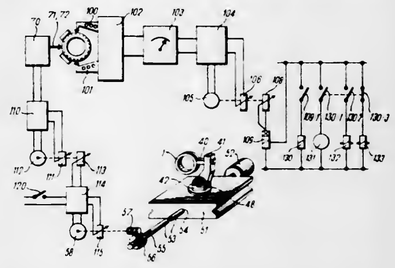
a. engaging the workpiece prior to mounting the same to the workpiece mounting means with measuring instruments and measuring;

aa. the location of a plane containing a point of predetermined position within the profiled surface with respect to a reference plane;

bb. the diameter of the annular workpiece;

b. actuating the means for displacing the honing tool mounting means after the workpiece measured in step (a) has been mounted to the workpiece mounting means for displacing the honing tool mounting means and consequently the honing tool in the parallel direction as a function of the measurement made in step (aa) so that the position of the pivotal axis defined by the honing tool mounting means corresponds to the distance of the plane containing the point of predetermined position from the reference plane;

c. applying the honing tool to the workpiece by actuating the tool pressing means over a time period, which is determined as a function of the measurement made in step (bb) so that the reduction of the diameter of the workpiece by honing depends on the diameter measured before the honing operation in order to compensate for variations of diameter to reduce their tolerances.

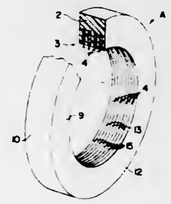


4,048,765

NON-CELLULAR POLYURETHANE WHEEL IN A PROCESS FOR FINISHING A METAL WORKPIECE

Ivar J. Samuelson, Fairview Park, Ohio, assignor to The Manufacturers Brush Company, Cleveland, Ohio

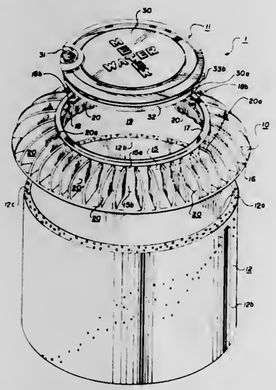
Continuation-in-part of Ser. No. 465,843, May 1, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,539
Int. Cl.² B24B 1/00, 37/02
U.S. Cl. 51—328 **6 Claims**



1. A process for finishing a metal workpiece without significant stock removal comprising rotating the workpiece about its axis while contacting the external surface thereof with the external peripheral surface of a circular finishing wheel having a peripheral speed from about 5000 to about 9000 surface feet per minute, characterized in that said finishing wheel comprises a dense molded non-cellular annular matrix having a

circumferential reinforcing means, the radially outer portion of said matrix being deformable and being formed of a cured solid elastomeric polyurethane composition having a no-grain Shore A durometer hardness from about 30 to about 55 and a tensile strength of at least 4000 pounds per square inch and being capable of being elongated several hundred percent, said composition comprising a solid linear polyurethane which is the reaction product of a long-chain polyol having terminal hydroxyl groups and a molecular weight of at least 500 and an organic polyisocyanate having 2 to 3 functional isocyanato groups, said composition containing, per 100 parts by weight of said polyurethane, at least 50 parts by weight of finely divided abrasive refractory grains.

4,048,766
CLOSURE LID ASSEMBLY FOR PROTECTIVE HOUSINGS
Peter H. Dantzer, Richardson, and Charles L. Tatay, Dallas, both of Tex., assignors to Intercontinental Plastics Mfg. Co., Dallas, Tex.
Filed Sept. 4, 1975, Ser. No. 610,266
Int. Cl.² E02D *29/10*
U.S. Cl. 52—19 **1 Claim**

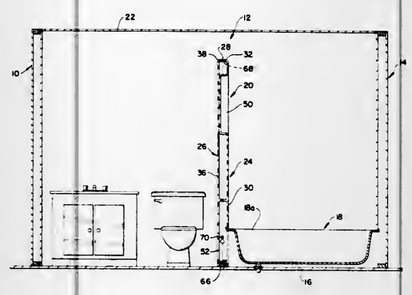


1. A two part closure assembly for closing off the surface access opening to a plurality of cylindrically shaped housings having peripheral walls of respectively different radii, the housings being of the type disposed around, and employed to protect, underground installations, said two part closure assembly comprising:

a. a closure support means of synthetic polymeric material construction and adapted for removable, but non-translatable, coupling with each of said cylindrically shaped housings, said closure support means comprising a circular, laterally extending base portion; an annular side wall integrally joined with, and inclined with respect to, said base portion; an annular ring portion integrally joined with said side wall and having a flange vertically recessed therefrom to define a support ledge, said annular side wall and ring portion displaced inwardly from the outer periphery of said base portion; a plurality of arcuately shaped ribs circumferentially disposed around the base portion and integrally formed with said base portion, side wall and ring portion; said ribs continuously extending from a location outside of, to a location inside, said annular side wall; a plurality of sets of circumferentially disposed lugs extending from the bottom surface of said base portion, each of said sets located at respectivey different radii along said base portion and corresponding to the radii of the peripheral walls of said cylindrically shaped housings, each of said lugs having surfaces adapted for non-translatable engagement with the peripheral wall of said housings; and a plurality of curcumferentially spaced notches in said flange; and

b. closure means of synthetic polymeric material removably coupled with said closure support means and closing off said surface access opening, said closure means supported by said support ledge and comprising projection means retainably received within one of said spaced notches.

4,048,767
BATHROOM PARTITIONS
Joseph Ferich, 10917 St. Mark, Cleveland, Ohio 44111
Filed Apr. 21, 1976, Ser. No. 679,013
Int. Cl.² A47K *3/16*
U.S. Cl. 52—35 **8 Claims**



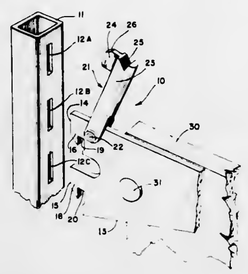
1. A preformed generally rectangular bathroom partition of plastic sheet material mountable on prepositioned L-shaped support member means comprising, spaced apart parallel front and rear panels having top edges, bottom edges, outer side edges and inner side edges, wall means interconnecting and closing said panels along said top and outer side edges, said panels having opposed inner surfaces, said inner surfaces being spaced apart along said bottom and inner side edges to receive said support member means therebetween, mounting means on the inner surfaces of said panels for attaching said partition to said support members, said mounting means including a first mounting strip connecting said inner surfaces of said panels and extending from said wall means along said outer side edges toward said inner side edges and a second mounting strip connecting said inner surfaces of said panels and extending from said wall means along said top edges toward said bottom edges, said second mounting strip having key slot openings therethrough, said rear panel having an access opening therethrough, and reinforcing means between the inner surfaces of said panels inwardly of said wall means and said first and second mounting strips.

4,048,768
DEVICE FOR LOCKABLY SECURING APPURTENANCES TO A DECORATIVE WALL
Wayne W. Good, Sturgis, Mich., assignor to Harter Corporation, Sturgis, Mich.
Filed Sept. 30, 1976, Ser. No. 728,432
Int. Cl.² E04B *1/00*; A47B *5/60*
U.S. Cl. 52—36 **5 Claims**

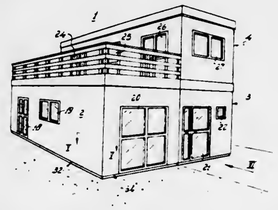
1. A device for lockably securing an appurtenance to a decoratable wall, the wall having at least one decoratable panel, and at least one spline with a plurality of slots therein, and a frame supporting the panel and splines, comprising:

bracket means to which the appurtenance may be attached having at least one hook member for removable insertion into a first slot in a spline, and

locking means mounted on said bracket means and movable with respect thereto into engagement with a second slot of the same spline, for preventing disengagement of said hook member from said spline while said locking means is engaged with said second slot.

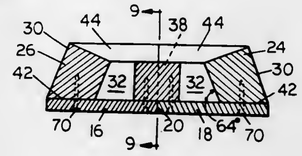


4,048,769
BUILDINGS FORMED BY ONE OR MORE PREFABRICATED BUILDING SECTIONS, AND METHOD OF MANUFACTURING PREFABRICATED BUILDING SECTIONS
Cornelis van der Lely, 7, Bruschenrain, Zug, and Hendricus Jacobus Cornelis Nieuwenhoven, Hirssattelweg, 6340 Baar, both of Switzerland
Continuation of Ser. No. 439,591, Feb. 4, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 643,002
Claims priority, application Netherlands, Feb. 9, 1973, 7301828
Int. Cl.² E04H *1/12*
U.S. Cl. 52—79.7 **36 Claims**



1. A building comprising a plurality of prefabricated box-shaped sections, each said section having a framework of horizontally and vertically disposed metal beams whereby the walls of said sections each have a framework of horizontally and vertically disposed metal beams at the periphery thereof, at least one of said walls composed of cast material and having a substantially rectangular opening, at least three sides of said opening defined by said cast material, stiffening bars which are entirely encased in said cast material of said one wall, each of said stiffening bars being inclined relative to but not touching and spaced from both said vertically and horizontally disposed beams of said one wall, each corner of said opening having proximate thereto a portion of one of said inclined stiffening bars, said stiffening bar portion proximate each corner of the circumference of said opening being spaced therefrom within said cast material so as not to touch its respective said corner.

4,048,770
BUILDING STRUCTURE
Alexander J. McKenzie, III, Box 704, Wolfeboro, N.H. 03894
Filed Feb. 11, 1976, Ser. No. 657,165
Int. Cl.² E04B *1/32*
U.S. Cl. 52—81 **7 Claims**



1. A panel for use with other identical panels in erecting a space enclosing structure in the form of a partial icosahedron, said panel comprised of six elements, said elements being two sheets of plywood each in the form of a right triangle whose hypotenuse is equal to twice the base and positioned to abut along their altitudes to form a two part equilateral triangular panel,

an equilateral triangular frame for supporting said panel, said frame comprising three identical elongated braces, each brace being the length of said hypotenuse and shaped as follows: each brace is four sided in cross section with a first side adapted to rest on an edge area of said panel, second and third parallel sides extending inwardly of said panel and away from the edges of said first side at an angle of approximately 69° and a fourth side at right angles to said parallel sides and at an angle to said first side of approximately 21°,

each brace cut at both ends at 30° to the long axis and at right angles to said first side to form two faces each trapezoidal in shape,

the six faces of said three braces being placed in face to face abutting pairs, and connected together to form a rigid equilateral triangular frame with said first sides lying in a common plane,

said frame mounted on said panel with said first sides in engagement with the edge areas of said panel and the said three pairs of abutting faces bisecting the three apexes of said panel,

said frame being securely affixed to said panel, and

a single nailing strip rectangular in cross section and overlapping and abutting altitude edges of said sheets, said nailing strip cut at one end to form two diverging equal sized parallelograms whose bottom and top edges are at 60° to each other and at 30° to the longitudinal axis of said strip, and the faces of said parallelograms are at 69° to the bottom of said strip,

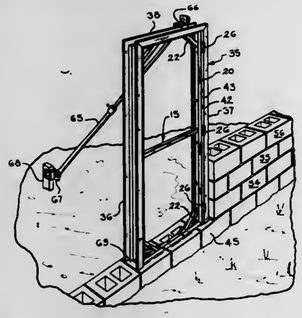
said faces abutting the inner sides of said braces immediately adjacent the inner edges of that pair of abutting trapezoidal faces that are aligned with said abutting altitude edges of said sheets,

said nailing strip extending along said abutting edges to a position at which its other end, which is cut crosswise at 69° to its bottom, is in engagement with the inner side of the opposite brace at its mid-point, and the abutting edges of said sheets being securely affixed to said nailing strip.

4,048,771
DOOR FRAMING FIXTURE AND METHOD
Mark K. Thistlethwaite, Toledo, Ohio, assignor to The Vicon Supply Company, Toledo, Ohio
Filed May 14, 1976, Ser. No. 686,308
Int. Cl.² E04G *23/00*
U.S. Cl. 52—127 **14 Claims**

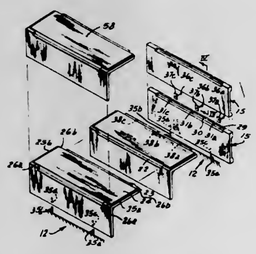
1. A door framing-fixture for use with a metallic frame having two opposed jambs and a connecting header, said door framing-fixture comprising a top member, a bottom member,

and a pair of opposed side members, said members being connected together to form an integral rectangular fixture complementary with the interior of such metallic frame, said integral rectangular fixture having an exterior periphery, wherein such periphery defines the desired interior alignment of the metallic



frame, brace members adjacent said bottom member extending rearwardly for connection to such metallic frame, said brace members being fixed to said bottom member, and a cross member extending between said opposed side members and being integrally attached to said side members.

4,048,772
MODULAR CRYPT SYSTEM
Michael F. Gaul, 2800 N. Lakeshore Drive, Chicago, Ill. 60657
Filed Apr. 5, 1976, Ser. No. 673,731
Int. Cl.² E04H *13/00*
U.S. Cl. 52—136 **7 Claims**



1. A modular crypt system adapted to provide the main structure support for a building, comprising:

a plurality of laterally adjacent inverted L-shaped modules, each module having a substantially planar load-bearing horizontal leg joined to a substantially planar load-bearing vertical leg at a respective first end of such legs so as to define a corner,

said module having a web-like reinforcement portion joined with said legs between inside adjacent surfaces of said legs,

said module having a notch portion position at an upper outer edge of said first end of the vertical leg, said notch portion being substantially aligned above said vertical leg and terminating at said first end of the horizontal leg;

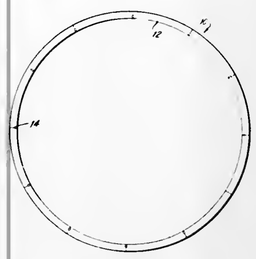
a second end of the horizontal leg of one of said plurality of modules having a tongue portion extending therefrom, said tongue portion having an upper support surface located below an upper planar surface of said horizontal leg, said tongue portion being received and supported by a notch portion of a laterally adjacent module; and

at least one substantially vertical column-shaped load-bearing end member having a notch portion at an upper inner edge of a top end thereof,

said end member notch portion being substantially aligned above a main body portion of said end member and terminating at an outer upper edge thereof,

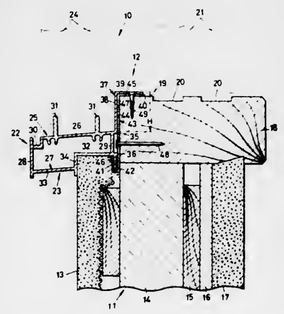
said end member being positioned laterally adjacent an end module of said plurality of laterally adjacent modules so that said end member notch portion receives and supports a second end of the horizontal leg of said end module.

4,048,773
ABOVE-GROUND POOL WALLS, PANELS THEREFOR, AND PANEL-MANUFACTURING METHODS
Merrill L. Laven, 4 Marion Ave., Albany, N.Y. 12203
Continuation-in-part of Ser. No. 428,882, Dec. 27, 1973, Pat. No. 3,938,199. This application Feb. 9, 1976, Ser. No. 656,594
Int. Cl.² E04H *3/16*
U.S. Cl. 52—169.7 **13 Claims**



1. In an above-ground pool, a plurality of upright adjoining wall panels situated in end-to-end relation along a predetermined enless path so that said panels surround a given space in which water for the pool can be situated, an upright rod situated between each pair of adjoining panels, each panel having a pair of opposed end regions and each panel having at each end edge region thereof a plurality of substantially rigid fastener portions distributed along each end edge region of each panel, said fastener portions at each end edge region of each panel including a plurality of inner fastener portions and a plurality of outer fastener portions respectively alternating in elevation with said inner fastener portions, said outer fastener portions respectively having inwardly directed surfaces directed inwardly toward said space and respectively formed with aligned grooves receiving part of a rod and said inner fastener portions respectively having outwardly directed surfaces directed away from said space and respectively formed with aligned grooves also receiving part of said rod, so that said rod can be situated in and removed from said grooves of said fastener portions at each end edge region of each panel only by being moved substantially vertically with respect to an upright panel, and the inner and outer fastener portions at an end region of one panel being situated respectively at the same elevations as outer and inner fastener portions at an adjoining end edge region of the next panel with all of the inner fastener portions at adjoining end edge regions of a pair of adjoining panels being interdigitated and all of the outer fastener portions at adjoining end edge regions of a pair of adjoining panels being interdigitated, so that by way of said rods said plurality of panels are held together to form a pool wall, said panels respectively having inner surfaces directed inwardly toward said space, and all of said inner fastener portions at each end edge region of each panel having inwardly directed surfaces respectively forming continuations of said inner surface of each panel, and the inner fastener portions at an end edge region of one panel being situated respectively between and respectively substantially filling the gaps between the inner fastener portions at an adjoining end edge region of the next panel with the inwardly directed surfaces of the inner fastener portions of adjoining end edge regions of a pair of successive panels forming a substantially continuous surface which forms a continuation of the inner surfaces of the adjoining panels so that all of said wall panels cooperate to form a substantially continuous inner wall surface for the pool, each wall panel being formed in its entirety of a single body of plastic material so that the entire pool wall consists only of said single bodies of plastic material which respectively form said panels and said rods, each panel having at its fastener portions a thickness greater than at the remainder of each wall panel, said outwardly directed surfaces of said inner portions being situated outwardly beyond an outer surface of each panel extending between said fastener portions thereof at each end region of each panel and said outer fastener portions also having outwardly directed surfaces situated outwardly beyond said outer surface of each panel extending between said fastener portions thereof at each end region of said panel, and said greater thickness of said fastener portions being provided only by the location of said outwardly directed surfaces of all of said fastener portions outwardly beyond said outer surface of each panel so that said inwardly directed surfaces of all of said inner fastener portions do not extend inwardly beyond the remainder of the inner surface of each panel and thus do not alter the continuity of said substantially continuous inner wall surface.

4,048,774
EXTERIOR WINDOW UNIT HAVING ADAPTER SILL MEMBER
Yukio Yamamoto, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 10, 1976, Ser. No. 684,888
Claims priority, application Japan, May 17, 1975, 50-66255
Int. Cl.² E06B *3/26*
U.S. Cl. 52—202 **5 Claims**



1. An exterior window unit for covering an opening in a building wall, the opening having a first sill, said exterior window unit comprising:

a. a frame having a second sill;

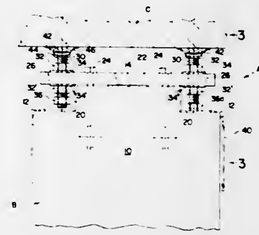
b. a pair of sashes mounted within said frame in parallel closely spaced planes;

c. an adapter sill member for extending along the length of the first sill, said member having a vertical section adapted to be secured flatwise against an exterior vertical surface of the first sill, and a horizontal section extending inwardly from said vertical section at the upper edge thereof and adapted to be secured flatwise against a horizontal top surface of the first sill, said adapter sill member having a marginal portion extending along its lower edge as a channel of upwardly opening U-shaped cross-section facing away from the first sill;

d. a first mounting means on said second sill having a vertical portion and a horizontal portion for being secured respectively to said vertical and said horizontal sections of said adapter sill member, said horizontal portion overlying said horizontal section for being secured directly to said first sill; and

e. a second mounting means on said second sill having an engaging means received in said channel.

4,048,775
ANCHOR ASSEMBLY FOR PILASTERS
Harold J. Dielman, Cleveland, Ohio, assignor to The Sanymetal Products Co., Inc., Cleveland, Ohio
Filed Oct. 22, 1975, Ser. No. 624,588
Int. Cl.² E04H *1/00;* E02D *27/00*
U.S. Cl. 52—239 **3 Claims**



1. A pilaster anchor for mounting a pilaster on stud bolts which extend from an existing structure and which have a remote end portion disposed away from said existing structure comprising a pilaster end surface having stepped portions and an intermediate non-stepped portion;

a footer bar on said non-stepped portion of said pilaster extending over said stepped portions of said pilaster and having stud bolt holes located therein;

mounting means for securing said footer bar to said non-stepped portion;

said stud bolts passing through said stud bolts holes on said footer bar and having:

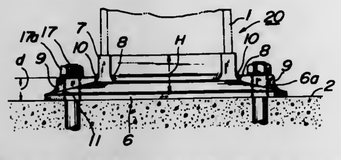
a first pair of adjustment nuts on said stud bolts to bear against a first side of said footer bar and be opposite a second side of said footer bar, said second side being spaced from said stepper portions of said pilaster; a second pair of adjustment nuts on said stud bolts to bear against said second side of said footer bar, and a pair of stabilizer nuts on said remote end of said stud bolts, said stud bolts extending to regions adjacent said pilaster end surface on said stepped portions, whereby, when said stabilizer nuts are in pressure contact with said pilaster end surface, a thrust is applied against said pilaster end surface by said stabilizer nuts and against said second side of said footer bar by said second pair of adjustmant nuts while said first pair of adjustment nuts acts against said first side of said footer bar.

4,048,776
STEEL COLUMN BASE MEMBER
Kuniaki Sato, Hiratsuka, Japan, assignor to Kajima Corporation, Tokyo, Japan
Filed Aug. 2, 1973, Ser. No. 385,166
Claims priority, application Japan, Aug. 21, 1972, 47.82799; Aug. 21, 1972, 47.82800
Int. Cl.² E04H *12/22;* E04C *3/02*
U.S. Cl. 52—297 **6 Claims**

1. A steel column base member for connecting a steel column member to a concrete foundation said member having a unitary body and comprising:

a substantially planar bottom plate portion engageable with said concrete foundation;

a projection extending from said bottom plate portion
said projection having a top surface whose shape is substantially identical to the cross-sectional shape of the steel column member; said portion designed to support said column member
a sloped top surface connecting a bottom of said projection to said bottom plate portion to increase the thickness thereof as the planar bottom plate portion extends toward the bottom of said projection;



smoothly curved surface portions at junctions between the projection and the sloped top surface;
J-shaped welding grooves along edges of said top surface which face outer vertical parts of the steel column members;
abutments formed on the planar bottom portion and having anchor bolt holes bored therethrough and smoothly curved surface portions at the junctions between the abutments and the planar bottom portions.

4,048,777

BUILDING DECK STRUCTURE

Frank E. Carroll, Barrington, Ill., assignor to Carroll Research, Inc., Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 457,996, April 4, 1974, Pat. No. 3,965,641. This application Jan. 12, 1976, Ser. No. 648,500
Int. Cl.² E04C *1/00, 3/04;* E04B *5/10*
U.S. Cl. 52—309.12 **11 Claims**

1. A building deck structure comprising:
a spaced series of parallel sheet metal structural shapes which are symmetrical about a bisecting plane through a central web having a central web, two diagonal legs projecting downwardly from one end of said web forming an included angle of about 30° to about 90° between said legs and having its vertex at the bottom of the web, said diagonal legs having a vertical height of about 1¼ to about 10 inches, each diagonal leg having a leg projecting downward at its extremity in a plane substantially parallel to said web, said legs being substantially parallel, each of said parallel legs having flanges extending outwardly at their extremity, a closure side extending between the extremities of said flanges enclosing the area formed by said diagonal sides, said parallel sides and said closure side, and a stiffening member at the other end of said web; and
decking assembly having its lower surface resting on said flanges and extending between adjacent structural shapes.

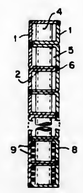
4,048,778

SHEETING-PLATE FOR TRENCH SHEETING

Josef Krings, Hans-Bockler-Strasse 23, D 5138 Heinsberg - Oberbruch, Germany

Filed Oct. 28, 1975, Ser. No. 626,057
Claims priority, application Germany, Jan. 2, 1975, 7500036[U]
Int. Cl.² E04C *2/34;* E21D *5/00*
U.S. Cl. 52—615 **7 Claims**

1. A new article of manufacture in the form of a sheeting-plate for trench sheeting of the type comprising first and second upstanding cover plates, spacers extending between said cover plates and maintaining said cover plates in spaced generally parallel relation, and reinforcing members extending vertically between said cover plates and transversely through said spacers, said sheeting-plate being improved by at least one of said cover plates being folded out of the plane thereof to form a plurality of laterally extending webs, said webs forming said spacers with said webs being horizontally disposed, and securing means securing said webs to an inner surface of the other of said cover plates, said webs being of a width equal to the spacing between said cover plates, said webs including portions of said one cover plate reversely folded upon themselves



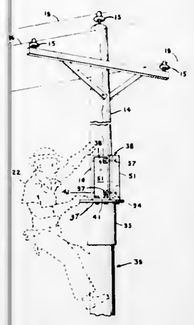
and including a reverse fold opposing said other cover plate, said securing means being in the form of seam welding joining said folded edge to said other cover plate, and said webs have aligned recesses receiving said reinforcing members, said webs being formed on both of said cover plates and being generally arranged in alternating parallel relation.

4,048,779

TURNBUCKLE CONNECTOR USEABLE IN A METHOD FOR REPLACING AN EXISTING UTILITY POLE WITHOUT DISTURBING HARDWARE MOUNTED THEREON

Frank P. Valenziano, Summit, and Daniel E. Olivier, Bedminster, both of N.J., assignors to Interpace Corporation, Parsippany, N.J.

Continuation-in-part of Ser. No. 606,073, Aug. 20, 1975, which is a continuation-in-part of Ser. No. 511,173, Oct. 2, 1974, Pat. No. 3,911,548. This application May 3, 1976, Ser. No. 682,758
Int. Cl.² E04C *3/30;* E02D *35/00*
U.S. Cl. 52—726 **8 Claims**



1. A turnbuckle connector useable in a method for replacing an existing utility pole, said existing pole comprising a proximal section having a bottom end attached to the earth and a distal section having hardware mounted thereon, without disturbing the hardware, said method comprising the steps of severing the distal section from the proximal section, thereby providing the distal section with a lower end,
temporarily supporting the severed distal section,
removing the proximal section,
providing a new pole section having an upper end,
attaching the new pole section to the earth in position to replace this existing proximal section in end-abutting relation to said distal section, and
connecting the distal section to the new proximal section in end-abutting relation;
said turnbuckle connector comprising:

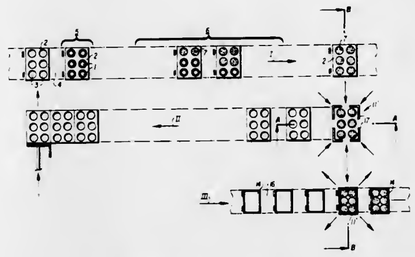
an end-embracing unit adapted to surround and grip a portion of a first pole section to be joined in end-abutting relation to a second pole section, adjacent the end of said first pole section to be so joined, said end-embracing unit being provided with a first radially-projecting flange adjacent said end to be joined,
a second radially-projecting flange secured in fixed relationship to said second pole section adjacent the end thereof to be joined to said first pole section, and
means for rigidly securing said first radially-projecting flange to said second radially-projecting flange;
said end-embracing unit comprising a plurality of girdle plates, each of said girdle plates having a radially-projecting flange portion, said flange portions cooperating to form said first radially-projecting flange,
said end-embracing unit further comprising at least one turnbuckle adapted to secure said girdle plates in clamping circumferential disposition with respect to said first pole section.

4,048,780

METHOD AND APPARATUS FOR PLACING OBJECTS INTO BOXES

Alexis Chenevard, Morges, Switzerland, assignor to SAPAL Societe Anonyme des Plieuses Automatiques, Switzerland

Filed Aug. 30, 1976, Ser. No. 718,563
Claims priority, application Switzerland, Oct. 27, 1975, 13901/75
Int. Cl.² B65B *5/08, 35/38*
U.S. Cl. 53—26 **11 Claims**



1. A method of placing sets of objects, such as assortments of chocolates, in boxes, comprising disposing a set of objects in a template, conveying the objects disposed in the template to a table, holding the objects on the table by suction, removing the template, bringing mobile walls about the objects held on the table, moving the walls against the objects to bring the objects together into an area corresponding to an inner space of a box which is to receive the objects, gripping and conveying the thus assembled set of objects and depositing the set of objects in the box.

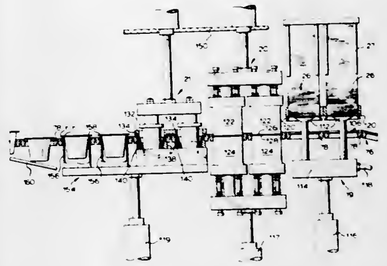
4,048,781

PROCESS FOR THE PRODUCTION OF A PRODUCT FILLED CONTAINER

Poul Egon Johansen, West Hill, Canada, assignor to Portion Packaging Limited, Rexdale, Canada

Division of Ser. No. 543,977, Jan. 24, 1975, Pat. No. 3,964,237, which is a continuation-in-part of Ser. No. 357,785, May 7, 1973, abandoned. This application Jan. 22, 1976, Ser. No. 651,257
Int. Cl.² B65B *3/02*
U.S. Cl. 53—30 R **9 Claims**

1. A process of forming an individual rimmed plastic container preparatory to the filling and closing thereof from a relatively stiff resilient blank formed entirely of heat formable material which is essentially rigid at normal ambient temperatures, comprising the steps of fixing the peripheral portion of the blank while leaving the major central portion thereof unsupported, heating said main central portion out to said fixed peripheral portion to a formable temperature while leaving said fixed peripheral portion at a temperature at which it remains rigid to constitute a rigid rim portion and, while holding a heated portion of the blank immediately adjacent to said fixed peripheral portion substantially in the plane of said fixed peripheral portion, forming said heated main central portion into a cavity of substantial depth, said heated portion immediately adjacent to said fixed peripheral portion constituting a reservoir of formable material from which material is necked down into the cavity to preclude any discontinuity occurring between said fixed peripheral portion and the cavity wall during the cavity forming operation.

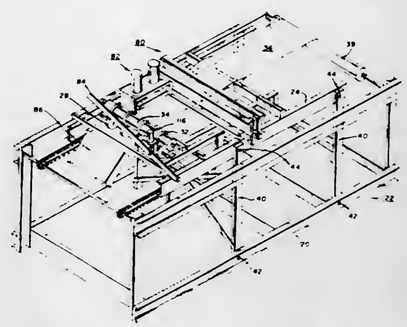


4,048,782

CONTROLLED FILM ADVANCE APPARATUS

Joel A. Hamilton, 101 Hardenburgh Ave., Demarest, N.J. 07627

Filed Oct. 4, 1976, Ser. No. 729,303
Int. Cl.² B65B *41/18*
U.S. Cl. 53—51 **19 Claims**



1. A film advancing apparatus for supplied film which is to be sealed, shaped, cut, laminated and the like during and with an intermittent advance, said apparatus including: (a) a fixed frame; (b) means for removably supporting at least one supply roll of film carried by this fixed frame; (c) a movable frame carried by the fixed frame so as to be cycled in a back and forth determined path and pattern; (d) a film feed roller carried by a shaft mounted on and movable with the movable frame and adapted to receive the film from the supply roll; (e) a one-way clutch carried by the film feed roller shaft, said clutch arranged so as to permit the film feeding roller and shaft to be turned only in a direction to move the film toward the discharge end of the apparatus; (f) a toothed member carried by the shaft carrying the film feed roller and one-way clutch; (g) a flexible drive means having one end operatively attached to the fixed

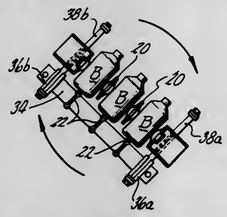
frame and the other to a take-up means adapted to maintain the flexible drive means in a taut condition and in a driving engagement with the toothed member as the movable frame is cycled back and forth; (h) an adjusting means for selectively changing the effective length of the flexible drive means in that extent of length between the end operatively fixed to the frame and the toothed member, said extent being changed in response to a signal which is actuated in response to the comparing of the actual advance of the film in relation to the desired advance of the film; (i) a pressure roller disposed to push the film being fed from the supply roll to the film feeding roller and to hold this supply film therebetween so that only a forward rotation of the film feeding roller occurs and the film is advanced therebetween and, (j) motive means for cycling the movable frame back and forth in a determined path and extent whereby the movable frame is moved from the head end and toward the discharge end of the apparatus and the film between the pressure roller and film feed roller is prevented from moving by the one-way clutch action on the feeding roller shaft and during the return stroke of the movable frame toward the head end the toothed member on the film feeding roller shaft is driven by the engaged flexible drive means to rotate the shaft and the film feeding roller to feed that film gripped between these rollers to that extent as determined by the relative rotation of the toothed member and the relative diameter of the film feeding roller.

4,048,783

CASE LOADER WITH INVERT GRID AND PUSHDOWN FEATURE

John L. Raudat, Madison, and Lloyd D. Johnson, Portland, both of Conn., assignors to Emhart Industries, Inc., Hartford, Conn.

Filed Nov. 19, 1976, Ser. No. 743,341
Int. Cl.² B65B *57/10, 35/56*
U.S. Cl. 53—61 **24 Claims**



1. Apparatus for loading groups of articles into open packing cases, comprising an infeed conveyor for advancing the articles in a plurality of lanes, lane defining grid means for receiving a charge of articles when in a first position adjacent the downstream end of said infeed conveyor, said grid means including means for holding the charge of articles in said lane defining grid means, means for rotating said grid means from said first position to an article discharge or second position, rails associated with the lanes of said grid means for engaging the bottoms of the articles in said grid means when said grid means in said first position, and means for moving said rails at least when said grid means is in its second position to push the articles out of said grid means and into a packing case.

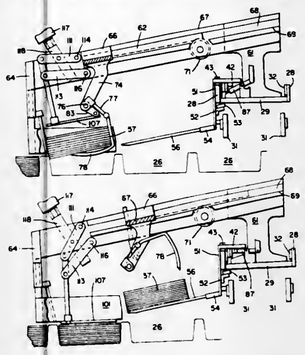
4,048,784

LOADER FOR SLICED COMESTIBLE PRODUCT

Max Edward Toby, 2265 Ocean Ave., San Francisco, Calif. 94127

Division of Ser. No. 552,851, Feb. 25, 1975, Pat. No. 3,991,685.
This application July 23, 1976, Ser. No. 708,136
Int. Cl.² B65B *5/06*
U.S. Cl. 53—77 **2 Claims**

1. In a device for transferring an article from a holding station to a loading station and for loading the article into a container, including loader transfer means extending to and above the container for supporting and translating the article thereto, support means for supporting the article adjacent to the opening of the container, and plunger means for pushing said article into the container, said holding station including a first plurality of spaced tines for supporting said article; the improvement wherein said loader transfer means includes track means extending from said holding station to the container and a loader carriage translatably supported on said track means, said loader carriage including a loader pusher



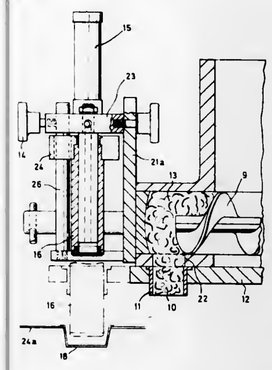
joined thereto by a pivot shaft, first means for selectively rotating said loader pusher about said shaft either to clear or engage said holding station; said loader pusher including a second plurality of spaced, parallel tines disposed to interdigitate with said first plurality of tines, with said loader pusher in the engaged position, and support and remove the article from the holding station; and means for reciprocally translating said loader carrige to deliver said article to said support means, and return.

4,048,785

APPARATUS FOR DEPOSITING FIBROUS MATERIAL INTO CONTAINERS

Edward James Wright, Peterborough, England, assignor to Baker Perkins Holdings Limited, Peterborough, England

Filed July 19, 1976, Ser. No. 706,701
Int. Cl.² B65B *63/02*
U.S. Cl. 53—122 **1 Claim**



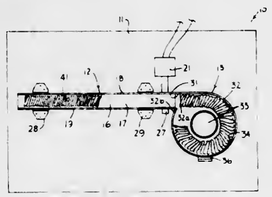
1. Apparatus for depositing a predetermined amount of material such as meat into a container comprising a housing having a discharge opening in one side thereof, extrusion means in said housing for extruding a predetermined portion of material from a mass of material in said housing through said opening, slide means mounted for sliding movement across said one side of said housing between a receiving position and an ejecting position, an open ended tubular receiver mounted on said slide means to be located with one end of said receiver in sealed registry with said opening when said slide means is in said receiving position to receive said portion of material from said container means, both open ends of said receiver being exposed when said slide means is in said ejecting position, and reciprocal piston means aligned with said receiver when said slide means is in said ejecting position and movable from a retracted position spaced from one end of said receiver entirely through said receiver to a location spaced a preselected distance beyond the opposite end of said receiver to eject said portion of material from said receiver into the container, and means for adjusting the length of stroke of said piston means to establish said preselected distance.

4,048,786

CIRCULAR PACKAGE LOADER

William A. Brastad, Minneapolis, and Nelson J. Beall, St. Michael, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Sept. 25, 1975, Ser. No. 616,749
Int. Cl.² B65B *5/06, 25/00, 35/22, 67/02*
U.S. Cl. 53—159 **6 Claims**



1. Apparatus for loading a column of snack chips into a container as a loop array, said apparatus comprising:
reservoir means;
means for feeding a column of nested, uniformly shaped chips into said reservoir means, said reservoir means including means for holding said nested chips in a loop array;
means for transferring said loop array of nested chips from said reservoir means into a container while maintaining said chips in said loop array;
said reservoir means including means for assisting in movement of said column into a loop array orientation as said nested chips are fed into said reservoir means, said assisting means including an arcuate reservoir side wall.

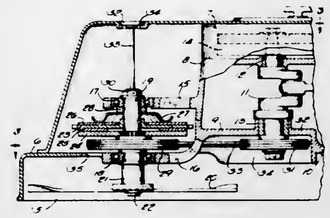
4,048,787

COMBINATION CLUTCH AND BRAKE FOR ROTARY POWER MOWER

Joseph R. Harkness, Germantown, and Daniel E. Braun, Brookfield, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed July 1, 1976, Ser. No. 701,619
Int. Cl.² A01D *69/10*
U.S. Cl. 56—11.3 **11 Claims**

1. In a rotary power lawn mower having a chassis with a substantially horizontal deck, a prime mover on the deck, and a rotary blade fixed to a spindle that is drivingly connected with the drive shaft of the prime mover,
the improvement whereby rotation of the blade can be abruptly stopped concomitantly with disconnection thereof from the drive shaft of the prime mover,
said improvement comprising the combination of:
A. bearing means fixed with respect to the deck of the chassis and the prime mover, with the axis thereof vertical and spaced laterally from the drive shaft;
B. a spindle journaled in said bearing means with the lower portion thereof beneath the deck and having the blade fixed thereto;
C. a disengageable clutch through which the spindle is drivingly connectable with the drive shaft
D. a brake for stopping rotation of the spindle, comprising
1. frictionally engaged complementary fixed and free brake elements encircling the spindle, the fixed brake element having a torque transmitting connection with the spindle and the free brake element having no torque transmitting connection with the spindle except



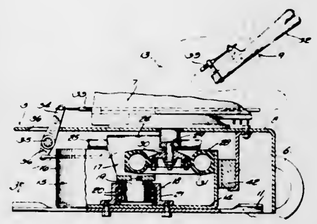
through its frictional engagement with the fixed brake element, and
2. brake applying means operable to abruptly stop rotation of the free brake element;
D. means interconnecting said brake applying means and said disengageable clutch, whereby application of the brake is concomitantly accompanied by disengagement of the clutch and vice versa; and
E. control means operatively connected with said interconnecting means and through which concomitant functioning of said brake and clutch may be manually controlled.

4,048,788

ROTARY POWER MOWER WITH IMPROVED CLUTCH AND BRAKE MECHANISM

Igor Kamlukin, Mequon, and Joseph R. Harkness, Germantown, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed July 9, 1976, Ser. No. 703,843
Int. Cl.² A01D *69/08*
U.S. Cl. 56—11.3 **12 Claims**



1. In a rotary power lawn mower having a wheeled chassis with a deck, a prime mover mounted on the deck with a drive shaft thereof projecting downwardly into the space below the deck, and a rotary cutter blade below the deck, improved

clutch mechanism for drivingly connecting the cutter blade with said drive shaft, comprising:

A. a drive wheel drivingly connected with and driven by said drive shaft, said drive wheel being located below the deck of the chassis and constrained to rotate about a substantially vertical axis that is fixed with respect to the chassis;

B. a ring fixed with respect to the cutter blade, said ring having internal and external circular surfaces, the diameter of each of which is larger than that of the drive wheel;

C. a carriage;

D. means movably mounting said carriage on the chassis and constraining the same to bodily movement in opposite directions along a defined path transverse to the axis of the drive wheel;

E. bearing means freely rotatably mounting the ring on said carriage with the ring encircling the drive wheel and its axis parallel to that of the drive wheel, so that upon bodily movement of the carriage in one direction the internal circular surface of the ring is tangentially and frictionally engaged with the periphery of the drive wheel to establish a torque transmitting connection between the prime mover and the cutter blade; and

F. manually operable means for effecting bodily movement of the carriage in said direction.

4,048,789

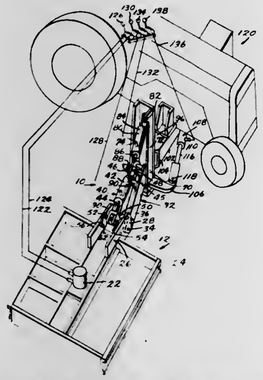
MOWER ATTACHMENT FOR TRACTORS

Jack O. Cartner, 1005 N. 8th St., Cambridge, Ohio 43725

Filed July 9, 1976, Ser. No. 704,071

Int. Cl.[2] A01D *35/26*

U.S. Cl. 56—11.9 **5 Claims**



1. A mower and attachment means for attaching the mower to a tractor, comprising:

rotary blade means;

motor means for rotating the blade means;

housing means for encompassing the rotational path of the blade means;

first bracket means rigidly secured to the housing means;

a main support member attached for relative pivotal rotation about a horizontal axis at one end thereof to the first bracket means;

first hydraulic cylinder means secured for relative pivotal rotation about a horizontal axis at one end thereof to an end of the main support member opposite the one end of the main support member;

second bracket means secured for relative pivotal rotation about a horizontal axis at one end thereof to the first bracket means about the pivotal axis between the main support member and the first bracket means, and said second bracket means being secured for relative pivotal rotation about a horizontal axis at an end opposite the one end thereof to an end of the first hydraulic cylinder means opposite the one end of the first hydraulic cylinder means so that action of the first hydraulic cylinder means will cause relative pivotal movement between the first and second bracket means;

third bracket means secured for relative pivotal rotation about a horizontal axis at one end thereof to the one end of the main support member at a position inwardly from the pivotal axis between the main support member and the first bracket means, and said third bracket means being secured for relative pivotal rotation about a horizontal axis at an end opposite the one end thereof to the opposite end of the first hydraulic cylinder means and having the same pivotal axis as the second bracket means and the first hydraulic cylinder means so that action of the first hydraulic cylinder means causes relative pivotal movement between the first and third bracket means such that contraction of the first hydraulic cylinder means causes upward pivotal movement of the housing means;

a vertical support member, to a lower end of which the main support member is secured for relative pivotal rotation about a horizontal axis at an end of the main support member opposite the one end thereof;

second hydraulic cylinder means secured for relative pivotal rotation about a horizontal axis at one end thereof to an upper end of the vertical support member and secured for relative pivotal rotation about a horizontal axis at an opposite end thereof to the main support member between the pivotal axes of the main support member to the vertical support member and the first bracket means so that action of the second hydraulic cylinder means causes relative pivotal movement between the main support member and the vertical support member such that contraction of the second hydraulic cylinder means causes upward pivotal movement of the main support member;

a horizontal attachment bracket to which the vertical support member is secured on the lower end thereof for relative pivotal rotation about a vertical axis;

third hydraulic cylinder means secured for pivotal rotation about a vertical axis at one end thereof to the horizontal attachment bracket remote from the connection of the vertical support member to the horizontal attachment bracket, an opposite end of the third hydraulic cylinder means being secured for pivotal rotation about a vertical axis to the lower end of the vertical support member so that action of the third hydraulic cylinder means causes relative pivotal movement of the vertical support member and the horizontal attachment bracket such that contraction of the third hydraulic cylinder means causes pivotal movement of the housing means in a horizontal plane; and

means for rigidly securing the horizontal attachment bracket to a tractor.

4,048,790

AGRICULTURAL IMPLEMENTS

Petrus Wilhelmus Zweegers, Nieuwendijk 46, Geldrop, Netherlands

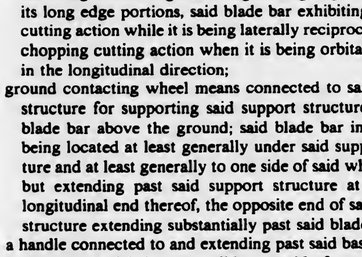
Filed May 31, 1974, Ser. No. 475,255

Claims priority, application Netherlands, June 14, 1973, 7308309

Int. Cl.[2] A01D *35/264*

U.S. Cl. 56—13.6 **12 Claims**

1. An agricultural implement hving a substantially horizontal frame beam extending tranversely to the direction of movement of the implement and comprising a plurality of frame beam sections, said frame beam sections having work performing elements thereon having crop or ground engaging ends such as rotary mowing elements, said crop or ground ends of the work performing elements being disposed at a substantial distance from and below said frame sections, arms extending obliquely downwardly from the adjacent ends of adjacent ones of said frame sections and pivotal connections on said arms to connect pivotally said frame beam sections, said pivotal connections of the frame beam sections being disposed from said frame beam sections by approximately said substantial distance and located at substantially the level of the crop or ground engaging ends of the work performing element so that the work performing elements will follow surface undulations of



the field being worked without change in the spacing between adjacent work performing elements on said adjacent end of said frame beam sections during mutual pivotal movements of said sections.

4,048,791

REVERSIBLE SICKLE-BAR TYPE LAWN MOWER AND TRIMMER

J. Paul Treen, 5025 St. Bernard Ave., New Orleans, La. 70122

Filed June 18, 1976, Ser. No. 697,474

Int. Cl.[2] A01D *35/12*

U.S. Cl. 56—17.6 **9 Claims**

1. A combined lawn mower and trimmer comprising:

a basic lawn mower support structure;

a cutting blade bar elongated in structure mounted on the underside of said mower support structure;

mounting and drive means connected to said support structure and said blade bar for mounting said blade bar onto said support structure and for driving said blade bar in a combined laterally reciprocating and longitudinally orbital motions in a generally horizontal plane, said blade bar being double-edged, having cutting edges on both of its long edge portions, said blade bar exhibiting a sliding cutting action while it is being laterally reciprocated and a chopping cutting action when it is being orbitally moved in the longitudinal direction;

ground contacting wheel means connected to said support structure for supporting said support structure and said blade bar above the ground; said blade bar in its travel being located at least generally under said support structure and at least generally to one side of said wheel means but extending past said support structure at only one longitudinal end thereof, the opposite end of said support structure extending substantially past said blade bar;

a handle connected to and extending past said basic support structure and being reversibly movable from one of its longitudinal ends to the other, the mower being movable and operational in either longitudinal direction, one for regular mowing and the other for close-in trimming; and

guard means positioned about said blade bar at least at the area it extends past said support structure.

4,048,792

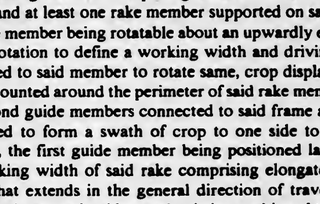
ROW CROP MEANS FOR A HARVESTING UNIT

Joe E. Shriver, and Donald O. Norman, both of East Earl, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 11, 1976, Ser. No. 713,327

Int. Cl.[2] A01D *45/02*

U.S. Cl. 56—98 **19 Claims**



1. In a row crop means for a mobile harvesting unit adapted to advance over a field of crop planted in rows, said means including a frame, laterally spaced generally fore-and-aft gathering members mounted on the frame defining at least one elongated fore-and-aft passageway adapted to receive a row of crop as the unit advances, each of said gathering members adapted to move crop rearwardly along the passageway to feed the crop to said unit, at least one of said gathering members having a relatively smooth upwardly and rearwardly inclined top surface adapted to slideably engage down crop as the unit advances, the improvement comprising: a rotary member disposed in a rear portion of at least one of said gathering members for assisting in the feeding of said down crop being draped over said member to said unit, said at least one gathering member having a cut-away portion on the rearward end thereof forming a recess area for positioning said rotary member such that the lower portion of said rotary member forms a substantially continuous path extending from said top surface of said at least one gathering member for the sliding of said draped-over crop rearwardly and upwardly from said member and onto said rotary member.

4,048,793

RAKING MACHINE

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland, and Ary van der Lely, 10, Weverskade, Maasland, Netherlands

Division of Ser. No. 514,309, Oct. 11, 1974. This application Jan. 30, 1976, Ser. No. 653,730

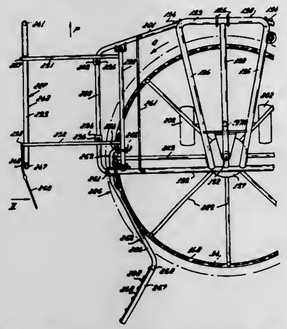
Claims priority, application Netherlands, Oct. 12, 1973, 7314028; Feb. 18, 1974, 7402172; Jan. 18, 1974, 7400685; June 19, 1974, 7408181

Int. Cl.[2] A01D *77/05*

U.S. Cl. 56—370 **16 Claims**

1. A raking machine comprising a frame movable over the ground and at least one rake member supported on said frame, said rake member being rotatable about an upwardly extending axis of rotation to define a working width and driving means connected to said member to rotate same, crop displacing tine means mounted around the perimeter of said rake member, first and second guide members connected to said frame and being positioned to form a swath of crop to one side to the rake member, the first guide member being positioned laterally of the working width of said rake comprising elongated screen means that extends in the general direction of travel of said machine, the second guide member being positioned to the rear of said first guide member and adjacent the working width of

the rake member to the rear thereof, said guide members being laterally spaced apart from one another and positioned to

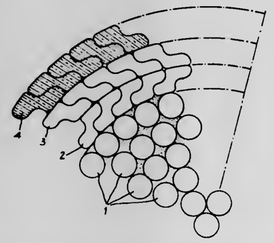


confine the displaced crop received from the rake head at said one side into a swath between the guide members.

4,048,794
SEALED CABLES FOR ATTACHMENT TO SUBMARINE ANCHORAGES

Bernard Charles Albert Falcy, and Adrien Vaudant, both of Bourg-En-Bresse, France, assignors to Societe Anonyme des Hauts Fourneaux de la Chiers, Longwy-Bas, France

Filed May 10, 1976, Ser. No. 684,831
Claims priority, application France, May 27, 1975, 75.16403
Int. Cl.[2] H01B *1/02, 7/28*
U.S. Cl. 57—149 **8 Claims**



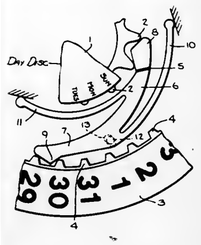
1. Sealed cable for submarine anchorages which comprises a central core, at least one intermediate layer of metallic wires having a Z-shaped cross-section, and a peripheral cathodic protective layer made of metallic wires having a Z-shaped cross-section formed from a metal more electronegative than the metal of the wires of said intermediate layer.

4,048,795
TIMEPIECE CALENDAR MECHANISM

Rene Risi, Berne, Switzerland, assignor to Bulova Watch Company, Inc., Flushing, N.Y.

Filed Nov. 4, 1975, Ser. No. 628,470
Claims priority, application Switzerland, Nov. 6, 1974, 14824/74
Int. Cl.[2] G04B *19/24*
U.S. Cl. 58—4 R **4 Claims**

1. In a calendar mechanism for a timepiece, the combination comprising:
A. a date ring having a circular set of internal gear teeth;
B. a day disc disposed within the interior space of the date ring and concentric therewith, said day disc having a circular set of external gear teeth; and
C. a double-acting twin jumper pivotally mounted between the two sets of teeth, the pivot of said jumper allowing for a limited degree of shifting movement, said jumper being formed by two oppositely-directed lever arms extending from either side of said pivot, each arm having a detent at the free end thereof engaging a respective set of teeth and

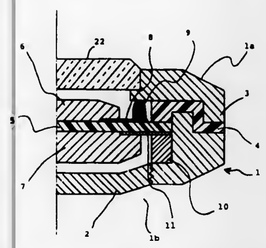


being angled in the same direction as the section of teeth in the set adjacent thereto, each arm having integral therewith a biasing spring whose free end rests against a fixed element to maintain the position of said jumper between said two sets of teeth.

4,048,796
TOUCH SENSITIVE ELECTRODES FORMED ON THE FRAME OF AN ELECTRONIC WRISTWATCH

Takehiko Sasaki, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed June 30, 1976, Ser. No. 701,204
Claims priority, application Japan, June 30, 1975, 50-91924[U]; Nov. 14, 1975, 50-155710[U]
Int. Cl.[2] G04B *37/00*; G04C *3/00*
U.S. Cl. 58—23 R **6 Claims**

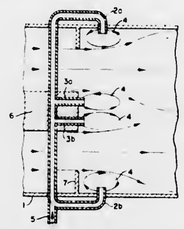


1. In an electronic timepiece including a front metal casing, a rear metal casing and a touch sensitive electronic switching circuitry, the improvement comprising:
an insulating ring for electrically isolating the front metal casing from the rear metal casing; and
a connection means for electrically connecting the front metal casing to an input terminal of the touch sensitive electronic switching circuitry.

4,048,797
COMBUSTION APPARATUS

John Philip Dabbs Hakluytt, Botley, near Southampton, and John Ronald Tilston, Farnham, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Dec. 5, 1975, Ser. No. 638,106
Claims priority, application United Kingdom, Dec. 6, 1974, 52934/74
Int. Cl.[2] F02G *1/00*
U.S. Cl. 60—39.72 R **7 Claims**

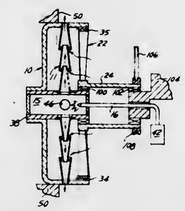


1. Combustion apparatus comprising a duct for conveying a stream of combustion supporting gas, means located within said duct providing a recirculatory flow of said gas which defines a flame stabilisation zone, and a source of fluid comprising an inert diluent connected to said duct for supplying said stabilisation zone with said inert diluent.

4,048,798
SUCTION POWER-DRIVEN AIR TURBINE

John S. Larkins, Jr., Mountain Valley Farm, Star Rte. No. 5, Box 60, New Castle, Va. 24127

Continuation-in-part of Ser. No. 618,623, Oct. 1, 1975, abandoned. This application Nov. 12, 1975, Ser. No. 631,040
Int. Cl.[2] F15B *15/18*
U.S. Cl. 60—407 **25 Claims**

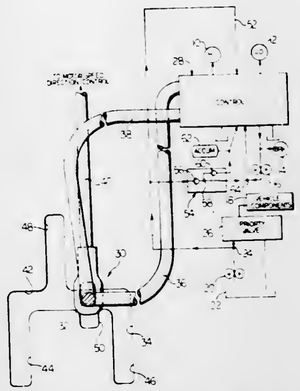


25. An engine comprising:
means defining a first chamber;
a turbine wheel mounted for rotation in said chamber, said turbine wheel having one side in communication with ambient air and the other in communication with the interior of said chamber; and
means operably connected in said first chamber for reducing the pressure level thereof to a magnitude below ambient pressure level whereby the resultant airflow between ambient and such chamber effects the driven rotation of such turbine wheel;
said first chamber further including a combustion chamber mounted therein and having a burner means, said pressure reducing means comprising a series of staged venturies communicating between said combustion chamber and ambient and extending through said first chamber; said staged venturis extending radially in a plurality of branches from said combustion chamber to ambient.

4,048,799
WINCH CONTROL

Kenneth F. Golan, Pekin, and James E. Winzeler, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 17, 1976, Ser. No. 742,966
Int. Cl.[2] F15B *1/02, 11/16*
U.S. Cl. 60—413 **8 Claims**



1. In a control for a hydraulically operated winch or the like having a hydraulically disengaged brake, and a multispeed, hydraulically controlled transmission and a drum to be driven or braked, the combination of:
a brake control valve having an inlet, an outlet and selectively variable metering valve means between said inlet and outlet;
a metering pump adapted to be operatively associated with a winch drum so as to be driven thereby;
a first fluid conduit extending from said outlet to said metering pump;
a port in said first fluid conduit adapted to be coupled to said hydraulically disengaged brake for the winch;
a second fluid conduit extending from said metering pump to said inlet; and
a source of fluid under pressure connected to said inlet.

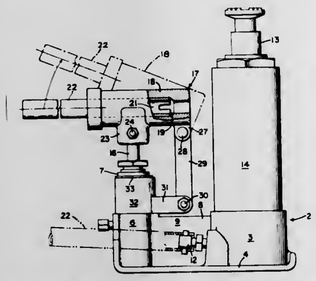
4,048,800
HYDRAULIC JACK HAVING ROTATING PUMP HANDLE

Philip S. Cancilla, 342 Ann Darling Drive, San Jose, Calif. 95133

Filed July 14, 1975, Ser. No. 595,866
Int. Cl.[2] F15B *15/18*
U.S. Cl. 60—477 **2 Claims**

1. In combination with a hydraulic jack structure having a main cylinder symmetrical about a longitudinal axis and a ram movable therewithin by hydraulic fluid and a pump assembly including a pump cylinder and a pump shaft symmetrical about a longitudinal axis and axially displaceable therewithin to pump fluid from within said pump cylinder into said main cylinder by axial displacement of said pump shaft, a pump handle assembly, comprising:
a. an elongated body having a socket therein adapted to receive a handle and pivotally connected to said pump shaft;
b. link means pivotally connected at one of its ends to said elongated body; and

c. means providing horizontal rotation of said pump handle, said means including parallel longitudinal axes of said main cylinder and said pump cylinder and further including means rotatably mounted on said pump cylinder in coaxial relation with said pump shaft and pivotally connected to the other end of said link means whereby said



pump handle assembly may be pivoted in an horizontal plane perpendicular to said parallel axes of said main and pump cylinders through about 320° about the axis of said pump shaft and cylinder to selectively position the elongated body in relation to the main cylinder to avoid obstruction of pumping action of a handle in said socket in said elongated body.

4,048,801

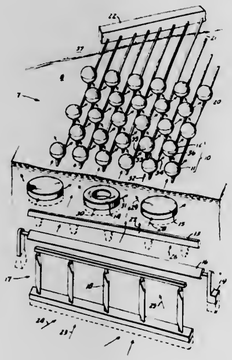
PROCESS AND DEVICE FOR HARNESSING WAVE ENERGY

Michael G. Tornabene, 285 Oak Neck Lane, West Islip, N.Y. 11795

Continuation-in-part of Ser. No. 428,349, Dec. 26, 1973, abandoned, and Ser. No. 432,211, Jan. 10, 1974, abandoned, and Ser. No. 566,985, April 10, 1975, and Ser. No. 566,983, April 10, 1975, and Ser. No. 566,984, April 10, 1975. This application Apr. 11, 1975, Ser. No. 567,127

Int. Cl.² F03G *7/10*

U.S. Cl. 60—502 **9 Claims**



1. A process for harnessing energy comprising in combination: employing in water, a plurality of float means in a predetermined pattern of positioning individual ones of said plurality relative to one another in off-set spaced-apart predetermined relationships to one-another at predetermined distances from one-another with a first one being obliquely rearwardly spaced relative to a second one and relative to a direction of substantially lineal direction of primary pressure movements of a body of water, said predetermined distances being within a range of dimensions sufficiently small and sufficiently great such that a first pressure energy wave within the body deflects obliquely and at least one of rearwardly and forwardly from said second one of said plurality to thereafter impel against said first one of said plurality at least in part coincident with another pressure energy wave within said water, each float means being of a predetermined shape and positioned such that the first pressure wave is deflected obliquely in the direction of a rearward float whereby the remaining energy of the wave may be utilized.

4,048,802

FLOATING WAVE BARRIER

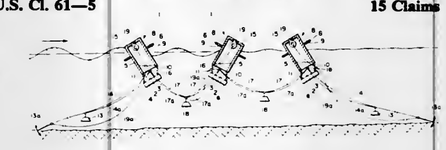
Wallace William Bowley, Stafford Springs, Conn., assignor to William Barney Ritchie, Jr., Duxbury, Mass., a part interest

Continuation-in-part of Ser. No. 485,831, July 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 383,346, July 27, 1973, Pat. No. 3,848,419, which is a continuation-in-part of Ser. No. 357,938, May 7, 1973, Pat. No. 3,846,990, which is a continuation-in-part of Ser. No. 267,086, June 28, 1972, abandoned. This application Feb. 14, 1975, Ser. No. 550,118

The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.

Int. Cl.² E02B *3/04*

U.S. Cl. 61—5 **15 Claims**



1. A wave barrier having a top member and a second member attached to said top member, said top member having at least one annulus extending from a body portion of said top member, said second member being positioned at a deeper water depth than said top member when said barrier is anchored in water, said top member being located at or near the water surface, said second member being submerged near the water surface, the masses and specific gravity of the top member, annulus and second member being controlled so that the top member and second member are maintained generally along a common vertical axis with respect to each other when placed in water, said barrier being anchored to the sea bottom by a flexible line extending from an anchor to a point at or near to an axis of pitch of said top member in order to maximize oscillation of said top member about said axis of pitch and so that said annulus causes formation of wave fronts to contact incoming waves to reduce a vertical wave velocity component of the incoming waves and without substantial contact of said members, said axis of pitch being determined under the average expected wave condition in the water, and said axis of pitch being oriented in a direction generally perpendicular to the direction of movement of incoming waves toward the shore when said barrier is anchored in water.

4,048,803

MINING SHIELD SUPPORT APPARATUS

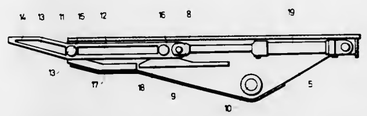
Karoly Bole; Kalman Nagy, both of Varpalota; Istvan Aufsatz, Budapest; Jozsef Bohnert, Budapest; Laszlo Branyi, Budapest; Zoltan Ilyes, Budapest; Jozsef Korbuly, Budapest, and Janos Nemeth, Budapest, all of Hungary, assignors to Banyaszati Kutato Intezet, Hungary

Filed Jan. 17, 1975, Ser. No. 531,165

Claims priority, application, Hungary, Dec. 3, 1974, BA 3007

Int. Cl.² E21D *17/02*

U.S. Cl. 61—45 D **1 Claim**



1. Shield support apparatus for use in long wall mining with a roof support member for supporting the portion of the roof between the working face and the front edge of a roof cap before advancing the shield support apparatus, said apparatus comprising a base, prop means connected to the base, a roof cap, pivot means for pivotally connecting the roof cap to the base and to the prop means, a roof support member, guides located in the sides of the roof cap, guide-engaging members for mounting the roof support member between said guides for movement in the longitudinal axial direction of the roof cap between an inoperative position wherein the roof support member is retracted in the roof cap and an operative position wherein said roof support member is extended forwardly of the front edge of the roof cap, and drive means for effecting said movement of the roof support member, said guides comprising, on each side of the roof cap, at least two tracks engaged by corresponding ones of said guide-engaging members carried by the roof support member, each said track comprising a first track portion substantially parallel to the plane of the roof cap and a second track portion disposed forwardly of said first and inclined forwardly and upwardly to form a ramp, said roof member being pivotally connected to said drive means for effecting movement of the roof support member so that when said roof member is moved by said drive means, said roof member moves from said inoperative position upwardly along said ramps of said first and second track portions to the operative position wherein the roof supporting surface of said roof support member is parallel to the upper surface of the roof cap, whereby a full surface wedging action of the roof support member against the roof is achieved in said operative position, said track portions being formed by two pairs of track members, one of said pairs being located adjacent the working face side of the roof cap and the other of said pairs being located adjacent the pivotal connection of the roof cap, the track members of said one pair being farther apart than the track members of said other pair.

4,048,804

SUPPORT ASSEMBLIES FOR USE IN MINE WORKINGS

Burckhardt Eisner; Lubomir Plevak; Günter Lagodka, all of Lunen, and Harry Rosenberg, Ludinghausen, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

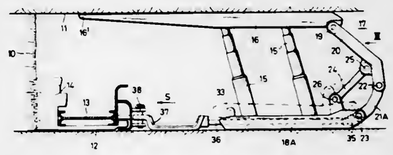
Filed Sept. 8, 1976, Ser. No. 721,636

Claims priority, application Germany, Sept. 9, 1975, 2540091

Int. Cl.² E21D *15/44*

U.S. Cl. 61—45 D **12 Claims**

1. A support assembly for use in a mine working; said assembly comprising: separate floor-engaging sills, at least one extendible prop carried by each of said sills, a common upper goaf shield, a roof cap, means pivotably connecting the upper goaf shield to the roof cap, the props being operable to raise and lower the roof cap and the upper goaf shield, plural linkage means each pivotably interconnecting the upper goaf shield to a respective one of the floor sills, lower goaf shield parts, means pivotably connecting the lower goaf shield parts to the upper shield and means pivotably connecting each of the



lower goaf shield parts to a respective one of the floor sills whereby the floor sills can move relative to one another to adjust to irregularities in the floor of a mine working.

4,048,805

CONCRETE PILE

Yoshikiyo Fukushima, Tokyo, and Shigeru Watanabe, Suita, both of Japan, assignors to Nippon Concrete Industries Co. Ltd., Tokyo and Nikkai Giken Co., Ltd., Osaka, both of Japan

Filed Jan. 20, 1976, Ser. No. 650,790

Int. Cl.² E02D *5/30*

U.S. Cl. 61—56 **7 Claims**



1. A cylindrical concrete pile, with a steel plate of a semi-cylindrical shape integrally fixed in the outer peripheral surface at a predetermined position, along the length of said pile, the length of said steel plate being substantially less than the length of said concrete pile, said steel plate having a suitable number of connectors protruding beyond the inner surface thereof in such a manner that the said connectors thrust into and adhere in said concrete.

4,048,806

APPARATUS FOR, AND A METHOD OF, DRIVING TUNNELS

Dieter Stuckmann, Selm; Siegmund Babendererde, Bad Vilbel; Hans Jütte, Dortmund-Brechten, and Reinhard Bokemeyer, Offenbach, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen and Hochtief A.G., Frankfurt, both of Germany

Filed May 10, 1976, Ser. No. 684,826

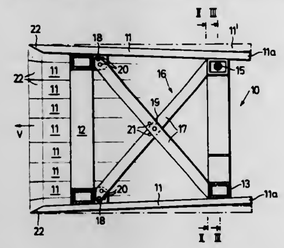
Claims priority, application Germany, May 10, 1975, 2520915

Int. Cl.² E21D *9/06*

U.S. Cl. 61—85 **16 Claims**

1. Tunnel driving apparatus having a shield composed of a plurality of elongate drive members arranged in side-by-side supporting and guiding all the members for longitudinal dis-

placement and adjustable means on part of said support means for varying the angular relationship between the individual



longitudinal axes of all the members and the tunnel axis in unison.

4,048,807

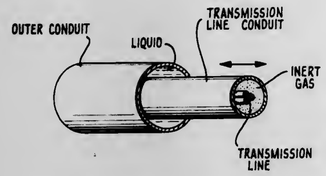
METHODS FOR EMPLACING AND MAINTAINING TRANSMISSION LINES

Fred S. Ellers, Menlo Park; Hugh G. Hally, San Mateo, both of Calif.; Edward E. McIlvees, Upper Montclair, N.J., and William A. Doble, San Mateo, Calif., assignors to Bechtel International Corporation, San Francisco, Calif. and The Okonite Company, Ramsey, N.J.

Continuation of Ser. No. 545,214, Jan. 29, 1975, abandoned. This application June 18, 1976, Ser. No. 697,412

Int. Cl.² F16L *1/02*

U.S. Cl. 61—105 **6 Claims**



1. A method for emplacing and maintaining a transmission line between two distant points comprising the steps: forming a first conduit between two distant points; filling said first conduit with a liquid; inserting a transmission line conduit into and through said first conduit, said transmission line conduit containing an electrical transmission line and an inert gas, the weight to volume ratio of the transmission line and contents being substantially equal to the density of the liquid within the first conduit, whereby the liquid filling said first conduit provides sufficient buoyancy and lubrication to float the transmission line conduit and contents axially through the first conduit; then substituting the inert gas within said transmission line conduit with an electrical insulating liquid, thereby decreasing the buoyancy of said transmission line conduit and contents.

4,048,808

ICE ISLANDS AND METHOD FOR FORMING SAME

Frederick C. Duthweiler, Anchorage, Alaska, assignor to Union Oil Company of California, Brea, Calif.

Filed Apr. 19, 1976, Ser. No. 678,317

Int. Cl.² E02B *3/00*; F25C *1/02*

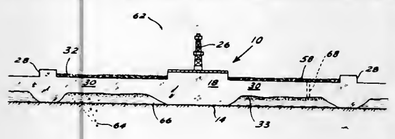
U.S. Cl. 61—103 **12 Claims**

1. An ice island for conducting offshore operations in a frigid environment, said ice island comprising:

an ice mass defining an operations pad, the base thereof being supported on the marine bottom at a desired operations site;

an ice structure defining a containment barrier surrounding said operations pad and spaced outwardly therefrom, the base of said containment barrier being also supported on the marine bottom;

a layer of ice disposed in the space between said operations pad and said containment barrier, the undersurface of said



layer of ice being spaced above the marine bottom and being unsupported thereby and upper and lower containment basins defined by the upper and under surfaces of said layer of ice and said containment barrier.

4,048,809

AIR CONDITIONING

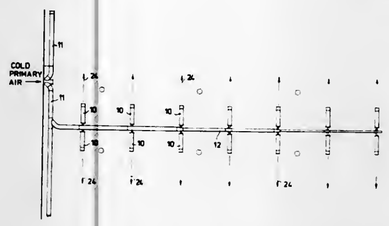
Robert Sidney Simmons, Pinner, England, assignor to Casaire Limited, England

Filed Dec. 2, 1975, Ser. No. 636,902

Claims priority, application United Kingdom, Dec. 2, 1974, 52089/74

Int. Cl.² F25D *17/06*; F25B *41/00*; F24F *7/00, 13/00*

U.S. Cl. 62—89 **13 Claims**



1. A method of cooling a space comprising providing tubular venturi mixing devices or diffusers having primary air nozzles, bell-mouthed secondary air inlets, and outlets for discharging mixed primary and secondary air into said space, said nozzles being disposed at the entrances of the secondary air inlets, and said mixing devices or diffusers and the inlets thereof being disposed at high level within the space; cooling a supply of primary air to a temperature substantially below a desired temperature of the space; distributing the so-cooled primary air to said nozzles into said secondary air inlets; inducing with said jets flows of secondary air from the high level in the space directly into the inlets; and forming a mixture of said primary air and secondary air in the devices or diffusers in which the volume of secondary air represents at least 50% of the total volume of mixed primary and secondary air discharged into the space through said outlets.

4,048,810

REFRIGERATING PROCESS AND APPARATUS THEREFOR

Sten Olof Zeilon, Heimdalsgatan 21, 260 14 Glumslov, Sweden

Filed Apr. 20, 1976, Ser. No. 678,489

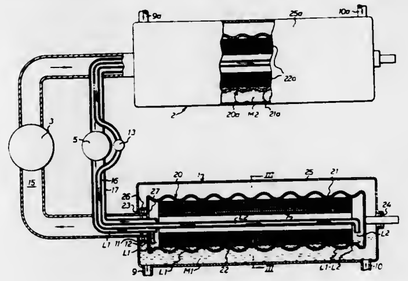
Claims priority, application Sweden, Apr. 28, 1975, 7504890

Int. Cl.² F25B *15/00*

U.S. Cl. 62—101 **19 Claims**

1. A refrigerating process according to the compression-absorption method in which use is made of apparatus comprising a gas evaporator and a gas absorber connected to each other by gas and solution circuit means in a closed system,

comprising the steps of (a) feeding in a closed cycle a solution enriched by gas from the absorber (2) to the evaporator (1); (b) supplying heat to said enriched solution in the evaporator for evaporating gas therefrom and producing a gas impoverished solution; (c) feeding said enriched solution to the evaporator; (d) withdrawing evaporated gas from the evaporator and increasing the pressure thereof; (e) introducing said pressure increased gas into the absorber and removing heat from said gas impoverished solution introduced into the absorber under conditions which will ensure therein a higher pressure level than in the evaporator and a lower average temperature of the impoverished solution introduced thereinto than the average



temperature of the enriched solution introduced into the evaporator for effecting gas dissolution in the former and gas evaporation from the latter solution, respectively; (f) effecting increase of the temperature of the enriched solution which is fed from the absorber and is introduced into the evaporator and a proportional increase of the temperature of the impoverished solution which is fed from the evaporator and introduced into the absorber by leading said solutions in countercurrent heat exchanging relationship before admixing the enriched solution with solution which is under gas evaporating conditions in the evaporator and admixing of the impoverished solution with the solution which is under gas absorbing conditions in the absorber.

4,048,811

COMBINATION OF AIR CONDITIONER AND VENTILATING UNIT PROVIDED WITH TOTAL HEAT EXCHANGER ASSEMBLY

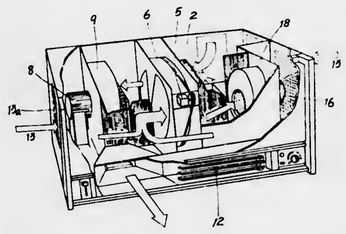
Tadashi Ito, Nara; Katuhiro Wakahara, Tenri, and Masao Tatsuoka, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 25, 1976, Ser. No. 670,103

Claims priority, application Japan, Mar. 28, 1975, 50-38844; Mar. 28, 1975, 50-38845; Mar. 28, 1975, 50-38848; June 9, 1975, 50-69837

Int. Cl.² F25D *23/12, 17/06*; F24F *13/00*

U.S. Cl. 62—263 **11 Claims**



1. A combination air conditioner and ventilator comprising:

an air conditioner unit including an air inlet and a supplied air outlet;

a ventilator unit mounted adjacent the air conditioner unit and provided with a total heat exchanger assembly for recovering heat from an air exhaust flow from the air conditioner unit;

said ventilator unit including first and second supplied air outlets;

said first ventilator supplied air outlet being separate from the supplied air outlet of the air conditioner unit;

said second ventilator supplied air outlet communicating with the interior of the air conditioner unit; and

a damper means operatively provided within the interior of the ventilator unit for directing the ventilator supplied air flow between said first ventilator supplied air outlet and said second ventilator supplied air outlet.

4,048,812

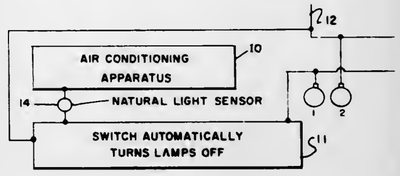
SOLAR-ENERGY CONSERVING

Harry E. Thomason, 609 Cedar Ave., Fort Washington, Md. 20022

Filed Feb. 17, 1976, Ser. No. 658,752

Int. Cl.² F25D *25/00*

U.S. Cl. 62—264 **7 Claims**



1. Energy-conserving apparatus comprising first means for air-conditioning an area, second means for illuminating said area, and third means interconnecting said first means and said second means to conserve energy by automatically reducing the level of illumination and energy consumption of said second means when said first means is energized and to reduce the heat energy output of said second means to thereby reduce the heat load on said first means.

4,048,813

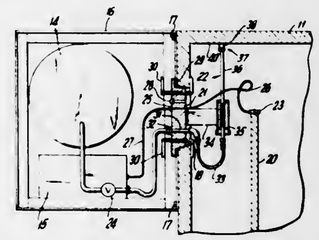
DETACHABLE CONTAINER REFRIGERATION SYSTEM

Henry Joseph Falk, Grand Island, N.Y., and Gerald Charles Tocci, Morrestown, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 11, 1975, Ser. No. 586,100

Int. Cl.² F25D *19/00*

U.S. Cl. 62—297 **5 Claims**



2. In apparatus for refrigeration of stored product within a portable thermally insulated shipping container having at least one porthole therein, a porthole closure assembly for gas

tightly sealing said porthole, a liquified gas refrigerant storage tank with associated flow control means, refrigerant dispensing and flow control means joined to said storage tank and said porthole closure assembly, and refrigerant spray means joined to said dispensing and flow control means through said porthole closure assembly for controllable refrigeration of said stored product, the improvement comprising: a support-refrigerant dispensing assembly joined to the inner side of said porthole closure assembly and having a base section; an upwardly extending fluid conduit joined to said base section for vertical movement; spray nozzle means joined to the fluid conduit upper end; thrust member means joined to said fluid conduit for vertical movement; mechanical compression exerting means positioned against said fluid conduit for upward urging thereof; said base section, fluid conduit, compression means and thrust member being sized and arranged for upward urging of said thrust member against the container ceiling when said porthole closure member is attached to said container so as to seal said porthole.

4,048,814

REFRIGERATING PLANT USING HELIUM AS A REFRIGERANT

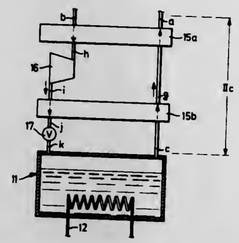
Hans Quack, Pfaffikon, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Apr. 8, 1976, Ser. No. 675,064

Claims priority, application Switzerland, Apr. 15, 1975, 4771/75

Int. Cl.² F25B 7/00

U.S. Cl. 62—335 **7 Claims**



1. A refrigerating plant having a helium circuit in which helium circulates as a refrigerant, said plant comprising

a precooling stage to precool a flow of helium to a temperature below the inversion temperature thereof with the performance of work, said stage including means for compressing the flow of helium and means for cooling the compressed flow of helium;

a Joule/Thomson stage including a pair of heat exchangers interposed in said helium circuit to place a flow of helium from said precooling stage in heat exchange relation with a flow of helium to said precooling stage to cool the flow of helium from said precooling stage to the liquefaction temperature thereof, an expansion turbine between said pair of heat exchangers in the flow of helium from said precooling stage for expanding the flow of helium to an intermediate pressure, and an expansion means in the flow of helium between the exit of the heat exchanger of said pair of heat exchangers downstream of said expansion turbine in the flow of helium from said precooling state and the entry to said heat exchanger in the flow of helium to said precooling stage for expanding the flow of helium to a liquefaction pressure; and

a cryogenic load for supplying heat to the flow of helium, said load being disposed between said exit and said entry of said heat exchanger in the flow of helium.

4,048,815

FLAKE ICE MAKER

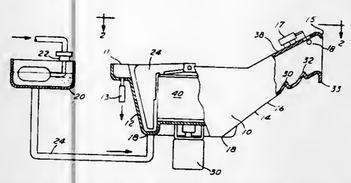
Theodore Kattis, 1315 Estes St., Lakewood, Colo. 80215

Division of Ser. No. 502,031, Aug. 30, 1974, Pat. No. 3,921,415.

This application Oct. 28, 1975, Ser. No. 626,363

Int. Cl.² F25C 1/14

U.S. Cl. 62—354 **4 Claims**



1. In a flake ice maker having an annular water chamber with an inner and an outer wall for maintaining a predetermined water level therein, means for refigerating one of said walls producing a layer of ice, rotary flaking means for progressively breaking flakes from the layer of ice around the wall and chute-type discharge means for ice from the annular chamber, the improvement of switch means located in said discharge chute for actuation upon a predetermined pressure of accumulated ice flakes in said chute, said switch means arranged to shut off the flake ice maker on being activated.

4,048,816

NEEDLE SELECTION MECHANISM

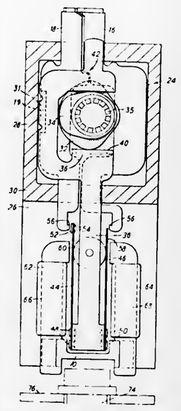
Michael Scarffe, Bletchley, England, assignor to Camber International (England) Limited, England

Filed Aug. 12, 1976, Ser. No. 713,987

Claims priority, application United Kingdom, Aug. 21, 1975, 34704/75

Int. Cl.² D04B 15/78

U.S. Cl. 66—50 R **8 Claims**



1. A needle selector mechanism for a knitting machine having a main drive therefor comprising:

a cam assembly arranged to be driven in synchronism with said main drive, the cam assembly including two cams or cam lobes and a single cam follower which is arranged to be always in contact with both cams and is mounted for rectilinear movement controlled by the cams;

two jack selector slides each operatively engageable with a knitting needle of said knitting machine to move said needle into one of a plurality of working positions;

two control members, each of said control members being associated with an individual jack selector slide and comprising a leaf spring one end of which is fixedly mounted to the cam follower;

a latch on each control member adjacent the other end of the leaf spring for releasable latching with a latching surface on the associated jack selector slide; and

electro-magnetic control means selectively operable upon each control member to cause said member to releasably latch with its associated jack selector slide in accordance with a predetermined knitting pattern.

4,048,817

KNITTING MACHINE CAM

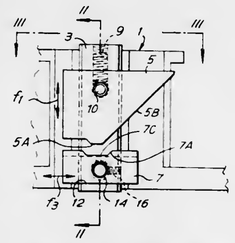
Massimo Bianchi, Florence, Italy, assignor to Macchine Tessili Circolari MATEC S.p.A., Rome, Italy

Filed Sept. 30, 1976, Ser. No. 728,024

Claims priority, application Italy, Oct. 6, 1975, 9575/75

Int. Cl.² D04B 15/32

U.S. Cl. 66—57 **2 Claims**



1. In a knitting machine, a lowering cam engageable with butts of needles to lower the needles along a predetermined lowering path, a stop cam engageable with the butts of the needles to effect progressive deceleration of the needles, said stop cam having means defining a first profile parallel with said lowering path, means defining a second profile corresponding to the maximum lowered position of the needles, and means defining a concave connecting profile between the first and second profiles, means for adjusting the position of one of said cams relative to the other of said cams in the direction of reciprocating movement of the needles, and means for adjusting the position of the other of said cams relative to the said one of said cams in a direction transverse to the first direction so as to ensure that the butt engages the stop cam tangentially to the connecting profile, slide means carrying said cams, and being movable to adjust the loop length of the stitches, said slide means comprising means defining two mutually transverse guides each mounting a respective one of the cams, screw-clamping means for locking each of the cams in a selected position along its associated guide, and respective stop screw means associated with each of the guides and defining said selected position of the cam, the axis of each screw means lying longitudinally of its associated guide.

4,048,818

THERAPEUTIC STOCKING AND METHOD

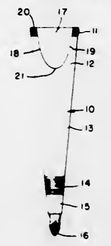
Glenn F. Cueman, Charlotte, N.C., assignor to Zimmer U.S.A., Inc., Warsaw, Ind.

Filed May 27, 1976, Ser. No. 690,553

Int. Cl.² D04B 9/52, 9/54, 9/56

U.S. Cl. 66—172 E **4 Claims**

1. A circular knit therapeutic stocking having foot, leg and welt portions, said foot, leg and welt portions having alternate wales with stitches of non-elastomeric yarn and intermediate wales in which alternate stitches of non-elastomeric yarn connect with intermediate stitches of bare elastomeric yarn in each said intermediate wale, said bare elastomeric yarn stitches being substantially dominated by said non-elastomeric yarn stitches whereby said bare elastomeric yarn stitches are protected by said non-elastomeric yarn stitches from direct contact with the leg of a wearer while providing graduated compessive force on the leg of a wearer, said foot portion having a closed toe portion, said welt portion of said stocking having an upper terminal portion and a longitudinal slit provid-



ing opposed edges, a flexible relatively non-stretchable downwardly-converging panel secured to said slit opposed edges in the welt portion, said panel extending at the upper terminal portion for less than 180° and converging downwardly, said panel engaging the inside of the upper thigh of the leg of a wearer.

4,048,819

KNITTED GARMENTS

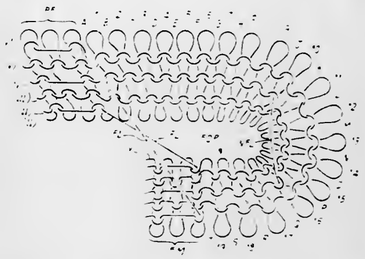
Martin Robert Johnson, Broughton Astley, England, assignor to Ridley, Spriggs and Johnson Limited, England

Filed Apr. 16, 1975, Ser. No. 568,440

Claims priority, application United Kingdom, Apr. 25, 1974, 18039/74; July 12, 1974, 30976/74

Int. Cl.² A41B 9/02, 9/04, 9/10

U.S. Cl. 66—177 **9 Claims**



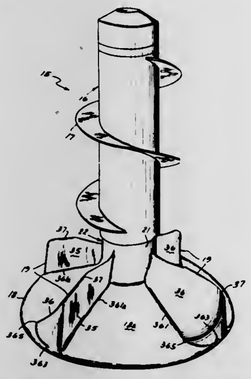
1. A knitted garment having a walewise extending free edge portion comprising a plurality of courses of loops knitted of relaxable yarn and disposed in a predetermined number of uniformly spaced wales, the outer free margin of said portion and also an inner margin which follows the latter and is contiguous with the body of the garment being each miss knitted at at least one wale in each of spaced ones of the courses, and the relaxable yarn being floated inwardly and coursewise across successions of wales located between said two margins in each of the same spaced courses, the defined knit structure being such that the coursewise extending floats, in a relaxed condition and contracted into the body of the fabric, anchor to the latter a flat fold produced, consequent upon contraction of said floats, by the turning over and down of the marginal edge fabric about a predetermined one of the aforementioned wales located between said two margins, the thus folded over edge portion extending at right angles to and across the courses.

4,048,820

RAMPED SCRUBBING VANES FOR AUGER AGITATOR

John William Pieksmeier, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 4, 1975, Ser. No. 628,585
Int. Cl.[2] D06F *13/06*
U.S. Cl. 68—133 15 Claims



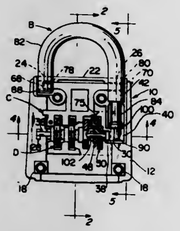
6. An agitator assembly for a vertical axis washing machine having an auger portion to be driven in unidirectional rotation and a skirt portion to be oscillated about the axis of rotation of the auger, the skirt portion including asymmetric, ramped scrubbing vanes affixed thereto and each comprising:
a vertical face opposed to the direction of rotation of the auger portion; and
a ramped surface facing in the direction of rotation of the auger portion,
whereby rotational movement imparted to the basket contents in a machine by the auger portion may be substantially counteracted by an opposite rotation induced in wash liquid by the asymmetry of the scrubbing vanes during oscillation in a machine.

4,048,821

COMBINATION PADLOCK

Lazio Bako, Woodcliff Lake, and Rudolf Wingert, High Crest Lake, both of N.J., assignors to Presto Lock Company, Division of Walter Kidde & Company, Inc., Elmwood Park, N.J.

Filed Jan. 30, 1976, Ser. No. 653,722
Int. Cl.[2] E05B *37/06*
U.S. Cl. 70—25 18 Claims



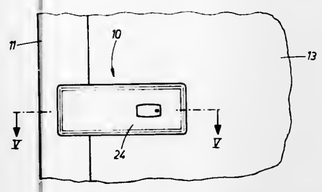
1. A combination padlock comprising:
a. a body having an internal cavity;
b. a plurality of rotatable permutation tumblers;
c. a shiftable member in the cavity for changing the combination of the tumblers;
d. a shackle having a long leg extending into the cavity and rotatable on the body about the axis of the leg, the leg being shiftable in the body along its axis between retracted and extended position;
e. a bolt cooperable with the tumblers for preventing the leg, when it is retracted in a first angular position, from being shifted to its extended position except when the tumblers are set on open combination;
f. means enabling the combination to be scrambled when the leg is in its extended position;
g. means provided by the shackle for shifting the shiftable member; and
h. means for preventing shifting of the shiftable member except when the tumblers are set in the open combination.

4,048,822

LOCKS FOR DOORS AND THE LIKE

Adalbert Luling, Meinerzhagen, Germany, assignor to Firma F. W. Luling KG, Volmarstein, Germany

Filed Apr. 17, 1973, Ser. No. 352,056
Claims priority, application Germany, Apr. 17, 1972, 2218574
Int. Cl.[2] E05B *65/00*
U.S. Cl. 70—93 24 Claims



1. A lock for a door having a door leaf swingable toward one side from an adjoining door post, comprising:
a keeper provided with pivot means and adapted to be secured to said door leaf at said one side;
a detent fastenable to said door post at said one side; and
a link provided at one end with gripper means for engaging said detent and with key-operable unlocking means for disengaging said gripper means from said detent, said link having a track permanently engaged by said pivot means and extending from said one end to the opposite end of said link for slidably articulating said link to said keeper and, with said detent engaged by said gripper means, allowing limited displacement of the door leaf away from the door post to an extent determined by the length of said track, said unlocking means being accessible through a gap existing between the door leaf and the door post upon such limited displacement.

4,048,823

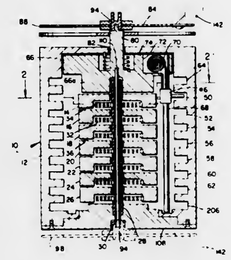
COMBINATION LOCK

Janos Szova, 3615 Greystone Ave., Bronx, N.Y. 10463

Filed Apr. 2, 1976, Ser. No. 673,100
Int. Cl.[2] E05B *37/02*
U.S. Cl. 70—306 10 Claims

1. A combination lock comprising a lock housing, dial means rotatably mounted on said lock housing, a plurality of ratchet wheels rotatably mounted in an aligned stack within said housing, for individual movement between a normal lock-closed position and a lock-open position, pawl means movably mounted in said lock housing, means providing a driving connection between said pawl means and said dial means for movement of said pawl means in a circular path in response to turning movement of said dial means, and guide means disposed within said lock housing for guiding said pawl means into successive engagement with each of said ratchet wheels

responsive to operation of said dial means, said guide means comprising a plurality of tracks formed in said lock housing,



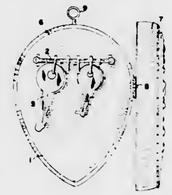
each of said tracks being in alignment with a respective ratchet wheel.

4,048,824

KEY CASE

Macy B. Blackmon, Indianapolis, Ind., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 9, 1976, Ser. No. 694,085
Int. Cl.[2] A47G *29/10*
U.S. Cl. 70—456 R 1 Claim



1. A neckcase, comprising
an ornamental openable housing large enough in dimensions to house a key, said housing comprising a pair of equal generally heart-shaped halves hingedly affixed to each other;
key fastening means in the housing for removably mounting a house key in the housing; and
housing fastening means for removably supporting said housing on a person, said housing fastening means comprising an eyelet affixed to one of the halves of the housing and a neck chain passing through the eyelet for suspending the housing from the neck of a person.

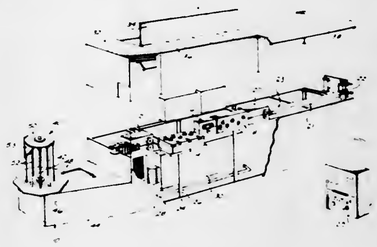
4,048,825

COIL RE-BAR STRAIGHTENER AND CUTTER

John Burke Dastrup, 5556 Thunderbird Lane, La Jolla, Calif. 92037, and Paul Oscar Green, 5908 Camber Drive, San Diego, Calif. 92117

Filed Dec. 29, 1975, Ser. No. 644,554
Int. Cl.[2] B21D *3/04*
U.S. Cl. 72—12 27 Claims

1. A machine having a coil unwinding station for a receiving and unwinding metal rod from the outer periphery of coils of metal rod, and rod driving and straightening stations remote from said coil unwinding station for straightening the unwound metal rod, and a rod cutting station for cutting of the rod to predetermined lengths and including, at said rod driving and straightening stations, the following rod slack detection means:
a rod follower pivotally mounted on said machine at the rod inlet to said driving and straightening stations;
resilient means biasing said rod follower against said rod entering said driving and straightening stations;
and cam means driven by said rod follower and responsive to the incident angle of entrance of said rod processed from said unwinding station to said driving and straightening stations; and
further including, at said coil unwinding station, the following:
spindle means for receiving the coil of metal rod;
support means for said spindle to permit said spindle free rotation thereon;



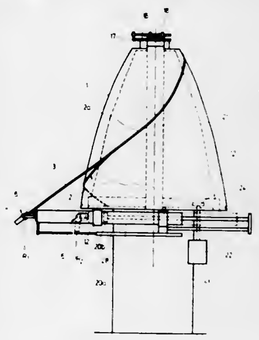
drive means for rotation of the spindle including prime mover means and brake means operatively connected to said spindle;
and
spindle rotation control means including a drive control circuit operatively connected to said prime mover means with switch means in circuit therewith and responsive to the movement of said cam means whereby said prime mover means is disengaged in response to excess slack in said unwound metal rod and is engaged in response to excess tension of said unwound metal rod, independently of the amount of unwound rod on said coil.

4,048,826

DEVICE FOR MANUFACTURING ROTATIONALLY SYMMETRICAL CONSTRUCTIONAL PARTS

Manfred Lechner, Munich; Volker Schirm, Brunnthal, and Heinrich Dettmann, Ingolfingen, all of Germany, assignors to Messerschmitt-Bolkow-Blohm, Germany

Filed Mar. 26, 1976, Ser. No. 670,821
Claims priority, application Germany, Apr. 3, 1975, 2514502
Int. Cl.[2] B21F *3/04, 3/10;* B21D *11/06*
U.S. Cl. 72—21 10 Claims



1. In a apparatus for manufacturing a rotationally symmetrical constructional part, with a three-dimensional geometry,

having walls formed of elongated tubes wound spirally about the axis of symmetry of the constructional part and connected to each other, with such manufacturing apparatus comprising a rotatable bending device having a central longitudinal axis of symmetry and at least one bending flank conforming to the predetermined three-dimensional geometry of the constructional part to be manufactured, holding means operable to clamp one end of each tube to the bending device for bending the tube to shape by bending it into contact with the bending flank, and a clamping and adjusting device operatively associated with the bending device and operable to clamp the other end of each tube, said clamping and adjusting device being radially displaceable relative to said axis of symmetry and angularly displaceable relative to said bending flank to continuously control the bending of the tube along the bending flank about three mutually intersecting axes, in conformity with such predetermined three-dimensional geometry of the constructional part to be manufactured; the improvement comprising a closed-loop control system for said clamping and adjusting device comprising, in combination, an actual-value transmitter operatively associated with said bending device and said clamping and adjusting device for measuring the radial displacement of said clamping and adjusting device relative to the central longitudinal axis of symmetry of said bending device; a reference-value transmitter operatively associated with said bending device, which is set automatically as a function of the angular displacement between said bending device and said clamping and adjusting device; means deriving an error signal value represented by the difference between the output values of said actual-value transmitter and said reference-value transmitter; and an actuator connected to said clamping and adjustment device and operable to radially displace said clamping and adjusting device as a function of the error signal value.

4,048,827

APPARATUS FOR FORMING A LARGE DIAMETER PIPE

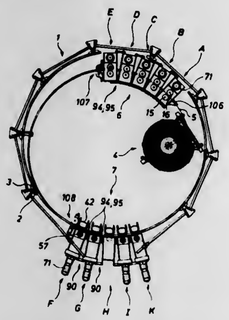
Xaver Lipp, Hohenstaufenstrasse 30, D 7090 Ellwangen, Jagst, Germany

Filed June 28, 1976, Ser. No. 700,733

Claims priority, application Germany, July 4, 1975, 2529925; Dec. 23, 1975, 2558454

Int. Cl.² B21C *37/12*

U.S. Cl. 72—50 **11 Claims**



1. An apparatus for helically winding sheet metal to form a larger diameter pipe comprising

means for forming and interconnecting adjacent edges of the sheet by rabbeting, said means including a profiling station and a rabbeting station,

each of said stations including a plurality of processing units and each of said units having pairs of processing rolls for forming said edges, said pairs of rolls being disposed along an arcuate path,

said units in each station being serially arranged to sequentially form said edges;

drive means for driving said rolls;

hinge means interconnecting adjacent ones of said units for relative pivotal adjustment about substantially parallel axes; and

means connected to said units for adjusting the angular relationship between adjacent ones of said units comprising a threaded spindle rotatable about an axis perpendicular relative to said substantially parallel axes and threadedly engaging adjacent ones of said units.

4,048,828

PROCESS FOR MANUFACTURING MONOBLOC WHEELS BY DIE STAMPING AND ROTARY EXTRUSION

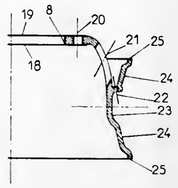
Roger Lucas, Issoire, and Jacques Auberger, Jumeaux, both of France, assignors to Forgeal, Societe pour le Forgeage et l'Estampage des Alliages Legers, Paris, France

Filed Mar. 9, 1976, Ser. No. 665,264

Claims priority, application France, Apr. 9, 1975, 75.11726; Dec. 3, 1975, 75.37697

Int. Cl.² B21D *22/14*; B21H *1/02*

U.S. Cl. 72—83 **10 Claims**



1. A process for manufacturing monobloc metal wheels for vehicles from a rough shaped cylindrical disc comprising the following steps:

a. a first die stamping (M1) which forms the wheel disc and on its circumference a thick bead oriented in a direction parallel to the wheel axis and the inner side of the wheel;

b. a second die stamping (M2) which produces an elongation of said bead in the same direction as in said first die stamping and forms in a rough shape a small flange of the rim;

c. a third die stamping (M3) which forms an additional elongation of said bead in the same direction as in the first and second die stamping and further forms said small flange of the rim in almost its final shape;

d. cylindrical rotary extrusion of the disc to provide additional elongation in the same direction parallel to the axis and the inner side of said wheel;

e. widening out in a press of the part elongated in step (d) which roughly shapes a large flange of the rim; and

f. conical rotary extrusion to complete the shaping of said large flange.

4,048,829

GASKET WINDING MACHINE

Hector Thomas, 59 Melvill St., Southdale, Johannesburg, Transvaal, South Africa

Filed July 29, 1974, Ser. No. 492,818

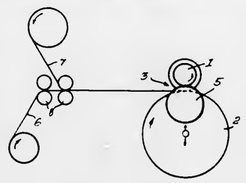
Claims priority, application South Africa, July 6, 1973, 73/4584; July 12, 1973, 73/4732

Int. Cl.² B21C *47/04*

U.S. Cl. 72—148 **12 Claims**

1. Apparatus suitable for manufacturing spirally wound gaskets, comprising at least two co-planar forming discs having differing diameters, defining between them a nip adapted to receive gasket-forming material so as to wind the material around the smaller diameter disc, and at least one guide member for the material located on each side of the larger diameter

disc, and mounted on an axis displaced from the axes of said forming discs, the arrangement being one wherein at least one forming disc is radially movable relative to the other forming



disc and movable with respect to said guide member, and the radially movable forming disc is flanked by at least a portion of the guide member and movable in the space between the guide members.

4,048,830

FOUR-ROLLER SHEET BENDING MACHINES

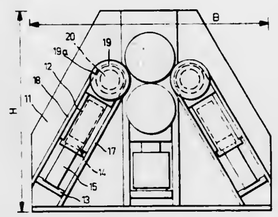
Fritz Eisener, Neuzlingen, Switzerland, assignor to Chr. Hausler AG, Switzerland

Filed Dec. 23, 1976, Ser. No. 753,594

Claims priority, application Switzerland, Jan. 29, 1976, 1103/76

Int. Cl.² B21D *5/14*

U.S. Cl. 72—175 **3 Claims**



1. A four-roller sheet bending machine comprising, in combination:

a frame;

a pair of nip rollers;

two side-rollers disposed on respectively opposite sides of said nip rollers;

four pressure-fluid operable devices each displaceably supporting a respective end portion of one of said side-rollers, each said device comprisng a cylinder and a piston provided with a rod extending through one end portion of said cylinder to bear against said frame, the respective other end portion of each said cylinder defining a housing;

bearing means for the respective side-roller end portion provided in each housing; and

respective guide means on said frame displaceably mounting each said cylinder.

4,048,831

TWO-ROLLER DRIVING DEVICE

Wolfgang Fabian, Dortmund, Hombruch; Konrad Klein, Dortmund, Wambel, and Theodor Sevenich, Dortmund, all of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Germany

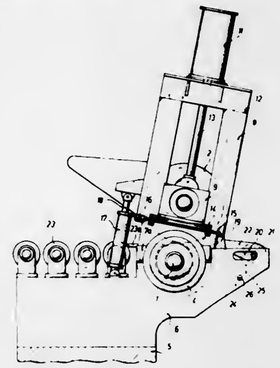
Continuation of Ser. No. 603,945, Aug. 12, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,706

Claims priority, application Germany, Aug. 13, 1974, 2438759

Int. Cl.² B21B *39/12*

U.S. Cl. 72—251 **8 Claims**

1. For use in connection with an underground reel in a rolling mill for band-shaped rolling stock, a two-roll driving device which includes in combination: frame means, a first driving roll rotatably journalled in said frame means, a stand independently pivotable about the axis of rotation of said first roll, a second roll supported by said stand for rolling cooperation with said first roll, adjusting means supported by said stand and operatively connected to said second roll for selectively adjusting said second roll relative to said first roll, and power operable pivoting means operatively connected to said stand independently to pivot the latter and thereby said second roll from a first position in which said second roll and said first roll have their axes of rotation located in an at least approximately common vertical plane to a second position in which their axes of rotation are located in an at least approximately common inclined plane forming an acute angle with said approximately common vertical plane while that part of said inclined plane which extends through said second roll is located behind said common vertical plane when viewing said driving device in the direction in which said first and second rolls are intended to pass the rolling stock to be rolled therethrough, said second roll also being pivotable by said power operable pivoting means from said second position to said first position.



4,048,832

SEPARATING DEVICE FOR REMOVING THE PRESS SKIN FROM A COMBINED EXTRUSION DISC

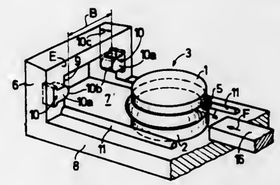
Richard Raab; Kurt Spindler, both of Rothenbach; Herbert Brand, Henfenfeld, and Leonard Gast, Nuraberg, all of Germany, assignors to DIEHL, Nuraberg, Germany

Filed Feb. 3, 1976, Ser. No. 654,755

Claims priority, application Germany, Feb. 15, 1975, 2506447

Int. Cl.² B21C *23/00*

U.S. Cl. 72—255 **7 Claims**



1. A separating device for separating the ring-shaped press skin from a composite extrusion disc comprising a press disc and a stripper disc superimposed but spaced from each other by an annular intermediate space for receiving the press skin,

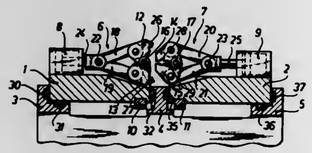
especially for copper containing alloys and difficult to press metals and alloys, which includes in combination; a separating head having a passage therethrough, a slideway leading into said passage for receiving and slidingly supporting a composite extrusion disc from which the press skin is to be removed, and two blocks connected to said separating head and located opposite to each other while projecting into said passage so as to be able to engage the annular intermediate space between a press disc and a stripper disc of a composite extrusion disc to be freed from a press skin at said intermediate space when such composite extrusion disc enters said passage, the distance between said blocks being within the range of from the length of the inner diameter of the intermediate space of the composite extrusion disc to be stripped of the press skin thereon to the total length of said inner diameter plus the thickness of the press skin to be stripped.

4,048,833

GRIPPING ARRANGEMENT

Horst Loreaz, Solingen, Germany, assignor to Kieserling & Albrecht, Solingen, Germany

Filed Dec. 16, 1975, Ser. No. 641,188
Claims priority, application Germany, Dec. 19, 1974, 2460168
Int. Cl.² B21C *1/14*
U.S. Cl. 72—290 **10 Claims**



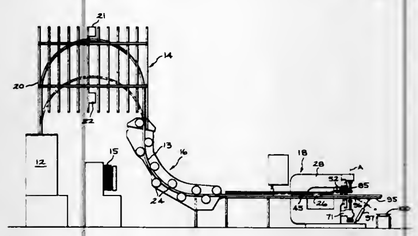
7. In a machine for treating elongated workpieces, such as a drawing bench, stripping machine and the like, a combination comprising a die having an opening for passage of a workpiece therethrough; and means for continuously advancing the workpiece in an advancement path through said opening of said die, including elongated guide means parallel to a section of the advancement path downstream of said die, a pair of supports each mounted on said guide means for reciprocatory movement along the same in a reciprocatory path that is parallel to, offset from, and coextensive with, the advancement path section and the reciprocatory path of the other support; means for reciprocating each of said supports in the reciprocatory path thereof in an advancement and a return direction, respectively, past the other support; at least a pair of jaws for each respective support; means for mounting each respective jaw pair on the respective support for displacement relative thereto only in a pivoting movement between a closed and an open position in which said respective jaw pair engages, and is disengaged from, the workpiece, respectively, and for joint reciprocation with said respective support, when in said closed position, in a first path having a path portion about the advancement path section in common with the first path of the other jaw pair, and, when in said open position, in a second path spaced from the advancement path section and from said common path portion; and means for so displacing said jaws of each respective pair between said positions thereof that at least one of said jaw pairs is always in said closed position thereof while moving with the respective support in said advancement direction for engaging the workpiece and continuously advancing the same through said opening of said die, while each of said jaw pairs is in said open position thereof at least while moving with the respective support in said return direction past the other jaw pair for avoiding interference with the movement of the latter by moving in said second path that is outside said common path portion.

4,048,834

APPARATUS FOR FORMING SERPENTINE HEAT EXCHANGERS

Charles R. Durbin, and Bernard W. Schoenbachler, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Apr. 15, 1976, Ser. No. 677,505
Int. Cl.² B21D *11/07, 53/06*
U.S. Cl. 72—294 **3 Claims**



1. An apparatus for forming a serpentine heat exchanger having a predetermined length from a continuous tubing including a forming and bending head means for successively bending increments of said continuous tubing in alternate directions about a central axis comprising:

a. tube supply means for receiving said continuous tubing;

b. support means associated with said supply means for receiving said tubing with its longitudinal axis in a plane substantially perpendicular to said central axis;

c. tube shifting means arranged on said support means for lateral movement relative to said central axis for successively placing the increments of said tubing to be bent on alternate sides of said central axis, including holding means being movable alternatively into engagement with opposite side walls of said continuous tube diametric to the rotational direction of said forming head to prevent lateral movement of said continuous tubing during the bending operation while said increment is positioned substantially parallel with said continuous tube;

d. tube feed means arranged on said support means for advancing said tubing along its longitudinal axis in predetermined increments relative to said head so that a selected portion of said increment to be bent in said plane is arranged in cooperative relationship with said head means, including an advancing member slidably mounted on a guide member for longitudinal movement in a path parallel to said plane, tube holding means mounted on said advancing member being movable into engagement with said tubing when said feed means is in its retracted position relative to said central axis, stop means adjustably arranged longitudinally on one of said members positioned to cooperatively engage damping members on the other of said members when said feed means is in said retracted position to regulate the length of said increment advanced longitudinally relative to said central axis by said advancing member;

e. said head means including a pair of shaping elements diametrically arranged on said central axis on either side of said plane being dimensioned to deform said selected portion into an oval cross section having its major axis lying parallel with said plane;

f. drive means associated with said head means being operable when said selected portion is in the advanced position between said shaping elements for moving said head means longitudinally along said central axis to move said shaping elements into engagement with said selected portion of said tube with sufficient pressure to deform said portion into said oval cross section; and means for imparting a successive rotational oscillation to said head means

in one direction while the shaping elements are in engagement with said selected portion to bend said increment in said selected portion substantially 180° about said central axis so that said increment is substantially parallel to said continuous tubing;

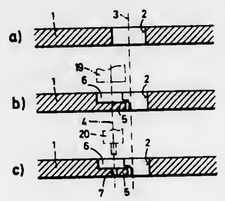
g. cutoff means positioned relative to said continuous tubing being movable radially through said longitudinal axis including a first cutter on one side of said plane arranged for cooperatively engaging a second cutter on the other side of said plane, said first cutter is mounted for lateral movement with said shifting means and said second cutter includes a plurality of cutting area so that said first cutter is aligned with one of said cutting areas, means for moving said cutters perpendicular to said plane and through said tubing to sever said heat exchanger from said continuous tube after a predetermined number of successive bending operations.

4,048,835

METHOD OF PUNCHING A SMALL HOLE IN A PRECISION MECHANICS WORKPIECE

Urs Giger, Solothurn, Switzerland, assignor to Eta A.G. Ebauches-Fabrik, Switzerland

Filed Aug. 27, 1976, Ser. No. 718,213
Claims priority, application Switzerland, Sept. 16, 1975, 11958/75
Int. Cl.² B21D *53/10*
U.S. Cl. 72—334 **4 Claims**



1. In a method of punching a small hole in a precision mechanics workpiece such as a component of a timepiece movement, which includes exerting pressure upon a predetermined region of a workpiece in such a way that a portion of the material of which said workpiece is made yields and is displaced so that the thickness of said region becomes less than the thickness of the remainder of said workpiece, the improvement comprising the steps of:

exerting said pressure in such a way that said material is displaced in the direction of said pressure and yields at right angles to said pressure to form a region of reduced thickness, and

punching said hole of a diameter from about 0.1 to 0.3 mm in said region at a location such that the distance between the edge of said hole and the edge of said region is greater than the diameter of said hole and the area of said region is at least five times as great as the cross-sectional area of the hole.

4,048,836

FORMING AND HEAT TREATING PROCESS

Robert A. Eddy; Norman F. Gustafson, both of Westboro, and Stephen J. Erwin, North Grafton, all of Mass., assignors to Wyman-Gordon Company, Worcester, Mass.

Continuation of Ser. No. 293,092, Sept. 28, 1972, abandoned, which is a continuation of Ser. No. 41,947, June 1, 1970, abandoned. This application Aug. 26, 1976, Ser. No. 718,050
Int. Cl.² B21J *1/06*
U.S. Cl. 72—364 **3 Claims**

1. A process for forming and heat treating an aluminum alloy article, comprising the steps of:

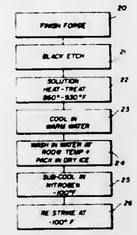
a. forging the article in a set of finish dies,

b. black etching the article,

c. solution heat treating the article at a temperature in the range from 830° F. to 930° F.,

d. immediately cooling the article in warm water at a temperature in the range from 140° F. to 180° F., and removing it as soon as it reaches water temperature,

e. immediately cooling the article in water at room temperature,



f. immediately packing the article in dry ice,

g. sub-cooling the article in nitrogen to −100° F., and

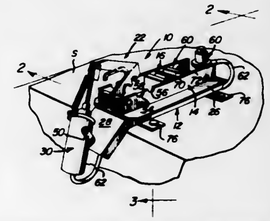
h. restriking the article in the said finish dies, the article being stored after restriking in a nitrogen atmosphere at −100° F., being checked for configuration, and being reworked if necessary before being allowed to return to room temperature.

4,048,837

CHOKER STRAIGHTENER

Clark V. Spencer, 817 NW. A St., and Benjamin G. Rondeau, 1170 NE. 10th, both of Grants Pass, Oreg. 97526

Filed Aug. 9, 1976, Ser. No. 713,050
Int. Cl.² B21D *7/06*
U.S. Cl. 72—387 **9 Claims**



1. A choker straightener, comprising, in combination:

a. a base member;

b. two laterally spaced cable support members arranged on the base member for supporting a bent portion of cable between the support members;

c. lever means pivotally mounted on the base member for movement toward and intermediate of the cable support members and selectively engaging a bent portion of cable intermediate the associated cable support members and straightening the bent portion; and

d. power means mounted on the base member and connected to the lever means for moving the lever means relative to the cable support members, the base member including a first mounting surface and a second mounting surface disposed at an obtuse angle with respect to the first mounting surface, the cable support members being mounted on the first mounting surface and the power means including a linear fluid motor mounted on the second support surface, with the lever means extending longitudinally and mounted on the first mounting surface adjacent to and

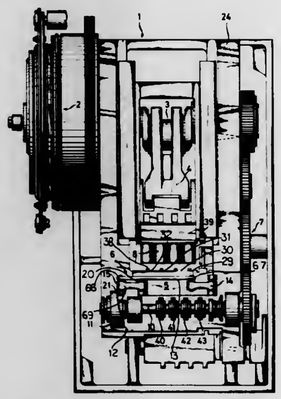
extending longitudinally away from the second mounting surface and connected to the fluid motor.

4,048,838

ARRANGEMENT FOR CONTROLLABLY RECIPROCATING A WORKPIECE GRIPPING ASSEMBLY OF A MULTI-STAGE PRESS

Ernst Faymonville, Dusseldorf-Wersten, Germany, assignor to Maimedie & Co. Maschinenfabrik, Dusseldorf, Germany

Filed Nov. 4, 1976, Ser. No. 738,869
Claims priority, application Germany, Nov. 4, 1975, 2549319
Int. Cl.² B21D *43/5*
U.S. Cl. 72—405 **3 Claims**



1. In a multi-stage press, a plurality of aligned, workpiece-holding first stations spaced along a first direction and supported in the frame, a first shaft rotatably supported in the frame, a first control disc secured to the first shaft and having an axially contoured front surface, an elongated carriage extending in a first plane over the first stations for supporting a plurality of selectively operable gripper means to engage and transport workpieces between successive ones of the first stations, a second shaft, a roller supported on the second shaft, means for connecting one end of the carriage to the second shaft, first and second elongated connecting rods having corresponding first and second ends, means for coupling the first end of the first rod to the second shaft, means for connecting the other end of the carriage to the first end of the second rod, means for individually pivotally mounting the second ends of the first and second connecting rods to the frame, means for urging the roller into steady contact with the contoured front surface of the control disc whereby the rotation of the first shaft about its axis will cause a positive movement of the carriage along a reciprocatory path in the first plane corresponding to each point of movement of the control disc about its axis with a minimum of play, and means for rotating the first shaft about its axis.

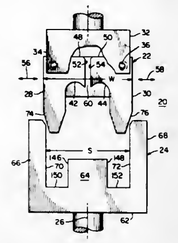
4,048,839

DIE MEANS HAVING WORKPIECE RELEASING MEANS

Joseph Peterpaul, West Orange, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Oct. 14, 1976, Ser. No. 732,325
Int. Cl.² B21D *37/12*
U.S. Cl. 72—412 **12 Claims**

1. A die set for selectively deforming a ferrule or similar article comprising: a first die member and a second die member; said first and said second die members being arranged for movement towards and away from one another along a central axis; said first die member having a first discrete die element, a second discrete die element, a support means, a first pin member loosely coupling said first die element to said support means, and a second pin member loosely coupling said second die element to said support means, said first and said second die elements being arranged in juxtaposed relationship on opposite sides of said central axis and moveable towards and away from said central axis along a common plane, said first and said second pin members each extending through a respective enlarged transverse opening in a respective one of said first and said second die elements and engaging said support means, the



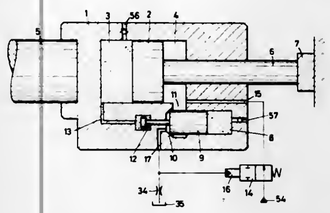
diameter of said transverse openings being sufficiently greater than the diameter of said pin members so as to permit each of said first and said second die elements to freely float thereabout; said second die member having a central anvil portion flanked by opposing leg portions selectively spaced apart to receive therebetween said first and said second die elements of said first die member and to move said first and said second die elements towards one another adjacent said central axis as said first and said second die members are brought together in mating relationship.

4,048,840

APPARATUS FOR PRODUCING AN INSTANTANEOUS PRESSURE ON A WORKPIECE

Korst Knabel, Uedesheimer Strasse 5, 4000 Dusseldorf, Germany

Filed Dec. 22, 1976, Ser. No. 753,483
Claims priority, application Germany, Jan. 13, 1976, 2600948
Int. Cl.² B21J *9/12*
U.S. Cl. 72—437 **20 Claims**



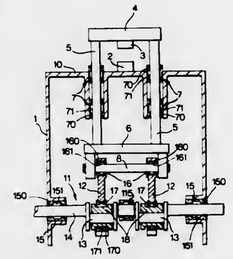
1. Apparatus for producing an instantaneous pressure on a workpiece, comprising a main cylinder having a pair of opposite ends; a working piston axially movable in said main cylinder between a working stroke and a return stroke and dividing the main cylinder into two compartments; a piston rod projecting through one of the compartments and one of the ends of the main cylinder to the outside of the latter and engaging with the free end thereof a workpiece; a gas under pressure in the other compartment and acting on one side of the working piston tending thereby to move said working piston along its working stroke; means including a control valve for feeding a pressure fluid into said one compartment to act on the other side of said working piston; means forming an enclosed space communicating with said one compartment so as to be filled with said pressure fluid; a control piston movable from a first position extending into said space to a second position withdrawn out of said space, one end face of the control piston being, in said first position, free of pressure, and pressure means acting on the other face of the control piston for biasing the same to said first position, said control piston having a volume to produce during its movement to said second position an instantaneous relief of the pressure of the pressure fluid acting on the other side of said working piston so that the gas pressure acting on the one side of the working piston will produce a corresponding instantaneous pressure by the piston rod on the workpiece; and means for moving said control piston from said first to said second position thereof.

4,048,841

FORMING APPARATUS

Anthony John Kent, Arbroath, Scotland, assignor to Matrix Engineering Limited, Scotland

Filed Apr. 30, 1975, Ser. No. 573,301
Claims priority, application United Kingdom, May 1, 1974, 19168/74
Int. Cl.² B21J *9/18*
U.S. Cl. 72—450 **7 Claims**



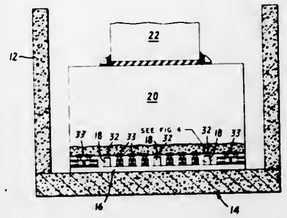
1. Forming apparatus comprising a support structure; a bed fixedly carried by said support structure for carrying a first part of form tooling; crosshead means consisting of two crosshead portions rigidly connected with one another, one of said crosshead portions being adapted to carry a second complementary part of form tooling for co-operation with said first part thereof; shaft means mounted on the second of said crosshead portions; linear motion hydrostatic bearing means mounting said crosshead means for guided reciprocation thereof relative to the support structure and for accurate registration of the co-operating form tooling parts; a single crankshaft rotatably mounted in the support structure and having a pair of spaced apart axially aligned eccentric crank pins; a pair of laterally spaced apart connecting rods each rotatably mounted about a corresponding crank pin of the crankshaft by respective rotary hydrostatic bearing means, the other ends of the connecting rods being pivotally connected by respective further rotary hydrostatic bearing means to the shaft means of said second of said crosshead portions, whereby synchronized reciprocation of the connecting rods is obtainable in imparting reciprocation to the crosshead means, the spacing apart of the crank pins and of the connecting rods being sufficient to impart reciprocation to the crosshead means in a balanced manner.

4,048,842

SHOCK AND VIBRATION CONTROL SYSTEM FOR FORGING HAMMER

Paul Baratoff, Jackson Heights, N.Y., assignor to Korfund Dynamics Corporation, Westbury, N.Y.

Filed Oct. 21, 1976, Ser. No. 734,586
Int. Cl.² B21J *13/04*
U.S. Cl. 72—455 **8 Claims**



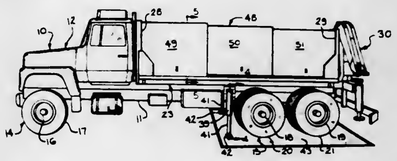
1. A shock and vibration control system for a forging hammer comprising an inertia block having the forging hammer mounted thereon, a foundation including isolator-supporting portions located under the inertia block and having horizontal upper surfaces located a distance X below the bottom of the inertia block, a multiplicity of shock and vibration isolators supported on said surfaces, at least one of the isolators including friction damper means for damping vertical vibration and vibration in a first horizontal direction of the inertia block and at least one other of the isolators including friction dampers for damping vertical vibration and vibration in a second horizontal direction perpendicular to the first direction of the inertia block, and at least one structural spacer interposed between each of the isolators and the inertia block for load support of the inertia block and forging hammer on the isolators, each spacer having a height S substantially equal to the difference between the distance X and the loaded height H of the isolator and the height S of each spacer being greater than the sum of (1) the difference between the unloaded height of the isolator and the loaded height and (2) the minimum height of a jack adapted to load the isolator in place under the inertia block, the aforesaid dimensions and dimensional relationships between the dimensions X, S and H permitting each isolator to be inserted in unloaded condition under the inertia block and to be loaded by a jack and the spacers then inserted between the loaded isolator and the inertia block.

4,048,843

SCALE TESTING VEHICLE

Glenn G. Dunbar, 2608 Overbrook Drive, Toledo, Ohio 43614

Filed July 12, 1976, Ser. No. 704,291
Int. Cl.² G01G *23/00*
U.S. Cl. 73—1 B **9 Claims**



1. A scale testing vehicle for use on platform scales having at least one scale section, said scale testing vehicle including a chassis, said chassis mounting a front axle assembly and a rear axle assembly, a weight bed mounted on said chassis, a plurality of uniform weight units positioned on said bed, crane means mounted adjacent said chassis for lifting said weight units between said bed and ground elevation and lifting cylinder

means mounted adjacent and forward of said rear axle assembly, said lifting cylinder means being movable to an extended position wherein said front axle assembly is elevated and the entire static load of such vehicle and weight units is applied to said lifting cylinder means and said rear axle assembly, such load being applied within the confines of a single one of such scale sections.

4,048,844

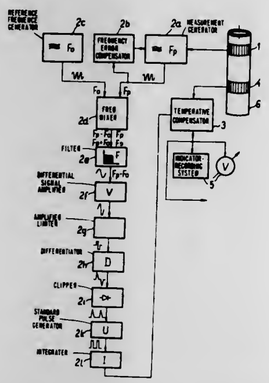
ELECTRIC SYSTEM OF METER FOR MEASUREMENTS OF DENSITY OF MIXTURES CONVEYED IN A PIPELINE

Andrzej Dunikowski, ul. Sienkiewicza 26; Jan Bednarczyk, ul. Chodowieckiego 5 m.39, both of Krakow; Jerzy Keska, powiat Krakow, Jaskowice 1; Tadeusz Pisarkiewicz, powiat Mlawa, Rydzyn Szlachecki, and Andrzej Zamarski, ul. Marchlewskiego 22/2, Krakow, all of Poland

Continuation of Ser. No. 503,911, Sept. 6, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 669,461

Int. Cl.² G01N *27/22, 9/00*

U.S. Cl. 73—32 R **2 Claims**



1. An electric system for a meter for the measurement of the content of a mixture being conveyed in a pipeline, said system comprising a capacity sensor installed in said pipeline, a mixer, a compensation system for frequency variations, a capacitance transducer including a measurement generator having a first input connected to the capacity sensor, a second input connected to the compensation system for frequency variations and an output connected to said mixer, a reference frequency generator having an output connected to said mixer, a series circuit connected to the output of said mixer including a low-pass filter, an amplifier, an amplitude limiter, a differentiating system, a pulse clipper, a generator of standard pulses and an integrating system; the series circuit having an output, an indicator-recording means, means for compensating temperature coupling the output of the series circuit with the indicator-recording means, and a temperature sensor in said pipeline, said means for compensating temperature being connected with the temperature sensor.

4,048,845

CANNING JAR LID TEST DEVICE AND METHOD

Ray Gilbert, Anaheim, Calif., assignor to Glass Containers Corporation, Fullerton, Calif.

Filed Oct. 14, 1976, Ser. No. 732,271

Int. Cl.² G01M *3/06*

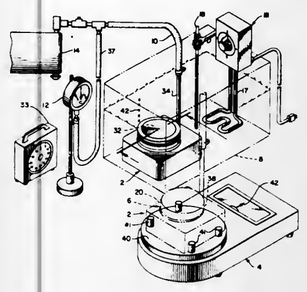
U.S. Cl. 73—45.5 **5 Claims**

1. An apparatus for testing the characteristics of jar closures comprising;

a chamber assembly, said chamber assembly including a base and a mock jar finish integrally attached thereto, said base and said mock jar finish defining a closed chamber upon fastening a jar closure to said finish, said closed chamber including a duct communicating between the interior and exterior of said chamber;

a pressure varying means communicating through said duct into said chamber whereby the pressure in said chamber may be varied;

means for measuring the pressure in said chamber;



a temperature bath adapted to allow immersion of said chamber assembly into said bath, whereby said assembly may be brought to a predetermined temperature;

means for detecting the passage of material through said jar closure upon creation of a sufficient pressure differential between the interior and exterior of said closed chamber; and

means for measuring the torque applied to a threaded jar closure when threaded onto the mock jar finish.

4,048,846

PRESSURE RESPONSIVE APPARATUS

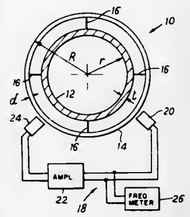
Reginald Catherall, Woking, England, assignor to Bell & Howell Limited, Basingstoke, England

Filed May 20, 1976, Ser. No. 688,428

Claims priority, application United Kingdom, May 30, 1975, 23719/75

Int. Cl.² G01N *29/02*

U.S. Cl. 73—67.2 **27 Claims**



1. Apparatus responsive to the pressure of a fluid contained in or surrounding a stiff but resilient hollow body, comprising a stiff but resilient ring, $2n$ (where n is an integer greater than 1) equi-spaced radially extending struts connected between a periphery of said ring and a peripheral surface of said body to support said ring concentrically with said body, means for exciting natural vibrations of said ring at a resonance frequency and means for providing a signal representative of the frequency of said vibrations.

4,048,847

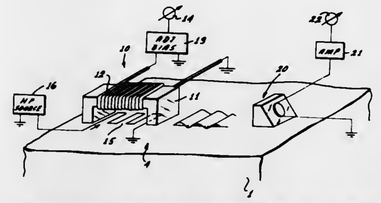
NONDESTRUCTIVE DETECTION OF STRESS

George A. Alers, and Robert B. Thompson, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed July 14, 1976, Ser. No. 705,213

Int. Cl.² G01N *29/00*

U.S. Cl. 73—67.5 R **30 Claims**



1. A method of measuring stress in a part of a structural material comprising the steps of:

generating magnetically in the material vibrations as a result of alternation of magnetostriction in the material and in a well defined first location of the structural part;

detecting at a different location the vibrations as generated and launched from the first location, thereby producing a signal having a particular amplitude;

deriving from the preceding steps a representation of the efficiency of the generation of the vibrations at said first location; and

comparing the representation with a representation of a generation of vibrations generated and detected in a similar manner but at a different location of the same part or at a location of a different part of the same material.

4,048,848

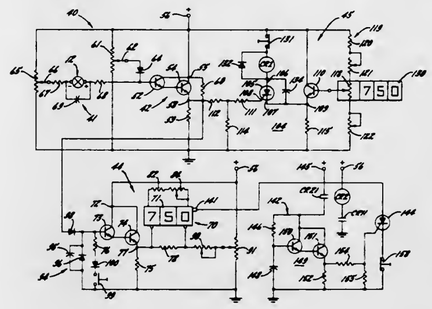
LOAD MONITORING SYSTEM

Frank R. Dybel, 981 Wingate Road, Olympia Fields, Ill. 60461

Continuation of Ser. No. 521,466, Nov. 6, 1974, abandoned. This application May 3, 1976, Ser. No. 682,463

Int. Cl.² G01B *7/16*

U.S. Cl. 73—88.5 R **28 Claims**



11. A system for sensing stresses and monitoring tonnage loads that are intermittently applied to a deformable member comprising a transducer having a pair of mounting means fixed to said member substantially in line with the stress to be detected, said transducer including a piezoelectric element interposed between said mounting means for generating output electrical signals having voltages substantially proportional to the loads applied to said member, amplifying means coupled to said transducer for amplifying a signal produced by said transducer, a load indicating circuit coupled to said amplifying means, said load indicating circuit including a digital readout meter which has a display of a plurality of numerical digits and is actuated in response to said transducer signals, a peak holding circuit means for maintaining a transducer signal to said amplifying means for a sufficient time to enable said meter to fully digitize the numerical value of successive loads applied to said member in response to said transducer signals, said peak holding circuit means including a capacitor coupled between an input side of said amplifying means and ground, and a diode connected between said transducer and amplifying means and poled to allow conduction of current from said capacitor only in the direction of said amplifying means.

4,048,849

METHOD AND APPARATUS FOR MEASURING SURFACE FLATNESS OF MATERIAL

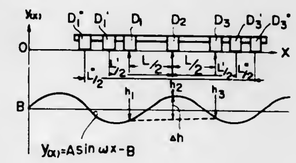
Makio Gocho; Masanori Ota, and Tatsuo Kuraishi, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed July 3, 1975, Ser. No. 592,817

Claims priority, application Japan, July 22, 1974, 49-83309

Int. Cl.² G01B *7/28*

U.S. Cl. 73—105 **7 Claims**



1. In an apparatus for measuring the surface flatness of a metal product with a plurality of detectors arranged opposite to said product to be measured to measure in non-contacting manner the gap between said detectors and the surface of said product, the combination comprising:

a reference plane arranged opposite to the surface of said product;

a first detector means including at least three detectors respectively arranged at each of a first set of at least three detecting points which are arranged at a predetermined substantially equal distance from each other on said reference plane along a direction of measurement, and a second detector means including at least three detectors respectively arranged at each of a second set of at least three detecting points using in common the detector of said first detector means which is located at said central detecting point of said first set of detecting points;

arithmetic means for receiving and operating on measured signal values from only one of said first and second detector means respectively associated with said first and second sets of detecting points;

means for selectively coupling only one of said first and second detector means to said arithmetic means at a time;

recording means coupled to said arithmetic means;

analyzing means coupled to said arithmetic means;

setting means coupled to said analyzing means for presetting the value of a distance L between the detecting points on both sides of the central detecting point in said selected set of three detecting points; and

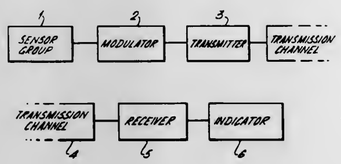
means coupled to said analyzing means for measuring the distance of relative motion between said product and only said selected set of detecting points which are defined by said selected detector means.

4,048,850

MECHANISM FOR GAUGING THE CATCH WITHIN A TRAWL NET

Kjell Øystein Ramberg, and Björn Kirknes, both of Horten, Norway, assignors to Simrad A.S., Norway

Filed Oct. 7, 1976, Ser. No. 730,479
Claims priority, application Norway, Oct. 8, 1975, 753403
Int. Cl.² G01L 5/00
U.S. Cl. 73—133 R **9 Claims**



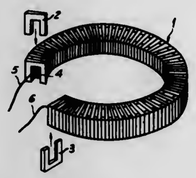
1. Apparatus for gauging the catch within a trawl net comprising:
- at least one sensor disposed to sense a change in the geometry of the trawl net and providing an output signal indicative of such change;
- a modulator receiving the output signals from said sensor and in response thereto generating a modulated signal;
- a transmitter coupled to said modulator for receiving the modulated signal and transmitting such signal;
- a receiver detecting the transmitted signal as an indication of the state of said sensor; and
- an indicator coupled to said receiver and providing an indication of the state of said sensor.

4,048,851

AXIAL AND ANNULAR MAGNETO-ELASTIC DYNAMOMETERS

Jean Louis Portier, Paris, France, assignor to Soletanche, France

Continuation of Ser. No. 420,276, Nov. 29, 1973, abandoned.
This application Apr. 15, 1975, Ser. No. 568,173
Claims priority, application France, Oct. 9, 1973, 73.35986
Int. Cl.² G01R 33/12
U.S. Cl. 73—141 A **12 Claims**



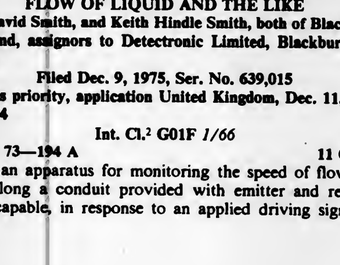
1. A stress measuring device, comprising:
- a plurality of U-shaped pieces joined together to form a ferro-magnetic core having an uninterrupted annular cylindrical shape, each U-shaped piece having a base portion and a pair of leg portions extending from said base portion, adjacent ones of said U-shaped pieces being located with respect to each other such that the base portion of one U-shaped piece lies adjacent the open end of the next adjacent U-shaped piece said adjacent U-shaped pieces together defining a central annular duct within said core; and
- means for detecting a compressive stress axially applied to said ferro-magnetic core, comprising an electric winding located in said annular duct in the form of a ring substantially surrounded by said core such that two ends of said winding comprising electrical leads extend out from said duct through an opening in a wall of said core.

4,048,852

INTEGRATING CALORIMETER

Kaichi Sakakibara, Kyoto, and Hiroyuki Sumida, Kagawa, both of Japan, assignors to Kabushiki Kaisha Takuma and Ryusho Sangyo Kabushiki, both of Osaka, Japan

Filed June 9, 1976, Ser. No. 694,289
Claims priority, application Japan, June 12, 1975, 50-71798; June 12, 1975, 50-71800; June 12, 1975, 50-80369[U]
Int. Cl.² G01K 17/16
U.S. Cl. 73—193 R **8 Claims**



1. An integrating flow calorimeter means for measuring heat exchanged between a load equipment and a liquid circulating therethrough, which comprises:
- an electric battery mounted integral with the integrating flow calorimeter means;
- a differential temperature measurement means operable when connected to said battery, said differential temperature measurement means including a liquid supply temperature sensing means for producing a first voltage proportional to the temperature of the liquid being supplied to the load equipment and a liquid exhaust temperature sensing means for producing a second voltage proportional to the temperature of the liquid being exhausted from the load equipment, each of said temperature sensing means comprising a temperature sensor of semiconducting materials having a P-N junction therein;
- a switch means for connecting said differential temperature measurement means to said battery, when said switch means is closed, said switch means being a normally open, electrically operated switch means;
- a liquid flow measurement means for continuously measuring the quantity of liquid being supplied to said load equipment, and for closing said switch means each time a predetermined quantity of liquid has been supplied to the load equipment; and
- integrating means, adapted to receive signals from said differential temperature measurement means, for indicating the total heat supplied to the load equipment.

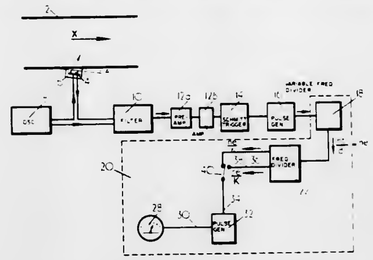
4,048,853

METHOD AND APPARATUS FOR MONITORING THE FLOW OF LIQUID AND THE LIKE

Peter David Smith, and Keith Hindle Smith, both of Blackburn, England, assignors to Detectronic Limited, Blackburn, England

Filed Dec. 9, 1975, Ser. No. 639,015
Claims priority, application United Kingdom, Dec. 11, 1974, 53598/74
Int. Cl.² G01F 1/66
U.S. Cl. 73—194 A **11 Claims**

1. In an apparatus for monitoring the speed of flow of a liquid along a conduit provided with emitter and receiver means capable, in response to an applied driving signal, of emitting a continuous acoustic signal of predetermined frequency into the liquid and capable of receiving at least a portion of the reflected signal which due to the Doppler effect has a different frequency than the emitted signal; said apparatus being connectable to said emitter and receiver means, the improvement comprising, oscillatory signal generating means for producing the driving signal at said predetermined frequency, filter means for demodulating the emitted frequency from the received frequency to give a first electrical output signal at a frequency equal to the Doppler difference frequency, first variable frequency divider means for dividing the



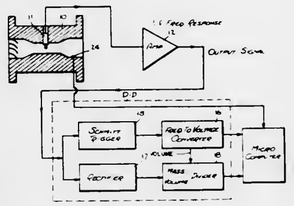
Doppler difference frequency by a first selectively variable predetermined divisor to give an electrical signal at a first quotient output frequency which is a predetermined function of the Doppler difference frequency per unit increment of liquid speed relative to the emitter and receiver means, second variable frequency divider means to further divide said first quotient frequency by a second selectively variable predetermined divisor to give an electrical signal at a second quotient output frequency correlated to the speed of the liquid, and means for utilizing said signal at the second quotient frequency to indicate variation of a parameter with respect to time which derives from movement of the liquid along the conduit.

4,048,854

SYSTEM FOR DETERMINING THE RATIO OF OIL TO WATER IN A METERED FLUID STREAM

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Division of Ser. No. 668,457, May 19, 1976, Pat. No. 4,010,645.
This application Sept. 17, 1976, Ser. No. 724,455
Int. Cl.² G01F 1/32
U.S. Cl. 73—194 VS **8 Claims**
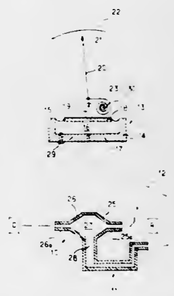


1. A system for metering a fluid stream constituted by a mixture of oil and water to determine the volumetric ratio of oil to water in said mixture, said system comprising:
- A. a vortex meter having a flow tube through which the stream is conducted to produce a meter signal whose frequency depends on the volumetric flow and whose amplitude depends on the mass flow of the stream;
- B. means solely responsive to the frequency of the meter signal to produce a volumetric flow signal;
- C. means solely responsive to the amplitude of the meter signal to produce a mass flow signal;
- D. means to divide the volumetric flow signal by the mass flow signal to produce a density signal;
- E. means to sense the temperature of the stream passing through said tube to produce a temperature signal; and
- F. an electronic computer whose memory has stored therein the relationship between water density and temperature and the relationship between oil density and temperature, said computer having fed thereto said volumetric, density and temperature signals and determining the respective volumes of oil and water in said mixture.

4,048,855

LIQUID LEVEL GAUGE PARTICULARLY FOR MOTORCYCLE

Jerome Sejournet, 53, rue du Ranelagh, 75016 Paris, France

Filed Sept. 27, 1976, Ser. No. 727,154
Claims priority, application France, Sept. 29, 1975, 75.29757
Int. Cl.² G01F 23/16
U.S. Cl. 73—299 **4 Claims**



1. A gasoline gauge, particularly for a motorcycle, for measuring the level of gasoline contained in a fuel tank, said gauge comprising a pipe line linking the lower portion of the tank and at least one carburetor, a take-off member formed in said pipe line and linked by siphon to a tube filled with gasoline when the gauge is in use, said siphon being effective to prevent passage of air into said tube when the tank is empty and said tube having a cross section sufficiently small so as effectively to attenuate pressure fluctuations due to vibrations, a pressure gauge device including a fluid-tight chamber, a wall of which includes a movable diaphragm, said chamber being linked to said tube, a removable plug arranged to close an opening in said chamber to facilitate the filling thereof with gasoline from the tank, and a display needle attached to a small plate carried by the diaphragm and adjustable by a preliminary calibration on a zero division of an indicating scale when the tank is empty.

4,048,856

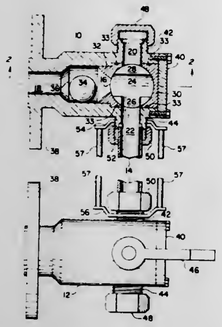
QUICK SHUT-OFF DIRECT READING LIQUID LEVEL INDICATOR

Donald W. Conrad, R.D. 1, Box 300, Duncannon, Pa. 17020

Filed June 30, 1976, Ser. No. 701,488
Int. Cl.² F16K 37/00; G01F 23/02
U.S. Cl. 73—324 **6 Claims**

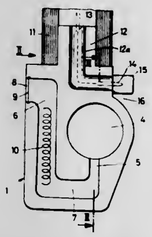
1. A direct reading liquid level indicator for monitoring liquid levels in liquid filled containers comprising:
- upper and lower valves, each of said valves having a inlet lateral walled passageway and an outlet sight glass walled passageway perpendicular to said lateral passageway to allow the flow of liquid from said container to pass through said valves;

a sight glass connected between said sight glass passageways of said upper and lower valves;
ball valves located in each of said upper and lower valves between said inlet and outlet passageways to allow connection and disconnection of said lateral and sight glass passageways by a 90° rotation of said ball valves;
an auxiliary passageway extending from the exterior of each of said valves to said ball valves parallel to and on the same axis as the sight glass passageways, whereby when both ball valves are in a closed position the lateral passage-



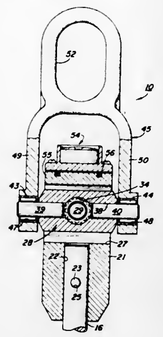
ways of said upper and lower valves are blocked off and an uninterrupted walled clean-out passageway is defined between said auxiliary passageways, said ball valves, said sight glass passageways and said sight glass;
a check valve located in said lateral passageways to seat against said ball valve and prevent the passage of liquid therethrough in the even said sightglass is broken while the liquid level indicator is in an open position; and
a perforated disk pressed into each of the walls of said lateral valve passageways to prevent said check ball valve from back sealing or leaving the valve.

4,048,857
SAMPLING A STEEL CONVERTER
Friedrich Bardenheuer, Immenhofweg 57, 415 Krefeld, and Gustav Kolb, 5984 Garbeck, both of Germany
Filed Dec. 17, 1976, Ser. No. 751,592
Int. Cl.² G01N *1/12*
U.S. Cl. 73—354 **9 Claims**



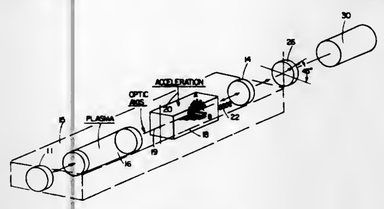
1. A probe for sampling steel from a blowing steel converter or the like, to be fastened to a tube, comprising:
a pair of elements with complementary mold cavity halves each to define mold cavities when assembled, the mold cavities including (a) a first, inner portion for the sampled steel; (b) a downwardly oriented inlet duct communicating with the first portion; (c) a traverse duct extending from said inlet duct; and (d) an upright feeler duct leading from an entrance above a level for the inner portion to the transverse duct; and
a thermo feeler disposed above the said inner portion for measuring the steel temperature when the probe is inserted in molten steel.

4,048,858
STATIC ROTOR BALANCER
Wallace F. Mitchell, Mettawa, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.
Filed Mar. 24, 1976, Ser. No. 669,897
Int. Cl.² G01M *1/12*
U.S. Cl. 73—486 **3 Claims**



1. Apparatus for statically balancing a rotor relative to the axis of rotation thereof, comprising
a bifurcated support member for supporting said apparatus from above with the bifurcations of said member depending therefrom,
a carrier member disposed between said bifurcations,
first shaft means journaled in said bifurcations for supporting said carrier member for pivotal movement about a first axis,
a body member,
second shaft means journaled in said body member for connecting said body member to said carrier member for pivotal movement about a second axis,
said first and second axes being mutually orthogonal, means for mounting said rotor to said body member with the axis of rotation of said rotor intersecting the point of intersection of said first and second axes, and
level indicating means carried on said body member.

4,048,859
LASER ACCELEROMETER
Gary D. Babcock, Mission Viejo, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Oct. 14, 1975, Ser. No. 621,725
Int. Cl.² G01P *15/08*
U.S. Cl. 73—516 R **12 Claims**



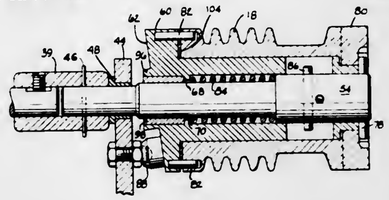
4. A laser accelerometer comprising:

a chamber,
means for forming a resonant optical laser beam in said chamber,
a birefringent sensor element mounted in said chamber, said beam passing through said element,
a proof mass integral with said sensor element, said sensor element providing a substantially flexural support for the proof mass along a predetermined acceleration sensing axis and a substantially rigid support along axes normal to said predetermined axes,
means for subjecting said laser beam to a transverse magnetic field to keep the beam separated into orthogonally polarized components,
means for combining said orthogonally related components for heterodyning, and
detector means for detecting the difference frequency between the heterodyned components,
whereby a difference frequency is developed between said components proportional to the magnitude of the acceleration of said proof mass along said predetermined sensing axis,
said sensor element having a web portion, the proof mass being joined only to the web portion of the sensor element,
the web portion being in the form of a cross, the proof mass having slots formed therein which matingly engage the arms of said cross.

4,048,860
METHOD OF DETERMINING STANDARD SOUND LEVELS
Fritz Konig, Wuppertal, Germany, assignor to Losenhausen Maschinenbau AG, Dusseldorf, Germany
Filed Mar. 22, 1976, Ser. No. 668,823
Claims priority, application Germany, Apr. 30, 1975, 2519151
Int. Cl.² G01H *3/10*
U.S. Cl. 73—556 **4 Claims**

1. Method of determining a standardized value of the sound level generated by a sound source to be investigated, using a sound level meter, a standard sound level measuring place, a selected sound level measuring place and sound recording and sound reproduction means, said method comprising the steps of:
a. Selecting a sound source from a group of sound sources including the sound source to be investigated, said group having common sound emission characteristics,
b. recording the sound emission from said selected sound source on said sound recording means,
c. supplying said sound reproduction means with said sound recording means on which the sound emission has been stored for replay,
d. placing said sound reproduction means and said sound level meter on said standard measuring place at a predetermined distance from each other and measuring a first value (L1) of sound level,
e. placing said sound reproduction means and said sound level meter on said selected measuring place at said predetermined distance from each other and measuring a second value (L2) of sound level,
f. placing said sound source to be investigated and said sound level meter on said selected measuring place at said predetermined distance from each other and measuring a third value (L3) of sound level,
whereby the difference of said first and said second value of sound level when applied to said third value of sound level yields said standardized value of sound level.

4,048,861
DEVICE FOR OSCILLATING A ROTATING BODY ALONG ITS ROTATIONAL AXIS
Richard Paul Woidke; Thomas Joseph Wester, both of Toledo, and Eric Joseph Brosch, Grand Rapids, all of Ohio, assignors to Johns-Manville Corporation, Denver, Colo.
Filed Feb. 2, 1976, Ser. No. 654,319
Int. Cl.² F16H *25/12*
U.S. Cl. 74—56 **2 Claims**

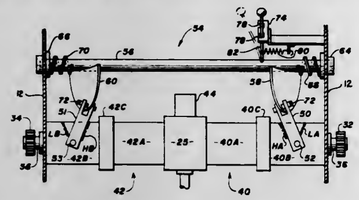


2. A device for oscillating a rotating body along its rotational axis comprising:
a. a shaft having three longitudinal portions each having a different diameter, a first portion having the smallest diameter being an end portion and being adapted to being coupled to a rotational shaft, a second portion being located at the opposite end portion of the shaft having the largest diameter, and a third portion extending between said first and said second portions and having a diameter intermediate that of said first and second portions,
b. a cam assembly comprising a cam having a cam surface generally perpendicular to said rotational axis and facing away from the rotating body, a longitudinal support for said body rigidly attached to said cam, said support and cam having an axis coinciding with said rotational axis and having a bore therethrough whose centerline coincides with said rotational axis to receive the second and third portions of said shaft, cooperating means on the second portion of said shaft and said support for transmitting torque to said support and for providing for axial movement of said support relative to said shaft, said support having a shoulder in said bore close to the cam end of said support, and means for causing said body to rotate when said cam and support are rotated,
c. a cam follower and means maintaining said follower in fixed position slidably engaging said cam surface; and
d. spring means located around said shaft and extending between said shoulder in the bore of said support and the shoulder formed at the junction of third and second portions of said shaft in biasing said cam surface towards said cam follower, said spring means being enclosed within a substantially closed chamber defined by the surfaces of said shoulder in the bore of said support, the shoulder formed at the junction of third and second portion of said shaft, and substantial portions of the third portion of said shaft and the bore of said support.

4,048,862
LINKAGE FOR CONTROLLING TWO INDEPENDENT POWER UNITS
Joseph C. Hurlburt, Leola; Howard R. Brown, Nottingham, and Ernest E. Buck, Reamstown, all of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Oct. 14, 1975, Ser. No. 622,189
Int. Cl.² F16H *25/12*
U.S. Cl. 74—57 **8 Claims**

1. Linkage for controlling at least two independent power units disposed in a predetermined alignment, said power units having first and second control arms moveable between first and second predetermined positions for changing the operation of said units, said linkage comprising:

a. a shaft disposed substantially parallel to the aligned power units;
b. means for mounting the shaft for rotational and axial movement relative to said power units;
c. drive means for turning said shaft about its longitudinal axis; and
d. means projecting from said shaft and slideably engaging each of said first and second control arms, said projecting means being skewed relative to the longitudinal axis of said shaft such that upon turning of said shaft in a clockwise direction by said drive means said first and second control arms are moved toward one of said predetermined



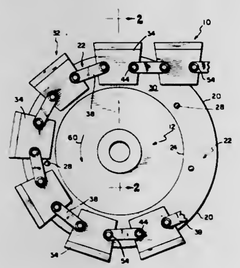
first and second positions respectively and upon turning of said shaft in a counterclockwise direction said first and second control arms are moved toward the other one of said predetermined first and second positions;
e. should one of said control arms reach one of said predetermined positions prior to the time the other control arm reaches its corresponding predetermined position then upon further turning of said shaft said projecting means slides on said control arm which has reached its predetermined position and thereby forces the shaft to move axially causing the other control arm to reach its predetermined position.

4,048,863

FRICTION DRIVE

Robert E. Pemberton, R.R. No. 2, Box 123, Edinburg, Ind. 46124

Filed June 24, 1976, Ser. No. 699,487
Int. Cl.² F16H *7/00, 7/18*
U.S. Cl. 74—229 **11 Claims**



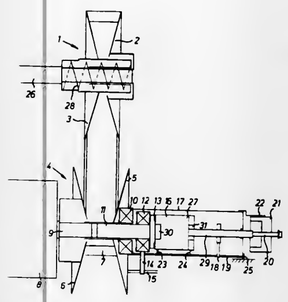
1. A friction drive comprising, in combination, a wheel having an annular friction band mounted thereon adjacent the wheel outer periphery on each outer axial side thereof; and a chain having a plurality of pivotally connected friction links trained over the wheel perimeter, said links being shaped for mating frictional engagement with said friction bands upon rotation of said wheel.

4,048,864

DRIVE WITH CONTINUOUSLY ADJUSTABLE SPEED VARIATION

Helmut Ritter, Wattwil, Switzerland, assignor to Heberlein Maschinenfabrik AG, Wattwil, Switzerland

Filed July 23, 1976, Ser. No. 707,960
Claims priority, application Switzerland, July 28, 1975, 9730/75
Int. Cl.² F16H *55/52*
U.S. Cl. 74—230.17 F **6 Claims**



1. For use in a belt driving mechanism providing a speed ratio that is infinitely variable between predetermined limits, an adjustable pulley mechanism comprising a driving member rotatable about an axis, a first conical disc coaxially fixed to said driving member, a second conical disc coaxially mounted on said driving member to slide towards and away from said first conical disc, said conical discs being mounted to provide an annular wedge-shaped groove therebetween tapering towards said axis for receiving in said groove a belt having a wedge-shaped cross-section, a hollow cylindrical thrust member for thrusting said second disc towards said first disc mounted coaxially with said discs for axial movement, a thrust bearing interposed between said thrust member and said second disc, means holding said thrust member in a set position about said axis, an element mounted to reciprocate within said thrust member, two abutment members respectively mounted for limiting opposite ends of the reciprocating movement of said element, a rod connected to said element for reciprocation therewith, said rod protruding from said thrust member at an end thereof remote from said discs, an abutment member adjustably mounted on said rod beyond said thrust member, said abutment member being adapted for fixing to said rod in any one of a range of positions thereon and for abutting against said end of said thrust member on movement of said rod in a direction towards said discs, and means for actuating said element to move from one of said abutments to the other of said abutments while initially moving said abutment member, by way of said rod, into engagement with said thrust member and thereafter moving said thrust member and said second disc from an initial position axially towards said first disc, whereby the distance moved by said second disc is the difference between the total stroke of said reciprocable element between said abutment members and the distance moved by said abutment member prior to engaging said thrust member.

4,048,865

TRANSMISSION BELTS

Richard Bell, Dumfries, Scotland; Takao Sato, Yamatokoriyama, Japan, and Chitta Ranjan Lahiri, Naugatuck, Conn., assignors to Uniroyal Limited, Midlothian, Scotland; Uniroyal, Inc., New York, N.Y. and Unitta Company Limited, Osaka, Japan

Filed Apr. 9, 1976, Ser. No. 675,358
Claims priority, application United Kingdom, Apr. 11, 1975, 14957/75
Int. Cl.² F16G *1/00*; D04H *1/00*
U.S. Cl. 74—231 R **13 Claims**

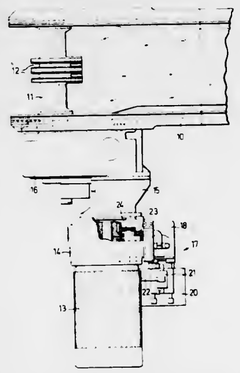
1. A toothed power transmission belt comprising a body having transversely extending teeth positioned along at least one face of said body, and an inextensible tensile member embedded in said body, the material of said body and said teeth comprising a blend of an epihalohydrin having a nominal Mooney viscosity of not more than 50 and an epihalohydrin having a nominal Mooney viscosity of not less than 50, wherein the ratio of the lower viscosity epihalohydrin to the higher viscosity epihalohydrin in said body material is from 60:40 to 75:25 by weight.

4,048,866

APPARATUS FOR USE IN CONTROLLING THE TENSION OF A CHAIN OR CHAINS OF MINING EQUIPMENT

Walter Weirich, Dortmund, and Willy Kussel, Altlunen, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westphalia, Germany

Filed Aug. 11, 1976, Ser. No. 713,537
Claims priority, application Germany, Aug. 14, 1975, 2536258
Int. Cl.² F16H *7/12*
U.S. Cl. 74—242.1 FP **9 Claims**



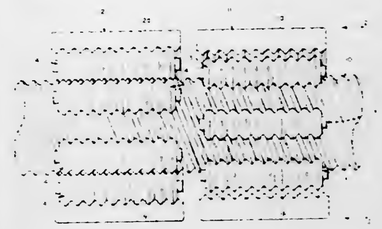
9. Apparatus for controlling the tension in a chain of mining equipment driven with a drive system; said apparatus comprising a gearing unit providing a reduction ratio and having an output drive, means for selectively coupling the output drive of the gearing unit to the drive system for the chain, a multi-piston hydraulic motor for driving the gearing unit, means for providing an oil-water emulsion as motive fluid for operating the motor and a pipe connected with the interior of the motor and extending above the motor to form a fluid trap to maintain fluid inside the motor.

4,048,867

MECHANICAL DEVICE CONVERTING ROTARY INPUT TO LINEAR COMPRESSION OR STRETCHING OUTPUT WITH A HIGH MECHANICAL ADVANTAGE

Oliver Edward Saari, Minneapolis, Minn., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed June 1, 1976, Ser. No. 691,671
Int. Cl.² F16H *1/18*
U.S. Cl. 74—424.8 B **6 Claims**



1. In a rotary to linear device, a screw member and a pair of jaw assemblies, said screw member having multiple-lead threads, each of said jaw assemblies comprising an outer member and a independent plurality of roller members equal in number to the number of thread starts on said screw member, each of said roller members having a plurality of annular teeth of substantially equal axial pitch and substantially matching configuration to the teeth of said screw member, each outer member of said jaw assemblies having a bore therethrough including a plurality of internal annular grooves of substantially equal pitch and complementary shape to the annular teeth of said roller members, the number of annular grooves in each of said outer members being substantially equal to the number of annular teeth on each of said roller members, the roller members of each of said jaw assemblies mounted in substantially equally spaced-apart positions orbit about the periphery of said screw member with said annular teeth thereof in rolling contact with the threads of said screw member and the grooves in said outer members, and the pitch diameters of the roller members and the annular grooves of the outer member of one of said jaw assemblies being greater than the corresponding pitch diameters of the other of said jaw assemblies.

4,048,868

INTERRUPTED INTERMITTENT MOTION DEVICE

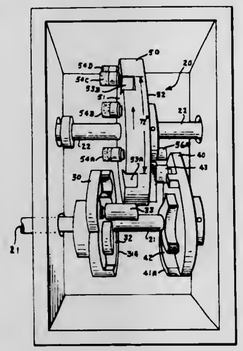
William E. Lock, 183 Wygant Road, Horseheads, N.Y. 14845

Filed June 18, 1976, Ser. No. 697,664
Int. Cl.² F16H *27/04*
U.S. Cl. 74—436 **2 Claims**

1. An interrupted intermittent motion device, comprising:
a. a rotatable input drive shaft;
b. a primary driver wheel disposed on said input drive shaft, with said primary driver wheel having an internal surface, a locking groove in said internal surface, and a driver roller connected to and protruding from said internal surface;
c. a secondary driver wheel disposed on said input drive shaft, with said secondary driver wheel having an internal surface facing said internal surface of said primary driver wheel, a locking groove in said internal surface, and a driver roller connected to and protruding from said internal surface;
d. a two-sided indexing driven wheel having:
1. a first side surface facing said internal surface of said primary driver wheel, with said first side surface having four adjacent and circumferentially-spaced drive slots therein which are dimensioned and configurated, individually and separately, to accept, engage with, and

releasably hold said driver roller of said primary driver wheel, and with said first side surface also having six locking rollers connected to and protruding from said first side surface;

2. and, a second side surface facing said internal surface of said secondary driver wheel, with said second side surface having one drive slot therein dimensioned and



configurated to accept, engage with, and releasably hold said driver roller of said secondary driver wheel, and with said second side surface also having two locking rollers connected to and protruding from said second side surface;

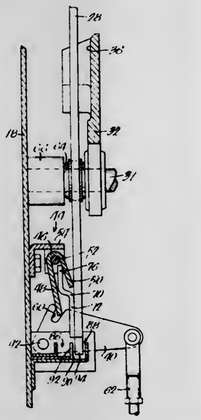
e. and, a rotatable output shaft on which is disposed said two-sided indexing driven wheel.

4,048,869

SHIFTING MECHANISM FOR CONTROL ELEMENTS

Donald L. Johnson, Kenosha, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 28, 1976, Ser. No. 681,267
Int. Cl.² G05G 9/00
U.S. Cl. 74—471 R **9 Claims**



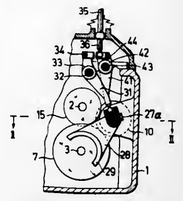
1. A shifting mechanism including a control lever rotated on a fixed axis adjacent a control member having a recess receiving a portion of said lever so that movement of said control lever will move said control member to a plurality of distinct positions, said lever being pivoted between first and second positions about a second axis perpendicular to said fixed axis, a control element pivoted about a third axis spaced from said second axis, and cooperating means between said control lever and said control element for moving said control element between positions in response to pivotal movement of said control lever between said positions, said cooperating means accommodating rotational movement of said lever about said fixed axis in any position for said control element, said lever being pivotable about said second axis between said first and second positions at each of said distinct positions of said control member so that said control element can be moved between positions of any of said distinct positions of said control member.

4,048,870

CHANGE GEAR TRANSMISSION FOR MOTOR VEHICLES, ESPECIALLY FOR USE IN AGRICULTURE AND CONSTRUCTION

Karl-Heinz Hulsebusch, Cologne, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed June 17, 1976, Ser. No. 697,131
Claims priority, application Germany, June 18, 1975, 2527052
Int. Cl.² G05G 9/14
U.S. Cl. 74—473 R **9 Claims**



1. A change gear transmission for motor vehicles, especially for use in agriculture and construction, which includes: a transmission housing, a shift stage comprising gear means arranged in said transmission housing, shifting means comprising axially displaceable shift fork menas and operable to control said shift stage, shift rod means arranged within said transmission housing and having said shift fork means connected thereto and supported thereby, an input shaft and an output shaft both arranged within said transmission housing, an auxiliary shaft likewise arranged within said transmission housing and extending parallel to one of said other shafts, said shift rod means being coaxially arranged with regard to said auxiliary shaft, said auxiliary shaft being non-rotatably journalled, and gears freely rotatably mounted on said auxiliary shaft.

4,048,871

VARIABLE SPEED POWER TRANSMISSION FOR SMALL VEHICLES AND THE LIKE

Norman G. Fyock, R.D. No. 2, Box 400, Johnstown, Pa. 15904

Continuation-in-part of Ser. No. 592,384, July 2, 1975, abandoned. This application July 6, 1976, Ser. No. 703,064
Int. Cl.² F16H 47/04, 57/10
U.S. Cl. 74—687 **19 Claims**

1. A power transmission apparatus, comprising

a first shaft,

a second shaft,

a rotatable housing member supported for independent rotation with respect to the first and second shafts,

a housing shaft rotatably supported in the housing and in spaced, parallel relation to the first and second shafts,

a first gear means in the housing comprising a gear connected to the first shaft for rotation therewith, and a second gear rotatably connected with said housing shaft, said gears being connected in driving relation one to the other,

a second gear means in the housing comprising a gear rotatably connected to said housing shaft and a gear connected for rotating the second shaft, said gears being connected in driving relation one to the other,

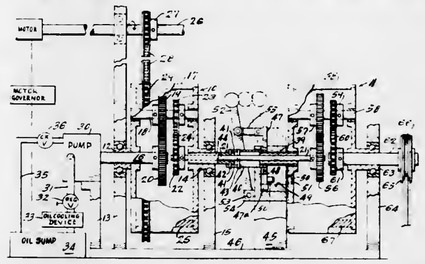
rotary drive means connected to the housing for rotating the latter,

a variable resistance means connected to the first shaft operable for resisting rotation thereof,

the second shaft being driven at variable speed responsive to variations of resistance of said resistance means, and

means connected to said resistance means operable for varying the resistance of rotation of the first shaft.

11. A power transmission comprising in combination a primary transmission device having variable speed output drive, a secondary transmission device in series with said primary



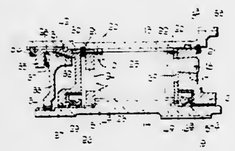
device and having forward and reverse modes, said secondary device being connected to said output drive of the primary device and to a driven rotary load, a power drive means connected to operate the said primary device in one direction of rotation, a variable control means consisting of a fluid pump and a flow regulation means connected to the primary transmission device for varying the speed output thereof independent of variation of the driving speed of the power means, and a control shift device for connecting the primary and secondary transmissions to produce a direct drive therebetween in the forward mode of the secondary device and a variable drive of multiple gear ratio between the two in either of the forward and the reverse modes of the secondary device.

4,048,872

CONTROL COUPLINGS

Oswald Webb, Whitley, England, assignor to GKN Transmissions Limited, Erdington, England

Filed May 28, 1975, Ser. No. 581,690
Claims priority, application United Kingdom, May 28, 1974, 23526/74
Int. Cl.² F16H 1/44
U.S. Cl. 74—711 **11 Claims**



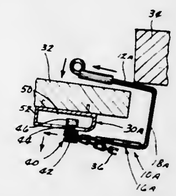
1. A control coupling comprising a liquid-tight enclosure, first and second sets of mutually interleaved elements within said enclosure and arranged for rotation about a common axis, a viscous liquid within said enclosure, said liquid being in contact with adjacent working surfaces of said elements, said first and second sets of elements being arranged for driving connection with first and second rotatable members respectively, a clutch outside said enclosure, resilient means urging said clutch to a disengaged state and pressure responsive means in communication with said enclosure and arranged to directly sense the level of liquid pressure in said enclosure, said pressure responsive means being arranged upon the attainment of a predetermined liquid pressure level in said enclosure to be displaced axially of the coupling by said predetermined pressure level thereby bringing said clutch into engagement against the action of said resilient means.

4,048,873

DOOR SECURITY LOCK OPENING TOOL AND METHOD OF USING SAME

Henry H. Stevens, Ottumwa, Iowa, assignor to Tony Johnson; Eloise Johnson; Dale Stevens, all of Ottumwa, Iowa; Doyle Stevens; Tom Stevens, both of Longmont, Colo. and Fern Cassady, Centerville, Iowa

Filed Aug. 10, 1976, Ser. No. 713,256
Int. Cl.² B25B 27/00
U.S. Cl. 81—3 R **6 Claims**



1. A tool for unlatching door security locks of the type having a chain extending from the door frame to a slider movable in an access opening at the inner end of a slot in a plate secured to the door and forming a passageway between the plate and door open at the end adjacent the door edge, said tool comprising,

a U-shaped elongated member having an actuating leg and a handle leg interconnected by a base portion wherein the outer end of said actuating leg positioned on the inside of the door is adapted to engage said slider in said passageway or on the outside of the said plate for moving the slider in said slot towards said access opening for removal therefrom as a person moves the handle leg along a line parallel to the longitudinal axis of said slot and passageway, and

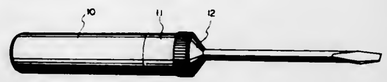
said actuating leg including telescopically extendable sections for varying the length thereof.

4,048,874

HAND TOOL

Arthur John Riches, Herne Bay, England, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jan. 20, 1975, Ser. No. 542,141
Claims priority, application United Kingdom, Jan. 21, 1974, 02752/74
Int. Cl.² B25B 17/00
U.S. Cl. 81—57.31 **9 Claims**



1. A clutchless hand tool, adaptable for use for manipulation with but one hand, for selectively making coarse and fine adjustments comprising:

a handle;

an output member coupled to said handle for axial rotation relative to said handle;

an actuating member mounted on said handle for axial rotation relative to said handle; and

a reduction gear means coupling said actuating member to said output member,

said output member including a coaxial shaft which extends from the output member through a bore in said gear means and through a bore in said handle where it is restrained,

whereby coarse adjustments of said hand tool can be performed by rotating said tool with said one hand, and

whereby fine adjustments of said hand tool can be performed by holding said handle, against rotation, with said one hand, while simultaneously rotating said actuating member with at least one finger of said one hand.

4,048,875

APPARATUS FOR SCREWING A THREADED NUT ONTO A STEEL ROD

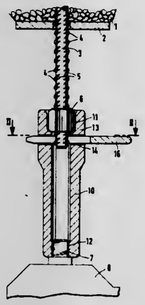
Richard Heinen, New York, N.Y., and Georg Rieger, Unterpfaffenhofen, Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

Filed Nov. 9, 1976, Ser. No. 739,870

Claims priority, application Germany, June 12, 1976, 7618699[U]

Int. Cl.² B25B *13/48*

U.S. Cl. 81—125 **14 Claims**



1. A device for screwing a threaded nut onto a rod of the type which has a partial spiral winding made up of spirally arranged ribs positioned on opposite sides thereof to leave substantially planar areas on opposite sides of the rods between the ribbed areas, the ribs sloping in opposite directions in passing from the planar areas, said device comprising a tubular sleeve adapted to surround a substantial length of ribbed rod and having

a recess at a first end adapted to receive a nut to be screwed into the rod,

means at the opposite end adapted to receive a driving means for imparting a twisting moment thereto,

locking means cooperating with said sleeve adapted to releasably lock the sleeve onto a portion of the rod which extends through a threaded nut to which the first end of the sleeve is applied whereby rotation of the sleeve also rotates the rod when said locking means is operative, but permits the sleeve to rotate the nut with respect to the rod when the locking means is inoperative,

said sleeve contains an opening extending transversely thereof, and said locking means operates in said opening.

4,048,876

ADJUSTABLE OPEN END WRENCH

William A. Cagle, 2414 Decotts Ave., Sanford, Fla. 32771

Filed Oct. 14, 1976, Ser. No. 732,422

Int. Cl.² B25B *13/16*

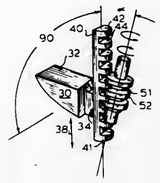
U.S. Cl. 81—165 **13 Claims**

1. An adjustable open end wrench comprising in combination:

a stationary jaw attached to a head section of said adjustable open end wrench;

a movable jaw slidably mounted on said stationary jaw for moving toward and away from said stationary jaw for defining a plane of motion therebetween;

a rack gear coupled to said movable jaw; and



a helical gear including thereon helical gear teeth of a known pitch angle for engaging rack gear teeth of said rack gear for driving said movable jaw along said plane of motion, with engaging tangential sections of said helical gear teeth and said rack gear teeth at the points of sliding contact being perpendicular to said plane of motion.

4,048,877

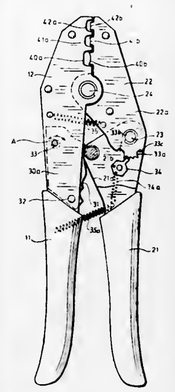
DEVICE, PARTICULARLY OF THE PLIERS OR SCISSORS TYPE

Hans Undin, Akersberga, Sweden, assignor to Pressmaster Ltd., Stockholm, Sweden

Filed Jan. 8, 1976, Ser. No. 647,437

Int. Cl.² B21D *9/00*; B25B *7/02*

U.S. Cl. 81—313 **7 Claims**



1. A tool comprising

i. a stationary first working jaw,

ii. a first extension having an outer periphery, an inner periphery and a rear terminal portion and being rigidly connected to and extending essentially in the same direction as the first jaw,

iii. a movable second working jaw, journalled to the first jaw in a first pivot point located intermediate the first jaw and the first extension,

iv. an elongated cam profile arranged at the inner periphery of the first extension intermediate the first pivot point and the rear terminal portion of the first extension,

v. a second extension formed on the second jaw on the reverse side from the first pivot point than where the second jaw is located and having an outer periphery, an inner periphery and a rear terminal position,

vi. an elongated drive means having an outer periphery, an inner periphery and a rear terminal portion and being journalled to the second extension in a second pivot point located in the rear terminal portion of the second extension,

vii. a cam follower means arranged at the inner periphery of the drive means, intermediate the second pivot point and the rear terminal portion of the drive means, and adapted, when the drive means is actuated by a driving force, to be pressed against the cam profile and to follow it so that the rear terminal portion of the second extension is moved away relative to the cam profile to an extent which is defined by the shape of the cam profile.

4,048,878

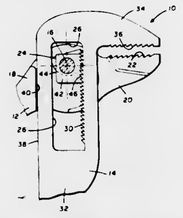
SLIP-TYPE PLIERS TOOL

Walter Albert Nystrom, Arlington Heights, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 5, 1976, Ser. No. 673,575

Int. Cl.² B25B *7/04*

U.S. Cl. 81—409 **1 Claim**



1. An improved slip-type pliers tool comprising in combination:

a first jaw member having a handle portion, a jaw head portion including an engaging surface, a shoulder on a side surface thereof, a cam portion projecting from said side surface spaced from said shoulder and a pivot hole extending through said jaw member and cam portion and eccentric to said cam portion;

a second jaw member having a handle portion, a jaw head portion including an engaging surface, an internal slot extending therethrough and receiving said cam portion, a toothed edge surface in said slot, and an exterior edge surface arranged to engage said shoulder;

a pivot pin having a head and a reduced body portion located in said hole and extending through said slot; a pivot pin retaining member connected to said body portion and located to prevent separation of said jaw members while permitting relative pivotal movement therebetween;

a ratchet dog movably disposed in said slot, said dog being located on said pivot pin and having a toothed edge arranged to mate with the toothed edge surface of said slot and movable by said pivot pin into and out of engagement with said toothed edge surface; and,

said jaw members being relatively pivotal on said pivot pin between an open position of said tool wherein said ratchet dog and toothed edge surface are out of engagement and the distance between said engaging surfaces can be varied by sliding movement of said jaw members and a closed or engaging position wherein said ratchet is in engagement with said toothed edge portion preventing sliding adjustment and the shoulder on said first jaw member is in engagement with the exterior edge surface on said second jaw member limiting the pivotal movement of said jaw members and retaining said engaging surfaces in a generally parallel, spaced relationship.

4,048,879

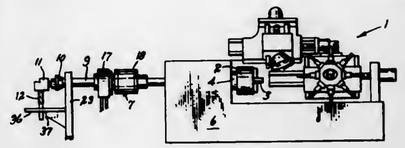
STOCK SENSING DEVICE

Joseph Henry Cox, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 12, 1976, Ser. No. 741,206

Int. Cl.² B23B *19/00, 13/02*

U.S. Cl. 82—28 R **9 Claims**



1. In a machine tool, an apparatus for sensing the presence of a workpiece, comprising:

a channel adapted to receive a workpiece at one end;

means for directing a pressurized fluid into said channel;

a seal around said channel, said seal adapted to yieldably engage the periphery of a workpiece extending through the channel and cooperating therewith to restrict fluid flow from the channel whereby a backpressure is maintained in the channel;

means for sensing the backpressure in the channel and operable to produce a workpiece present signal when the backpressure exceeds a predetermined level; and

means responsive to the workpiece present signal for controlling functions of the machine tool.

9. In a machine tool, having a chuck with work gripping members for holding a workpiece being machined, an apparatus for sensing sufficient chuck stock, comprising:

a channel adapted to receive a workpiece at one end, said channel extending into the chuck;

means for directing a pressurized fluid into said channel;

a plurality of flow passages for said pressurized fluid, said passages being proximally located to said chuck and having unequal flow resistances including at least one flow passage through a labyrinth bushing adapted to encompass a workpiece and a flow passage through said workpiece channel;

means for sensing the backpressure in the channel and operable to produce a workpiece present signal when the backpressure exceeds a predetermined level; and

means responsive to the workpiece present signal for controlling functions of the machine tool.

4,048,880

SYSTEM FOR SUPPLYING HYDRAULIC FLUID TO AGGREGATES ON SPINDLES OR THE LIKE

Helmut Link, Schanbach, Germany, assignor to Index-Werke KG Hahn & Tessky, Esslingen, Germany

Division of Ser. No. 385,479, Aug. 3, 1973, abandoned. This application Feb. 9, 1976, Ser. No. 656,584

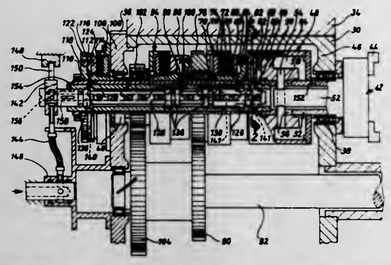
Claims priority, application Germany, Aug. 8, 1972, 2238986

Int. Cl.² B23B *19/02, 3/34*

U.S. Cl. 82—29 R **17 Claims**

1. In a spindle arrangement for a machine tool, a combination comprising support means; at least one rotary work supporting spindle member mounted in said support means; a plurality of fluid-operated devices mounted on said rotary work supporting spindle member, said devices including at least one clutch device, at least one brake device, and at least one work clamping device; a source of pressurized fluid; and control means for connecting selected devices with said source and for permitting selected devices to discharge control fluid, said control means comprising a valve member, one of said members being hollow and surrounding the other of said members, said valve member being movable axially of said work supporting spindle member between a plurality of positions in

each of which at least one of said devices is connected with the source while the other are free to discharge control fluid, and



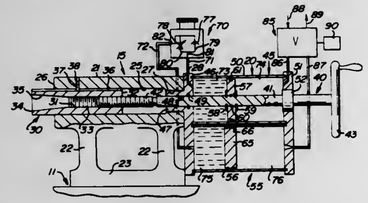
actuating means for moving said valve member between said positions.

4,048,881

TAILSTOCK POWERING DEVICE

Horace C. Disston, Jr., Cherry Hill, N.J., assignor to Van Wood Manufacturing Co., Inc., Cherry Hill, N.J.

Filed Apr. 14, 1976, Ser. No. 676,691
Int. Cl.² B23B *23/00*
U.S. Cl. 82—31 **5 Claims**



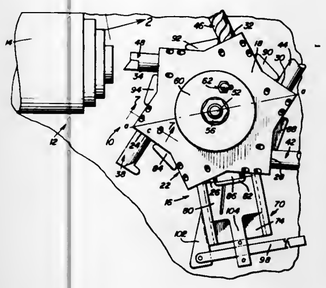
1. A tailstock power device for a tailstock having a housing selectively positionable on a bed, a carrier mounted in said housing for longitudinal shifting extensile and retractile movement with respect to said housing, and an actuating shaft threadedly engaged with said carrier in said housing and extending exteriorly therefrom for threaded rotation relative to said carrier and shifting movement therewith, said device comprising: a first cylinder for mounting on said housing and surrounding said shaft with the latter extending in slidable and rotatable sealed relation through said cylinder, a first piston shiftable in said first cylinder and connected to said shaft for shifting movement with said shaft and carrier, fluid operating means selectively communicable with said cylinder to drive said piston is a desired direction for selective movement and positioning of said shaft and carrier, said shaft being rotatable upon fixed positioning of said piston in threaded engagement with said carrier to shift the latter, a second cylinder, a second piston shiftable in said second cylinder, and fluid operating means comprising a source of pressure fluid selectively communicable with said first mentioned cylinder on one side of sad first mentioned piston to feed said carrier and selectively communicable with said second cylinder on one side of said second piston to feed the latter, metering means communicable between said first mentioned cylinder on the other side of said first mentioned piston and said second cylinder on the other side of said second piston to meter fluid passing therebetween upon feeding of said carrier, and one-way valve means communicable in the direction between said second cylinder on said other side of said second piston and said first cylinder on said other side of said first piston, for rapidly returning metered fluid and consequently rapidly returning of said carrier.

4,048,882

POST TURRET TOOL HOLDER FOR ENGINE LATHES

Richard F. Watkins, 1168 Oak Glen Road, Santa Ynez, Calif. 93460

Filed Aug. 11, 1976, Ser. No. 713,608
Int. Cl.² B23B *29/00*
U.S. Cl. 82—36 A **3 Claims**



1. A post turret tool holder for an engine lathe, including a work holder and a tool holder station, comprising, in combination:

a. a rotatable body member disposed at the tool holder station;

b. a plurality of tool retainers provided on the body member; and

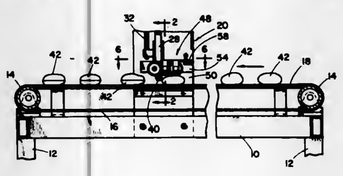
c. indexing means mounted on the lathe for restraining the body member against motion when each of the tool retainers is presented to the work holder, while permitting the body member to be rotated from tool retainer to tool retainer relative to the work holder, and the tool retainers being repeatedly positioned accurately with respect to the work holder by the indexing means, the indexing means including a slide guide affixed to the lathe at the tool holder station, a slide movably disposed in the guide and provided with a recess, and projections mounted on the body member and associated with the tool retainers for sequentially engaging in the recess and restraining the body member from rotation, the indexing means further including a slot provided in the slide and communicating with the recess for permiting the slide to spread and snap onto the projections in order to tightly engage the projections and permit movement of the projections relative to the slide.

4,048,883

BAND-TYPE ROLL SLICING MACHINE

Dale S. Lecrone, 4447 Bonnymede, Jackson, Mich. 49201

Filed Sept. 16, 1976, Ser. No. 723,918
Int. Cl.² B26D *3/28*
U.S. Cl. 83—4 **16 Claims**



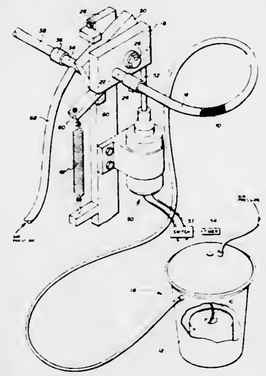
1. A band type roll slicing machine comprising a substantially horizontal endless conveyor supported for movement in a direction to support and feed a plurality of rolls simultaneously in a predetermined direction, an endless band type knife supported adjacent said conveyor and one section of said knife being disposed transversely and parallel to said conveyor in spaced relationship above the upper surface thereof a predetermined distance between the top and bottom surfaces of rolls to be sliced thereby, and power means to drive said conveyor and knife in operative directions; in combination with pressure means mounted above and substantially in vertical alignment with said section of said knife and supported for limited yieldable movement away from said conveyor, means engaging said pressure means and exerting relatively light pressure thereon toward said conveyor, said pressure means comprising a series of relatively narrow rollers operable upon axes extending transversely to the direction of movement of said conveyor and spaced apart axially relatively short distances to form a nested arrangement of said rollers to permit a plurality of said rollers simultaneously to engage the upper surfaces of rolls upon said conveyor in locations both transverse and longitudinal to and extending substantially in parallel relationship to the path of movement of said conveyor, and friction means on the peripheries of said rollers engaging the upper surfaces of said rolls with light pressure as carried by said conveyor into contact with said section of said knife to minimize lateral movement of said rolls from said path of movement thereof while being sliced and also hold said rolls in frictional engagement with said conveyor without unduly compressing or deforming the upper surfaces of rolls and thereby also maintain the upper and lower portions of rolls in superimposed vertical relationship when the same have the slicing thereof into said upper and lower portions completed.

4,048,884

FIBER SHEAR SYSTEM

James Buchanan Winn, Jr., Wimberley, Tex., assignor to The Archilithic Company, Dallas, Tex.

Filed Dec. 15, 1975, Ser. No. 640,874
Int. Cl.² B26D *7/06*
U.S. Cl. 83—24 **10 Claims**



1. An apparatus for controlling the flow of fibrous material and selectively shearing the material which comprises:

a first shear element having an aperture in a plane face thereof,

an input tube attached to said first shear element for feeding the fibrous material through the aperture in said first shear element,

a second shear element rotatably attached to said first shear element and having an aperture in a plane face thereof alignable with the aperture in said first shear element with the plane faces in confronting relation,

an egress tube attached to said second shear element for receiving the material from the aperture in said second shear element when the apertures in said first and second shear elements are aligned,

means for moving the fibrous material through said input tube and out of said egress tube when the apertures in said first and second shear elements are aligned, and

rotation means for rotating said second shear element and said egress tube relative to said first shear element to shear the material passing through the apertures in said first and said second shear elements and to stop the flow of material therethrough.

8. A method for controlling the flow of continuous fiber roving and selectively shearing the roving comprising:

passing the roving under pressure into an input tube and through an egress tube closely aligned therewith,

shearing the roving by moving the egress tube relative to the input tube and out of alignment therewith, and

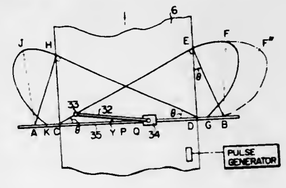
blocking the end of the input tube when the input tube is misaligned with the egress tube to stop the flow of roving therethrough.

4,048,885

METHOD AND APPARATUS FOR CUTTING CONTINUOUSLY MOVING SHEET MATERIAL BY JET STREAM OF FLUID UNDER HIGH PRESSURE

Hiroshi Miyakita, and Ichiro Miyakita, both of Toyonaka, Japan, assignors to Ichiro Miyakita, Toyonaka, Japan

Filed Mar. 15, 1976, Ser. No. 666,544
Claims priority, application Japan, Mar. 17, 1975, 50-32781; Jan. 30, 1976, 51-9556
Int. Cl.² B26F *3/00*; B26D *1/56*
U.S. Cl. 83—38 **9 Claims**



5. An apparatus for cutting a web of sheet material continuously fed at a predetermined velocity into sheets of predetermined length by a jet stream of fluid under pressure, comprising a jet nozzle for directing a jet stream of fluid under high pressure having energy sufficient to cut said sheet material, a carriage adapted for making reciprocating movement along a straight track, an arm mounting said nozzle at one end thereof and pivoted at the other end thereof to said carriage, and drive means for causing reciprocating movement of said carriage along said straight track at a controlled velocity and causing alternate normal and reverse swinging movement of said arm around the pivot at a controlled angular velocity.

4,048,886

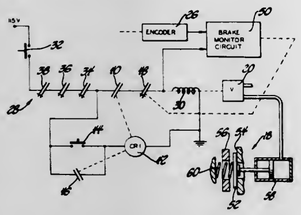
BRAKE MONITOR WITH SELF-CHECKING

John Francis Zettler, Stow, Mass., assignor to Xenex Corporation, Birmingham, Mich.

Filed Sept. 16, 1976, Ser. No. 724,059
Int. Cl.² B21J *7/46*
U.S. Cl. 83—58 **22 Claims**

1. A brake monitor for a press having clutch means, brake means and control means for alternately starting and stopping the press crank in a cycle of operation, said monitor comprising: a signal circuit adapted to be connected with the press to produce a brake signal at the start of braking, a timing circuit responsive to the brake signal for generating a timing signal having a value which is a function of time, said signal circuit being connected with the timing circuit for starting the timing signal, detecting means connected with the timing circuit for

producing logic signals indicative of the value of the timing signal relative to reference signals representing stopping times for the press, motion stop detecting means adapted to be connected with the press for generating a motion stop signal when the press comes to a stop, memory means connected with the detecting means for storing said logic signals in response to a motion stop signal, a relay circuit adapted to be connected



with said control means of the press for shutting down the press in response to a disabling signal, and logic means connected to said memory means and producing a disabling signal when said logic signals represent a timing signal indicative of excessive stopping time, said logic means being connected with the relay circuit to apply the disabling signal thereto for shutting down the press when the stopping time is excessive.

4,048,887

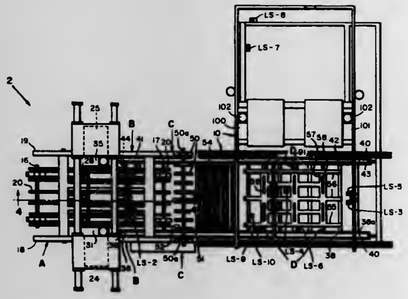
MACHINE FOR TRIMMING THE EDGES OF PANELS

Donald B. Morse, and Bernard A. Pribish, both of Joliet, Ill., assignors to Kemlite Corporation, Joliet, Ill.

Division of Ser. No. 599,335, July 28, 1975, Pat. No. 3,990,335, which is a division of Ser. No. 404,105, Oct. 5, 1973, Pat. No. 3,922,940. This application June 25, 1976, Ser. No. 699,954

Int. Cl.² B26D *7/06*; B27B *5/04*

U.S. Cl. 83—79 **7 Claims**



1. A machine for trimming the edges of panels comprising a first pair of spaced saws, means for passing a panel in one direction past said first pair of saws to trim the side edges off said panel, a second pair of spaced saws, a carriage reciprocally movable in a direction angularly displaced from sid one direction, a rack, means for passing the panel to a position on said rack after the panel has been trimmed by said first pair of spaced saws, means for supporting said rack above the bed of said carriage, said supporting means including a fluid cylinder, means sensitive to the arrival of the panel at said position for deactivating said fluid cylinder to permit said rack with a panel thereon to descend to the bed of said carriage, means for holding the panel in fixed position on said carriage, and power means for moving said carriage with said panel thereon past said second pair of saws whereby to trim the end edges of the panel.

4,048,888

MACHINES FOR CUTTING CARDBOARD AND OTHER ARTICLES

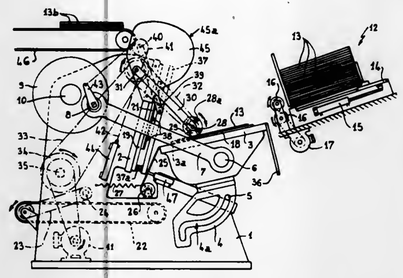
Louis Antoine Bonnard, 49, rue Gaspard Picard, Venissieux, France (69200), and Claude Raymond Pierron, 32, avenue Gambetta, St Cyr au Mt d'Or, France (69450)

Filed Sept. 24, 1976, Ser. No. 726,333

Claims priority, application France, Oct. 22, 1975, 75.32985

Int. Cl.² B26D *7/06*

U.S. Cl. 83—89 **8 Claims**



1. A machine for cutting cardboard and other articles comprising a frame; a platen affixed to the frame substantially vertically thereon, a movable platen pivotally mounted on the frame, a horizontal shaft carried by the frame to impart an oscillating movement to the movable platen and rods pivoted on the shaft and to the movable platen, a chassis, parallel arms pivoted on the chassis and a transverse shaft mounted in the frame, a chain and chain wheels mounted on the shaft, a crank on the horizontal shaft to which one end of the chassis is affixed and a cylinder mounted on the frame to which the opposite end of the chain is affixed, a cam track mounted on the frame and rollers carried by the chassis to engage the cam track and a motor for driving the horizontal shaft, rotation of the shaft lifting the movable platen from a sheet receiving position to a delivery position, a pusher rod for feeding the sheets onto the movable platen, a centering member and blades thereon which cut the sheet on the movable platen, suction members for securing one portion of the sheet on the movable platen whilst the other portion falls away by gravity, means for releasing the suction members when the movable platen is in its horizontal position and a conveyor for removal of the portions released from the movable platen.

4,048,889

ELASTOMERIC STRIPPER HAVING METAL HEAD AND STRIPPING PLATES

George C. Finley, 242 E. Fitzgerald Road, Gerald, Mo. 63037

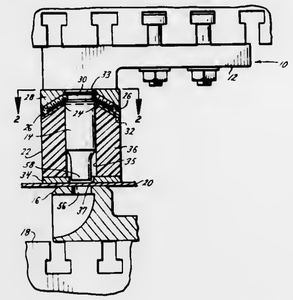
Filed July 7, 1975, Ser. No. 593,277

Int. Cl.² B26D *7/08*

U.S. Cl. 83—138 **15 Claims**

1. A stripper for use in a mechanical punching operation comprising means to attach the stripper to a punch, means to contact a workpiece during punching, and means to resiliently exert a force on the contacting means during punching, the resilient means being interposed between the attaching means and the contacting means, the resilient means having an axially extending cavity therein, the attaching means and contacting means having perpendicular projections cooperating with the

cavity to removably connect the stripper into an assembly, the cooperating means being selectively engageable and disengageable to allow the assembly to be selectively assembled and disassembled.



4,048,890

PUNCHING TOOL DIE

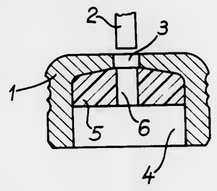
Fritz Aeschbach, Morges, Switzerland, assignor to Raskin S.A., Switzerland

Filed Nov. 4, 1976, Ser. No. 738,723

Claims priority, application Switzerland, Nov. 17, 1975, 14843/75

Int. Cl.² B26F *1/14*

U.S. Cl. 83—146 **5 Claims**



1. In a stamping or punching tool comprising a die and a punch, in which the die has a through hole for receiving the punch, said hole having a greater cross-sectional area than the punch to receive the punch with a clearance, the improvement wherein the die comprises on a side thereof opposite the side in which the punch is inserted a body of softer and more elastic material than the material of the die, said body having a through hole in extension of said through hole of die but of a lesser cross-sectional area substantially equal to that of the punch.

4,048,891

CUTTER MECHANISM FOR CUTTING SHEET MATERIAL

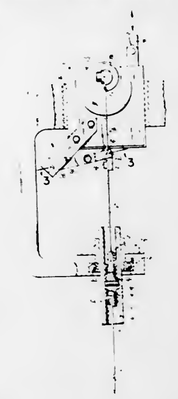
David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., East Hartford, Conn.

Filed Oct. 26, 1976, Ser. No. 735,750

Int. Cl.² D06H *7/00*; B26D *1/10*

U.S. Cl. 83—528 **8 Claims**

1. A cutter mechanism for cutting sheet material, said cutter mechanism comprising: a drive pin movable in a circular path about a given crank axis, a crossarm supported at one of its ends for pivotal movement about a crossarm pivot axis fixed relative to and parallel to said crank axis, a connecting link connected between said drive pin and the other end of said crossarm for oscillating said crossarm about said crossarm pivot axis in response to travel of said drive pin repeatedly about said circular path, a knife supported for movement along a knife axis fixed relative to said crank and pivot axes and located in a plane perpendicular to said crank and crossarm pivot axes, and an intermediate link connected between said other end of said crossarm and said knife for reciprocating said knife along said knife axis in response to oscillation of said crossarm about said crossarm pivot axis.



4,048,892

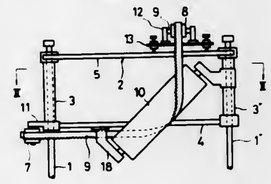
BELT SAW GUIDING DEVICE FOR A BELT SAW MACHINE

Daizo Yamashita, 3-23-11, Kaijin, Funabashi, Chiba, Japan

Filed Apr. 22, 1976, Ser. No. 679,213

Int. Cl.² B23D *55/06*; B27B *13/10*

U.S. Cl. 83—799 **1 Claim**



1. A band saw comprising in combination:

a. four upright pillars supporting a channel-shaped frame (2) having two pairs of sleeves slidably mounted thereon and moveable up and down with two pairs of parallel upper (5, 6) and lower bars (4) connecting each pair of sleeves, said frame defining lower and upper frame sections and front and rear ends;

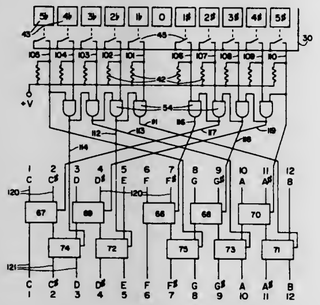
b. a first set of guide pulleys (7, 7') rotatably mounted toward said front end of said lower frame section with a vertical axle so that said pulleys rotate in the horizontal plane;

c. a second set of guide pulleys (8, 8') mounted towards said rear end of said upper section with a horizontal axle so that said pulleys rotate in the vertical plane;

d. a pair of inclined parallel guide rollers (10, 10') held between said lower frame section and said pillars towards said rear end, an endless belt saw (9) extending between said first and second set of guide pulleys and turned 90° by said guide rollers; and,

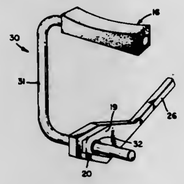
e. drive means coupled to one of said pulleys to rotate said pulley and drive said band saw.

4,048,893
ELECTRONIC MUSICAL INSTRUMENT
Donald K. Coles, 2505 Capitol Ave., Fort Wayne, Ind. 46806
Continuation-in-part of Ser. No. 496,806, Aug. 12, 1974, Pat. No. 3,943,811, and a continuation-in-part of Ser. No. 507,118, Sept. 18, 1974, Pat. No. 3,973,460. This application Mar. 8, 1976, Ser. No. 664,903
Int. Cl.² G10C *3/12*; G10H *1/00, 5/06*
U.S. Cl. 84—1.01 **9 Claims**



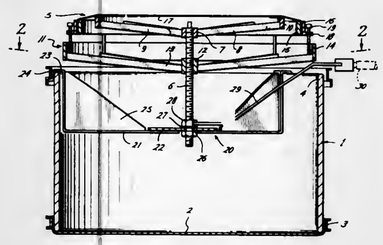
1. In an electrically keyed musical instrument, tone transposition apparatus comprising:
- means for generating two individual musical tones differing in pitch by a single semitone,
- first and second manually operated digitals, individual digitals playing individual ones of the musical tones,
- electrical switching means coupling the digitals to the tone generating means, the electrical switching means having first and second switch states, the difference between the switch states being an interchange of the tones played by the first and second digitals.

4,048,894
CAPO TASTO
Elliot Lee Myerson, 1815 Grismer St., Burbank, Calif. 91504, and Richard W. Gillis, 5661 Cleon St., North Hollywood, Calif. 91601
Filed Jan. 19, 1976, Ser. No. 650,147
Int. Cl.² G10D *3/04*
U.S. Cl. 84—318 **9 Claims**



1. A capo tasto for attachment to a stem of a stringed instrument, said stem having a longitudinal axis, an upper surface and a lower surface, a fret board disposed on said upper surface and a plurality of strings disposed parallel to said longitudinal axis, said capo tasto comprising:
- a. a pressure bar having a length adapted to extend across said stem transversely to said longitudinal axis adjacent to said fret board;
- b. mounting means for mounting said pressure bar on said stem above said strings, said mounting means including a C-shaped member having a first arm and a second arm, said pressure bar being mechanically coupled to said first arm;
- c. cam means axially mounted to said second arm for rotation thereabout, said rotation being effective to apply pressure to said lower surface, said pressure being transmitted through said mounting means to said pressure bar to depress said strings; and
- d. means for holding said cam means against axial movement along said second arm of said C-shaped member at such a location that said cam means is centered on said stem when said capo tasto is attached thereto.

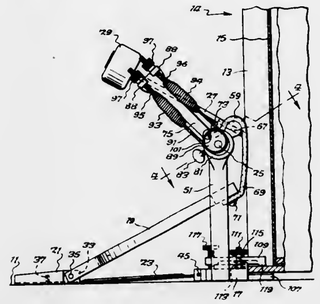
4,048,895
ADJUSTABLE PITCH DRUM
Randall L. May, 6027 Effingham, Houston, Tex. 77035
Filed Oct. 12, 1976, Ser. No. 731,361
Int. Cl.² G10D *13/02*
U.S. Cl. 84—411 A **14 Claims**



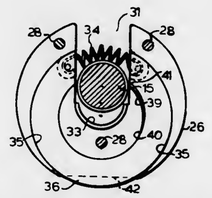
13. An adjustable musical drum assembly comprising,
- a cylindrical drum shell having an open end,
- a threaded supporting rod,
- means secured to said drum shell for adjustably supporting one end of said rod, and
- drum head turning means comprising a drum head mounted on supporting means rotatably threaded on said rod and tension means non-rotatably mounted on the rod end opposite said one end of said rod, said drum head being stretched over said tension means, whereby rotation of said drum head supporting means varies the tension of the drum head and adjustment of said rod one end relative to said means secured to said drum shell varies the spacing of said drum head from said shell open end.

4,048,896
DRUM BEATER
Joseph D. Calato, 8685 Rivershore Drive, Niagara Falls, N.Y. 14304, and Joseph S. Calato, 2750 Dickersonville Road, Niagara Falls, N.Y. 14131
Filed Dec. 24, 1975, Ser. No. 644,419
Int. Cl.² G10D *13/00*
U.S. Cl. 84—422 R **9 Claims**

1. A drum beater mechanism comprising: a base plate; drum clamping means carried by said base plate; a pivotally mounted treadle connected to said base plate; spaced standards mounted on said base plate, said standards mounted on said base plate, said standards extending upwardly and being provided at their upper ends with aligned bearing portions; a cam shaft rotatably mounted in said bearing portions; a rocker cam mounted on said shaft between said bearing portions for movement with said shaft; a beater stem, having a beater ball thereon, adjustably carried by said rocker cam; first flexible means connecting said treadle and said rocker cam for moving the latter to move said beater ball into contact with a drum when said treadle is depressed; tensioning means connected to said shaft for resisting rotary movement thereof, said tensioning means comprising two tension springs, each opposing the other; and a pulley carried by said cam shaft for rotation therewith, said springs being joined by second flexible means passing around said pulley.

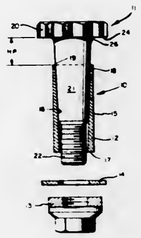


4,048,897
LATERALLY ENGAGABLE AND RELEASABLE NUT ASSEMBLY
Ellie Edward Price, Jr., Rte. 13, Box 166, Charlotte, N.C. 28213
Filed May 10, 1976, Ser. No. 684,486
Int. Cl.² F16B *37/08*
U.S. Cl. 85—33 **8 Claims**



1. In combination, a nut (26) provided with a centrally disposed threaded bore (33) and a U-shaped slot (31) extending outwardly therefrom to permit lateral insertion of the nut upon a threaded shaft (15);
- a C-shaped retainer ring (36) mounted for rotation on said nut (26) in a path encircling said bore (33);
- means operable in response to the rotation of said ring for selectively
  - confining said nut (26) and shaft (15) in relatively rotatable lateral threaded engagement with one another, and
  - connecting the nut and shaft for yielding lateral threaded engagement and disengagement;
- said selectively operable means including a tension spring (34) bridging the gap in said C-shaped ring, the ends of said spring being detachably secured to the ends of said ring respectively, and
- cam means (39) operable in response to the rotation of said ring for locking said nut and shaft in fixed relative position.

4,048,898
FASTENER FOR MULTI METAL STACK-UPS
Larry Salter, Lakewood, Calif., assignor to Paul R. Briles, Inglewood, Calif., a part interest
Continuation-in-part of Ser. No. 515,578, Oct. 17, 1974, abandoned. This application Sept. 29, 1976, Ser. No. 727,800
Int. Cl.² F16B *13/06*
U.S. Cl. 85—77 **25 Claims**



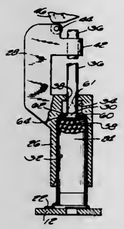
1. A pre-assembled device for use with multiple layers of material having axially aligned holes extending through the layers of material comprising,
- a fastener comprising a sleeve and a fastening means,
- said sleeve being circumferentially continuous and having a substantially cylindrical exterior throughout its length and a gently tapered bore through the sleeve,
- said fastening means comprising a shaft with a head element at one end and clamping means at the other end,
- said head element having a circumferentially continuous annular bearing area extending in a direction transverse to the axis of the shaft,
- the outside of said shaft having a gentle taper varying from a size adjacent the head element end relatively larger than the initial diameter of the large end of said sleeve bore to a size adjacent the opposite end relatively smaller than said large end of the sleeve bore,
- whereby there is a taper on the shaft substantially the same as the taper of said sleeve,
- an auxiliary clamping means in operable engagement with the clamping means of the other end of the shaft,
- said shaft having an initial pre-assembly condition with the sleeve with the sleeve slightly expanded,
- said shaft having a final fastening position in the sleeve wherein the head and adjacent end of the sleeve are in pressure engagement with the material adjacent one face of the multiple layers of material and the auxiliary clamping means and sleeve end adjacent thereto are in pressure engagement with the other face of multiple layers of material at the opposite side, the tapered sleeve bore being under pressure throughout its length by the tapered exterior of the shaft,
- said sleeve being in expanded condition throughout a portion of its length in an amount that overcomes the aggregate of maximum permissible tolerance of the cylindrical hole plus an amount of not less than 0.002 inches per inch providing interfering engagement outwardly with the wall of the cylindrical hole,
- the exterior diameter of said sleeve reformed substantially cylindrical after being expanded,
- a section of the end of the sleeve adjacent the small end of the sleeve bores in initial pre-assembly condition has a reduced thickness compensating deviation in the tapered wall thickness corresponding to an adjusted wall thickness of the balance of the sleeve when in said pre-assembly condition, said reduced thickness having the same taper as said first and said sleeve, whereby the exterior of said sleeve in final expanded condition is uniformly cylindrical through its entire length of said cylindrical hole.

4,048,899

SHOTGUN SHELL CRIMPER

Theodore J. Bachhuber, and Philip C. Bachhuber, both of Mayville, Wis., assignors to Mayville Engineering Company, Inc., Mayville, Wis.

Filed July 29, 1976, Ser. No. 709,695
Int. Cl.[2] F42B *33/12*
U.S. Cl. 86—39 **3 Claims**



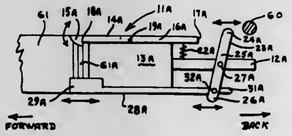
1. In a shotgun shell crimper having a crimping sleeve with a cylindrical interior cavity which is dimensioned to fit over the exterior surface of an uncrimped shotgun shell, having a rounded crimping corner on one end of said cavity, and having a crimping die movably mounted in said one end of said cavity in position to crimp the end of said shotgun shell, said crimping die having an end wall engageable with the end of a said shotgun shell and a side wall joined to the end wall, the improvement wherein said side wall is generally conical and smaller in diameter than said end wall except where said side wall and said end wall meet and the base of said generally conical shape lies on the side of said crimping die toward said shotgun shell, to permit the crimped end of the shell to overhang the crimping die to cause ironing of the crimped end of the shell against said rounded crimping corner when the crimping die is withdrawn from the crimped shell.

4,048,900

EXTRACTION ASSEMBLY

William E. Lock, 183 Wygant Road, Horseheads, N.Y. 14845, and Charles J. Churillo, 221 Gilda Place, Fort Walton Beach, Fla. 32548

Filed June 18, 1976, Ser. No. 697,663
Int. Cl.[2] F42B *39/10*
U.S. Cl. 86—48 **3 Claims**



1. An extractor-release assembly, comprising:

a. a plurality of extractor-release mechanisms, wherein each of said plurality of extractor-release mechanisms is identical and includes:

1. a support shaft;
2. a cylindrical body attached to said support shaft;
3. a plurality of finger-like grasping elements having a first end, a middle portion, and a second end, with the first end having a hook-like projection, the middle portion pivotally connected to said cylindrical body, and the second end biased to said support shaft;
4. an actuation lever having a first end, a middle portion, and a second end, with said middle portion pivotally connected to said support shaft;
5. and, at least one finger-like slide element having a first end and a second end, with said second end pivotally connected to said first end of said actuation lever, and with said finger-like slide element abutting with and slidably movable along said cylindrical body;

b. a movable extractor bar to which each of said plurality of extractor-release mechanisms are mounted in a side-by-side relationship;

c. means for moving said extractor bar;

d. means for causing said extractor-release mechanisms to extract and to release;

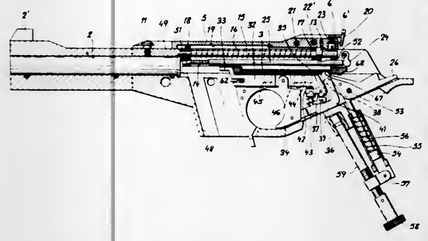
e. and, an extractor-release table disposed below said plurality of extractor-release mechanisms, with said table having a drop-off section.

4,048,901

RECOIL-OPERATED AUTOMATIC PISTOL

Emilio Ghisoni, Via Villa Serafina 4, Pavia, Italy

Filed Apr. 29, 1976, Ser. No. 681,589
Claims priority, application Italy, Apr. 29, 1975, 22834/75
Int. Cl.[2] F41C *3/00, 15/00, 17/04, 19/00*
U.S. Cl. 89—132 **19 Claims**



1. An automatic pistol comprising:

a gunstock with a gun barrel adapted to receive a succession of cartridges from a magazine, said gunstock forming a track to the rear of said gun barrel;

a breechblock slidable along said track between a forward position adjacent said gun barrel and a retracted position remote therefrom, said breechblock being provided with a restoring spring urging same into said forward position;

a firing mechanism on said gunstock including a trigger and a spring-loaded hammer at the rear of said track releasable by said trigger from a cocked position to strike a firing pin slidably lodged in said breechblock for detonating a cartridge introduced into said gun barrel upon a retraction of said breechblock from said forward position, said breechblock being displaceable by recoil into said retracted position upon the detonation of said cartridge and being engageable with said hammer upon such displacement to recock said hammer preparatorily to another detonation;

a pair of upstanding wings rigid with said gunstock flanking a rear portion of said track and bracketing said breechblock therebetween, said wings having front edges forming an abutment engageable with an enlarged front part of said breechblock in said retracted position thereof; and

a retaining member detachably secured to said gunstock at said wings and at an elevated land adjacent said gun barrel for guiding said breechblock along said track.

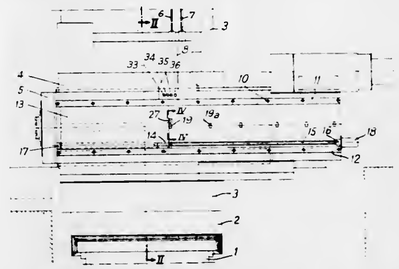
4,048,902

BALANCING AND COMPENSATING ARRANGEMENT

René Deflandre, 6 rue Alfred Dehodencq, 75016 Paris, France

Filed Jan. 20, 1975, Ser. No. 542,496
Claims priority, application France, Jan. 31, 1974, 74.03270
Int. Cl.[2] B23Q *5/22;* B23C *1/027*
U.S. Cl. 90—11 F **6 Claims**

1. An arrangement for balancing and compensating for the overhang effect caused by longitudinal moment of a movable part of a machine along a supporting table, in which the said movable part is suspended at a point situated substantially on a vertical line passing through its center of gravity, wherein the movable part is provided with a counterweight which is movable longitudinally on the movable part to create a moment which can be adjusted in relation to the point of suspension of the movable part; said counterweight including at least one



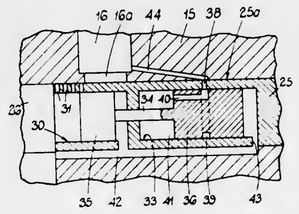
actuator selectively acting on electric contact members fixed to the movable part, said contact members being positioned as a function of the tipping moment of an accessory mounted on the movable part; and means for moving the counterweight along said movable part, said contact members controlling the moving means to stop the displacement of the counterweight by the moving means when the contact members are engaged by the actuator.

4,048,903

ROTARY HYDRAULIC MACHINE HAVING A VALVE RESPONSIVE TO ROTOR BORE PRESSURE AND STATOR PORT PRESSURE

Thomas Ernest Edwin Roberts, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 15, 1976, Ser. No. 667,042
Claims priority, application United Kingdom, Apr. 24, 1975, 16957/75
Int. Cl.[2] F01B *3/00, 13/04*
U.S. Cl. 91—6.5 **8 Claims**



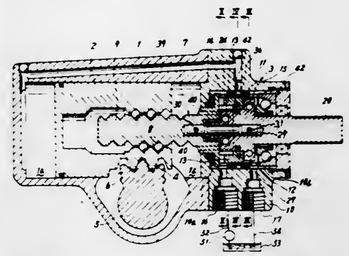
1. A rotary hydraulic machine comprising a housing, a rotor within the housing, said rotor having a plurality of bores which open onto a face of the rotor, means, responsive to rotation of the rotor, for causing liquid displacement within said bores to accompany said rotation, a port plate against one face of which said rotor face is engaged, said port plate including a first port with which said bores can successively communicate, a first passage in said port plate, said first passage communicating with said first port and with port means which open on to said port plate face, said port means being spaced from said first port, in a direction of the path of movement of said bores across said port plate face, so that said bores communicate, in use, with said port means before communicating with said first port, said port means extending in said direction of movement, and a control element, responsive to an increase in pressure in said bores, for progressively uncovering said port means in a direction away from said first port, and to an increase in pressure in said first port for progressively covering said port means in a direction towards said first port.

4,048,904

SERVO VALVE DEVICE IN POWER STEERING APPARATUS

Minoru Kawabata, Chita, and Kenji Takahashi, Kariya, both of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Japan

Filed May 11, 1976, Ser. No. 685,259
Claims priority, application Japan, May 30, 1975, 50-65709
Int. Cl.[2] F15B *9/10*
U.S. Cl. 91—375 A **6 Claims**



1. In a power steering apparatus having a fluid pressure motor supplementing manual steering torque, a first rotatable steering rod member rotating in response to the action of said fluid pressure motor, a manually rotatable second steering rod member aligned with said first steering rod member, and a servo valve device serving to distribute fluid under pressure to said fluid pressure motor in response to rotational phase difference between said first steering rod member and said second steering rod member due to manual steering torque, said servo valve device comprising:

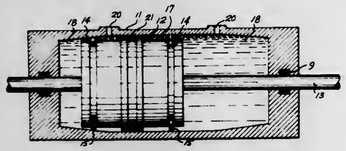
a main valve member mounted on one of said two steering rod members nd having an axial slot extending from one open axial end thereof toward a closed axial end in a plane containing a rotational axis thereof;

partition means housed in said axial slot and separably fixed to said main valve member for fluid-tightly partitioning said axial slot into at least two axially spaced slots so as to respectively define a first valve chamber and a second valve chamber being axially spaced apart, said first valve chamber being connected to a fluid supply line and being provided with a pair of distribution ports, one of which communicates with one of the operative ports of said fluid pressure motor and the other of which communicates with the other of said operative ports of said fluid pressure motor, said second valve chamber being connected to a fluid exhaust line and being provided with a pair of injection ports, one of which communicates with said one of said distribution ports and the other of which communicates with said other of said distribution ports;

a radially extending first flap valve member mounted on the other of said two steering rod members and located in said first valve chamber for controlling flow of said fluid being supplied under pressure to said two distribution ports; and

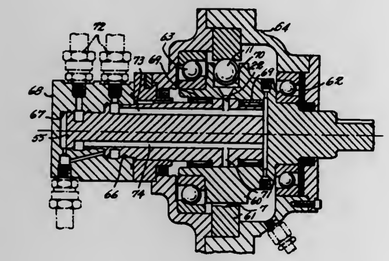
a radially extending second flap valve member integrally formed with said first flap valve member and located in said second valve chamber for controlling flow of said fluid under pressure from said two injection ports.

4,048,905
VARIABLE ORIFICE HYDRAULIC SNUBBER
Richard Ervin Souslin, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Mar. 29, 1976, Ser. No. 671,633
Int. Cl.² F15B 15/22; F01B 11/02
U.S. Cl. 91—405 2 Claims



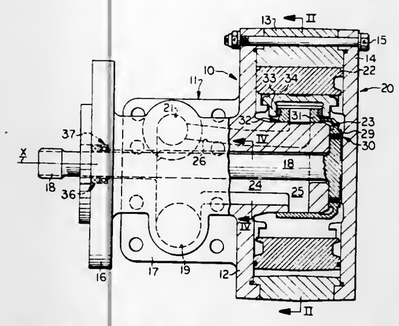
1. A piston and cylinder assembly comprising:
a cylinder having a closed end, the internal diameter of said cylinder increasing, over a portion of the length, with distance from said closed end;
a piston movable in said cylinder, said piston being provided with an annular piston-ring groove;
a piston ring in said groove and in contact with said cylinder having a circumference such that its ends form an opening therebetween, which opening is determined by the diameter of said cylinder with which the ring is in contact.

4,048,906
LOW-STRESS CAM-DRIVEN PISTON MACHINES
Donald Firth, and Sinclair Upton Cunningham, both of Glasgow, Scotland, assignors to National Research Development Corporation, London, England
Filed Mar. 19, 1969, Ser. No. 808,536
Claims priority, application United Kingdom, Mar. 22, 1968, 14082/68
Int. Cl.² F01B 13/06
U.S. Cl. 91—491 7 Claims



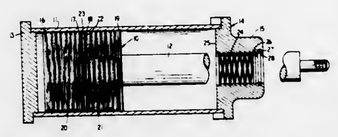
1. A hydrostatic piston-and-cylinder machine having an array of cylinders and a piston for, and movable in, each such cylinder, a sinuous cam track, and cam-following surfaces of or carried by the pistons engaging the cam track whereby the pistons move to and fro along the axes of their cylinders on movement of the cylinder array along the length of the cam track characterized in that the cam track is so shaped as to impose on the piston for an outward stroke of said piston, commencing with the associated cam follower surface engaging the center of a crest of the cam, an initial phase of acceleration starting at a relatively low rate of velocity change and during which the magnitude of the function of piston velocity plotted against time rises concavely, and a terminal phase of deceleration concluding with a relatively high rate of velocity change and during which the magnitude of the said piston velocity function falls convexly and further characterized in that each inward stroke of a piston, terminating with the associated cam follower surface engaging the center of a crest of the cam, has an initial phase of acceleration for said piston starting at a relatively high rate of change of velocity in which the magnitude of the said piston velocity function value rises convexly and a terminal phase of deceleration concluding with a relatively low rate of change of velocity, and in which the magnitude of the said piston velocity function value falls concavely and in which the initial phase of acceleration in respect of an outward stroke is equal in duration to the terminal phase of deceleration in respect of an inward stroke and the terminal phase of deceleration in respect of an outward stroke is equal to the initial phase of acceleration in respect of an inward stroke, the initial acceleration phase of the stroke of one piston in a given direction, i.e. either inwards or outwards of the cylinder, is coincident with the terminal deceleration phase of the stroke in the same direction of another piston, the change of velocity of the two pistons at any instant during the two coincident phases, being equal in rate but opposite in sense whereby the aggregate of displacement of such two pistons does not vary during such coincident phases.

4,048,907
RADIAL PISTON PUMP OR MOTOR WITH UNRESTRICTED INLET MEANS
William K. Engel, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 8, 1975, Ser. No. 638,582
Int. Cl.² F01B 13/06
U.S. Cl. 91—492 10 Claims



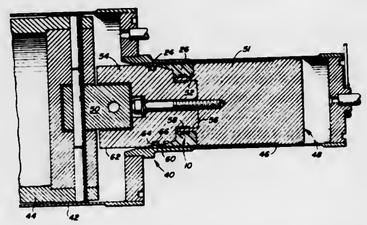
1. A radial piston apparatus comprising
a housing,
a shaft rotatably mounted in said housing for rotation about a longitudinal axis thereof,
inlet means defined in said housing for communicating fluid therein,
outlet means defined in said housing for communicating fluid therefrom, and
pump means mounted in a cylindrical chamber defined in said housing, said pump means comprising
pintle valve means mounted in said housing and defining a single inlet chamber therein,
a rotor operatively connected to said shaft for rotation therewith and rotatably mounted on said pintle valve means in eccentric relationship relative to said cylindrical chamber,
a plurality of circumferentially spaced and hollow piston means mounted on said rotor to extend radially outwardly therefrom,
a cylinder means mounted on an end of each of said piston means for relative reciprocal movement therebetween and disposed in sliding bearing contact internally of said cylindrical chamber,
first passage means, having said shaft disposed therein constituting a single and substantially unrestricted passage defined in said housing and extending from said inlet means to said single inlet chamber, and
second passage means defined in said housing for communicating an outlet side of said pintle valve means with said outlet means.

4,048,908
PISTONS
William James Urquhart, Tumbi Umbi, Australia, assignor to F. B. J. Engineering Services Pty. Limited, Granville, Australia
Filed Dec. 9, 1975, Ser. No. 639,045
Claims priority, application Australia, Dec. 9, 1974, 76169/74
Int. Cl.² F01B 31/10
U.S. Cl. 92—159 4 Claims



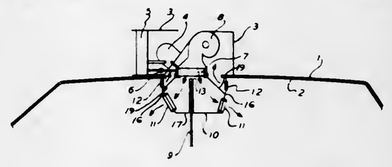
1. A liquid operated double-acting device, such as a hydraulic ram comprising: a cylinder with a bore, a piston reciprocable in said bore, said piston having at least one circumferentially complete sealing means arranged around the circumference thereof in slidable sealing relationship with said bore, left and right hand intersecting helical channels formed on the surface of said piston between each end of said piston and said sealing means, each of said channels terminating in a circumferential groove at each end of said piston.

4,048,909
PISTON RING
Robert E. Jepsen, Emmaus, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.
Division of Ser. No. 302,932, Nov. 1, 1972, Pat. No. 3,999,768.
This application Aug. 5, 1976, Ser. No. 711,945
Int. Cl.² F16J 1/06
U.S. Cl. 92—194 5 Claims



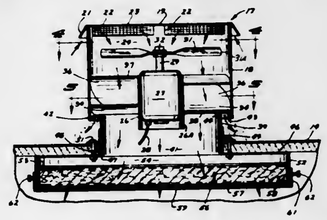
1. A piston assembly for reciprocation inside a cylinder having a generally cylindrical cylinder wall comprising in combination:
a first piston section substantially cylindrical in shape having a top and bottom planar surface with a thin walled, open ended cylindrical adaptor defining an internal chamber fixed to one planar surface of the first section, said wall of said adaptor constructed to deflect elastically under circumferential loads;
a second piston section having means to secure it to the first section and having a first generally cylindrical portion having a diameter smaller than the thin walled adaptor of said first section and a second portion substantially cylindrical in shape and substantially identical in diameter with the first piston section and an annular projection on said first portion adapted to engage said thin walled adaptor within said chamber adjacent said one planar surface to axially align aid first and second piston sections whereby said thin walled adaptor can deflect toward the smaller diameter portion of said first cylindrical portion; and
a piston ring between said first and second piston sections, said ring sealingly engaging the outside surface of the thin walled adaptor of said first piston section and adapted to engage a cylinder wall in sealing engagement so that fluid leakage between said ring and a cylinder wall and said ring and said piston is prevented.

4,048,910
PLENUM COVER FOR ROOF MOUNTED VEHICLE AIR CONDITIONER
Robert Weir, 277 Bronx River Road, Yonkers, N.Y. 10704
Continuation-in-part of Ser. No. 633,667, Nov. 20, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 735,051
Int. Cl.² B60H 1/28
U.S. Cl. 98—2.16 1 Claim



1. A plenum cover for use with a vehicle air conditioner of the roof mounted type, said cover having an opening at its top and being formed by elongated side walls and a base joined to said side walls, said base being formed defining a continuous elongated groove extending upwardly toward said opening at the top and spaced between said side walls being adapted to receive a partition said vehicle, a plurality of air flow diffusers being located in said cover on opposite side of said elongated groove, said side walls having a plurality of openings for admitting return air into said cover, and a plurality of flow vanes positioned in said cover and being adapted to separate cool air flow being discharged through said diffusers from return air flow entering through said openings in said side walls.

4,048,911
AIR SUPPLY APPARATUS
Ross K. Petersen, 5211 Lakeland Ave., Minneapolis, Minn. 55429
Filed July 29, 1976, Ser. No. 709,551
Int. Cl.² F24F 7/00
U.S. Cl. 98—39 20 Claims



1. An apparatus for supplying air to a location comprising: a casing surrounding a chamber, said casing having a first end, a second end, and at least one air inlet opening open to the chamber to allow outside air to flow into the chamber; means for covering the first end of the casing, a plurality of stationary inclined vanes located in the chamber secured to the casing, adjacent vanes being spaced from each other to form passages open to the chamber and the second end of said casing, a rotatable fan located in the chamber between the vanes and

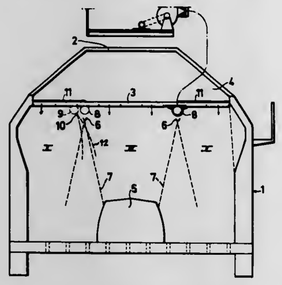
means for covering the first end of the casing, motor means for rotating said fan whereby air is moved through the air inlet opening into the chamber and through the chamber in a circular path thereby concentrating particulates in an outer zone of air moving through the chamber and passages, means mounting the motor means in the central portion of the chamber, and a collar located adjacent the second end of the casing providing a clean air outlet passage and an air discharge opening, said outer zone of air and particulates being discharged through said air discharge opening and the remaining air being discharged through the clean air outlet passage.

4,048,912

COLOR SPRAY BOOTH AND METHOD OF VENTILATING THE SAME

George Walker, Staines, England, assignor to AB Svenska Flaktfabriken, Nacka, Sweden

Filed Sept. 19, 1975, Ser. No. 615,971
Claims priority, application Sweden, Sept. 19, 1974, 7411766
Int. Cl.² F23J *11/00*
U.S. Cl. 98—115 SB **7 Claims**



1. In a process for ventilating a station for the surface treatment of spaced-apart successive objects arriving sequentially at said station, by passing inlet ventilating air downward through said station and about said objects from inlets in a ceiling above said station, removing said ventilating air by way of outlets in a floor below the level of the objects, and dividing the interior of said station into a first zone adjacent each said successive object and at least a pair of other zones more remote from said each object by means of a pair of curtains of air moving at a velocity higher than that of said ventilating air and disposed generally adjacent opposite sides of said object, the improvement wherein said curtains are directed convergently downward so that said flow of said ventilating air in said first zone converges downwardly, whereby the outflow of said ventilating air from said one zone is principally by way of the spacing between said objects and at relatively high velocity.

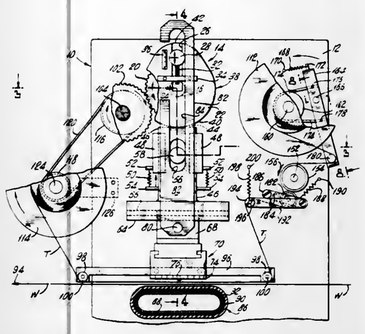
4,048,913

APPARATUS FOR REPETITIVE IMPRINTING AT UNIFORM INCREMENTS ON A CONTINUOUSLY MOVING WEB

Menashe Navi, Elizabeth, N.J., assignor to Adolph Gottscho, Inc., Union, N.J.

Filed Sept. 6, 1974, Ser. No. 503,882
Int. Cl.² B41F *1/04*
U.S. Cl. 101—27 **39 Claims**

1. A printing apparatus for webs continuously moving along a first path comprising printing means positioned on one side of the path; back-up means on the other side of said path facing said printing means; means for cyclically displacing said printing means along a second path having a first portion extending substantially along said first path and a second portion spaced from said first path, said printing means engaging said web against said back-up means while in said first portion of said second path to effect printing, said means for displacing said printing means including a first displacing means for displacing the printing means toward and away from said web and a second displacing means for displacing the printing means substantially parallel to said first path, said first displacing means being operatively coupled to said second displacing means for the coordinate operation thereof, said second displacing means including a wheel continuously rotating about its axis, a displaceable pivot means mounted on said wheel at a location radially spaced from said wheel axis, a fixed pivot means positioned intermediate said wheel axis and said printing means, and means coupling said displaceable pivot means and said printing means, said coupling means being pivotally mounted on said printing means and formed with a slot means



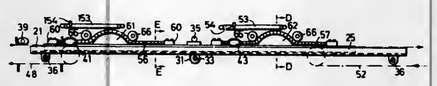
for receiving said displaceable and fixed pivot means to permit pivotable and lateral displacement of said coupling means relative to said displaceable and fixed print means, said coupling means pivoting about said fixed pivot means in response to the rotatable displacement of said displaceable pivot means on said wheel to reciprocally displace said printing means in a direction substantially parallel to said first path, said means for displacing said printing means including means for selectively adjusting the velocity of said printing means so that said printing means and web are moving at substantially the same velocity while said printing means is traversing said first portion of said second path and printing is effected; and means for displacing said back-up means with said web and printing means when said printing means engages said web thereagainst.

4,048,914

APPARATUS FOR SCREEN PRINTING IMAGES ON OBJECTS

Wilfried Kammann, and Manfred Keller, both of Bunde, Germany, assignors to Werner Kammann Maschinenfabrik, Bunde, Germany

Filed Oct. 23, 1975, Ser. No. 625,348
Claims priority, application Germany, July 8, 1975, 2530360
Int. Cl.² B41F *17/20*
U.S. Cl. 101—35 **29 Claims**



1. An apparatus for printing images on objects, comprising at least one printing stencil; at least one doctor associated with said stencil; means for moving said stencil and doctor relative to one another; means for transporting the objects in a predetermined path and direction past said stencil, including a carrier extending along said path and mounted for reciprocation in said direction and opposite thereto by a given distance and at least two pairs of support members connected to said carrier

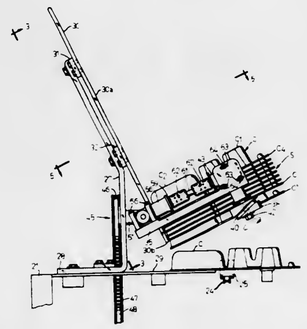
to share the reciprocatory movement thereof and being spaced from one another by said distance, each of said pairs having a common axis transverse to said path and being operative for coaxially supporting a respective object, said carrier including at least one carrier component which is flexible in a plane extending parallel to said direction and substantially normal to said stencil, said support members being mounted on said flexible carrier component; means for flexing said carrier component in said plane and including a guide member in engagement with said carrier component and having a configuration which is dependent on the shape of the object transported thereby, and a plurality of rollers engaging said carrier component opposite said guide member; and at least one intermediate support along said path for temporarily supporting the objects.

4,048,915

METHOD AND APPARATUS FOR DENESTING CARTONS

Thomas R. Martin, Milwaukee, Wis., assignor to Condes Corporation, Milwaukee, Wis.

Filed Apr. 7, 1976, Ser. No. 674,541
Int. Cl.² B65H *3/28*; B65G *59/10*
U.S. Cl. 101—35 **7 Claims**



1. A carton denester for supporting a stack of nested cartons and for separating the cartons one at a time from the bottom of said stack, and wherein each of the cartons includes a lateral flange, the carton denester comprising:

support means for supporting a stack of cartons, said support means being inclined to vertical for at least partially supporting the weight of the stack of cartons thereon, the stack of cartons being downwardly movable along the support means as the cartons are separated from the bottom of the stack and said support means including a lower edge;

rotatable feed screw means for separating the bottom carton from said stack of cartons, and being supported generally below said stack of cartons with respect to the direction of movement of said cartons along said support means, said screw means having an upper surface coplanar with said lower edge of said support means for partially supporting the said stack of cartons, said screw means also having a helical groove intersecting said upper surface for receiving the flange of the bottom carton of the stack when the flange of the bottom carton has moved below said lower edge, to thereby separate the bottom carton from the stack when the feed screw means rotate; and

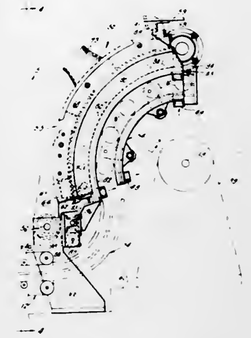
means for rotating the feed screw means.

4,048,916

CURING SECTION FOR CONTINUOUS MOTION DECORATOR

Stanley Silverman, Deaville, and John Broeils, Wyckoff, both of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Sept. 26, 1975, Ser. No. 617,006
Int. Cl.² B41F *17/20*; F26B *3/30*
U.S. Cl. 101—40 **8 Claims**



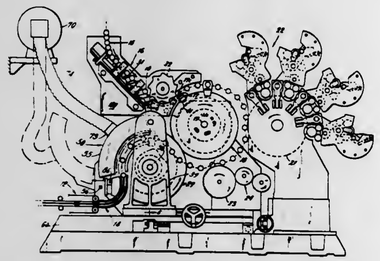
1. Apparatus for decorating and curing generally cylindrical articles including continuously moving conveyor means having an input which receives undecorated articles and an output from which decorated articles are discharged, decorator means for applying decorations to undecorated articles on said conveyor means, and curing means for curing decorations applied to articles by said decorator means; said conveyor means including a plurality of rotatably mounted mandrels which carry articles while said decorator means applies decorations thereto; said conveyor means also including a transfer assembly including a plurality of heads which receive decorated articles directly from said mandrels and hold these articles while decorations thereon are being cured by said curing means; said transfer assembly being mounted for continuous rotation about a main axis; each of said heads holding a cylindrical article with its cylindrical axis extending generally parallel to said main axis; said curing means disposed adjacent a peripheral portion of said transfer assembly and outboard of articles held by said heads; said curing means including a plurality of sources emitting radiation for rapidly curing decorations, said plurality of sources being in an arcuate array and said peripheral portion of said transfer assembly extending upstream from said output of said conveyor means; each of said sources including an elongated lamp having it longitudinal axis positioned generally parallel to said main axis; said arcuate array being part of a subassembly that is mounted for movement between an operating position adjacent to said spindles and a service position remote from said spindles and wherein said lamps are accessible for removal and replacement; a pivot means at the downstream end of said subassembly about which the latter is moved between its said operating and said service positions; said downstream end being below the upstream end of said subassembly in the vicinity of the output of said conveyor means.

4,048,917

CONTINUOUS MOTION PRINTING APPARATUS

John P. Skrypek, Mahwah, and Arnold Peters, West Paterson, both of N.J., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Sept. 26, 1975, Ser. No. 617,007
Int. Cl.[2] B41F *17/20*; H01J *37/00*
U.S. Cl. 101—40 6 Claims



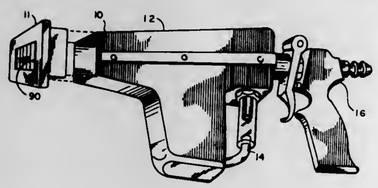
1. Apparatus for decorating and curing generally cylindrical articles including continuous motion conveyor means having an input which receives undecorated articles and an output from which decorated articles are discharged, decorator means for applying decorations to undecorated articles on said conveyor means, and curing means for curing decorations applied to articles by said decorator means; said conveyor means including a plurality of rotatably mounted mandrels in continuous motion transverse to their rotational axes, said mandrels carrying articles while said decorator means applies decorations thereto; said conveyor means also including a transfer assembly including a continuously rotating wheel mounting a plurality of heads which receive decorated articles directly from said mandrels and hold these articles while decorations thereon are being cured by said curing means, each of said heads including a spindle having an axis substantially coincident with the axis of an article carried thereby; and means for rotating both said spindle and an article thereon about their axes while an article on the spindle is having its decorations cured by said curing means, said means for rotating said spindle and an article thereon being inactive to rotate said spindle while an article is being received by said spindle from said mandrel.

4,048,918

STENCILING APPARATUS AND IDENTIFICATION SYSTEM

Gregory George Alexander Peck, Brisbane, Australia, assignor to Identicar Corporation of America, Watertown, Mass.

Filed Nov. 6, 1975, Ser. No. 629,650
Claims priority, application Australia, Aug. 13, 1975, 2784/75
Int. Cl.[2] B41F *15/36*
U.S. Cl. 101—114 5 Claims



5. A stenciling apparatus of the type having a pistol-type compressed air supply member for stenciling medium delivery means comprising:

a hollow casing having a rear end portion receiving said air supply member, a front end portion defining a rectangular aperture and a lower stenciling medium and recycling area, said front and lower casing portions being interposed by means of a sloping curvature casing portion;

a stencil holding unit, having a circumscribed interior rectangular aperture smaller than said casing aperture positioned within and over said casing aperture;

means about said stencil holding unit aperture for forming two parallel retaining grooves of two resilient converging lips for each of said grooves and for forming two retaining groove slots by means of overlapping flanges, said slots perpendicularly abutting said retaining grooves;

a plurality of rectangular body unit stenciling indicia members having triangularly shaped end members, perpendicularly affixed along the stencil body width, capable of being engageable within said retaining groove converging lips;

at least two rectangular body end unit stencil indicia members having said triangularly shaped end members for insertion into said retaining groove and having a protruding flange member, abutting the length of the body of one side of said stencil member, capable of being engageable within said retaining slot and flange;

each of said unit stencils having a protruding triangular flange extending from one corresponding side of each of said triangular end members and having a complimentary mating triangular indentation upon the opposing side of each of said triangular end members for interlocking adjacent unit stencil members; and

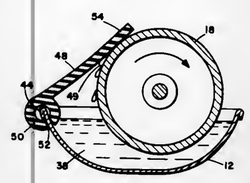
each of said unit stencils having a protruding flange extending the length of one edge of the body of said unit stencil member for overlapping adjacent unit stencil members.

4,048,919

WATER FOUNTAIN CONTROL WIPER UNIT FOR OFFSET PRINTING MACHINES

Kenneth D. Woods, P.O. Box 141 Star Rte., Spring Valley, Calif. 92077

Filed Aug. 4, 1975, Ser. No. 601,362
Int. Cl.[2] B41F *7/26, 9/10*
U.S. Cl. 101—148 7 Claims



1. A water fountain control wiper unit for mounting on the edge of a fountain tray in offset printing machines for controlling the amount of water on selective portions of the water fountain roller comprising:

a wiper blade and connector means unitarily constructed on a common resilient material,

said wiper blade having a given length defined by that dimension extending parallel to the axis of a roller with which said blade cooperates and a width sufficient to extend from the edge of the water fountain tray to a point beyond the adjacent trangentially aligned surface of the water fountain roller,

said wiper blade having a flat surface for engagement with the surface of a water fountain roller,

said connector means includes a slit tubular portion extending at least partially along the length of said blade defining resilient gripper means for securing the wiper blade to the edge of the water fountain tray,

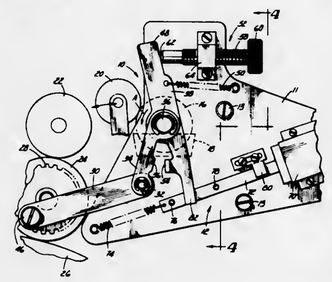
said gripper means and said blade defining biasing means for resiliently biasing the flat surface of the wiper blade for resiliently contacting tangentially against the surface of the water fountain roller for removing water therefrom upon rotation of the water fountain roller.

4,048,920

MOISTURE SYSTEM CONTROL APPARATUS

Gerhard A. Nothmann, Wilmette, Ill., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Aug. 2, 1976, Ser. No. 710,401
Int. Cl.[2] B41F *7/26*
U.S. Cl. 101—148 10 Claims



1. In a lithographic duplicating machine having a main power source, a master cylinder and fountain means including a fountain roller for supplying dampening fluid to a master on the master cylinder, a control means for metering the rate of feed of the fluid, comprising:

drive means mechanically connected to said main power source for rotating the fountain roller unidirectionally in intermittent increments in time with the master cylinder and operable in a first mode to control the feed of dampening fluid during a printing operation;

means for adjusting the drive means to set the magnitude of the incremental motions of the fountain roller to a desired value by infinitesimal degrees, with respect to operation of the drive means in said first mode; and

means for overriding the adjusting means and shifting the drive means into a second mode of operation which rotates the fountain roller in substantially shorter intermittent increments than those which characterize the printing operation so as to meter the feed of the fluid at a rate substantially reduced from the rate of feed of the fluid obtaining during the first mode and for maintaining the drive means in said second mode during non-printing operation while the machine is idling, and also for shifting the drive means from the second mode into the first mode and maintaining the same in said first mode during a printing operation.

4,048,921

ELECTROSTATIC PRINTING/DUPLICATING METHOD USING POLARIZATION FORCES

Curt R. Raschke, Somerset, N.J., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 447,170, March 1, 1974, abandoned. This application Sept. 18, 1975, Ser. No. 614,502
Int. Cl.[2] B41M *1/22*
U.S. Cl. 101—426 2 Claims

1. The process of producing copies of an original document on plain paper, comprising the steps:

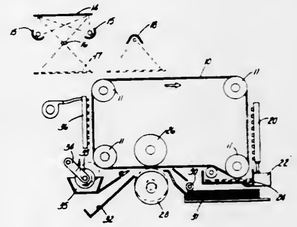
a. providing a carrier comprising a conductive sheet with a dielectric surface;

b. establishing an electrostatic charge pattern on the surface of said dielectric surface;

c. providing substantially uncharged toner particles of material in a size range of 5 to 25 microns and a dielectric constant of about 8 or higher, and

bringing a plurality of the selected particles into contact with said charge pattern, to polarize and attract said particles to the charge pattern, without discharging said pattern, and therefore hold said particles with polarization forces of a low first order of magnitude;

d. placing said dielectric surface after being toned, into contact with a sheet of plain paper under pressure to establish mechanical adhesion forces between said paper and toner particles with a second order of magnitude



greater than the said first order produced by said polarization forces;

e. retoning the undischarged charge pattern and repeating the process of steps (c) and (d) a plurality of cycles to produce multiple copies; and

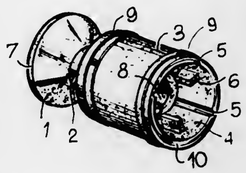
f. removing residual toner and the electrostatic charge from said dielectric surface at the end of the production of a predetermined number of copies, rendering said dielectric surface capable of receiving a new image.

4,048,922

SELF-FRAGMENTABLE BULLET

Stephan Buljovcic, Versailles, France, assignor to Rese Cosson S.A., Paris, France

Filed June 2, 1976, Ser. No. 692,215
Claims priority, application France, June 3, 1975, 75.17308
Int. Cl.[2] F42B *11/18*
U.S. Cl. 102—92.7 10 Claims



1. A self-fragmented bullet comprising a block containing a central core, a peripheral part surrounding said core, said peripheral part comprising a plurality of panels extending longitudinally and separated by weakened areas which also extend longitudinally, and passageways between said peripheral part and said core extending from end to end of said block.

4,048,923

RETURN LOOP FOR TRANSPORT VEHICLES

Francois Louis Giraud, Plaisir, France, assignor to Savec, Maurepas, France

Filed Mar. 31, 1976, Ser. No. 672,129
Claims priority, application France, Apr. 3, 1975, 75.10440
Int. Cl.[2] B61J *1/12*; B61K *1/00*
U.S. Cl. 104—21 4 Claims

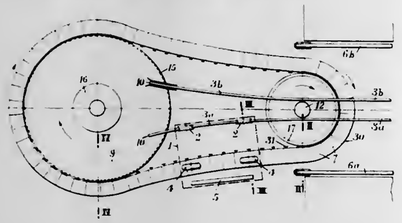
1. In a transport system comprising at least one vehicle, a

device for returning this vehicle at a line terminal, which comprises in combination:

a conveyor forming a closed, partly circular loop at said terminal;

a rotary platform having a substantially circular marginal portion, which is partly encircled by said conveyor;

at least one lead-rail leading to said terminal and one return rail, both rails terminating with a bevelled portion in the vicinity of said platform marginal portion;



conveyor engaging means carried by said vehicle to enable said vehicle to bear on said conveyor during the returning operation, and

at least two wheels also carried by said vehicle and also adapted to constitute bearing member therefor, said wheels comprising each a first bearing surface located in a first plane and enabling said wheels to roll on said rails, and a second bearing surface located in a plane other than said first plane and enabling said wheels, after they leave said lead-rail and before they engage said return rail, to roll and slide on said platform.

4,048,924

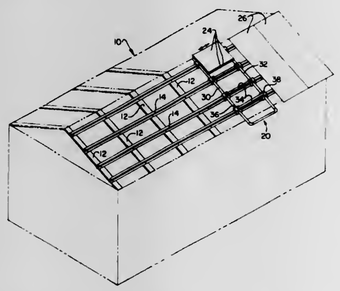
ROOFING SYSTEM

Warren G. Wibben, 479 N. State St., Apt. B-1, Concord, N.H. 03301

Continuation-in-part of Ser. No. 542,121, Jan. 20, 1975, abandoned. This application Jan. 12, 1976, Ser. No. 648,529

Int. Cl.[2] E04E *3/02;* **E04D** *15/07*

U.S. Cl. 104—245 **2 Claims**



1. Roofing apparatus for handling roofing panels over purlins having tops and top free edges running the length of a pitched roof for supporting the lengths of panels in a slope direction of roof pitch comprising,

means defining a carriage structure with an elongated skeletal frame extending orthogonal to the purlins and spaced wheel means riding on each of several adjacent purlins and carrying the skeletal frame,

the carriage structure extending over a length of at least half the length of the roofing panels to be emplaced,

each of the wheel means comprising at least first and second wheels with said first wheel having an essentially horizontal axis and said second wheel having an essentially vertical axis,

the first wheel riding on top of a purlin and the vertical axis second wheel being arranged to bear against the top free edge of a purlin, at least one such wheel wheel being provided for each of several adjacent purlins of the roofing,

and wherein the carriage structure is of ladder form and comprises at least two of said wheel means at each rung of the ladder,

and wherein each said wheel means comprises a wheel supporting frame demountably clamped onto said carriage structure,

and wherein each wheel supporting frame comprises an inverted U-form straddling the top of a purlin and holes in opposing legs of the U-form define said horizontal axis while opposing bent out ears in one of said legs with holes therein define said vertical axis,

the U-form wheel supporting frame having cutouts in opposing U-legs for fitting closely over a ladder leg,

and further comprising,

means for demountably securing the wheel supporting frame to the ladder leg and means for securing a ladder rung end to the wheel supporting frame.

4,048,925

VEHICLE FOR AND METHOD OF OPERATION ON BOTH ROAD AND RAILROAD TRACK

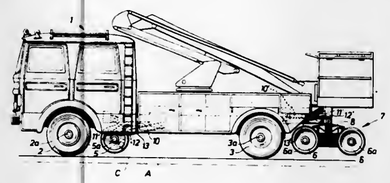
Anders Georg Storm, Solna, Sweden, assignor to Swedish Rail System AB SRS, Solna, Sweden

Filed June 10, 1976, Ser. No. 694,634

Claims priority, application Sweden, June 11, 1975, 7506711

Int. Cl.[2] B61F *13/00*

U.S. Cl. 105—215 C **6 Claims**



1. A vehicle for operation on both road and railroad track, provided with a wheeled chassis which enables the vehicle to transfer between a road and a railroad track that are substantially perpendicular to each other comprising a steered front rubber tire wheel axle and a rear rubber tire wheel axle, and at least one front and rear rail wheel axle provided with rail wheels, each rear rail wheel axle pivoting around a vertical axis relative to the wheel chassis, said rail wheel axle being vertically displaced by drive means into engagement with the railroad track during the lifting of adjacent rubber tire wheels out of engagement with the road wherein the rear rail wheel axle is located behind the rear wheel axle for rubber tire wheels of the vehicle and pivots at least 180° around the vertical axis.

5. A method of turning around a vehicle having rail wheels on axles positioned behind a front steered and a rear road wheel axle carrying rubber tire wheels, respectively, on a railroad track, comprising the steps of at the turning around movement keeping the rail wheels for the rear wheel axle or axles which pivots about a vertical axis on the track while supporting the forward portion of the vehicle on the rubber tire wheels on the steered axle, moving off the road by having rubber tire wheels at a position where the vehicle forms an angle of about 90° with the track, thereafter moving the vehicle with the rear rail wheel axle on the track to a position in parallel with the track, so that the vehicle is turned into the opposite direction relative to the starting position, and engaging the rail wheels on the front rail wheel axle with the track.

4,048,926

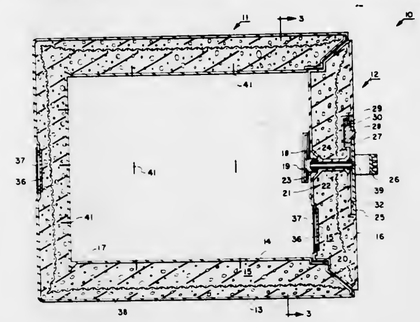
SAFE

John D. Brush, Jr., and George M. Burgess, both of Webster, N.Y., assignors to John D. Brush & Co., Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 588,967, June 20, 1975. This application Jan. 12, 1976, Ser. No. 648,504

Int. Cl.[2] E05G *1/026*

U.S. Cl. 109—65 **16 Claims**



1. A fire-resistant safe for protecting stored contents from ambient fire, said safe having a box and a door formed of a thermal insulating material and having a jamb region that is non-linear in cross section where a peripheral region of said door confronts and fits together with a region around an opening in said box, and said safe comprising:

a. the space between said insulating material of said box and said door in said jamb region being substantially filled with a resin material overlying said insulating material, said resin material being combustable at temperatures substantially less than the temperature of said ambient fire;

b. said resin material being substantially thermally non-conductive and arranged to provide means for substantially preventing conduction of heat from said ambient fire through said jamb region to the interior of said box;

c. said space between said insulating material of said box and said door in said jamb region being thin enough relative to the length of said non-linear cross section to provide means for protecting an inner portion of said resin material in said jamb region from combustion in said ambient fire; and

d. said resin material providing means for substantially sealing said jamb region against passage of hot gases from said ambient fire into said interior of said box, said sealing resulting from a charred resin residue adjacent said unburned inner portion of said resin material after said ambient fire burns away an outer portion of said resin material.

4,048,927

PLANT FOR BURNING WASTE

Heinz Mallek; Werner Jablonski, both of Tetz, and Friedhelm Augustin, Julich, all of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

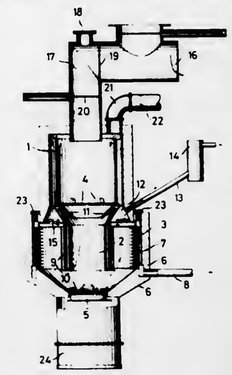
Filed Sept. 11, 1975, Ser. No. 612,475

Claims priority, application Germany, Sept. 14, 1974, 2444125

Int. Cl.[2] F23G *5/00;* **F23L** *17/00*

U.S. Cl. 110—8 R **12 Claims**

1. A plant for burning waste, which includes: a main combustion chamber having inlet means for receiving waste to be burned and for receiving fresh gases for burning said waste, a post-combustion chamber arranged below said main combustion chamber and open at its top, means for normally providing a down draft through the main combustion chamber into said post-combustion chamber and including therewith a grate interposed between said main combustion chamber and said post-combustion chamber and forming the bottom of said main combustion chamber and the top of said post-combustion chamber, said post-combustion chamber having an opening in its bottom for discharging ashes and residues from the combustion in said main and post-combustion chambers and having a



volume equalling at least the volume of said main combustion chamber, cover means for selectively closing said opening, said post-combustion chamber also being provided with outlet means for discharging waste gas from said post-combustion chamber and a wall structure of highly heat resistant material arranged within said post-combustion chamber and open at its bottom for guiding flue gases passing through said grate toward the bottom of said post-combustion chamber.

4,048,928

APPARATUS FOR DISCHARGING CINDERS FROM AN INCINERATOR

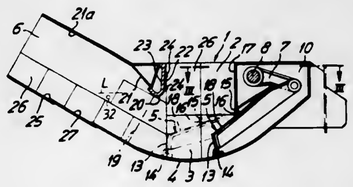
Johannes Josef Martin, Leopoldstrasse 248, 8000 Munich 40, Germany

Filed Aug. 31, 1976, Ser. No. 719,147

Claims priority, application Germany, Sept. 5, 1975, 2539615

Int. Cl.[2] F23J *1/06*

U.S. Cl. 110—165 R **18 Claims**



1. An apparatus for discharging cinders, said apparatus comprising: an intake having horizontally spaced front and rear walls defining an upwardly open cinder-receiving pit; a water-filled trough below said intake having an upwardly concave floor and defining an upwardly extending outlet for quenched cinders extending under said rear wall and away from said pit, whereby cinders falling into said trough through said pit are quenched by the water in said trough; a stepped plunger having a front face slidable in an arcuate path along said floor between a retracted position relatively close to said front wall and an advanced position relatively far from said front wall, an upper surface turned toward and alignable under

said pit, and a step face turned toward said outlet and lying in back of said front wall in said retracted position and between said walls in said advanced position; and means for advancing said plunger between said positions and thereby sweeping said front wall in said arcuate path across said floor and pushing quenched cinders in said trough with said faces toward said outlet, said step face being inclined relative to said floor so as to exert on said quenched cinders on advance of said plunger from said retracted into said advanced position a component of force toward said floor.

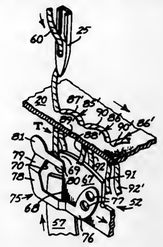
4,048,929
COMBINED APPARATUS FOR TILLING AND PLANTING
Vincent J. Zumbahlen, R.R. No. 3, Newton, Ill. 62448
Filed Jan. 8, 1976, Ser. No. 647,655
Int. Cl.² A01C *5/00, 5/08*
U.S. Cl. 111—85 **11 Claims**



1. A machine for tilling and planting the surface of a field comprising:
- a frame adapted for movement across a field, said frame adapted to be drawn by a prime mover tractor, the longitudinal attitude of said frame being adjustable from said tractor, whereby the operator of said tractor can independently adjust both the elevation of the front of said frame and the elevation of the rear of said frame;
- a plow unit mounted below the forward portion of said frame, said plow unit comprising a plurality of chisel plows adapted to plow the soil as said frame is moved through the field;
- a reel unit flexibly mounted below said frame, to the rear of said plow unit, said reel unit extending substantially the width of said plow unit, adapted to rotate as said frame is pulled through the field and thereby pulverize the soil, said reel unit being biased downwardly but being limited as to downward movement and as to depth of soil penetration;
- a roller unit flexibly mounted below said frame, to the rear of said reel unit, said roller unit extending substantially the width of said plow unit, and adapted to roll the soil to prepare a seed bed as said frame is pulled through the field; and
- a seed planting unit rigidly mounted on the rear of said main frame whereby the seed planting unit is raised from the ground when the rear of the main frame is elevated, said seed planting unit adapted to plant a plurality of rows of seeds as said frame is pulled through the field.

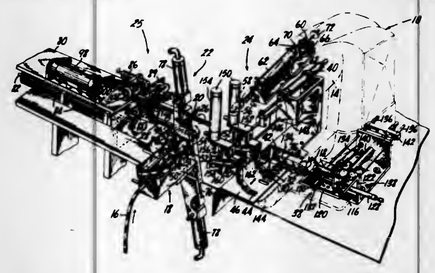
4,048,930
METHOD AND APPARATUS FOR FORMING J-TUFT PILE
Roy T. Card, Chattanooga, Tenn., assignor to Card & Co. Inc., Chattanooga, Tenn.
Filed Mar. 16, 1971, Ser. No. 124,829
Int. Cl.² D05C *15/36*
U.S. Cl. 112—79 A **9 Claims**

8. In a tufting apparatus for producing cut pile fabric having reciprocable needle means including a needle, and looper means including a looper having a bill, and a knife, said needle cooperating with one side of said looper to form a loop on said looper, said knife cooperating with the other side of said looper to cut a loop on said looper, a clamping member, mounting means fixing said clamping member relative to said looper and on the same side of said looper as said needle, said clamping member being resilient and having a retaining portion thereof disposed in close juxtaposition with a yarn-carrying portion of



said looper bill for clamping one leg of a cut loop between the retaining portion of said clamping member and said looper bill.

4,048,931
STYLE LOOP FORMING AND ATTACHING APPARATUS
Howard A. Hodgins, Pittsford, N.Y., assignor to The Rochester Button Company, New York, N.Y.
Filed Sept. 22, 1976, Ser. No. 725,426
Int. Cl.² D05B *23/00*
U.S. Cl. 112—121.27 **16 Claims**

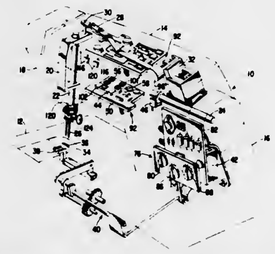


1. Apparatus for forming a style loop having one end folded over and the other end turned flat under the loop and for attaching the ends of the loop to a surface, the apparatus comprising:
- means adjacent the surface for attaching the ends of the loop thereto;
- a turning clamp positioned over the surface;
- means receiving loop material for folding over one end and for advancing the folded end to the turning clamp and the other end flat to the attaching means;
- means operating the turning clamp for thereafter holding the folded end of the loop while the attaching means attaches the flat end to the surface; and
- means relatively moving the turning clamp and the surface for turning the loop over the attached flat end and transferring the folded end to the attaching means for attachment to the surface.

15. An attachment for a sewing machine for forming a style loop which is to be sewn to a surface, the style loop having one end folded over and adapted to be sewn to the surface through the folded end and the other end turned under the loop and adapted to be sewn to the surface flat, the attachment comprising:
- a turning clamp having a pair of cooperatively closable jaws above the surface which are closed on the folded end of the loop, the fold being upward from the surface and the other end of the loop being positioned flat for sewing to the surface;
- means moving the turning clamp toward the flat sewn end for turning the loop over the sewn end; and

means rotating the turning clamp in the same direction for orienting the upward fold downwardly toward the surface for sewing to the surface through the folded end.

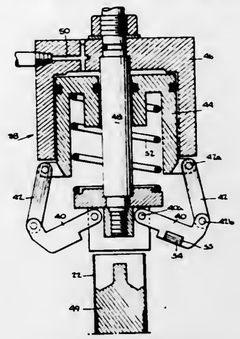
4,048,932
BIGHT STOP MECHANISM FOR SEWING MACHINES
Charles R. Odermann, Montville; Wesley R. Peterson, Bound Brook; John A. Herr, Garwood, and Oswald M. Porter, Livingston, all of N.J., assignors to The Singer Company, New York, N.Y.
Filed Feb. 17, 1976, Ser. No. 658,632
Int. Cl.² D05B *3/02*
U.S. Cl. 112—158 E **5 Claims**



1. In a sewing machine including a housing, an endwise reciprocable needle bar means and needle means removably supported in said needle bar means for movement therewith, jogging means for initiating relative lateral movement of said needle bar means, electric motor means operatively connected to said jogging means such that initiation of the relative lateral movement of said needle bar means is controlled in accordance with movement of said electric motor means, means for generating electrical input signals in accordance with predetermined stitches in a plurality of selected patterns and for connecting said electrical input signals to said electric motor means, said electric motor means having a work output proportional to said electric input signals, and circuit means including switch means for limiting the magnitude of the electrical input signals to said electric motor means, said circuit means being operative for reducing said electrical input signals a fixed percentage each time said switch is actuated whereby upon actuation of said switch means the maximum extent of lateral movement of said needle bar means for any selected pattern will be limited and means responsive to the insertion of a needle means in said needle bar means for automatically actuating said switch means.

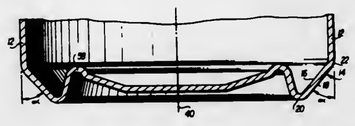
4,048,933
CONTAINER HEAD FORMING
Warren N. Hubert, Duncanville, Tex., assignor to Dixico Inc., Dallas, Tex.
Filed Apr. 5, 1976, Ser. No. 673,444
Int. Cl.² B21D *51/36, 37/06*
U.S. Cl. 113—1 B **6 Claims**

1. Apparatus for manufacturing a collapsible squeeze tube comprising:
- a form adapted to hold and position a collapsible cylinder such that one end of the cylinder extends free of said form,
- pleating means to form a plurality of pleats at the free end of whatever cylinder is held by said form, each of said pleats having a shoulder portion and a neck portion, said shoulder portion being intermediate between said neck portion and the uncrimped cylinderical body portion,
- creasing means to crease the same side of each of said pleats with a transverse crease at approximately the line between said shoulder portion and said neck portion, and



biasing means to partially fold over at least the neck portion of each of said pleats in the same circumferential direction.

4,048,934
METHOD OF BOTTOM EMBOSSING
Joseph W. Wallace, Henrico County, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed July 29, 1976, Ser. No. 709,905
Int. Cl.² B21D *51/26*
U.S. Cl. 113—120 H **3 Claims**

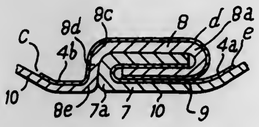


1. A method of embossing the bottom of a container of the type formed between a bottom-former element and a punch element of a can press, said method comprising the steps of:
- providing recessed indicia on one of said elements for indicating that said container is produced by said can press;
- providing a blank surface on the coactive portion of said other element;
- and ramming the can bottom between said punch element and said bottom-former element; and, in so doing, trapping air or lubricant adjacent said can bottom so that said indicia is embossed into said bottom by said air or lubricant without leaving objectionable stress concentrations in said bottom.

4,048,935
CONTAINER AND METHOD OF FORMING SAME
John Beveridge, Uxbridge; Thomas Roderick Harries Davies, Pinner; Fred Fidler, Cuffley, and Maurice Frank Ring, Epsom, all of England, assignors to Metal Box Limited, England
Division of Ser. No. 523,928, Nov. 14, 1974, Pat. No. 4,003,492.
This application Oct. 29, 1976, Ser. No. 736,817
Int. Cl.² B21D *51/28*
U.S. Cl. 113—120 F **8 Claims**

1. A method of forming a container body having a side seam of the hook type comprising the steps of providing a body blank having two opposite faces, forming the body blank to have hook portions along opposite edges of a main portion thereof with the hook portions having bonded thereto adhesive strips applied to a single face of said body blank and extending beyond the hook portions into the main portions, forming the body blank into tubular shape, interlocking the hooks, flattening the hook portions to form a side seam and to maintain the

interlocked relationship of the hook portions and to clamp the adhesive strips in opposed contacting relation between the hook portions with parts of the adhesive strips extending out of the side seam to seal the usual entrance thereinto, and heat



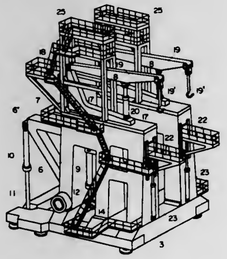
treating the adhesive strips to effect bonding of the adhesive strips to adjacent side seam portions while the flattened interlocked hook portions remain stationary and hold the side seam portion in fixed relation.

4,048,936

APPARATUS AND METHOD FOR SELECTIVELY SUPPORTING, CONVEYING AND MOUNTING A PROPELLER AND RUDDER

Kazuhiro Uchizono; Kentaro Yamada, both of Tsu; Kenji Saito, Hisai; Takato Tanisaka; Yoshinari Abe, both of Tsu; Masayoshi Ishii, Gifu; Hiroo Nakayama, Mie, and Sachio Futatsuki, Machida, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha; Kayaba Kogyo Kabushiki Kaisha and Nihon Koki Kabushi Kaisha, all of Tokyo, Japan

Filed June 8, 1976, Ser. No. 693,907
Claims priority, application Japan, June 11, 1975, 50-70578
Int. Cl.² B63B *3/00*
U.S. Cl. 114—65 R **5 Claims**



1. A propeller and rudder supporting, conveying and mounting apparatus comprising a frame including a conveying structure, a scaffold mounted on said frame, and mounting means mounted on said scaffold for selectively supporting a propeller and a rudder and mounting the same in a predetermined position, said frame means comprising an upper frame member and a lower frame member, each including four jacks mounted thereon, a double-rod jack connected to said upper frame member on the underside thereof and including two rods extending from said jack and supported at their ends by the lower frame member; said lower frame member including two jacks for turning and moving the lower frame member back and forth, said two jacks including two rods connected to said two rods of said double-rod jack; sliding contact means between said two frame members; and a pair of scaffolds erected on the frame means and having a space therebetween to selectively accommodate a propeller and a rudder; said mounting means comprising fine adjustment means mounted on said scaffolds respectively for lifting, lowering and positioning the propeller and rudder.

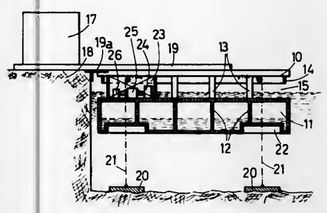
5. A method of selectively supporting a propeller and a rudder and for mounting the same in a predetermined position by a scaffold erected on a conveyable frame structure, comprising the steps of: supporting the rudder by a plurality of pairs of jacks for handling the same and carrying the rudder higher than a lower gudgeon; conveying the rudder to a position where the pintle of the rudder is fittable in a bore of the lower gudgeon; and after said pintle is fitted in said bore, disengaging both ends of holding means supporting the rudder from the jacks thereby permitting the support for the propeller and rudder to move away from the position for the mounting operation.

4,048,937

CARGO CARRYING VESSEL HAVING AT LEAST ONE CARGO CARRYING DECK

Klas Heyman, Goteborg, Sweden, assignor to AB Gotaverken, Goteborg, Sweden

Filed Dec. 10, 1975, Ser. No. 639,622
Claims priority, application Sweden, Dec. 27, 1974, 7416293
Int. Cl.² B63B *25/00*
U.S. Cl. 114—72 **1 Claim**



1. In a cargo carrying vessel having at least one cargo carrying deck and suited for cargo handling in a horizontal plane to and from an embankment, anchors for location at the bottom of the sea below the vessel,

devices for connecting said vessel to said anchors, and

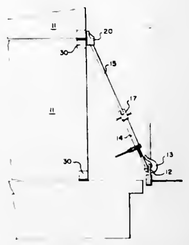
further means for varying the distance between said deck and said anchors, trimming tanks forming part of a pontoon divided into a number of cells and adapted during transfer of cargo always to remain below water level for providing an excess of buoyant force when positioning said at least one cargo carrying deck at a level substantially corresponding to the embankment level, a number of pillar structures connecting said pontoon with said deck, a side shell-plating enclosing a space between said deck and said pontoon, openings in said plating, means for temporarily closing said openings, and pumping means for displacing water in to and out of said cells.

4,048,938

CONTAINER LASH SYSTEMS

W. W. Patterson, III, and Eugene F. Grapes, both c/o W. W. Patterson Co., Pittsburgh, Pa. 15222

Filed Sept. 8, 1975, Ser. No. 611,200
Int. Cl.² B63B *25/24*
U.S. Cl. 114—75 **2 Claims**



2. A container corner casting comprising a base, a shaft

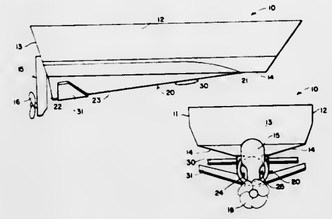
extending from one side of said base and having a locking cam member at the end remote from the base and at least one generally ball shaped socket on the base opposite the shaft, said socket having a keyhole shaped opening providing access thereto, said casting having a pair of generally ball shaped sockets on the base opposite the shaft, said sockets having keyhole shaped access openings thereto at about 45° to one another.

4,048,939

FREE-FLOODING CHAMBER STRUCTUREMOUNTABLE ON THE UNDERSIDE OF A WATERCRAFT

Allen Jones, Jr., 5028 Lauderdale Ave., Virginia Beach, Va. 23455

Filed Mar. 10, 1976, Ser. No. 665,715
Int. Cl.² B63B *1/16*
U.S. Cl. 114—125 **16 Claims**



1. Apparatus for enhancing the operating efficiency and stability of a power boat, comprising:

a. a hollow, elongated structure exteriorly mountable on the underside of a boat to define a chamber extending exteriorly along the underside of and substantially paralleling the length of the boat;

b. the structure having forward and rearward end regions and having an outer surface which extends in length therebetween;

c. the forward end region defining a substantially pointed, closed end formation positionable substantially adjacent the forward end of the wetted surface area of the underside of the boat when said boat is at rest in the water;

d. the rearward end region defining a rearwardly facing opening positionable completely beneath the underside of the boat communicating with the chamber permitting the passage of water therethrough (i) to substantially fill the chamber and thereby stabilize the boat when the boat is at rest in the water and (ii) to empty the chamber and thereby reduce the effective mass of the boat when the boat is underway; and

e. the outer surface being tapered along its entire length to progressively increase the cross-sectional area of the structure as it provides a smooth transition from the pointed forward end formation to the rearward end region thereby forming a planing surface which operates to lift the boat in the water when it is underway to reduce the wetted surface area of the boat.

4,048,940

TROLLING ATTACHMENT FOR OUTBOARD ENGINE

William L. Smith, 1156 Blewett Ave., San Jose, Calif. 95125

Filed Mar. 18, 1977, Ser. No. 779,165
Int. Cl.² B63H *25/48*
U.S. Cl. 114—145 A **8 Claims**

1. A trolling attachment for an outboard engine comprising in combination:

first attachment means adapted to be detachably secured to an upper section of the housing of an outboard engine and having a first aperture therein dimensioned to slidably receive an elongated handle rod therein;

second plate-like attachment means adapted to be detachably secured adjacent one end thereof to a lower section of the housing of an outboard engine so as to extend substantially horizontally beyond the location of the engine propeller, second aperture being provided in said platelike attachment means adjacent the other end thereof dimensioned to slidably receive the handle rod therein;

a trolling flap hingedly connected to the lower surface of said plate-like attachment means inwardly to said second aperture such that said flap is pivotable between a first horizontal position closely adjacent the lower surface of



said plate-like attachment and a second vertical position spaced rearwardly of the engine propeller, means being provided on said flap for pivotably mounting the lower extremity of the handle rod;

an elongated handle rod of sufficient length to extend through the apertures in said first and second attachment means, said handle rod having a locking notch formed in the lower region thereof cooperable with said plate-like attachment means for releasably locking said trolling flap in its vertically disposed position;

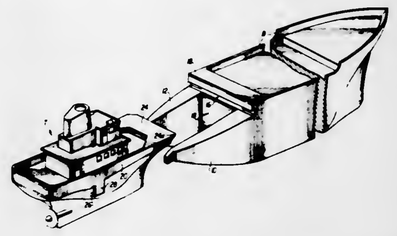
and latch means carried by said first attachment means cooperable with said handle rod for releasably locking said handle rod in a selected vertical position.

4,048,941

SEAGOING COMPOSITE BARGE-TUG VESSEL

Peter John Legnos, 973 North Road, Groton, Conn. 06340

Filed May 10, 1976, Ser. No. 684,648
Int. Cl.² B63H *28/00*
U.S. Cl. 114—248 **39 Claims**



29. A tug adapted for use as part of a composite tug-barge vessel, said tug comprising a bow including sidewalls, a prow tongue which extends across the bow thereof and projects outwardly from the bow, first and second laterally extending wings distinct from said sidewalls and defining first and second inclined, continuous, downwardly facing mating planes so as to present a single continuous planar mating surface on each side of the tug which extends rearwardly from said prow tongue for engaging the corresponding mating planes of a barge and sliding longitudinally therealong, and connection

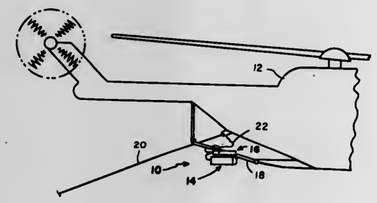
means located at the innermost ends of said mating planes on opposite sides of said tug and defining first and second connection apertures, said tug further comprising means located at said connection means for preventing lateral movement between the tug and the barge of the tug-barge vessel, and position fixing means for fixing the longitudinal positions of the tug and barge when the two are engaged.

4,048,942

HELICOPTER TOWLINE RECOVERY BUOY SYSTEM

Charles C. Cotton, and Guy S. D. Jencks, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 22, 1977, Ser. No. 770,732
Int. Cl.² B63B *21/56*
U.S. Cl. 114—253 **11 Claims**



1. A towline recovery system for use with a helicopter equipped with a droppable towline, said system comprising:

a retrieval line and float package comprising a housing, an attachment member on said housing, a retrieval line coiled in said housing and having a first end portion extending therefrom and connected to said towline, inflatable float means disposed in said housing and connected to a second end portion of said retrieval line, and means for inflating said float means; and

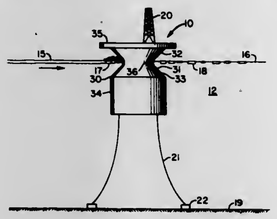
attachment and release means, mounted on said helicopter and cooperable with said attachment member, for securing said package to said helicopter and for releasing said package in response to dropping of said towline.

4,048,943

ARCTIC CAISSON

Ben G. Gerwick, Jr., San Francisco, Calif., assignor to Exxon Production Research Company, Houston, Tex.

Filed May 27, 1976, Ser. No. 690,469
Int. Cl.² B63B *35/08*
U.S. Cl. 114—256 **19 Claims**



1. An offshore structure which is adapted for operation in an arctic sea containing floating ice masses comprising:

a floating caisson, said caisson having a radially downwardly tapered upper ice-breaking portion;

a plurality of mooring lines secured at a first end to said caisson and at a second end to the sea floor; and

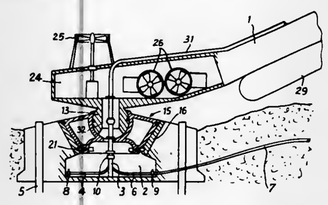
means for vertically moving said caisson a sufficient distance and with sufficient dynamic force so that said upper portion of said caisson obliquely contacts and breaks said ice masses.

4,048,944

INTERCONNECTION OF A FLOATING STRUCTURE AND A SUBMERGED ANCHOR STATION

Jean Louis Corgnet, Boulogne, France, assignor to Compagnie Francaise des Petroles, Paris, France

Filed Feb. 23, 1976, Ser. No. 660,589
Claims priority, application France, Feb. 21, 1975, 75.05418
Int. Cl.² B63B *21/50*
U.S. Cl. 114—293 **14 Claims**



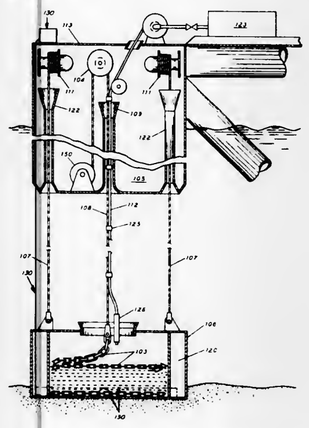
1. Apparatus for interconnecting a floating structure and a submerged anchor station including an enclosure, said apparatus comprising an anchor cap adapted to be fixed to the anchor station and pressed down to the enclosure by hydrostatic pressure, an arm adapted to be pivotally connected to the floating structure, and a ball-and-socket joint pivotally coupling said arm to said anchor cap, said socket engaging more than one half of the surface of said ball to form a rigid pivotal coupling.

4,048,945

REMOVABLE ANCHOR HAVING RETRIEVABLE BALLAST

Sidney J. Shrum, Charlotte, N.C., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 7, 1976, Ser. No. 684,343
Int. Cl.² B63B *21/24*
U.S. Cl. 114—294 **12 Claims**



1. A removable anchor for a floating vessel, comprising:

a retrievable ballast chain having a density greater than water, said retrievable ballast chain lowerable from said floating vessel;

means secured to said vessel floating on a body of water for lowering and raising said ballast chain; and

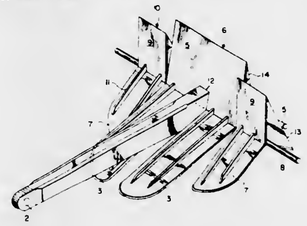
retrievable enclosure means positionable on the bottom of said body of water, for containing said ballast chain lowered into said retrievable enclosure means, so that the combined weight of said ballast chain and said retrievable enclosure means form a fixity for anchoring said vessel.

4,048,946

ANCHOR WITH INDEPENDENT PAIRS OF FLUKES

Henry C. Mayo, 8319 Midwood St., Alexandria, Va. 22308

Filed Sept. 8, 1976, Ser. No. 721,642
Int. Cl.² B63B *21/24*
U.S. Cl. 114—307 **6 Claims**



1. In an anchor of the type having a shank, a set of primary flukes pivotally mounted on opposite sides of one end of the shank, and a set of secondary flukes of a length less than the length of said primary flukes mounted on the same sides of said shank as the primary flukes, the improvement comprising:

a. a first crown assembly including tripping and rear crown plates affixed to the primary flukes as an extension thereof;

b. a second crown assembly including tripping and rear crown plates affixed to each of the secondary flukes as an extension thereof;

c. stopping surfaces on said one end of the shank which contact said first crown assembly when said flukes are pivotally rotated a fixed number of degrees to either side of said shank;

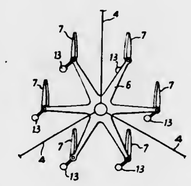
d. stopping means attached to the second crown assemblies in a position such that they engage a surface on said first crown assembly when said second crown assemblies are rotated a prescribed number of degrees relative to said first crown assembly wherein said fixed angle and said prescribed angle are such that the secondary flukes will form a larger angle with respect to said shank than said fixed angle.

4,048,947

ROTARY DEVICE DRIVEN BY A MOVING FLUID

Charles Andre Sicard, 29 rue Dierville, 6211 Bucquoy, France

Filed Jan. 20, 1976, Ser. No. 650,742
Claims priority, application France, Jan. 22, 1975, 75.01907
Int. Cl.² B63H *13/00*
U.S. Cl. 115—3 **13 Claims**



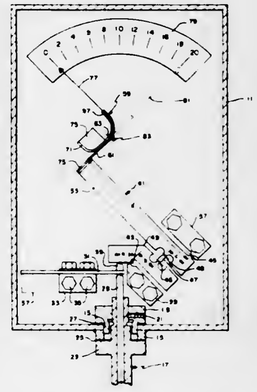
1. A rotatable device powered by a moving fluid such as water or air, comprising a generally cylindrical rotor disposed for rotation about a vertical axis, a plurality of blades mounted on said rotor adjacent its periphery for free unrestrained rotation, in normal usage, through 360° about essentially vertical axes passing through said blades, each of said blades having a symmetrical aerodynamic profile and a leading edge remote from the blade axis, a counterweight rigid with each of said blades, said blades and counterweight being constructed such that the center of gravity of each blade and its associated counterweight is spaced from associated blade axis and lies in a plane passing through the blade axis and which is perpendicular to a chord connecting said axis and the blade leading edge.

4,048,948

PRESSURE GAUGE

Neil L. Sarasohn, San Jose, Calif., assignor to Gentran Inc., Sunnyvale, Calif.

Filed Mar. 4, 1976, Ser. No. 664,014
Int. Cl.² G01L *7/00*; G01D *13/00*
U.S. Cl. 116—114 PV **12 Claims**



1. A pressure gauge comprising a cause, a push rod carried by said case and adapted to be coupled at one end to a source of pressure to be measured, lever means having one end coupled to the other end of said push rod, and spring means coupled to the other end of said lever means, said spring means including first, second and third tapes secured together at one end, the other end of said first tape being secured to said lever means, the other end of said second tape being secured to said case, the third tape being disposed between said first and second tapes and being formed of a material having a low coefficient of friction with respect to said first and second tapes whereby differential movement between said first and second tapes is facilitated, and indicator means disposed at said one end of the first, second and third tapes.

4,048,949

PLANETARY TURRET INDICATOR

Hans Schmidt, Schiller Park, Ill., assignor to Matsushita Electric Company of America, Franklin Park, Ill.

Filed Nov. 15, 1976, Ser. No. 741,711
Int. Cl.² F16H *35/00*; H03J *1/02*
U.S. Cl. 116—124.3 **10 Claims**

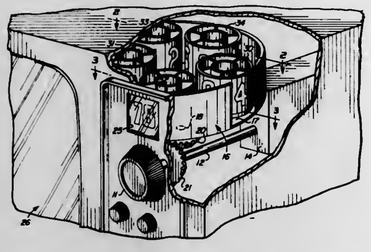
1. A turret indicator for providing numerical indications of relative rotational positions of a rotating member including, in combination:

a rotatable carrier turret means rotatable to N predetermined equi-angular spaced rotational positions within each complete 360° rotation thereof, where N is a positive integer greater than 1;

means for rotating said carrier turret means;

N planetary indicator turret members, each having N equi-angular spaced indicia portions thereon, each indicia por-

tion associated with a segment comprising 360/N degrees of such planetary indicator turret member, and said N planetary indicator turret members being mounted on said rotatable carrier turret means and being spaced each 360/N degrees about the axis of rotation of said carrier turret means; and



drive means responsive to the rotation of said rotatable carrier turret means to said spaced rotational position and coupled with said planetary indicator turret members for rotating each of said planetary indicator turret members $360n \pm (360/N)$ degrees for each 360° rotation of said carrier turret means, where n is any positive integer.

4,048,950

DEVICES FOR APPLYING ADHESIVES TO A MOVING WEB

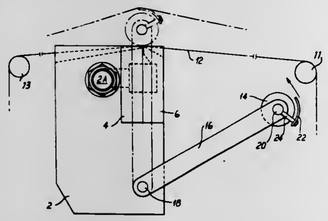
Jan Antoni Rakowicz, and Brian Harrison, both of London, England, assignors to Molins Limited, England

Filed Oct. 30, 1975, Ser. No. 627,280

Claims priority, application United Kingdom, Nov. 2, 1974, 47481/74

Int. Cl.² B05C 5/02

U.S. Cl. 118—6 **11 Claims**



1. A device for applying adhesive to a moving web, comprising a nozzle against which the web is arranged to run and from which adhesive is to be delivered, guide means for feeding the web along a path which bends around the nozzle, a closure member which is mounted on the same side of the said path as the nozzle, and means for moving the closure member between a position in which it allows the web to run against the nozzle and a position in which it holds the web away from the nozzle and lies against the nozzle so as to stop the flow of adhesive from the nozzle.

4,048,951

APPARATUS FOR APPLYING A GLASS FRIT TO A SEAL EDGE OF A FUNNEL PORTION OF A PICTURE TUBE

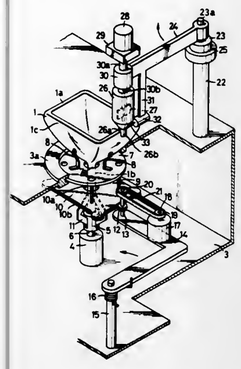
Michio Tamura, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 6, 1975, Ser. No. 602,362

Claims priority, application Japan, Aug. 14, 1974, 49-92971

Int. Cl.² B05C 5/02, 13/00

U.S. Cl. 118—6 **7 Claims**



1. An apparatus for applying glass frit to an end surface of the funnel portion of a picture tube, which end surface is of varying width, said apparatus comprising a rotatable turntable for supporting said funnel portion with said end surface facing upwardly; a container for the glass frit having a nozzle at the bottom thereof for discharging the glass frit at a substantially constant rate; means supporting said container for positioning said nozzle over said end surface of the funnel portion; means for rotating said turntable and the funnel portion thereon; and means for varying the speed of rotation of said turntable in the course of each revolution thereof so that the relative speed between said nozzle and said end surface therebelow is varied substantially in inverse proportion to variations in said width of the end surface.

4,048,952

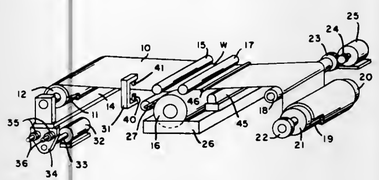
DIRECT RIBBON INKING BY GRAVURE

Glenn E. Peterson, Carle Place; Robert T. Emerson, Manhasset, and William J. Schoenlein, Levittown, all of N.Y., assignors to Columbia Ribbon & Carbon Mfg. Co., Inc., Glen Cove, N.Y.

Filed Apr. 12, 1976, Ser. No. 676,301

Int. Cl.² B05C 11/00, 11/04, 1/08

U.S. Cl. 118—6 **8 Claims**



1. An apparatus for the application of sufficient amounts of liquid printing ink to a used printing ribbon, comprising an ink-absorbent fabric web containing an unveven distribution of residual printing ink, to provide said fabric web with an even, uniform impregnation of printing ink, comprising a web-supply roll, an ink-applicator roll having a gravured surface, and a web-windup roll, means for transporting under tension a continuous length of a used printing ribbon, comprising an ink-absorbent fabric web containing an uneven distribution of residual printing ink, from said supply roll, over a portion of the gravured surface of said applicator roll and onto said windup roll, means for turning said applicator roll in the same direction as said web is transported but at a surface speed which is slower than the speed of said web so as to place a drag thereon, means for supplying liquid printing ink to the gravured surface of said applicator roll, blade means associated with the inked gravured surface of said applicator roll for removing said liquid printing ink from the surface of said applicator roll except for ink within the recesses of said gravured surface, and means for maintaining said ink-absorbent fabric web in compression-free contact with the inked gravured surface of said applicator roll whereby said ink-absorbent fabric web is free to absorb said liquid printing ink from the recesses of said applicator roll in different amounts across the width of said web to satisfy the different degrees of ink-absorbency of said web, as determined by the different amounts of residual ink remaining within different areas of said web, to provide said web with a uniform, even impregnation of said liquid printing ink.

4,048,953

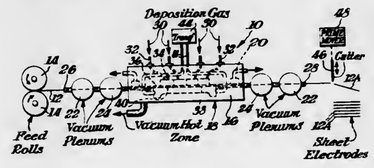
APPARATUS FOR VAPOR DEPOSITING PYROLYTIC CARBON ON POROUS SHEETS OF CARBON MATERIAL

Robert W. Froberg, Easton, Pa., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 480,922, June 19, 1974, Pat. No. 3,944,686. This application Dec. 19, 1975, Ser. No. 642,607

Int. Cl.² C23C 13/08

U.S. Cl. 118—49 **27 Claims**



1. An apparatus for the continuous vapor deposition of pyrolytic graphite on a porous fibrous sheet of carbon material comprising a subatmospheric pressure chamber, a pair of elongated guide plates disposed parallel to and adjacent to each other within the chamber forming a narrow slot between them through which the porous fibrous carbon sheet is longitudinally traversed, flow passes though said plates having substantially restricted flow areas, the flow passages intersecting the slot, exhaust means connected to the chamber for maintaining the subatmospheric pressure in the chamber, feed means for causing the elongated porous fibrous sheet of carbon to longitudinally move through the slot, electrical heating means associated with at least one of the guide plates for heating it and the sheet adjacent it, a source of hydrocarbon gas under pressure connected to the flow passages for causing the relatively high velocity flow of hydrocarbon gas to pass through and to cool the flow passages and to impinge upon the sheet whereby a deposit of pyrolytic graphite is infiltrated on the sheet without clogging the flow passages seal means including at least at one end of the apparatus, the device having a pair of endless belts having a substantial length of each disposed substantially parallel to form a sheath adjacent each other, and said sheath intersecting an extension of the slot disposed between the pair of the elongated guide plates in a region having subatmospheric pressure whereby the sheath is caused to closely envelope and support the porous fibrous sheet of material as a result of the differential pressure of ambient atmospheric pressure relative to the subatmospheric pressure between the belts in the sheath, a pointed nose piece attached to the said one end of the apparatus, the endless belt device being constructed and arranged to cause the belts to be disposed close to the nose piece just ahead of the sheath and belt guide means on the endless belt device which contacts the belts adjacent the end of the pointed nose piece for maintaining the endless belts close to it whereby a vacuum seal is provided for the chamber, a subatmospheric antechamber disposed on the chamber in the path of travel of the porous fibrous sheet material, and the pointed nose piece being connected to the end of the subatmospheric antechamber.

4,048,954

COATING DEVICE FOR SMALL ELECTRICALLY CONDUCTIVE COMPONENTS

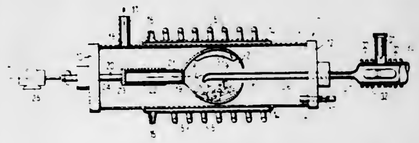
Alfred Politycki, Ottobrunn, and Konrad Hieber, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 19, 1976, Ser. No. 715,940

Claims priority, application Germany, Sept. 4, 1975, 2539434

Int. Cl.² C23C 13/08

U.S. Cl. 118—49.1 **14 Claims**



1. Apparatus for coating electrically conductive small components comprising

A. an electrically non-conductive drum member having
   1. a longitudinal axis
   2. continuously interiorly concavely curved side walls,
   3. radially inwardly projecting longitudinally extending rib members associated with said side walls, and
   4. an aperture defined in one end region thereof about said axis,

B. a gas-tight vessel located exteriorly about said drum member in spaced relationship thereto, portions of said drum member adjacent said vessel being electrically non-conductive, said vessel having a gas output orifice defined therein,

C. shaft means associated fixedly with said drum member and axially extending outwardly from the opposed end region thereof through a first wall portion of said vessel, said shaft means including sealing means therefor adjacent said first wall portion, said shaft means being electrically non-conductive in regions thereof adjacent said drum member, said shaft means including bearing means adapting said shaft means for axial rotational movements,

D. a power head functionally associated with said shaft means exteriorly of said vessel and adapted to drive rotatably said shaft means,

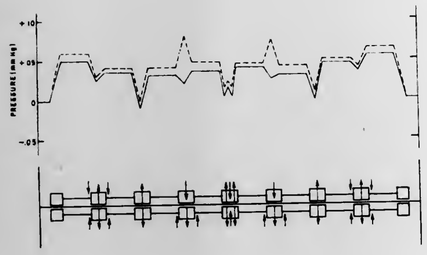
E. electric inductive heating coil means circumscribing said vessel about portions thereof adjacent said drum member, and

F. conduit means for delivering a thermally decomposable gas into said first vessel, said conduit means extending continuously from a position exteriorly of said vessel through a second wall portion of said vessel and through said aperture, said conduit means terminating in an output orifice in said drum member, said conduit means including sealing means therefor adjacent said second wall portion.

4,048,955
CONTINUOUS CHEMICAL VAPOR DEPOSITION REACTOR

Roger Norman Anderson, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 2, 1975, Ser. No. 609,879
Int. Cl.² C23C 13/10
U.S. Cl. 118—49.5 8 Claims

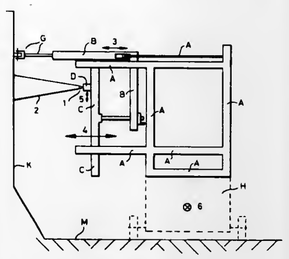


1. A continuous chemical vapor deposition reactor comprising:
an elongated central core having a restricted opening at each end communicating to the outside atmosphere;
a plurality of junction units interdisposed between said ends and dividing said elongated central core into a plurality of interconnected chambers comprising sealing chambers and substrate treating chambers and each unit having a restricted passageway therethrough aligned with and communicating adjacent ones of said chambers;
a plurality of substrate carriers and spacers travelling into, through and out of said elongated central core;
a plurality of viscous loss seals formed by means of the propinquity between said passageways and openings and said substrate carriers and spacers;
said plurality of substrate carriers and spacers operatively associated with said elongated central core whereby to divide said core into a continuous elongated substrate treating and handling section comprised of said sealing and substrate treating chambers and a coextensive opposed section, said sections being isolated from each other;
each of said junction units communicating with said opposed central core section and collectively providing means to subject adjacent isolated chamber portions comprising said opposed section to either an exhaust means or to a flush gas; and
each of said junction units communicating with said substrate treating and handling core section and collectively providing means to subject adjacent isolated chamber portions comprising said treating and handling section with appropriate ones of sealing gases, substrate treatint gases and exhaust means;
whereby all of the chamber sections are maintained isolated frome one another and from ingress of the atmosphere.

4,048,956
APPARATUS FOR TREATING A SURFACE

Joseph Estebanez, Upton-by-Chester, England; David V. Harrison, Flint, Wales; Clifford P. Jones, Ellesmere Port; Wirral, and Henry G. E. Wilson, Chester, both of England, assignors to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Apr. 7, 1976, Ser. No. 674,489
Claims priority, application United Kingdom, June 4, 1975, 24100/75
Int. Cl.² B05B 13/06
U.S. Cl. 118—306 4 Claims



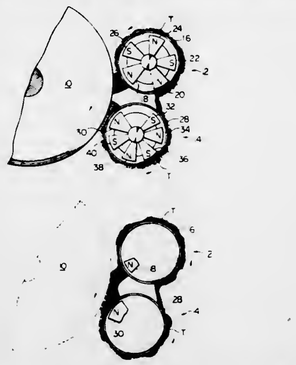
1. Apparatus for treating a surface, comprising:
a first frame adapted to be moved across the surface to be treated, a sliding frame mounted on and adapted to slide linearly relatively to said first frame in a direction perpendicular to the surface to be treated, an adjustable frame mounted on and adapted to be adjusted linearly relatively to said sliding frame in a direction perpendicular to the surface to be treated, a tool carrier mounted on said adjustable frame in such a manner that the position of said tool carrier can be adjusted relatively to said adjustable frame in a direction parallel to the surface to be treated, and means for maintaining said sliding frame at substantially a predetermined distance from the surface to be treated, which means comprise surface following means carried by said sliding frame and cooperating with said adjusting means arranged between said first frame and said sliding frame.

4,048,957
MAGNETIC BRUSH DEVELOPING APPARATUS FOR ELECTROPHOTOGRAPHY

Kazuaki Tagawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 14, 1975, Ser. No. 621,882
Claims priority, application Japan, Oct. 18, 1974, 49-120078
Int. Cl.² G03G 13/00
U.S. Cl. 118—653 9 Claims

1. A magnetic brush developing apparatus for applying toner particles to a photoconductive member, comprising, in combination, first and second rotary magnetic brush means which have the same magnetic polarity and are spaced from each other, said second magnetic brush means being disposed closer to the photoconductive member than the first magnetic brush means, said first magnetic brush means comprising a first non-magnetic cylindrical member with a first magnet mounted within the first cylindrical member, said second magnetic brush means comprising a second non-magnetic cylindrical member with a second magnet mounted within the second cylindrical member, and magnetic fields of the first and second magnetic brush means comprising at a first angular orientation of the first and second magnetic brush means to allow toner particles from the first magnetic brush means to be thrown by centrifugal force onto a portion of the photoconductive member to perform cascade development and the second magnetic brush means slidingly contacting the portion of the photoconductive member at a subsequent second angular orientation of the first and second magnetic brush means to perform magnetic brush development, said first and second magnets being

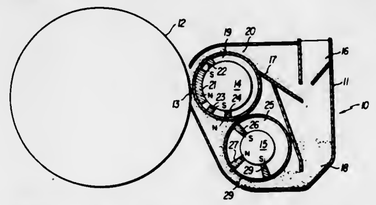


arranged to be adjacent to each other at the first angular orientation of the first and second magnetic brush means such that magnetic fields thereof constitute said magnetic fields.

4,048,958
MAGNETIC BRUSH DEVELOPING DEVICE

Michiharu Nakaguchi, and Toshio Nagashima, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1976, Ser. No. 664,680
Int. Cl.² B05B 5/02
U.S. Cl. 118—658 1 Claim

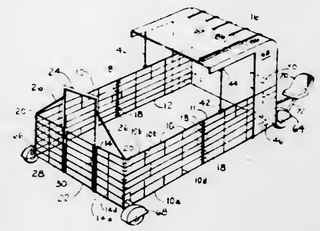


1. A magnetic brush developing device comprising a developing roller including a cylindrical stationary magnet and a sleeve rotatably mounted around said magnet, said developing roller being disposed adjacent the surface of a latent image bearing member, said cylindrical magnet having a developing magnetic pole facing the surface of said latent image forming member and transporting magnetic poles respectively disposed above and below said developing magnetic pole in adjacent relation thereto, said transporting magnetic poles being narrower in width than and having an opposite polarity to said developing magnetic pole, said cylindrical magnet having an auxiliary magnetic pole disposed adjacent the transporting magnetic pole, the polarity of said auxiliary magnetic pole being the same as that of said developing magnetic pole, a developer reservoir and a transporting roller including a second cylindrical stationary magnet and a second sleeve rotatably mounted around said second magnet, said transporting roller being disposed below said developing roller and adjacent said developer reservoir, said second cylindrical magnet having a first magnetic pole being of opposite polarity to and disposed adjacent to and in facing relation to said auxiliary magnetic pole to smooth the delivery of the developer from said transporting roller to said developing roller, said second cylindrical magnet having further poles to effect the delivery of said developer from said reservoir to said first magnetic pole.

4,048,959
MOBILE CORRAL

James E. Steele, 1425 E. Magee Road, Tucson, Ariz. 85718

Filed July 15, 1976, Ser. No. 705,405
Int. Cl.² A01K 1/02
U.S. Cl. 119—20 9 Claims

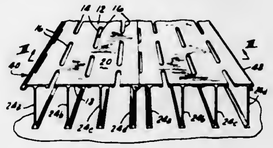


1. A self-propelled corral enclosure to pen animals comprising a plurality of connected fence sides forming an enclosure, a plurality of wheel means attached to said fence sides, steering means operably connected to at least one of said wheel means, and prime mover means permanently attached to one of said fence sides and made a part thereof, said prime mover means also operably connected to at least one of said wheel means whereby said enclosure may be steered by an operator while propelled by said prime mover means.

4,048,960
SLOTTED SURFACE FLOORING FOR USE IN ANIMAL HUSBANDRY

Thomas O. Barnidge, Sunset Hills, and Russell D. Hasty, Maryland Heights, both of Mo., assignors to Danforth Agri-Resources, St. Louis, Mo.

Filed May 5, 1976, Ser. No. 683,323
Int. Cl.² A01K 1/00; F04C 1/30
U.S. Cl. 119—28 3 Claims



1. A flooring structure for use in animal husbandry comprising: a floor assembly constructed of a plurality of individual lengths of extruded material, each of said lengths having a flooring surface with transverse side margins, a top surface and an undersurface, at least three support beams extending normal to said undersurface from said undersurface, said support beams extending longitudinally of the length of said lengths, said support beams terminating in increased dimension footed ends, a plurality of longitudinally spaced apart slots through said flooring surface intermediate adjacent support beams, longitudinally continuous raised stiffening ribs extending the length of said lengths projecting from the undersurface adjacent the slots on either side thereof, one of said side margins having an arcuate male connection configuration portion projecting therefrom, the male portion defining an open top longitudinally extending groove, the other of said side margins having an arcuate female connection portion extending thereinto, the male portion of one length receivable in the female portion of an adjacent length, and said adjacent lengths being transversely coupled together by the indexing of said connect-

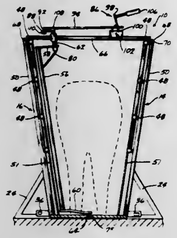
ing portions, an additional row of longitudinally spaced apart slots provided at the side edge having the male coupling member with the slots of said additional row of slots formed partially through portions of said male portion projection, including portions of a bottom of the groove, and at least partially formed through adjacent portions of the flooring surface.

4,048,961

SQUEEZE BAR STRUCTURE FOR A CATTLE CHUTE

William D. Priefert, Mount Pleasant, Tex., assignor to Priefert Mfg. Co., Mount Pleasant, Tex.

Filed July 14, 1976, Ser. No. 705,143
Int. Cl.² A01K *29/00*
U.S. Cl. 119—96 **11 Claims**



1. An animal squeeze structure for a cattle chute comprising a base frame and a pair of transversely spaced longitudinally extended upright side panels mounted on said base frame having forward and rearward ends, said squeeze structure including:

a. an upright squeeze bar located between and intermediate the ends of said panels, and

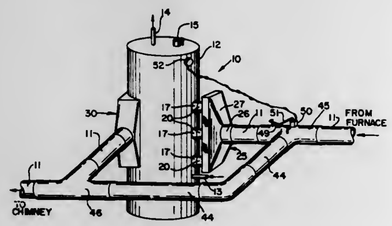
b. means on said side panels and base frame supporting said squeeze bar for swingable movement transversely of the chute toward and away from one of said panels about an upright axis situated inwardly from said one panel, said squeeze bar, from a rest position adjacent said one panel, being swingable to a first operative position located forwardly of the upright axis and spaced inwardly from said one panel and swingable rearwardly to a second operative position located rearwardly of the upright axis and spaced inwardly from said one panel.

4,048,962

WATER TANK HEATED BY SMOKE FROM A FURNACE

Stanley Pristelski, Rte. 1, Box 132c, Marinette, Wis. 54143

Filed May 10, 1976, Ser. No. 684,793
Int. Cl.² F22B *33/00*; F22D *1/02*
U.S. Cl. 122—20 B **8 Claims**



1. Apparatus for recovering energy from a smoke flue of a furnace and for heating water therewith, said apparatus adapted for interposition in said flue between said furnace and a chimney such that said apparatus is in gaseous communication with said flue, said apparatus comprising;

a tank with an interior for containing a volume of water;

a water inlet for providing water to said tank;

a water outlet for removing water from said tank;

heat exchanging means comprising a heat exchanging tube extending through the interior of said tank, said tube having a pair of ends and an outer surface, an inside diameter, and sufficient length that said pair of ends communicate with opposite exterior surfaces of the tank or extend outwardly beyond said surfaces;

a sleeve with an outside diameter slightly smaller than said inside diameter of the tube such that said sleeve is positionable within said tube and is concentric in relation thereto, said sleeve being sealed to said tube at the ends of said tube in a manner exterior to said tank thereby defining an annular air space between said tube and said sleeve,

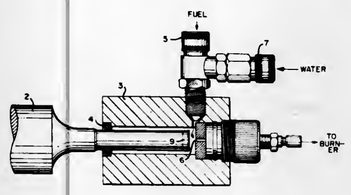
said sleeve adapted to communicate with said smoke flue between said furnace and said chimney with said heat exchanging means transferring some of the heat in the smoke flue to said water thereby heating said water while avoiding moisture condensation and soot build-up in said sleeve.

4,048,963

COMBUSTION METHOD COMPRISING BURNING AN INTIMATE EMULSION OF FUEL AND WATER

Eric Charles Cottell, P.O. Box 1415, Bayville, Long Island, N.Y. 11709

Continuation-in-part of Ser. No. 489,710, July 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 280,967, Aug. 16, 1972, abandoned, which is a division of Ser. No. 122,632, March 1, 1971, Pat. No. 3,749,318. This application May 21, 1975, Ser. No. 579,399
Int. Cl.² F02D *19/00*
U.S. Cl. 123—25 R **5 Claims**



1. A process of burning liquid fuel comprising, in combination, generating sonic vibrations, amplifying the energy density thereof by acoustic transformation which distributes the sonic power over a reduced area providing a narrow restrictive zone at the point of amplifying sonic energy density, the restricted zone being between the end of the acoustic transformer, which effects the acoustic transformation, and a stationary element which acts as an anvil, introducing water and liquid fuel in a thin film in said restricted zone whereby the water and oil are subjected to the sonic vibration of amplified energy density and whereby a water-in-oil emulsion of fine particle size is produced, the water being in the range of 10% to 50% of the total fuel and water, and burning said emulsion.

4,048,964

FUEL METERING APPARATUS AND METHOD

William Ronald Kissel, Milford, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed July 24, 1975, Ser. No. 599,243
Int. Cl.² F02B *3/00*; F02M *39/00*
U.S. Cl. 123—32 ED **47 Claims**

1. In a closed loop regulated fuel metering system for supplying a quantity of fuel for combustion with the air ingested by an internal combustion engine and maintaining a scheduled

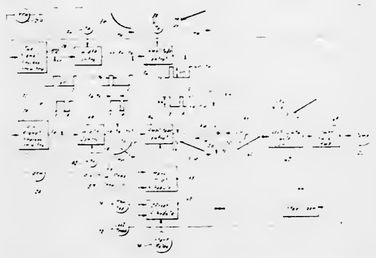
mass ratio between the fuel and air both supplied in fluid form to the engine, said system comprising in combination,

means for sensing a selected set of ambient parameters which affect the mass flow of at least one of said fluids,

mass fuel-air ratio scheduling means responsive to at least one mode of engine operation and providing an output signal representative of a desired mass fuel-air ratio for that mode of operation of the engine,

means for sensing the air supplied to the engine and generating a pulsatory electrical signal whose pulse repetition rate characteristic varies with the volumetric flow rate thereof,

means for sensing the fuel supplied to the engine and generating a pulsatory electrical signal having a pulse repetition rate characteristic which varies with the volumetric flow rate thereof,



means for modifying a pulse characteristic of one of said pulsatory fluid flow signals in accordance with a function of said desired mass fuel-air ratio representative signal from said mass fuel-air ratio scheduling means,

correction means for additionally modifying a pulse characteristic of one of said pulsatory fluid flow signals in accordance with at least one ambient parameter of said set of ambient parameters, and

control means responsive to and electrically combining said fluid flow signals as modified by said scheduled mass fuel-air ratio signal and by said correction means for controlling the mass flow of fuel ralative to the air into the engine in accordance with a predetermined relationship between said fluid flow signals that will maintain the actual mass flow of fuel supplied to the engine relative to the air ingested thereby in correspondence with the desired mass fuel-air ratio scheduled by said mass fuel-air ratio scheduling means.

4,048,965

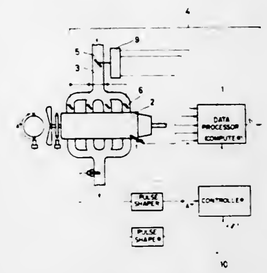
APPARATUS FOR DETERMINING THE FUEL INJECTION QUANTITY IN MIXTURE COMPRESSING INTERNAL COMBUSTION ENGINES

Valerio Bianchi, Hochdorf; Reinhard Latsch, Vaihingen, and Peter Schmidt, Schwieberdingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 5, 1975, Ser. No. 638,267
Claims priority, application Germany, Dec. 5, 1974, 2457461
Int. Cl.² F02D *5/00*
U.S. Cl. 123—32 EA **13 Claims**

1. In an apparatus for controlling the operation of an internal combustion engine including determination of the fuel injection quantity, said internal combustion engine including cylinders defining combustion chambers and injection valves for injecting fuel into said combustion chambers, said fuel being injected in dependence on throttle valve position and engine r.p.m. and being controlled by controlling the injection duration of said fuel injection valves on the basis of characteristic engine data, said apparatus including a system clock for providing master timing signals and a digital arithmetic circuit including a read-only memory in which said characteristic engine data is stored, first transducer means for providing a first digital datum corresponding to throttle valve position and second transducer means for providing a second digital datum corresponding to engine r.p.m., means for feeding the most significant bits (MSB) of the instantaneous values of said first and second digital datum to said read-only memory thereby selecting a digital word contained in said read-only memory, the improvement comprising:

said digital arithmetic circuit includes a shift register connected behind said read-only memory, for adding selected



data from said read-only memory and for transmitting it in serial bit form to a subsequent accumulator circuit, and further includes a 1-bit full adder circuit the input of which is connected to the outputs of said shift register and said accumulator and the output of which is connected to the input of said accumulator; whereby

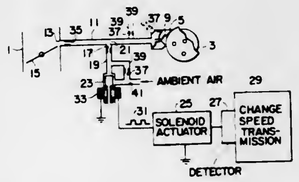
said digital arithmetic circuit performs the generation of a weighted average of a number of said digital words from said read-only memory.

4,048,966

VACUUM ADVANCE CONTROL SYSTEM

Masanori Harada, Yokohama; Shinzo Katou, Sagamihara, and Nobuyuki Hayashi, Yokosuka, all of Japan, assignors to Nissan Motor Company, Yokohama, Japan

Filed July 15, 1975, Ser. No. 596,193
Claims priority, application Japan, July 29, 1974, 49-90201[U]
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 A **9 Claims**



1. In an internal combustion engine having a carburetor with a spark port above the idle speed position of the throttle valve,

a distributor breaker plate spring biased to a retarded spark timing setting position;

vacuum servo means having a vacuum chamber for moving said distributor breaker plate in an advanced spark timing direction in response to vacuum in said vacuum chamber;

a vacuum line connecting said vacuum chamber to said spark port, said vacuum line having a first orifice therein adjacent said spark port;

a conduit having one end opening to the interior of said vcuum line at a position between said first orifice and said vacuum chamber of said vacuum servo means and other

end opening to the atmosphere, said conduit having a second orifice therein;

solenoid valve means normally closing said conduit at a position intermediate said second orifice and said other end of said conduit, said solenoid valve means being operative upon energization thereof to open said conduit to bleed an ambient air into said vacuum line through said conduit;

means for cyclically energizing said solenoid valve means during a predetermined range of operating conditions of the engine; and

air bleed orifice means for bleeding an ambient air into said vacuum line.

4,048,967

SYSTEM FOR DETOXICATING EXHAUST GASES

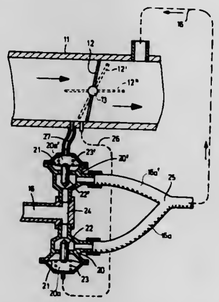
Gerhard Stumpp, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Division of Ser. No. 366,260, June 4, 1973, Pat. No. 3,954,091. This application Nov. 3, 1975, Ser. No. 628,382

Claims priority, application Germany, Aug. 25, 1972, 2241935

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **3 Claims**



1. In a system for detoxicating exhaust gases in an internal combustion engine, having air intake pipe means and conduit means for recycling a part of the exhaust gases of said engine into said air intake pipe means, the improvement comprising, in combination, valve means for controlling the flow of said part of the exhaust gases being thus recycled, throttle means comprising a flap and being associated with said air intake pipe means, and means for controlling said valve means in dependence on the adjustment of said throttle flap, wherein

i. said means for controlling said valve means are so connected to said air intake pipe means that said valve means are controlled by the pressure prevailing in the adjacent zone of said air intake pipe means;

ii. said flap of said throttle means is turnably disposed in said air intake pipe means whereby during turning of said flap to admit air to the engine a portion of said flap moves against the direction of flow of intake air through said air intake pipe means;

iii. said valve means comprise pneumatically operating valve means being closed in non-actuated position, and a control conduit from said air intake pipe means to said valve means for having the air pressure in the former act on the latter, which conduit opens into said air intake means upstream of the flap of said throttle means and upstream of that portion of said flap which moves against the direction of intake air flow, but still within the immediate vicinity of the latter flap portion, whereby, at almost closed flap during idling of the engine, and also during wide open flap position during full load operation of the engine, said pneumatically operating valve means remain closed; and

iv. said pneumatically operating valve means comprise two valves controllable independently of one another and interposed in parallel in said exhaust gas recycling conduit means and two control conduits, one of said control conduits leading from one of said valves to said air intake pipe means and opening in the latter upstream of said throttle means, and the other control conduit leading from the other valve to said air intake pipe means and opening in the latter upstream of the opening of the former control conduit thereinto.

4,048,968

EXHAUST GAS RECIRCULATION SYSTEM

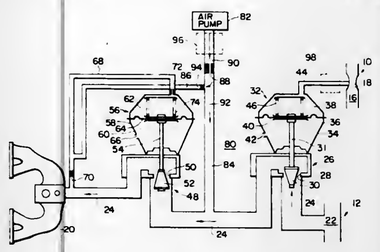
Syuniti Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed July 15, 1976, Ser. No. 705,436

Claims priority, application Japan, July 17, 1975, 50-99314[U]

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **4 Claims**



1. An exhaust gas recirculation system for an internal combustion engine including an intake passageway having a throttle valve rotatably mounted therein, said system comprising an exhaust gas recirculation (EGR) passage for feeding exhaust gases of the engine into the intake passageway downstream of the throttle valve, a first exhaust gas recirculation (EGR) control valve disposed in said EGR passage, a first actuator operable in response to a vacuum representative of the amount of air drawn through the intake passageway to cause said first EGR control valve to meter the amount of the engine exhaust gases fed into the intake passageway to a predetermined ratio to the amount of said air, a second exhaust gas recirculation (EGR) control valve disposed in said EGR passage downstream of said first EGR control valve, a second actuator operable in response to the vacuum in the intake passageway downstream of the throttle valve and the pressure in said EGR passage between said first and second EGR control valves to cause said second EGR control valve to maintain the pressure differential of parts of said EGR passage upstream and downstream of said first EGR control valve at a predetermined value, passage means to communicate and EGR passage between said first and second EGR control valves with said second actuator, and control means for limiting the amount of the engine exhaust gases passing in said passage means to prevent said passage means from being clogged by the engine exhaust gases.

4,048,969

FUEL VAPORIZER APPARATUS

D. Edward Widman, Roberts Road, Sauquoit, N.Y. 13456

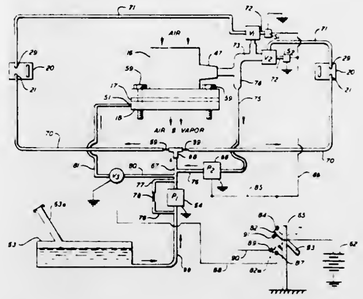
Filed June 24, 1976, Ser. No. 699,576

Int. Cl.² F02M *31/00, 17/18*

U.S. Cl. 123—133 **5 Claims**

1. An internal combustion engine having intake and exhaust manifolds, a gasoline tank, ignition means including an ignition switch and a battery, an L.P. gas carburetor, the L.P. gas carburetor having an air intake and being mounted on a base plate having a carburetor bore connecting the L.P. gas carburetor discharge passage with the engine intake manifold, the

base plate having jet means for spraying gasoline into the bore, the engine having heat exchanger means associated with its exhaust manifold for heating gasoline passing to the carburetor to a high temperature for breaking down the gasoline to a hot vapor in which heavy molecules are broken down into lighter molecules, the engine having a cam driven fuel pump for supplying gasoline to a delivery conduit to two passages, the first passage supplying gasoline to the base plate carburetor bore through first normally closed electrically-operated shutoff valve means, the second passage supplying fuel to the carburetor through the heat exchanger and through second normally closed electrically-operated shutoff valve means, the conduit from the heat exchanger to the carburetor being the hot gas conduit and having a sump adjacent its entrance to the caburetor for collecting gasoline condensed during its passage through the hot gas conduit, the sump being connected by a drain conduit to the intake of an auxiliary electrically operated pump whose delivery outlet is connected by a return conduit



to the delivery conduit, the delivery conduit is connected to a by-pass conduit having a metering passage for the slow return of gasoline boiled in the hot gas conduit to the gasoline supply tank for the engine when the engine is turned off, switch means associated with the ignition switch of the engine has two alternative positions in which the movable contact of the switch is first in contact with a first fixed contact for supplying electric current from the engine battery to the first normally closed electrically operated shutoff valve means, and a second fixed contact for supplying electric current to the second shutoff valve means and to the auxiliary pump, whereby the engine is started and the movable contact is held in contact with the first fixed contact for shutting off the flow of fuel through the heat exchanger means and the hot gas conduit to the carburetor for about one minute, and then when the heat exchanger means is warmed, the movable contact is moved to contact with the second fixed contact for shutting off the flow of fuel to the base plate and starting flow of fuel through the hot gas conduit and starting the auxiliary pump.

4,048,970

FUEL INJECTOR

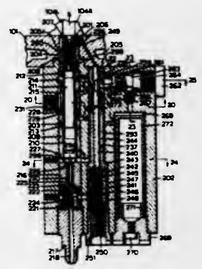
William Maurice Bard Fitzgerald, R.R. No. 1, Claremont, Ontario, Canada

Division of Ser. No. 305,453, Nov. 10, 1972, Pat. No. 3,841,797. This application Sept. 9, 1974, Ser. No. 504,728

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 AJ **13 Claims**

1. A fuel injector for an internal combustion engine of a compression ignition type, comprising in combination: a fuel injection nozzle, a valve-controlled fuel supply chamber located behind the injection nozzle for storing a quantity of fuel, a port for admitting fuel to the supply chamber, a fuel piston operating in the supply chamber for compressing the fuel stored therein and expelling the fuel therefrom via the injection nozzle, a supply of pressurized hydraulic fluid, and hydraulic actuator means responsive to engine cylinder pressure for actuating the fuel piston, the actuator means including a spring-loaded shuttle valve arranged to reciprocate between two limit positions in accordance with cyclical variations of gas pressure in the engine cylinder, and pumping means for controlling the supply of pressurized hydraulic fluid to actuate the fuel piston in accordance with the position of the shuttle valve, the spring-loaded shuttle valve being slidable in a valve



cylinder having an inlet for pressurized hydraulic fluid and an outlet communicating with the fuel piston, said pumping means comprising a reciprocatory free piston operating in a cylinder providing a pump chamber communicating with said valve cylinder, said pump chamber being connected to said inlet in one limit position of the shuttle valve and being connected to said outlet in the other limit position of the shuttle valve.

4,048,971

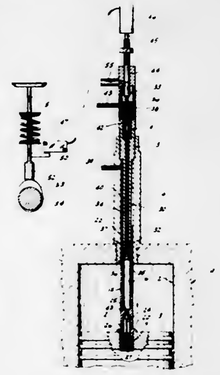
FUEL INJECTION SYSTEM

Donald H. Pritchett, 17 Rosewood, Rte. 2, Collinsville, Ill. 62234

Filed Apr. 15, 1976, Ser. No. 677,507

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 R **5 Claims**



1. In a fuel injection system for an internal combustion engine having a head and a cylinder, and having a piston reciprocatively mounted in the cylinder:

a. a ram fixed to and movable with the piston, the ram being provided with a fuel compression chamber having a fuel injection port communicating with the cylinder,

b. a first valve means in the ram normally closed to preclude flow through the injection port,

c. a tubular stem telescopically and slidably related to the ram,

d. a second valve means located in the tubular stem and

interconnecting the tubular stem and ram chamber for regulating fuel flow therebetween,

e. a fuel inlet means for introducing fuel into the tubular stem at one side of the second valve means,

f. actuating means operatively connected to the second valve means for opening the second valve means every second expansion of the ram chamber and permitting fuel to flow from the tubular stem into the ram chamber under suction pressure in the ram chamber as the ram and stem are relatively extended when the ram moves with the piston in one direction in the cylinder, and for closing the second valve means and compressing the fuel in the ram chamber between the first valve means and the second valve means as the ram and stem are relatively retracted when the ram moves with the piston in the other direction in the cylinder, and

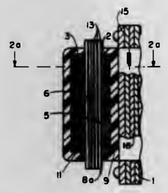
g. the first valve means opening at a predetermined pressure to eject the compressed fuel in the ram chamber through the injection port and into the cylinder.

4,048,972

IGNITION COIL FOR INTERNAL COMBUSTION ENGINES

Paul Wörz, Schwieberdingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 1, 1975, Ser. No. 618,556
Claims priority, application Germany, Oct. 12, 1974, 2448768
Int. Cl.² F02P *7/00*
U.S. Cl. 123—148 D **11 Claims**



1. Ignition coil for an internal combustion engine providing ignition pulses with a sharply rising flank having

an iron core (1) of approximately square cross section, a primary winding (2) and a secondary winding (3);

one of the windings (2) being a square coil of approximately square cross section and surrounding the iron core (1), the other winding (3) being a cylindrical coil of essentially circular cross section and surrounding the first winding (2) so that a sector-shaped space (10) will be included between the outer circumference of the first, square cross section winding and the second, circular cross section winding;

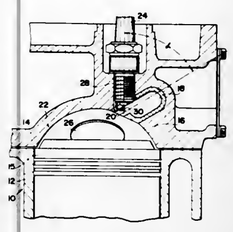
and an insert of magnetic material (8*a*, 8*b*, 8*c*, 8*d*) located within said essentially sector-shaped space (10), between the primary (2) and the secondary (3) windings and essentially filling the space (10) between the windings, said magnetic insert forming a magnetic shunt with respect to the core to modify the wave form of pulses induced in the secondary winding (3) upon interruption of current flow through the primary winding (2) and providing pulses having a sharply rising flank.

4,048,973

INTERNAL COMBUSTION ENGINE PROVIDED WITH PRE-COMBUSTION CHAMBER

Shoogo Sanda, Okazaki, and Norihiko Nakamura, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Dec. 19, 1974, Ser. No. 534,686
Claims priority, application Japan, Feb. 21, 1974, 49-20102
Int. Cl.² F02B *23/00, 75/02*
U.S. Cl. 123—191 SP **3 Claims**



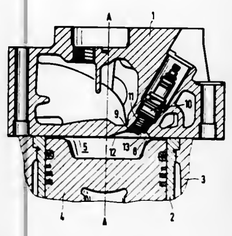
1. In an internal combustion engine provided with a main combustion chamber which is defined in the upper portion of a cylinder volume and provided with an intake valve for introducing a lean mixture into said main combustion chamber and an exhaust valve and a pre-combustion chamber free of an intake valve, said main combustion chamber being communicated by a passage with said pre-combustion chamber, an ignition plug provided in said engine, said ignition plug having a spark gap, the improvement which comprises; having said spark gap located within said passage, the central axis of the passage being off-set relative to the longitudinal central axis of the pre-combustion chamber so that the longitudinal central axis of the pre-combustion chamber is asymmetrical with respect to the longitudinal central axis of the passage, whereby said lean mixture pressed into said pre-combustion chamber through said passage is ignited by said spark plug, and blowing as a torch flame from said pre-combustion chamber into said main combustion chamber.

4,048,974

EXTERNALLY IGNITED FOUR CYCLE GAS ENGINE

Hans Seifert; Kurt Will, both of Augsburg, and Horst Zapf, Steppach, all of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg AG, Nurnberg, Germany

Filed Mar. 22, 1976, Ser. No. 669,266
Claims priority, application Germany, Mar. 20, 1975, 2512218
Int. Cl.² F02B *23/00*
U.S. Cl. 123—191 M **7 Claims**



1. An external auto-ignited four stroke cycle gas engine which includes: a cylinder, a piston reciprocable in said cylinder, a piston head mounted on and connected to said cylinder, said piston having that end thereof which faces said cylinder

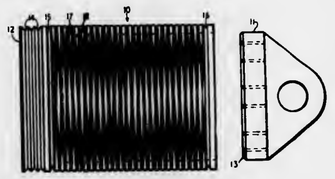
head provided with a truncated cone-shaped combustion chamber having a substantially flat bottom and widening and opening toward said cylinder head and being adapted in the upper dead center position of said piston to take in nearly the total gas-air mixture supplied per cycle to said cylinder, said cylinder head being provided with inlet valve means for admission of a gas-air mixture, means provided in said cylinder for imparting turbulence upon the gas-air mixture being admitted through said inlet valve means, said cylinder head also being provided with a truncated cone-shaped trough arranged completely in said cylinder head and communicating with said combustion chamber, a spark plug provided with a connecting thread and extending into said trough, the greatest diameter of said combustion chamber amounting to from about 55 to 70% of the diameter of said piston, and the depth of said combustion chamber equalling from about 15 to 20% of the diameter of said piston while the mantle surface of said combustion chamber is inclined at an angle of from 10° to 30° relative to the longitudinal axis of said cylinder, the greatest diameter of said trough equalling about twice the diameter of said connecting thread of said spark plug, and the depth of said trough amounting to from about 20 to 25% of the diameter of said trough, and wedge-shaped ignition passage means extending from said trough toward the longitudinal axis of said cylinder while tapering toward said last mentioned axis so that the tip of said taper ends flat at said cylinder axis.

4,048,975

PISTONS

William James Urquhart, Tumbi Umbi, Australia, assignor to F. B. J. Engineering Services Pty. Limited, Granville, Australia

Filed Nov. 12, 1975, Ser. No. 631,213
Claims priority, application Australia, Nov. 13, 1974, 75328
Int. Cl.² F01B *31/10*
U.S. Cl. 123—193 P **1 Claim**



1. A piston for use in an internal combustion engine or compressor without piston rings, said piston having as a sealing means a pair of circumferential grooves formed in the external surface of the piston, said grooves being spaced apart axially and being interconnected by right and left hand intersecting helical channels formed on the external surface of the piston, said grooves and channels being adapted to trap and retain lubricating oil, and a plurality of grooves in a plane perpendicular to the axis of the piston separated by at least one land having a sharp apex formed in the external surface of the piston, provided at one end of said piston wherein the diameter of the piston at the apex being substantially the same as the maximum diameter of the piston between the pair of grooves.

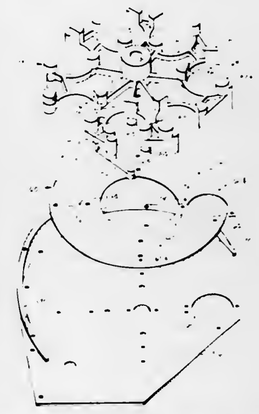
4,048,976

MAGAZINE ASSEMBLY FOR TOURNAMENT TRAP

James Marion Alday, Williamson, and Kenneth Charles Rowlands, Utica, both of N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Division of Ser. No. 586,207, June 12, 1975, Pat. No. 4,005,695, which is a division of Ser. No. 417,185, Nov. 19, 1973, Pat. No. 3,937,204. This application Feb. 13, 1976, Ser. No. 657,884
Int. Cl.² F41C *25/00;* **F41B** *3/04*
U.S. Cl. 124—47 **2 Claims**

1. In an apparatus for feeding targets on to a launching platform of a target throwing trap means, a magazine assembly positioned above said trap means, said assembly comprising a stationary frame member, means attaching said frame member to said trap means, a rotatable member having means thereon to position a number of columns of targets, means for rotating said rotatable member in predetermined increments, a stationary floor plate located beneath said rotatable member, said floor plate having an upper portion and a lower portion displaced thereof a distance equal to the height of one target, a ramp connecting said upper and lower portions, an opening in said lower portion through which a target can be dropped onto said launching platform, means on said rotatable member for gripping the lowermost target of each column of targets thus preventing each column from dropping by its own weight, a



continuous cam means beginning just ahead of and terminating just after said ramp for disengaging said target gripping means to permit the weight of an associated column of targets to be borne by the ramp which with further rotation then lowers the column gradually to said lower portion of said floor plate whereupon the column has descended a height of one target, said cam means positioned over said lower portion and terminating before the associated column of targets reaches said opening in the floor plate so that upon moving past the end of said cam means said target gripping means engages and supports the second target from the bottom of the column of targets, Whereupon further rotation of the rotatable member results in the now-free lowermost target to drop through the opening in the floor plate onto the launching platform.

4,048,977

FLUTE BREAKER

Jimmie M. Jenkins, Rte. No. 3, Canton, Miss. 39046

Filed Jan. 19, 1976, Ser. No. 650,514
Int. Cl.² B28D *1/32*
U.S. Cl. 125—23 R **6 Claims**

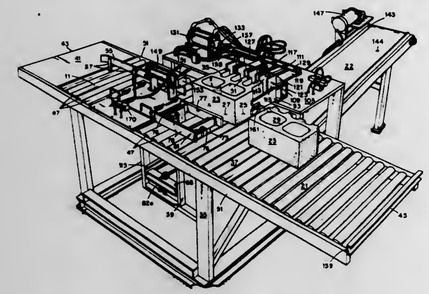
1. Apparatus for developing a decorative surface on a frangible building block having a flute extending at substantially a right angle to and outwardly from said surface of said block by breaking said flute from said block at a location inwardly of the distal end of said flute comprising

a breaker head including base means mounted for pivotal movement relative to said flute about a pivot located outwardly of and away from said flute, a rigid fulcrum member extending from said base means to a location on one side of said flute adjacent the position of the desired break of said flute, and an anvil member extending from said base to a location adjacent said distal end of said flute and on the opposite side of said flute as said fulcrum member, said fulcrum member and said anvil member being

immovable with respect to one another and defining an opening therebetween to receive said flute, the spacing between said fulcrum and anvil members being of a dimension greater than the corresponding dimension of the flute disposed therebetween,

means urging said flute on said block into a position between said fulcrum and anvil members while not placing absolute restraint against movement of said block in a direction generally perpendicular to the direction said flute extends from said block, and

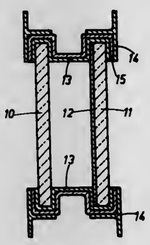
means for rotating said breaker head in a direction whereby said fulcrum member contacts said flute adjacent the desired break and said anvil member contacts the distant end of said flute on the side thereof opposite said fulcrum member to exert a breaking force to said flute.



4,048,978
HEAT INSULATING SCREEN

Emile Plumat, Gilly; Pol Bandin, Ransart; Robert Posset, Mont/S/Marchienne, and Jean-Marie Autequitte, Moustier/S/Sambre, all of Belgium, assignors to Glaverbel-Mecaniver, Brussels, Belgium

Continuation of Ser. No. 336,333, Feb. 27, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 569,937
Claims priority, application Luxembourg, Mar. 2, 1972, 64874
Int. Cl.² F23M *7/00*
U.S. Cl. 126—200 **21 Claims**

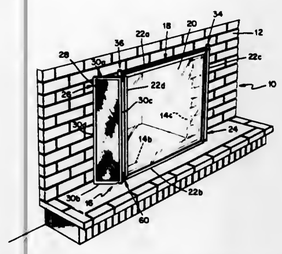


1. In an oven or furnace, the combination with a wall thereof having an opening therein of a heat insulating screen mounted in said opening, said heat insulating screen comprising two transparent sheets of glass or vitrocrystalline material disposed in facing relation to each other, the sheet which is directed toward the outside of the oven or furnace being chemically tempered, and the sheet which is directed toward the inside of the oven or furnace bearing an infrared screening coating wherein said infrared screening coating comprises an oxide or a mixture of oxides, at least one oxide selected from the group consisting of tin oxide and indium oxide, said coated sheet having a low energy transmission and a high energy reflection in the wavelength range of from about 0.8–15 microns.

4,048,979
FUEL-SAVING FIREPLACE SCREEN UNIT

Jon D. LaVasseur, 12305-24th Ave. N., Minneapolis, Minn. 55441

Filed Mar. 1, 1976, Ser. No. 662,730
Int. Cl.² F24C *15/36*
U.S. Cl. 126—202 **8 Claims**



1. A portable fireplace screen unit comprising imperforate central panel means including a transparent glass pane, said panel means having a top, a bottom and opposite sides, the top being spaced sufficiently above the bottom and the sides spaced sufficiently apart so that said imperforate panel means will close the opening of a conventional fireplace when placed in a confronting position thereagainst, said bottom constituting an uninterrupted straight edge for contacting the hearth of a fireplace, first and second perforate wing panel means, each having a top, a bottom and opposite sides, first hinge means pivotally connecting one side of said perforate panel means to one side of said imperforate panel means so that said first perforate panel means can be freely pivoted into angular relationships to either side of a planar relationship with said imperforate cen ral panel means, and second hinge means pivotally connecting one side of said second perforate means to the other side of said imperforate panel means so that said second perforate panel means can be freely pivoted into angular relationships to either side of a planar relationship with said imperforate central panel means, the bottoms of said first and second wing panel means also constituting uninterrupted straight edges for contacting the hearth of a fireplace and being at the same general elevation as the edge of the bottom of said central panel means, whereby with the bottom edge of said central panel means resting on said hearth both of said perforate panel means can be swung into angles extending toward the fireplace so as to maintain said imperforate panel means away from the fireplace to permit a substantial flow of air through the fireplace opening and swung into angles extending away from the fireplace so as to maintain said imperforate panel means in its said confronting position with the fireplace to prevent substantial flow of air through said opening.

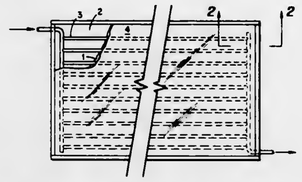
4,048,980
SOLAR RADIATION ABSORBING MATERIAL

John M. Googin; Charles R. Schmitt; James M. Schreyer, all of Oak Ridge, and Harlan D. Whitehead, Clinton, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 8, 1976, Ser. No. 664,859
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **10 Claims**

1. In a solar collector comprising in combination means for absorbing solar energy from incident solar radiation and means for conducting said energy to a heat transfer medium, the improvement wherein said means for absorbing solar energy is provided with a solar selective surface comprising carbon, said surface having a majority of external pores within the range of about 0.2–2 micrometers.

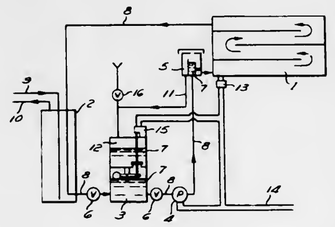
9. A method of providing a thermally conductive substrate with a selective solar energy absorbing coating, said method comprising adhering a coating comprising carbon particles to said surface, said carbon particles having a majority of external pores within the range of about 0.2–2 micrometers.



4,048,981
SOLAR HEATER

James C. Hobbs, II, 4384 Ingraham Highway, Miami, Fla. 33133

Filed Jan. 16, 1975, Ser. No. 541,417
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **13 Claims**



1. A system utilizing solar energy for heating purposes comprising:

a. a heat absorber to be exposed to sunlight and through which heat exchange liquid can flow, said absorber having an inlet for said liquid at one elevation and an outlet for said liquid at a higher elevation;

b. a liquid supply for the absorber, open to the atmosphere and communicating with the absorber inlet, said supply being at an elevation no higher than the elevation of the heat absorber inlet; and

c. a pump having an inlet operatively connected to the absorber outlet;

d. whereby liquid will be drawn through the absorber by the pump and be introduced to the absorber from the supply at no greater than atmospheric pressure.

4,048,982
BULB-TYPE SOLAR ENERGY COLLECTOR

Yu Kun Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

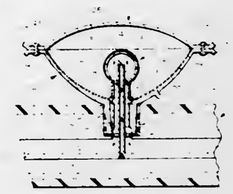
Filed May 3, 1976, Ser. No. 682,816
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **12 Claims**

1. A solar collector apparatus comprising an integral endless glass wall defining a parabolic surface disposed about a central focal axis, an aperture at one end of said wall centered on said axis at the apex of said parabolic surface, the opposite end of said wall defining an enlarged open end,

a continuous reflective coating layer over the parabolic surface of said wall for reflecting solar radiation striking said surface to said focal axis,

a hollow glass absorber member comprised of an enlarged bulbar end portion and an integral tubular stem portion depending therefrom that is open at one end, the stem of said member being inserted through said aperture and coaxial with said focal axis such that the open end thereof is disposed outside of said parabolic surface and adjacent the apex aperture,

fusion connecting means sealingly attaching said glass absorber member integrally with said parabolic glass wall at the apex aperture region thereof such that the bulbar end portion is disposed along said focal axis and within said parabolic surface,



said glass absorber member including an energy absorbing surface thereon extending over the surface area of the bulbar end portion thereof,

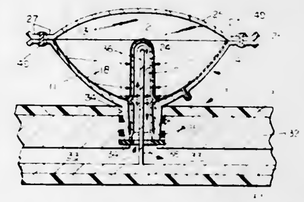
a transparent glass cover member for covering the open end of said parabolic wall opposite the aperture thereof, and

means for sealingly connecting the glass cover plate over said parabolic glass wall closing the parabolic chamber defined thereby, said chamber being evacuated to at least a partial vacuum.

4,048,983
SOLAR ENERGY COLLECTOR APPARATUS

Yu Kun Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 3, 1976, Ser. No. 682,817
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **18 Claims**



1. A solar collector apparatus comprising an integral endless glass wall defining a parabolic surface disposed about a central focal axis, an aperture at one end of said wall centered on said axis at the apex of said parabolic surface, the opposite end of said wall defining an enlarged open end,

a continuous reflective coating layer over the parabolic surface of said wall for reflecting solar radiation striking said surface to said focal axis,

a hollow, tubular glass member having a closed end and an opposite open end, said member being inserted through said aperture and coaxial with said focal axis such that the open end thereof is disposed adjacent the apex aperture,

connecting fusion means sealingly attaching said hollow tubular glass member integrally with said parabolic glass wall at the apex aperture region thereof,

said tubular glass member including an energy absorbing surface thereon extending over substantially the entire

surface area thereof disposed along the focal axis of said parabolic wall,

a transparent glass cover member for covering the open end of said parabolic wall opposite the aperture thereof, and

means for sealingly connecting the glass cover plate over said parabolic glass wall closing the parabolic chamber defined thereby, said chamber being evacuated to at least a partial vacuum.

4,048,984

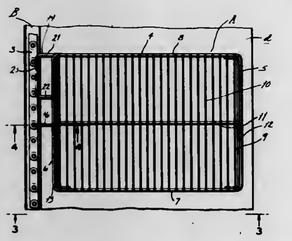
OVEN RACK

Timothy J. Eberhardt, 3932 Dunnica, St. Louis, Mo. 63116

Filed Apr. 7, 1976, Ser. No. 674,565

Int. Cl.² F24C *15/16*; A47J *37/00*; A23L *3/00*

U.S. Cl. 126—337 R **4 Claims**



1. For use with a tunnel type oven having an endless conveyor chain adapted for movement therethrough and with the courses of the latter being disposed in a horizontal plane, an oven rack comprising a frame, means provided on said frame defining a support for matter to be subjected to the oven, said frame having opposed or chain-adjacent and outer or chain-remote ends and opposed leading and trailing sides, an extension projecting from said frame's inner end, a finger depending from the outer end of said extension for detachably engaging said chain, guide means provided on said frame inner end forwardly of said extension for abuttingly engaging said chain to inhibit forward swinging of said rack during conveyance by said chain, and support surface engaging components secured to said frame and being located downwardly thereof.

4,048,985

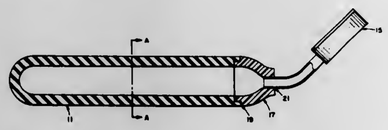
EXERCISE DEVICE

Howard A. Sasse, Buffalo, N.Y., assignor to H. Sass-E International Inc., Buffalo, N.Y.

Filed May 21, 1976, Ser. No. 688,936

Int. Cl.² A61B *5/00*; A61H *19/00*

U.S. Cl. 128—2 S **9 Claims**



1. An exercise device comprising in a single unit

a. an elongated tube member simulating a tumescent penis,

b. said tube member having a substantially circular outer cross-section, and having one rounded and enclosed and one open end,

c. a pressure indicating means positioned contiguous to, and in fluid tight relation to said open end of said tube member, forming a closed gas-containing system,

d. said pressure indicating means reflecting changes in pressure of said closed system.

4,048,986

INDIVIDUAL IDENTIFICATION AND DIAGNOSIS USING WAVE POLARIZATION

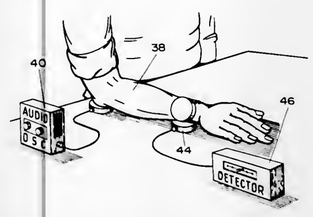
James H. Ott, Akron, Ohio, assignor to Novar Electronics Corporation, Barberton, Ohio

Division of Ser. No. 607,234, Aug. 25, 1975, Pat. No. 3,990,436.

This application Aug. 5, 1976, Ser. No. 712,038

Int. Cl.² A61B *10/00*

U.S. Cl. 128—2 R **1 Claim**



1. An apparatus for determining the polarization shift of wave energy transmitted through a portion of a body, the apparatus comprising:

a. a wave generating transducer for applying wave energy to a first body part at a selected polarization;

b. first circuit means connected to said wave generating transducer for energizing said wave generating transducer;

c. a plurality of receiving transducers mounted in side-by-side arcuate arrangement for at least partially surrounding a second body part and for receiving wave energy transmitted through a portion of said body; and

d. second circuit means for detecting the magnitude of the wave energy received by each of said receiving transducers.

4,048,987

SURGICAL ACID

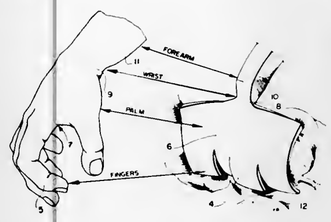
James Kevin Hurson, 14 Second St., Orangeville, Ontario, Canada

Filed July 26, 1974, Ser. No. 492,208

Claims priority, application United Kingdom, Aug. 6, 1973, 37278/73; Canada, June 28, 1974, 203740

Int. Cl.² A61B *17/02*

U.S. Cl. 128—20 **46 Claims**



1. A surgical retractor comprising an elongated body of polymeric material having a polymeric surface which is non-toxic to cells and characterized in being three-dimensionally deformable merely by bending and without torsional deformation, with one end of said retractor fixedly secured at a point in space, into a full circle the plane of which may be in any angular orientation relative to said point in space.

4,048,988

SHUTTER FOR A RECTOSCOPE

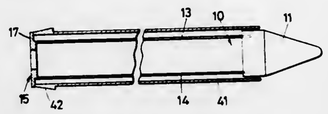
Eberhard Regenbogen, Osnabruck, Germany, assignor to Richard Wolf GmbH, Knittlingen, Germany

Filed Jan. 8, 1976, Ser. No. 647,568

Claims priority, application Germany, Jan. 8, 1975, 002925

Int. Cl.² A61B *1/00*

U.S. Cl. 128—4 **7 Claims**



1. A shutter for a rectoscope instrument, comprising a bolt insertable into the anterior terminal cross section of a rectoscope tube, and a terminal part rigidly connected to the bolt, arranged at a distance corresponding approximately with the length of the rectoscope, characterized by the fact that the bolt **(11, 19, 21, 31)** is made from translucent material and connected by parallel elongated spaced rods, eccentric to the axis of the instrument thereby exposing a central visible cross section, to a terminal ring having an aperture therein affording an unobstructed view from the ring to the bolt.

4,048,989

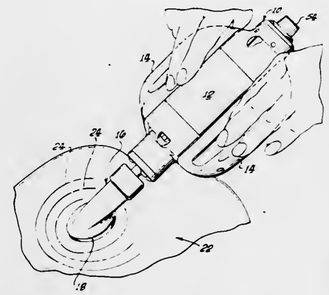
TISSUE PULSATOR OPERATING WITH A TAPPING ACTION, AND METHOD

E. Lowell Schaefer, 6347 Deerfield Ave., San Gabriel, Calif. 91775

Filed Apr. 27, 1976, Ser. No. 680,760

Int. Cl.² A61H *23/00*

U.S. Cl. 128—55 **4 Claims**



1. A tissue pulsator capable of operating on an area to be treated with a tapping action, said pulsator including a head having on one side thereof a surface engageable with the area to be treated, said head comprising an enlarged, laterally facing pad having said surface on one side thereof, said surface being convex in all directions, and said pulsator including a rotary eccentric drive means connected to said head for laterally moving said surface thereof inwardly and outwardly substantially parallel to itself so as to operate on the area to be treated with a tapping action, said rotary eccentric drive means including:

a. a housing providing a socket;

b. a shaft having inner and outer ends and having intermediate its inner and outer ends a ball disposed in said socket;

c. said head being connected to said outer end of said shaft;

d. a crank connected to said inner end of said shaft;

e. a rotary motor in said housing and substantially coaxial with said shaft and connected to said crank for rotating said crank substantially about the axis of said shaft so as to cause said outer end of said shaft to orbit, thereby laterally moving said surface of said head inwardly and outwardly substantially parallel to itself so as to operate on the area to be treated with a tapping action; and

f. means interconnecting said shaft and said housing for preventing rotation of said shaft about its axis.

4,048,990

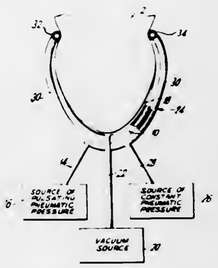
HEART MASSAGE APPARATUS

Robert H. Goetz, 80 Vernon Drive, Scarsdale, N.Y. 10583

Filed Sept. 17, 1976, Ser. No. 724,456

Int. Cl.² A61H *7/00*

U.S. Cl. 128—64 **6 Claims**



1. Apparatus for directly massaging a patient's heart, comprising:

a cup-like, inflatable bladder formed to surround a heart and operable to intermittently squeeze the heart in a massaging manner in response to the creation of predetermined pressure pulses within said bladder;

a collapsible, basket-like, bladder support means for disposing said bladder in an operational posture around the heart during a heart massaging operation, said support means being erectible into a generally rigid, bladder supporting condition and being collapsible to a non-rigid, pliable condition;

suction means for creating a predetermined vacuum in the generally annular space defined between said bladder and the heart when the bladder is disposed in an operational posture with respect to the heart; and

said bladder and said support means being so formed that upon the collapse of said bladder and said support means, and upon the release of said suction means, the overall heart massaging apparatus collapses into non-rigid, pliable condition so that the overall apparatus may be safely pulled from over the heart and out through an opening defined by a generally closed incision in the patient, such opening being several times smaller than the transverse thickness of said basket-like supporting means when said last mentioned means is erected in an operational posture.

4,048,991

BRACE APPARATUS

Alvin J. Marx, 315 College Road, Bronx, N.Y. 10471

Continuation-in-part of Ser. No. 617,144, Sept. 26, 1975. This application Aug. 25, 1976, Ser. No. 717,483

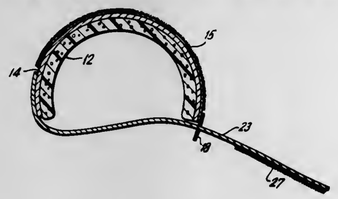
The portion of the term of this patent subsequent to June 7, 1994, has been disclaimed.

Int. Cl.² A61F *13/00*

U.S. Cl. 128—165 **8 Claims**

1. A brace adapted for application over a subject's wrist comprising an elongated semi-flexible curved backer sheet having a plurality of perspiration eliminating interstices therein, a porous perspiration passing inner sheet disposed about and secured to the inner surface of said backer means, said semi-flexible backer means being curved in a generally

rounded fashion, strap means attached to said semi-flexible curved backer sheet-inner sheet laminate about one end thereof, buckle means affixed to said semi-flexible backer sheet-inner sheet laminate about the other end thereof, said buckle means being adapted to receive the other end of said strap



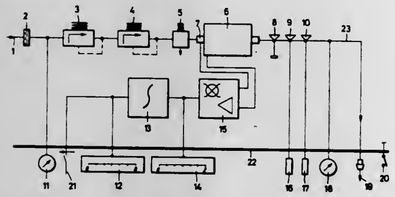
means, and brace securing means comprising mating first and second cooperating portions, said first portion of said mating means being affixed to the outer surface of said strap about its said other end and the second portion of said fastening means being secured to the outer surface of said semi-flexible backer sheet.

4,048,992

INSUFFLATOR

Hans-Joachim Lindemann, Kleiner Schaferkamp 43, 2 Hamburg 6, and Peter P. Wiest, Gothaallee 19, 1 Berlin 19, both of Germany

Filed Oct. 22, 1975, Ser. No. 624,845
Claims priority, application Germany, Oct. 26, 1974, 2451383
Int. Cl.² A61M *16/00*
U.S. Cl. 128—184 **4 Claims**



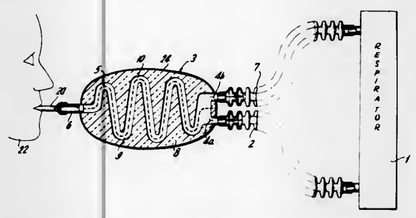
1. In an insufflator for introducing limited quantities of carbon dioxide into the human body for operational purposes, particularly for laparoscopy of the type including an inlet for connection to a source of carbon dioxide under pressure, an adapter connection for medical instruments, particularly, laparascopes and hysteroscopes, insertable in the human body, and pressure regulator means connected in series to the inlet and followed by a gas flow monitoring device, and through which, in series, the carbon dioxide is directed from the gas supply to the adapter connection, the improvement comprising, in combination, said pressure regulator means being constituted by two pressure regulators connected in series between said inlet and said flow-monitoring device and constantly adjusted to respective fixed gas supply pressures; said monitoring device comprising an expansion container having end and side walls with an inlet port located centrally of one end wall and an outlet port located centrally of the other end wall, the expansion container having a large cross-sectional area perpendicular to the flow direction therethrough, and having a peripheral zone spaced laterally from said inlet and outlet ports in which the gas flow velocity approaches a zero rate; sensing elements, providing currents corresponding to a measured variable of the gas flow, provided in said expansion container and including first sensing element located immediately in the area of said inlet port, and subjected to the gas flow, and a second sensing element located in said peripheral zone close to the side wall of said container at the maximum possible lateral spacing from said first element; a flow-directing cylindrical screen surrounding said first sensing element and shielding said second sensing element from the gas flow through said inlet port to said outlet port; a precision aperture, permanently adjusted to the maximum rate of flow, connected in series following said outlet port; an adjustable precision needle valve following said precision aperture; a pressure gauge connected to said adapter connection to indicate the back pressure at said adapter connection; a measuring bridge including said first and second sensing elements and having an input and an output; a source of electrical potential connected to the input of said measuring bridge; a measuring amplifier having an input connected to the bridge output and deriving the quotient of the respective currents of said first and second sensing elements, and having an output; an indicator, of the rate of gas flow per unit of time, connected to the amplifier output; the rate of flow being adjustable by said precision needle valve in accordance with the reading of said indicator; an integrator connected to the output of said amplifier; and a second indicator, for indicating the total gas flow, connected to said integrator, whereby the reading of said second indicator permits the drawing of a quantitative conclusion as to the size of the gas bubble in the human body.

4,048,993

HUMIDITY EXCHANGER IN AN APPARATUS FOR RESPIRATION AND ANASTHESIA

Gunter Dobritz, Lubeck, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

Filed May 28, 1976, Ser. No. 690,840
Claims priority, application Germany, June 30, 1975, 2529050
Int. Cl.² A61M *16/00*
U.S. Cl. 128—212 **7 Claims**



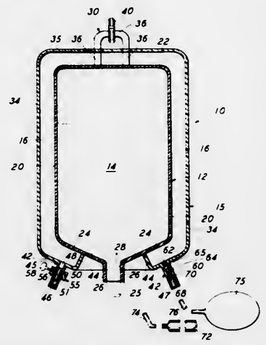
1. A humidity exchanger apparatus for respiration and anesthesia, comprising a combined breathing conduit having a partition wall extending longitudinally therethrough and comprising a diffusion foil, said conduit with said partition defining a separate inhalation passage in juxtaposed relation to a separate exhalation passage, a mouthpiece connected to said combined breathing conduit and interconnecting said passages adjacent one end, a respirator connection connected to said combined breathing conduit adjacent the opposite end and having a separate inhalation conduit connected to said inhalation passage and exhalation conduit connected to said exhalation passage and having valve means permitting inhalation air and exhalation air to pass in respective opposite directions through said inhalation and exhalation passages and conduits, and a first portion of said breathing conduit adjacent said one end of said breathing conduit defining a condensation zone, a second portion of said breathing conduit between said first portion and said opposite end defining a diffusion zone, and temperature control means to maintain said condensation zone of a predetermined length of said inhalation and exhalation conduit portions adjacent said one end at temperatures in which the air passing through said inhalation and exhalation conduit portions have a temperature difference in said condensation zone and also to maintain said diffusion zone of corresponding length of said inhalation and exhalation conduit portions adjacent said opposite end at temperatures which are substantially equal.

4,048,994

SELF-INFLATING LIQUID CONTAINER FOR KEEPING I.V. FLUID OR BLOOD PLASMA

Liu Ying P. Lo, 35-80 Central Ave., Oxford House, Apt. 104, Fort Meyers, Fla. 33901

Filed Aug. 24, 1976, Ser. No. 717,116
Int. Cl.² A61M *5/00*
U.S. Cl. 128—214 F **4 Claims**



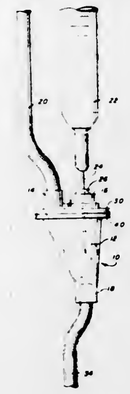
1. A self-inflating liquid container, comprising:
a. an inner flexible plastic receptacle for the retention of a liquid such as blood or the like,
b. a drain tube connected to the lower end of said inner receptacle, so as to permit the outward flow of the liquid from said inner receptacle,
c. supporting means connected to the upper end of said inner receptacle so as to permit the liquid contained therein to exit through said drain tube,
d. an outer flexible plastic receptacle substantially surrounding and enclosing said inner flexible receptacle so as to form a chamber therebetween,
e. a first unidirectional valve on said outer receptacle for permitting the inward flow of gas into said chamber such that said outer receptacle can be inflated, so as to obtain a force applied to said inner receptacle to air in the outward flow of the liquid from said inner receptacle through said drain tube,
f. said supporting means includes a hanger fastened at one end thereof to said inner receptacle and having a portion thereof extending beyond said outer receptacle and in sealed relationship thereto,
g. said chamber is initially at or below atmospheric pressure and is inflated by the flow of gas therein to apply a compressive force to said inner receptacle,
h. a second unidirectional valve on said outer receptacle for permitting the inward flow of gas into said chamber,
i. said inner receptacle includes:
1. a pair of inner spaced apart side walls,
2. a pair of inner spaced apart end walls,
3. an inner top wall,
4. an inner bottom wall all joined together with said drain tube extending outwardly therefrom, and
j. said outer receptacle includes:
5. a pair of spaced apart outer side walls in overlapping relationship to said inner side walls,
6. a pair of spaced apart outer end walls in overlapping relationship to said inner end walls,
7. an outer top wall extending in overlapping relationship to said inner top wall with said supporting means extending through said outer top wall, and
8. an outer bottom wall extending in partially overlapping relationship to said inner bottom wall and connected thereto by a peripheral terminal wall portion surrounding said outlet tube.

4,048,995

INJECTION SITE

Herbert Mittleman, Deerfield, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 605,170, Aug. 15, 1975, Pat. No. 4,000,740, which is a continuation of Ser. No. 475,215, May 31, 1974, abandoned. This application July 19, 1976, Ser. No. 706,363
Int. Cl.² A61M *5/14*
U.S. Cl. 128—214 R **17 Claims**



1. An injection site for location between a parenteral source of fluid and a patient, which comprises: a first inlet to which a conduit from a first liquid container is adapted to be connected; a second inlet adapted to receive needle-injected medication; an outlet through which the combined first liquid and injected medication can flow with said outlet adapted for coupling to a conduit; a main body portion defining a single chamber that communicates with said first and second inlets and said outlet, said chamber having a sloped wall between said first inlet and said outlet, said chamber having a cross-sectional area adjacent said first and second inlets that is greater than the cross-sectional area of said chamber adjacent said outlet, said chamber having a cross-sectional area that is substantially greater than the cross-sectional area of said first inlet; said chamber having a length that is no greater than 1.5 inches to aid in preventing the medication that is injected from dropping through air; said second inlet and said outlet being substantially coaxial, whereby the needle is substantially prevented from piercing the chamber, and said chamber being constructed to provide unobstructed flow of the first liquid and medication to said outlet.

4,048,996

DUAL INJECTION SITE

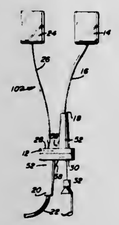
Herbert Mittleman, Deerfield, and Joseph L. Schopen, Crystal Lake, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed June 14, 1976, Ser. No. 695,703
Int. Cl.² A61M *5/00*
U.S. Cl. 128—214 R **23 Claims**

1. An injection site for location between a parenteral source of fluid and a patient, which comprises: a first inlet for coupling to a conduit from a first liquid container; a second inlet having a pierceable, self-sealing diaphragm positioned therein; a third inlet having a pierceable, self-sealing diaphragm positioned

therein; an outlet for coupling to a conduit for connection to a patient; and a main body portion having a chamber coupling said first, second and third inlets to said outlet, said first inlet and said outlet being oppositely positioned and said second and third inlets being oppositely positioned, said second inlet and said outlet being substantially coaxial, and said third inlet being substantially coaxial with said first inlet.

19. An injection site for location between a parenteral source of fluid and a patient, which comprises: a main body portion; a first inlet on one side of said body portion for coupling to a conduit from a first liquid container; a second inlet on said one side of said body portion, laterally displaced from said first



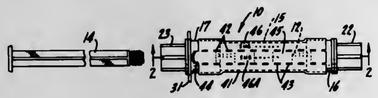
inlet, and having a pierceable, self-sealing diaphragm positioned therein and held under compression; an outlet on the opposite side of said body portion and laterally displaced from said inlet for coupling to a conduit connected to a patient, a third inlet on said opposite side of said body portion and laterally displaced from said outlet, said third inlet having a pierceable, self-sealing diaphragm positioned therein and held under compression; said main body portion having a chamber coupling said first, second and third inlets and said outlet, said second inlet being positioned for injection from said first side and said third inlet being positioned for injection from said opposite side.

4,048,997

SYRINGE WITH ACTINIC RADIATION PROTECTION

Srinivas T. Raghavachari, Chicago, and Robert L. Striebel, II, Evanston, both of Ill., assignors to MPL, Inc., Chicago, Ill.

Filed Nov. 1, 1976, Ser. No. 737,209
Int. Cl.² A61M *5/00*
U.S. Cl. 128—215 **7 Claims**



1. A syringe-type dispenser for storing and dispensing a liquid which is adversely affected by exposure to actinic light, comprising:

a housing including a clear, transparent tube having an outlet at one end;

outlet seal means, at the outlet end of the housing, including means for opening an outlet passage through the housing outlet;

a piston in the other end of the tube, the outlet seal means and the piston conjointly defining a normally sealed chamber, within the tube, for storing the liquid to be dispensed, the piston being axially movable through the tube toward the outlet end of the housing to discharge the liquid through the outlet;

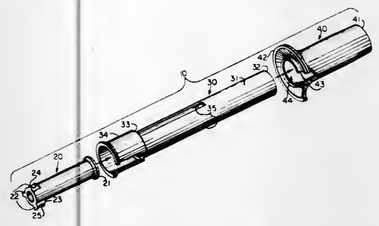
and a thin, protective film sheath, covering and tightly fitting over the outside of the housing throughout the length of the tube between the seal means and the piston, the protective film sheath being formed of a material which inhibits the transmission of actinic light but passes other light in the visible spectrum to permit limited inspection of the dispenser contents, at least a part of the sheath being readily detachable to expose the contents of the dispenser for improved inspection directly through the housing.

4,048,998

TAMPON INSERTER

Louis V. Nigro, Saugus, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Feb. 19, 1976, Ser. No. 659,489
Int. Cl.² A61F *15/00*
U.S. Cl. 128—263 **6 Claims**



1. A tampon inserter of the pull type comprising an outer tube, an insertion tube slidable within said outer tube, and retainer means fixedly connected within said outer tube, said insertion tube including means permitting said retainer means to extend to the inside thereof while permitting free movement thereof, said insertion tube having a proximal end for insertion into a body cavity and adapted to contain a tampon between said proximal end and said retainer means, said retainer means so positioned that when said insertion tube is moved away from said body cavity, said retainer means engages said tampon to cause it to be deposited outside said tampon inserter in said body cavity.

4,048,999

TWO-CHAMBER MIXING SYRINGE

Erich Kobel, Darmstadt, Germany, assignor to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed July 12, 1976, Ser. No. 704,631
Claims priority, application Germany, July 24, 1975, 2533036; Oct. 17, 1975, 2546495
Int. Cl.² A61J *1/00*
U.S. Cl. 128—272.1 **9 Claims**

1. A two-chamber syringe assembly for initially isolating a first liquid component to be provided in one chamber thereof from a second component to be provided in a second chamber thereof and thereafter mixing the two components; comprising a piston and cylinder type syringe having an axially-bored dispensing fitting at one end of the cylinder, with the cylinder forming a chamber for the liquid component when the piston is in outward retracted position at the opposite end of the cylinder; a container providing a second chamber for the second component and having an opening at one end; a first axially bored resilient stopper in the form of a sleeve, with one end thereof adapted for sealed engagement with the open end of the container and the bore thereof adapted to mounting the dispensing fitting of the cylinder therein in sealed engagement therewith at its other end; and a second stopper adapted to mounting in the bore of the first stopper below the dispending fitting in sealed engagement with the first stopper to seal off the piston cylinder chamber and included liquid component from the other component in the second chamber during storage and transport, the second stopper being ejectable from the bore of the first stopper after mounting therein into the second chamber upon actuation of the piston inwardly of the cylinder



to communicate the two chambers for mixing the components in the second chamber.

4,049,000

SUCTION RETRACTION INSTRUMENT

Robert W. Williams, 3201 Maryland Parkway, Las Vegas, Nev. 89109

Filed Aug. 1, 1975, Ser. No. 601,058
Int. Cl.² A61M *1/06*
U.S. Cl. 128—276 **12 Claims**



1. A suction retraction instrument comprising:

an elongated hollow suction pipe having a suction port at its lower end and secured to a manifold at its upper end and having a straight lower portion extending along an axis, and

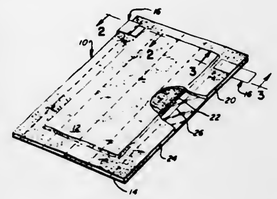
a unitary support rod and retractor arm secured along the length of said suction pipe, the retractor arm comprising the lower end of said support rod, and wherein said retractor arm extends beyond the lower end of said suction pipe and at an obtuse angle from said axis.

4,049,001

DIAPER WITH RESEALABLE TAPE CLOSURE

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 27, 1976, Ser. No. 661,920
Int. Cl.² A61F *13/16*
U.S. Cl. 128—287 **2 Claims**



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

a backing web, folded over to form first and second anchoring legs, each having an inner face and an outer face, and receiving a marginal portion of said diaper there-between, said inner face of said legs being provided with an adhesive coating by means of which said legs are permanently attached to said marginal portion, said first leg being attached to said diaper inside surface and said second leg being attached to said diaper outside surface;

a first securing tape ribbon having a fixed end and a free working end;

an adhesive coating on at least one face of said fixed end of said first securing tape ribbon by means of which said fixed end of said first securing tape ribbon is attached to said second leg to attach said fixed end to a marginal location of said diaper, and a pressure-sensitive adhesive coating on said one face of said free working end of said first securing tape ribbon;

a second securing tape ribbon having a fixed end and a grippable free working end, said fixed end of said second securing tape ribbon being coextensive with and adhesively but releasably attached to said adhesive-coated face of said free working end of said first securing tape ribbon and the free working end of said second securing tape ribbon extending beyond the free working end of said first securing tape ribbon, and a pressure-sensitive adhesive coating on said second securing ribbon on the face thereof opposite to the face attached to said free working end of said first securing tape ribbon; and

release means on said outer face of said first leg providing a release region facing in the same direction as said diaper inside surface;

said second securing tape ribbon being movable from a folded-over storage position in which said second securing tape ribbon is releasably adhered to said release region to a working position in which said adhesive-coated second securing tape ribbon is available for use in securing said diaper about said infant; and

said free working end of said first securing tape ribbon being separable from said fixed end of said second securing tape ribbon to enable said diaper to be removed from said infant and to make said pressure-sensitive adhesive coating on said free working end of said first securing tpe ribbon available for use in refastening said diaper about said infant.

4,049,002

FLUID CONVEYING SURGICAL INSTRUMENT

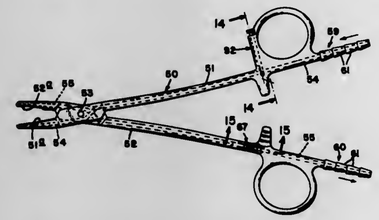
Harold D. Kletschka, Minneapolis, and Edson D. Rafferty, Excelsior, both of Minn., assignors to Bio-Medicus, Inc., Minnetonka, Minn.

Division of Ser. No. 597,095, July 18, 1975, Pat. No. 3,980,086, which is a continuation of Ser. No. 446,809, Feb. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 368,192, June 8, 1973, Pat. No. 3,807,406, which is a continuation of Ser. No. 156,825, June 25, 1971, abandoned. This application May 3, 1976, Ser. No. 682,386

The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.

Int. Cl.² A61B *17/32*

U.S. Cl. 128—318 **10 Claims**



1. A surgical instrument of scissors type configuration, comprising:
   a. first and second elongated members of essentially the same length, each having a manipulating end and a functional end, said functional ends having opposed impermeable inner faces and distal outer faces, said inner faces being substantially adjacent each other in the closed position, the first and second elongated members being pivotally connected at an intermediate point and arranged so that the functional ends together provide a surgical function upon relative movement of said manipulating ends;
   b. first and second fluid conduit means respectively associated with the first and second elongated members, each of said conduit means terminating in an opening in the distal outer face of the associated elongated member at the extreme functional end thereof;
   c. said first fluid conduit means being adapted for connection to a source of negative fluid pressure;
   d. and the second fluid conduit means being adapted for connection to a source of positive fluid pressure.

4,049,003

DIGITAL CARDIAC PACER

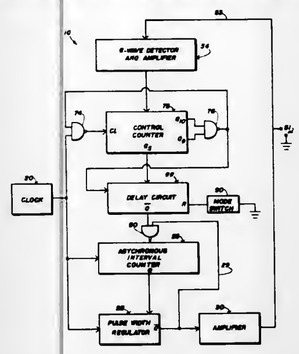
Robert A. Walters, Pittsburgh, and Steve A. Kolenik, Leechburg, both of Pa., assignors to ARCO Medical Products Company, Leechburg, Pa.

Continuation-in-part of Ser. No. 625,295, Oct. 23, 1975, abandoned. This application Feb. 2, 1976, Ser. No. 654,504

Int. Cl.² A61N *1/36*

U.S. Cl. 128—419 PG **6 Claims**

1. A heart pacer for supplying stimulation pulses to electrodes adapted to be connected to a heart, comprising;
   a source of clock pulses a plurality of which being spaced within an interval between normal heartbeats;
   counting means for counting said clock pulses for producing an output upon reaching a pulse count corresponding to a predetermined interval within said interval between normal heartbeats, said counting means being reset upon reaching said count;
   a stimulation pulse generator actuated by said counting means output to provide a stimulation pulse for delivery to said electrodes;
   a detecting circuit for receiving signals from said electrodes for detecting and amplifying heartbeat indicative signals;
   and control interval counting means for counting a preselected number of said clock pulses corresponding to a preselected refractory interval, said control interval counting means being reset by said heartbeat indicative signals, each control interval consisting of the sum of said refractory interval and a variable interval resulting from



said control interval counting means being reset by said heartbeat indicative signals, if any, detected prior to the reaching of the count corresponding to said refractory period, said control interval counting means thereafter generating an output when actuated by heartbeat indicative signals to disable and reset said counting means.

4,049,004

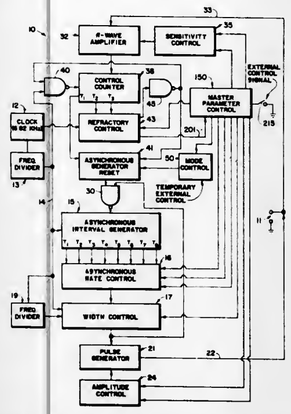
IMPLANTABLE DIGITAL CARDIAC PACER HAVING EXTERNALLY SELECTIBLE OPERATING PARAMETERS AND "ONE SHOT" DIGITAL PULSE GENERATOR FOR USE THEREIN

Robert A. Walters, Pittsburgh, Pa., assignor to ARCO Medical Products Company, Leechburg, Pa.

Continuation-in-part of Ser. No. 654,584, Feb. 2, 1976, which is a continuation-in-part of Ser. No. 625,295, Oct. 23, 1975, abandoned. This application Mar. 3, 1976, Ser. No. 663,372

Int. Cl.² A61N *1/36*

U.S. Cl. 128—419 PG **24 Claims**



1. An implantable cardic pacer for connection to heart contacting electrodes comprising:
   means for generating a plurality of clock pulses within a normal heartbeat interval;

triggerable means for generating a heart stimulation pule for delivery to said heart electrodes;
means for counting said clock pulses for a stimulation pulse interval to thereafter deliver a trigger signal to said stimulation pulse generating means;
means for counting said clock pules to a refractory interval count;
means for detecting signals upon the heart electrodes and for generating a signal in response thereto to reinitiate the count of said said refractory interval counting means;
means responsive to said detected heart electrode signal after said refractory interval count for resetting said stimulation counter;
means for independently adjusting the width of said stimulation pulse, the amplitude of said stimulation pulse, the refractory interval count, the stimulation pulse interval, the sensitivity of said detecting means, and the resetting of said stimulation counter;
means for receiving externally transmitted parameter control signals;
register means connected to said receiving means into which said parameter control signals are loaded prior to their execution;
memory means connected to receive signals from said register means for storing said parameter control signals for controlling said independent adjusting means;
means operative to load said parameter control signals into said memory means after said parameter control signals are loaded into said register means;
and means interconnecting said memory means to said adjusting means to execute the parameter control signals in said memory means, whereby said stimulation pulse width, stimulation pulse amplitude, refractory interval count, stimulation pulse interval, sensitivity of said detecting means and resetting of said stimulation counter are controlled by said parameter control signals.

19. For use in a digital heart pacer of the type which receives externally transmitted pulses, a "one shot" digital pulse generator for producing a pulse of controlled amplitude and width upon the application of said received pulse, comprising:
   a source of digital "high" and "low" states;
   a clock pulse generator;
   first and second flip-flop means each having a data input terminal, an output terminal, an inverted output terminal, a clock terminal operable to produce a next state output in accordance with the present state input, and a reset terminal;
   said received pulse being conducted to the clock input of said first flip-flop, said data input terminal of said first flip-flop being connected to a digital "high" state, and the output of said first flip-flop being connected to the data input of said second flip-flop, and additionally defining the output of said digital "one shot" generator;
   counter means having a clock input and an output which changes state after the application of a predetermined number of clock pulses to the clock input, and a reset terminal to initialize said counter;
   said counter being reset by the signal on the inverted output terminal of said first flip-flop, and providing a signal upon said output terminal to said clock terminal of said second flip-flop, said counter receiving clock pulses from a clock generator upon its clock input terminal;
   the output from said second flip-flop being connected to reset said first and second flip-flops to an initial state;
   whereby upon the application of a received pulse to said first flip-flop, an output is presented upon its output terminals which is of predetermined amplitude, continuing until said first and second flip-flops are reset as controlled by the count output of said counter.

4,049,005

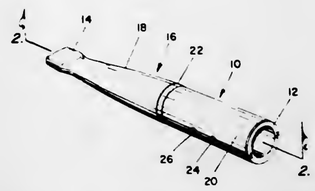
FILTERING APPARATUS FOR CIGARETTE SMOKERS

Armando C. Hernandez, 1582 Clear View Lane, Santa Ana, Calif. 92705, and Jack P. Proboroff, 9736 Pettswood Drive, Huntington Beach, Calif. 92646

Filed May 17, 1976, Ser. No. 687,308

Int. Cl.² A24F *13/02*

U.S. Cl. 131—187 **5 Claims**



1. In a cigarette holder of the kind in which tars and nicotine components are to be precipitated out of the smoke and which holder includes a shank having a cigarette coupler at its smoke input end and a bit at its smoke outlet end and a flow path extending through the shank from the inlet at the coupler to the outlet at the bit, in combination:
   means in said flow path for causing smoke traversing the flow path to be accelerated, change direction, and expand, in that order, at first, second and third successive positions, respectively, along said flow path;
   means for introducing a quantity of ambient air into said flow path at said third position at which said smoke is made to expand; and
   a second inlet for ambient air formed through the wall of said shank downstream from said coupler and upstream from said first of said positions.

4,049,006

HAIR-WEAVING DEVICE

Proxy G. Saunders, 9129 Phillips Ave., Chicago, Ill. 60617, and Lorine Moorman, 554 E. 92nd Place, both of Chicago, Ill. 62223

Filed May 10, 1976, Ser. No. 684,769

Int. Cl.² A41G *3/00*

U.S. Cl. 132—5 **10 Claims**



1. A hair-weaving machine for attaching a hairpiece having an endportion to a strand of hairs comprising:
   first holding means for gripping and forcing a needle having a thread attached thereto through the end portion of said hairpiece past the strand of hairs, the needle being releasable from said first holding means upon having been forced through said endportion of said hairpiece and past the strand of hairs;
   second holding means for gripping the needle upon the latter having been forced through said endportion of said hairpiece and past the strand of hairs, and for guiding the needle to said first holding means, the needle being releasable from said second holding means upon being in the vicinity of said first holding means and grippable by the latter upon release from said second holding means; and
   thread-tension producing means for creating a tension in a needle-attached thread so that a tight loop of the thread is formed around at least part of said endportion of said

hairpiece and at least part of the strand of hairs upon the needle being forced through the endportion of said hairpiece and past the strand of hairs at least a second time.

4,049,007

PERMANENT WAVING OF HUMAN HAIR BY MEANS OF CROSSLINKING URETHANE AND/OR HYDROXAMATE DERIVED FROM REACTIVE ACRYLIC RESINS AND ADIPODINITRILE CARBONATE

Donald H. Russell, Cherry Hill, N.J., and Charles J. Kremer, Brookhaven, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 579,765, May 22, 1975, abandoned, which is a continuation of Ser. No. 400,099, Sept. 24, 1973, abandoned, which is a continuation-in-part of Ser. No. 307,281, Nov. 16, 1972, abandoned. This application Apr. 1, 1976, Ser. No. 672,578

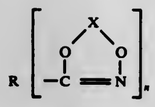
Int. Cl.² A45D *7/00*

U.S. Cl. 132—7 **34 Claims**

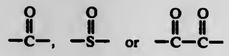
1. A composition useful for waving hair comprising

a. at least one hydroxyl, amine, or thiol group-containing acrylic or methacrylic film-forming resin having a number average molecular weight of about 500 to 500,000 or polyol, polyamine or polythiol resin forming precursor containing 1 to 30 carbon atoms,

b. a cyclic nitrile compound of the formula:



wherein R is an organic radical free of nucleophilic groups and having 1 to about 200,000 carbon atoms, X is a member selected from the group consisting of



and *n* is at least 2, and

c. a flexibilizing adhesion promoter.

4,049,008

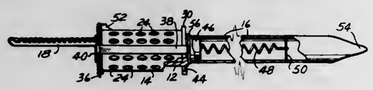
HAIR-CURLING DEVICE

Richard V. Brothers, deceased, late of Fontana, Calif., by Magdalena M. Brothers, executrix, 17388 Merrill, Fontana, Calif. 92335

Filed June 7, 1976, Ser. No. 693,339

Int. Cl.² A45D *1/00*

U.S. Cl. 132—33 B **2 Claims**



1. A hair-curling device comprising:

a substantially cylindrical spool-like body with a flange at each of its ends and having a longitudinal slot;

a sleeve-like member disposed about said body and turnable relative thereto for confining an end portion of a lock of hair between the member and the body after which the member and body are turnable as a unit for winding the lock of hair thereabout and forming it into a curl, said member being substantially cylindrical and having a longitudinal slot registrable with the slot in the body;

a hollow structure detachably mounting the body and having a slot registrable with the slots in the body and member;

comb means mounted for longitudinal movement in the hollow structure and disposable in the body, said comb means being extendable for engaging the lock of hair and combing it into a layer of substantially uniform thickness and retractable for disposing the free end portion of the combed lock of hair in the registered slots; and

curl holding means movably mounted on the body for engaging the combed lock of hair adjacent the scalp end portion after curling.

4,049,009

APPARATUS FOR TRIMMING THE NAILS

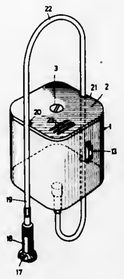
Florian Marchand, Rue la Golatte 1, 2738 Court, Berne, Switzerland

Filed Apr. 23, 1973, Ser. No. 353,412

Claims priority, application Switzerland, Apr. 27, 1972, 6285/72

Int. Cl.² A45D *29/04*

U.S. Cl. 132—76.4 **4 Claims**



1. An apparatus for trimming the nails, comprising a casing, an electric motor in said casing, a rotary shaft in said casing driven by said motor, a socket, a grinding-wheel mounted for rotary motion in said socket, a flexible wire connecting said rotary shaft to said grinding-wheel for driving said wheel together with said shaft, a sheath surrounding said wire, said sheath having one end secured to said casing and the other end connected to said socket, and grooves provided in the outer surface of said casing, said grooves having sizes adapted to said sheath in order to enable tightly fitting said sheath into said grroves upon winding said sheath and said wire around said casing without disconnecting said wire from said shaft, said casing having a front wall to which said sheath is connected, two opposed side walls on either side of said motor and being substantially parallel to the motor axis, and a rear wall, said grooves being provided in said opposed side walls in order that said sheath and said wire form a loop beyond said rear wall upon winding them around said casing, and said sheath being fitted in said grooves strongly enough in order that said loop constitutes a handle permitting the apparatus to be hung thereby.

4,049,010

FINGERNAIL CONDITIONING AND POLISHING METHOD AND APPARATUS

Bernard A. Mitchell, and Barry E. Shipp, both of Chicago, Ill., assignors to Jovan, Inc., Chicago, Ill.

Filed Mar. 10, 1976, Ser. No. 665,633

Int. Cl.² A45D *40/30*

U.S. Cl. 132—88.5 **14 Claims**

1. A method of conditioning and polishing fingernails or toenails comprising the steps of:

a. smoothing the surface of the nail by a delicate abrasion to remove substantially all longitudinal ridges without locally wearing away part of the nail;



b. applying a conditioning cream over the smoothed surface of said nail, said conditioning cream comprising at least softeners, preservatives, and protein; and

c. buffing said cream and said nail.

4,049,011

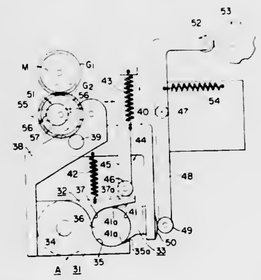
COIN STACKING DEVICE

Shiro Nakai, and Yoshio Nishikawa, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Japan

Filed Aug. 31, 1976, Ser. No. 719,382

Int. Cl.² G07D *9/06*

U.S. Cl. 133—1 A **2 Claims**



1. A coin stacking device comprising:

a first wall member having an arcuately recessed curved surface rotatably supported on a first pivot shaft which is fixed in space;

a second wall member having an arcuately recessed curved surface disposed contiguously to said curved surface of the first wall member to form therewith a continuous curved surface defining a substantially semicylindrical cavity, said second wall member being rotatably supported on the first pivot shaft and being biased to rotate about the first pivot point in the direction to widen the cavity;

a support lever rotatably supported at one end thereof by a second pivot shaft fixed to an extended part of the first wall member and biased to rotate about the second pivot point in the direction to separate the other end thereof away from said cavity;

a third wall member supported on said other end of the support lever, thereby being movable toward and away from said cavity, and having an arcuately recessed curved surface opposed to said cavity and forming therewith a continuous curved surface of substantially circular cross section which is of variable diameter and defines a cylindrical space for stacking of coins supplied thereinto;

a regulating device provided on the support lever and functioning to determine the angular position of the second wall member relative to the first wall member thereby to determine the degree of opening of the cavity; and

adjusting means adjustably operable to move the support arm thereby to adjustably vary the diameter of said cylindrical space to any selected one of a plurality of predetermined values corresponding to the diameters of different kinds of coins.

4,049,012

METHOD AND DEVICE FOR MEASURING AND KEEPING CONSTANT THE WATER CONTENT IN A SALT BATH

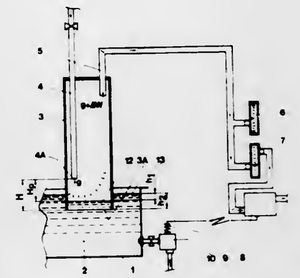
Johannes Maria van de Kooi, Montfoort, Netherlands, assignor to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

Filed Sept. 20, 1976, Ser. No. 724,917

Claims priority, application Netherlands, Sept. 22, 1975, 7511138

Int. Cl.² G05D *11/08*

U.S. Cl. 137—3 **14 Claims**



1. A method for measuring and keeping substantially constant the proportion of water in a salt bath, where the water vapor pressure over the bath corresponds to the proportion of water in the bath, comprising the steps: flowing a gas having a predetermined initial dew point toward and onto the surface of said salt bath, absorbing a quantity of water vapor from said salt bath with said gas and thereby changing the value of said dew point, measuring said change in value of the dew point, and supplying a selected quantity of water to said salt bath for returning the dew point of said bath back to the initial value thereof and thereby maintaining the water proportion of said bath.

4,049,013

SEWAGE SYSTEM

William Shenk, 8118 Oakleigh Road, Baltimore, Md. 21234

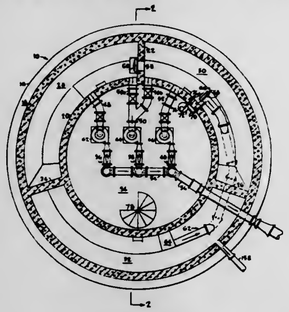
Filed Oct. 22, 1976, Ser. No. 734,725

Int. Cl.² F17C *3/00*

U.S. Cl. 137—263 **12 Claims**

1. In a sewage station having circular means for receiving sewage and pumping means powered for discharging sewage from the receiving means, the improvement comprising: the means for receiving including structure defining: a drywell, a plurality of wells in annular array around the drywell, means

for power-free distribution of sewage in predeterminable sequence among portions of the plurality of wells, and means for



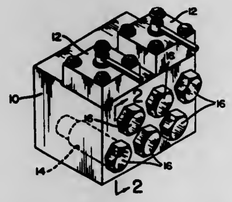
selectively delivering sewage to the pumping means from the plurality of wells in predeterminable sequence.

4,049,014

POWER TRANSMISSION

Gary L. Johnson, Pontiac, Mich., and Walter J. Zoya, Rolling Hills Estates, Calif., assignors to Sperry Rand Corporation, Troy, Mich.

Filed Oct. 3, 1975, Ser. No. 619,532
Int. Cl.² F16K *43/00*
U.S. Cl. 137—315 **3 Claims**



1. A cartridge type sleeve valve comprising a body having at least two spaced passages, a stepped bore in the body connecting the passages, a replacable cartridge mounted in the bore, a closure plug retaining the cartridge in the bore and a spring in the opposite end of the bore, the cartridge comprising a stationary outer sleeve having a lateral opening to one passage and an axial opening to the other passage, an elastomeric seal in the sleeve between the passages, a plunger slidable in the sleeve and having a first section positionable within the seal to block flow between the passages and a second section positionable within the seal to connect the passages, and a spring in the bore at the end opposite the closure plug biasing the plunger to closed position, the plunger being shiftable by pressure in the one passage from closed to open position against the spring bias.

4,049,015

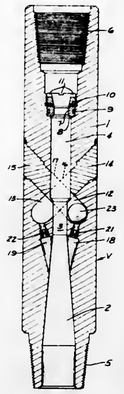
CHECK VALVE ASSEMBLY

Cleero C. Brown, deceased, late of Houston, Tex., by Joe R. Brown, executor, assignor to Brown Oil Tools, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 495,901, Aug. 8, 1974, which is a division of Ser. No. 322,226, Jan. 9, 1973, Pat. No. 3,850,191.
This application Feb. 2, 1976, Ser. No. 654,522
Int. Cl.² F16K *15/04*
U.S. Cl. 137—496 **6 Claims**

1. A check valve assembly for permitting unrestricted flow in one direction and limited flow in the reverse direction comprising:

a. a valve body having a longitudinal flowbore therethrough comprising first and third concentric sections connected by a second concentric section of restricted diameter;
b. seat means carried by said valve body at one end of said third flowbore section;
c. a pair of discreet recesses in said valve body communicating with said flowbore near the junction of said second and third flowbore sections and inclined from said flowbore radially and longitudinally away from said third section;
d. ball closure means for disposal in either one of said recesses and movable into said flowbore for sealing engagement with said seat means, in response to a predetermined rate of reverse flow through said check valve assembly, to block reverse flow of fluid through said check valve assembly;



e. a pair of elongate equalizing passages each having one end communicating with said first flowbore section and another end communicating with a respective one of said recesses, each of said equalizing passages having at least a part thereof adjacent said one end which is radially and longitudinally inclined with respect to said first flowbore section and adapted to receive replaceable orifice means, and
f. means preventing direct communication between said flowbore and a portion of each of said equalizing passages intermediate the ends of said equalizing passage.

4,049,016

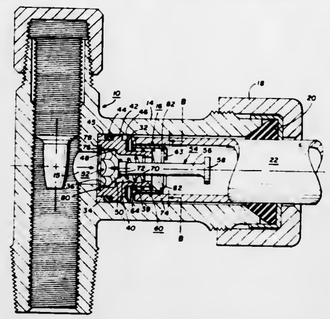
COMBINATION EXCESS FLOW AND DISCONNECT SHUTOFF VALVE FITTING

Ralph Eugene Henry, Rixford, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 13, 1976, Ser. No. 686,205
Int. Cl.² F16K *15/06*
U.S. Cl. 137—498 **7 Claims**

1. An excess flow pipe fitting for gas service piping comprising in combination:

a. a tubular body defining an at least partially annular flow passage between an inlet and an outlet and sized for insertion within gas service piping for effecting a seal tight mounting therein;
b. an annular seat defined in said passage at an intermediate location thereof;
c. a poppet in said passage for cooperating with said seat to open and close said passage to gas flow of the piping with which it is to be utilized; and
d. poppet biasing means urging said poppet away from said seat toward the open position of said passage in opposition to gas flow received through said inlet;
e. said poppet having a head of polygonal periphery positioned in the annular portion of said flow passage and facing the inlet of said body to define a flow control orifice of varying dimension with respect to the passage wall



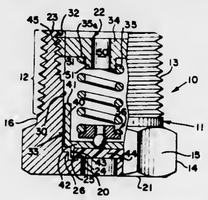
thereat; said head having a front face confronting the inlet gas flow that is formed multiply dished sloping inwardly away from a central portion thereof toward the flats of said polygonal periphery and being responsive to excess flow pressure encountered at said inlet for moving said poppet in opposition to said poppet biasing means toward the closed position of said passage.

4,049,017

ADJUSTABLE RELIEF VALVE

Evan Jones, Evanston, Ill., assignor to Henry Valve Company, Melrose Park, Ill.

Filed Apr. 12, 1976, Ser. No. 675,975
Int. Cl.² F16K *15/02*
U.S. Cl. 137—540 **2 Claims**



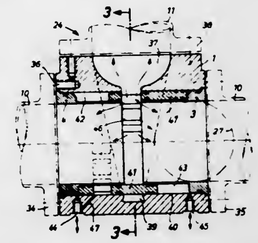
1. In a relief valve for a refrigeration system including
a valve body having an inlet, an outlet, and a passageway extending therebetween;
a stationary annular valve seat forming a portion of said passageway;
a valve member slidably retained in said passageway including a surface thereon which is adapted for moving into and out of sealing engagement with said valve seat as said valve member slides in said passageway;
adjustable retaining means which threadedly engage a portion of said passageway, and
spring biasing means including a coil spring and a disc-shape spring guide mounted on one end of said spring positioned in said passageway between said adjustable retaining means and said slidable valve member for biasing said sealing surface against said valve seat, the improvement comprising:
bearing means including a ball bearing, substantially concave bearing surfaces axially aligned on said retaining means and said spring guide into which said ball bearing is positioned, and holes through said retaining means and said spring guide in communication with said concave bearing surfaces thereon for providing a means of escape for particulate matter finding its way between said bearing surfaces and said ball bearing; and
said bearing means having a lower coefficient of friction than that between said sealing surface and said valve seat when engaged for preventing the rotational force necessary to adjust said retaining means from extending to said sealing engagement between said valve seat and said sealing surface.

4,049,018

SHUT-OFF AND REGULATOR DEVICE FOR CONTROLLABLE MECHANISMS INTENDED FOR INSTALLATION IN PIPELINES

Hubert Skibowski, Schimmelmannstieg 3, 2 Hamburg 70, Germany

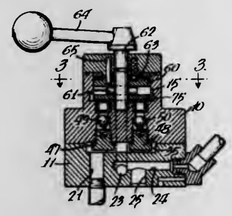
Continuation of Ser. No. 451,746, March 18, 1974, abandoned. This application July 18, 1975, Ser. No. 597,200
Claims priority, application Germany, Mar. 24, 1973, 2314702; Apr. 11, 1973, 2318165; Apr. 4, 1973, 2316681
Int. Cl.² F16K *3/26*
U.S. Cl. 137—561 R **4 Claims**



1. A valved tee fitting to be mounted in a fluid line comprising, in combination, a housing having an open unobstructed primary cylindrical flow passage defined therein, means defined on said housing for attaching said housing in a fluid line wherein said flow passage is coaxial with the fluid line, said passage being defined by an annular guiding bushing axially fixed within said housing having a central region, end regions, an inner cylindrical surface and an outer cylindrical surface, said inner cylindrical surface defining the minimum diameter of said flow passage, a lateral flow passage defined in said housing transversely disposed to said primary flow passage, means defined on said housing for attaching a lateral fluid line to said housing in communication with said lateral flow passage, at least one first port defined in said bushing central region selectively communicating with and in radial alignment with said lateral flow passsage, an annular chamber defined in said housing in radial alignment with said bushing having an inner cylindrical surface defined by said bushing outer surface, an annular spool sleeve axially defined by ends and defining a shut-off element axially slidably received within said chamber for movement between first and second axial positions and sealed with respect to said bushing outer surface, at least one second radial port defined in said spool radially aligning with said first port at said sleeve first position, said sleeve sealing said first port at said sleeve second position, control pressure medium ports defined on the exterior of said housing communicating with said chamber at each end of said sleeve and selectively communicating with a controlled source of fluid pressure whereby said sleeve comprises a piston selectively movable between said first and second positions by a controlled pressurized medium, sealing means on said sleeve sealing said chamber and said control pressure ports from communication with said housing flow passage, said lateral flow passage defined in said housing communicating with said second port upon alignment of said first and second ports permitting

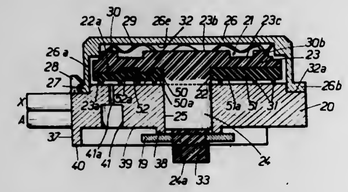
fluid flow through said housing from said primary flow pas sage through said lateral flow passage.

4,049,019
ROTARY VALVE
Samuel B. McClocklin, Owatonna, Minn., assignor to Owatonna Tool Company, Owatonna, Minn.
Filed Sept. 13, 1976, Ser. No. 723,025
Int. Cl.² F15B *13/04*
U.S. Cl. 137—625.21 **9 Claims**



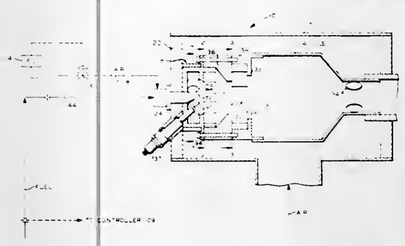
1. A valve having a body with a chamber, a pressure port, and a control port for controlling the flow of fluid to and from a fluid-operated member, passage means in said body between said control port and said chamber with said passage means having two communicating branch passages connecting to said chamber, a check valve positioned in one branch passage to block flow toward said chamber, and a valve member movable in said chamber and having means operable in a first neutral hold position to connect said pressure port to tank, operable in a second position to connect said pressure port to said branch passage having the check valve for flow to the control port, and operable in a third position to connect the other of said branch passages to tank with movement of the valve member from the second position back to the first position not permitting flow from said control port to said chamber because of said check valve.

4,049,020
VACUUM CONTROL VALVE
Rene Elie Neveux, Les Clayes-sous-Bois, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France
Filed May 4, 1976, Ser. No. 683,223
Claims priority, application France, May 5, 1975, 75.13994
Int. Cl.² F16K *11/02*
U.S. Cl. 137—625.11 **7 Claims**



1. A control valve comprising:
a. a valve body having a smooth surface, a plurality of ports, a plurality of passages bored through the valve body and opening in the smooth surface, each said passage leading to a respective one of said ports, and a bore formed centrally though the body;
b. a distributing member having a hub portion engageable though said bore for mounting the distributing member for rotation, a distributing surface with a plurality of ribs extending along coaxial part-circular respective lines and a plurality of radially extending rib portions intersecting the same, said ribs and rib portions projecting on said distributing surface to define therewith and with said smooth surface a plurality of coaxial channels of part-annular shapes and an outer face;
c. an annulus of spring material having at least three angularly spaced currugations athwart the annulus;
d. a hood member, and means fastening the hood member onto said valve body to clamp said spring annulus between an inner face of the hood member and said outer face of said distributing member with resilient deflection of said corrugations, whereby to retain said ribs and rib portions in engagement with said smooth surface of said valve body;
e. means for rotating said hub to place said distributing member selectively into any of a plurality of angular positions wherein selected ones of said passages are interconnected by said channels; and
f. means fastening said spring annulus to one of said outer and inner faces against rotation relative thereto, and a plurality of recesses in the other face for receiving said spring corrugations to hold said distributing member in any one of said angular positions.

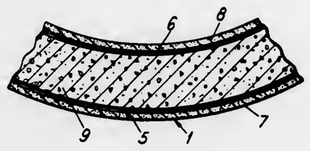
4,049,021
VARIABLE DOME VALVES AND COMBUSTORS PROVIDED WITH SAID VALVES
Ellsworth H. Fromm, and Norman R. Murray, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Apr. 14, 1975, Ser. No. 567,954
Int. Cl.² F16K *5/10*
U.S. Cl. 137—625.31 **10 Claims**



1. A variable dome valve, adapted to be mounted on the upstream dome end of a flame tube in a combustor for controlling flow of a stream of combustion air into said flame tube, said valve comprising:
a fixed generally cylindrical inner member, closed at one end to the flow of said combustion air and open to the flow of said combustion air at the other end;
a plurality of openings provided at spaced apart locations around and extending through the cylindrical wall of said inner member adjacent said closed end thereof;
a mounting flange secured to and around said inner member adjacent said open end thereof for mounting said valve on a said flame tube;
an adjustable throttle ring rotatably mounted on and around said cylindrical inner member;
a plurality of openings provided around and extending through said throttle ring, said openings being of a size, a shape, a number, and located at spaced apart locations, corresponding to said openings in said inner member, and
means for rotating said throttle ring around said inner cylindrical member so as to bring said openings in said throttle ring into and out of register with said openings in said inner member and vary the effective combined open area of said openings and thereby control the flow of said stream of combustion air into said flame tube, wherein:

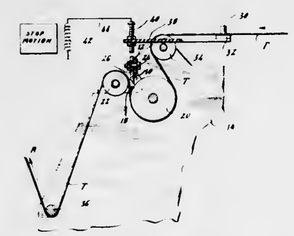
a groove is provided in said mounting flange adjacent and around the base of said cylindrical inner member;
said throttle ring seats in and rotates in said groove;
a pair of spaced apart stop pins extend perpendicularly from said flange and adjacent the outer wall surface of said cylindrical inner member; and
said means for rotating said throttle ring comprises an actuator pin extending radially from the outer wall surface thereof at a location between said stop pins.

4,049,022
CONCRETE PIPES
Robert M. Farahar, Sevenoaks, England, assignor to ARC Concrete Limited, London, England
Division of Ser. No. 370,145, June 14, 1973, Pat. No. 3,950,465.
This application July 7, 1975, Ser. No. 593,791
Claims priority, application United Kingdom, July 27, 1972, 35184/72
Int. Cl.² B28B *21/48*
U.S. Cl. 138—176 **6 Claims**



1. A tubular body comprising an integrally and centrifugally cast mass of cementitious material including a matrix of inorganic cement which hardens by hydration, and a glass fibre strand or roving reinforcing said mass, said strand or roving being resistant to deterioration by said cementitious material and constituting a winding which extends around said body and is intimately incorporated in and bonded directly to said matrix.

4,049,023
STOP MOTION FOR NARROW WIDTH NEEDLE LOOMS
Robert Doyal Frazier, Rome, Ga., assignor to Champion International Corporation, Stamford, Conn.
Filed May 25, 1976, Ser. No. 689,870
Int. Cl.² D03D *51/18*
U.S. Cl. 139—339 **4 Claims**

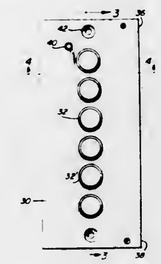


1. In a loom for forming a woven tape from yarn material and including a pair of woven tape pull rollers spaced to form a nip therebetween with the woven tape passed through the nip under tension and a stop motion device for stopping the loom when an excess of woven tape occurs in the nip such as with the commencement of a full wrap of woven tape around a tape pull roller the improvement including
conductive electrode means reciprocally mounted on said loom in the nip between said tape pull rollers for sensing the presence of excess yarn in said nip through physical displacement thereby; and
conductive stop means adjustably mounted on said loom in the path of the reciprocal motion of said electrode means for establishing an electric circuit to actuate said stop motion device and stop operation of said loom in response to contact by said electrode means .

4,049,024
MANDREL AND METHOD OF MANUFACTURING SAME
James J. Auborn, Groton, and Elizabeth Ann Trickett, Acton, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.
Filed June 4, 1976, Ser. No. 693,022
Int. Cl.² B21F *3/04*
U.S. Cl. 140—71.5 **15 Claims**

14. A process of making incandescent lamp filaments comprising the steps of directly electroplating a tungsten electrodeposition solution contaminated with from about 0.1 to about 0.3 gms/l of copper ion, winding filament wire around the tungsten coating, annealing the filament wire winding, and selectively dissolving the tungsten coated copper substrate metal from the filament wire.

4,049,025
WIRE BENDING FIXTURE
Abel R. Gillingwater, 947 Wall St., Jeffersonville, Ind. 47130
Filed Feb. 24, 1976, Ser. No. 661,007
Int. Cl.² B21F *1/04, 45/00*
U.S. Cl. 140—102.5 **4 Claims**



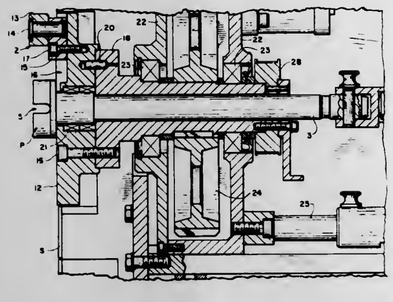
1. A wire bending fixture for shaping a length of wire comprising, means for forming the wire into a picture frame easel back including, a planar base plate having a top and bottom surface, a series of more than three spaced wire shaping knobs permanently arranged in a straight row on said top surface, a stop pin on said top surface laterally spaced from the first knob of said series, and a wire bending bar opposite to and spaced from said bottom surface of the plate and co-extensive with an edge thereof, the base plate being rectangular and the knobs mounted in a row parallel to and midway the longitudinal edges of the plate, said stop pin being positioned laterally of and above the first knob of the series so that a tangent line drawn between the wire engaging surfaces of the stop pin and knob defines an angle less than 90° with the center line of the series of knobs, the bar being aligned with the longitudinal edge of the plate farthest from the stop pin, and secured to the plate by spacer elements affixed to the upper and lower corners of the plate.

4,049,026

BENDING APPARATUS HAVING A SHAPED MANDREL USED IN AUTOMATIC BENDING MACHINES FOR METAL WIRE AND BAR STOCK

Remigio Del Fabro, 62-33010 Reana Del Rojale, Villaggio Morena (Udine), Italy

Filed Apr. 15, 1976, Ser. No. 677,171
Claims priority, application Italy, Apr. 18, 1975, 83354/75
Int. Cl.[2] B21D 7/024
U.S. Cl. 140—105 7 Claims



1. Bending apparatus for use in automatic bending machines for metal wire, strip or bar stock and in particular for automatic bending machines for forming fasteners with continuous feeding comprising an axially movable, removably mounted, non-rotatable shaped central mandrel and a relatively rotatable and axially movable faceplate mounting a peripheral bending pin disposed coaxially therewith, a pair of shears disposed adjacent the mandrel in advance of the mandrel along the path of the movement of the stock past the mandrel, and means to automatically feed the stock through the mandrel, characterized in that the said central non-rotatable mandrel has substantially an L-shape and comprises a support rod lying axially at the center of rotation of said bending pin and an arm disposed perpendicularly to the support rod and having a U-shaped groove in the front face thereof, the groove being dimensioned to provide a passage for and to closely receive the stock to support the received portion against bending during bending and means for actuating the shears to sever the fastener from the stock after it is formed.

4,049,027

ACTIVE MATERIAL FOR PRESSED NICKEL ELECTRODES

Harvey N. Seiger, Waterford, Conn., assignor to Yardney Electric Corporation, Pawcatuck, Conn.

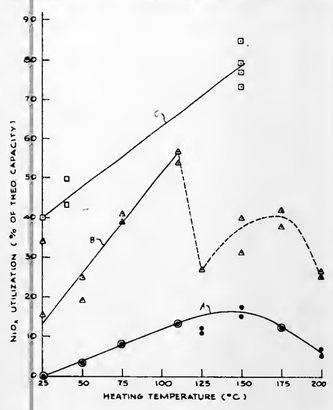
Filed Aug. 26, 1976, Ser. No. 717,860
Int. Cl.[2] H01M 4/88
U.S. Cl. 141—1.1 15 Claims

1. A method of making an active electrode material admixture comprising the berthollides NiO_x and CoO_x where x is not an integer, said method comprising the steps of:

preparing a nickelous/cobaltous salt solution for addition to an oxidant/base solution to produce a salt/oxidant solution, by dissolving at least one nickelous salt and at least one cobaltous salt in water to provide a nickelous salt concentration in said salt/oxidant solution between about 0.17 molar and about 2 molar and a ratio of nickel to cobalt between about 9:1 and about 9.8:0.2;

preparing said oxidant/base solution by dissolving lithium hydroxide and an oxidizing agent in water to provide concentrations of said lithium hydroxide and oxidizing agent in said salt/oxidant solution between about 2 molar and about 6.5 molar and between about 0.34 molar and about 1 molar, respectively;

slowly adding said nickelous/cobaltous salt solution with stirring to said oxidant/base solution to produce said salt/oxidant solution, whereby said NiO_x and CoO_x are formed in said salt/oxidant solution and co-precipitated therefrom as a lithium-containing black precipitate; and



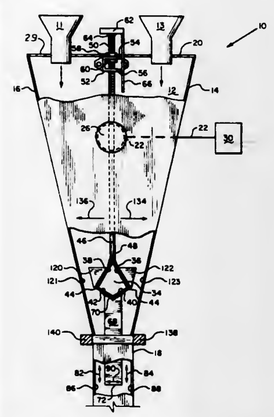
recovering the lithium-containing NiO_x/CoO_x co-precipitate from said salt/oxidant solution.

4,049,028

TRANSITION SECTION FOR A BAG FILLING DEVICE AND METHOD

Thomas C. Harris, Monroe, and Charles E. DeCrane, West Monroe, both of La., assignors to Olinkraft, Inc., West Monroe, La.

Filed Mar. 25, 1976, Ser. No. 670,284
Int. Cl.[2] B65B 1/06; B67D 5/06
U.S. Cl. 141—10 15 Claims



1. In a bag filling machine having a weighing section with alternately discharging weighing hoppers disposed in communication with respective opposite sides of a bag filling section by means of an intermediate transition section, the improvement which comprises in combination:

a. said transition section having a chute projecting downwardly with a portion thereof inclined inwardly, and terminating in a substantially vertical elongated throat section defining the bag filling section;

b. a control device, means for suspending the control device in said inwardly inclined portion of the chute, said control device having means permitting movement thereof in a generally horizontal direction within said inwardly inclined portion of the chute in response to alternate discharge of the weighing hoppers, said control device serving to absorb energy of the material flowing in the filling machine as it falls in the transition section and also serving to control flow of the material in the transition section, said control device serving also to allow dust to be generated in the upper portion of the transition section where it can be readily removed;

c. an elongated divider member rigidly attached to said control device at one end thereof and extending into said vertical elongated throat section a predetermined distance, said divider member being also movable in a generally horizontal direction as said control device moves, said divider member defining in cooperation with inner surfaces of said vertical elongated throat section at least two flow paths within said vertical elongated throat section, one flow path being utilized for downwardly flow of the material being filled in the bag filling machine and another flow path being utilized for upwardly flow of suspended dust and air resulting from the filling process;

d. means, associated with said divider member and said throat section, for stopping the movement of said divider member at a predetermined position so that the path utilized for upward air flow always remains open regardless of the position of said divider member; and

e. means, associated with said transition chute, for removing the suspended dust from the transition chute.

4,049,029

VALVE SYSTEM FOR A VAPOR RECEIVING SYSTEM ON A DISPENSING NOZZLE

William B. Hansel, Media, Pa., assignor to Suntech, Inc., St. Davids, Pa.

Filed Mar. 8, 1976, Ser. No. 665,147
Int. Cl.[2] B65C 3/02
U.S. Cl. 141—206 6 Claims

1. A liquid fuel dispensing nozzle for dispensing fuel into a fuel tank and for receiving fuel vapors displaced from the fuel tank during the filling process, and wherein the nozzle has a system for preventing the flow of liquid fuel back through a vapor return line which carries the fuel vapors away from the nozzle, and comprising:

a. a nozzle housing;

b. a discharge spout connected to the nozzle housing;

c. means for controlling the flow of fuel through the nozzle;

d. a vapor receiving system having a vapor return passageway for allowing fuel vapors to flow to the vapor return line;

e. means, responsive to the liquid fuel backing up to the discharge spout, for automatically disabling the controlling means so that dispensing is terminated; and

f. means for preventing the flow of liquid fuel through the vapor receiving system and including a valve seat through which fuel vapors flow when they flow through the vapor receiving system, and means responsive to the level of liquid fuel in the vapor receiving system, for covering the valve seat, whereby when the liquid fuel level in the vapor receiving system reaches a predetermined level, the valve seat will be covered and liquid fuel will be prevented from flowing into the vapor return line.

4,049,030

VENT TUBE WITH REMOVABLE TIP FOR FILLING CONTAINERS

Alfred A. Abramoska, Jr., Medina, Ohio, assignor to Arthur Products Co., Medina, Ohio

Filed Apr. 2, 1976, Ser. No. 673,295
Int. Cl.[2] B65B 3/04
U.S. Cl. 141—286 8 Claims



1. A vent tube for a container filling machine to be disposed within a container as it is being filled with liquid, which comprises:

a tubular body having a wall with an interior axially extending first passage through which gas may be vented as the container is being filled and having means for attachment to the filling machine at its upper end, said tubular body having a socket comprising a wall at its lower end for receiving a tip and said tubular body being provided with locking means for removably holding the tip in said socket; and

a tubular tip comprising a wall surrounding an interior axially extending second passage for venting gas and having at least one opening in said wall at a predetermined level by which the gas being vented enters said second passage, said tip having lock engagement means for removably attaching said tip to said tubular body at a predetermined level by insertion into said socket and into engagement with said locking means, and said tip being adapted to be removably held at said predetermined level in said socket by said locking means.

4,049,031

AUTOMATIC FRACTION COLLECTOR

David J. Cooper, Downingtown; George W. Gebhardt, Philadelphia; Joseph R. Valenta, Wayne, all of Pa., and Francis E. Wdzieczkowski, Barrington, N.J., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Dec. 22, 1975, Ser. No. 642,704
Int. Cl.[2] B67C 3/26, 3/34
U.S. Cl. 141—284 5 Claims

1. A liquid fraction collector comprising:

a first series of containers,

a second series of containers,

a conduit leading upwardly from each container in said first series with the upper ends of the conduits lying in a first row,

a conduit leading upwardly from each container in said second series with the upper ends of the conduits lying in a second row parallel to the first row,

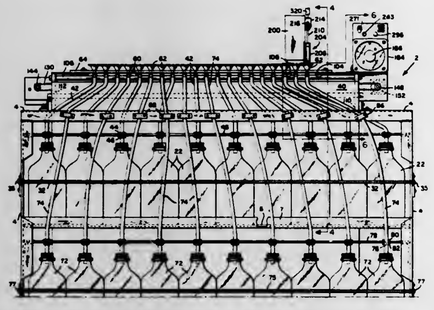
a carriage,

a stationary carriage support parallel to said rows and sup-

porting the carriage above said rows for movement along a straight line at a fixed distance from each row,

means mounted on the carriage to discharge a liquid comprising an inverted V guide member having one trough over one row and another trough over the other row and a discharge tube having a discharge end,

means to advance the carriage along a straight line on the stationary support stepwise from one conduit to the next and return it stepwise along said straight line on the stationary support to said one end, and



means mounted on the carriage to adjust the discharge means to discharge into the conduits of one row as the carriage advances and to change the adjustment to cause discharge into the conduits of the other row when the carriage returns,

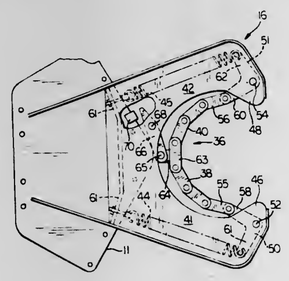
said last mentioned means comprising means to move the discharge end of the discharge tube relative to the carriage from a position over one trough of the guide member to a position over the other trough of the guide member when the direction of movement of the carriage is reversed.

4,049,032

CHAIN DELIMBER ASSEMBLY FOR TREE HARVESTER

Dorrance Oldenburg, Yorkville, and Robert L. Fischer, New Lenox, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 24, 1975, Ser. No. 644,234
Int. Cl.² A01G *23/08*
U.S. Cl. 144—2 Z **6 Claims**



2. In a delimber assembly suitable for use with a tree harvesting machine including elongate, flexible blade means for cutting limbs from a tree, means connected between the machine and the oppositely disposed end portions of the blade means for urging the end portions outwardly from the machine, means on the machine for urging the tree against the blade means, and means on the machine for moving a tree through the delimber assembly, the improvement comprising:

a lever pivotally mounted on the assembly, said lever being operatively connected to a portion of the blade means intermediate the oppositely disposed end portions for movably supporting said intermediate portion, said lever permitting relative motion between the machine and said intermediate portion whereby said intermediate portion of the blade means is permitted to float along the tree surface, and the blade means at least partially encircles and engages the tree so that the limbs of the tree are cut off near the surface of the tree by the blade means as the tree moves through the delimber assembly; and

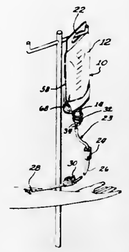
stop means carried by said assembly adjacent said lever to provide an abutment for said lever whereby said lever pivots only a predetermined amount so that said intermediate portion is movable outwardly until said lever abuts said stop means.

4,049,033

MOLDED COLLAPSIBLE SOLUTION CONTAINER

Philip G. Ralston, Jr., Buffalo Grove, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 526,092, Nov. 21, 1974. This application Oct. 9, 1975, Ser. No. 621,095
Int. Cl.² B65D *1/02*
U.S. Cl. 105—.5 **6 Claims**



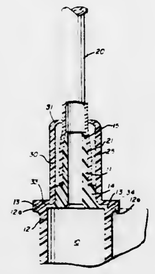
1. A molded, collapsible solution container, which container defines a chamber-defining body portion wall having an integral neck portion and shoulder portion at one end thereof, and is sealed at its end opposite said one end, the improvement comprising: in combination, said shoulder portion being generally oval, said body portion defining, in its normal, unstressed state, a generally oval, transverse cross-section adjacent said neck and shoulder portion, said cross-section tapering progressively along a major portion of its length to a flat, sealed end portion at said end of the container opposite to said one end and extending in the direction of the longitudinal axis of the container, to facilitate a uniform manner of flat collapse of said container progressively from said opposite end towards said one end as the contents thereof are withdrawn through said neck portion, when said container is disposed in neck-downward position, the chamber end opposite to said one end being tapered sufficiently narrowly to permit essentially all of the chamber-defining wall of the body portion adjacent said chamber end to collapse flat together upon said withdrawal of the contents.

4,049,034

ATTACHING MEANS AND METHOD FOR ATTACHING FLEXIBLE TUBING TO A PLASTIC CONTAINER

John Leonard Vcelka, Zion, and David A. Winchell, Twin Lakes, both of Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed July 14, 1976, Ser. No. 705,319
Int. Cl.² B32B *5/22*
U.S. Cl. 150—8 **11 Claims**



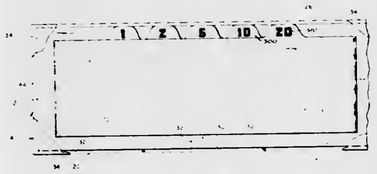
1. An improved attaching means for permanently attaching a flexible tube to a stub port of a container of the type wherein an end of the tube is fitted over the stub port, said attaching means comprising a tight-fitting resilient ring fitted over the tube end and over the stub port sealing the tube end against the stub port, and a retainer cap fitted over the ring, said retainer cap being rigidly connected to said container, said retaining cap and ring resiliently squeezing the tube around the stub port, said retainer cap including an inwardly turned lip for preventing axial movement of said resilient ring.

4,049,035

CURRENCY BILL BILLFOLD FILE

Donald J. Finn, 5100 N. Ocean Blvd., Sea Ranch Club No. 712, Fort Lauderdale, Fla. 33308

Filed Jan. 25, 1977, Ser. No. 762,262
Int. Cl.² A45C *1/06*
U.S. Cl. 150—38 **15 Claims**



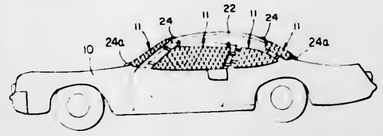
1. A billfold file for receiving currency bills, said file being for carrying inside a billfold for quick, easy and accurate storage and removal of bills, said file comprising: a master plate, said master plate being formed of semi-rigid bendable material of sufficient rigidity as to maintain itself upright when in a billfold during times when said billfold is held with its open side upward containing said master plate, said master plate being a thin sheet of material, left and right retainers attached to said master plate and protruding from said master plate and each disposed offset from said master plate, said left and right retainers respectively having left and right retainer edges extending transversely to said elongation of said master plate, and a plurality of substantially parallel panels of flexible material, said panels having a central bill-engaging portion for engaging currency bills disposed between adjacent panels, said panels being sufficiently rigid as to tend to remain with their central bill-engaging portions disposed substantially in vertical planes respectively during times when a billfold containing said file is held unfolded with its open end upward, said bill-engaging portions of said panels each being of a size for totally receiving there against a conventional currency bill disposed in parallelism therewith, each of said panels having left and right positioning end portions disposed in parallelism with respective left and right end portions of said bill engaging portions thereof, each of said panels having a left end and a right end inter-connection portion respectively interconnecting the said bill engaging portion with the left and right positioning end portion thereof, said positioning end portions being disposed on the master plate side of said off-set retainers respectively, said inter-connecting portions extending around said retainer edges respectively, said panels each being sufficiently taut between its two inter-connecting portions and said panels each being formed of sufficiently rigid material that the inter-connecting portions of each panel in normal use each hold a position extending around the respective retainer edges thereof, the left and right interconnection portions of said panels being disposed at progressively greater distances from respective retainer edges, said panels being disposed one inside another with the space between the positioning end portion and the bill-engaging portion of each respective panel being greater than the equivalent spacing for any of the panels disposed inwardly thereof.

4,049,036

WINDSHIELD COVERS

Paul A. Gebhardt, 917 N. 11th St., Springfield, Ill. 62702

Filed Aug. 3, 1976, Ser. No. 711,415
Int. Cl.² B60J *11/00*
U.S. Cl. 150—52 K **6 Claims**



1. A vehicle window cover, comprising a pair of sheets in opposing relation, said sheets joined about their ends forming a pocket, resilient means disposed in said pocket in spaced apart relation, said means being a plurality of springs defining a plurality of interstices, and a plurality of clip means engaging said pocket and adapted to affix said cover to a window of a vehicle.

4,049,037

INFLATION VALVE FOR TUBELESS TIRE

Ronald J. Gale, Hornchurch, and Edwin M. Rowbotham, Colchester, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed June 7, 1976, Ser. No. 693,575
Claims priority, application United Kingdom, June 10, 1975, 24738/75
Int. Cl.² B60C *29/00*
U.S. Cl. 152—427 **5 Claims**

1. An inflation valve assembly for a wheel and tubeless tire combination comprising a valve housing having an interior wall defining an air passage;

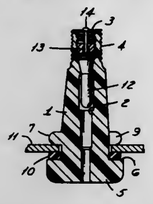
said interior wall having a screw-threaded portion constructed to threadedly receive a valve core;

said housing having a shoulder and a flange means spaced apart from said shoulder;

said flange means comprising a plurality of circumferentially spaced apart flange portions;

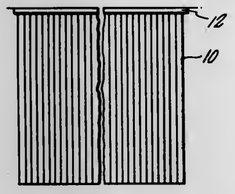
said shoulder and said flange means defining a groove therebetween constructed to receive the periphery of a valve hole in a wheel rim;

an elastomeric annular seal disposed in said groove sealingly engaging said shoulder and constructed to engage said wheel rim;
said screw-threaded portion, said shoulder and said flange means being integral portions of said housing;



said seal being a separate element from said shoulder and said shoulder having substantially greater rigidity than said seal.

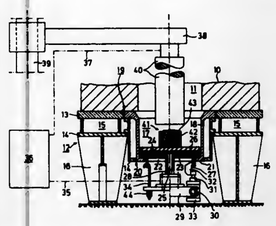
4,049,038
LOUVERED COVERING SYSTEM
David L. Hyman; Robert J. Cayton, and Kurt E. Rosenquist, all of Pacific Palisades, Calif., assignors to Louverdrape, Inc., Santa Monica, Calif.
Filed Apr. 23, 1976, Ser. No. 679,764
Int. Cl.² E06B 9/26
U.S. Cl. 160—166 A **5 Claims**



1. A louvered covering system comprising
a vertical louver support system;
elongate louvers, each said elongate louver including means adjacent one end thereof for attachment to said vertical louver support system such that said elongate louver depends vertically therefrom, an elongate panel forming the body of said elongate louver, a flange along each elongate edge of said panel, said flanges extending inwardly toward one another on a first side of said panel, an elongate sheet slidably arranged on said elongate panel between said flanges, and mounting means for fixing said sheet at one spot only to said panel near said attachment means.

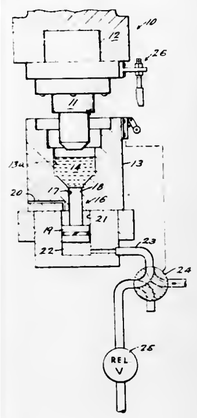
4,049,039
METHOD AND APPARATUS FOR THE PRODUCTION OF SOLID FORGING BLOCKS WITH MANIPULATOR PINS
Helmut Theodor Gröf, Brouchkobel; Jochen Schumann, Maintal; Anton Wanner; Rainer Schumann, both of Hanau am Main, and Werner Friedrich Thomas, Hasselroth, all of Germany, assignors to Leybold-Heraeus GmbH & Co. Kg, Cologne, Germany
Filed Oct. 15, 1976, Ser. No. 732,962
Claims priority, application Germany, Dec. 6, 1975, 2554959
Int. Cl.² B22D 19/00, 27/02
U.S. Cl. 164—52 **10 Claims**

1. In a method for the manufacture of solid forging blocks with manipulator pins wherein an ingot having a vertical borehole is filled by an electro-slag remelt process with at least one consumable electrode, the improvement comprising placing the ingot with the vertical borehole on a block table with at least one power connection in the region of said block table and with the vertical borehole of the ingot aligned with a depression in the block table for slag start material, the depth of the depression being at least 25% of the diameter of the



ingot borehole, applying a a movable starting disk as lower boundary of the depression; placing the slag start material on top of said disk; filling after formation of liquid slag said depression exclusively from material of said consumable electrode; and feeding a power connection to the starting disk along during the entire remelt process.

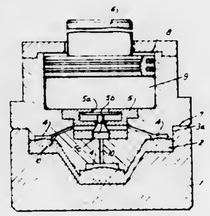
4,049,040
SQUEEZE CASTING APPARATUS AND METHOD
Richard F. Lynch, Toledo, Ohio, assignor to N L Industries, Inc., New York, N.Y.
Filed Aug. 7, 1975, Ser. No. 602,687
Int. Cl.² B22D 27/12
U.S. Cl. 164—120 **12 Claims**



1. A method of casting a metal article, comprising:
placing a quantity of molten metal into an open-topped female die, such quantity being in excess of the quantity required for the article;
lowering a sealingly fitted punch die into the female die until the molten material fills the resulting closed die cavity;
continuing to lower the punch die until a predetermined punch position is reached, while forming a die extension and displacing excess metal into the die extension from the closed die cavity;
terminating die extension formation and the displacement of metal from the die cavity when the predetermined punch position is reached;
applying a continuous high pressing force on the punch die until the metal has solidified; and

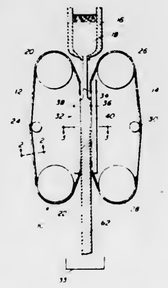
retracting the punch die.

4,049,041
METHOD OF AND APPARATUS FOR FLUID DIE STAMPING
Ivan Dimov Nikolov; Hristo Georgiev Kortenski; Dimiter Tanev Dimitrov, and Asparuh Mihaylov Antonov, all of Sofia, Bulgaria, assignors to Institute po Metalosnanie i Technologia na Metalite pri Ban, Sofia, Bulgaria
Filed Aug. 20, 1975, Ser. No. 606,208
Claims priority, application Bulgaria, Aug. 30, 1974, 27602
Int. Cl.² B22D 27/12, 27/14
U.S. Cl. 164—120 **3 Claims**



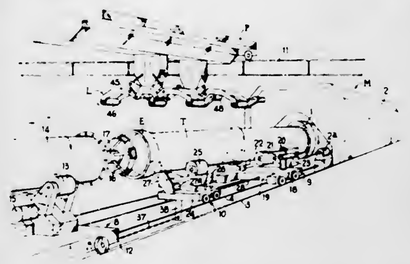
1. A method of fluid die stamping which comprises:
pouring a fluid material between members of a stamping die having a stamping surface comprising a stationary member and a movable member provided with at least one cavity extending over a limited region of said stamping surface;
forcing the movable member into the stationary member to distribute and compress said fluid in said cavity; and
arresting the movable member and forcing a piston located within said movable member toward said cavity to compress a gas in said movable member and force said compressed gas through at least one channel leading to the cavity to exert additional pressure on the fluid material between the members and exposed to the cavity at said limited region.

4,049,042
APPARATUS FOR CONTINUOUS CASTING
Robert E. Maringer, Worthington, Ohio, assignor to GTE Laboratories Incorporated, Waltham, Mass.
Filed Mar. 31, 1976, Ser. No. 672,569
Int. Cl.² B22C 11/06
U.S. Cl. 164—278 **12 Claims**



1. A continuous casting assembly comprising:
a plurality of flexible belts;
means defining a continuous path for each belt including a common region of proximate travel wherein the paths are generally parallel and radially disposed about a central axis;
means conducting the belts along their respective paths and in a common direction through the proximately travelled region, the paths being spaced therethrough to define a travelling open-ended axially-extending mold channel between the opposing surfaces of the belts,
each of the belts including an inner face for defining a portion of the channel wall during the period of proximate travel, an outer face, and a pair of oblique edges therebetween,
the edges of each belt being contiguous with a complimentary edge of an adjacent belt during the period of proximate travel to supportably contact the adjacent edge through the proximately travelled region;
means for continuously injecting a quantity of molten material into one end of the channel;
means for cooling the molten material to a solid form while within the channel; and
means for collecting the solidified material at the other end of the channel.

4,049,043
INSTALLATION FOR EXTRACTING PIPES FROM A CENTRIFUGAL CASTING MACHINE
Pierre Henri Marie Fort, Nancy, and Michel Pierrel, Pont-a-Mousson, both of France, assignors to Pont-A-Mousson S.A., Nancy, France
Filed June 26, 1975, Ser. No. 590,739
Claims priority, application France, July 8, 1974, 74.23701
Int. Cl.² B22D 13/02, 13/10
U.S. Cl. 164—295 **8 Claims**

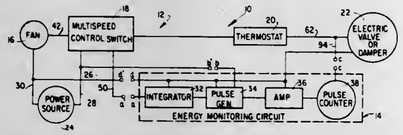


1. An installation comprising a rotary mould of a centrifugal casting machine, means for rotating said mould at a given speed and in a given direction about an axis, and means for extracting a cast pipe from the mould, said extracting means comprising an extracting carriage movable parallel to said axis, pipe extracting tongs coaxial with the mould and carried by the carriage, a tubular girder coaxial with the mould and having a diameter substantially equal to the diameter of the cast pipe, the extracting tongs being mounted inside and connected to rotate with the tubular girder and extending beyond an end of the girder adjacent the mould, rotatable rollers carried by the carriage and rollingly supporting the girder adjacent opposite ends of the girder, a motor drivingly connected to at least one of said rollers to drive the girder and tongs in rotation about said axis, and means for synchronizing the speed and direction of rotation of the tongs with the speed and direction of rotation of the mould during pipe extraction.

4,049,044
HEATING AND COOLING SYSTEM CONSUMPTION METER

David J. Cohen, 9614 N. Crawford Ave., Skokie, Ill. 60076

Filed Jan. 28, 1976, Ser. No. 653,224
Int. Cl.[2] F28F 0/00
U.S. Cl. 165—11 15 Claims

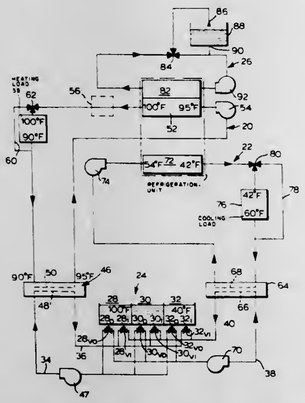


1. A device for monitoring the heating and cooling energy consumed by a single unit of a multi-unit building, in proportion to the total energy consumed by said multi-unit building, said device comprising in combination:
a control circuit for controlling the speed of a blower fan, said blower fan being used to force heated and cooled air into the single unit;
an energy monitoring circuit for monitoring the amount of heating and cooling energy used in a unit, said circuit being electrically coupled to said control circuit, said energy monitoring circuit having an integrating circuit, a pluse generator, and a pulse counter;
wherein said integrating circuit is electrically coupled to the pulse generator and the pulse generator is electrically coupled to the pulse counter.

4,049,045
HEATING AND COOLING SYSTEM FOR BUILDINGS

Gerhard W. Moog, Toronto, and Kenneth R. Cooper, Don Mills, both of Canada, assignors to Canada Square Management Limited, Toronto, Canada

Filed May 21, 1975, Ser. No. 579,341
Int. Cl.[2] F24D 11/00; F25B 29/00
U.S. Cl. 165—12 10 Claims

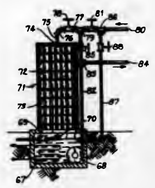


10. In a heating and cooling system for a building having a heating load and cooling load, the system including:
a cooling circuit for a cooling fluid; means in said circuit for cooling said fluid by removing heat energy therefrom; and means for circulating said fluid in said circuit; the building cooling load being connectible in said circuit so that said fluid can pass through the building load; and,
a heating circuit for a heating fluid; means in said heating circuit for retrieving heat energy removed from the cooling fluid by said cooling means and for transferring said heat energy to the heating fluid; and means for circulating said fluid in said circuit; the building heating load being connectible in said circuit so that said heating fluid can pass through the building load;
the improvement comprising:
a. a first heat energy storage reservoir containing a fluid, the reservoir comprising a tank having therein a plurality of upright baffles disposed in spaced, generally parallel positions, each baffle extending from the bottom of the tank to a position above the level of the fluid, and from an upright wall of the tank to a position spaced from an opposite upright wall so that the baffles together define an elongate fluid flow path of serpentine form along which the fluid can blow in the form of a column in a generally horizontal direction, the tank having an inlet connection communicating with one end of said path and an outlet connection communicating with the opposite end of said path, said inlet and outlet connections of the reservoir being coupled to said cooling circuit so that heat energy derived from said circuit can be stored in the reservoir for subsequent transfer back to the said circuit to assist the action of said cooling means; and,
b. a second heat energy storage reservoir containing a fluid, the reservoir comprising a tank having therein a plurality of upright baffles disposed in spaced, generally parallel positions, each baffle extending from the bottom of the tank to a position above the level of the fluid, and from an upright wall of the tank to a position spaced from an opposite upright wall so that the baffles together define an elongate fluid flow path of serpentine form along which the fluid can flow in the form of a column in a generally horizontal direction, the tank having an inlet connection communicating with one end of said path and an outlet connection communicating with the opposite end of said path, said inlet and outlet connections of the reservoir being coupled to said heating circuit so that heat energy derived from said circuit can be stored in the reservoir for subsequent transfer back to the said circuit to assist the action of said heat energy varying means.

4,049,046
SOLAR HEATING/COOLING SYSTEM

Mark N. Worthington, 10227 White Mountain Road, Sun City, Ariz. 85351

Continuation-in-part of Ser. No. 519,521, Oct. 31, 1974, Pat. No. 3,957,109. This application Feb. 17, 1976, Ser. No. 658,476
Int. Cl.[2] F24D 11/00
U.S. Cl. 165—18 10 Claims

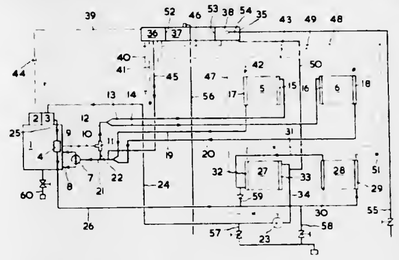


1. In a solar heating and cooling system:
a. a tier unit providing a plurality of longitudinal channels in parallel relation including upper and lower flat metallic sheets arranged in spaced relation with a longitudinally grooved sheet therebetween,
b. a manifold at each end of said channels communicating with all of said channels,
c. a duct extending from and communicating with each of said manifolds, one of said ducts constituting an air inlet and the other duct an air outlet,
d. said tier unit being arranged in a position having a vertical component and thereby presenting upper and lower ends, a perforated feed pipe extending across the upper end of said upper flat sheet,
e. a trough at the lower end of the said upper flat sheet with a drain pipe connected to said trough,
f. a vertical evaporator having its upper end below the level of said trough,
g. a pipe connecting said drain pipe to the upper end of said evaporator,
h. a storage tank below and communicating with said evaporator,
i. a pipe extending from said storage tank to said feed pipe; and,
j. a pump for pumping water from said storage tank through one of said pipes to the circulated through said tier unit.

4,049,047
LIQUID HEAT EXCHANGE SYSTEM WITH SEPARATELY COMPARTMENTED MAKE-UP TANKS

John William Keen, Telford, England, assignor to Marston Excelsior Limited, England

Filed July 1, 1975, Ser. No. 592,269
Int. Cl.[2] F01P 3/12
U.S. Cl. 165—107 7 Claims



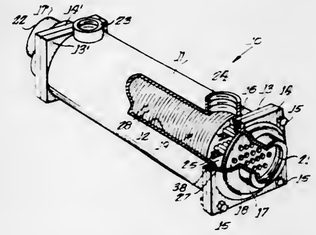
1. A liquid filled heat exchanger system comprising a first circuit including at least one first heat generator and at least one first heat remover, a second circuit including at least one second heat generator and at least one second heat remover, the two circuits operating, in use at two different average temperatures, a liquid make-up tank for both circuits, the tank having three zones, a first zone, a second buffer zone and a third zone, the first zone being in direct communication with the second zone for the passage of liquid therebetween, the third zone being in direct communication with the second zone for the passage of liquid therebetween, there being no direct communication between the first and the third zones except through the second zone, a liquid supply line and at least one liquid bleed return line for the first circuit, the lines being connected to the first zone, a liquid supply line and at least one liquid bleed return line for the second circuit, the lines being connected to the third zone.

4,049,048
FINNED TUBE BUNDLE HEAT EXCHANGER

Harry W. T. Leedham, Kitchener, Canada, assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 19, 1975, Ser. No. 642,506
Int. Cl.[2] F28F 9/22
U.S. Cl. 165—159 20 Claims

1. A heat exchanger comprising an outer elongated shell having a central passage extending therethrough, a pair of header plates having first fluid conduit means associated therewith, a plurality of tubes within said shell and extending longitudinally thereof with their ends sealed within apertures in said header plates, said tubes being in communication with said first conduit means, a plurality of fins stacked on said tubes between the header plates and generally conformably received within said shell, each fin having a plurality of openings defined by annular flanges extending from one surface of each fin receiving the tubes therethrough and a plurality of slits therein providing for liquid flow therethrough and generally axially along the tubes, said fins being stacked with the flanges of one fin



abutting the opposite surface of the next adjacent fin to provide for spacing between adjacent fins, and second fluid conduit means associated with said shell for communication thereinto for fluid contact with the fins and the outer surfaces of said tubes.

4,049,049
RECUPERATOR STRUCTURES

Donald F. Mold, and Ronald G. Rice, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 554,791, March 3, 1975. This application May 10, 1976, Ser. No. 684,698
Int. Cl.[2] C03C 23/20; C03B 32/00; F28D 7/00; F28F 1/00
U.S. Cl. 165—165 4 Claims



1. A recuperator heat exchanger assembly, comprising
a. a plurality of stacked layers of tubes, each tube having open ends and a portion intermediate the open ends which is essentially parallel to corresponding intermediate portions of the other tubes in the same layer and to corresponding intermediate tube portions in the other layers to form a first series of longitudinally extending parallel passageways for receiving a first fluid;
b. header connecting means for receiving the open tube ends of each layer and supporting the opening open ends in each layer to maintain the intermediate tube portions of each layer in a spaced relationship with respect to the intermediate tube portions of the tubes in at least one of the adjacent stacked layers in said assembly to define a second series of passageways between layers of intermediate tube portions for receiving a second fluid, said header connecting means closing the spaces between and around the open ends of said tube to prevent crossflow between the first and second fluid streams; and
c. wall means extending longitudinally along each of said second passageways for confining said second fluid in and directing the flow of the second fluid through said second series passageways in a direction parallel to and in heat

exchange relationship with the intermediate tube portions adjacent the second series passageways, said second fluid confining and directing means having entry and exit port means formed therein for receiving and discharging the second fluid, said second fluid confining and directing means including a plurality of layers of tightly packed individually axially elongated elements arranged with their axes parallel to each other and also parallel to the intermediate tube portions of said stacked layers of tubes, a group of such layers of elements being disposed adjacent each side of said stacked layers of tubes and the second series passageways formed therebetween to direct the flow of the second fluid through said second passageways in a direction parallel to the intermediate tube portions of said stacked layers of tubes, and sealant means comprised of a sintered frit of a crystallizable glass interposed between adjacent elongated elements in a layer, between adjacent layers of said elongated elements, and between said elongated elements and said stacked layers of tubes and said header connecting means, thereby joining said elongated elements as an integral part of said assembly and preventing crossflow between the first and second fluid streams; and

d. a further group of such layers of elements being disposed essentially parallel to the intermediate tube portions and between the first series layers and spaced inwardly in said second series passageways from said first-mentioned group of elements to guide the second fluid through each second series passageway in plural parallel paths,

e. said stacked layers of tubes, said header connecting means, and said second fluid confining and directing means being constructed of material having essentially zero porosity, consisting essentially of an inorganic crystalline oxide ceramic material, and having an average coefficient of lineal thermal expansion of about -18 to $+50 \times 10^{-7}$/° C over the range of 0°–300° C;

f. said stacked layers of tubes, said header connecting means, sealant means and said second fluid confining and directing means being fused together to form an integral assembly.

4,049,050

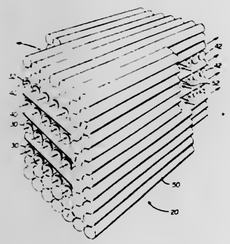
RECUPERATOR STRUCTURES

Donald F. Mold, and Ronald G. Rice, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 554,791, March 3, 1975. This application May 19, 1976, Ser. No. 687,956

Int. Cl.² C03C *23/20;* C03B *32/00;* F28D *7/00;* F28F *1/00*

U.S. Cl. 165—165 **6 Claims**



1. A recuperator heat exchange assembly, comprising

a. a plurality of stacked layers of elongated tubes extending lengthwise of the recuperator assembly, each tube having open ends and a portion intermediate the open ends which is essentially parallel to the corresponding intermediate portions of the other tubes in the same layer and to corresponding intermediate tube portions in the other layers to form a first series of longitudinally extending parallel passageways for receiving a first fluid, the open ends of at least one end of said tubes in said layers terminating along a line extending obliquely with respect to the longitudinally extending passages thereof;

b. header connecting means at each end of said stacked layers of tubes supporting the opposite open tube ends of each layer to maintain the intermediate tube positions of each layer in a spaced relationship with respect to the intermediate tube portions of the tubes in the adjacent stacked layers in said assembly and to define a second series of passageways between said spaced layers of intermediate tube portions for receiving a second fluid, said header connecting means extending obliquely across tube ends at each end of said stacked layers with respect to said parallel tubes, and closing the spaces between and around the open ends of said tubes to prevent crossflow between the first and second fluid streams;

c. means extending longitudinally along each of the opposite sides of said second series passageways extending between said header connecting means at each end of said stacked layers for confining said second fluid for flow in and through said second series passageways, said side confining means having entry and exit port means formed therein on opposite sides of the recuperator assembly for respectively receiving and discharging the second fluid; and

d. flow directing wall means extending along each second series passageway between said stacked tube layers and parallel therewith, said wall means being spaced laterally inwardly in said second series passageway from said side confining means thereof to guide the second fluid through each second series passageway in paths intermediate said entry and exit ports which are substantially parallel to and in heat exchange relationship with said adjacent tubes;

e. said stacked layers of tubes, header connecting means, wall means, and side confining means having essentially zero porosity, consisting essentially of an inorganic crystalline oxide ceramic material, and having an average coefficient of lineal thermal expansion of about -18 to $+50 \times 10^{-7}$/° C over the range of 0°–300° C;

f. said stacked layers of tubes, said header connecting means, wall means, and said side confining means being fusion bonded together to form an integral assembly.

4,049,051

HEAT EXCHANGER WITH VARIABLE THERMAL RESPONSE CORE

Kenneth O. Parker, Rolling Hills Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

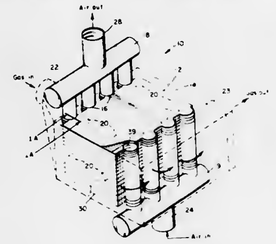
Division of Ser. No. 490,833, July 22, 1974, abandoned. This application Jan. 6, 1976, Ser. No. 646,828

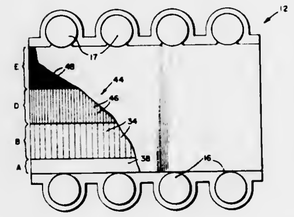
Int. Cl.² F28F *3/02*

U.S. Cl. 165—166 **5 Claims**

1. In combination with a heat exchanger of the counterflow type having air outlet manifolds and hot gas passages in the core, the improvement comprising:

heat transfer means establishing core thermal response zones of different heat transfer capability for varying the thermal response of the core in the hot gas flow direction to decrease temperature gradients and reduce thermal fatigue of the core, each succeeding zone in the hot gas flow direction having greater heat transfer capability than a preceding zone, and including a zone of degraded thermal response positioned adjacent the outlet manifolds, and first, second, and third rows of plain fins of increased fin density respectively positioned in the zones succeeding the zone of degraded thermal response.





4,049,052

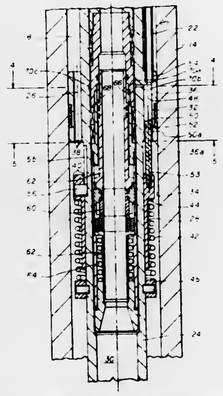
SUBSURFACE ANNULUS SAFETY VALVE

Henry P. Arendt, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 5, 1976, Ser. No. 673,928

Int. Cl.² E21B *23/00, 43/12*

U.S. Cl. 166—183 **17 Claims**



1. An annulus subsurface safety valve for controlling flow in the annulus between concentric well pipes comprising:

mandrel means adapted to be connected in the inner pipe;

packer means extending circumferentially about said mandrel means and adapted to seal with the outer pipe;

passage means by-passing said packer means through said mandrel means;

valve seat means on said mandrel means at the lower end of said passage means;

valve member means axially movable on said mandrel means between a position engaging said valve seat means thereby closing said passage means and a position spaced from said valve seat means thereby opening said passage means and located exterior of said mandrel means upstream from said valve seat means;

means for biasing said valve member means to a position engaging said valve seat means;

chamber means, including pressure responsive means forming a portion of said chamber means;

said pressure responsive means being adapted to move said valve member means to a position spaced from said valve seat means when said chamber means is pressurized; and

said chamber means being located downstream from said valve seat means in a position to be protected from well fluids in the annulus when said valve member means engages said valve seat means.

4,049,053

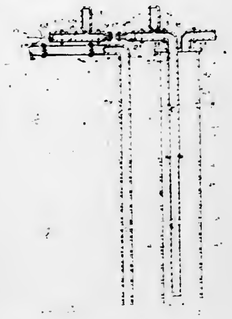
RECOVERY OF HYDROCARBONS FROM PARTIALLY EXHAUSTED OIL WELLS BY MECHANICAL WAVE HEATING

Sidney T. Fisher, 53 Morrison Ave., and Charles B. Fisher, 2850 Hill Park Road, both of Montreal, Quebec, Canada

Filed June 10, 1976, Ser. No. 694,700

Int. Cl.² E21B *43/24, 43/25*

U.S. Cl. 166—249 **13 Claims**



1. The mechanical wave heating in situ of a selected portion of an underground deposit of hydrocarbons by means of a mechanical wave radiator immersed in a fluid medium which is in direct contact with the said selected portion and located in a well communicating with said selected portion of the deposit, the radiator transmitting mechanical wave energy to the selected portion of the deposit until the selected portion becomes fluid, the said radiator comprising a tube for containing a liquid medium for transmitting mechanical waves, said tube being closed at one end and having connecting means at the other end for connection to a source of mechanical waves, said tube having side walls made of elastic material suitably formed for oscillatory deflection in response to the application of mechanical waves from said source to said liquid medium.

4,049,054

STABLE MIXTURES OF POLYMERS AND SURFACTANTS FOR SURFACTANT FLOODING

Donald R. Wier, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 531,158, Dec. 9, 1974, abandoned. This application Oct. 8, 1976, Ser. No. 730,773

Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—273 **12 Claims**

1. A method of preparing a stable surfactant waterflooding fluid comprising:

dissolving a polymer selected from the group consisting of a high molecular weight copolymer of acrylamide or methacrylamide with an alkali metal or ammonium salt of acrylic or methacrylic acid, carboxymethyl cellulose, or a heteropolysaccharide produced by fermentation of carbohydrates by bacteria of the genus Xanthomonas in water;

thereafter combining said thus-formed polymer solution and a solution of a salt selected from the group consisting of sodium chloride and sulfate salts in the absence of a petroleum sulfonate surfactant and mixing thoroughly; and

thereafter combining said thus-formed mixture with a petroleum sulfonate surfactant and mixing until a homogeneous fluid is obtained,

said polymer being present in an amount within the range of 0.01 to 5 weight percent based on the weight of said fluid, said salt being present in an amount within the range of 0.1 to 10 weight percent based on the weight of said fluid, and said surfactant being present in an amount within the range of 0.01 to 10 weight percent based on the weight of said fluid.

11. A process for recovering crude oil from an oil-bearing subterranean formation having at least one injection means in fluid communication with at least one production means, comprising: injecting into the formation a surfactant waterflooding fluid made by:

dissolving a polymer selected from the group consisting of a high molecular weight copolymer of acrylamide and sodium acrylate, carboxymethyl cellulose, or a heteropolysaccharide produced by fermentation of carbohydrates by bacteria of the genus xanthomonas in fresh water;

thereafter combining said thus-formed polymer solution and a solution of a salt selected from the group consisting of sodium chloride and sulfate salts in the absence of a petroleum sulfonate surfactant and mixing thoroughly; and

thereafter combining said thus-formed mixture with a petroleum sulfonate surfactant and mixing until a homogeneous fluid is obtained;

said polymer being present in an amount within the range of 0.01 to 5 weight percent based on the weight of the fluid, said salt being present in the range of 0.1 to 10 weight percent based on the weight of said fluid, and said surfactant being present in an amount within the range of 0.01 to 10 weight percent based on the weight of said fluid; and

displacing said fluid toward said production means to recover said crude oil.

4,049,055

GRAVEL PACK METHOD, RETRIEVABLE WELL PACKER AND GRAVEL PACK APPARATUS

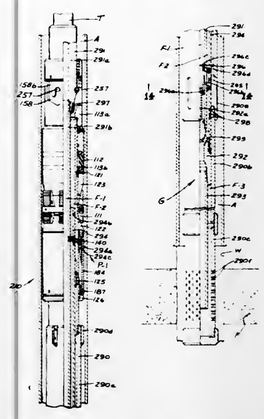
Joe R. Brown, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.

Filed Apr. 30, 1971, Ser. No. 139,006

Int. Cl.[2] E21B *23/04, 23/06, 33/129, 43/04*

U.S. Cl. 166—278 **43 Claims**

40. A method of treating a well for production which includes lowering an operating tool string having connected thereto a packer having a screen supported therebelow into the well bore; seating the packer in sealing position in the well bore above a producing formation therein with the screen in communication with the producing formation; opening a flow path for circulation downwardly past the packer and the screen to the producing formation and upwardly past the screen and the packer to the well surface for treating the well formation; introducing gravel through said circulation flow path into the well bore below the packer exteriorly of the screen to form a gravel pack filling the annular space between the screen and the well bore to a point above the screen; removing the operating tool string from the well bore; establishing a production flow course from the packer to the well surface for conducting well fluids entering said flow course from the producing formation through the gravel pack and screen; and reconnecting the operating tool string to the packer for reestablishing a flow path past the packer and screen to the producing formation for additional treatment of said formation.



41. An operating tool for setting a packer and screen in place in a well and establishing a circulation path through the packer and screen in place including: means for connecting said operating tool to said packer for setting the same in the well; means for establishing a flow path through the set packer and screen to the exterior of the screen; means for establishing a circulation path through the packer and the screen downwardly from the surface and upwardly to return to the surface; means for closing off the circulation path; and means for opening the circulation path by movement of an operating string connected to the operating tool.

4,049,056

OIL AND GAS WELL STIMULATION

Charles S. Godfrey, Berkeley, Calif., assignor to Physics International Company, San Leandro, Calif.

Continuation-in-part of Ser. No. 250,184, May 4, 1972, abandoned, which is a continuation-in-part of Ser. No. 138,618, April 29, 1971, abandoned. This application June 28, 1976, Ser. No. 700,470

Int. Cl.[2] E21B *43/26*

U.S. Cl. 166—299 **17 Claims**

1. A method of fracturing the rock formation at a pay zone at a predetermined depth in a well, comprising:

establishing an elongated closed chamber in said well of material which can withstand a detonation which can fracture rock and which has openings at said predetermined depth to permit fluid outflow to said rock formation,

filling said chamber with a fracturing fluid to a level above said predetermined depth,

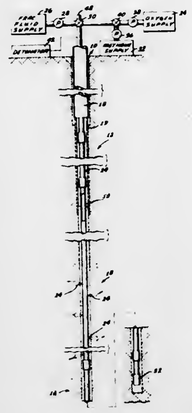
applying a shock wave to said fracturing fluid, which has a rise time faster than the time required for sound to traverse one half of the periphery of the well opening in said rock at said pay zone, and which when applied to said rock by said fluid has an amplitude which will fracture said rock but which is less than the amplitude required to crush said rock, whereby said rock formation at said predetermined depth is fractured and fluid is forced into the fractures.

4. Apparatus for stimulating a well that has a casing which can withstand a rock fracturing detonation, and which has a pay zone with rock formation exposed through the casing to permit fluid access to said rock formation, comprising:

a source of a fracturing fluid,

means to transfer said fracturing fluid from said source into said well to a level above said pay zone,

means for rendering the portion of said well including said fracturing fluid gas tight, and



means for applying a shock wave to said fracturing fluid, which has a rise time faster than the time required for sound to traverse one half of the periphery of the well opening in said rock at said pay zone, and which when applied to said rock by said fluid has an amplitude which will fracture said rock but which is less than the amplitude required to crush said rock, whereby said rock formation at said predetermined depth is fractured and fluid is forced into the fractures.

4,049,057

PARAFFIN CLEANER

William Stan Hewes, P.O. Box 3051, Midland, Tex. 79701

Filed Sept. 30, 1976, Ser. No. 728,298

Int. Cl.[2] E21B *37/00*

U.S. Cl. 166—304 **7 Claims**



4. In an offshore oil well having

a. an eduction tube, within

b. a casing;

AN IMPROVED METHOD OF TREATING A WELL FROM WITHIN THE EDUCTION TUBE WITHOUT POLLUTING THE ENVIRONMENT COMPRISING:

c. placing

i. an in pressure relief valve for flow from the annulus of the casing into the tubing adjacent to

ii. an out pressure relief valve for flowing from the tubing into the annulus,

d. pumping treatment fluids into the eduction tube, thus

e. opening the out pressure relief valve so that the eduction tube contents are pumped into the annulus between the tube and casing, then

f. pumping neutral fluids into the annulus, thus

g. opening the in pressure relief valve so that the eduction tube contents are returned thereto.

4,049,058

SUGAR BEET HARVESTER

Fred W. Eisenhardt, Fargo, N. Dak., and Wayne S. Tonsfeldt, Savin, Minn., assignors to Alloway Manufacturing, Inc., Fargo, N. Dak.

Filed Aug. 28, 1975, Ser. No. 608,741

Int. Cl.[2] A01D *19/00*

U.S. Cl. 171—58 **45 Claims**



1. A machine for lifting sugar beets from the soil and delivering sugar beets to a selected location comprising: a movable frame, means mounted on the frame for lifting sugar beets rearwardly from the means for lifting beets, second conveyor means mounted on the frame for receiving sugar beets from the first conveyor means and moving the sugar beets transversely of the machine, a grab roller assembly having a plurality of rollers located longitudinally along one side of the frame, said grab roller assembly having an input end and a discharge end, means mounting the grab roller assembly along said one side of the frame, said second conveyor means operable to deliver sugar beets to the input end of the grab roller assembly, elevator means mounted on said one side of the frame for receiving sugar beets from the discharge end of the grab roller assembly and delivering the sugar beets to an elevated selected location, and drive means connected to the first and second conveyor means, grab roller assembly and elevator means to operate the same.

4,049,059

COMBINED GARDEN CULTIVATOR AND LAWN EDGER

Robert L. Weibling, 5041 E. Lake Road, Sheffield Lake, Ohio 44054

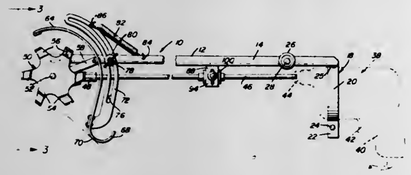
Continuation-in-part of Ser. No. 616,877, Sept. 25, 1975, abandoned. This application June 17, 1976, Ser. No. 696,841

Int. Cl.[2] A01B *1/00*; A01G *3/06*

U.S. Cl. 172—15 **13 Claims**

1. In combination, an elongated inclined support arm including forward lower and rear upper ends, a rotary shaft member journaled from the lower end of said support arm for rotation about a horizontal transverse axis, motor support means on the other upper end of said support arm for supporting motor

means including a rotatable output shaft, said support arm including rotary torque transmitting means having a first portion drivingly connected to said rotary shaft member and a second portion adjacent said other upper end of said support arm adapted to be driven by the rotatable output shaft of motor means supported from said support means, a rotary blade structure mounted on one end of said rotary shaft member to one side of said one end of said support arm, an arcuate shield panel, support means supporting said panel in position partially



embracingly encircling said rotary blade structure and opening toward the latter away from said other end portion of said support arm, the rear arch end portion of said shield panel including ground engaging means for supportive contact with the ground at a level above the lower periphery of said rotary blade structure, said support means including means mounting said arcuate shield panel for adjustable angular displacement about the axis of rotation of said shaft member, whereby the elevation of said ground engaging means relative to said lower periphery of said rotary blade structure may be varied.

4,049,060

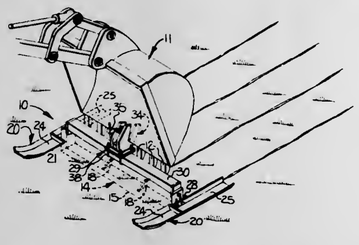
SOD CUTTER

Clyde Rockwell Hoke, Rte. 3, Box 505, Statesville, N.C. 28677

Filed June 11, 1976, Ser. No. 695,078

Int. Cl.[2] A01B *45/04*

U.S. Cl. 172—19 **10 Claims**



1. Sod cutting apparatus for attachment to an excavating machine such as a backhoe and comprising elongate blade means for cutting a surface layer from the earth, depth control means operatively connected with said blade means for positioning the same substantially parallel to the surface of the earth, and mounting means operatively connected with said blade means and said depth control means for detachable engagement with a portion of an excavating machine and comprising crossbar means spanning said blade means and pivotally connected thereto for accommodating varying angulations of the excavating machine with respect to the surface of the earth whereby movement of the excavating machine adjacent the surface of the earth moves said depth control means across the surface and said blade means through the earth and cuts a surface layer therefrom.

4,049,061

ROTARY HARROWS

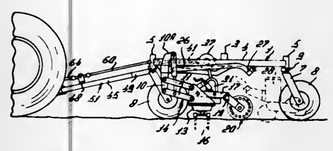
Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Filed Aug. 6, 1975, Ser. No. 602,467

Claims priority, application Netherlands, Aug. 6, 1974, 7410530

Int. Cl.[2] A01B *33/06*

U.S. Cl. 172—49 **5 Claims**



1. A soil cultivating implement or rotary harrow comprising a frame and at least two separate groups of soil working members supported on respective elongated portions of said frame, said soil working members being rotatably mounted on upwardly extending axes afforded by shafts and said shafts being positioned in a row that extends transverse to the direction of operative travel, each frame portion being hollow and independently pivoted to said frame, said portion being vertically displaceable relative to the remainder of the frame to match ground undulations during operation, said frame portion being at least partly sustained in operative position above the ground by a corresponding supporting roller coupled to that frame portion, at least three ground wheels pivoted to said frame and said ground wheels being positioned to support said frame during operation, driving means connected to a corresponding gear box of each said group and said gear box containing transmission parts that engage the shafts of the soil working members of said group, said frame including a leading beam and rearwardly extending arms being pivotably connected to that beam, tool bar means on the ends of said arms and said tool bar means being positioned to support additional tools at the rear of the rollers.

4,049,062

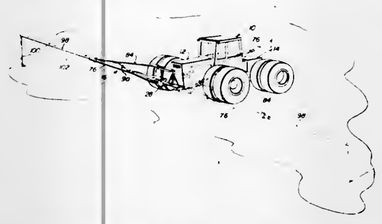
SWING MOUNT PIVOTALLY SUPPORTING WIDTH GAUGE FROM VEHICLE

Lawrence E. Rossmiller, and George D. Gemar, both of Brady, Mont. 59416

Filed Aug. 27, 1975, Ser. No. 608,236

Int. Cl.[2] A01B *35/32*

U.S. Cl. 172—126 **3 Claims**



1. In combination with a vehicle to be used in pulling wide trailing structures, a width gauge comprising an upstanding mount frame including remote horizontally spaced inner base and outer free marginal portions, a central forward portion of said vehicle including mounting means mounting said frame at said base marginal portion thereof for oscillation of said frame relative to said vehicle about a first upstanding axis between positions with said free marginal portion disposed adjacent and facing outwardly of opposite sides of said vehicle, an elongated

horizontal arm having an inner base end and an outer free end, said base end of said arm and free marginal portion of said frame including first coacting means pivotally supporting an upper portion of said base end from an upper portion of said free marginal portion to define an upstanding upper pivot connection, said free marginal portion including first and second lower mounting portions spaced horizontally apart on opposite sides of the medial plane of said frame and inwardly of said first coacting means in the direction of said inner base marginal portion, said base end portion including first and second lower support portions spaced horizontally apart on opposite sides of said arm, said first mounting and support portions and said second mounting and support portions defining releasably and alternately engageable means defining first and second upstanding lower pivot connections, respectively, on opposite sides of said arm and frame, said first coacting means and said lower mounting and support portions collectively defining a shiftable upstanding axis to be canted between positions alternately aligning said first coacting means with said first and second lower pivot connections to respectively define oppositely inclined axes about which said arm may be oppositely swung relative to said frame from a horizontal center position projecting outwardly from said free marginal portion toward rearwardly and upwardly inclined positions extending along said opposite sides of said vehicle, when said free marginal portion of said frame is disposed at said opposite sides of said vehicle.

4,049,063

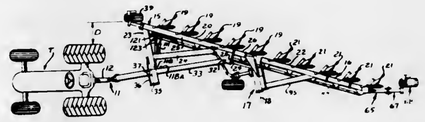
MULTI-UNIT ADJUSTABLE PLOW SYSTEM

William John Dietrich, Congerville, Ill., assignor to DMI, Inc., Goodfield, Ill.

Filed Sept. 29, 1975, Ser. No. 617,892

Int. Cl.[2] A01B *69/00*

U.S. Cl. 172—283 **8 Claims**



1. In a plow system adapted to be pulled by a traction vehicle having a rear wheel, sid plow system having a frame with an inclined beam, a plurality of plow units mounted on said inclined beam and connected together for rotation in unison to adjust the cutting width of the plows, and power adjustment means for adjusting the width of said plow units, the improvement comprising:

a front furrow wheel mounted adjacent the forward end of said inclined beam and adapted to ride in a previously formed furrow;

a tongue pivotally connected at its forward end to a hitch on said vehicle and pivotaly connected at its rear end to said frame;

means for slidably supporting a portion of said frame on said tongue; and

link means pivotally interconnecting said tongue and said adjustment means for rotating said frame relative to said tongue responsive to the adjustment of said plow units such that the distance between said forward furrow wheel and said rear wheel of said vehicle remains constant over a continuous range of width adjustments for said plow units.

4,049,064
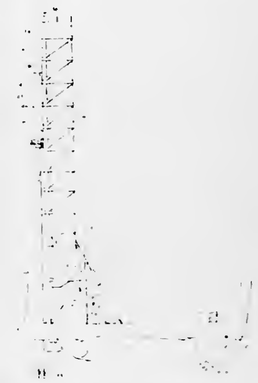
MULTI FUNCTION DRILL DRIVE SYSTEM

Raymond L. Chubb, Garland; Lawrence F. Haven, Dallas, and Robert W. Hisey, Richardson, all of Tex., assignors to Gardner-Denver Company, Dallas, Tex.

Filed Apr. 30, 1976, Ser. No. 682,355

Int. Cl.[2] B23Q *5/00*

U.S. Cl. 173—147 **4 Claims**



1. In an earth drilling apparatus having an elongated upstanding mast and a drive means to drive a drill pipe through a traverse means connected to the drill pipe and mounted for movement along the length of the mast to transmit hoist and pulldown forces to the drill string, the combination therewith which comprises:

a. a variable speed motor coupled in driving relation through a reduction unit to a high torque shaft,

b. a clutch shaft driven in accordance with the input to said reduction unit,

c. a first clutch for driving an output shaft in accordance with said clutch shaft,

d. means for driving said traverse means in accordance with said output shaft,

e. a second clutch for alternatively driving said output shaft from said high torque shaft, and

f. means for changing the operating mode of said motor and shifting energization from one of said clutches to the other.

4,049,065

DRILLING APPARATUS

Hans-Philipp Walter, 22 Oderstrasse, D-3570 Stadt Allendorf 1, Germany

Filed July 16, 1975, Ser. No. 596,551

Claims priority, application Germany, July 24, 1974, 2435535

Int. Cl.[2] E21B *19/14*

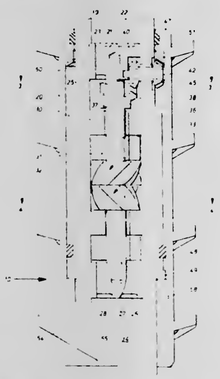
U.S. Cl. 175—52 **13 Claims**



1. A drilling apparatus comprising:

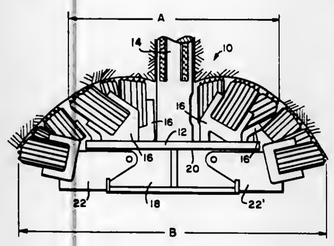
a. a mobile base support structure,
b. a drilling tower supported on said support structure,
c. a bearing means upon which said tower is mounted on a horizontal axis, said bearing means permitting adjustment of said drilling tower in a transverse direction relative to said horizontal axis,
d. a drilling head mounted on said drilling tower so that the drilling head can move along the length of said drilling tower,
e. rotary driving means for a drill rod mounted on said drilling head,
f. a storage means included in said drilling tower for receiving a plurality of drill rods in a parallel arrangement of rotational symmetry, said drill rods having cone thread ends for the formation of a drill string and being adapted to be singly handled, said storage means including
1. a revolving rack means which is mounted centrally with respect to said drilling tower, and
2. means for rotating said rack means in arcuate increments so as to permit both the transfer of drill rods out of said rack means and into said rack means, and
g. nesting means associated with said revolving rack, said nesting means including grapplers having spreader arms and transverse drive means, said spreader arms and transverse drive means being adapted to cooperate to transfer drill rods into and out of said rack.

4,049,066
APPARATUS FOR REDUCING ANNULAR BACK PRESSURE NEAR THE DRILL BIT
Vernon T. Richey, 1111 Blalock, Apt. 160, Houston, Tex. 77055
Filed Apr. 19, 1976, Ser. No. 677,926
Int. Cl.² E21B *17/00*
U.S. Cl. 175—323 **10 Claims**



1. An annular mud pump for use in a drill string in drilling a well bore which is adapted to be located above the drill bit in the drill string and which comprises:
an elongate tubular member adapted to be connected in a drill string at the upper end and further adapted to be located above a drill bit attached at the lower end of the drill string;
a second tubular member positioned concentrically about the first tubular member;
motor means in said first tubular member, said motor means being positioned and exposed to the flow of mud therethrough flowing through the drill string and said tubular member, said motor means having a set of blades which are rotated by the mud flow and which rotates an output shaft;
gear means connected to the output shaft of said motor means;
a gear connected to said second tubular member and comprising a portion of said gear means said gear being fixed to said outer tubular member for rotating the second tubular member in response to operation of said motor means; and
a multiflite screw on the exterior of said second tubular member which is rotated in the annulus of the well bore in a direction to lift drilling mud by the flites of the said screw.

4,049,067
CUTTER MOUNTING EXTENSION APPARATUS
Charles R. Dively, Seattle, Wash., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Nov. 5, 1975, Ser. No. 629,052
Int. Cl.² E21B *9/22*
U.S. Cl. 175—406 **25 Claims**

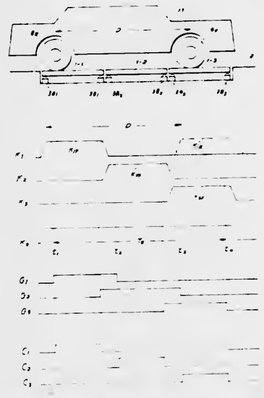


1. Cutter mounting extension apparatus, for use in extending the radius of a raise boring head having a drive stem, comprising:
extension support means having means adapted for a coupling thereof to a raise boring head; and
a cutter mounting extension element coupled to said support means; wherein
said extension support means comprises a planar base having a pair of opposed sides;
said extension element comprises a flat plate;
said extension element is coupled to said base at one of said sides thereof;
said base and said plate being in abutting relationship and occupying a common plane; and
fastening means replaceably securing said base and said plate together and prohibiting relative displacement, between said base and said plate, from said common plane.

4,049,068
PRICE LABELING SYSTEM WITH FLOATING ZERO REFERENCE
George Kavanagh, Ithaca, N.Y., and John L. Caron, Oakland, Calif., assignors to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.
Filed May 3, 1976, Ser. No. 682,852
Int. Cl.² G01G *11/04*
U.S. Cl. 177—25 **14 Claims**

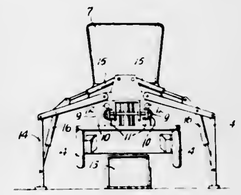
1. In a high speed weight computing system, in combination:
weight-sensitive means for producing an output signal in response to weight acting thereon;
conveyor means for conveying articles along a path passing over said weight-sensitive means and including control means for transiently depositing said articles on said weight-sensitive means;
sensor means for actuating said control means transiently to deposit an article on said weight-sensitive means; and
computer means interfaced with said sensor means and with said weight-sensitive means for computing the gross weight of an article based upon the difference in outputs of said weight-sensitive means when an article is transiently deposited on the weight-sensitive means and when the article is not on the weight-sensitive means, said weight-sensitive means producing an analog output signal linearly proportional to weight, and including amplifier means connected to the analog output signal, and an analog-to-digital converter connected to the output of the amplifier means, said amplifier means amplifying the output signal to produce a difference in digital outputs from said converter which represents the measured load times a factor *m* and said computer means computing said gross weight on the basis of said difference in output signals divided by said factor *m* whereby to minimize weight computation errors due to converter inaccuracy in converting to the least significant bit of the output thereof.

4,049,069
DEVICE FOR WEIGHING RUNNING VEHICLE
Ryozo Tamamura, Osaka, and Masami Yamanaka, Miki, both of Japan, assignors to Yamato Scale Company, Limited, Japan
Filed May 5, 1976, Ser. No. 683,048
Claims priority, application Japan, Aug. 26, 1975, 50-103861
Int. Cl.² G01G *19/02*
U.S. Cl. 177—134 **3 Claims**



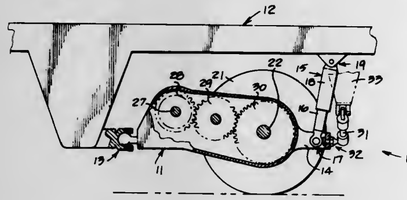
1. A device for weighing moving vehicles having the maximum number *n* l *and the minimum distance D of wheel axles, comprising M weighing platforms arranged serially on a road surface along the running direction of said vehicles, the dimension of said weighing platforms being less than said minimum distance D of wheel axles, M electromechanical converting means for producing electric signals which are respectively proportional to the loads applied respectively onto said weighing platforms, N adder circuits connected respectively to the outputs of said converting means for summing up the outputs of said converting means, where N is equal to or greater than n,* N groups of gate circuits, each group consisting of M gate circuits inserted respectively between said converting means and adder circuits for effecting separate conduction control of the outputs of said converting means, N averaging circuits for calculating average loads from the outputs of said adder circuits respectively, and a control circuit for controlling said gate circuits such that said groups of gate circuits pass exclusively the load signals corresponding to the respective wheel axles.

4,049,070
EXCAVATOR HAVING LIFTING LEGS AND COOPERATING BOOM MOUNTED BUCKET FOR "WALKING"
Ingebret Soyland, Solhogda 2 Brynehaugen, Bryne, Norway (N-4340)
Filed July 18, 1975, Ser. No. 597,228
Claims priority, application Norway, July 19, 1974, 742642
Int. Cl.² B62D *57/00*
U.S. Cl. 180—8 C **3 Claims**



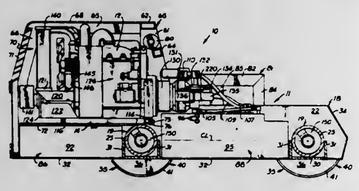
1. an excavator, comprising:
frame means having wheel means thereon;
rail means mounted on said frame means;
a rail carriage mounted on said rail means, and movable along the longitudinal axis thereof;
first motive means connected between said rail carriage and said rail means, operable to effect movement of said rail carriage along the longitudinal axis of said rail means;
a boom and bucket assembly carried by said rail carriage, and including a second motive means operable separate from said first motive means to move said boom and bucket in a generally vertical plane to engage said bucket with the earth, said generally vertical plane including the longitudinal axis of said rail means; and
a lifting leg assembly mounted on each of the opposite sides of said rail carriage to project laterally from the longitudinal axis thereof, each of said lifting leg assemblies including a third motive means operable separate from said first and said second motive means to press the lower end of the associated leg assembly against the ground,
said third motive means of said lifting leg assemblies and said second motive means of said boom and bucket assembly being operable separately but cooperatively to engage all three of said bucket and said laterally projecting leg assemblies with the ground to lift said wheel means on said frame means to a height spaced above the ground, whereupon said first motive means connected between said rail carriage and said rail means can be operated separately to move said frame means relative to said rail carriage to thereby move said wheel means to a different location.

4,049,071
MODULAR DUAL WHEEL SUSPENSION AND DRIVE ARRANGEMENT FOR TRUCKS
Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 8, 1976, Ser. No. 664,849
Int. Cl.² B62D 61/10
U.S. Cl. 180—24.05 11 Claims



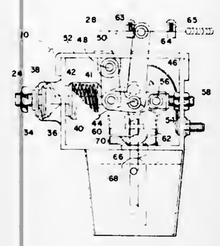
1. A modular axle suspension and drive arrangement attached to a main frame of a vehicle comprising
a hollow sub-frame, said main frame at least partially overlying said sub-frame,
connection means universally pivoting a forward end of said sub-frame to a rearward end of said main frame,
a drive motor, having an output shaft, mounted on said sub-frame,
at least one roadwheel rotatably mounted on said sub-frame, and
drive means disposed entirely within said sub-frame and drivingly interconnected between the output shaft of said drive motor and said roadwheel for driving the same.

4,049,072
MODULAR VEHICLE SUBASSEMBLY
Donald D. Savage, Huntsville, Ala., assignor to B. J. Powell, Atlanta, Ga.
Division of Ser. No. 439,736, Feb. 5, 1974, Pat. No. 3,907,053.
This application Sept. 23, 1975, Ser. No. 616,028
Int. Cl.² B60K 5/10
U.S. Cl. 180—64 M 2 Claims



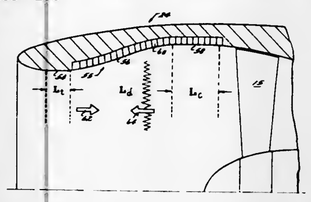
1. A modular vehicle subassembly comprising:
a base frame including a pair of spaced apart tubular side rails, each of said side rails having spaced apart inside and outside walls, and defining a prime mover enclosure, a first space, and a second space therein, said base frame further including a pair of spaced apart and opposed slide rails mounted on said side rails within said enclosure;
a prime mover module including an undercarriage movably supporting said module on said slide rails within said enclosure;
a first fluid tank removably mounted in said first space;
a second fluid tank removably mounted in said second space, and connected to said prime mover module;
locating means for selectively and releasably fixing said prime mover module in said enclosure;
fluid motor means carried by said base frame outside of said side rails adjacent said outside walls;
fluid pump means having an output connected to and driven by said prime mover module, said fluid pump means operatively connected to said first fluid tank;
a first coupling inside of said inside wall of one of said side rails;
a first opening defined through said inside wall of said one of said side rails in registration with said first coupling;
a second coupling between said inside and said outside walls of said one of said side rails releasably engaging said first coupling through said first opening;
a second opening through said outside wall of said one of said side rails at said fluid motor means;
first means operatively connecting said fluid motor means with said second coupling through said second opening and between said outside and inside walls of said one of said side rails; and,
second means operatively connecting said first coupling with the output of said fluid pump means to power said fluid motor means.

4,049,073
CIRCUIT BREAKER
Meril D. Gebert, 560 - 30th Ave. Sp. 37, Santa Cruz, Calif. 95060
Filed Apr. 5, 1976, Ser. No. 673,723
Int. Cl.² B60K 28/00
U.S. Cl. 180—103 A 6 Claims



1. An automatic circuit breaker for a vehicle having an internal combustion engine having an associated electrical power circuit which comprises
a switch in said power circuit,
a toggle joint operative to open or close said switch, and
means responsive to vehicle impact to move said toggle joint between switch-closed and switch-opened positions,
said toggle moving means including a weight supported by rigid members for universal pivotal motion to contact and move said toggle joint.

4,049,074
SOUND-ATTENUATING INLET DUCT
Stephen B. Kazin, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed May 14, 1975, Ser. No. 577,293
Int. Cl.² F04B 39/00; B64D 33/06
U.S. Cl. 181—286 5 Claims



1. In a gas turbine engine of the type having rotatable compression means adapted to pressurize a motive fluid there is provided a sound-attenuating inlet duct comprising:
causing means open at opposing ends to accommodate the passage of the motive fluid therethrough and defining, in serial flow relationship, a throat of predetermined axial extent, a diffuser and a generally cylindrical section ahead of the compression means; and
acoustic treatment disposed upon and within said casing means, wherein
the throat, the diffuser and cylindrical section geometry cause an acceleration of the motive fluid to a higher axial velocity proximate the casing acoustic treatment than proximate the rotational axis to provide sound attenuation by imparting to the acoustic waves propagating through the inlet duct a velocity component normal to the acoustic treatment, the geometry of the throat and the diffuser being substantially defined by the relationships:

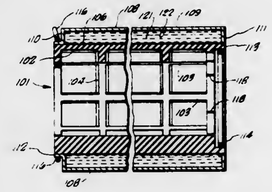
$L_d/D = 2.6\ M - 1.12,$

and

$L_t/D = 1.28 - 1.6\ M,$

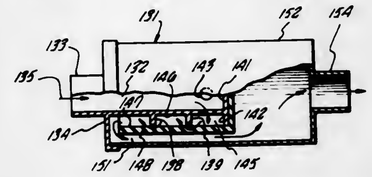
wherein
D = diameter of the cylindrical section;
L_d = axial extent of the diffuser;
L_t = axial extent of the throat; and
M = average throat Mach number substantially between 0.7 and 0.8.

4,049,075
SOUND DAMPING APPARATUS
Milo E. Murphy, Long Beach, Calif., assignor to Murphy Muffler, Inc., Los Angeles, Calif.
Division of Ser. No. 408,388, Oct. 23, 1973, Pat. No. 3,918,549.
This application Nov. 6, 1975, Ser. No. 629,681
Int. Cl.² F01N 1/22
U.S. Cl. 181—220 3 Claims



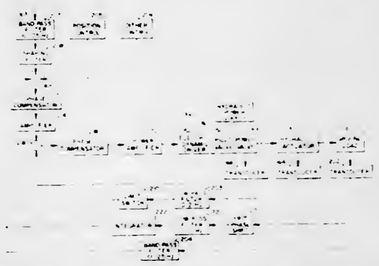
1. A sound damper for gas streams emerging from a ported periphery comprising:
a resilient first wall comprised of a cylindrical sheath of gas impervious material surrounding said periphery, said first wall including end portions extending between said sheath and said periphery defining a first volume into which said gas streams emerge;
a rigid second wall concentrically surrounding said first wall defining a closed second volume between said first and second walls;
a fluid filling said second volume;
means for securing one of said end portions in gas tight relation to said periphery; and
the other of said end portions resilient opening in response to gas pressure to define intermittent gas exit means.

4,049,076
SOUND DAMPING APPARATUS
Milo E. Murphy, Long Beach, Calif., assignor to Murphy Muffler, Inc., Los Angeles, Calif.
Division of Ser. No. 408,388, Oct. 23, 1973, Pat. No. 3,918,549.
This application Nov. 6, 1975, Ser. No. 629,682
Int. Cl.² F01N 1/08
U.S. Cl. 181—224 1 Claim



1. A sound damper for use with gas streams, comprising:
a resilient cylindrical sheath first wall of gas impervious material defining a first volume,
a rigid second wall defining a second volume, said second wall being surrounded by and concentric with said first wall, said second wall having gas ports therein connecting said first and second volumes,
a tube fixed to the second rigid wall and defining a gas entry means connecting to said second volume,
contact means including annular ribs integral with a wall and between the first and second walls and dividing the volume between said first and second walls, said contact means being separable from a wall in response to gas pressure to define intermittent gas exit means between said wall and said contact means,
a third rigid wall about said resilient wall and defining a third volume, said gas exit means intermittently connecting said second and third volumes, and
a gas exit tube on said third wall.

4,049,077
SEISMIC VIBRATOR CONTROL SYSTEM
Joseph F. Mifsud, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.
Continuation of Ser. No. 516,329, Oct. 21, 1974, abandoned.
This application Apr. 19, 1976, Ser. No. 678,502
Int. Cl.² G01V 1/04
U.S. Cl. 181—114 31 Claims



1. An improved apparatus for controlling the operation of seismic vibrator, said vibrator including a coupling plate, the movement of which is responsive to an electrical input signal, the improvement comprising a feedback loop which includes:
means for generating an electrical feedback signal which includes a transducer coupled to said coupling plate, said feedback signal having an amplitude which varies instantaneously with coupling plate motion;

summing means having said electrical input signal connected to a first input terminal thereto and said feedback signal having an amplitude which varies instantaneously with coupling plate motion connected to a second input terminal thereto; and

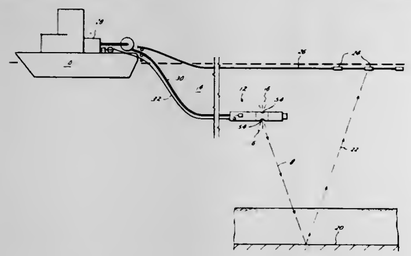
phase compensator means connected in series circuit relation within said feedback loop.

4,049,078

MARINE ACOUSTIC PULSE TRAIN SIGNAL GENERATOR

John Lloyd Paitson, Galveston, and Clifford E. Anderson, Huntsville, both of Tex., assignors to Western Geophysical Co. of America, Houston, Tex.

Continuation-in-part of Ser. No. 460,867, April 15, 1974, abandoned. This application Jan. 8, 1976, Ser. No. 647,549
Int. Cl.² G01V *1/04*
U.S. Cl. 181—120 **12 Claims**



1. An air gun for generating a train of discrete acoustic pulses in a body of water at a desired pulse repetition rate during a single recording cycle of predetermined length comprising:

a housing defining a supply chamber for receiving a volume of high pressure air, the housing including an inlet and at least one exhaust port fluidly communicating, in use, with said body of water;

sliding valve means mounted in said housing between said supply chamber and said exhaust port;

reciprocatingly mounted, rigid linkage means fixedly secured to said sliding valve means;

control means for continuously varying the repetition rate of said pulses from 5 to at least 40 Hertz, thereby to define a seismic chirp signal; and

drive means mechanically connected to said linkage means and cooperating with said control means for opening and closing said valve means, thereby periodically emitting a high pressure air jet through said exhaust port into said body of water.

4,049,079

TRACTOR MOUNTED APPARATUS FOR PERFORMING AERIAL WORK TASKS

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 19, 1976, Ser. No. 687,728
Int. Cl.² B66F *11/04*
U.S. Cl. 182—2 **20 Claims**

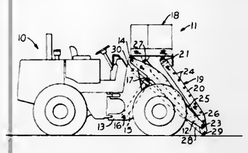
1. An aerial work task apparatus mounted on a frame of a mobile vehicle comprising

lift arm means pivotally mounted directly on said frame,

lift cylinder means pivotally interconnected between said frame and said lift arm means for selectively moving said lift arm means between lowered and raised positions relative to ground level,

platform means adapted to carry a workman thereon and

linkage means pivotally interconnected between said frame, said lift arm means and said platform means for raising and lowering said platform means at least substantially vertically above said vehicle and for at least substantially maintaining said platform means parallel relative to ground level upon raising and lowering thereof, said linkage means being universally connected to said platform means and wherein said linkage means comprises adjustment means for selectively moving said platform means relative to said vehicle in pitch, roll and yaw directions for universal movement, first linkage means pivotally connected to said lift arm means and universally connected at a single point connection to said platform means and second linkage means, forming a parallelogram-type linkage with said first linkage means, pivotally connected to said lift arm means and universally connected to said platform means at a two point connection thereon.



4,049,080

ESCAPE DEVICE FOR A MULTI-STOREY BUILDING

Yoshio Suzuki, 529 Futago, Takatsu, Kawasaki, Kanagawa, Japan

Filed Apr. 14, 1976, Ser. No. 676,694
Int. Cl.² A62B *1/20*
U.S. Cl. 182—48 **6 Claims**



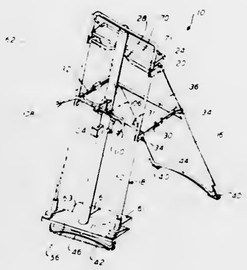
1. An escape device for a multi-storey building having emergency exits in the outer side wall of each of the storeys of said building, said escape device comprising a plurality of support brackets secured to said outer side wall of the building storeys, a downwardly inclined main body including a plurality of straight sections connected integrally together by means of outwardly curved corner sections to provide a meandering chute construction to said main body and supported by said support brackets, evacuation openings provided adjacent the lower ends of alternate straight sections of said plurality of straight sections and positioned adjacent said emergency exits, a plurality of pulleys mounted on the bottom of said main body in two parallel rows at a plurality of spaced positions along the length of the main body, ropes guided over said rows of pulleys, and a shock absorbing means provided at the lower end of the lowermost straight section of said plurality of straight sections.

4,049,081

OPERATOR-ACTUATED ELEVATING DEVICE

Walter McDonald, 558 Dell Road, Landing, N.J. 07850; Norbert F. Seitel, 45 Gilette Place, Gilette, N.J. 07933, and John E. Ayres, 540 Fairview Ave., Westwood, N.J. 07675

Filed Jan. 12, 1976, Ser. No. 648,384
Int. Cl.² E06C *7/12*; B66B *9/20*
U.S. Cl. 182—148 **7 Claims**



1. An elevatable operator-actuated lifting platform, comprising in combination:

a lower support frame;

a platform section including means for supporting said operator, telescopically interfitted with said support frame as to be elevatable with respect thereto;

hydraulically actuated piston and cylinder means, for telescoping and de-telescoping said platform section away from and toward said support frame, to enable elevation and lowering of said platform section;

said piston and cylinder means including a cylinder associated with and fixed with respect to one of said support frame and platform, and a piston fixed with respect to the other of said frame and platform; said piston being received within said cylinder and being axially displaceable outwardly from said cylinder by pressurization thereof to enable said elevation of said platform;

means moveable with said platform for manually pressurizing and de-pressurizing said piston and cylinder means with said fluid, to enable raising and lowering of said platform by said operator;

and wherein said manually actuated means moveable with said platform includes a reservoir of hydraulic fluid and a manually operable pumping means for providing said fluid to said cylinder; a first flow path being defined between said reservoir and said cylinder including said manually operable pumping means for effecting elevation of said platform section by pressurization of said cylinder; a second flow path being defined between said reservoir and pressurized cylinder for enabling return of fluid to said reservoir for lowering of said platform; and manually operable valve means moveable with said platform section for enabling operator selection between said first or second flow paths.

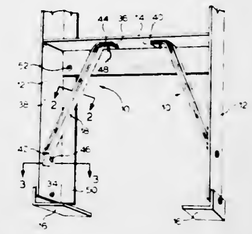
4,049,082

STRUCTURAL MEMBER FOR A STRUCTURAL FRAME

Robert Reid, Mississauga, Canada, assignor to Daymond Limited, Mississauga, Canada

Filed Dec. 9, 1975, Ser. No. 639,054
Int. Cl.² E06C *7/10*
U.S. Cl. 182—217 **9 Claims**

1. In a ladder frame, a structural member of malleable metal comprising a substantially planar wall and two opposing irregular-shaped sidewalls which are integral with substantially parallel edges of said substantially planar wall, each of said irregular-shaped sidewalls having a corrugation therein which extends along the length of each sidewall, said member having two free ends, said corrugation adapting each sidewall to fold upon itself when a force is applied to an area of said member to provide a flattened portion on said member, the flattened portion being adapted to be secure by fastening means to a component of said ladder frame, the width of the flattened portion being substantially the same as the nominal width of said member.

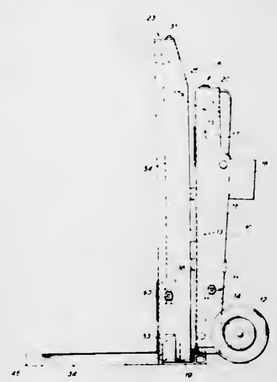


4,049,083

ELECTRICALLY POWERED HAND TRUCK WITH STACKER ATTACHMENT

Eugene N. Garvey, Appleton, Wis., assignor to Woodward Mfg. & Sales Co., Inc., Appleton, Wis.

Filed Nov. 23, 1976, Ser. No. 744,425
Int. Cl.² B66B *9/20*
U.S. Cl. 187—9 R **12 Claims**



1. A stacker attachment for releasably mounting to a two wheel, battery powered hand truck which has a movable elongated inner frame, an elongated stationary outer frame, said inner frame movable only below the wheels at the bottom of said stationary frame, said stacker attachment including

an elongated outer stationary frame having spaced sides and a connecting top, a stabilizing member extending at a right angle from the bottom of the spaced sides for making ground contact, mounting means on said stationary frame for releasably mounting the stacker to a two wheel hand truck,

a movable inner frame having spaced sides and a connecting top member, said inner movable frame having a height substantially less that the height of the stationary frame, a lifting member mounted at a right angle to the bottom of said movable frame,

an electric motor at the bottom of the stacker, means mounting said motor to the sides of the stationary frame,

mechanical means to raise and lower said movable inner frame, said mechanical means interconnected between said electric motor, said stationary frame, and said movable frame,

conductors extending from said electric motor with battery lead portions for connection to a battery, and

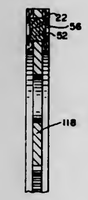
switch means to selectively operate said mechanical means to raise the movable frame, and mounted lifting member, above the bottom of the stationary frame, and to lower the movable frame, and mounted lifting member, to the bottom of said stationary frame.

4,049,084

AUDIBLE LINING WEAR INDICATOR

Richard B. Beemer, Lombard, and Richard G. Hennessey, Oak Lawn, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Nov. 28, 1975, Ser. No. 635,817
Int. Cl.² F16D *66/02*
U.S. Cl. 188—1 A **2 Claims**



1. In a friction disc for use in a frictional engagement device including reaction members operating in a fluid environment the improvement comprising:

a core plate having obverse and reverse faces and a plurality of apertures passing therethrough including a central aperture and apertures spaced inwardly of the outer periphery of the core plate;

a primary frictional material of microporous material in a configuration of an annular ring having a plurality of apertures therethrough, having its static coefficient of friction substantially similar to its dynamic coefficient, bonded to each face of the core plate with the apertures of the primary frictional material annular ring aligned with the apertures of the core plate which are spaced inwardly of said outer periphery;

slugs of secondary frictional material occupying the outer periphery core plate apertures, the slugs being slightly longer than the length of the outer periphery core plate apertures and freely slidable therein where the slugs are of such material as to produce an audible signal upon contact with cooperating reaction members to indicate wear of the primary frictional material.

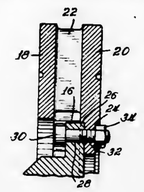
4,049,085

CALIPER BRAKE WITH ASSEMBLY FOR ROTOR ATTACHMENT TO HUB

Donald E. Blunier, Niles, Mich., assignor to Safety Racing Equipment, Incorporated, Eau Claire, Mich.

Filed Aug. 10, 1976, Ser. No. 713,110
Int. Cl.² F16D *65/12*
U.S. Cl. 188—18 A **6 Claims**

1. In a caliper brake comprising a hub and a rotor, the combination of a hub having an annular rotor-attaching flange and a rotor having apposed annular chamfers complementary to said annular flange and means for attaching said rotor to said flange with the said flange in one of said chamfers, said chamfers being off center so that when the rotor seated in one chamfer



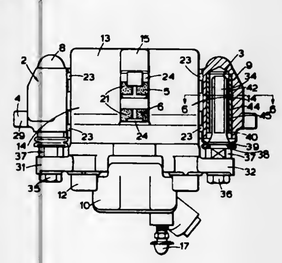
it is closer to the hub than when it is seated in the other chamfer.

4,049,086

VEHICLE DISC BRAKES

Heinrich Bernhard Rath, Vallendar, Rhine, Germany, assignor to Girling Limited, Birmingham, England

Filed Aug. 12, 1976, Ser. No. 713,815
Claims priority, application United Kingdom, Aug. 30, 1975, 35855/75
Int. Cl.² F16D *65/02*
U.S. Cl. 188—73.3 **14 Claims**



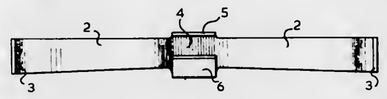
1. An hydraulically operated disc brake for a vehicle, comprising a rotatable disc, a stationary drag-taking part located against one face of said disc, a caliper straddling a portion of the peripheral edge of said disc, first and second circumferentially spaced guide means carried on said drag-taking part and adapted to guide said caliper for sliding movement in a direction generally parallel to the axis of said disc, friction pad assemblies for engagement with opposite faces of said disc located in said caliper, and actuating means for applying one of said friction pad assemblis directly to said disc and for causing said caliper to slide relative to said drag-taking part to apply the other of said friction pad assemblies indirectly to the opposite face of said disc, each of said guide means comprising guide member, said guide member being provided with a circular bore, a peg member working in said bore, one of said members being secured to said drag-taking part and the other to said caliper, a resilient moulded bush having an inner elongate bore being located in one of said bores, only the first of said peg members sliding in an elongate bore with some free play along a line extending perpendicularly between the axes of said two peg members, said first peg member being a substantially tight fit in said bush in a direction perpendicular to said line.

4,049,087

FRICTION PAD ASSEMBLIES FOR SLIDING CALIPER DISC BRAKES

Kurt Erich Heinz, Neuwied, and Horst Willi Klassen, St. Sebastian, both of Germany, assignors to Girling Limited, Birmingham, England

Filed Dec. 23, 1975, Ser. No. 643,826
Claims priority, application United Kingdom, Dec. 24, 1974, 55726/74
Int. Cl.² F16D *65/00*
U.S. Cl. 188—73.5 **3 Claims**



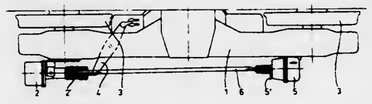
1. A combination of friction pad assembly and a sliding caliper disc brake, the brake comprising a torque member and a caliper member, the caliper member being attached to the torque member for sliding movement relative thereto and arranged to act on the friction pad assembly which is located in a recess in the torque member, the friction pad assembly comprising a backing plate, a pad of friction material secured to the backing plate and a leaf spring securely attached to the backing plate prior to installation of the assembly in the disc brake, the leaf spring comprising a central clip portion and two oppositely directed arms, the arms being integrally formed with the central clip portion and extending substantially parallel to the plane of the backing plate, the flat surfaces of the arms being substantially normal to the plane of the backing plate, the central clip portion having, in transverse cross-section, a generally inverted u-shape comprising a substantially planar base section from each side of which depends a leg, one leg being substantially normal to the base section and the other leg being angled towards said one leg, the legs engaging one on either side of a tab which is free of friction material and projects from an edge of the backing plate, said other leg engaging into a recess in the tab, the two arms of the spring engaging the caliper member whereby the friction pad assembly is held in the recess in the torque member and the caliper member and torque member are biased apart, the pad assembly and brake being so designed that the spring at all times is outside the area which, when the brake is in use, is swept by the disc.

4,049,088

PARKING BRAKE ARRANGEMENT FOR A RAIL VEHICLE BRAKE

Anders Olov Gunnar Stjarne, and Nils Borje Leanart Sander, both of Malmo, Sweden, assignors to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Filed Feb. 24, 1976, Ser. No. 660,856
Claims priority, application Sweden, Feb. 27, 1975, 7502201
Int. Cl.² F16D *65/30*
U.S. Cl. 188—107 **1 Claim**



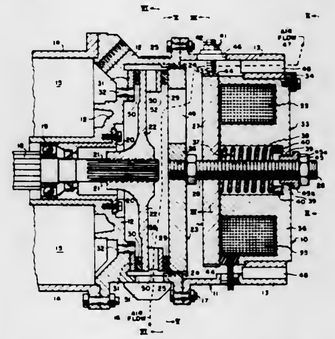
1. A parking brake arrangement for a rail vehicle brake, comprising in combination, a service brake actuator with a piston and built-in slack adjuster for providing a braking force along an actuator force transmission path to braking levers in said vehicle, a separate spring brake cylinder unit remotely located from said actuator with the spring brake spring acting in the brake application direction of said actuator, and a fluid pressure responsive piston keeping the spring compressed in the presence of fluid pressure, a force transmitting pull rod linkage coupling the spring brake cylinder between the service brake piston and the slack adjuster, and a disengagement mechanism built into said spring brake unit with an externally extending control lever for permitting a retuurn movement of the actuator and linkage in the absence of fluid pressure in said spring brake piston.

4,049,089

ELECTROMAGNETIC BRAKE ASSEMBLY

Frederick Stanley Rundle, Montour Falls, N.Y., assignor to Shepard Niles Crane & Hoist Corporation, Montour Falls, N.Y.

Filed July 6, 1976, Ser. No. 702,420
Int. Cl.² B60T *13/04*
U.S. Cl. 188—171 **17 Claims**



1. An electromagnetic brake assembly comprising:

A. A rotatable brake wheel fixed to a shaft which has the rotation thereof selectively braked by the brake assembly;

B. a pressure ring nonrotatably mounted axially a given distance from said brake wheel during operational rotation of said shaft and adapted to axially move toward and away from the brake wheel;

C. a brake armature mounted axially from said pressure ring and adapted to axially move in fixed relation with respect to said pressure ring during operational rotation of said shaft;

D. at least one brake liner adapted to fricationally engage between the brake wheel and pressure ring when the pressure ring is moved axially toward the brake wheel;

E. an electromagnetic means mounted axially from the brake armature for engaging the brake armature to move the pressure ring away from the brake wheel;

F. biasing means for urging the brake armature and pressure ring toward the brake wheel to engage the brake liner between the brake wheel and pressure ring and brake the rotation of the brake wheel; and

G. gap control means for adjusting the axial distance between the brake wheel and the pressure ring.

4,049,090

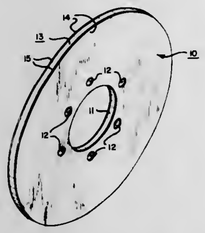
BRAKE DISCS

Erik F. Buell, Box 418, R.D. No. 2, Gibsonia, Pa. 15044

Continuation-in-part of Ser. No. 611,621, Sept. 9, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,608
Int. Cl.² F16D *69/02*
U.S. Cl. 188—251 M **5 Claims**

1. In a vehicle disc brake assembly including a brake disc and a pair of brake pads engaging opposite sides of said disc over an area less than the circumferential disc surface the improvement comprising a brake disc providing a reduction in unsprung

weight and improved thermal dissipation consisting essentially of a circular core from the group consisting of high strength and hardenable aluminum alloys forming the major thickness component and having substantially parallel spaced sides clad



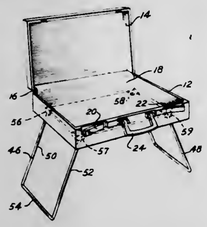
with stainless steel sheets applied in sheet form fully covering each parallel side of said core, said stainless steel sheets bonded thereto with a diffusion bond of aluminum and stainless steel forming an integral disc.

4,049,091

ATTACHE CASE AND THE LIKE

Wayne L. Chubb, Porter, Ind., assignor to Faircraft Engineering, Inc., Porter, Ind.

Filed May 27, 1976, Ser. No. 690,374
Int. Cl.[2] A45C *5/04*
U.S. Cl. 190—18 R **5 Claims**



1. An attache case and the like, comprising a lower section having a side panel, an upper section hinged to said lower section, means on said side panel forming a recess, legs foldable into said recess, a reversible top insertable in said recess, and means secured to said top pivotally holding said legs near each end of said recess and pivoting said legs outwardly for supporting the case, said top being substantially the same size and shape as said recess for enclosing said legs in said recess when the legs are in folded position and when the top is disposed in the recess with the legs between the bottom of the recess and the top.

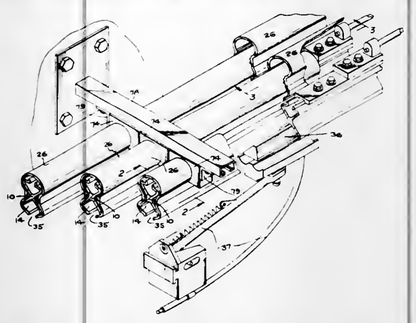
4,049,092

CURRENT CONDUCTOR SYSTEM

Richard E. Lillard, and William M. Cope, both of Lynchburg, Va., assignors to H. K. Porter Company, Inc., Lynchburg, Va.

Filed Sept. 15, 1976, Ser. No. 723,240
Int. Cl.[2] B60M *1/20*
U.S. Cl. 191—40 **13 Claims**

12. In a current conducting system of the character described, a current conductor bar of a uniform transverse cross-section throughout its length having a bottom guide channel for a current collector in slidable contact with the underside of said bar and a pair of branches respectively extending upwardly and outwardly in divergent relation to provide the top of said bar with a longitudinally extending cavity of substantially V-shape in transverse section, the outer ends of said divergent branches being respectively provided with inturned coplanar flanges which respectively terminate in substantially parallel upstanding lips spaced equidistantly from the vertical



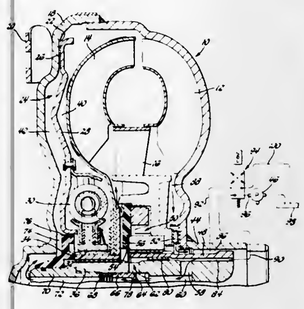
median plane of the conductor bar, thereby providing the topside cavity of said conductor bar with a top wall part having a longitudinally extending slot centered midway between the opposite sides of the bar.

4,049,093

TORQUE CONVERTER AND LOCK-UP CLUTCH WITH A FLOW DIVIDER VALVE

William J. Vukovich, Pittsfield Township, and Paul D. Stevenson, Ann Arbor, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 19, 1976, Ser. No. 706,396
Int. Cl.[2] F16H *45/02*
U.S. Cl. 192—3.3 **2 Claims**



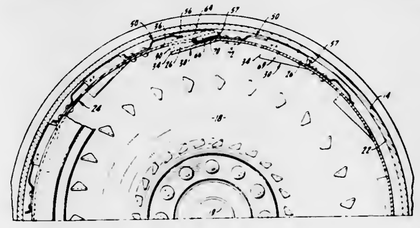
1. A torque converter and lock-up clutch having a flow divider control valve comprising; a torque converter having an input shell adapted to be rotated by a prime mover, an impeller secured to said input shell, a turbine in fluid flow relation with said impeller and a stator disposed between said impeller and turbine; a friction clutch disposed between said turbine and said input shell and cooperating with said input shell to form a release chamber and with said turbine and input shell to form an apply chamber; an output shaft drivingly connected to said turbine and said friction clutch and having a fluid passage formed therein; first fluid path means for communicating fluid between said stator and said impeller to engage said clutch; second fluid flow path means for communicating fluid to said passage to release said clutch; and pressure differential responsive valve means disposed in said passage for dividing fluid flow between said release chamber and said torque converter wherein the fluid flow is introduced between said stator and said turbine when fluid flow is toward said release chamber and for permitting fluid flow from said release chamber when fluid is exhausted therefrom, said valve means including a restriction means for permitting a predetermined flow to said release chamber when the fluid flow is toward said release chamber before said valve means directs fluid flow to said torque converter between said stator and said turbine; and means for controlling fluid flow to and from said first and second fluid flow path means.

4,049,094

CENTRIFUGAL AND TORQUE RESPONSIVE LOCK UP CLUTCH FOR COUPLINGS

John Polomski, Birmingham; Willis Lorenz Schulz, Utica, and Victor Joseph Specht, Fowlerville, all of Mich., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 7, 1975, Ser. No. 620,461
Int. Cl.[2] F16H *45/02*
U.S. Cl. 192—3.31 **9 Claims**



1. An engaging mechanism comprising, first and second relatively rotating members, an annular sheet metal support having a periphery and fixed to said first member, a plurality of friction shoes mounted between said support and said second member, cam means on said support in engagement with said shoes, said shoes having a frictional surface thereon, said cam means being formed of the material of said support and extending radially inwardly from said periphery, centrifugal force acting to urge said devices to move into engagement with said second member at a given speed of rotation to lock said members for rotation together, said cam means comprising a series of ramps distributed around the periphery of said support, said cam means acting after initial engagement to wedge said shoes between said support and said second member over the entire arcuate length of said shoes, the torque capacity of said mechanism being so designed that said engagement will release during torque surges and torque reversals through said mechanism to momentarily allow relative rotation between said members.

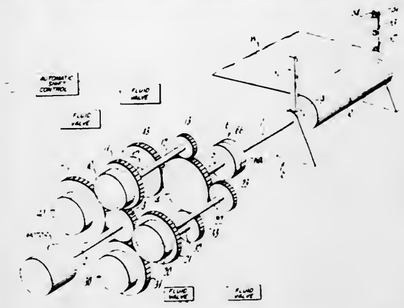
4,049,095

MULTIPLE SPEED WEB REWIND TRANSMISSION IN SERIES WITH A SLIP COUPLING

Edwin J. Montalvo, Sr., 283 Anderson St., Hackensack, N.J. 07602

Filed May 15, 1975, Ser. No. 577,949
Int. Cl.[2] F16D *67/00*
U.S. Cl. 192—3.51 **8 Claims**

2. In combination, a motor, a plurality of non-slip clutches and a slip clutch which slips constantly during driving, means for driving input elements of said non-slip clutches at mutually different ratios with respect to the output speed of said motor, means for successively engaging said non-slip clutches one at a time, each of said non-slip clutches having an output shaft



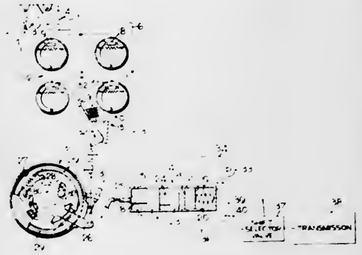
mounted in driving relationship with an input side of said slip clutch.

4,049,096

PARKING BRAKE RELEASE FOR TRANSMISSION CLUTCH

John W. Barth, Topeka, Kans., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Division of Ser. No. 534,566, Dec. 19, 1974, Pat. No. 3,957,143.
This application Dec. 22, 1975, Ser. No. 643,320
Int. Cl.[2] B60K *41/26*
U.S. Cl. 192—4 A **5 Claims**



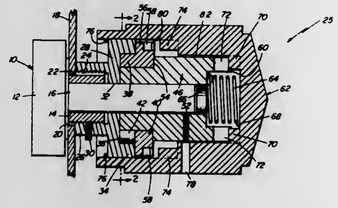
1. A vehicle control system comprising, a source of pressurized fluid, a hydraulically actuated vehicle transmission, a transmission shift selector valve for selectively engaging said transmission, a mechanically operated vehicle parking friction brake, brake operating means including, a brake lever, a brake actuating means operatively connected between said brake lever and said vehicle parking brake for actuating said vehicle parking brake, a cutoff valve connected through said shift selector valve between said source of pressurized fluid and said transmission, a cable connected between said brake operating means and said transmission cutoff valve for operating said cutoff valve to interrupt communication between said source of pressurized fluid and said transmission for rendering said transmission inoperative when said vehicle parking brake is actuated.

4,049,097

KNOB WITH LOCK RELEASE MEANS

Albert R. Pratt, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 12, 1976, Ser. No. 648,613
Int. Cl.² F16D 67/00
U.S. Cl. 192—8 R 11 Claims



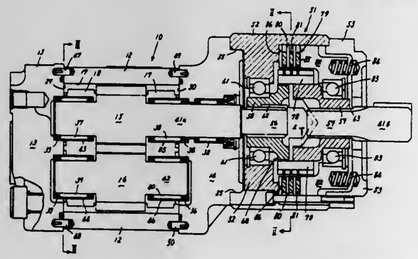
1. A knob assembly for mounting on a rotatable shaft and comprising:
- a fixed race having a cylindrical cavity therein and having an outer peripheral wall;
- a rotatable cylinder having a cam-shaped end portion axially disposed in the cavity of the race and having an adjacent radial shoulder, the cam-shaped end portion including a plurality of angularly spaced projections disposed in predetermined spaced relationship with the wall of the race;
- locking means disposed between the projections of the cam-shaped end portion in the cavity of the race for releaseably engaging the cam-shaped end portion of the cylinder;
- a rotatable release disc encircling the cam-shaped end portion of the cylinder and having angularly spaced portions disposed between respective projections of the cam-shaped end portion and the wall of the race, the disc also having an end surface disposed in abutting engagement with the radial shoulder and having overlying the wall of the race a flange provided with a plurality of angularly spaced release slots;
- an enclosing knob shell rotatable about the fixed race and having means for controllably engaging the release means and the cylinder; and
- resilient means coupled to the knob shell and the cylinder for positioning the shell with respect to the cylinder and the disc.

4,049,098

HYDRAULIC MOTOR WITH A MECHANICAL BRAKE DEVICE

Yasuo Kita, and Makoto Kou, both of Kyoto, Japan, assignors to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed July 26, 1976, Ser. No. 708,550
Claims priority, application Japan, Aug. 23, 1975, 50-102498
Int. Cl.² F16D 67/00
U.S. Cl. 192—8 R 6 Claims



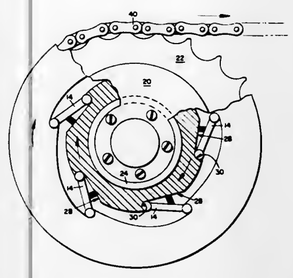
1. In a hydraulic motor having a primary drive shaft (41*a*), a brake device capable of being removed in response to the driving torque from said primary drive shaft, the brake device comprising:
- a. a secondary drive shaft (41*b*) aligned on the same axis with said primary drive shaft;
- b. a shaft coupling assembly (60) for connecting said secondary drive shaft to said primary drive shaft, said coupling assembly including a pair of coupling element members (58, 59) one of which is fixed to the either of said two drive shafts and other of which is slidably mounted in the axial direction with the other of said two drive shafts;
- c. a brake means (79) held on said slidable coupling element member, said brake means including the plurality of circular brake shoes (81) and circular brake plate members (80);
- d. a cylindrical brake operating member (82) with a bearing (83) mounted on said slidable coupling element member and slidable therewith;
- e. a case (52) for holding said brake device, a plurality of spring members (84) for pressing said brake means (79) against the case (52) of said brake device through said brake operating member (82); and,
- f. a cam means for sliding said slidable coupling element member together with said brake operating member (82) in the axial direction resisting against said spring members (84) in response to the driving torque from said primary drive shaft.

4,049,099

MOTORCYCLE SAFETY HUB

Joseph Spence Zeigler, 166 Cullinane Drive, Marlborough, Mass. 01752

Filed Mar. 3, 1976, Ser. No. 663,261
Int. Cl.² F16D 11/00, 13/04; F16H 57/00
U.S. Cl. 192—46 1 Claim



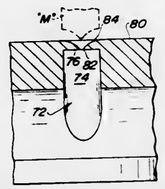
1. In a motorcycle safety mechanism for automatically changing from a primary operative mode to a secondary failure mode upon any malfunction leading to a stoppage in the drive train, the combination of:
- a rotatable driven plate mounted integrally with the rear wheel brake drum hub assembly of the motorcycle,
- a friction disc supported by the driven plate,
- a plurality of spring-loaded driving dogs each pivotally mounted on a boss of the rear wheel axle of the motorcycle,
- a rotatable driving plate mounting the rear wheel driving sprocket and mounted rotatably relative to the driven plate,
- an annular clutch plate mounted on the driving plate and having a plurality of circularly-arranged equispaced ramps inwardly inclined in the direction of normal rotation and each terminating in a dog receiving stop,
- adapted and arranged while the mechanism is in primary operative mode for the preclusion of relative rotation of the driven and driving plates with the dogs each in confrontation with a respective stop and while in a state of seizure in a secondary failure mode for the dogs to be withdrawn from the respective stops under the influence of the reversed input torque and led across the stops allowing free wheeling between the plates.

4,049,100

TORQUE CONTROL DEVICES OF THE VISCOUS SHEAR TYPE AND COMPONENTS THEREFOR

William P. Davis, Exton, Pa., assignor to L G Industries, Incorporated, Coatesville, Pa.

Filed Dec. 15, 1975, Ser. No. 640,454
Int. Cl.² F16D 13/72
U.S. Cl. 192—58 C 11 Claims



1. A torque control device comprising a housing, input and output members journalled in to said housing, spaced pressure plates coupled to one of said members for rotation therewith, a clutch plate interposed between said pressure plates and coupled to the other of said members, and means for applying axially directed force to said pressure plates and said clutch plate, said pressure plates comprising annular disks having a torque-transmitting face thereon and a plurality of circumferentially spaced fluid transfer ports extending therethrough, said ports comprising a blind slot portion opening upon the other face of said disk and extending toward said torque transmitting face, and an indentation in said torque transmitting face extending from said torque transmitting face and intersecting said blind slot, said indentation being elongated in a direction parallel to the major axis of said blind slot portion so that the intersection of said blind spot and said intersection defines an opening having a width and length less than the width and length of said blind slot portion, said indentation providing a bevel between said torque transmitting face and said opening, and resilient lining means on said clutch plate juxtaposed to said fluid transfer ports.

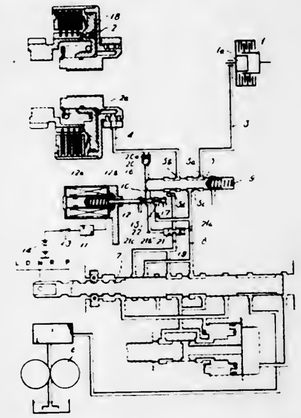
4,049,101

APPARATUS FOR PREVENTING FAULTY OPERATION IN TRANSMISSION OF MOTORCARS

Toraо Hattori, Wako, and Masakazu Maezono, Niiza, both of Japan, assignors to Honda Gikea Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1976, Ser. No. 673,890
Claims priority, application Japan, Apr. 8, 1975, 50-41777
Int. Cl.² F16D 25/10
U.S. Cl. 192—87.19 3 Claims

1. An apparatus for preventing faulty operation in automatic transmission of motor cars, said transmission having a speed-change sensor and a shift valve therein, for controlling the operation of the latter, the apparatus comprising an oil-pressure operated high-speed clutch interposed in a high-speed system, and an oil-pressure operated low-speed clutch interposed in a low-speed system of said transmission, and means for interchangeably connecting said systems through said shift valve to a main line circuit that is connected to an oil-pressure source, wherein said shift valve is operable by the oil pressure, and has at one end an oil-pressure chamber connectable to said main circuit through a pilot valve that can be opened by operation of said sensor, and wherein said chamber is connected to said low-speed clutch through a by-pass, and a flow passage that connects said chamber to said main circuit has a restrictor interposed therein, while said low-speed clutch is provided with a leak valve that is opened when said low-speed clutch is operated at a speed higher than a predetermined value, for discharging the oil pressure from said low-speed clutch.

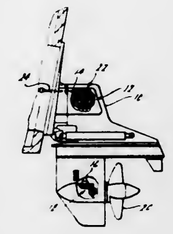


4,049,102

CLUTCH SHIFTING MECHANISM

John W. Hurst, Port Huron, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed July 19, 1976, Ser. No. 706,365
Int. Cl.² F16D 21/04, 23/12
U.S. Cl. 192—93 R 10 Claims



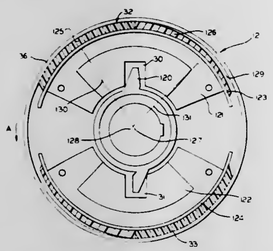
1. In a reversing clutch mechanism wherein two rotatable members are disposed spacedly on a shaft and are axially movable on the shaft to positions of engagement and non-engagement with the clutch mechanism, means coupling the two members together for joint axial movement on the shaft and including
- a cam,
- means mounting the cam for bidirectional rotation in a plane spaced from the shaft and substantially parallel thereto,
- means for selectively rotating the cam in either rotary direction,
- a cam follower positioned between the shaft and the cam and including a portion which extends toward the cam and is located eccentrically relative to the center of rotation of the cam,
- means mounting the cam follower for reciprocating linear movement in a plane substantially parallel to the shaft,
- means connecting the cam follower portion eccentrically to the cam whereby partial rotation of the cam in either rotary direction causes the cam follower to move parallel to the shaft in a corresponding linear direction, and

means connecting the two members to the cam follower.

4,049,103
AUTOMATIC TRANSMISSION

John A. Sessler, 1600 W. Townline Road, Milton Junction, Wis. 53564

Continuation-in-part of Ser. No. 511,443, Oct. 2, 1974, abandoned. This application May 17, 1976, Ser. No. 686,915
Int. Cl.² F16D *43/14*
U.S. Cl. 192—105 CD **8 Claims**

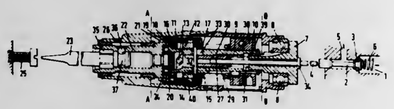


1. An automatic power train comprising a power input means and a power output means with an automatic transmission means in between;
dry clutch means interposed in said power train to prevent sudden applications or over-running of a load;
said clutch means comprising at least one shoe and drum;
means responsive to centrifugal force for causing said at least one shoe to engage said drum only when said power input means is up to driving speed with respect to said power output means; and
means for varying coefficients of friction between portions of said drum and shoes of said clutch to promote slippage between each when said power output means overruns said power input means.

4,049,104
POWER OPERATED TORQUE TOOL

George Heary Webb, Berkhamsted, England, assignor to Desoutter Brothers Limited, London, England

Filed Apr. 13, 1976, Ser. No. 676,402
Claims priority, application United Kingdom, Apr. 30, 1975, 17945/75
Int. Cl.² F16D *43/20*
U.S. Cl. 192—150 **6 Claims**

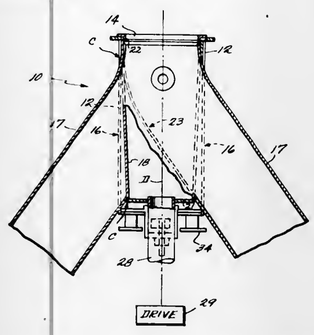


1. A pressure-fluid operated torque tool having
a pressure-fluid driven motor,
a valve controlling the flow of pressure fluid to the motor,
a torque-responsive clutch having a clutch member adapted to move axially when the torque delivered exceeds a predetermined level,
a tubular member carrying the drive from the motor to the clutch, and having an internally-tapered portion,
a push-rod extending centrally through the tubular member,
a plurality of rod-engaging balls arranged between the tapered portion of the tubular member and the rod, to be forced against the rod by the tapered portion to grip the rod, and
a cage for supporting the balls, which cage is moved axially by said axially movable clutch member, when the predetermined torque level is reached, to release the grip of the balls on the rod; and below the predetermined torque is biassed by a spring to bring the balls into cooperation with the tapered portion, where they grip the rod.

4,049,105
DIVERTER VALVE

Peter G. Kindersley, Glens Falls, N.Y., assignor to Kamyr Incorporated, Glen Falls, N.Y.

Filed Nov. 7, 1975, Ser. No. 629,902
Int. Cl.² B65G *11/20*
U.S. Cl. 193—31 R **8 Claims**

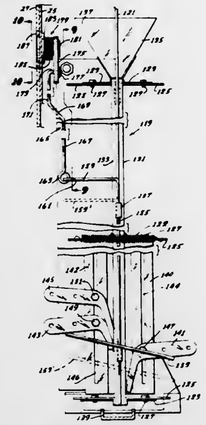


1. A gravity-feed flowable material diverter valve assembly comprising
a. a valve housing having an inlet, a tubular substantially constant diameter main body portion symmetrical about a generally vertical axis, and a plurality of outlets, said inlet being located vertically above said outlets,
b. means for diverting flowable material flowing through said inlet to a selected one of said plurality of outlets while preventing delivery of flowable material to the other of said outlets, said means comprising
i. an inner element in the shape of a truncated cone, said inner element concentric with and located in said housing and symmetrical about said generally vertical axis and spaced from said housing main body portion a distance that increases from said inlet toward said outlets, and extending generally the whole length of said housing, and mounted for non-eccentric rotation about said generally vertical axis,
ii. a hollow diverter element mounted within and rigidly connected to said inner element and having a first end defining an open top thereof in communication with said housing inlet, and having a second end defining a side opening located about 90° from said open top end for communication with a selected one of said plurality of outlets, said inner element having top and side openings therein corresponding to said top and side openings of said diverter element,
iii. a plurality of outlet arm members, one corresponding to each of said housing outlets, each of said arm members having a portion thereof extending through said housing and making sealing contact with the outer surface of said inner element, and
c. means for rotating said inner element with respect to said housing about said generally vertical axis of rotation.

4,049,106
VENDING MACHINE MECHANISM HOUSING AND ARMOR PROTECTION THEREFOR

Jack S. Chalabian, Huntington Beach, Calif., assignor to K-Jack Engineering Company, Inc., Gardena, Calif.

Continuation-in-part of Ser. No. 664,546, March 8, 1976, abandoned. This application May 19, 1976, Ser. No. 687,881
Int. Cl.² G07F *5/08*
U.S. Cl. 194—1 B **24 Claims**



1. A coin mechanism housing comprising a body having
means for mounting said body to a vending machine,
means for receiving coins of various combinations inserted by a consumer for delivery to a coin selection and control mechanism,
means for storing coins of predetermined value passed through a coin selection and control mechanism in said body,
means for returning coins of other than predetermined value and which have been rejected by a coin selection and control mechanism to a consumer who has inserted them into said receiving means,
means for delivering the coins inserted into said receiving means to one of said storing means and said returning means,
baffle means through which coins must pass, intermediate said delivery means and said storing means,
a key-operated locking mechanism on said body which is operable to alter the operating mode of a coin selection and control mechanism within said body, and
indicia placed on the exterior of said body with the position of the indicia relative to the locking mechanism indicating the operating mode of the coin selection and control mechanism.

4,049,107
PRINTING DEVICES OR HEADS FOR PRINTERS OR THE LIKE AND A PROCESS FOR MAKING SUCH A PRINTING HEAD

Roger Murat, Argenteuil, France, assignor to Societe d'Applications Generales d'Electricite et de Mecanique SAGEM, Paris, France

Filed Oct. 3, 1975, Ser. No. 619,321
Claims priority, application France, Oct. 8, 1974, 74.33837
Int. Cl.² B41J *3/04*
U.S. Cl. 197—1 R **8 Claims**

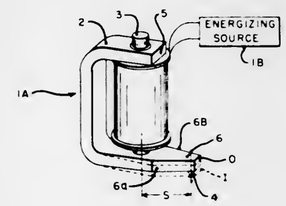
1. In a printing device for a printer having an assembly of needles and respective control means for each of said needles one end of each needle being intended to strike an information and support and mark thereon selected points representative of figures, characters or the like, said control means comprising a metal plate and an electro-magnet for displacing said plate when a signal is applied across the winding of the electro-magnet, the displacement being such as to cause the projection of the respective needle towards said support, each electro-magnet of said control means being supported in a base, the improvement wherein each electro-magnet includes a substantially U-shaped element having arms defining a magnetic circuit, said element being separate from said base, the winding of said electro-magnet being disposed around an arm of said U-shaped element, said base having housings for supporting said magnetic circuit elements, and a surrounding material is provided to adhere to said magnetic circuit element and said base, said surrounding material encapuslating each winding and said arm supporting said winding to fix said elements and windings with respect to said base and protect said windings.



4,049,108
ACTUATOR FOR A MATRIX PRINT HEAD

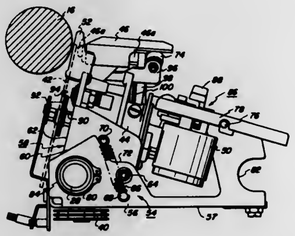
Frank Giessner, Augsburg, Germany, assignor to NCR Corporation, Dayton, Ohio

Filed July 29, 1976, Ser. No. 709,739
Claims priority, application Germany, Dec. 23, 1975, 2558380
Int. Cl.² B41J *3/04*
U.S. Cl. 197—1 R **5 Claims**



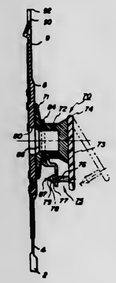
1. An actuator comprising:
a magnet means having first and second ends; and
a spring means having one end fixed to said first end of said magnet means and also having a free end located near said second end and having an actuating element on said free end;
said spring means being shaped to provide a magnetic flux path for said magnet means; and
said spring means being generally U-shaped and formed from a single piece of magnetic material, and said magnet means being an electromagnet means.

4,049,109
PRINT MEMBER CARRIAGE ASSEMBLY
Mario G. Plaza, Fremont, and Richard D. Trezise, Newark, both of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Mar. 8, 1976, Ser. No. 664,789
Int. Cl.[2] B41J *1/24*
U.S. Cl. 197—53 8 Claims



1. A carriage assembly for transporting a print member along a predetermined path adjacent a support member, comprising:
- a first carriage section adapted to be mounted adjacent said support member for movement along said predetermined path;
- means for mounting a print member to said first carriage section for movement between first and second positions relative to said support member; and
- means, coupled to said means for mounting, for retaining a print member mounted to said first carriage section in each of said first and second positions, said means for retaining including a dual biasing spring for biasing said print member in a direction opposite said second position when at said first position and for biasing said print member in a direction opposite said first position when at said second position.

4,049,110
PRINT WHEEL MOUNTING ASSEMBLY
Kenneth R. Frechette, Dallas, Tex., assignor to Xerox Corporation, Stamford, Conn.
Filed May 28, 1976, Ser. No. 691,264
Int. Cl.[2] B41J *1/30*
U.S. Cl. 197—53 4 Claims



1. In a daisy wheel print element having a plurality of spokes extending radially outward from a central section, character slugs having a print surface and an impact surface and coupled to the ends of the spokes, said central section having an opening centered therein for mounting the print element on a shaft of a print wheel motor; an improved print element mounting assembly comprising:

a generally circular disc section having a central opening and being coupled to the central sectin and positioned coaxially with the opening in the central section,

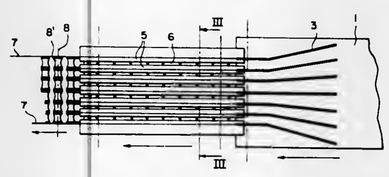
a generally cylindrical section having a central opening and being coupled at one end to the generally circular disc section and positioned coaxially with the opening in the central section,

a coil spring having at least one turn positioned around the periphery of the generally cylindrical section, and coil spring having two end portions which extend radially from the generally cylindrical section and are spaced apart a predetermined distance,

means for tightening the spring around the generally cylindrical section, said tightening means having an end cap section pivotally coupled to one edge portion of the end of the generally cylindrical section which is positioned furthest from the central section in an axial direction, said end cap section having a portion which extends in a radial direction beyond the outer periphery of the generally cylindrical section, said extended portion having a shaft extending at right angles therefrom back toward the central section of the print wheel, said shaft having a cylindrical section coupled to a tapered section increasing in peripheral distance which is coupled to a tapered section decreasing in peripheral distance, said end cap section being positioned such that the shaft is capable of being inserted between the two end portions of the coil spring to spread the end portions apart,

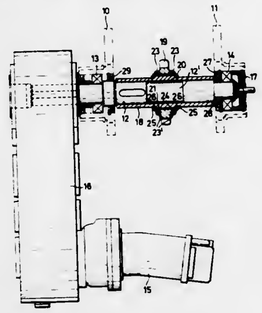
whereby the print wheel is clamped to the shaft of the print wheel motor.

4,049,111
DEVICE FOR CONVEYING EGGS
Jacob Hendrik Mosterd, Barneveld, Netherlands, assignor to Moba Holding Barneveld B.V., Barneveld, Netherlands
Filed July 23, 1975, Ser. No. 598,422
Claims priority, application Netherlands, Aug. 8, 1974, 7410666
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—445 9 Claims



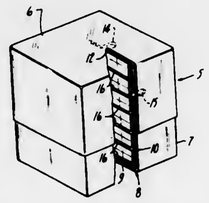
1. A device for conveying eggs, comprising a broad conveyor on which a number of eggs can be randomly positioned, a discharge device having a number of juxtapositioned discharge locations, and a number of generally horizontal mutually parallel gutters located between the broad conveyor and the discharge device, each gutter having slightly tilting sidewalls and a slot in the central portion between the sidewalls, push members protruding only slightly through said slots, and means for moving said push members longitudinally through said slots relative to the gutter sidewalls in the direction from the broad conveyor towards the discharge device, said push members comprising freely rotatable circular members for passing beneath an obstructed egg in said gutters without injuring the egg, but pushing unobstructed eggs along said gutters, whereby obstructed eggs caused by irregular feed to or discharge from said gutters may be temporarily stowed along any of said gutters without breakage.

4,049,112
CHAIN DRUM FOR CHAIN CONVEYORS
Willy Tyslauk, Lunen, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Westphalia, Germany
Filed Dec. 16, 1975, Ser. No. 641,326
Claims priority, application Germany, Dec. 19, 1974, 2460099
Int. Cl.[2] B65G *23/06*
U.S. Cl. 198—834 6 Claims



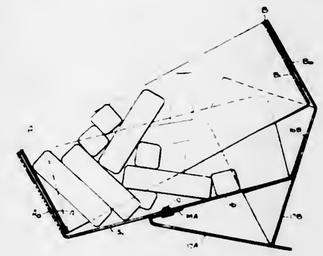
1. In a chain drum for a chain conveyor, in particular a scraper-chain conveyor mounted on a cutting jib of a cutter-loader or the like, having a shaft supported at axially spaced apart locations, the improvement comprising a one-piece sleeve separate from said shaft, said sleeve surrounding said shaft and being disposed between said axially spaced locations, means constraining the sleeve to rotate with the shaft, the sleeve being provided with external teeth, at least one diametrally split sprocket surrounding said sleeve, said at least one sprocket comprising two sprocket halves having axial shoulders, removable locking means overlapping said shoulder portions to hold said sprocket halves on said sleeve, and circlips holding the locking means in place against axial movement, the sprocket halves being provided with internal teeth which interengage with the teeth on the sleeve and constitute therewith a force-transmitting connection between the sleeve and the split sprocket, whereby said sprocket halves may be removed from said sleeve without disassembly from said shaft.

4,049,113
MERCHANDISE CONTAINER
James E. Joyce, 878 Darien, Rochester, Mich. 48063, and Judy A. Zeller, 5559 Westwood Lane, Birmingham, Mich. 48010
Filed Oct. 26, 1976, Ser. No. 735,910
Int. Cl.[2] B65D *5/50, 5/52*
U.S. Cl. 206—44 R 28 Claims



1. A merchandise container comprising: an outer carton; a plurality of merchandise trays disposed in stacked relationship within said carton; and at least one wrapper of sheet material, each having a bottom and opposed side portions terminating in integrally hinged flaps, each wrapper being disposed around a portion of said stacked trays, the side portions of each wrapper being of such height as to enclose said portion of stacked trays disposed within and permitting said flaps to fold over the top of said portion of stacked trays, the cumulative height of said side portions of said wrappers substantially filling said carton, wherein some of said wrappers have registering apertures formed in their flaps and side portions and the other said wrappers have pairs of registering apertures formed in their flaps which straddle a fold line which divides each flap, said apertures to act as a double-walled reinforced handle to permit the wrapper and trays disposed within to be lifted from the carton.

4,049,114
CONVERTIBLE CARTON
Hans Danbeisser, Merrick, N.Y., assignor to Inmco Industries, Inc., Flushing, N.Y.
Filed July 26, 1976, Ser. No. 708,686
Int. Cl.[2] B65D *5/52, 25/24*
U.S. Cl. 206—44 B 11 Claims

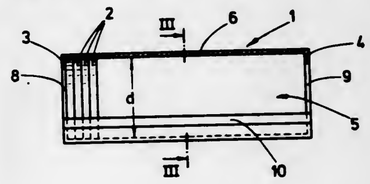


1. A convertible carton which is capable in a storage mode of containing a multiplicity of like items in an orderly array and when converted to assume an open-bin form in a jumble mode to display these items in disarray, the carton comprising:

A. a rectangular shell having front, rear and side walls; and

B. a drop-out base secured to said shell, said base in the storage mode being flat to provide a carton of uniform depth and having a predetermined interior volume sufficient to accommodate said items in an orderly array, said base in the jumble mode having a V-shaped trough-like configuration serving to enlarge the interior volume of said carton, whereby the arrayed items then drop into the trough-like base and assume random positions therein to create said disarray.

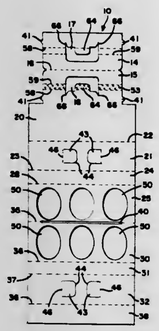
4,049,115
COIN HOLDER
Max Pasbrig, Orselina, Ticino, Switzerland, assignor to Lacrex Brevetti S.A., Minusio, Switzerland
Filed June 7, 1976, Ser. No. 693,700
Claims priority, application Germany, June 25, 1975, 2528324
Int. Cl.[2] A45C *11/28, 1/02*
U.S. Cl. 206—.84 7 Claims



1. A holder for receiving a number of coins and the like which are stacked on top of one another comprising:

a substantially cylindrical casing having a casing wall and opposed ends;
said cylindrical casing possessing an internal crosssection essentially corresponding to the outer contour of the coins to be inserted;
a rim defining a locating edge provided at each end of the cylindrical casing for forming an end face boundary for limiting said cylindrical casing;
said cylindrical casing being provided with a longitudinal slot extending over the entire length of said cylindrical casing;
the width of said longitudinal slot being less than the diameter of each of the coins to be inserted into said cylindrical casing;
said longitudinal slot being enlarged at least at one of the ends of the casing to form a gripping opening surrounded by the rim at said one end;
said longitudinal slot being bounded by feed strips having inner guide surfaces which open outwards to form sliding surfaces for the coins to be inserted;
the wall and each of the rims of said cylindrical casing being formed at least in part of a flexible material to enable the longitudinal slot to expand to the width of the coins to be inserted at least in predetermined places of said longitudinal slot.

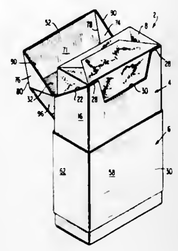
4,049,116
BOTTLE AND GLASS CARRIER
Kenneth Cope, Dayton, Ohio, assignor to Neff Folding Box Company, Dayton, Ohio
Filed Nov. 12, 1976, Ser. No. 741,471
Int. Cl.² B65D *85/30, 5/46, 5/48*
U.S. Cl. 206—176 **9 Claims**



1. A carrier for glasses or bottles comprising a generally vertical major divider wall, a handle portion extending upwardly from said major divider wall, means forming a cutout in said handle portion to provide a hand opening for manually grasping the carrier, a first bottom wall extending generally laterally away from said major divider wall, a first lower side wall extending generally upwardly from said first bottom wall, a first upper side wall extending generally upwardly and laterally from said first lower side wall to said handle portion, a second upper side wall extending generally downwardly and laterally from said first upper side wall and said handle portion, means forming a slot in said carrier between said first and second upper side walls for said handle portion and said handle portion passing upwardly through said slot, means forming openings through said first and second upper side walls for receiving the glasses or bottles therethrough, a second lower side wall extending generally downwardly from said second upper side wall, a second bottom wall extending generally laterally away from said second lower side wall to said major divider wall and said first bottom wall, an additional divider wall extending upwardly from said second bottom wall adjacent said major divider wall, means adhering said additional divider wall to said major divider wall, a separate separator piece passing through said handle cutout above said upper side walls, and wings on said separator piece extending downwardly above said upper side walls substantially between said openings therein for separating the tops of glasses or bottles within said openings in said carrier.

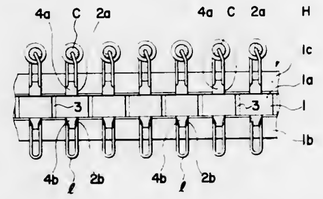
6. Two blanks for forming a carrier for glasses or bottles, the first blank comprisng a handle portion, means forming a cutout in said handle portion to provide a hand opening therein, a major divider wall extending from said handle portion, a first bottom wall foldably extending from said major divider wall opposite said handle portion, a first lower side wall foldably extending from said first bottom wall opposite said major divider wall, a first upper side wall foldably extending from said lower side wall opposite said first bottom wall, a second upper side wall foldably extending from said first upper side wall opposite said first lower side wall, means forming a slot in said blank between said first and second upper side walls, said slot having a width corresponding to that of said handle portion, means forming openings through said first and second upper side walls for receiving the glasses or bottles, a second lower side wall foldably extending from said second upper side wall opposite said first upper side wall, a second bottom wall foldably extending from said second lower side wall opposite said second upper side wall, and an additional divider wall foldably extending from said second bottom wall opposite said second lower side wall, the second blank comprising a separate separator piece having wings foldably extending from opposite sides thereof and sized for positioning within said handle cutout with said wings spaced at distances aligned substantially with the portions of said upper side walls between said openings therein.

4,049,117
PACKAGE HAVING A SLIDE ACTUATED CLOSURE MEMBER
Wolfgang H. Grimm, Richmond, Va., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.
Division of Ser. No. 512,957, Oct. 7, 1974, Pat. No. 3,977,520.
This application May 4, 1976, Ser. No. 682,901
Int. Cl.² B65D *5/38, 85/12*
U.S. Cl. 206—270 **7 Claims**



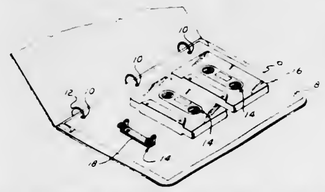
1. A blank for forming a receptacle for cigarettes or other articles comprising:
a. a rear wall panel,
b. a first side wall panel operatively connected to the rear wall panel by a first score line, the upper edge of the side panel being diagonal from a lower point adjacent the rear panel to an upper point,
c. a front wall panel operatively connected to said first sidewall panel by a second score line opposite said first score line, the upper edge of said panel at each side thereof is at the elevation of the upper point of the diagonal top edge of the first side panel and the center portion of the upper edge is recessed relative thereto,
d. a second sidewall panel operatively connected to the front wall panel by a third score line opposite the second score line, the upper edge of the side panel being diagonal from the upper edge of said front panel downwardly in a manner generally corresponding to the upper edge of said first sidewall panel,
e. at least one bottom panel connected to one of the front and rear panels by a fourth score line,
f. a glue flap connected to the top edge of the rear wall panel by a fifth score line.

4,049,118
HOLDING DEVICE FOR ELECTRICAL AND ELECTRONIC PARTS
Fumio Honda, Kyoto; Tsuneo Taki, Hakui, and Masatoshi Kajiwara, Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan
Filed Aug. 31, 1976, Ser. No. 719,383
Claims priority, application Japan, Oct. 3, 1975, 50-135858
Int. Cl.² B65D *73/02*
U.S. Cl. 206—330 **10 Claims**



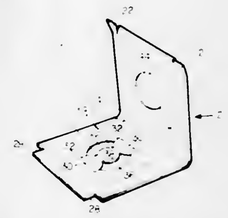
1. A holding device for holding therein a plurality of electrical and electronic components at the lead wire portions thereof with regular intervals thereinbetween, said holding device comprising:
a base member of tape-like configuration;
a plurality of holding means for holding said electrical components spaced from each other longitudinally along said base member, each holding means comprised of:
a first hinge-like tongue member cut from said base member perpendicular to the longitudinal direction of said base member, whereby said lead wires can be inserted into said base member through said cut therein and held therein by said tongue member pressed into said cut and forcing said lead wires between the side of said tongue member and said cut.

4,049,119
TAPE CASSETTE FILING UNIT
Robert B. Wilson, Holyoke, Mass., assignor to National Blank Book Company, Inc., Holyoke, Mass.
Filed May 17, 1976, Ser. No. 687,154
Int. Cl.² B65D *85/672, 85/67, 25/02*
U.S. Cl. 206—387 **4 Claims**



1. Filing unit for tape cassettes comprising a base sheet, at least one cassette retainer clip affixed to the surface of said sheet, said clip including a base and upwardly extending post portions, said post portions being spaced apart a distance approximately equal to the spacing between reels of said tape cassette, each of said post portions including outwardly extending lugs to engage the inner surface of the reel opening of said cassette.

4,049,120
TAPE REEL SHIPPING FOLDER
Thomas E. Bower, Long Beach, Calif., assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Mar. 29, 1976, Ser. No. 671,890
Int. Cl.² B65D *85/67*
U.S. Cl. 206—396 **2 Claims**

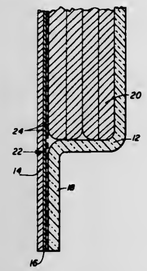


1. A tape reel shipping folder for packaging a reel of tape, wherein the tape is tightly wound into an annular reel about an annular reel hub, the annular reel hub having a thickness greater than the thickness of the tape, said shipping folder comprising a pair of folder panels hingedly connected and adapted to be folded into overlying relationship with the reel of tape positioned therebetween, one of said folder panels including a pair of hub-locking tabs hingedly attached to said folder panel and foldable into underlying, surface-to-surface contact with said folder panel and into free edge-abutting relationship with each other to form a substantially circular locking member adapted to fit within and continuously contact a major portion of the circumference of a center opening in said annular reel hub to position said reel of tape between said folder panels and a reduced thickness region overlying said annular reel hub and being adjacent to said hub-locking tabs to accomodate the greater thickness of said annular reel hub and allow said folder panel to flushly contact and securely hold said tape wound on said annular reel hub, and folder locking means formed on said pair of folder panels and locking said folder panels into engagement around said reel of tape.

4,049,121
MOISTURE DETECTION SYSTEM FOR A STERILE PACKAGE
Leonard Alan White, Gurnee, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed July 14, 1976, Ser. No. 705,212
Int. Cl.² A61B *19/02;* **B65P** *77/22;* **G01D** *13/00;* **A22C** *17/10*
U.S. Cl. 206—439 **17 Claims**

1. A system for detecting water contamination which com-

prises: a package having sterile unfrozen contents covered by a gas permeable barrier; a water soluble dye pattern in said



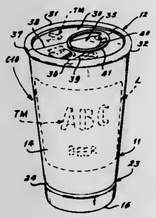
package, said pattern adapted to bleed in response to water in said package, for visibly indicating said water contamination.

4,049,122

NESTABLE NON-CORROSIVE CONTAINER FOR PRESSURIZED BEVERAGES AND PROCESSES FOR MANUFACTURE AND HANDLING THEREOF

Earl G. Maxwell, 9108 Halls Ferry Road, St. Louis, Mo. 63136

Filed Oct. 21, 1974, Ser. No. 516,378
Int. Cl.[2] B65D *21/02, 7/48, 17/24*
U.S. Cl. 206—519 **12 Claims**



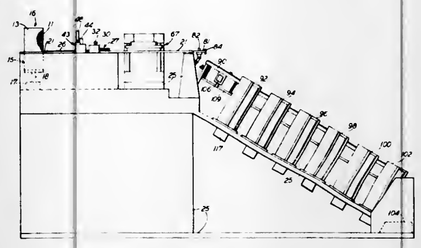
1. A returnable and refillable metal container for pressurized beverages or the like, comprising a one-piece seamless container body having a frusto-conical side wall and an integral bottom end wall forming an interior cavity to be filled with pressurized beverage, said container body also having an open top end with means adapted to receive and sealably hold a rupturable closure seal thereon against pressures exerted by the beverage within the container, means projecting radially from said side wall between the top and bottom ends and forming an abutment ledge in predetermined spaced relation with one of said top and bottom ends, said container body being adapted to nestably receive a similar container body in any relative circumferential position thereof in non-wedging contact with said abutment ledge means to maintain the side and bottom end walls of the first and similar nested containers in a spaced-apart and non-locking condition for subsequent unrestricted separation for use, said interior cavity being defined by a permanently non-corrosive metal surface which, upon sterilization, is chemically inert to the pressurized beverage, said container body being of predetermined strength and rigidity, and said container being adapted to be used and repeatedly returned for immediate reuse in substantially the original manufactured condition of the container after sterilization of the container.

4,049,123

METHODS OF AND APPARATUS FOR SORTING ARTICLES IN ACCORDANCE WITH THEIR RESISTIVITY AND THICKNESS

Charles R. Fegley, Laureldale; Richard H. Winings, Lawrence, and Clifford R. Yeich, Jr., Reading, all of Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Filed June 1, 1976, Ser. No. 691,804
Int. Cl.[2] B65G *47/34*
U.S. Cl. 209—74 M **13 Claims**



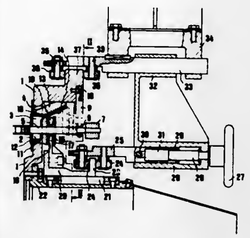
1. A method of sorting articles, which comprises the steps of:
moving the articles successively along a first track to a thickness determining device;
producing a signal from said thickness determining device indicative of the thickness of each article;
storing said thickness signal;
rendering effective a resistivity determining device in response to the stored thickness signal;
continuing to move the articles successively along the track and to the resistivity determining device;
producing a signal from said resistivity determining device indicative of the resistivity of each article;
storing said resistivity signal;
continuing to move each article successively along the first track onto a second track; and
moving each article in response to said stored signals successively along the second track into a preselected position associated with both the thickness and resistivity of each article.

4,049,124

SORTING MACHINE FOR ELONGATED ARTICLES

Joseph Coppolani, Meudon la Foret, and Leon Vanderaette, Rueil-Malmaison, both of France, assignors to Societe Franco-Europeenne de Material pour l'Industrie Alimentaire "F.E.M.I.A" France, Paris, France

Filed Mar. 25, 1976, Ser. No. 670,269
Claims priority, application France, Apr. 2, 1975, 75.10243
Int. Cl.[2] B07C *5/04*
U.S. Cl. 209—98 **9 Claims**



1. In a sorting machine for elongate articles in which fixed and movable bars are disposed alternately around a rotary

drum having a bearing flange, an adjustment assembly for adjusting the spacing between said fixed and movable bars, said adjustment assembly being operative when said sorting machine is in operation and including parts with radial slots accommodating said movable bars for sliding displacement therein, means for displacing said movable bars in said slots comprising cam members associated with said movable bars and inclined with respect to the axis of the drum, means mounting said cam members on the bearing flange of the drum, cam followers freely slidably mounted on said movable bars, resilient return means constantly urging said cam followers in contact with said cam members and in a direction corresponding to a limit position of said movable bars in said radial slots, slide control members for controlling the sliding of said cam followers along said movable bars, and means independent of the rotation of the drum for displacing said slide control members in unison, parallel to the axis of the drum.

4,049,125

CARPET SAMPLE DISPLAY APPARATUS

Barnett B. Rochestie, Trenton, N.J., assignor to Royal Engineering Company, Trenton, N.J.

Filed July 27, 1976, Ser. No. 709,037
Int. Cl.[2] A47F *7/16*
U.S. Cl. 211—47 **10 Claims**

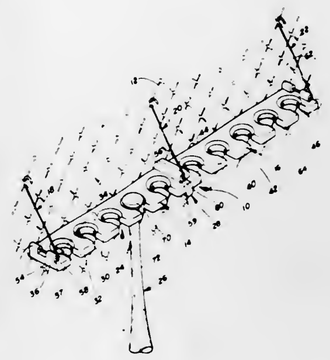
1. A carpet sample display apparatus comprising:
a. a plurality of pivotally moveable hanger arms;
b. support means for holding said hanger arms in spaced relation, with respect to one another and the surrounding environment, said hanger arms being pivotally movably mounted within said support means; and
c. a plurality of hanger members for holding a plurality of carpet samples extending downwardly therefrom for display, said hanger members further comprising:
   1. at least one downwardly extending channel means which defines a longitudinally extending channel slot means for receiving and holding the carpet samples for display;
   2. a mounting sleeve adapted to receive one of said hanger arms therein to secure said hanger member to said support means, said mounting sleeve defining a sleeve slot means extending longitudinally therealong to allow flexing of the walls of said mounting sleeve to facilitate gripping of said hanger arms; and
   3. tab means along the edges of said channel slot means and extending into said channel means to hold displayed carpet samples therein.

4,049,126

WEIGHT EQUALIZED FOLDABLE BAT RACK

Lance K. Halverson, Seattle, Wash., assignor to Rolf Sporting Goods, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 589,016, June 23, 1975, abandoned. This application Mar. 26, 1976, Ser. No. 670,637
Int. Cl.[2] A47F *5/08*
U.S. Cl. 211—104 **14 Claims**



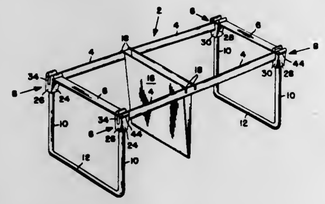
1. A bat rack with a first, open, configuration attachable to an open weave fence for the storage of baseball bats and a second, closed, configuration for transporting the rack, comprising:
a first and second support bar for receiving a plurality of bats, each having front and rear edges, spaced ends, an upper surface, and forward opening recesses spaced along its length and communicating with said front edge to separately receive and hold each bat in a substantially vertical position, each recess having a width smaller than the width of the handle knob of the bat;
a first and second hanger pivotally connected to said first support bar, each hanger including a forward opening hook attachable to the open weave fence, said hangers being positionable normal to said upper surface in the first open configuration of said bat rack, and said hooks being engageable with the fence at a point forward of said rear edge and above said upper surface, and said hangers also being rotatable to a position parallel to and contacting said upper surface of said first support bar in the second closed configuration of said bat rack;
a hinge disposed between said first and second support bars and attached near adjacent joined ends of said first and second support bars, said adjacent joined ends abutting in the first configuration thereof;
a third hanger pivotally connected to said second support bar near the free end thereof, said third hanger also including a forward opening hook attachable to the open weave fence forward of said rear edge of said second support bar;
whereby in the first open configuration thereof the moments tending to tilt the bat rack are partially equalized by said hangers engaging said open weave fence forward of said rear edge of each support bar and whereby said bat rack is foldable to a size of lesser overall dimensions in the second configuration thereof.

4,049,127

HANGING FILE FOLDER SUPPORT FRAME

Robert L. Alexander, Erlanger, Ky., assignor to Hunt Manufacturing Co., Philadelphia, Pa.

Filed Aug. 30, 1976, Ser. No. 718,561
Int. Cl.² A47F 5/10
U.S. Cl. 211—189 **9 Claims**



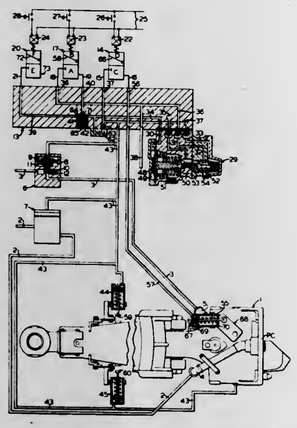
1. A hanging file folder support frame comprising:
a pair of file folder support rails,
a pair of transverse members,
four corner fittings each having a substantially vertical slot receiving one end of a rail and having an entrance at the top thereof for the passage of a rail into the slot and a substantially horizontal slot receiving one end of a transverse member and securing it against upward movement.
each transverse member overlying both rails to prevent the upward movement of the rails, and
a leg supporting each corner fitting.

4,049,128

CONTROL SYSTEM FOR AUTOMATIC RAILWAY CAR COUPLER

William B. Jeffrey, North Huntingdon, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Nov. 18, 1976, Ser. No. 742,772
Int. Cl.² B61G 5/08, 5/10
U.S. Cl. 213—1.6 **8 Claims**



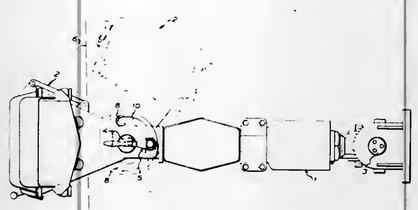
1. Control apparatus for an automatic railway car coupler comprising one mating head, including an electrical contact portion for connecting electrical train circuitry and a pipe connector portion for connecting fluid pressure train lines, said mating head being carried on one car and adaptable for coupling with a counterpart mating head on another car for automatically and concurrently effecting coupling of the cars and connection of the respective electrical circuitry and pipe lines of the train, said control apparatus comprising:
a. a source of fluid under pressure;
b. normally open cut-out valve means interposed in the respective fluid pressure train lines and operable, in response to actuating fluid pressure, to respective closed positions for interrupting flow through said train lines;
c. centering means carried by the respective mating heads in normally disengaged positions relative to the mating heads and operable, responsively to actuating fluid pressure, to respective abutting positions with the mating heads and in which said mating heads are positioned in axial alignment with each other prior to coupling engagement;
d. retracting means disposed on the respective mating heads and operable, in response to actuating fluid pressure, to respective retracted positions in which electrical contact blocks of the electrical portions of the mating heads, respectively, are electrically disengaged from each other;
e. latching means carried by the respective mating heads normally biased to respective latching positions for locking the mating heads, upon engagement, in a coupled relation and being operable, in response to actuating fluid pressure, to an unlatching position for releasing the mating heads from said coupled relation prior to disengagement thereof; and
f. actuating means operable, at will, for effecting supply of actuating fluid pressure from said source to said latching means for effecting sequential operation thereof to their unlatching positions subsequently to concurrent operation of said cut-out valve means, said centering means, and said retracting means to their closed positions, abutting positions, and retracted positions, respectively.

4,049,129

AUTOMATIC COUPLING FOR STREETCARS AND THE LIKE

Olof Sune Bergs, Sundborn, Sweden, assignor to AB Dellner-Malmco, Falun, Sweden

Filed July 1, 1976, Ser. No. 701,561
Claims priority, application Sweden, July 14, 1975, 7508039
Int. Cl.² B61G 7/12
U.S. Cl. 213—4 **4 Claims**



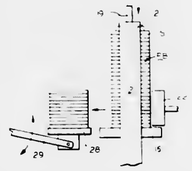
1. In an automatic coupling for streetcars and similar railborne vehicles, the coupling comprising:
a. a connecting rod pivotally connected to the vehicle; and
b. a coupling head pivotally connected to the connecting rod, the improvement that the coupling head is pivotal in the horizontal plane between an operative position in an extension of the connecting rod, in which position the coupling head projects beyond the front profile of the vehicle, and an inoperative position beside the connecting rod, in which position the coupling head is located inside the front profile of the vehicle; and that the coupling head cooperates with a locking device by means of which the coupling head may be locked to the connecting rod at least in said operative and inoperative positions; said locking device including a cone or the like which, in the locking positions, may be lodged in corresponding recesses; said cone being lodgably connected to a pin provided on said connecting rod or said coupling head, said pin extending through a groove in said coupling head or said connecting rod, said groove being curved and having the pivotal center of the coupling head as its center of curvature, and said groove being provided with said recesses corresponding to said locking positions.

4,049,130

APPARATUS FOR HANDLING AND MOVING ARTICLES

John T. Bell, St. Charles, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 16, 1976, Ser. No. 667,254
Int. Cl.² B65G 59/06
U.S. Cl. 214—8.5 A **2 Claims**



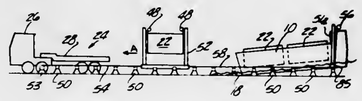
1. Apparatus for moving a portion consisting of a predetermined number of yieldable flat articles, such as paperback books or the like, from a group of such articles disposed with the sides thereof in contiguous relationship, said apparatus comprising:
a. guide means for maintaining a group of said yieldable articles in aligned contiguous relationship;
b. said guide means having an opening on one side thereof to accomodate the movement of a portion of said group out of side guide means in a direction transverse to a longitudinal axis passing through said group;
c. means for imposing a varying pressure load along the longitudinal axis of said group so that the compression of said group will cause a predetermined number of articles to be in said portion;
d. means engageable with a side of said portion and movable in a direction transverse to said longitudinal axis to remove said portion from said group maintained in said guide means.

4,049,131

FREIGHT CONTAINER UNLOADING SYSTEM

William L. Schrader, Orchard Lake, and Harold T. Rose, Sterling Heights, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1975, Ser. No. 595,188
Int. Cl.² B65G 63/00
U.S. Cl. 214—14 **4 Claims**



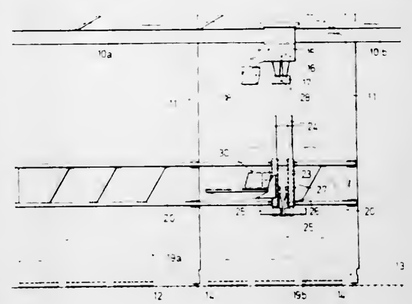
1. A transport system for moving a multi-ton freight container from a beached watercraft to a waiting vehicle located on firm terrain; said system comprising two parallel rows of anti-friction support units positionable on the beach at spaced points along a path leading from the beached watercraft to the waiting vehicle; the two rows of support units being spaced apart by a distance that is greater than the craft width or vehicle width; the support units having termination points alongside the beached watercraft and waiting vehicle; a sled of tunnel shape supported for translatory movement along the support units from a starting position straddling the watercraft to a delivery position straddling the waiting vehicle; hoist means carried by the sled for initially lifting the freight container from the watercraft and later lowering the freight container onto the waiting vehicle; and winch-cable means for towing the sled over successive ones of the anti-friction support units to thereby transport the container from the watercraft to the vehicle; each anti-friction support unit comprising a terrain-engageable pedestal, a roller-mount assembly (73) located above the pedestal, and a jack (76) operatively trained between the pedestal and roller-mount assembly for selectively locating the mounted roller at different elevations relative to the subjacent terrain.

4,049,132

CRANE ADAPTED TO THE HANDLING OF UNIFORM CARGO UNITS

Per Strömbäck, Lindome, Sweden, assignor to Salen & Wicander Terminalsystem AB, Goteborg, Sweden

Filed Sept. 9, 1976, Ser. No. 721,713
Claims priority, application Sweden, Sept. 12, 1975, 7510168
Int. Cl.² B66C 19/00
U.S. Cl. 214—14 **5 Claims**



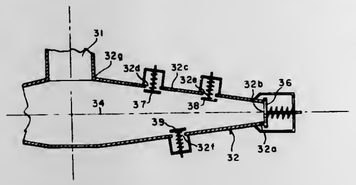
1. Means for handling cargo units of uniform size at a quay having a ranging area and adapted for mooring a ship along its water edge, and comprising
a crane extendable over said ranging area and reaching outside the quay's water edge and having lifting means being terminated by a yoke for piecemeal engaging said cargo units,
guiding means at two opposite edges of said yoke,
an operator's cage at an elevated level at said crane,
a gantry means extendable over said ranging area and located at a lower level than said operator's cage,
a trolley movable along said gantry means and an operator's seat at said trolley, and
two guides at said trolley located oppositely to each other and each having a guide member for cooperating with the guide means at said yoke.

4,049,133

PROCESS AND APPARATUS FOR THE SUPPLY OF A DRY, FREE-FLOWING COAL POWDER TO A HIGH-PRESSURE COAL GASIFICATION REACTOR

Gernot Staudinger, Amsterdam, Netherlands, assignor to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Apr. 14, 1976, Ser. No. 676,725
Claims priority, application Netherlands, Apr. 24, 1975, 7504844
Int. Cl.² B65G *65/32*
U.S. Cl. 214—17 B 10 Claims



1. In a process for the supply of a dry, free-flowing coal powder to a high-pressure coal gasification reactor, wherein the coal powder is introduced by means of a centrifugal pump into a chamber brought under high pressure with an inert gas and wherein the coal powder is passed from the high-pressure chamber into a reactor space of a high-pressure coal gasification reactor by means of a dosing apparatus communicating therebetween, the improvement comprising:

introducing the coal powder into the pressurized chamber via a centrifugal pump comprising an inlet tube passing through a wall of the chamber and a rotatable rotor connected with the inlet tube and disposed in the chamber, said rotatable rotor including a plurality of outwardly tapering centrifugal nozzles disposed in a radial position with respect to the axis of rotation of the rotor, said coal powder being introduced by:

feeding the coal powder via the inlet tube to the rotor; and

rotating the rotor to throw the coal powder into the chamber by centrifugal forcce through the outwardly tapered centrifugal nozzles and to create a gas leakage from the chamber to the center of the centrifugal pump via the outwardly tapered centrifugal nozzles such that the gas pressure at any point in the centrifugal nozzles is about 70 to about 90% of the pressure exerted at that point on the coal particles by centrifugal force and by frictional force between respective coal particles and between the coal particles and said centrifugal pump whereby blockage of the coal particles in said centrifugal nozzles is prevented.

8. An apparatus for the supply of dry, free-flowing coal powder to a high-pressure coal gasification reactor, comprising:

a high-pressure chamber, including means for supplying gas to the chamber to provide high pressure therein, and centrifugal pump means for supplying coal powder to the chamber under high pressure, said centrifugal pump means comprising:

an inlet tube passing through a wall of the high-pressure chamber; and

a plurality of rotatable centrifugal nozzles grouped to form a rotor connected with the inlet tube and disposed in the chamber in a radial position relative to the inlet tube, each of said centrifugal nozzles respectively tapering outwardly from said inlet tube and having a longitudinal inverse trumpet shape; and

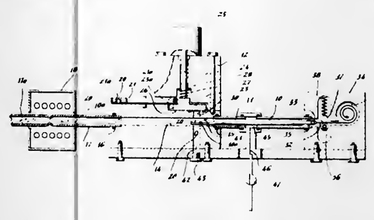
a dosing apparatus means for passing the coal powder from the high pressure chamber to a high-pressure coal gasification reactor.

4,049,134

MOVABLE LADLE IN A PRESSURIZED CONDUCT FOR TRANSPORTING SPECIMENS TO A COMBUSTION CHAMBER

Igor E. Dolgen, Monroe, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 2, 1976, Ser. No. 654,426
Int. Cl.² B65G *65/30*; G01N *1/00*
U.S. Cl. 214—29 6 Claims



1. A pressurized ladle transport for operation between supply and delivery locations, comprising:

an elongated conduit connected at one end to the delivery location and having an aperture thereinto at the supply location;

an elongated ladle slideably disposed within said conduit and having a spoon portion on the end thereof that is directed toward the delivery location;

a housing connected to the other end of said conduit;

a flexible tape connected to the other end of said ladle and extending into said housing, the length of said tape being sufficient to extend from within said housing when said spoon portion on said ladle is at the delivery location;

means for driving said tape bidirectionally relative to said housing;

means for storing said tape within said housing; and a source of gas connected to pressurize said conduit, said source being at a pressure greater than the atmosphere exterior to said conduit, said drive means being controllable to move said tape in positioning said ladle at either the supply or delivery locations with material being deposited on said spoon portion thereof through said aperture at the supply location and the environment within the ladle transport being uncontaminated by the exterior atmosphere due to the pressurization therein.

4,049,135

CONTAINER HANDLING ARRANGEMENT WITH CHASSIS ADAPTER FRAME

John J. Glassmeyer, Covington, Ky., assignor to Pullman Incorporated, Chicago, Ill.

Filed Apr. 30, 1976, Ser. No. 681,998
Int. Cl.² B65G *67/02*
U.S. Cl. 214—38 CC 13 Claims

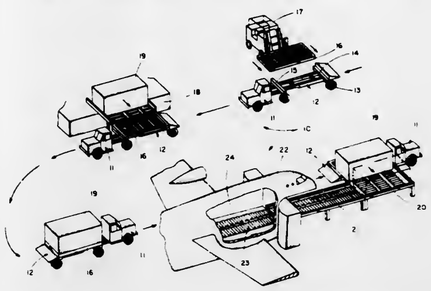
10. For a cargo container having a light-weight wall structure which is susceptible to destruction during conventional transshipment handling such as upon a highway vehicular chassis;

a temporary transporter frame cradling the container and providing an underframe therefor,

first locking means for releasably securing said transporter frame to said wall structure of the container in supportive rigidfying relation,

second locking means adapted for releasably securing said transporter frame to the vehicular chassis, and

means on said transporter frame interposed between the same and said cargo container providing limited side surface areas to facilitate removal of said container off said transporter frame for deposit upon an adjacent limited load-carrying cargo transport adapted to receive and



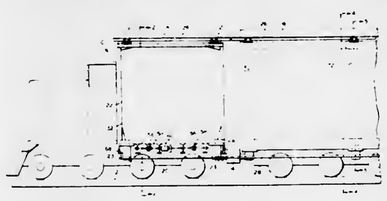
adequately support said container and cargo therein without said transporter frame.

4,049,136

PRIME MOVER AND BOX CAR COMBINATION FOR HANDLING CARGO

Warren O. Fleenor, 8250 W. Bergen Road, LeRoy, N.Y. 14482

Filed Dec. 22, 1975, Ser. No. 643,086
Int. Cl.² B60P *1/44*
U.S. Cl. 214—38 R 12 Claims



7. An improved prime mover for use in conveying a box car between cargo handling stations for loading and unloading cargo comprising:

a prime mover frame having a movable support rail separate from a box car to be conveyed and movable to an extended operating position; and

a cargo handling mechanism carried by said support rail of said prime mover and slidably mounted and positioned on said support rail in said extended operating position, and movable from said extended operating position of said support rail to the box car for loading and unloading cargo therefrom.

4,049,137

HAULING VEHICLE WITH SIDE DUMP BODY

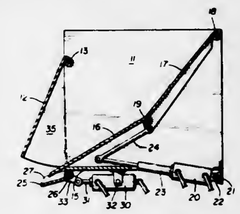
Gustave Meyer, Northglenn, Colo., assignor to Irvin L. Stumpf, Wheat Ridge, Colo., a part interest

Filed Jan. 27, 1976, Ser. No. 652,837
Int. Cl.² B60P *1/00*
U.S. Cl. 214—82 3 Claims

1. An improved side dump hauling body, adapted for heavy duty, of the kind having a pair of stationary end walls running between first and second sides of the hauling body, a stationary bottom wall connecting the lower edges of the end walls and an ejector hingedly attached at its top edge at the top of the second side of the hauling body, and moveable from a retracted to an extended position, and wherein the improvement comprises:

a. a free swinging side panel hingedly attached at its top edge at the top of said first side of the hauling body and depending from said hinge in substantially vertical position for sealing said first side in cooperation with said first and second end walls and said stationary bottom wall, and being swingable outwardly from sealing position in response to pressure of the load carried within the body to open sufficiently for load discharge;

b. said ejector comprising a first ejector plate depending from said hinged attachment at the top of the second side of the hauling body and substantially closing said second side, and a second ejector plate having a hinge attaching a first edge to the lower edge of the first ejector plate, the second plate having a second edge opposite said first edge and supporting the second plate in slidable contact with said stationary bottom wall, the second ejector plate forming an acute angle between its lower side and the stationary bottom wall and having its second edge substantially spaced from the first side of the hauling body when the ejector is in retracted position, the spacing between the second ejector plate and the first side of the hauling body allowing a load within the hauling body to be partially supported on the stationary bottom wall and partially supported on the second ejector plate, the acute angle with the bottom wall allowing the second plate to initiate shifting of the load toward the free swinging side without the second plate having to lift the entire mass of the load, the second ejector plate sliding on its second edge over the stationary bottom wall to the first side of the hauling body during movement into extended position and sliding with the bottom face of the second ejector plate against the first side edge of the bottom wall when the second edge of the second ejector plate has extended outside the first side of the hauling body;



c. said hinged attachment at the top of the first ejector plate being at a relatively higher vertical position than the hinge at the top of the free swinging side, the relatively lower height of the free swinging side aiding loading of the hauling body by ground based loaders, and the relatively greater height of the second side of the hauling body allowing the ejector to extend in a steeper angle for load discharge and also allowing the first plate of the ejector to swing the hinged attachment between the two ejector plates along an arc of increased radius, during ejector extension initially moving said second ejector plate with a greater horizontal component for inducing shifting of a load toward the free swinging side without undue lifting of the load;

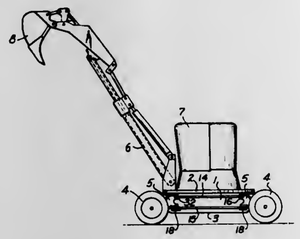
d. ejector activating means for swinging the ejector on said hinge at the top of the second side of the hauling body, moving the hinged connection between the two ejector plates toward the free swinging side during ejector extension, the connection between the activating means and the ejector allowing the two ejector plates to be moved beyond a single plane position when the ejector is fully extended; and

e. latching means for holding the free swinging side panel in position sealing said first side of the hauling body when the load is to be retained in the hauling body, and being releasable independently of the operation of said ejector activating means in connection with load discharge.

4,049,138
EXCAVATOR HAVING ADJUSTABLE WHEELS

Ingebret Soyland, Solhogda 2 Brynehaugen, Bryne, Norway (N-4340)

Filed July 18, 1975, Ser. No. 597,227
Claims priority, application Norway, July 19, 1974, 7422642
Int. Cl.² B62D *61/00*; E02F *9/02*
U.S. Cl. 214—132 **2 Claims**



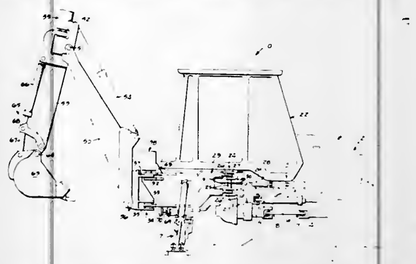
1. An excavator, comprising:
an under frame, said under frame being generally cylindrical and including vertical wall means;
upper and lower circular, continuous rib means forward on the exterior of said vertical wall means of said cylindrical under frame, said upper and lower rib means lying in parallel, generally horizontal planes;
an upper frame rotatably mounted on said under frame, and supporting a boom and bucket assembly, and an operator cabin;
a pair of fore brackets and a pair of aft brackets, all of said brackets being engageable with both of said upper and said lower circular, continuous rib means and being slidable therealong to any desired selected position;
clamp means for releasably securing said brackets to said upper and said lower continuous rib means in selected locations therealong about the periphery of said vertical wall means of said cylindrical under frame;
a horizontally elongated arm pivoted at one end thereof each of said brackets, for pivotal movement in a horizontal plane; and
means for releasably securing said elongated pivoted arms to their associated brackets in a selected pivoted relationship; and
wheel means carried on the free, other end of each of said arms, said brackets being movable about the periphery of said cylindrical under frame to vary the width between said wheel means at the fore end and the aft end of said excavator, and said arms being adjustable relative to their associated brackets to properly align said wheel means.

4,049,139
BACKHOE WITH MULTI-MOVEMENT CAPABILITIES

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 25, 1976, Ser. No. 661,088
Int. Cl.² E02F *3/75*
U.S. Cl. 214—138 R **26 Claims**

1. A backhoe comprising
a frame,
a support member,
first pivot means pivotally mounting said support member on said frame for horizontal pivotal movements relative thereto,
first actuating means operatively interconnected between said support member and said frame for selectively pivoting said support member relative thereto,
a boom assembly,
second pivot means pivotally mounting a lower end of said boom assembly on said support member for horizontal pivotal movements relative thereto,
second actuating means operatively interconnected between said boom assembly and said support member for selectively swinging said boom assembly relative thereto,
a dipper stick assembly, including a support bracket and a dipper stick having a clevis, defining a pair of spaced arms, rotatably mounted on said support bracket,

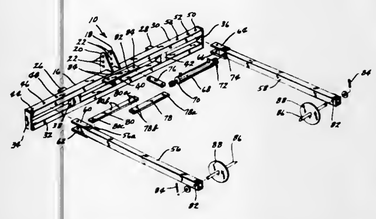


third pivot means pivotally mounting said support bracket on an upper end of said boom assembly for vertical pivotal movements relative thereto,
third actuating means operatively interconnected between said support bracket and said boom assembly for selectively pivoting said dipper stick assembly relative thereto,
fourth actuating means operatively interconnected between said dipper stick and said bracket for selectively rotating said dipper stick thereon, and
a work tool mounted on a lower end of said dipper stick.

4,049,140
BALE CARRYING AND UNROLLING DEVICE

Gerald L. Roose, Rte. 3, Pella, Iowa 50219

Filed Feb. 23, 1976, Ser. No. 660,662
Int. Cl.² B66F *9/18*
U.S. Cl. 214—147 G **7 Claims**

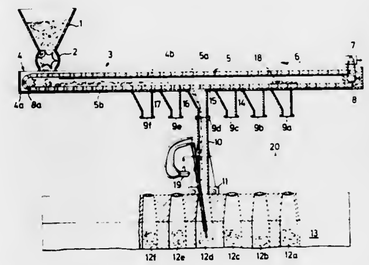


1. A bale carrying and unloading device for use with a three-point hitch or the like, said device comprising:
a cross-bar frame structure with a plurality of horizontally spaced apart vertical apertures,
securing means on said frame to secure said frame to an implement hitch of a prime mover,
a pair of spaced apart rearwardly extending arms pivotally mounted by hinge means on said cross bar frame structure for pivotal movement about a vertical axis,
said hinge means comprising a pin for pivotally mounting each of said arms to said cross bar, said pin being received within one of said apertures in said cross bar frame and being selectively movable to other of said apertures,
a hydraulic cylinder having an extendable and retractable ram at one end and mounted at its opposite end to one of said arms, said ram being operatively secured to said other arm for selectively effecting the pivoting of said arms towards and away from one another, and
a cylinder movement strap of adjustable length to adapt to lateral adjustment of the pivotal axis of said arms having one end secured to said ram and the other end secured to said other arm.

4,049,141
METHOD OF CHARGING A PLURALITY OF COKING OVENS

Wolfgang Rohde, and Werner Siebert, both of Essen, Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed Apr. 30, 1975, Ser. No. 573,284
Claims priority, application Germany, May 4, 1974, 2421615
Int. Cl.² C10B *31/04*
U.S. Cl. 214—152 **9 Claims**



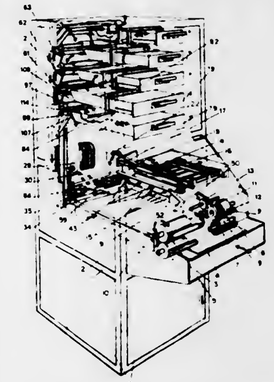
1. A method of charging a plurality of coking ovens which are arranged in a horizontal row, by means of an endless scraper conveyor which extends along the row above the charging holes of the ovens and has an upper run and a lower run each extending from a first end portion of the conveyor adjacent one end of the row of ovens to a second end portion of the conveyor adjacent another end of the row of ovens, comprising the steps of admitting a quantity of coal at a location adjacent said first end portion through said upper run of said conveyor onto said lower run thereof; transporting the coal on said lower run lengthwise of said row in direction from said one end towards said other end of said row; charging coal from said lower run into the charging holes of said ovens in a sequence which begins with an oven closer to said other end than to said one end and which progresses counter to said direction of transportation to ovens which are successively closer to said one end while skipping intermediate ovens; terminating the charging of the respective ovens in response to generation of a signal indicating that a predetermined filling level has been reached in the charging hole of the oven; conveyinng any residual portions of the coal which have not been discharged from the lower run by the time respective increments of the lower run reach said second end portion of the conveyor, from said lower run onto said upper run and thereon counter to said direction towards said first end portion; and discharging said residual portions of coal from said upper run onto said lower run at said location adjacent said first end portion of the conveyor.

4,049,142
AUTOMATIC MACHINE FOR UNLOADING AND RELOADING OF PLATES IN CASSETTES, PARTICULARLY RADIOGRAPHS

Cesare Azzaroni, Bologna, Italy, assignor to Cesare Azzaroni, Bologna, Italy

Filed Feb. 27, 1976, Ser. No. 662,043
Claims priority, application Italy, Feb. 27, 1975, 3346/75
Int. Cl.² B65G *65/04*
U.S. Cl. 214—301 **7 Claims**

1. Automatic machine for receiving a cassette with an exposed plate, having any of a wide variety of sizes, opening the cassette, unloading the exposed plate, reloading with an unexposed plate of appropriate size, and closing and ejecting the cassette, comprising:
a loading plane, including first sensor means for detecting the presence of a cassette thereon, and further including the input and output station means, which contain a means for hermetic protection against light, for gripping and conveying the cassettes inside the machine when the presence of a cassette is detected by said first sensor means and for taking the cassettes out of the machine;
a first conveyor means, placed behind said input and output station means, for receiving the entering cassette and for transferring the cassette inside the the machine;
control means, including a first stop, for stopping the movement of said first conveyor means and for changing the direction of said first conveyor means to supply said input and output station means with the reloaded cassette during the phase of ejection of the cassette form the machine;
a pushing means for the positioning of the cassette in orthogonal direction with respect to the moving direction of the cassette on said first conveyor means;
second sensor means, placed laterally to said first conveyor means for determining the span of said pushing means and for detecting the lateral dimension of the cassette;
unlocking means for unlocking of the cassette, placed above said first conveyor means, the operation of said unlocking means being controlled by said second sensor means;



opening means, operating in synchronization with said unlocking means, for rotating the cassette cover from the originally closed position into the open position of the cassette, said opening means including first suckers;
plate removing means for taking off the exposed plate, from inside the cassette, said plate removing means being timed with said opening means and including second sucker means for taking the plate out of the cassette and transferring the plate onto a second conveyor means, placed inside a tunnel with hermetic protection against light, for the output of the plate from the machine;
a plurality of magazine drawers for storing plates to be forwarded singly to the cassettes, from where the exposed plate had been previously taken off;
a plurality of feeding ducts, each having an inlet corresponding to one of said magazine drawers;
a plurality of plate transfer means, one corresponding to each of said magazine drawers, for taking a plate from one of said magazine drawers and transferring the plate to the corresponding one of said feeding duct inlets, each of said plate transfer means including second suckers to hold the plates, the particular plate transfer means which is activated, corresponding to the desired magazine drawer, being controlled by said second sensor means and the position of said pushing means;

loading means for transferring the plate from said feeding ducts to the open cassette; and

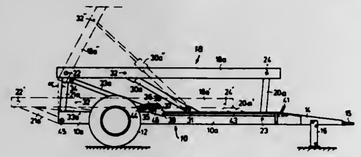
closing means for closing and locking the cover of the cassette, thereby preparing the reloaded cassette for ejection by said input and output station means.

4,049,143

TRAILER-TYPE VEHICLE FOR LIFTING, TRANSPORTING, AND DEPOSITING LOADS

Vesa Hatakka, Helsinki, and Jussi Sarvela, Espoo, both of Finland, assignors to Oy Innovation Services Co., Finland

Filed July 27, 1976, Ser. No. 709,096
Claims priority, application Finland, Jan. 19, 1976, 760113
Int. Cl.² B60P *1/34*
U.S. Cl. 214—390 **14 Claims**



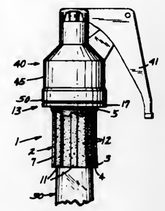
1. A vehicle for lifting, transporting, and depositing a load, comprising lower frame means of substantially U-shaped configuration having a front transverse bar means adapted to be attached to a pulling vehicle and a pair of opposed side longitudinal bar means connected with and extending rearwardly from said front transverse bar means and defining with the latter a space for accommodating a load, at least a pair of wheels being operatively connected with said pair of opposed side bar means to support said lower frame means during travel thereof, upper frame means also of substantially U-shaped configuration situated at an elevation higher than said lower frame means and being of substantially the same size and configuration as said lower frame means, said upper frame means also having a front transverse bar means and a pair of opposed side bar means connected with said front transverse bar means of said upper frame means and extending rearwardly therefrom for also defining with said lower frame means a space for accommodating a load, connecting means extending between and interconnected with said lower frame means and said upper frame means for connecting said upper frame means to said lower frame means for movement with respect thereto downwardly to a lower load-receiving position and upwardly to an upper load-transporting position, said connecting means also providing for said upper frame means a transverse pivot axis about which said upper frame means turns when carrying out a load-depositing operation, a pair of expandable and contractable fluid-pressure means respectively situated on opposite sides of and beyond the load-accommodating space defined by said upper and lower frame means with each of said fluid-pressure means being operatively connected to a side bar means of said lower frame means and a side bar means of said upper frame means for lowering said upper frame means from said upper load-transporting position thereof down to said lower load-receiving position thereof during expansion of each fluid-pressure means and for turning said upper frame means about said pivot axis during a load-depositing operation also during expansion of each fluid-pressure means, and releasable holding means operatively connected between part of said connecting means and said lower frame means for releasably holding said pivot axis stationary during turning of said upper frame means about said pivot axis when carrying out a load-depositing operation.

4,049,144

LIQUID DISPENSING APPARATUS

Lloyd J. Schimke, Box 1272, Highway 2 East, Minot, N. Dak. 58701

Filed Mar. 17, 1976, Ser. No. 667,878
Int. Cl.² G01F *11/38*
U.S. Cl. 222—448 **10 Claims**



6. In combination with a measuring device of the type having a body defining a measuring chamber with a cylindrical outlet located at the top of said chamber and a cylindrical inlet located at the bottom of said chamber, and means for selectively sealing each of said cylindrical outlet and cylindrical inlet while the other remains open, wherein said means are actuated by the action of a handle pivotally attached to said body, the improvement comprising:

a. flexible, cylindrical sleeve member having an exterior surface and a tubular inner surface, the length of said sleeve member being at least as great as the interior diameter of said sleeve member, said sleeve member having first and second end portions, the interior surface of said first end portion being sealably abuttable against said liquid container inserted therein; and

b. means for connecting said second end portion of said flexible sleeve member to said cylindrical inlet of said measuring chamber, said means for connecting said second end portion of said flexible sleeve member to said cylindrial inlet of said measuring chamber comprising a base member connected to said second end portion of said sleeve member, said base member defining an opening to permit the passage of liquid therethrough, said base member including a threaded portion for threadably engaging a measuring device; and a flange positioned between said sleeve member and said threaded portion of said base member and abuttable against said cylindrical inlet of said measuring chamber for forming a seal between said measuring device and said adapter.

4,049,145

REVERSIBLE AND VARIABLE SPEED DRIVE MEANS FOR CONVEYORS AND BEATERS ON A FORAGE WAGON

James H. Downing, Mineral, and Harold F. Bear, Timberville, both of Va., assignors to Bear Industries, Inc., Alexandria, Va.

Filed Mar. 26, 1976, Ser. No. 670,917
Int. Cl.² B60P *1/38*
U.S. Cl. 214—519 **2 Claims**

1. A self-unloading argicultural wagon comprising:

a frame having a frame front wall and having an enclosure, the frame having forward and aft ends;

an unloading assembly on the forward end of the frame;

the unloading assembly including side walls and forward and rear walls;

a power input shaft journaled between the forward and front walls and adapted to be driven by the power take-off output shaft of a prime mover for the wagon;

a pair of end axles journaled between said forward and rear walls of the unloading assembly and carrying sprockets;

a driven gear fixed to one of said axles;

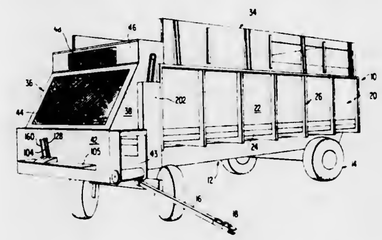
an endless unload conveyor trained about said axles and having chain means engaged by said sprockets;

a reversible direction drive for said unload conveyor disposed between said frame front wall and said unloading assembly rear wall, and comprising a drive gear, a tension gear, and an idler gear, all aligned with said driven gear, and a chain extending transversely of the wagon and changeably trained about the drive gear and idler gear to vary the direction of rotation of the tension and driven gears and thereby change the direction of movement of the conveyor;

a variable speed drive disposed between said frame front wall and said unloading assembly rear wall and comprising drive means connecting the drive gear and the power input shaft, an adjustable first main drive pulley on said power input shaft, a variable diameter pulley on a floor web drive shaft journaled between the forward and front walls, and a belt extending transversely of the wagon and connecting said main drive and variable diameter pulleys;

an elongated pipe drive disposed above said reversible and variable speed drive and rotatably journaled between the side walls of the unloading assembly, said pipe drive being connected to said floor web drive shaft; and

endless floor webs disposed above said unload conveyor within said enclosure and driven forwardly by said pipe drive to deliver material in the enclosure to said unload conveyor.

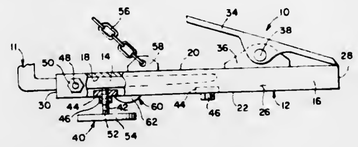


4,049,146

FIFTH WHEEL ATTACHMENT

Karl Decker, Lenape Way, Box 144, Ironia, N.J. 07845

Filed May 24, 1976, Ser. No. 689,353
Int. Cl.² B62D *53/08*; B66F *9/12*
U.S. Cl. 214—620 **3 Claims**



1. A portable, self-contained fifth wheel device for detachable mounting on a vehicle, such as a fork lift truck or the like, for towing a wheeled container, such as a trailer, comprising:

a. a frame for detachable connection on a wheeled vehicle of the type having a pair of spaced apart support arms, said frame having a pair of spaced apart, oppositely disposed housings with a front end and a rear end and including elongated hollow channels for receiving a corresponding pair of support arms therein from said rear end;

b. said frame including an upper surface and a lower surface with a fifth wheel pivotally mounted to said upper surface of said frame for detachable connection to a wheeled container;

c. locking means supported by said frame for selective engagement with said support arms when disposed in said housing channels, each of said channels includes members secured thereto in confronting relation to a respective one of said arms for clamping said support arms therebetween;

d. said locking means further includes:

i. a first threaded socket extending into the hollow channel on each of said housing along the lower surface thereof,

ii. a second threaded socket extending into said hollow channel on each of said housing on a plane transversely of each said first threaded socket, and

iii. a threaded member extending through each of said threaded sockets into the housing for engagement with the arms of the fork lift truck and having a screw lock handle externally of said frame for locking said frame in place relative to the arms of the fork lift truck;

e. releasing means mounted on said frame for controlling air brakes on the wheeled container, said means including:

i. an air tank mounted between said housings and comprising a pressure gauge mounted thereon with an air tank fill valve,

ii. at least one air hose connected to said air tank at one end thereof and adapted to be connected to the wheeled container, and

iii. valve means connected between said air tank and said air hose and operable from the fork lift truck for regulating said valve for selectively controlling the air flow;

f. anchor means secured to each of said oppositely disposed housings to extend above said upper surface;

g. safety ties secured at one end to said anchor means and the opposite end adapted to be secured to the fork lift truck or the like, said safety ties include spaced apart chains secured to each of said anchor means; and

h. spacing means extending rearwardly from said air tank to said valve means in the direction of the fork lift truck or the like, so as to prevent the wheeled container from accidentally engaging said air hose, said spacing means extending beyond said rear end.

4,049,147

PLASTIC SKIN ENVELOPES FOR GLASS BOTTLES AND THE LIKE

Claude J. Stiles, Tuscola, and Daniel Tomo, Arthur, both of Ill., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 433,169, Jan. 14, 1974. This application Feb. 7, 1977, Ser. No. 766,114
Int. Cl.² B65D *11/16, 23/08*
U.S. Cl. 215—12 R **8 Claims**

1. A seamless, lightweight, strong, uniform, multiply, oriented foamed layer tubular preform laminate with good opacity adapted to heat-shrunk onto a tubular substrate rapidly and uniformly, said laminate comprising first and second plies of plastic material in overlying adherent relation, said first ply comprising a low density polyethylene and said second ply comprising an expanded ethylene polymer, the ply of low density polyethylene being about 10–20% of the thickness of the laminate, the skrinkage along the length of said preform upon application of heat being about 70–90% and the shrinkage in the transverse direction being about 5–15%.

2. The tubular preform laminate of claim 1 wherein the expanded ply is disposed interiorly of said preform.

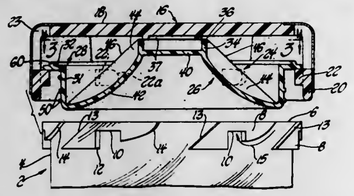
5. A glass bottle having an adherent coating of the tubular preform laminate of claim 2 heat shrunk thereon.

4,049,148

CHILD RESISTANT CLOSURE ASSEMBLY

Donald C. Suhr, Farmington Hills, Mich., and Peter Hedgewick, Windsor, Canada, assignors to International Tools (1973) Ltd., Windsor, Canada

Continuation-in-part of Ser. No. 687,740, May 19, 1976, abandoned. This applicatioa Nov. 5, 1976, Ser. No. 739,172
Int. Cl.² B65D *53/00, 55/02*
U.S. Cl. 215—214 **21 Claims**



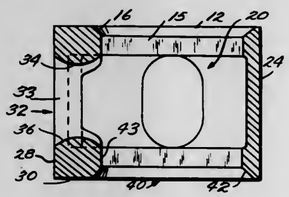
1. A safety closure assembly comprising: a cap having an end wall with a skirt projecting therefrom and a plurality of peripherally spaced bayonet locking elements formed on the inner surface of the skirt adapted to be engaged with and disengaged from complementary container bayonet locking elements on a container by combined axial and rotary motion of the cap relative to such container, and a combined spring and sealing member for sealingly engaging a container to which the cap is adapted to be applied and at the same time biasing the cap locking elements into locked engagement with the container locking elements, wherein the improvement comprises the spring and sealing member having a unitary plastic body with a cylindrical sealing wall having inner and outer ends for sealingly engaging the inner wall of the mouth of a container; a flange projecting radially outwardly from the outer end of said cylindrical sealing wall for overlying the container rim; a plunger having a base portion concentric with said cylindrical sealing wall and a side wall extending between said base portion and the inner end of said cylindrical sealing wall; and a plurality of radial stiffening members extending between said base portion and the inner end of said cylindrical sealing wall for applying radially outward sealing forces on said cylindrical sealing wall in response to flexure of the side wall of said plunger in response to movement of the base portion thereof toward the inner end of said cylindrical sealing wall.

4,049,149

FREIGHT CONTAINER UNIVERSAL CORNER

Peter Duresec, Annandale, Va., assignor to William Brener, Annandale; Edward Ball and Floyd Branan, both of Bailey's Crossroads, all of Va., a part interest to each

Filed Nov. 24, 1975, Ser. No. 634,744
Int. Cl.² B65J *1/02;* **B65D** *21/02*
U.S. Cl. 220—1.5 **8 Claims**



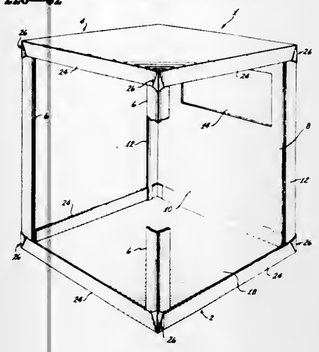
1. An improved corner coupling for forming each corner of a shipping container comprising: a substantially rectangular block having a top wall, a bottom wall and four sidewalls defining around a hollow interior area, one of said four sidewalls being a rear wall, a second of said four sidewalls being a front wall positioned opposite said rear wall, a third of said sidewalls being an interior wall and the fourth of said sidewalls being an exterior wall positioned opposite from said interior sidewall, two adjacent ones of said four sidewalls being solid, said rear wall being one of said solid walls and said interior wall being the other solid wall, the other two adjacent ones of said four sidewalls including means defining an opening therein extending therethrough, said front wall being one of said sidewalls having an opening therein and said exterior wall being the other sidewall having an opening therein, means defining generally rectangular openings extending through said top and bottom walls leading therethrough into the hollow interior of said block, said openings in said top and bottom walls being substantially identical and in axial alignment, wall portions defining upper and lower edges of said openings within the other two adjacent sidewalls, said wall portions being rounded across their width from the exterior to the interior so as to provide a lifting surface for distributing loads placed thereon so that when said corner coupling is positioned in place, regardless of which corner is being formed, whereby said front wall will always face toward the end of the shipping container and said solid walls will always form two of the interior walls through which the coupling is secured to the shipping container.

4,049,150

PAN STRUCTURE

Adam D. Goettl, 4960 E. Palomino Road, Phoenix, Ariz. 85018

Filed Jan. 30, 1975, Ser. No. 545,428
Int. Cl.² B65D *7/42, 5/24*
U.S. Cl. 220—62 **13 Claims**



1. A pan shaped sturcture having at least one structural member attached thereto comprising:

a. a planar surface the periphery of which is defined by a plurality of angularly related edges;

b. a marginal flange at each edge of said planar surface, said marginal flanges normal to said planar surface and unitary therewith, said marginal flanges disposed to form an angular corner junction between each of said marginal flanges;

c. a plurality of corner tab means unitary with said planar surface and said marginal flanges with a different one of said corner tab means located at each of the angular corner junctions, each of said corner tab means folded diagonally toward its respective one of the corner junctions and angularly toward the ones of said marginal flanges which form that corner junction; and

d. at least one structural member normal to said planar surface, said structural member having a portion thereof interlockingly interposed between at least one of said corner tab means and the ones of said marginal flanges which form that corner junction, said structural member comprising,

an elongated corner post having a pair of angularly related surfaces with that angular relationship being substantially equal to the angular relationship of said angular corner junctions,

said elongated corner post having a slot formed in one end thereof which extends longitudinally along the junction between the pair of angularly related surfaces, and

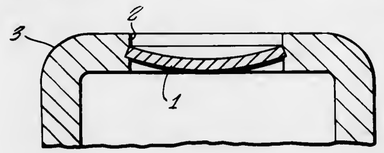
said elongated corner post having a cutout formed in the end of each of the pair of angularly related surfaces, each of the cutouts forming a relatively short tab in its respective one of the pair of angularly related surfaces with those tabs being laterally adjacent the slot of said corner post and on opposite sides thereof, the cutouts also forming a flap member in their respective ones of the pair of angularly related surfaces with those flap members being located laterally adjacent their respective ones of the tabs and spaced outwardly from the slot of said corner post.

4,049,151

METAL EXPANSION PLUG

Robert J. Schweiso, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 4, 1973, Ser. No. 320,930
Int. Cl.² B65D *51/12, 55/00*
U.S. Cl. 220—201 **7 Claims**



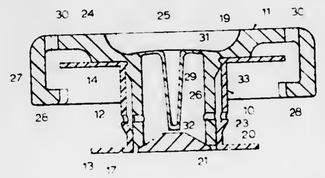
1. A heat recoverable metal plug, which has been deformed from a heat-stable configuration into a heat-unstable configuration, having a transverse dimension smaller in its heat-unstable condition than in its heat-stable condition, said plug being capable of changing its transverse dimension upon being heated to above the transition temperature at which it recovers to its heat-stable condition from its heat-unstable condition, said plug is heat unstable in its martensitic state and heat-stable in its austenitic state.

4,049,152

CLOSURE CAPS FOR VESSELS

Eugene Joseph Treanor, Burnham-on-Sea, England, assignor to Makap Limited, London, England

Filed Jan. 9, 1976, Ser. No. 647,933
Int. Cl.² B65D *51/16*
U.S. Cl. 220—209 **13 Claims**



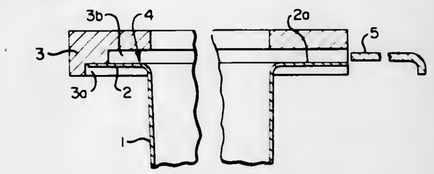
1. A closure cap for insertion into an opening in a vessel, comprising an attachment component with attachment means operative to enable the cap to be releasably secured in the opening and a sealing component separately formed from the attachment component, said sealing component being of a flexible and resilient plastics material formed as a unitary whole and comprising a support and including an inner seal integral with said support for engagement with an inner seating around the opening and an outer seal integral with said support for engagement with an outer seating around the opening, at least one of said seals comprising an outwardly directed flange integrally supported at its inner edge by the support and capable of yielding resiliently when it engages its associated seating so that the flange is urged towards the seating due at least in part to the innate resilience of the material, said closure cap having a duct leading from a space inwardly of the inner seal and communicating with a space outward of at least the inner seal, and a valve for closing the duct and comprising a valve member integral with the sealing component and openable in use in response to a pressure differential across the valve, the higher pressure being in the duct.

4,049,153

SLIDING CLOSURE ARRANGEMENT

Konrad Elsasser, Kalckreuthweg 5, D-7000, Stuttgart 1, Germany

Filed May 3, 1976, Ser. No. 682,345
Claims priority, application Germany, May 3, 1975, 2519847
Int. Cl.² B65D *43/20*
U.S. Cl. 220—345 **13 Claims**



1. A packaging arrangement which includes a container means for accommodating a material to be packaged and cover means for selectively sealing and unsealing an opening of the container means, characterized in that the container means includes a radially extending connecting flange means disposed about the opening thereof, a frame means is arranged at the opening of the container means, said frame means includes a first recess means arranged above the opening of said container means when said frame means is secured thereto and a second recess means arranged at a position below said first recess means, said second recess means having a greater radial width than said first recess means so as to define a shoulder extending over at least a portion of the frame means above said connecting flange means, said frame means being secured to the container at least between said shoulder and an upper surface of said connecting flange means, means are provided in said frame means for accommodating and retaining said cover means therein including a continuous groove means provided in said frame means, said groove means including means for permitting insertion of said cover means therein, said first recess means and an upper portion of said container means defining said groove means and said means for permitting insertion of the cover means.

4,049,154

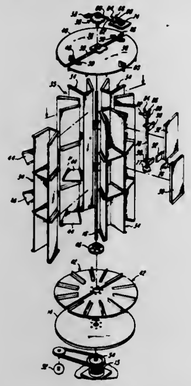
VENDING MACHINE WITH TIERED TURN TABLE CONSTRUCTION

Howard L. Burks, Dunedin, Fla., assignor to Perino B. Wingfield, Yellow Springs, Ohio, a part interest

Filed Mar. 8, 1976, Ser. No. 664,747
Int. Cl.² B65G *1/06*
U.S. Cl. 221—76 **14 Claims**

1. For use in a vending or like machine, a tiered turntable type structure providing receptacles for articles to be vended or dispensed comprising upper and lower plates spaced apart by channel shaped elements providing vertically orienting channels the sides of which are bridged by means providing horizontal partitions dividing said channels into a vertical

series of said receptacles, said channel shaped elements being circularly spaced, at least in part, and the vertical spaces thereby provided between said upper and lower plates and between adjacent of said channel shaped elements which are circularly spaced being similarly bridged by horizontal partition means to form an additional vertical series of receptacles, said upper and lower plates being each comprised of a plurality of plate segments the mating of which produces a composite



structure having a circularly configured periphery, each of said upper plate segments being paired with a lower of said plate segments by a plurality of said channel shaped elements which extend therebetween to form therewith a separable section of said tiered turntable structure, said structure being made up of mating separable sections each comprising plural vertical series of receptacles and each being formed by an upper and a lower plate segment and a plurality of interconnecting channel shaped elements.

4,049,155

APPARATUS FOR ASSEMBLING SLIDERS TO SLIDE FASTENER CHAIN

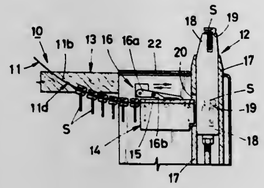
Koichi Kawakami, Kurobe, and Tatsuo Osaki, Uozu, both of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Apr. 4, 1974, Ser. No. 457,785

Claims priority, application Japan, Apr. 18, 1973, 48-46258[U]

Int. Cl.² B21D *53/52*

U.S. Cl. 221—192 **4 Claims**



1. A slider-applying apparatus for manually applying a slider to a fastener chain previously attached to a garment or the like, which comprises a supply chute having spaced parallel rails for delivery of sliders therebetween, a chute support having a horizontal track connected to one end of said chute, a vertically movable slider holder located adjacent said chute support and adapted to receive one slider from said chute and releasably retain said slider at a time for assembling said slider on a fastener chain previously attached to a garment or the like, and a working table having a cutaway recess at its front end behind said slider holder directly over said chute support, said recess being open to said front end and subdivided by said chute support into symmetrical halves positioned to allow a portion of the garment to depend on each side of each slider holder.

4,049,156

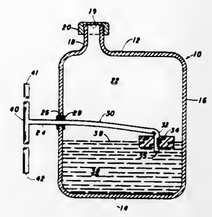
THERMALLY-RESPONSIVE LIQUID DISPENSER

Charles B. Hood, Columbus, Ohio, assignor to Chardon Laboratories, Inc., Columbus, Ohio

Filed Sept. 4, 1975, Ser. No. 610,114

Int. Cl.² B65D *83/14*

U.S. Cl. 222—54 **4 Claims**



1. A liquid dispenser comprising:

a. a fluid-tight container partially filed with a liquid and having an air space above the liquid;

b. an open-ended conduit sealed to and extending outwardly through a side of said container a distance above the liquid in said container, said conduit having an inlet end submerged in the liquid in said container and a discharge outlet disposed exteriorly of said container and below the level of liquid therein; and

c. a vent connected with said conduit exteriorly of said container and at a level above the liquid in said container for venting said conduit to the atmosphere surrounding said container.

4,049,157

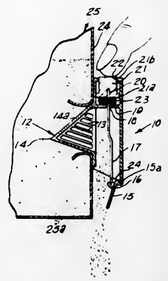
POUR SPOUT CONSTRUCTION

Eunice Carson, 9910 S. Clyde Ave., Chicago, Ill. 60617

Filed Dec. 31, 1975, Ser. No. 645,706

Int. Cl.² B07B *7/26*

U.S. Cl. 222—81 **10 Claims**



3. A pouring spout including an upstanding elongated hollow body, a hollow outwardly tapering prong carried by and projecting outwardly from one side of said body, said one side of said body having an opening formed therein communicating the interiors of said prong and body for rapid flow of granular material from within the interior of said prong into the interior of said body, the lower end of said body defining a downwardly opening discharge opening, closure means shiftably supported from said body and rapidly movable into and out of positions closing and opening the discharge opening, said prong including side walls extending outwardly from said body and converging toward a pointed outer end of said prong, at least one of said prong side walls having at least one opening formed therethrough, spring means operably connected between said body and closure means yieldingly biasing the latter toward its closed position, and operator means shiftably supported from said body for back and forth oscillating movement relative thereto between active and inactive positions and readily engageable from the exterior of said body, connecting means operatively connected between said closure means and said operator means for movement of said closure means between its open and closed positions upon shifting of said operator means between its active and inactive positions, respectively, said connecting means including an elongated longitudinally reciprocal rod extending lengthwise in said body, connected at its lower end to said closure means, and connected at its upper end to said operator means, wherein said prong is generally in the form of a three-sided pyramid, at least two sides thereof having at least one opening formed therethrough, wherein said two sides of said pyramidal prong are defined by the sets of corresponding legs of a plurality of inverted V-shaped teeth spaced along said prong and progressively increasing in size outwardly from said body, the third side of said prong closing the space between the legs of the outermost inverted V-shaped tooth.

4,049,158

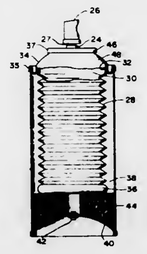
PRESSURIZED CONTAINER-DISPENSERS AND FILLING METHOD

Vincent Lo; Kenneth D. Vos, and Germane M. Suchla, all of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Nov. 13, 1975, Ser. No. 631,772

Int. Cl.² B65D *35/28, 83/14*

U.S. Cl. 222—95 **37 Claims**



1. In a pressurized container-dispenser of the type having a container body and a product chamber therein, valve means for controlling the dispensing of a product therefrom and means to pressurize the product chamber whereby to expel product through the valve means, the improvement wherein said pressurizing means comprises:

a separate pressure source chamber within said container body;

a gas-adsorbent solid and a gas adsorbable thereon within said source chamber to provide a gas reserve whereby pressure in said source chamber is substantially reinforced despite a decrease in gas/volume in the source chamber; and

means to transmit pressure of the source chamber to the product chamber.

4,049,159

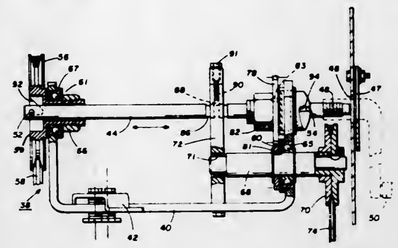
HAND DRIVE FOR BLENDING-TYPE GASOLINE DISPENSER

John Arnold Todd, and George Edward Chevallier, both of Salisbury, Md., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 4, 1976, Ser. No. 729,062

Int. Cl.² B67D *5/60*; F16H *37/06*; B60L *5/40*

U.S. Cl. 222—144.5 **7 Claims**



1. In a motor driven blender-type gasoline dispenser including a first motor driven pump adapted for operable connection to a first source of low octane level gasoline for dispensing, a second motor driven pump adapted for operable connection to a second source of relatively high octane level gasoline for dispensing and blender means operative to simultaneously actuate both motors of said pumps for dispensing a blended mixture of the gasolines from each of said sources, the improvement which comprises a hand drive for manually operating said dispenser comprising in combination an operating shaft mounted for hand driven rotation, drive means drive connected individually with each of said pumps and selection means presettable to selectively connect said drive means with said operating shaft for optionally actuating said first pump alone, said second pump alone or said first and second pumps simultaneously.

4,049,160

FLEXIBLE SQUEEZE DISPENSER FOR LIQUID SEALANT

Arnold Rumm, 63 Purdon Drive, Downsview, Ontario, Canada

Filed Sept. 8, 1975, Ser. No. 611,578

Int. Cl.² B65D *37/00, 35/38*

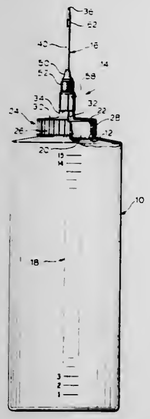
U.S. Cl. 222—215 **5 Claims**

1. A liquid sealant dispenser for use with inflatable balls, each including means defining a closable opening in the ball, the dispenser comprising:

a resiliently deformable container for said sealant, said container having a neck which defines an opening communicating with the interior of the container; and,

a cap assembly comrpising: a cap fitted to the neck of the container, said cap and container neck being formed with co-operating means for removably retaining the cap on the container; a slender elongate dispensing element of tubular form which projects from said cap and which has an inner end portion communicating with the interior of the container, and an outer end which is outwardly rounded, said inner end portion of the dispensing element including an outwardly directed flange, and said cap including an outwardly projecting tubular formation receiving and surrounding said flange; and a sleeve crimped around said formation at the position of said flange and coupling said formation in liquid-tight relationship with said flange; the dispensing element being formed with a single, laterally-directed dispensing opening which communicates with the interior of the container, said opening being of a length not substantially greater than its width and being positioned closely adjacent to but spaced from the outer end of the element so that the portion of the

dispensing element between said opening and the cap is of substantial length compared with the overall length of the element and is unapertured, said portion of the element being of constant cross-sectional shape and having a small external diameter in relation to the overall length of the element to allow insertion of the element in said closable opening in a ball;



whereby when the dispensing element is inserted through said opening in a ball, said unapertured portion of the dispensing element extends through the wall of the ball and spaces said dispensing opening of the element substantially inwardly of the ball so that the element communicates only with the interior of the ball, whereupon the container can be deformed to dispense sealant into the ball.

4,049,161

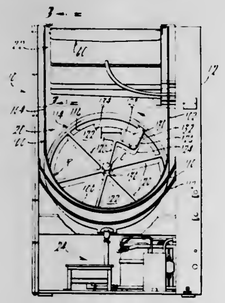
ICE MAKING AND VENDING MACHINE

Vance L. Kohl, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.

Continuation of Ser. No. 437,468, Jan. 28, 1974, abandoned. This application Nov. 7, 1975, Ser. No. 630,045

Int. Cl.[2] F25C *1/04*

U.S. Cl. 222—233 **8 Claims**



1. In an ice cube vending machine,
a housing including an ice cube dispensing area,
ice storage bin means within said housing and providing an ice cube storage area for ice cubes to be dispensed at said dispensing area,
means providing an ice transfer path between said storage and dispensing areas,
a rotatable ice transfer drum means within said storage area for selectively conveying ice cubes toward said transfer path, a first electrically energized motor means for selectively rotating said drum,
a pivotally mounted shutter element located adjacent said path and movable between a first position substantially out of registry with said path thereby permitting relatively unobstructed movement of ice along said path, and a second position substantially in registry with said path so as to at least limit movement of ice along said path,
a second electrically energized motor means operatively connected to said shutter element for causing selective pivotal movement of said element, and
control means for operating said first motor means independently of said second motor means in a first mode of operation of said machine and for operating both said first and said second motor means in a second mode of operation of said machine.

4,049,162

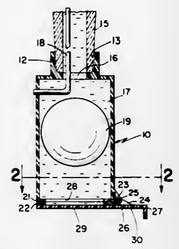
METERING VALVE

Lance S. Yule, P.O. Box 324, Ogunquit, Maine 03907

Filed Mar. 5, 1976, Ser. No. 664,318

Int. Cl.[2] B65D *47/00*

U.S. Cl. 222—476 **5 Claims**



1. A liquid dispenser metering valve comprising:
a housing defining a metering chamber therein, a liquid inlet communicating therethrough with said chamber and adapted for connection to a liquid container adjacent its opening, and a liquid outlet communicating therethrough with said chamber;
a ball in said chamber floatable in liquid to be dispensed therefrom;
a valve seat for said ball at said outlet, defining an aperture having a diameter smaller than that of said ball;
a cover pivotally connected to said housing adjacent said outlet adapted to open and close said aperture;
biasing means connected to said cover biasing said cover to a normally closed position;
lever means connected to said cover and extending therefrom beyond the pivotal connection thereof to said housing, adapted for actuation to open said cover; and
a vent tube having an opening at each end, extending from said housing through said inlet and having a length sufficient to place one end adjacent the bottom of said liquid container, said tube also extending through said housing for establishing a vent to atmosphere at its other end.

4,049,163

CLOTHES-HANGING CLIP

Gerhard Stolz, Hanfelderstrasse 317, 8130 Starnberg, Germany

Filed July 19, 1976, Ser. No. 706,213

Int. Cl.[2] A47J *51/14*

U.S. Cl. 223—96 **10 Claims**



1. A clothes-hanging clip commprising:
a main part having an upper portion and a lower portion;
means for securing said main part on a vertical surface with said upper portion above said lower portion;
a pivotal part having an upper portion and a lower portion respectively adjacent the upper and lower portions of said main part;
a pivot having a horizontal pivot axis between said portions and interconnecting said parts, whereby said pivotal part can pivot about said axis relative to said main part;
a spring braced between said parts and urging said lower portions toward each other;
a horizontally extending ridge on each of said lower portions formed with a central seam-receiving notch and engageable against the corresponding ridge of the other lower portion;
and a flat surface on each of said lower portions below the respective ridge inclined downwardly away from the other lower portion and forming with the flat surface of the other lower portion a downwardly widening V-shaped throat.

4,049,164

BACK FRAME

John L. Sullivan, Fort Erie, Canada; Veronica A. Knauber, Lancaster, and James E. Nelson, Williamsville, both of N.Y., assignors to A-T-O Inc., Willoughby, Ohio

Filed July 21, 1976, Ser. No. 707,232

Int. Cl.[2] A45F *3/00*

U.S. Cl. 224—5 W **12 Claims**



1. An improved back frame for use in a life support breathing system supplying regulated breathing air to a user thereof wherein said system includes a tank of compressed breathing air supported on the back of a user by said back frame, a face mask and regulated air hose means, said latter means being intermediately disposed in fluid connection with said tank of compressed breathing air and said face mask, said improved back frame comprising:
a body portion adapted for placement on the back of a user and harness means for so securing said body portion thereon, and a retaining strap operable to releasably retain said tank of compressed air on the side of said back frame body portion outward of the user's back, each of the ends of said retaining strap being secured to a corresponding lateral edge of said body portion so as to at least partially encircle and engage said tank, at least one of said lateral edges of said body portion being inclined with respect to the longitudinal axis of said tank with the correspondingly associated end of said strap being slidable therealong so as to adjust the retention force applied to said tank by said strap.

4,049,165

CASE AND CLOSURE CAP FOR INSTANT MINIATURE FISHING ROD AND REEL

Morris Goldhaft, 8100 Shorefront Parkway, Rockaway Beach, N.Y. 11693

Filed Jan. 12, 1976, Ser. No. 648,647

Int. Cl.[2] A45F *5/00*

U.S. Cl. 224—5 E **7 Claims**



1. In a key holder for instant fishing, the combination of a cylindrical case consisting of a transparent tube having upper and lower end caps screw threaded to upper and lower ends of said tube, a quantity of water in said case and conventional fishing hooks, lures, and keyring fish hooks which are interchangeable, floating on the water; a bracket mounted upon said upper end cap supporting a reel of fishing line and a miniature fishing rod, said bracket having a pair of aligned openings which align with a D-shaped opening formed through a sideward projecting tab of said upper end cap, all three said openings being fitted with friction sleeves which frictionally grasp said fishing rod which is cross-sectionally D-shaped, said fishing rod being slidable between a retracted position alongside said case and an extended upward position, and means coupled to at least one of said end caps for holding keys.

4,049,166

CLAMP APPARATUS

William K. Medlin, 2406 Victoria Ave., Ann Arbor, Mich. 48104

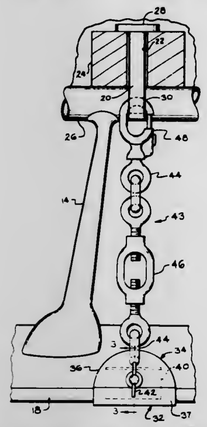
Filed May 10, 1976, Ser. No. 684,732

Int. Cl.[2] B60R *11/00*

U.S. Cl. 224—42.1 G **5 Claims**

1. Apparatus for securing an inverted boat with integral oarlock, or similar receptacles on the roof of a motor vehicle, said apparatus comprising a bolt for positioning in and extending downwardly from one of said receptacles, said bolt having

an enlarged head at one end for supporting said bolt in said receptacle and an eyelet opening at the other end, a clamp assembly for detachably fastening to said motor vehicle, and extensible and contractible coupling means extending between and connected to said bolt and said clamp assembly, said clamp assembly including a member having an upright portion con-

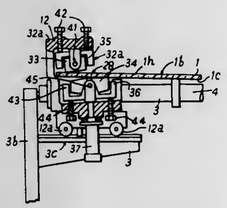


nected to said coupling means and a transverse portion for engaging said motor vehicle, said extensible and contractible coupling means including fastening means releasably connected to said bolt through said eyelet opening and a turnbuckle device operable when contracted to draw said bolt and said clamp assembly toward one another thereby to secure said boat on said roof.

4,049,167
CUTTING OF GLASS

Jean Guissard, Courbevoie, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Apr. 22, 1975, Ser. No. 570,554
Claims priority, application France, Apr. 25, 1974, 74.14357; Mar. 19, 1975, 75.08513
Int. Cl.[2] C03B *33/02*
U.S. Cl. 225—2 **8 Claims**



1. An automatic method of recovering glass of good quality from a longitudinal glass ribbon having a central part of good quality and edge portions of inferior quality which comprises the steps of:

scoring merely a line of cut on a first surface of the ribbon between the central part and the edge portion,

hammering a second surface of the glass along a path opposite the score line to initiate breakage, the glass being subject to pressure exerted on both surfaces at points facing each other and at the point where the glass is hammered,

bending the glass by lifting the central part of the glass adjacent the score line and rebating the edge portions to bring the surfaces of the central portion and said edge portion to predetermined angular positions to complete breakage,

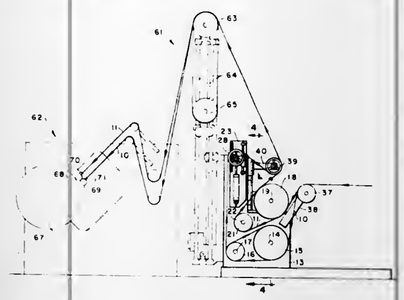
dividing the ribbon to give a sheet of the required length, and

removing the edge portion from the central portion.

4,049,168
TENSION EQUALIZER

Leon J. Cole, Lima, Ohio, and John R. Tolan, South Bend, Ind., assignors to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 616,156, Sept. 24, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,763
Int. Cl.[2] B65H *59/38, 77/00*
U.S. Cl. 226—40 **3 Claims**



1. Apparatus for coordinating the transfer of a first cord and a second cord comprising:

a frame;

a first roll means, mounted on said frame, over which said first cord may be passed;

a second roll means, mounted on said frame, over which said second cord may be passed;

a first drive means, mounted on said frame, for driving said first roll means;

a second drive means, mounted on said frame, for driving said second roll means; and

control means, operably associated with said second roll means, for varying the speed of said second roll means in response to variations in the tension of said first cord.

4,049,169
CRESCENT SILENCING RESET MECHANISM FOR FAST FORWARD 8-TRACK CARTRIDGE

Robert Henry Houf, Jr., Wheaton, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 25, 1976, Ser. No. 661,227
Int. Cl.[2] B65H *17/22*
U.S. Cl. 226—47 **10 Claims**

1. An interlock mechanism for a cartridge tape player comprising;

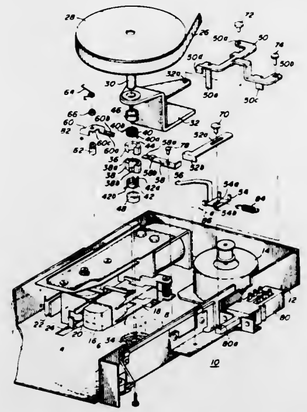
a cylindrical capstan rotatably driven about its longitudinal axis by a motor actuated flywheel, the longitudinal axis being located in a vertical plane and predeterminedly positioned to forcibly engage the tape and pressure roller of a tape cartridge to be played;

a plurality of crescents vertically stacked on, and rotatable about, the capstan, each crescent having an inner face, an outer face and a vertical dimension, the inner face encircling greater than 180° of the capstan circumference while revealing a substantial arc on the capstan surface, the outer face of predetermined curvature, the vertical height predeterminedly fixed;

first means coupling the uppermost crescent to the capstan for rotation therewith in a first mode;

means coupling each crescent to the crescent beneath it in the first mode, including means aligning the crescents such that the outer faces form a substantially circular configuration as viewed from a point above the axis of the capstan;

means decoupling the uppermost crescent from the capstan in a second mode and indexing the uppermost crescent such that it reveals the capstan to the pressure roller; and

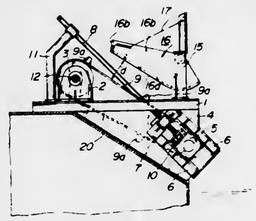


second means coupling rotational drive of the capstan to the lowermost crescent actively driving it to index at a position such that it exposes the capstan to the pressure roller when the player is activated from the first to the second mode, the second means comprising means for disengaging the lowermost crescent upon activation to the first mode and forcibly engaging the lowermost crescent on activation to the second mode.

4,049,170
DEVICE FOR PULLING UP AND PAYING OUT AN OIL BOOM

Hiroshi Kawakami, Kamakura; Isao Nagaoka, and Yukio Tsukagawa, both of Yokohama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Apr. 23, 1976, Ser. No. 679,613
Claims priority, application Japan, May 1, 1975, 50-52008
Int. Cl.[2] B65H *17/34*
U.S. Cl. 226—74 **4 Claims**



1. A device for pulling up and paying out an oil boom formed by a plurality of longitudinally spaced floats fixed to at least one side of a continuous flexible skirt at certain equally spaced predetermined intervals, said device comprising:

a structural frame,

a pair of end pulleys journaled to said frame for rotation about substantially horizontal axes at positions spaced from each other,

an endless belt engaging said end pulleys and having on its outer surface a plurality of float engaging projections for said oil boom,

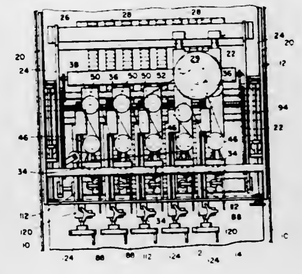
a pusher member mounted in juxtaposition to said structural frame overlying and facing the projection on a surface of the endless belt,

means for resiliently supporting said pusher member at a given distance relative to said endless belt and wherein said engaging projections are arranged on said endless belt at intervals substantially equal to the intervals between said float on said oil boom.

4,049,171
ADJUSTABLE ROLL SLICING SYSTEM

Dale S. Lecrone, 4447 Bonnymede, Jackson, Mich. 49201

Filed Sept. 16, 1976, Ser. No. 723,919
The portion of the term of this patent subsequent to Oct. 14, 1992, has been disclaimed.
Int. Cl.[2] B26D *3/28*
U.S. Cl. 225—94 **12 Claims**



7. A machine for slicing rolls between the tops and bottoms thereof while arranged in clusters of a predetermined number of separably adjoined rolls by cutting into one side of the rolls in such clusters along but spaced from a longitudinal joint between adjacent rolls in said clusters, said machine comprising:

a. a cutter head frame having side members and a plurality of parallel guide rods extending horizontally between said side members to comprise a rigid frame,

b. a conveyor beneath said guide rods and parallel thereto and supported for movement in a direction to support and feed clusters of rolls in a feeding direction parallel to said side members and transverse to said rods,

c. a plurality of bearing blocks supported upon said rods and respectively and rotatably supporting spindle shafts extending perpendicularly above said conveyor and provided with circular disc knives on the ends thereof nearest said conveyor,

d. power means operable to rotate said spindle shafts and knives simultaneously to slice rolls in clusters as the same are moved past said knives by said conveyor,

e. an elongated arm connected to and projecting forwardly from each of said bearing blocks and provided with a supporting shaft, roll breaking units pivotally supported respectively by said elongated arms upon said supporting shafts thereon forwardly of said spindle shafts in said bearing blocks relative to the direction of feed of said rolls by said conveyor, said breaking units being in longitudinal alignment with said spindle shafts for said knives and mounted for operation immediately above the plane in which said knives rotate and operable to break apart pairs of rolls along the joints therebetween above the slice made in each roll by said knives to provide a clearance for

passage of said spindle shafts of said knives between said pairs of rolls incident to said rolls being sliced from end to end, and

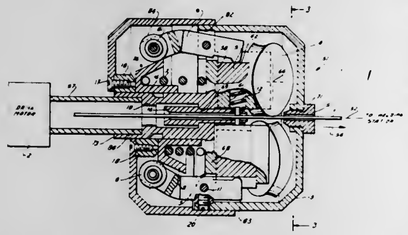
f. roll breaking units each comprising a pair of rotatable shafts mounted within bearings in supplemental blocks supported upon said supporting shafts in said elongated arms, means normally urging said supplemental blocks and rotatable shafts of said units toward said operative positions thereof relative to said knives, and tension spring means connected to said supplemental blocks of said units and operable to move the same toward the inoperative positions and hold the same in said inoperative positions.

4,049,172

PLANETARY WIRE-FEEDING MECHANISM FOR ELECTRIC ARC-WELDING APPLICATIONS

David Albert Samokovliiski; Petko Kostadinov Grozdanov; Alfred Emmerich Nemechek; Peter Dimitrov Petrov, and Simeon Georgiev Punchev, all of Sofia, Bulgaria, assignors to Institute po Zavaryavane, Sofia, Bulgaria

Filed Sept. 24, 1976, Ser. No. 726,412
Claims priority, application Bulgaria, Sept. 24, 1975, 31062
Int. Cl.[2] B65H *17/22*
U.S. Cl. 226—90 4 Claims



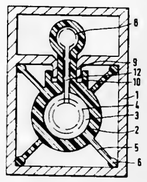
1. In an apparatus for converting the rotational force of a motor shaft to a prescribed linear force along a first axis for selectively advancing an elongated wire along the first axis, a substantially cylindrical hollow feed housing coaxial with the first axis and through which the wire may be advanced in a forward direction along the first axis, the housing having a radial flange intermediate its ends and a rear portion projecting axially rearwardly from the flange, the outer surface of the rear housing portion being threaded at a rear end thereof, first and second pistons supported in a forward portion of the housing on generally opposite sides of the first axis for radial reciprocation toward and away from the first axis, first and second rollers rotatably carried by the respective first and second pistons for planetary rotation about the first axis during a rotation of the housing, the first and second rollers respectively having axes that are skewed with respect to the first axis to cooperate when in an innermost radial position to engage the wire and to advance the wire along the first axis when the first and second rollers are rotated, a conical guide member supported for slidable axial movement on the outer surface of the rear housing portion, an adjustment nut disposed in threaded engagement with the rear end of the rear housing portion, a calibrated spring extending between the flange and the front end of the conical guide member to normally urge such member toward the adjustment nut, first and second levers individually pivoted in the housing intermediate their respective ends on generally opposite sides of the first axis, the first and second levers extending longitudinally in the housing, corresponding first ends of the levers terminating opposite the conical guide member and corresponding second ends of the lever terminating opposite the radially outer ends of the respective first and second pistons, resilient means coupled to each piston for urging the outer end of the piston against the opposed second end of the associated lever, means disposed at the first end of each lever for coupling such first end to the opposed portion of the conical guide member, and means for fixedly connecting the motor shaft to the rear housing portion.

4,049,173

BAR STOCK FEEDING DEVICE

Laurentino Gomez-Alecha, Mondragon, Spain, assignor to Alacoop S. Coop., Mondragon, Spain

Filed May 5, 1976, Ser. No. 683,374
Claims priority, application Spain, June 17, 1975, 213217
Int. Cl.[2] B65H *23/04*
U.S. Cl. 226—196 5 Claims



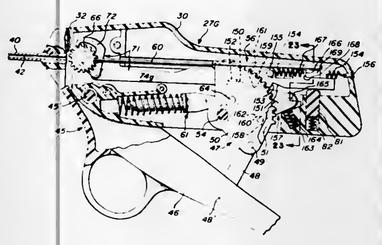
1. An assembly for feeding bar stock into a machine tool, comprising an elongated feeder housing of non-circular internal cross-section and a plurality of blocks disposed in said housing, said blocks each having a central aperture to slidably receive the bar stock, and a series of outwardly extending portions comprised of vibration damping material positioned and dimensioned for engaging the interior of the feeder housing to prevent vibration of the bar stock from being transmitted to the housing and to render the block non-rotatable in the housing.

4,049,174

TAG ATTACHING APPARATUS

Paul H. Hamisch, Sr., Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 571,342, April 24, 1975, Pat. No. 3,971,497. This application Mar. 25, 1976, Ser. No. 670,204
Int. Cl.[2] B25C *1/00*
U.S. Cl. 227—67 8 Claims



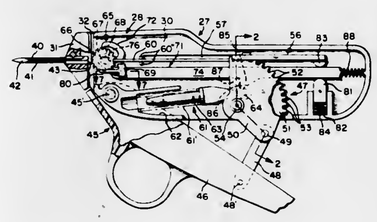
1. Apparatus for attaching tags using fasteners, the fasteners being arranged in an assembly, each fastener including a bar section and a head section joined by a filament section, the fasteners being coupled to a common carrier member by respective coupling members, the apparatus comprising: a body, a hollow needle having an elongated slot along one side supported by the body and extending outwardly of the body, a push rod supported by the body for driving a bar section of a fastener through the needle while a filament section of the fastener extends through the slot, means engageable with the coupling members for feeding the fastener assembly to bring the bar sections one-at-a-time along a path into alignment with the push rod, means for severing the bar sections from the respective coupling members, the feeding means including a toothed wheel, a pawl for engaging the wheel to advance the wheel, the pawl being movable between first and second positions, and means for moving the push rod and the pawl in a sequence in which the push rod is moved to effect severing of the bar section by the severing means and to effect movement of the bar section through the needle while the respective filament section passes along the slot and in which the pawl is thereafter moved to advance the toothed wheel, and a latch controlled by the moving means and mounted by the body to prevent the pawl from advancing the toothed wheel until after the push rod has moved clear of the path of movement of the bar sections.

4,049,175

TAG ATTACHING APPARATUS

Paul H. Hamisch, Sr., Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 571,342, April 24, 1975, Pat. No. 3,971,497. This application Mar. 25, 1976, Ser. No. 670,205
Int. Cl.[2] B25C *1/00*
U.S. Cl. 227—67 3 Claims



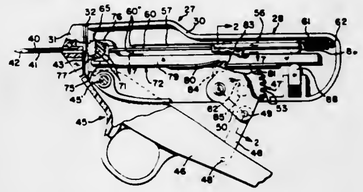
1. Apparatus for attaching tags using fasteners, the fasteners being arranged in an assembly, each fastener including a bar section and a head section joined by a filament section, a runner and a connector individual to each fastener connecting the respective bar section to the runner, the apparatus comprising: a body, a needle mounted by the body, the needle having a bore and an elongated slot communicating with the bore, a push rod engageable with the bar section of a fastener for driving the bar section through the bore while its filament section extends through the slot, means for advancing one fastener at a time into alignment with the bore including a rotatably mounted toothed wheel, a pawl for driving the toothed wheel, and means for driving the push rod and the pawl, means providing an annular bearing surface disposed adjacent to and coaxial with the toothed wheel, the pawl including a first arm in contact with the means providing the bearing surface and a second arm having a tooth cooperable with the toothed wheel, at least one of the arms being flexible and resilient, the first arm exerting force on the means providing the bearing surface to cause the tooth to be in cooperable contact with the toothed wheel.

4,049,176

TAG ATTACHING APPARATUS

William A. Jenkins, Englewood, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed May 11, 1976, Ser. No. 685,245
Int. Cl.[2] B25C *1/00*
U.S. Cl. 227—67 16 Claims



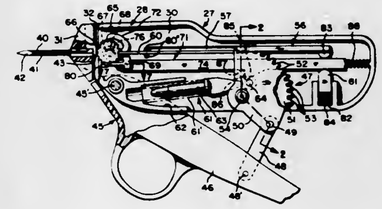
1. Apparatus for attaching tags using an assembly of fasteners, each fastener including a bar section and a button section joined by a filament section, a runner and a connector individual to each fastener connecting the respective bar section to the runner, the apparatus comprising: a body, a needle mounted by the body, the needle having a bore and an elongated slot communicating with the bore, a push rod engageable with the bar section of a fastener for driving the bar section through the bore while its filament section extends through the slot, means for advancing one fastener at a time into alignment with the bore including a rotatably mounted toothed wheel, a pawl for driving the toothed wheel, and means for driving the push rod and the pawl, means providing an annular bearing surface disposed adjacent to and coaxial with the toothed wheel, the pawl including a first arm in contact with the means providing the bearing surface and a second arm having a tooth cooperable with the toothed wheel, at least one of the arms being flexible and resilient, the first arm exerting force on the means providing the bearing surface to cause the tooth to be in cooperable contact with the toothed wheel.

4,049,177

TAG ATTACHING APPARATUS

Charles B. Bussard, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 571,345, April 24, 1975, Pat. No. 3,971,498. This application July 8, 1976, Ser. No. 703,321
The portion of the term of this patent subsequent to July 27, 1993, has been disclaimed.
Int. Cl.[2] B25C *1/00*
U.S. Cl. 227—67 2 Claims



1. Apparatus for attaching tags using fasteners, the fasteners being arranged in an assembly, each fastener including a bar section and a head section joined by a filament section, the fasteners being coupled to a common carrier member by respective coupling members, the apparatus comprising: a body, a hollow needle having an elongated slot along one side supported by the body and extending outwardly of the body, a push rod supported by the body for driving a bar section of a fastener through the needle with a filament section of the

1. Apparatus for attaching tags using fasteners, the fasteners being arranged in an assembly, each fastener including a bar section and a head section joined by a filament section, the fasteners being coupled to a common carrier member by respective coupling members, the apparatus comprising: a body, a hollow needle having an elongated slot along one side supported by the body and extending outwardly of the body, a push rod supported by the body for driving a bar section of a fastener through the needle while a filament section of the fastener extends through the slot, means engageable with the coupling members for feeding the fastener assembly to bring the bar sections one-at-a-time along a path into alignment with the push rod, means for severing the bar sections from the respective coupling members, the feeding means including a toothed wheel, a pawl for engaging the wheel to advance the wheel, the pawl being movable between first and second positions, and means for moving the push rod and the pawl in a sequence, the moving means including a slide having rack teeth, a gear segment in mesh with the rack teeth, the gear having a groove with spaced apart abutment faces, a projection received in the groove, a link connected to the pawl and to the projection, a manually operable actuator coupled to the gear segment, the projection cooperating with one abutment face upon manual actuation of the actuator to move the pawl from the first position to the second position, means for returning the push rod, the slide, the gear segment, and the actuator to their initial positions, the projection being cooperable with the other abutment face after the push rod has moved clear of the path of movement of the bar sections for moving the pawl from the second position to the first position to effect advance of the toothed wheel.

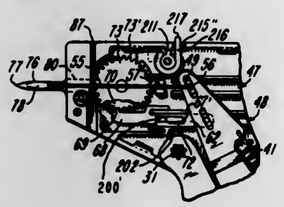
fastener extending through the slot, means engageable with the coupling members to feed the fastener assembly so that one bar section of one fastener at a time can be brought into position to be pushed through the needle by the push rod, the feeding means including a toothed wheel, a pawl for engaging successive teeth of the wheel to advance the wheel, the pawl being movable between first and second positions, and means for actuating the push rod and the pawl in sequence, the actuating means including first and second abutment members, means for movably mounting the first and second abutment members on and for movement relative to the pawl, the mounting means including first and second spaced-apart pivots for the respective first and second abutment members, first and second springs for urging the respective first and second abutment members into initial positions, and first and second spaced-apart projections, the actuating means including means for movably mounting the first and second projections, the first projection being cooperable with the second abutment member to move the second abutment member out of the way against the action of the second spring so that the first projection can cooperate with the first abutment member to drive the pawl from the first position to the second position and the second projection being cooperable with the first abutment member to move the first abutment member out of the way against the action of the first spring so that the second projection can cooperate with the second abutment member to cause the feed wheel to feed the fastener assembly, the first and second springs being effective to return the respective first and second abutment members to their initial positions.

4,049,178

TAG ATTACHER

Larry D. Strausburg, Miamisburg, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 587,745, June 17, 1975, Pat. No. 3,973,710. This application May 12, 1976, Ser. No. 683,101
Int. Cl.² B25C *5/06*
U.S. Cl. 227—67 **4 Claims**



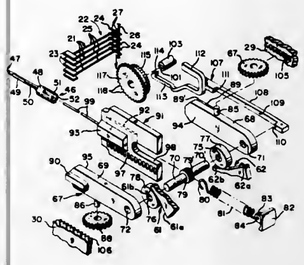
1. Apparatus for attaching tags using fasteners, each fastener including a bar section and a button section joined by a filament section, the apparatus comprising: a body, a needle mounted by the body, the needle having an elongated slot communicating with the bore, a push rod engageable with the bar section of a fastener for driving the bar section through the bore while its filament section extends through the slot, means for advancing one fastener at a time into alignment with the bore including a toothed member, a movable member, means for driving the movable member to advance the toothed member and for driving the push rod, first and second guides secured to the body for guiding the movable member, the movable member including a flexible resilient first arm in slidable contact with the first guide, a second arm in slidable contact with the second guide, a flexible resilient third arm having a tooth cooperable with the toothed member, the first guide being cooperable with the first arm to urge the tooth into contact with the toothed member and to urge the second arm into contact with the second guide, both the first and third arms being yieldable as the pawl tooth moves relative to the toothed member.

4,049,179

TAG ATTACHING APPARATUS

William A. Jenkins, Englewood, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed May 11, 1976, Ser. No. 685,244
Int. Cl.² B25C *1/00*
U.S. Cl. 227—67 **31 Claims**



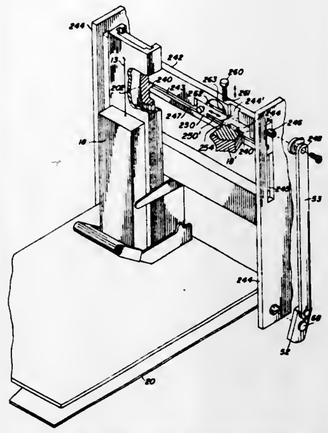
1. Apparatus for attaching tags using fasteners, each fastener including a bar section and a button section joined by a filament section, and apparatus comprising: a body, a needle mounted by the body and having an elongated bore and an elongated slot communicating with the bore, a push rod engageable with the bar section of the fastener for driving the bar section through the bore while its filament section extends through the slot, means for advancing one fastener at a time into alignment with the bore including a toothed member, a pawl for driving the toothed member, means for driving the push rod and the pawl, the driving means including a carrier connected to the push rod, a first rack at one side of the carrier, a second rack at the other side of the carrier, third and fourth racks secured to the body, first gear means meshing with the first and third racks, second gear means meshing with the second and fourth racks, and means mounting the first and second gear means for translational and rotational movement.

4,049,180

STITCHING HEAD BYPASS APPARATUS

Jonathan E. Hause, Canandaigua, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 24, 1976, Ser. No. 689,319
Int. Cl.² B27F *7/18*
U.S. Cl. 227—78 **2 Claims**



1. In an apparatus for fastening an assemblage of sheets together to form a pack using one more fasteners, the combination of:

a. at least two fastening heads for driving fasteners through said sheets to form said pack, each of said heads including
   1. a drive ram supported for reciprocable movement toward and away from said sheet assemblage to drive said fasteners through said sheet assemblage whereby to form said pack, and
   2. anvil means opposite said ram for receipt of said sheet assemblage therebetween, said anvil means cooperating with said ram to clench the portions of said fastener protruding through said sheet assemblage whereby to prevent withdrawal of said fastener and disassembly of said pack; and

b. drive means for reciprocating said ram, at least one of said drive means including
   1. a reciprocable driver plate,
   2. an interposer for drivingly coupling said driver plate to said ram,
   3. means supporting said interposer for movement between a first position where said interposer drivingly couples said driver plate with said ram and a second position where said driver plate is not coupled with said ram, and
   4. lock means for selectively retaining said interposer in either of said first or second positions,

means supporting said driver plate for reciprocable driving movement,

a slot-like driving recess in said driver plate adjacent each of said stitching heads and including an enlarged portion,

said drive ram including a projecting tang member disposed in said enlarged portion of said driving recess

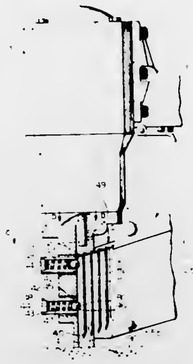
said interposer being disposed in said driving recess for selective movement between said first position to engage said tang member with said driver plate and drive said one stitching head and said second position wherein said interposer is withdrawn from between said driver plate and said tang member whereby engagement of said tang member with said driver plate is prevented.

4,049,181

AUTOMATIC NAILING MACHINE

Shigemasa Kametaki, 7225-5 Shingu, Shingu, Wakayama, Japan

Filed June 15, 1976, Ser. No. 696,315
Claims priority, application Japan, Dec. 4, 1975, 50-144866; Mar. 22, 1976, 51-31538
Int. Cl.² B25C *1/00*
U.S. Cl. 227—113 **2 Claims**



1. In an automatic nail driving device having a guide hole through which the nail to be driven is driven, a reciprocal compressed air piston rod means at the top of said guide hole above said nail for driving said nail downward, and a magazine means at the side of said guide hole for supplying nails to said guide hole, the improvement comprising:

a magnetic attraction means positioned on the side of said guide hole opposite said magazine at a right angle to said guide hole and resiliently projecting into said guide hole for attracting said nails in said magazine, said attraction means comprised of:

at least one cylindrical member fitted through the wall of said guide hole opposite said magazine at a right angle to said guide hole and having an opening into said guide hole,

a spherical permanent magnet in said cylindrical member at the end thereof open into said guide hole, and

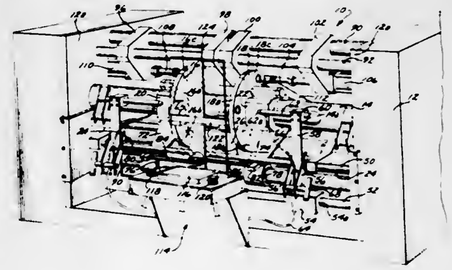
biasing means within said cylindrical member against said permanent magnet for resiliently forcing said magnet toward said guide hole.

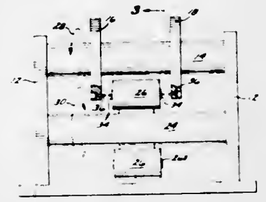
4,049,182

INERTIA WELDING INDEXING SYSTEM

Johan August Louw, Orange, and Robert Earle Ghiselin, Costa Mesa, both of Calif., assignors to Textron Inc., Santa Ana, Calif.

Filed Feb. 19, 1974, Ser. No. 443,233
Int. Cl.² B23K *19/02*
U.S. Cl. 228—2 **9 Claims**





3-

1. Friction welding apparatus comprising in combination,

a transfer wheel having three workpiece retainers and being rotatable about a first axis to move said retainers sequentially from a load station to a weld station to an ejection station and back to the load station,

at least three motors each of which is adapted with at least on workpiece holder,

mounting means for said motors to rotate the same about a second axis sequentially from a load station to at least one speed station to a weld station and back to the load station,

and motive power means operatively connected to said transfer wheel and to said mounting means to simultaneously move said retainers and motors from one to another of their respective stations, each of said motors being moved from its speed station to its weld station while one of said retainers is moved from its load station to its weld station, whereby each of said motors is afforded

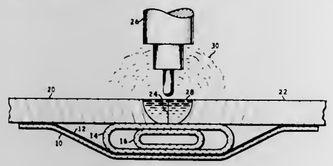
time between its load and weld stations to attain predetermined speed.

4,049,183

WELDING BACK-UP TAPE

William A. Roden, Rancho Santa Fe, and Glenn L. Criger, San Diego, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed May 24, 1976, Ser. No. 689,416
Int. Cl.² B23K *9/02*
U.S. Cl. 228—50 **14 Claims**



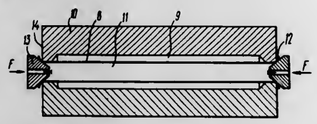
1. A welding back-up tape comprising:
an elongated narrow thin strip of flexible flat material;
an adhesive coating on one surface of said strip;
an outer tubular sleeve of woven refractory fibers;
said outer sleeve being in contact with said adhesive coating substantially along the centerline of said strip and bonded to said strip by said coating; and
at least one inner sleeve of woven refractory fibers located within and substantially concentric with said first sleeve;
said sleeves increasing in diameter from the innermost sleeve to said outer sleeve;
whereby said first sleeve and said strip may be pressed against a structure and held in place by said adhesive coating along the edges of said strip adjacent to said first sleeve.

4,049,184

METHOD OF MANUFACTURING POLYMETALLIC PIPES

Jury Iosifovich Rozengart, ulitsa Fuchika 14, kv. 11; Viktor Yakovlevich Ostrenko, ulitsa Komsomolskaya, 65/44; Efim Abramovich Reznikov, ulitsa Simferopolskaya, 19/10; Izrail Moisheevich Sukonnik, ulitsa Poligonnaya, 22/16; Oleg Georgievich Fedorov, prospekt Ilicha, 21/15; Robert Georgievich Kheifets, ulitsa Kirova, 8/29; Viktor Jurievich Untilov, ulitsa Kazakova, 11 8/29; Jury Viktorovich Chichkov, prospekt Kirova, 48a/45; Vladimir Khrisanfovich Kasyan, ulitsa Naberezhnaya imeni Lenina, 1/132, and Lev Semenovich Lyakhovetsky, ulitsa Lenina, 1/12, all of Dnepropetrovsk, U.S.S.R.

Filed June 7, 1976, Ser. No. 693,554
Int. Cl.² B23K *19/00*
U.S. Cl. 228—131 **9 Claims**



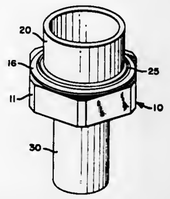
1. A method of manufacturing polymetallic pipes consisting of preparing the contacting surfaces of pipe billets for producing a diffusion joint between them; inserting said pipe billets coaxially into one another; sealing off the gap between said pipe billets at the ends of said billets thus forming a multilayer pipe billet; heating said multilayer pipe billet and placing it in a die; sealing off the space of said multilayer pipe billet; filling said space of said multilayer pipe billet with a fluid medium for building up pressure inside said space; creating a temperature gradient in the body of said multi-layer pipe billet so that the temperature at at least one end of said billet is lower than it is in the other parts of said billet; and selecting a pressure sufficient for making a diffusion joint between said contacting surfaces of said pipe billets.

4,049,185

METHOD OF FORMING DOUBLE EXTRUDED MOUNT

Russell A. Nippert, Delaware, Ohio, assignor to The Nippert Company, Delaware, Ohio

Filed Mar. 11, 1977, Ser. No. 776,709
Int. Cl.² B23K *31/00*; H01L *21/48*
U.S. Cl. 228—155 **3 Claims**



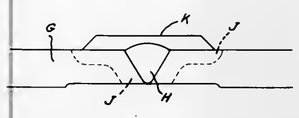
1. The method of forming a mount for a solid state rectifier and the like which comprises
a. forming a hexagonal shaped billet of high conductivity copper,
b. brazing a steel ring on the upper surface of said billet,
c. brazing a steel tube in position within said ring on the upper surface of said billet,
d. cold-forming said billet in a first extrusion step to provide a recess in the upper face of said billet of the same diameter as the inner diameter of said tube and concurrently generating a weld-projection on the upper surface of said ring,
e. and additionally cold-forming said billet in a second extrusion step to form a downwardly projecting stem thereon (and to additionally shape said weld projection), said first and second extrusion steps causing work-hardening of said brazed joints and of the copper of said billet.

4,049,186

PROCESS FOR REDUCING STRESS CORROSION IN A WELD BY APPLYING AN OVERLAY WELD

Rodney E. Hanneman, Burnt Hills; Richard M. Chrenko, and Donald B. Kittle, both of Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 20, 1976, Ser. No. 734,323
Int. Cl.² B23K *9/04*
U.S. Cl. 228—225 **5 Claims**



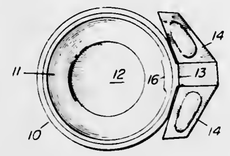
1. The method of eliminating or substantially reducing the stress corrosion tendency in a weld constraint zone terminating within a primary weld heat affected zone of a butt welded austenitic steel pipe joint in a pipe in service in a nuclear reactor which comprises the step of applying to the outside of the pipe a secondary or overlay weld extending across the pipe joint and bridging on each side of the pipe joint beyond the axial extremities of the primary weld heat affected zone at the inner surface of the pipe.

4,049,187

THERMOFORMED HOT DRINK CUP

John Florian, Bakersfield, Calif., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 511,144, Oct. 2, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 661,209
Int. Cl.² B65D *1/26, 23/10*
U.S. Cl. 229—1.5 B **7 Claims**



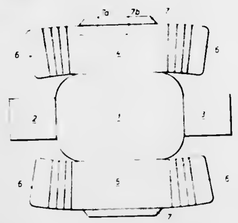
1. A nestable thermoformed cup and handle means formed integrally therewith in such fashion as to not interfere with nesting of stacked cups and to form a stable handle upon movement of the handle means to operative position comprising:
a. a cup body having an upper brim portion, a bottom of smaller dimension than said brim portion and sides tapering inwardly from said brim portion to said smaller bottom;
b. a tab integral with the upper edge of said brim portion extending outwardly therefrom and normal thereto; and
c. a flange integrally hinged to each side of said tab and having an inner edge adjacent to and free of the brim portion, said inner edge being immediately adjacent the brim at its point of attachment to the tab and shaped to conform to the inwardly tapering side of cup body so that when the flanges are folded downwardly substantially the entire length of each inner edge will contact the side of the cup body to provide an elongated bearing surface against the body.

4,049,188

PACKAGE

Lennart Gerhard Persson, Bjarred, Sweden, assignor to AB Akerlund & Rausing, Lund, Sweden

Filed Nov. 8, 1976, Ser. No. 739,451
Claims priority, application Sweden, Nov. 13, 1975, 7512727
Int. Cl.² B65D *5/56, 21/02*
U.S. Cl. 229—14 BL **5 Claims**



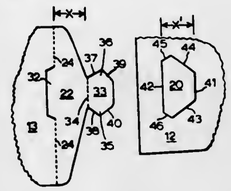
1. A package formed from a blank of rigid material, said blank including a bottom wall and a plurality of side walls and extension members extending outwardly from portions of said side walls, a lining of plastic material lining the internal walls of said package, said internal lining extending over the top edge of said side walls, said lining further extending along a portion of the exterior of the side walls of said package and along said extension members to define an exterior lining, said exterior lining further including a free edge defining a flange extending in a direction outwardly from the side walls of the package, said extension members reinforcing said flange and being operable to act as a stop for one part of the package and said flange being operable to act as a stop for another part of the package and engage a portion of another package nested therewith to prevent said nested packages from being wedged within each other.

4,049,189

PANEL INTERLOCKING MEANS AND METHOD

Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 542,913, Jan. 22, 1975, abandoned. This application Feb. 25, 1976, Ser. No. 661,057
Int. Cl.² B65D *5/02*
U.S. Cl. 229—48 R **11 Claims**



1. Interlocking means for securing two panels together in overlapping relation, said interlocking means comprising a locking panel foldably joined to one of the panels, a locking heel integral with said locking panel and projecting therefrom, a locking toe foldably joined to said locking panel and having a neck portion and outwardly projecting shoulders, and locking aperture means formed in the other panel and having spaced locking edges one of which is at least as long as the width of said neck portion of said locking toe and said locking aperture means having holding edges spaced apart and configured so that said shoulders of said locking toe can swing directly through said locking aperture from a position of substantially flat face contacting relation with said locking panel without deformation of said locking toe in such manner that the shoulders of said locking toe are interlocked with parts of the other panel adjacent said holding edges and adjacent said one locking edge and so that said locking heel is adjacent the other of said locking edges due to the angular disposition of said locking toe relative to said other panel which is maintained by the inherent bias exerted on said locking toe at said neck portion tending to urge said locking toe into engagement with said one of said locking edges so that a tension force at said neck portion resists any tendency of said locking toe to slip out of said locking aperture whereby said locking heel is retained within said aperture means and in engagement with the other of said locking edges thereby to prevent substantial relative movement between the panels.

4,049,190

MAILING AND STORAGE BOX

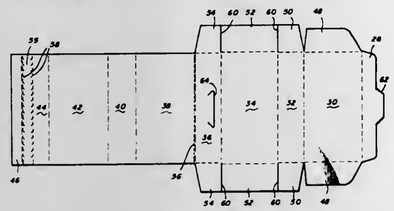
James L. O'Neill, Norfolk, Mass., assignor to Merkert Enterprises, Inc., Canton, Mass.

Filed Nov. 26, 1976, Ser. No. 744,953
Int. Cl.² B65D *5/54*
U.S. Cl. 206—611 **22 Claims**

1. A blank for a container comprising:
a tray portion including a series of serially connected flaps and panels including, in sequence a lid front flap, a lid panel, a rear panel, a tray panel and a tray front flap, each of said panels having end flaps extending therefrom at opposite ends thereof, said flaps and panels being foldable to define an end-loadable, top-opening box configuration;
said blank further including a wrapper extension extending from and defining a continuation of the tray portion, said wrapper extension including, serially, a wrapper top

panel, a wrapper rear panel, a wrapper bottom panel and a wrapper front panel;

at least one of said wrapper panels having a tear-strip formed therein; and



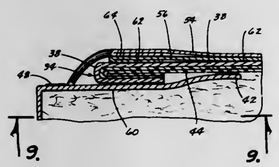
the juncture between the tray portion and wrapper extension being weakened to facilitate tearing of the wrapper extension from the tray portion.

4,049,191

BLOCK BOTTOM VALVE BAG

Robert J. Stearley, Des Moines, Iowa, assignor to Great Plains Bag Corporation, Des Moines, Iowa

Filed Feb. 2, 1976, Ser. No. 654,567
Int. Cl.[2] B65D *31/14*
U.S. Cl. 229—62.5 8 Claims



1. A block bottom bag comprising:

a front wall, a back wall, and opposite end walls forming an enclosed container, said end walls having an interior facing surface and an exterior facing surface;

at least one of said end walls having an approximately flat configuration and having a valve opening formed therein;

a valve member extending through said valve opening, said valve member comprising an elongated flexible tube collapsed into a flat configuration having an upper tube wall and a lower tube wall in facing engagement;

said valve member having a first end extending within the interior of said container and a second end extending outwardly from the exterior of said container;

said upper wall of said flexible tube being operatively secured to the interior surface of said end wall whereby upward flexing movement of said end wall causes upward flexing movement of said upper wall of said flexible tube;

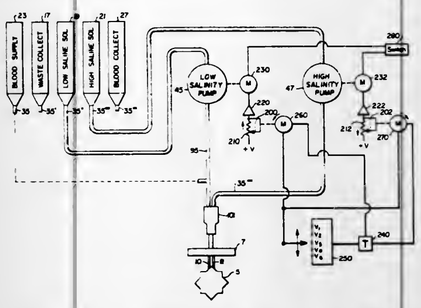
said lower wall of said flexible tube being detachably secured to the exterior facing surface of said end wall adjacent said second end of said tube so as to prevent said lower wall from moving upwardly when said upper wall is flexed upwardly.

4,049,192

BLOOD WASHING METHOD USING A SALINE WASH SOLUTION OF VARYING CONCENTRATION FOR USE WITH BLOOD WASHING APPARATUS

Daniel Fritz Krebs, Norwalk, Conn., and Hector Miranda, Yorktown Heights, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,606
Int. Cl.[2] B04B *11/02*
U.S. Cl. 233—14 R 2 Claims



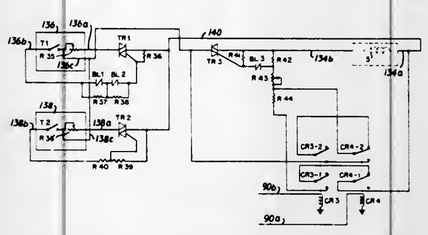
1. In a method of washing blood by providing blood in a rotatable enclosure member and thereafter introducing saline wash solution into said rotatable enclosure member to contact said blood for a pre-determined washing period and thereby remove contaminants therefrom the improvement which comprises decreasing the concentration of the introduced saline solution from an initial relatively high concentration to a predetermined lower concentration at a substantially linear rate while maintaining the flow rate of the saline solution at a constant value throughout the washing period.

4,049,193

SYSTEMS AND APPARATUS FOR CONTROL OF FUELED HEAT GENERATORS

Herbert Haviland, deceased, late of Norfolk, Conn., by Diane Haviland, administratrix, Stratford, Conn.; Arthur Smith, Ansonia, Conn., and Charles Boyer, Bronx, N.Y., assignors to Fuel Computer Corporation, Bronx, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,442
Int. Cl.[2] F23N *5/20*
U.S. Cl. 236—46 R 14 Claims



1. A system for use in operating a heat generator, comprising:

a. first circuit means for generating first and second output signals respectively upon occurrence of successive times of day;

b. second circuit means for generating successive pairs of first and second output signals, each such signal pair defining a preselected time period following occurrence of said first circuit means first output signal and before occurrence of said first circuit means second output signal;

c. third circuit means for generating a first output signal throughout each said preselected time period and for generating a second output signal upon occurrence of said first circuit means second output signal and thereafter until recurrence of said first circuit means first output signal;

d. first and second temperature-sensitive switch elements; and

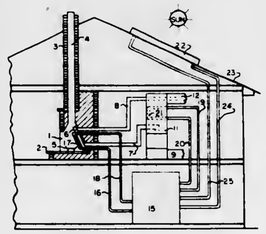
e. switching means having output terminals for connection with said heat generator and settable in first state by said third circuit means first output signal for connecting said first switch element to said output terminals and settable in second state by said third circuit means second output signal for connecting said second switch element to said output terminals.

4,049,194

FIREPLACE/FORCED AIR FURNACE HEAT GENERATION AND DISTRIBUTION SYSTEM

Vernon Lawton Tice, 2 Olney Mill Court, and Donald Francis Glover, 4128 Sir Walter Road, both of Olney, Md. 20832

Filed Mar. 9, 1976, Ser. No. 665,310
Int. Cl.[2] F24B *7/00*; F24J *3/02*
U.S. Cl. 237—1 A 14 Claims



1. A method for distributing heat energy in a fireplace to a plurality of rooms of a structure using the forced air heating of said structure comprising:

a. providing said fireplace with a heat exchange device;

b. providing a forced air heating system containing interconnected in sequence as components thereof return air conduit means, a fan air moving means, an air heating means, a plenum chamber, and distribution air conduit means whereby in operation said distribution air conduit means delivers air to a plurality of rooms and said return air conduit means removes air from said plurality of rooms;

c. driving a portion of air from the plenum chamber of said forced air heating system into said fireplace heat exchange device by means of said fan air moving means of said forced air heating system;

d. flowing said portion of air through said fireplace heat exchange unit at a positive pressure created by said fan air moving means; and

e. flowing said portion of air now in a heated condition back into said forced air heating system at a point in one of said air conduit means components of said forced air heating system.

2. An improved fireplace heat distribution system comprising:

a. a fireplace containing a heat exchange device therein;

b. a forced air heating system containing interconnected in sequence as components thereof return air conduit means, a blower fan air moving means, an air heating means, a plenum chamber, and distribution air conduit means whereby in operation said distribution air conduit means delivers air to a plurality of rooms and said return air conduit means removes air from said plurality of rooms;

c. a first opening in said fireplace heat exchange device to receive a portion of air from said forced air heating system and a second opening on said heat exchange device to remove heated air therefrom; and

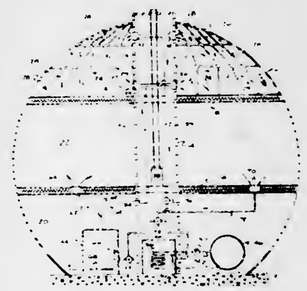
d. first interconnecting conduit means for flowing air to be heated to said fireplace heat exchanger from said forced air heating system and second interconnecting conduit means for flowing heated air to said forced air heating system from said fireplace heat exchange device, each connected at one end to said first and second openings respectively of said fireplace heat exchange device with the other end of said second interconnecting conduit means connected to said forced air heating system at a point in one of said air conduit means components thereof, with said other end of said first interconnecting conduit means connected to said forced air heating system at a point in the plenum chamber of said forced air heating system whereby said fan air moving means of said forced air heating system causes a forced flow therethrough and provides pressure of greater than prevailing atmosphere pressure within said fireplace heat exchange device.

4,049,195

SOLAR HEATED BUILDING STRUCTURE

Robert W. Rugenstein, Rte. 2, Box 251, Inman, S.C. 29349

Filed Dec. 8, 1976, Ser. No. 748,637
Int. Cl.[2] F24J *3/02*
U.S. Cl. 237—1 A 17 Claims



1. A solar-heated building structure comprising an exterior shell including a generally semi-spherical roof section, said roof section having exterior light-transmitting surface means for admitting passage of sunlight into said shell, horizontal floor means within said shell dividing the interior of the shell into a living compartment and an attic compartment extending between said living compartment and said roof section for the storage of air to be heated by sunlight passing through said exterior surface means of said roof section, conduit means extending through said floor means and into said attic compartment for the passage of air into said attic compartment to be heated therein and for the passage of heated air out of said attic compartment, and means in said shell communicating with said conduit means for circulating the heated air through said living compartment and for returning air from said living compartment to said conduit means for reintroduction into said attic compartment to be heated therein.

4,049,196

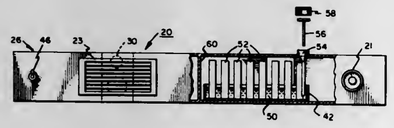
FIREPLACE HEATER, CIRCULATOR, AND HUMIDIFIER SYSTEM

Samuel S. Bergami, Jr., 18 King St., and Samuel S. Bergami, Sr., 192 York St., both of West Haven, Conn. 06516

Filed Mar. 8, 1976, Ser. No. 664,529
Int. Cl.[2] F24B *7/00*
U.S. Cl. 237—51 2 Claims

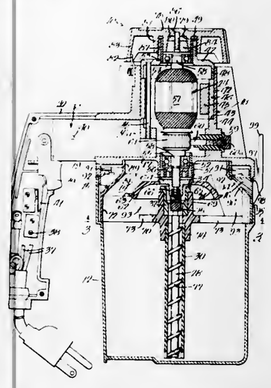
1. A heater, circulator and humidifier system for installation in conventional fireplaces comprising:

A. an enclosed air circulation chamber incorporating
   a. a forward, substantially rectangular hollow, air-conducting housing portion having a horizontal length slightly greater than the horizontal fireplace hearth opening and a vertical width substantially equal to the width of two bricks, thereby providing a housing portion which is dimensioned to be compatible with any conventional fireplace with a minimum of conspicuousness; and
   b. a substantially U-shaped in plan, hollow, air-conducting portion having forward, free open ends in air-conducting relationship with rear wall of the rectangular portion and rearwardly extending therefrom substantially perpendicularly to the rear wall of the rectangular portion;
   c. an overall substantially L-shaped configuration in a side elevation with the housing portion forming the base of the L and the U-shaped portion forming the vertical leg of the L, adapted for installation in a fireplace with the L rotated 90°, whereby the entire air circulation chamber when installed in position provides a substantially flat horizontal planar lower surface extending from the front of the fireplace to the rear thereof;
B. an inlet portal formed in said housing portion for directing air into said chamber;
C. an outlet portal formed in said housing portion for directing air circulating within said chamber out of the chamber;
D. an air circulation fan mounted in said housing portion in juxtaposed relationship with said inlet portal, whereby the air drawn from the room is drawn into said inlet portal and forced therefrom through the entire air circulation cham-



ber, thereby providing a positive circulation pressure throughout;
E. a humidification unit mounted within said housing portion in juxtaposed spaced relationship to said outlet portal and incorporating
   a. a water container mounted in said housing portion in juxtaposed spaced relationship to said outlet portal,
   b. a plurality of upstanding water absorbing members positioned in said water container and extending above the water level into the air flow path,
   c. a fill tube extending from an external surface of said housing portion into said water container, providing easy replacement of water into said container, and
   d. an elongated water level measuring stick cooperating with said fill tube for determining the level of water in said container;
F. mounting means for securely maintaining said system along the lower horizontal row of bricks of said fireplace defining the open hearth and comprising
   a. brackets mounted to the top surface of said rearwardly extending substantially U-shaped portion, and
   b. screw clamp assemblies
      1. threadedly engaged in said brackets for cooperative association with the rear surface of said housing portion, and
      2. incorporating wing nuts mounted on one end thereof, enhancing the ease of manual rotation of said clamping bolts into their secure position;
G. thermostat means for controlling the flow of heated air through said system depending upon the temperature thereof; and
H. switch means connected to said air circulation means for manually controlling the air circulation.

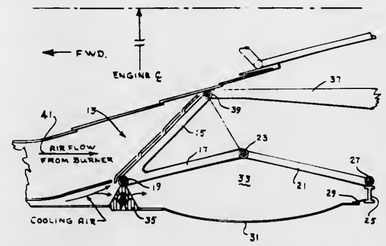
4,049,197
SPRAY DISPENSER
Frans Brouwer, Glencoe, Ill., assignor to Albert E. Sloan, Chicago, Ill.
Filed Oct. 16, 1975, Ser. No. 622,908
Int. Cl.² B05B 3/08
U.S. Cl. 239—218.5 **12 Claims**



1. In a spray dispenser comprising a housing, a receptacle attached thereto for holding a liquid to be dispensed in spray form, a rotatable disk mounted in said housing fo spraying said liquid, motor means including a rotor for rotating said disk, a shaft projecting axially from said rotor, said disk being fixed to said shaft, means for feeding said liquid from said receptacle to the side of said spraying disk which faces the bottom of said receptacle, a fixed member spaced below the underside of said disk and cooperating therewith to define a metering opening therebetween, and means for moving said rotor, shaft and disk axially relative to said housing to vary the size of said metering opening to regulate the volume of liquid fed to said spraying disk,
   means for setting the metering opening in a predetermined position comprising a threaded collar fixed to said housing, a control cap in threaded engagement with said collar, said control cap having an inner flange with an outer surface and a tapered inner surface, a correspondingly tapered member cooperatively positioned within said inner flange, a sleeve connected to said shaft and being juxtaposed to said outer surface of said inner flange, and means for moving said tapered member axially relative to said inner flange to urge said inner flange into securing engagement with said sleeve, such that rotation of said cap in first direction moves said sleeve, shaft and disk away from said fixed member to increase the size of said metering opening and rotation of said cap in the opposite direction moves said sleeve, shaft and disk toward said fixed member to decrease the size of said metering opening.

4,049,198
DUCT PRESSURE ACTUATED NOZZLE
John H. Maurer, Santa Clara, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed June 17, 1976, Ser. No. 696,963
Int. Cl.² B64C 15/06
U.S. Cl. 239—265.39 **4 Claims**

1. In a variable area convergent-divergent nozzle for use on an aircraft powered by a jet engine having an inner and an outer casing with a cooling air flow passage therebetween, the improvement comprising, a series of converging flaps pivotally mounted in the flow path of the engine exhaust, a corresponding series of forward pressure flaps integral with said coverging flaps, both of said series of flaps mounted for rotation about a common pivot point, an aft pressure flap pivotally mounted on the aft end of each of said forward pressure flaps and extending rearwardly therefrom, means for sealing the area outside said forward and aft pressure flaps to create a pressure cavity between the outer casing of the jet engine and the pressure flaps, the aft ends of said aft pressure flaps being pivotally



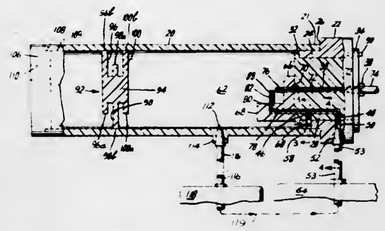
attached to said sealing means, a diverging flap pivotally mounted on the aft end of each of said converging flaps, and means for controlling the flow of cooling air into and out of the pressure cavity to cause the pressure therein to be increased and decreased, respectively, causing said integral converging and pressure flaps to move inward and outward, respectively, in response to the requirement of the aircraft.

4,049,199
NOZZLES FOR GAS TURBINE ENGINES
Douglas John Nightingale, Bristol, England, assignor to Rolls-Royce (1971) Limited, England
Filed Apr. 13, 1976, Ser. No. 676,411
Claims priority, application United Kingdom, May 9, 1975, 18889/75
Int. Cl.² B64C 15/02
U.S. Cl. 239—265.39 **7 Claims**



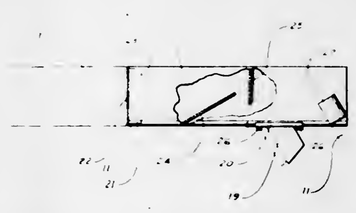
1. A variable area nozzle for a gas turbine engine comprising fixed structure including a jet pipe, a circumferential array of nozzle petals, including certain master petals arranged about the discharge opening of the jet pipe and means supporting the petals for nozzle area varying movement relative to the jet pipe, said means including in respect of at least said master nozzle petals respective pairs of axially spaced apart rollers which engage guide track surfaces supported from said structure, there being, in respect of the upstream roller of each said pair, a radially outwardly facing guide track surface and in respect of the downstream roller of each said pair a radially inwardly facing guide track surface, the radially inwardly and outwardly facing guide track surfaces being mutually inclined for changing the relative petal inclinations on operation of means for simultaneously moving all the said petals along said guide track surfaces, there being further provided structure interconnecting the radially inwardly facing guide track surfaces whereby in operation radially outward loads from the said downstream rollers are borne at least partially by tension in said structure.

4,049,200
NEBULIZER
Jacob M. Sobol, 62 Tet Zayin, Zefat, Israel
Filed Apr. 5, 1976, Ser. No. 674,044
Int. Cl.² B05B 7/26
U.S. Cl. 239—338 **7 Claims**



1. Nebulizer apparatus comprising;
an elongate housing having a chamber therein and supporting a pneumatic nozzle in aspirating relation to a liquid nozzle in said chamber;
a liquid inlet formed in said housing in fluid communication with said liquid nozzle;
a pneumatic inlet formed in said housing in fluid communication with said pneumatic nozzle;
a liquid passage between said chamber and said liquid nozzle; and
flow control means for selectively connecting said liquid nozzle to one of said liquid inlet and liquid passage and comprising;
a drum rotatably mounted at one end of said housing;
said pneumatic inlet comprising a first axial passage;
said drum having an eccentric axial passage parallel with said first axial passage and connected to a first transverse passage terminating in said liquid nozzle;
said liquid inlet comprising a second transverse passage in fluid communication with said eccentric passage; and
said liquid passage comprising a third transverse passage in fluid communication with said eccentric passage and angularly displaced from said second transverse passage.

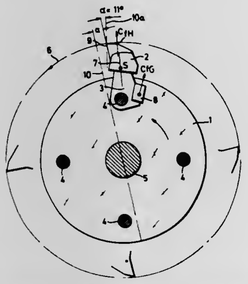
4,049,201
MECHANICAL SEPARATION OF SUBSTANCES
Glen MacArthur, 1659 Sweetbrier St., Palmdale, Calif. 93550
Filed Aug. 4, 1976, Ser. No. 711,546
Int. Cl.² B02C 19/12
U.S. Cl. 241—5 **2 Claims**



1. A device for dry separation of solid particles of different weights when acted upon by the force of gravity, said device comprising a receiving chamber provided with a screen for limiting size of particles introduced into said chamber, a cylindrical passageway to receive particles from said chamber, said cylinder having a spreader plate positioned to impart a laminar flow to the particles, a strike plate to check speed of the parti-

cles and break particles into smaller sizes, a screened opening to receive particles of greater weight and an outlet for discharging lighter weight particles.

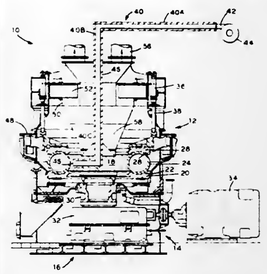
4,049,202
IMPACT HAMMER MILL
Horst Schmidt, Schildgen, Germany, assignor to KHD Industrieanlagen Ag, Germany
Filed Aug. 27, 1976, Ser. No. 718,332
Claims priority, application Germany, Mar. 4, 1976, 2608883
Int. Cl.² B02C *13/04*
U.S. Cl. 241—30 **11 Claims**



1. An impact hammer mill apparatus comprising:
at least two hammer assemblies having arm portions and equalization masses, the hammers being arranged symmetrically about a periphery of said rotor;
each of said hammer assemblies being pivotable about a pivot axis through its respective arm and parallel to and offset from said rotor axis;
each of said hammers having a wearing head with an impact surface facing in the general direction of rotation of the rotors; and
each said equalization masses being affixed to a side of the arm portion of each of said hammers circumferentially opposite the impact surface of the head thereof and having a center of gravity behind a radial line connecting the pivot axis with the rotor axis, with respect to the direction of rotation of the rotor, whereby the impact surface of the head is maintained in an optimum impact orientation, despite wear thereof, by centrifugal forces acting upon the equalization mass and the wearing head.

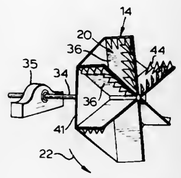
4,049,203
COAL SLURRY DRYING APPARATUS
Edwin Charles McKenzie, Wallington, England, assignor to Babcock & Wilcox, Limited, London, Great Britain
Filed Aug. 5, 1976, Ser. No. 711,925
Int. Cl.² B02C *23/30*
U.S. Cl. 241—52 **2 Claims**

1. A slurry drier comprising a pulverizer having a housing enclosing a pulverizing zone including horizontally disposed upper and lower grinding rings, a circular row of rotatable grinding elements positioned between the upper and lower rings, means for passing heated carrier air through the pulverizing zone, a fixed tubular walled conduit for delivering slurry to be dried and pulverized in the pulverizing zone, the conduit having a horizontally oriented outlet section surrounded by the grinding elements and discharging thereto, and a vertically oriented section connected to the outlet section and extending upwardly through the top of the housing, and wherein insulation covers the walls of the horizontally and vertically oriented



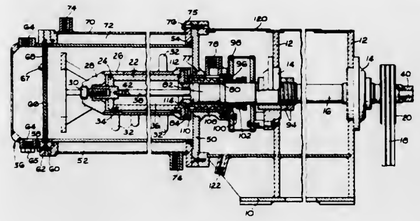
sections thereby inhibiting the drying of slurry within said conduit.

4,049,204
FAN FOR FORAGE HARVESTING SYSTEM
Russell C. McKee, Elmira, Canada, assignor to McKee Bros. Limited, Elmira, Canada
Filed Sept. 23, 1976, Ser. No. 726,012
Int. Cl.² B02C *23/28*
U.S. Cl. 241—55 **6 Claims**



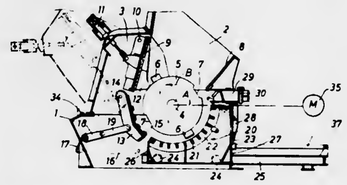
1. In a fan for blowing forage, said fan having a closed back, a front opening for receiving said forage and a side opening for discharging said forage, said fan comprising:
a. a rotatable axle extending in a front to rear direction,
b. a plurality of paddles mounted on said axle and projecting radially therefrom, each paddle having a propelling surface extending radially and in a front to rear direction for propelling air and forage through said side opening, each propelling surface having a front edge, an opposite rear edge, and a radially outer edge,
c. a plurality of shredder blades located on each propelling surface adjacent said outer edge, each said shredder blade having a radially innermost lower end, a radially outermost trailing raised end, and a sharpened upper edge, the improvement comprising:
d. a plurality of further shredder blades located on each propelling surface, each further shredder blade having a lower front end, a trailing raised end, and a sharpened upper edge,
e. said front ends of said further shredder blades on each paddle being spaced apart in a radial direction on the said propelling surface of their associated paddle and such front ends being located adjacent said front edge of said propelling surface of their associated paddle, each further shredder blade extending in a direction both towards said back edge and radially outwardly along its associated paddle, so that forage entering said front opening of said fan will slide over said further shredder blades and will be cut thereby and so that said further shredder blades and said shredder blades in combination will cut said forage to varied lengths.

4,049,205
HORIZONTAL, DETACHABLE, BALL MILL
Robert William English, Stratford-on-Avon, England, assignor to The Mastermix Engineering Company Limited, Hereford, England
Filed July 23, 1976, Ser. No. 708,039
Claims priority, application United Kingdom, July 29, 1975, 31628/75
Int. Cl.² B02C *23/36*
U.S. Cl. 241—67 **3 Claims**



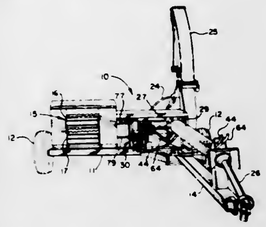
1. A mill comprising a shaft mounted in a pair of bearings located at one end of the shaft, and a wall having an opening through which the shaft extends, wherein the improvement comprises a horizontal-flow container for the charge, which is removably mounted at one end in cantilever fashion upon one side of said wall and has a screened outlet at its other end, a tubular inlet housing which is mounted on the other side of said wall, surrounding a portion of the shaft between said wall and said bearings, and which has a seal through which the shaft enters the inlet housing, a feed screw mounted on said portion of the shaft, another portion of the shaft, extending within the container, being of greater diameter than said opening and being closely spaced from said wall to provide a narrow gap through which material passes from the inlet housing into the container, the shaft being hollow and having means for circulating a cooling fluid therethrough, and a shroud for holding a cooling fluid in contact with the exterior of said seal.

4,049,206
COMMINUTING MACHINE FOR TRASH
Rolf Konig, Handorf; Bernhard Nordemann, Munster, and Herbert Motek, Altenberge, all of Germany, assignors to Hazemag Dr. E. Andreas Kg, Munster, Germany
Filed Apr. 8, 1976, Ser. No. 675,052
Claims priority, application Germany, Apr. 12, 1975, 2516014
Int. Cl.² B02C *13/02*
U.S. Cl. 241—73 **11 Claims**



1. An apparatus for comminuting trash and the like, said apparatus comprising:
a generally closed housing having at its top an inlet and at its bottom an outlet;
a rotor in said housing rotatable about a horizontal axis and provided with at least one radially extending beater element;
means for rotating said rotor about said axis in a predetermined rotational sense;
an impact member in said housing generally above said axis and spaced radially from the orbit of said beater element, said inlet being upstream of said impact member relative to said sense;
a crusher plate pivotally mounted in said housing generally below and downstream of said impact member;
means for pivoting said crusher plate between an effective position spaced radially relatively close to said rotor and an ineffective position radially relatively far from said rotor; and
a grate displaceable through a hole in a sidewall of said housing between a withdrawn position outside said housing and an operative position under and relatively closely spaced from said rotor at said outlet.

4,049,207
FORAGE HARVESTER DRIVE
Donald P. Storm, Hinsdale; Peter Sammarco, Downers Grove; Edward A. Fritz, Hinsdale, and Robert J. Mackert, Downers Grove, all of Ill., assignors to International Harvester Company, Chicago, Ill.
Filed Feb. 12, 1976, Ser. No. 657,515
Int. Cl.² B02C *18/24*
U.S. Cl. 241—101.7 **9 Claims**

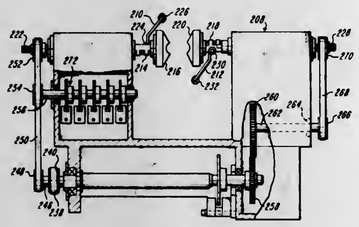


1. In a forage harvester, said forage harvester including a cutterhead, drive means for said cutterhead, a feed roll mechanism including at least a pair of counter-rotating rolls for delivering crops to said cutterhead, and a feed roll drive mechanism driven from said cutterhead drive means and driving said feed rolls, the improvement wherein said feed roll drive mechanism comprises two alternative power paths for transmitting power from said cutterhead drive means to produce forward and reverse drive of said feed rolls, each of said power paths including an electromagnetic clutch operably disposed therein to control the transmission of power therethrough, a source of electrical power for energizing said clutches, and remote switch means for supplying said electrical power for alternative exclusive engagement of each of said electromagnetic clutches to shift said feed roll mechansim from forward to reverse drive while maintaining forward drive to said cutterhead.

4,049,208
CHUCK SPINDLE POSITIONING MECHANISM FOR ARMATURE WINDING MACHINE
Glen E. Bucholtz, and Hyman B. Finegold, both of Dayton, Ohio, assignors to The Globe Tool and Engineering Company, Dayton, Ohio
Filed Oct. 14, 1976, Ser. No. 732,541
Int. Cl.² H02K *15/04*
U.S. Cl. 242—7.05 B **5 Claims**

1. In a flier-type armature winding machine, mechanism for axially positioning a spindle rotatably driven through a spline connection and supporting a flier comprising, in combination,

a cartridge receiving said spindle, thrust transmitting bearing means journalling and axially retaining said spindle within said cartridge, frame means supporting said cartridge for movement in a direction parallel to the rotational axis of said spindle,



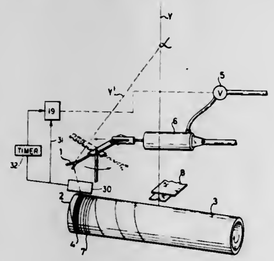
lever means pivoted to said frame means and engaged at one end to said cartridge, and actuator means for actuating said lever means to move said one end in a direction parallel to the rotational axis of said spindle.

4,049,209

PROCESS AND DEVICE FOR FORMING A TRANSFER TAIL

Josef Bach, Leiterhofen; Horst Kollwig, Augsburg; Wolfgang Meitzner; Horst Weintritt, both of Bobingen, and Ralf Ueberdiek, Augsburg, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 478,277, June 11, 1974, abandoned.
This application Jan. 26, 1976, Ser. No. 652,495
Claims priority, application Germany, June 18, 1973, 2330961
Int. Cl.² B65H *54/34*
U.S. Cl. 242—18 PW **12 Claims**



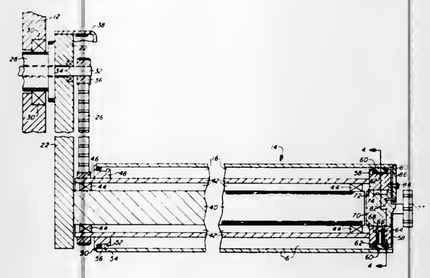
1. A process for forming an adjustable and reproducible transfer tail of yarn wound on a winding bobbin on a high-speed winding frame having a reciprocating thread guide moving through a planar operating zone having forward and reverse traverse limits and an auxiliary rotatable thread guide having a substantial grooved recessed portion for releasably engaging the yarn, the auxiliary rotatable thread guide being initially engaged with the yarn outside of the forward traverse limit of the planar operating zone for holding it in position to form a waste ridge on the bobbin, the process comprising the steps of applying sufficient rotational force to the auxiliary thread guide to positively and automatically rotate it at a predetermined angular speed independent of fluctuations in yarn tension or in surface properties of the yarn whereby preselected turns of yarn are consistently wound as a transfer tail on the bobbin, and continuing rotation of the auxiliary thread guide to rotate the grooved recessed portion forward traverse limit end of the operating zone of the reciprocating thread guide, releasing the yarn from the recessed portion to transfer it at a predetermined coordinated speed to the reciprocating thread guide after the transfer tail is completed to permit the winding to then proceed without undue sliding between the yarn and thread guides to completion under control of the reciprocating thread guide whereby the stress and damage to the yarn is minimized.

4,049,210

STRAND WINDING APPARATUS

John H. Pierce, Reidsville, N.C., assignor to The John Pierce Co., Inc., Reidsville, N.C.

Filed July 30, 1975, Ser. No. 600,327
Int. Cl.² B65H *54/02, 54/44*
U.S. Cl. 242—18 R **12 Claims**



1. In an apparatus for winding a textile strand onto a bobbin to form a strand package, said apparatus including a frame, a generally horizontally-extending spindle assembly adapted to mount said bobbin for rotation about a central axis during operation of said apparatus, strand-guiding means for guiding the strand onto the bobbin during operation of said apparatus, said strand-guiding means including a pressure roll extending generally parallel to said spindle assembly and engagable with the periphery of the strand package formed upon said bobbin carried by said spindle assembly during operation of said apparatus, and movable support means carried by said frame and mounting said spindle assembly for translatory movement toward and away from said pressure roll, the improvement comprising:

said spindle assembly including inner and outer elongate spindle members extending in substantially concentric relationship to each other and to said central axis of said spindle assembly throughout substantially the entire length of said assembly, said inner member being of massive rigid construction and being fixedly and immovably secured at one end thereof to said support means for movement in unison therewith, first and second bearing means disposed between said inner and outer spindle members adjacent opposite ends of said members, said bearing means mounting said outer member for translatory movement in unison with said inner member relative to said pressure roll and mounting said outer member for rotative movement relative to said inner member about said central axis of said spindle assembly;

bobbin-gripping means carried by said spindle assembly for when actuated releasably securing said bobbin upon said outer member of said assembly during operation of said apparatus;

drive means, operatively connected to said spindle assembly separately from and independently of said support means, for during operation of said apparatus imparting rotative movement to said outer spindle member and to said bobbin secured thereon;

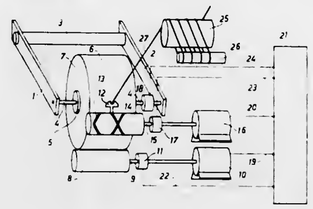
said support means including a cylindrical journal member, and bearing means innerconnecting said journal member and said frame of said apparatus for direct support of said journal member by said frame; and said drive means including a rotatable drive shaft extending freely and generally co-axially through said journal member in radially-spaced relationship thereto.

4,049,211

WINDING APPARATUS FOR TEXTILE THREADS

Gelli Spescha, Winterthur, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Nov. 2, 1976, Ser. No. 738,086
Claims priority, application Switzerland, Nov. 5, 1975, 14252/75
Int. Cl.² B65H *59/38*
U.S. Cl. 242—45 **14 Claims**



1. A winding apparatus for textile threads comprising

a rotatable bobbin chuck for forming a bobbin package thereon;

a friction drive drum for rotating a bobbin package on said chuck;

a thread guide for guiding a thread to said bobbin chuck to form a bobbin package;

a helical groove shaft for moving said thread guide transversely of said chuck;

a first drive having a speed control for rotating said friction drive drum;

a second drive having a speed control for rotating said helical groove shaft;

an electronic control unit including first means for calculating the rotational speed (f_{RS}) of said friction drive drum as a function of the thread speed in accordance with a mathematical formula, said means receiving the desired value of the thread speed (V_F) and the desired value of the rotational speed of said helical groove shaft (f_C) wherein said speed control of said first drive adjusts the speed of said friction drive drum in accordance with the calculated rotational speed (f_{RS}).

4,049,212

APPARATUS FOR INDEPENDENTLY REWINDING SLIT STRIPS IN A WEB SLITTING AND REWINDING MACHINE

Toshiaki Yamaguchi, and Jinichi Shoji, both of Kyoto, Japan, assignors to Nishimura Seisakusho Co., Ltd., Kyoto, Japan

Filed July 19, 1976, Ser. No. 706,781
Claims priority, application Japan, July 21, 1975, 50-89952
Int. Cl.² B65H *19/04, 17/08*
U.S. Cl. 242—56.9 **8 Claims**

1. Apparatus for independently rewinding a plurality of slit strips in a web slitting and rewinding machine comprising:

a contact roller supported for rotation at a fixed position:

a plurality of slit strip rewinding cores arranged generally parallel to the axis of said contact roller at least in one row for contact with said contact roller;

a plurality of support means for rotatably supporting said rewinding cores, respectively;

a common support base for said plurality of support means, said common support base pivotally carrying said support means to allow said support means to swing for a limited angular range;

means for detecting any angular displacement of at least one of said support means to provide control signals; and

drive means for moving said common support base in response to said control signals in such a manner that said



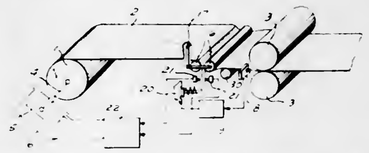
slit strip rewinding cores may be moved away from said contact roller according as the diameter of each of the rewound rolls on said rewinding cores is increased, each of said rewound rolls being kept in contact with said contact roller.

4,049,213

AUTOMATIC REGULATION OF THE POSITION OF THE LATERAL EDGE OF A TRAVELLING WEB

Dietrich Hank; Gerhard Lipfert, and Tassilo Niesgoda, all of Leipzig, Germany, assignors to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Filed Apr. 27, 1976, Ser. No. 680,875
Claims priority, application Germany, May 12, 1975, 185938
Int. Cl.² B65H *25/26*
U.S. Cl. 242—57.1 **17 Claims**

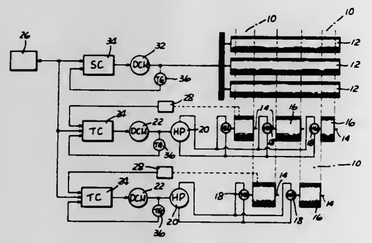


1. In an apparatus for transporting an elongated web along a predetermined path, a regulating system for automatically keeping the position of the lateral edge of the travelling web within preselected first and second tolerance ranges, the regulating system comprising, in combination, sensing means operative for sensing the position of the lateral edge of the travelling web; position-correcting means operative when activated for effecting corrective movement of the travelling web in a direction causing the lateral edge thereof to change position; and regulating means connected to the sensing means and to the position-correcting means and operative for causing the latter to effect corrective movements of the travelling web at a first speed when the sensed position of the web edge is outside the first tolerance range and at a different second speed when the sensed position of the web edge is outside the preselected second tolerance range, the first tolerance range being a narrower tolerance range and the second tolerance range being a wider tolerance range, the first speed being a lower speed and the second speed being a higher speed.

4,049,214
METHOD AND APPARATUS FOR DRIVING REWINDING SHAFTS FOR SLIT STRIPS

Toshiaki Yamaguchi, and Jinichi Shoji, both of Kyoto, Japan, assignors to Nishimura Seisakusho Co., Ltd., Kyoto, Japan

Filed July 19, 1976, Ser. No. 706,782
Claims priority, application Japan, July 21, 1975, 50-89953
Int. Cl.² B65H 59/00
U.S. Cl. 242—75.51 4 Claims

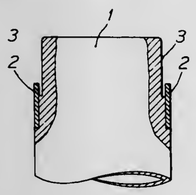


1. A method of rewinding a plurality of slit strips into rolls on separate rewind shafts comprising
driving a first hydraulic pump connected to a first group of said shafts;
driving a second hydraulic pump connected to a second group of said shafts;
interconnecting a first plurality of variable volume hydraulic motors in parallel between said first hydraulic pump and said first group of shafts;
interconnecting a second plurality of variable volume hydraulic motors in parallel between said second hydraulic pump and said second group of shafts; and
providing control means to control said hydraulic pumps to rotate said shafts separately with independent adjustment of the volume of each said hydraulic motor in relation to the width of the respective strip being rewound.

4,049,215
FLYER BOBBIN

Gerd Hueges, Ingolstadt, Germany, assignor to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Germany

Filed July 16, 1976, Ser. No. 705,772
Claims priority, application Germany, July 24, 1975, 7523559[U]
Int. Cl.² B65H 75/28
U.S. Cl. 242—125.1 2 Claims

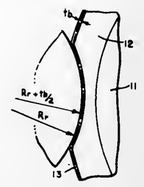


1. A flyer bobbin for receiving roving comprising:
an elongated cylindrical barrel;
a longitudinally extending groove provided in the surface of said barrel;
an elongated resilient clamping member having one end secured to said barrel in said groove and the other end extending therefrom;
a flattened area on the surface of said barrel directly adjacent one end of said groove directly under said other end of said resilient clamping member.
said one end of said resilient clamping member being substantially flush with the periphery of said barrel so as not to interfere with the winding of roving on said barrel; and
said end of said roving being secured between said flattened area on said barrel and said other end of said resilient clamping member for holding sand roving against said barrel in order to initiate the winding of said roving thereon.

4,049,216
METHOD AND APPARATUS FOR GENERATING CONSTANT TAPE TENSION IN A TAPE TRANSPORT APPARATUS

Donald L. Burdorf, Newport Beach, and James Bjordahl, Arcadia, both of Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 6, 1975, Ser. No. 574,959
Int. Cl.² G03B 1/04; G11B 15/32
U.S. Cl. 242—192 2 Claims



1. In a tape transport of the type having supply and take-up reels on shafts rotatably mounted on relatively movable supports and having means biasing said reels, by way of said supports, toward a rotatably mounted driving capstan having a resiliently deformable peripheral portion, with a substantially constant, reel-size independent force in such a way that the bias of said take-up reel towards said capstan is greater in magnitude than the bias of said supply reel toward said capstan,
a method of minimizing the effects of reel size upon the level of tape tension, said method comprising:
driving each said reel from said capstan through the medium of a relatively thin layer which circumferentially surrounds, and is attached to, said peripheral portion of the capstan, said layer being of flexible but substantially inelastic material and, at the interface between said reel and said capstan, said layer being deformed, together with said peripheral resilient portion, in conformity with the contour of said reel, and the thickness of said layer being chosen substantially according to the equation

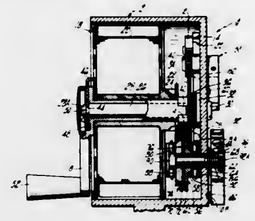
$$V_r = V_c(R_r/R_r + t_b/2$$

wherein:
V_r is the velocity of the reel periphery;
V_c is the constant pitch line velocity of the layer;
R_r is the radius of the reel; and
t_b is the thickness of the layer
so that, as the diameter of said reel increases and decreases during the tape transport operation, the surface speed of said reel is increased and decreased, respectively, relatively to the speed of the pitch-line of said layer by an amount of the same order of magnitude as, but of a sign opposite to changes in said surface speed due to variations in the rates of elastic flow of said peripheral portion of the capstan as a function of said reel diameter.

4,049,217
FISHING REEL DRIVE MECHANISM

Richard Koopman, 85 Ganby St., West Hartford, Conn. 06002

Filed Oct. 1, 1975, Ser. No. 618,478
Int. Cl.² A01K 89/015, 89/02
U.S. Cl. 242—213 18 Claims

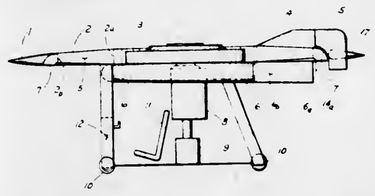


1. A fishing reel comprising a cup-shaped frame, a line spool, means for removably supporting the spool on the frame for rotation, a direct drive transmission and brake subassembly mounted on a supporting axle in offset parallel relation to the rotational axis of the spool, a unitary drive and brake operator selectively movable between first and second positions respectively for establishing a direct drive for spool winding and alternatively actuating the brake while permitting reverse rotation of the spool with a controlled braking force applied thereto for tensioning the line during run-out, means for operatively mounting the direct drive transmission and brake subassembly and the drive and brake operator on the bottom of the cup-shaped frame, a crank operated main rotary drive, means for mounting the rotary drive in coaxial relation to the spool, the direct drive transmission and brake subassembly including a rotary input and a rotary output, the rotary input being drivingly connected to the rotary drive and rotatable thereby in a first angular direction, the rotary output being drivingly connected to the spool to rotate the spool in a line winding direction responsive to rotation of the rotary input in said first angular direction, and a no-back device drivingly connected to the rotary input and limiting its movement against rotation in a direction opposite said first angular direction.

4,049,218
VERTICAL TAKE OFF AND LANDING AIRCRAFT

Lian-Tong Wen, New York, N.Y., assignor to Yung-Heng Wang, Cliffside Park, N.J. and Charles Chang, Honolulu, Hawaii, part interest to each

Filed Mar. 12, 1976, Ser. No. 666,467
Int. Cl.² B64C 29/00
U.S. Cl. 244—23 C 5 Claims

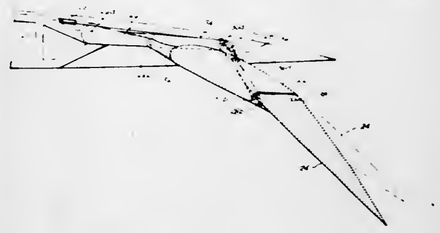


1. An aircraft comprising
an annular wing capable of supporting the aircraft in horizontal flight,
a centrally located impeller having a substantially vertical axis of rotation,
means for moving said impeller axially between an upper position and a lower position,
an annular airstream guide housing within said annular wing and surrounding the periphery of the impeller for receiving air discharged radially from the impeller when the impeller is in the upper position, said airstream guide housing having an annular deflector spaced outwardly from the periphery of the impeller for deflecting downwardly the radially discharged air to provide lift for the aircraft, and
a collecting manifold under said housing and surrounding the periphery of the impeller for receiving air discharged radially from the impeller when the impeller is in the lower position, said manifold having a rearwardly facing exhaust port for discharging air from the manifold to provide forward thrust for the aircraft.

4,049,219
VARIABLE PIVOT TRAILING EDGE FLAP

Roy Delmar Dean, and Richard Herschel Weiland, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 546,578, Feb. 3, 1975, Pat. No. 3,985,319.
This application Mar. 30, 1976, Ser. No. 671,926
Int. Cl.² B64C 9/04
U.S. Cl. 244—217 5 Claims



1. In an airplane wing having a double variable flap comprising: a flap having two parts comprising leading and trailing parts capable of movement with respect to each other, a four-bar linkage with a fore and an aft bar extending from wing support structure to the leading part of the flap, a pivotable linkage extending from the wing support structure to an actuation pivot point, and means for imparting relative movement between the leading and trailing parts of the flap through the actuation pivot point wherein the means for imparting relative movement comprises: a pivotable connection between the two parts of the flap, a linkage extending from the trailing part of the flap to the actuation pivot point having an axis for rotation at each end of the linkage identical to the axis for rotation at each end of the aft bar when the two parts of the flap are in cruise position, and means for imparting motion through the actuation pivot point.

4,049,220
EJECTOR SLEEVES FOR AIRCRAFT MOUNTED GAS TURBINE ENGINES

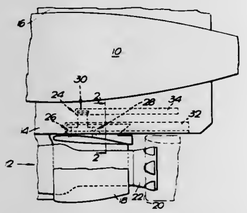
Leonard John Rodgers, Spondon, England, assignor to Rolls-Royce Limited, London, England

Filed Aug. 30, 1976, Ser. No. 718,470
Claims priority, application United Kingdom, Sept. 12, 1975, 37534/75
Int. Cl.² B64D 33/06, 29/00
U.S. Cl. 244—53 R 2 Claims

1. In a jet propelled aircraft:
aircraft structure including a fuselage and a stub wing-like member projecting generally horizontally from the fuselage;
a gas turbine engine having an exhaust nozzel with an exhaust outlet, said gas turbine engine being supported in generally horizontally spaced cantilever relationship to said fuselage;
an annular ejector sleeve movable between an upstream position where it surrounds the gas turbine engine and a

downstream position where its upstream end just overlaps a plane of the exhaust outlet in radial spaced relationship to the exhaust nozzle; and

support means for supporting said ejector sleeve independently of said gas turbine engine in generally horizontally spaced cantilever relationship to said fuselage, said support means comprising an arm rigidly attached to one end to said ejector sleeve and projecting generally horizontally therefrom and having a free end, a pair of generally horizontally spaced, longitudinally extending, a parallel tracks supported on said stub wing-like member with one of said tracks being positioned closer to said ejector sleeve than the other said tracks, said one track positioned closer



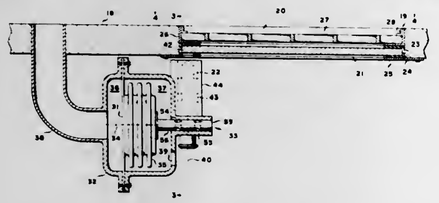
to said ejector sleeve having upwardly facing, downwardly facing, outwardly facing and inwardly facing bearing surfaces, said other of said tracks having a downwardly facing bearing surface, a first group of four rollers mounted on said arm adjacent the regidly connected end thereof for respectively engaging the bearing surfaces of said one of said tracks to prevent said ejector sleeve bodily rotating in planes which contain its longitudinal axis, and at least one roller mounted on the free end of said arm and engaging the downwardly facing bearing surface of said other track for counteracting any bending moment exerted by the weight of the ejector sleeve on the said one track.

4,049,221

RELIEF OF INTER-COMPARTMENT DIFFERENTIAL PRESSURE IN AIRCRAFT

Claude Lloyd Fountain, Granada Hills, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Dec. 24, 1975, Ser. No. 644,278
Int. Cl.[2] B64C *1/18*
U.S. Cl. 244—118 R **7 Claims**



1. In an aircraft having a fuselage containing a plurality of compartments which are pressurized when the aircraft is in flight, the improvement comprising:

a wall located between and separating two of the pressurized compartments and containing an opening through which those two compartments may communicate;

a frangible closure extending across the opening and at least partially closing off communication therethrough;

a single striker operable to strike said frangible closure with a force sufficient to break it and thereby permit the rapid flow of air between the two compartments; and

spring means yieldingly urging said striker along a path toward said frangible closure with a force sufficient to break said closure;

detent means for holding said striker in a retracted position against the force of said spring means;

means communicating with both compartments andmovable in either of two opposite directions, repsonsive to an increase in pressure differential between the two compartments resulting from a presssure decrease in either compartment to actuate said detent means and release said striker for movement by said spring means and breaking said frangible closure;

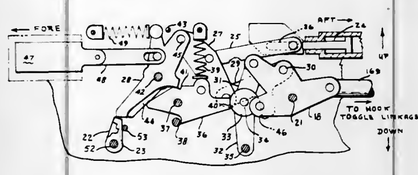
whereby the pressure is equalized on opposite sides of said wall, preventing damage thereto.

4,049,222

EJECTOR RACK FOR NUCLEAR STORES

Paul F. Peterson, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 20, 1976, Ser. No. 707,139
Int. Cl.[2] B64D *1/04*
U.S. Cl. 244—137 R **8 Claims**



1. An ejector rack for releasably supporting, and for selectively ejecting forcibly, a nuclear store from an aircraft, wherein said store has a plurality of lugs from which said store is removably engaged with and to said ejector rack, comprising:

a. means for releasably supporting said removably engaged nuclear store by said store lugs, wherein said support means includes:

1. two oppositely disposed hooks configurated and dimensioned to accept and to removably engage said nuclear store by said store lugs, with said hooks at a distance of 30 inches from each other;

2. suitable dimensioned and configurated linkage, disposed between, and interconnecting, said oppositely disposed hooks, whereby said responsive simultaneously to any movement of said interconnecting linkage;

3. means, connected to said interconnecting linkage, for moving said interconnecting linkage to effect simultaneous movement of said hooks downwardly to close said hooks and thereby to removably engage said nuclear store and said store lugs by said hooks, and also to effect simultaneous movement of said hooks upwardly to open said hooks and thereby to disengage and to release said store lugs and said nuclear store from said hooks, wherein said interconnecting linkage moving means includes a centrally located, pivotally movable main bellcrank;

4. means, connected to said interconnecting linkage, for selectively preventing any movement of said interconnecting linkage, wherein said linkage movement prevention means includes:

aa. a first safety lock assembly that further includes a first locking member pivotally rotatable about a first shaft, with said first locking member selectively movable to a lock position and to an unlock position;

bb. a second safety lock assembly that further includes a second lbcking member pivotally rotatable about said first shaft independently of said first locking member of said first safety lock assembly, with said second locking member aligned with said first locking membe, and with said second locking member selectively movable to the same lock position, and also to the same unlock position, as said first locking member, and also with said second safety lock assembly operatively associated with said first safety lock assembly;

cc. and, a plurality of iinterlinked components common to both said first locking member of said first safety lock assembly and said second locking member of said second safety lock assembly, wherein said interlinked components common to both locking members and both lock safety assemblies include:

11. a pivotally movable release pawl component selectively abutable by either and both of the locking members, with said release pawl having a lock position and an unlocked position;

22. and a pivotally movable trigger component selectively abuttable by said release pawl component, with said trigger component linked to said main bellcrank of said interconnecting linkage movement means;

whereby, when both said locking members of said safety lock assemblies are moved to said lock position, said release pawl component locks with said trigger component, and said trigger component locks with said common interlinked components, and said common interlinked components lock with said main bellcrank, thereby preventing any movement of said interconnecting linkage of said support means, and thereby preventing release and ejection of a nuclear store supported and engaged by said hooks of said support means;

5. and, means connected to said interconnecting linkage moving means, for preventing acceleration forces from acting on said interconnecting linkage moving means and inadvertently causing said interconnecting linkage moving means to move said interconnecting linkage to open said hooks and thereby to disengage and to release said store lugs and said nuclear store from said hooks, wherein said inadvertent release prevention means includes a counterbalance system which further includes a plurality of counterweights having a total mass which is equal to a total mass of those components which can cause the inadvertent release of said supported and engaged nuclear store;

b. means for selectively ejecting said nuclear store forcibly, with said ejection means operatively associated with said support means, wherein said ejection means includes:

1. a plurality of ejection piston cylinders connected to said attachment means, with each said cylinder of said plurality of ejection piston cylinders having an upper portion, a metering probe disposed within said cylinder and releasably connected to the upper portion of the cylinder, and an open-ended lower portion;

2. a plurality of ejection pistons, with a piston for each of said plurality of ejection piston cylinders, and with each said piston of said plurality having a head with an opening therein, with said opening dimensioned and shaped to accept said metering probe of said cylinder, and with said metering probe removably fitted into said piston head opening;

3. a plurality of ejection piston cylinder lower end plugs, with an end plug for closing the open-ended lower portion of each cylinder of said plurality of cylinders, and with each said end plug removably fitted into the open-ended lower portion of its respective cylinder;

4. and, a plurality of ejection piston cylinder springs, with a spring for each of said plurality of ejection piston cylinders, and with each spring disposed internal of its respective cylinder, and also with each said spring interposed between and captured by its respective metering probe and its respective end plug;

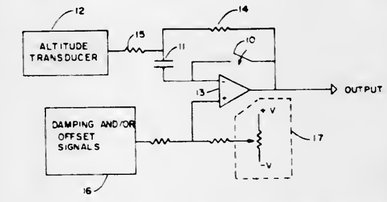
c. and, means for attaching said support means and said ejection means to said aircraft, with said attachment means also functioning as a housing means for said support means, said ejection means, and said attachment means.

4,049,223

CONSTANT ALTITUDE AUTO PILOT CIRCUIT

William S. Watson, Tucson, Ariz., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 21, 1976, Ser. No. 699,007
Int. Cl.[2] G05D *1/08*
U.S. Cl. 244—180 **4 Claims**



1. A constant altitude hold auto-pilot which samples an altitude electronically and produces error output voltages proportional to the changes in altitude which are used to command a control system of an aircraft, comprising:

an altitude transducer means for providing an analog altitude output signal corresponding to the altitude of an aircraft;

a first resistor connected in series with said transducer means;

a high impedance input operational amplifier having a positive input, a negative input and an output;

a second resistor connected between the output of said first resistor and the output of said operational amplifier;

a low leakage capacitor connected between the output of said first resistor and the negative input of said operational amplifier; and,

a switch connected between the negative input of said operational amplifier and the output of said operational amplifier, and said switch, when closed, allows said capacitor to charge to a voltage proportionate to the output of said transducer by the operating characteristics of said amplifier, and said switch, when opened on an externally applied altitude hold command signal, allows the capacitor to be in series with the present altitude signal thereby causing the error signal to be amplified by said operational amplifier.

4,049,224

CHAIN-LINK FENCING PACKAGE AND METHOD OF MAKING SAME

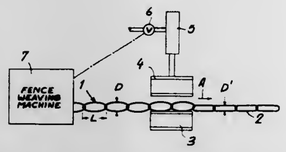
Kurt Wener; Günter Stock; Klaus Herrig, and Heinz Wagner, all of St. Ingbert, Germany, assignors to ARBED, Acieries Reunies de Burbach-Eich-Dudelange, Luxembourg, Luxembourg

Continuation-in-part of Ser. No. 471,907, May 21, 1974, abandoned. This application Aug. 27, 1975, Ser. No. 608,340
Claims priority, application Germany, May 26, 1973, 2327005
Int. Cl.[2] B21F *27/04*
U.S. Cl. 245—6 **2 Claims**

1. A method of making a package of chain-link fencing, said method comprising the steps of:

weaving round-section metal wire provided with a protective synthetic-resin covering into a mesh of interlinked wire coils having a transverse thickness equal to between five and eight times the overall diameter of the coated wire,

flattening the coils of said mesh immediately following weaving thereof to reduce said transverse thickness to a



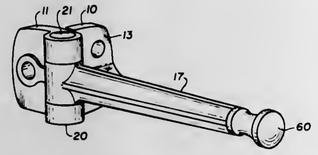
dimension equal to between two and four times said diameter, and, rolling up the flattened-coil mesh.

4,049,225

MOUNTING BRACKET HAVING HINGED BASE

Lee Richard Chasen, Port Chester, and Ruediger Einhorn, Katonah, both of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.

Division of Ser. No. 598,399, July 23, 1975, abandoned. This application May 12, 1976, Ser. No. 686,048
Int. Cl.[2] F16M *13/02*
U.S. Cl. 248—219.4 8 Claims



1. A mounting bracket adapted to be mounted on flat, curved and angular surfaces,

comprising first and second base members each having a substantially flat mounting surface and being hinged together for relative angular displacement about an axis displaced from and parallel to the planes of the mounting surfaces, whereby said second base member may be rotated from one position at which the planes of the mounting surfaces coincide and another position at which the planes of the mounting surfaces are normal to each other, the material of each member extending only on one side of the plane of the respective mounting surface, said axis extending through each base member,

said first base member having a first edge extending normal to the respective mounting surface at a side thereof facing said axis, said second base member having a second edge extending normal to the respective mounting surface at a side thereof facing said axis, said first and second edges extending parallel to said axis and being spaced apart, said first and second edges being positioned to engage the mounting surfaces of said second and first base members respectively to limit the minimum angle between the planes of said mounting surfaces,

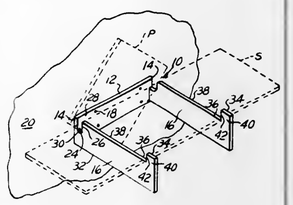
said first base member further comprising a fixed mounting projection extending therefrom substantially at said axis.

4,049,226

HORIZONTAL SHELF AND VERTICAL PANEL BRACKET

Louis A. Harvey, 15107 Ilene St., Detroit, Mich. 48238

Filed May 10, 1976, Ser. No. 684,538
Int. Cl.[2] A47G *29/02*
U.S. Cl. 248—248 1 Claim



1. A supporting bracket for horizontal shelves and vertical panels, comprising

a substantially U-shaped one-piece bracket structure consisting of a single strip of sheet material including a horizontally-elongated bridge portion adapted to be secured to an upright supporting structure,

and a pair of elongated arm portions extending perpendicularly outward in laterally-spaced parallel relationship from the opposite ends of said bridge portion,

each arm adjacent its junction with said bridge portion having a downwardly-extending vertical panel-receiving notch therein,

each arm also having an elongated horizontal shelf-receiving recess in the upper edge thereof extending horizontally outward therealong remote from its respective notch and having a length a multiplicity of times the width of its respective notch,

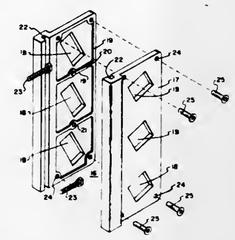
each arm near its outer end having an upstanding stop portion therein disposed remote from its respective notch, and each recess terminating at its outer end at its respective stop portion.

4,049,227

MOUNTING ARRANGEMENT FOR ELECTRICAL COMPONENTS AND ELECTRICAL COMPONENT CASES ADAPTED TO BE USED THEREWITH

Thomas Georgopulos, Chicago, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Continuation of Ser. No. 393,267, Aug. 30, 1973, abandoned. This application Apr. 14, 1976, Ser. No. 676,780
Int. Cl.[2] A47F *5/00*
U.S. Cl. 248—309 R 5 Claims



1. A mounting arrangement for facilitating the mounting of component cases having projecting retaining tabs comprising:

an elongated mounting block having a longitudinal axis, being of a predetermined substantial thickness, and having front and rear major surfaces;

a plurality of openings arranged in longitudinal spaced relation in said block, each said opening defined by intersecting rectangular cut out portion parts of substantially equal dimension, wherein the longitudinal axis of each said rectangular cut out portion is substantially 45° relative to said block longitudinal axis, and wherein the longitudinal axis of each rectangular cut out portion pair are substantially at right angles and bisecting each other; and

a first pair of mounting ridges along the minimum dimension sides of a given one of each said rectangular cut out portion pairs, said first pair of mounting ridges being immediately adjacent one of said major surfaces and being relatively thin in cross sectional thickness relative to said predetermined substantial thickness of said block, and a second pair of mounting ridges along the minimum dimension sides of the other one of each said rectangular cut out portion pairs, said second pair of mounting ridges being immediately adjacent the other one of said major surfaces and being relatively thin in cross sectional thickness relative to said predetermined substantial thickness of said block, whereby,

the first and second pairs of mounting ridges of each said opening are oriented substantiallly at right angles to one another and arranged for independently receiving cooperating retaining tabs carried by component cases to be mounted on said block to facilitate the external mounting of such component cases to both major surfaces of said block.

4,049,228

ADJUSTABLE TRUCK SIDE MIRROR SYSTEM ADJUNCT

William A. Skewis, P.O. Box 251, Sequim, Wash. 98382

Filed Apr. 19, 1976, Ser. No. 678,141
Int. Cl.[2] B60R *1/06*
U.S. Cl. 248—480 5 Claims



1. A vertically positioned mirror unit connected to the cab door of a truck, comprising:

a mounting bracket including (1) upper arms secured above the side window of the cab door of the truck extending laterally outwardly therefrom, and (2) lower arms secured beneath the side window of the cab door of the truck extending laterally outwardly therefrom essentially parallel to the upper arms,

a vertically oriented mirror support bar secured to the upper and lower arms and extending a substantial distance below the lower arms of the mounting bracket,

an upper and lower mirror support extension extending laterally from the vertical bar, the upper mirror support extension secured to the bar so that the upper terminating edge of the mirror does not impair the forward lateral vision of the driver of the truck while allowing unobstructed rear vision and the lower mirror support extension is secured to the bar beneath the side window of the cab door of the truck,

a U-shaped mirror mounting bracket having parallel arms pivotally secured at their respective ends to the upper and lower mirror support extensions, and

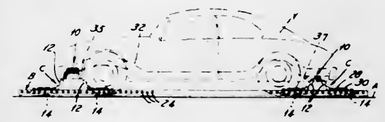
a mirror supported for pivotal adjustment to the U-shaped mirror mounting bracket.

4,049,229

HOOK

Israel Daniel Peisner, Huntington Woods, Mich., assignor to Whitehead & Kales Company, River Rouge, Mich.

Filed June 25, 1976, Ser. No. 699,803
Int. Cl.[2] B60P *7/08*
U.S. Cl. 248—503 2 Claims



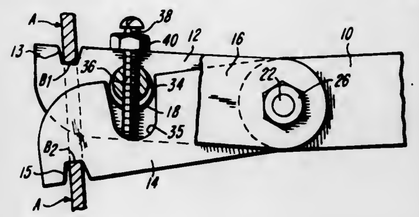
1. A hook structure adapted to be secured in an anchorage member provided with an elongated slot, said hook structure comprising an elongated body having attaching means adjacent opposite ends thereof each for attachment to a tensioning element, said body having a central cylindrical hole, a bolt, said bolt having a shank extending through said hole and adapted to enter and turn in said slot, said shank having a cross head at one end and a retainer at the other end, said cross head and retainer being disposed at opposite sides of said body and having maximum dimensions greater than the diameter of said hole to retain said bolt and body in assembled relation, said cross head being of a length greater than and a width less than the width of the slot to permit said bolt shank to be inserted head first into the slot from one side of the anchorage member when said cross head is disposed lengthwise of the slot and then to be rotated to dispose said cross head crosswise of the slot to bear against the opposite side of the anchorage member, said bolt shank having a first portion adjacent said cross head of such non-circular cross section as to prevent rotation of said bolt by engagement with the side walls of the slot when said cross head is disposed crosswise of the slot and bears against such opposite side of the anchorage member, said bolt shank having a cylindrical portion more remote from said cross head than said first portion permitting rotation of said bolt when said bolt shank is inserted further into the slot to move said head away from such opposite side of the anchorage member, said body being free to turn on said cylindrical portion of said bolt shank in response to varying tension in the tensioning elements and to bear against said retainer to hold said cross head in bearing contact with such opposite surface of the anchorage member.

4,049,230

BRACKET DEVICE

Carl E. Minnear, Dingman Slagel Road., R.R. No. 5, Sidney, Ohio 45365

Filed Feb. 6, 1976, Ser. No. 656,013
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—539 13 Claims



1. Bracket apparatus comprising at least two anchoring

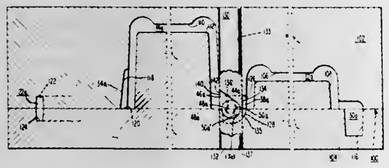
means pivotally mounted to adapt their projected end portions to be disposed in an opening between opposite edge portions of a base structure to which the bracket is intended to mount, means for inducing a scissors-like spread of said anchoring means to have remote portions thereof engage to the said opposite edge portions of said base structure, means defining a mounting device interconnected with said anchoring means and adapted to be supported thereby and in a fixed relation thereto, said anchoring means being formed by a plurality of arm-like elements having a common means to which they mount, a first portion of said arm-like elements providing one of said two anchoring means and mounting means extending in a sense transversely thereof and movable relative thereto which mounts in turn a device which is movable to and retractable from a further portion of said arm-like elements which forms a second of said anchoring means, said device providing said means for inducing said scissors-like spread of said anchoring means, being a screw and said transversely extending means being a pivot which is mounted for rotative movement in said first portion of said arm-like elements.

4,049,231

MOLD FOR MANUFACTURING AN INTEGRALLY MOLDED BALL AND SOCKET TYPE HINGE

Michael Lutz, 226 High Tor Drive, Watchung, N.J. 07060

Filed Jan. 7, 1976, Ser. No. 647,088
Int. Cl.² B29C *11/00*
U.S. Cl. 249—64 **13 Claims**



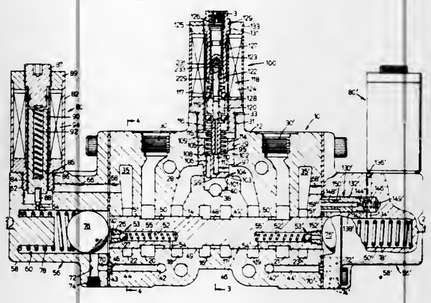
1. A mold for use in forming an article including two sections articulated to one another by at least one hinge that includes a substantially spherical male hinge member disposed within a recess provided by a surface of a female hinge member said hinge including rib means for confining the male hinge member within said recess, said mold including upper and lower mold sections which, when brought into engagement with each other, include section forming compartments for molding said article sections adjacent to one another, a female hinge member forming compartment communicating with one of the article section forming compartments, a mold segment including walls which interrupt the female hinge member forming compartment, said mold segment including inner surfaces defining a substantially spherical male hinge member forming compartment, said walls having an outer periphery which corresponds in shape to the surface of the female hinge member providing the recess therein, said walls having rib defining slots therethrough for communicating the female hinge member forming compartment with the male hinge member forming compartment, a wall of said mold segment being interrupted by an additional slot which provides a communicating passage between the other article section forming compartment and the male hinge member forming compartment.

4,049,232

PRESSURE COMPENSATING FLUID CONTROL VALVE

James Otto Byers, Jr., Racine, Wis., assignor to Tomco, Inc., Racine, Wis.

Division of Ser. No. 403,509, Oct. 4, 1973, Pat. No. 3,893,471.
This application June 25, 1975, Ser. No. 590,344
Int. Cl.² F16K *31/383*
U.S. Cl. 251—30 **11 Claims**



1. A proportional solenoid valve assembly for controlling the flow rate of fluid between an inlet passage and a pressure passage in a hydraulic valve, said assembly comprising:
a poppet valve element for controlling the flow of fluid between the inlet passage and the pressure passage,
a housing mounted on the hydraulic valve in a spaced relation to said poppet valve element, means in said space for biasing said poppet valve element to a closed position, said poppet valve element including a first passage providing fluid communication between said inlet passage and said space and a second passage providing fluid communication between said space and said pressure passage,
a coil in said housing,
an armature mounted for axial movement in said coil,
a pilot valve element carried by said armature for controlling fluid flow through said second passage,
said element having an axial passage providing fluid communication between the ends of said element, whereby the fluid pressure acting on one end of said element is balanced by the fluid pressure acting on the other end of said element and the movement of said armature will open said second passage allowing said poppet valve element to open in response to the pressure differential between inlet pressure and the sum of the forces exerted on the poppet valve element by said biasing means and the pressure of the fluid in said space.

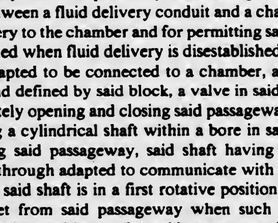
4,049,233

DEVICE FOR ESTABLISHING AND BREAKING A FLUID COMMUNICATION

Johan A. I. Brandin, Norrkoping, Sweden, assignor to Stal Refrigeration AB, Norrkoping, Sweden

Filed Sept. 30, 1976, Ser. No. 728,124
Claims priority, application Sweden, Oct. 3, 1975, 7511100
Int. Cl.² F16K *31/126*
U.S. Cl. 251—61.1 **3 Claims**

1. In combination with first and second wall means forming first and second openings, respectively, said openings being spaced from each other and facing each other in substantially coaxial relation, a device surrounding said first opening for establishing and breaking fluid communication between the openings, said device comprising an inflatable ring operable, when inflated, to seal against the second wall means around the second opening to complete a fluid flow path between said openings, and a generally circular body located in said flow path in coaxial relation to the ring, said ring in its deflated state



bearing sealingly against said body to prevent flow through said first opening.

4,049,234

SAFETY COCK

John A. Spisak, Avon, Ohio, assignor to The Pipe Line Development Co., Cleveland, Ohio

Filed Aug. 11, 1975, Ser. No. 603,644
Int. Cl.² F16K *5/04, 51/00*
U.S. Cl. 251—149.9 **3 Claims**

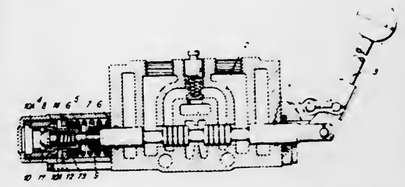
1. A safety cock for positively maintaining a coupled connection between a fluid delivery conduit and a chamber during fluid delivery to the chamber and for permitting said conduit to be uncoupled when fluid delivery is disestablished, comprising a block adapted to be connected to a chamber, a passageway through and defined by said block, a valve in said passageway for alternately opening and closing said passageway, said valve comprising a cylindrical shaft within a bore in said block and intersecting said passageway, said shaft having a transverse bore therethrough adapted to communicate with said passageway when said shaft is in a first rotative position and adapted to be offset from said passageway when such shaft is in a second rotative position so that said passageway is blocked by said shaft, a projecting nipple having a planar face at which one end of said passageway terminates, groove means in said nipple extending transversely with respect to the axis of said passageway for laterally receiving and coupling said conduit to said block, said groove means including portions on diametrically opposite sides of said axis whereby said groove means is capable of solely preventing axial separation of said conduit from said nipple, a handle connected to said shaft for rotating said shaft between first and second rotative positions, said handle intersecting a plane defined by said planar face when said shaft is in its first rotative position and clearing said plane when said shaft is in its second rotative position.

4,049,235

DETENTS FOR LOCKING MOVABLE ELEMENTS

Anthony Singleton, Grantham, England, assignor to Kontak Manufacturing Company Limited, Great Britain

Filed Feb. 19, 1976, Ser. No. 659,516
Claims priority, application United Kingdom, Feb. 19, 1975, 06902/75
Int. Cl.² F15B *13/01*
U.S. Cl. 251—297 **1 Claim**



1. A control device having a housing, a control element which is shiftable in the housing between first and second positions, an operating member connected to the control element and operable manually to shift the control element, return spring means continuously biassing the control element towards the first position, the control element being shiftable beyond the second position in a direction away from the first position, second spring means arranged to augment the manual effort required to shift the control element beyond the second position, and releasable detent means for holding the control elements at the second position, said detent means comprising a cage member having a bore and shiftable to permit the control element to shift to the second position, a carrier axially slidable in said bore and attached to said control element, a resiliently depressible element arranged in the carrier and pressing on said bore, means defining a recess in said bore engageable by said depressible element to effect detent, and stop means fixed to said housing and engageable by the cage member and allowing the cage member to shift within limits defined by the stop means in directions parallel with the axis of the bore.

4,049,236

TOOL FOR REMOVING STAPLES

Carl E. Grill, 1432 E. Second St., and Phillip M. Levi, Jr., 2600 Knollwood, both of Casper, Wyo. 82601

Filed Nov. 5, 1976, Ser. No. 739,260
Int. Cl.² B25C *11/00*
U.S. Cl. 254—28 **1 Claim**



1. A staple remover comprising
a. a generally cylindrical handle,
b. a unitary shank projecting axially from the handle and having a part adjacent the handle which is upwardly bowed between its ends,
a blade part formed as a forward extension of the bowed part of the shank and forming an obtuse angle therewith, and having a lower surface,
the entire lower surface of the blade part extending in a straight line from the obtuse angle area to lie flat on a surface in which a staple is embedded, and

c. a work part forming the forward end of the blade part having a surface at its distal end, and comprising

i. Spaced lower and upper jaws separated by a horizontal slot which extends rearwardly from the distal end of the work part entirely across the work part and is of sufficient height to receive the bridge of a staple,

ii. The lower jaw having curved side edges which converge to a point at the distal end of the lower jaw and having an upwardly and rearwardly inclined upper surface extending from the lower surface of the distal end of the blade part to the slot and forming with the flat lower surface of the blade part a sharp leading edge point,

iii. The upper jaw terminating at its distal end in a sharp transverse edge positioned rearwardly of the forward end of the lower jaw and forwardly of the bottom of the slot, and

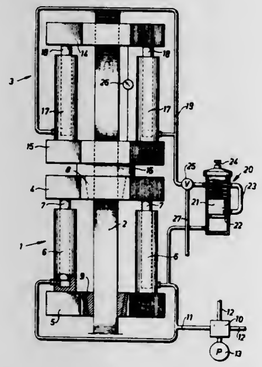
iv. The upper jaw having an upwardly and rearwardly inclined upper surface at its distal end which is aligned with the upper surface of the lower jaw.

4,049,237

APPARATUS FOR OBTAINING SUBSTANTIALLY EQUAL STEPLENGTH OF EACH JACK IN A GROUP OF PRESSURE FLUID OPERATED CLIMBING JACKS

Arne Mattson, Vasteras, Sweden, assignor to Paul Anderson Industrier AB, Vasteras, Sweden

Filed Nov. 19, 1976, Ser. No. 743,254
Claims priority, application Sweden, Dec. 18, 1975, 75143826
Int. Cl.² B66F *1/00*
U.S. Cl. 254—106 **5 Claims**



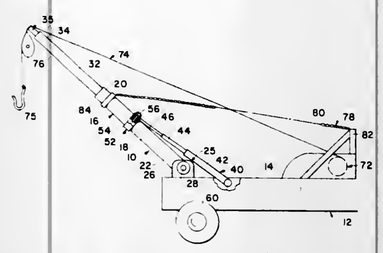
1. In an apparatus for obtaining substantially equal step lengths in a group of pressure fluid operated climbing jacks having pressure cylinders, said climbing jacks used for lifting or lowering a common object, the improvement comprising at least one compensating jack and having a pressure cylinder, said compensation jack in a load transfer relationship with each climbing jack, means to transfer substantially the load to the associated climbing jack from the compensating jack, means to actuate said compensating jack when the climbing jack has carried out a full stroke without reaching said equal step length, wherein a complementary movement of the load is effectuated.

4,049,238

PORTA-CRANE

Harold E. Brown, 419 W. 101st St., Chicago, Ill. 60628

Filed Sept. 27, 1976, Ser. No. 726,698
Int. Cl.² B66C *23/60*
U.S. Cl. 254—139.1 **3 Claims**



1. A truck crane for use on a vehicle frame, comprising:

A. a support frame including a pair of spaced apart support members,

B. means for pivotally mounting said support members at substantially one end thereof between operative and inoperative positions,

C. an extension device cooperatively associated with said support members, said extension device comprising a pair of extension members, each extension member and a respective support member being interfitted one within the other and being slidable and longitudinally adjustable relatively to its support member, so as to be adjustable between extended and retracted positions,

D. bridging means interconnecting said extension members at the free end thereof,

E. releasably interconnecting means for retaining said support members and said extension members in longitudinally aligned extended and retracted positions,

F. said interconnecting means including:

1. a band in telescopic relation to each said support member,

2. cooperating apertures in each said support member and said extension member in alignment with each other when said extension members are in said extended and retracted positions, and

3. a fastener associated with each band to extend within said apertures for obtaining a locking relationship therebetween,

G. means for maintaining said support members in laterally spaced relation to each other, said maintaining means including a cross-member extending between said bands of said interconnecting means,

H. hydraulic means pivotally connected at one end thereof to the vehicle frame and at the opposite end pivotally connected to said cross-member, so as to support said support frame in selected operative positions,

I. said hydraulic means includes a cylinder connected to the vehicle frame at one end thereof and a longitudinally extending arm hydraulically powered by and extending from one end of said cylinder and coupled at its opposite end to said cross-member, said hydraulic means being connected to the vehicle frame and to said cross-member in a manner to permit rotating motion therebetween,

J. winch means contained on the vehicle,

K. cable means having a hook at one end extending over said bridging means and connected to said winch means at the opposite end thereof, such that said support frame is adjustable in the operative position extending beyond the vehicle to the inoperative position in which the said support frame is contained on the vehicle and said cable powered by said winch operates the hook in the operative position of said support frame, and

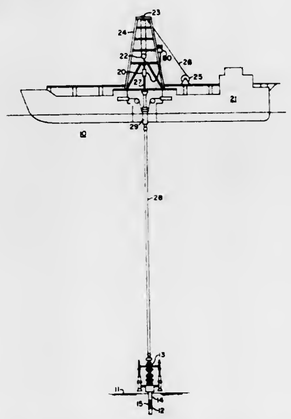
L. adjustable securing means extending between the vehicle and said support frame.

4,049,239

DRILL SPRING TENSION LIMITING DEVICE FOR FLOATING DRILLING VESSELS

James D. Howell, Gretna, La., assignor to Exxon Production Research Company, Houston, Tex.

Filed Dec. 8, 1975, Ser. No. 638,255
Int. Cl.² B66D *1/48*
U.S. Cl. 254—172 **6 Claims**



1. In a floating drilling system including a floating drilling vessel having a drilling derrick, a crown block disposed within the derrick, a traveling block which is suspended below the crown block by a hoisting cable which extends through the traveling block and over the crown block, and a string of drill pipe which is suspended by and below the traveling block, an improved apparatus for limiting tension in the drill pipe which is interconnected between the traveling block and the drill pipe which comprises:

a. a cylinder closed at one end and having an opening at the other end;

b. a piston disposed within said cylinder, slideable therewithin and forming a slideable seal with the inner wall thereof;

c. a piston rod connected to said piston, extending through said opening in the end of said cylinder and forming a slideable seal with the wall of said cylinder at said opening;

d. a bypass conduit extending from one side of the piston to the other;

e. a return conduit extending from one side of the piston to the other and a means in said return conduit for permitting flow therethrough to the rod side of the piston from the other side and preventing fluid flow in the opposite direction;

f. means in said bypass conduit for controlling the flow of a fluid therethrough from the rod side of said piston to the other, said means adapted to actuate when pressure on the rod side of the piston reaches a predetermined level to permit sufficient fluid to flow through the said conduit to maintain such pressure at the predetermined level, said means otherwise preventing flow therethrough when said pressure is below said predetermined level; and

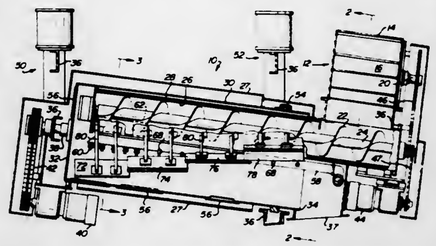
g. means for connecting said piston rod and said cylinder to the drill pipe and the traveling block.

4,049,240

CONTINUOUS MIXER AND UNLOADER

Thomas Walters, Jr., Primos, Pa., assignor to Ecolaire Incorporated, Philadelphia, Pa.

Filed June 16, 1976, Ser. No. 696,464
Int. Cl.² B01F *9/06*
U.S. Cl. 259—3 **11 Claims**



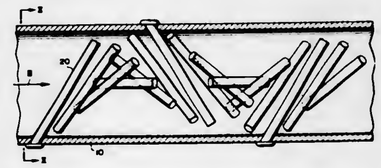
1. Apparatus for continuously mixing and unloading of particulate material and water comprising a conveyor, a support for said conveyor, a drum circumscribing said support and conveyor, said drum having an outlet providing communication between the conveyor and the interior of said drum, means for rotating said drum to cause material to flow from the conveyor to said drum outlet, a plurality of discrete blades in said drum adjacent to but spaced from said drum ID, means for supporting said blades so as to be stationary with respect to said drum, a water conduit in said drum, a plurality of nozzles on said conduit radially inwardly of and adjacent said blades, said blades being curved so as to direct material radially inwardly from the drum ID to a spray from said nozzles, and said blades being arranged along a helical path with the outer peripheral edge of said blades being adjacent to but spaced from the ID of said drum.

4,049,241

MOTIONLESS MIXING DEVICE

Toru Taniguchi, Tokyo, Japan, assignor to Reica Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1976, Ser. No. 650,547
Claims priority, application Japan, Jan. 21, 1975, 50-9413
Int. Cl.² B01F *15/02*
U.S. Cl. 259—4 AC **6 Claims**



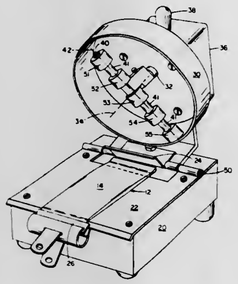
1. A motionless mixing device, comprising a hollow cylindrical housing for introducing a plurality of fluidic materials and a plurality of mixing elements of circular cross-section fixedly positioned within the housing, each of said mixing elements being inclined transversely of the longitudinal axis of the housing at a linear edge thereof in the direction of the flow of fluidic materials through the housing, one end of each of said mixing element in the radial direction of the housing being fixedly disposed in the inner wall of the housing and extending across and through the longitudinal axis of said cylindrical housing, said mixing element further having a space formed between another end of each said mixing element and the adjacent inner wall thereof so that the materials trapped by said element are permitted to pass therethrough.

4,049,242

MIXER FOR PRODUCTS CONTAINED IN SEALED ENVELOPES

John H. Porter, Colchester, Vt., assignor to Ladd Research Industries, Inc., Burlington, Vt.

Filed Apr. 19, 1976, Ser. No. 677,917
Int. Cl.[2] B01F *7/30*
U.S. Cl. 259—72 **10 Claims**



1. In apparatus for mixing products contained in a flattened flexible package resting on a flat support by means of a roller assembly having a plurality of rollers urged toward the support as they rotate to press the package thereagainst, the rollers being aligned on an axis generally parallel to the support and orbiting a second axis generally perpendicular to the support, the apparatus having mechanism for rotating the roller assembly and support relatively to one another on said second axis to produce the rolling movement, the improvement

wherein the rolling surface of a centermost roller extends at least to said second axis to prevent accumulation of unmixed product thereat,

the remaining rollers extend radially outwardly from said axis in at least one direction to cover the area occupied by said package, and

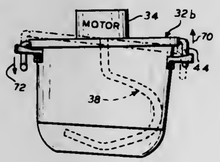
including means for maintaining at least some of said rollers out of pressure contact with package across at least a portion thereof during at least a portion of their orbital movement to cause mixing movement of product within the package for rapid and intimate mixing thereof and to prevent product entrapment at locations therein.

4,049,243

BLENDING AND KNEADING APPARATUS

Hyman Kramer, 50 Carter Drive, Stamford, Conn. 06902

Filed July 19, 1976, Ser. No. 706,752
Int. Cl.[2] B01F *7/16, 15/00*
U.S. Cl. 259—122 **14 Claims**



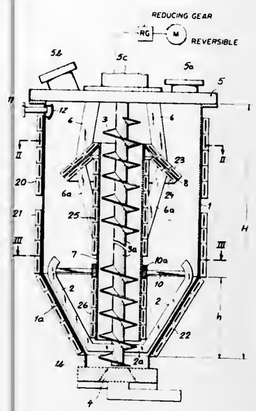
1. Apparatus for kneading ingredients into a mixture having an associated viscosity, comprising an open-topped container for said ingredients, support means capable of bridging the open top of the container, and interengaging means carried by the container and the support means for removably securing the support means on the container and for resisting forces tending to rotate the support means relative to the container, rotary drive means including an electric motor carried by said support means, and a kneader arm drivable by said drive means for rotation in the container about an axis of rotation, said kneader arm being supported solely at its upper end by said drive means and being otherwise free for movement relative to the container, said container having a bottom, said interengaging means and support means in combination comprising connection means between said container and said rotary drive means for enabling both rotation of said kneader arm about said axis of rotation and angular displacement of said axis of rotation with respect to said container bottom during said rotation for enabling the axis of rotation of the kneader arm to sweep over said container bottom during rotation of said kneader arm.

4,049,244

APPARATUS FOR THE HIGH-SPEED MIXING AND DEGASIFICATION OF VISCOUS MATERIALS ESPECIALLY SYNTHETIC RESIN

Wilhelm Hedrich, Katzenfurt, Germany, assignor to Firma Wilhelm Hedrich Vakuumanlagen, Katzenfurt, Germany

Filed Oct. 2, 1975, Ser. No. 618,923
Claims priority, application Germany, Dec. 3, 1974, 2457001
Int. Cl.[2] A21C *1/00;* **A23G** *1/00;* **B01F** *7/16;* **B01D** *19/00*
U.S. Cl. 259—185 **7 Claims**



1. An apparatus for mixing, degassing or thickening a composition comprising a plurality of reactive components, said apparatus comprising:

a substantially round upright vessel having a lower portion extending over about one third of the height of said vessel and converging downwardly to a cylindrical outlet;

a discharge valve at said outlet;

a cover hermetically to and removable from the top of said vessel;

a worm extending vertically in said vessel and journaled on said cover, said worm reaching downwardly into said cylindrical outlet and terminating just above said valve;

a fixed mixing tube closely surrounding said worm and opening at its upper and lower ends into the interior of said vessel;

a laterally and downwardly diverging apron at said upper end of said mixing tube whereby material induced to rise in said tube by rotation of said worm cascades over said apron in a thin layer;

means for evacuating said vessel;

agitating vanes on said worm extending along the wall of said lower portion for mixing material therein around the lower end of said tube; and

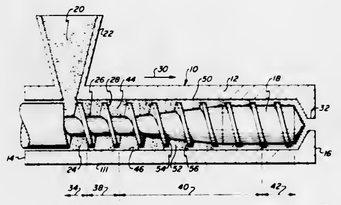
temperature-control elements distributed in sections along the walls of said vessel, said tube and said apron for controlling the temperature of material in said vessel.

4,049,245

APPARATUS AND METHOD FOR PREPARING A PLASTICATED MATERIAL

Zehev Tadmor, Haifa, Israel, and Imrich Klein, Highland Park, N.J., assignors to Scientific Process & Research, Inc., Highland Park, N.J.

Filed July 7, 1975, Ser. No. 593,432
Int. Cl.[2] B29B *3/00;* **B29H** *1/10*
U.S. Cl. 259—191 **15 Claims**



1. Apparatus for preparing a plasticated material from solids of a given material introduced into the apparatus, said apparatus comprising:

a barrel having an inner surface;

supply means for introducing said solids of a given material into the barrel;

a screw conveyor in the barrel, said screw conveyor including a flight which, together with the inner surface of the barrel, defines a channel for conveying the given material from the supply means in a downstream direction as the material is melted within the channel, said flight having a leading face facing downstream and a trailing face facing upstream, said channel having a predetermined width between confronting leading and trailing faces;

the channel including a solids conveying zone having a length extending between the supply means and a point where the temperature of the inner surface of the barrel is at the melting point of the given material, and a melting zone located downstream from the solids conveying zone; and

means on the screw conveyor, at the leading face of the flight, in the vicinity of said point where the temperature of the inner surface of the barrel is at the melting point of the given material for inducing the formation of a melt pool in the channel at a location downstream from the supply means a distance approximately equal to the length of the solids conveying zone, said melt pool inducing means having a configuration which effects a change in the width of the channel in at least that portion of the channel located in the vicinity of said point, said change in width being accompanied by so abrupt an increase in width at that portion as to form a void between the solids and the leading face of the flight to accommodate the melt pool at said location.

4,049,246

BUMPER GUARD FOR STEEL CONVERTING APPARATUS ENCLOSURE

Joseph Ziegler, Apollo, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Mar. 8, 1976, Ser. No. 664,533
Int. Cl.[2] C21C *5/28*
U.S. Cl. 266—158 **11 Claims**

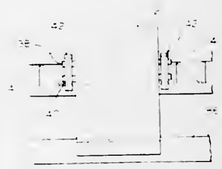
1. A stationary enclosure for a pivotally mounted metallurgical vessel, said enclosure including: a side wall and

an access opening formed in said enclosure whereby said vessel may be charged with metal from metal conveying means movable in a first direction toward said enclosure,

door means movably mounted relative to said opening for selectively closing the same,

support means,

arm means pivotally mounted on said support means for movement in said first direction, bumper means mounted adjacent said door means, said bumper means including shield means mounted on said arm means and having plate means provided with a first surface facing in a direction opposite to said first direction, said shield means having an initial position and being mounted for limited movement in said first direction as said arm means pivots,



and shock absorber means disposed adjacent said shield means and being positioned, constructed and arranged for resisting pivotal movement of said arm means in said first direction as a result of engagement of said plate means by said conveyer means,

said shock absorber means being operative for absorbing impact energy resulting from the engagement of said conveying means with said shield means and for yielding to permit movement of said shield means in said first direction and for restoring said shield means to an initial position.

4,049,247

EQUIPMENT FOR THE CONTINUOUS PNEUMATIC INTRODUCTION OF COAL DUST

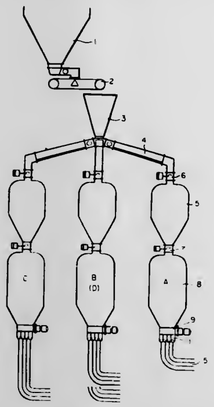
Walter Stamer, Hamburg, and Frithjof Eichinger, Buxtehude, both of Germany, assignors to Claudius Peters AG and MAX-PETERS Gesellschaft fur Verfahrenstechnik mbH, both of Hamburg, Germany

Filed Aug. 23, 1976, Ser. No. 717,005
Claims priority, application Germany, Aug. 22, 1975, 2537370
Int. Cl.[2] C21B *7/00*
U.S. Cl. 266—182 **5 Claims**

1. Equipment for the continuous, pneumatic introduction of finely divided materials, in particular coal dust, into several consumption sites, in particular into the tuyeres of blast-furnaces, characterized

by combining systems partly known per se in such manner that a plurality of double-story vessels is preceded by a distribution system consisting of a supply bin (1) with metering conveyor scale and distribution bin (3), in that a pressure-resistant bucket-wheel distributor (9) is mounted underneath every pressure-vessel (8), the buckets of said distributor being multiply subdivided (10) transversely to the axis, and in that a pressure-pan (11) provided with conveyor-gas hook-up (13) and subdivided into mini-

chambers (12) corresponding to the bucket-wheel distributor is mounted underneath each bucket-wheel distributor, the conveyor lines (15) to the consumption sites being connected to said pressure pan.



4,049,248

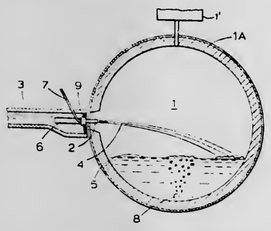
DYNAMIC VACUUM TREATMENT

Ole Georg Gjosteen; Trygve Olavson Terum, and Aksel Ola Aarflot, all of Sunndalsora, Norway, assignors to A/S Ardal og Sunndal Verk, Oslo, Norway

Division of Ser. No. 496,859, Aug. 12, 1974, Pat. No. 3,895,937, which is a continuation-in-part of Ser. No. 269,086, July 5, 1972, abandoned. This application Jan. 15, 1975, Ser. No. 541,273

Int. Cl.² C21C *1/00*

U.S. Cl. 266—202 11 Claims



1. Apparatus for use in the batch production of light metal alloys, said apparatus comprising a vacuum furnace with a vacuum chamber, said vacuum chamber having a completely closed bottom wall, means for evacuating said vacuum chamber, and nozzle means for introducing molten light metal into said vacuum chamber by suction, said nozzle means comprising at least one nozzle for forming at least one free-falling jet of molten light metal in said vacuum chamber, said at least one nozzle being directed into said vacuum chamber at an angle with the horizontal plane in the range of from 3° to 20°.

4,049,249

TILTABLE CONVERTER

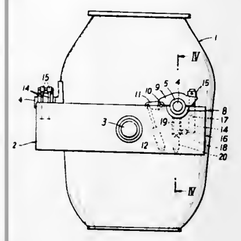
Peter Moser; Manfred Eysn; Bernhard Enkner; Rupert Berger, all of Linz; Wolfgang Wagner, Vienna, and Ronald Spannlang, Linz, all of Austria, assignors to Vereinigte Osterreichische Eisen - und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Dec. 9, 1975, Ser. No. 639,245

Claims priority, application Austria, Mar. 12, 1975, 1891/75

Int. Cl.² C21C *5/42*

U.S. Cl. 266—247 8 Claims



1. In a tiltable converter having a converter body, supporting trunnions fixed to the converter body, a bearing structure surrounding the converter body for at least half of its circumference, bearing bushings releasably connected to the bearing structure for mounting engagement of the supporting trunnions, and drawing hooks for attaching the bearing bushings to the bearing structure and being pivotable into and out of an engagement position, the improvement comprising:

a bearing bushing bolting piece for each bearing bushing, said bolting piece being arranged for engagement and disengagement with at least one drawing hook so as to attach the bearing bushings to the bearing structure or to release them, respectively, said at least one drawing hook having a hook end and a shaft end with an axis therebetween, each drawing hook being arranged on the bearing structure so as to be pivotable around said axis, the hook end of the at least one drawing hook being pivotable into engagement with the bearing bushing bolting piece;

at least a first pressure medium cylinder allocated to each bearing bushing for actuating the at least one drawing hook, said first pressure medium cylinder having one side articulately connected to the bearing structure; and

self-locking bracing means fastened to the bearing structure for releasably locking the at least one drawing hook in its engagement position, said self-locking bracing means includes a push rod for each drawing hook and a guide for the push rod, the shaft end of the drawing hook being hinged to one end of the push rod and the other end of the push rod being connected to the other end of the first pressure medium cylinder, the other end of the push rod also being guided in said guide and being movable along said guide into a locked position by means of said first pressure medium cylinder.

4,049,250

CRUCIBLE

Walter Schmidt, Schaffhausen, Switzerland, assignor to Prolizenz AG, Chur, Switzerland

Filed Feb. 26, 1976, Ser. No. 661,439

Claims priority, application Switzerland, Mar. 6, 1975, 2845/75

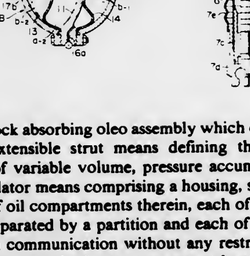
Int. Cl.² F27B *14/10*

U.S. Cl. 266—275 8 Claims

1. A crucible for use with an oxidizing melt at elevated temperatures, comprising

a crucible body composed of a material selected from the group consisting of platinum metals and tungsten and which is able to withstand the elevated melt temperatures but is subject to corrosion due to the oxidizing character of the melt; and

a continuous anti-corrosion coating on the inner surface of said crucible body, said coating being of a metal which is



substantially non-alloying with the material of said crucible body and which has a low affinity for oxygen so as to protect said material of said crucible body from said oxidizing melt and thereby prolong the useful life of said body.

4,049,251

SHOCK ABSORBING STRUT ASSEMBLY

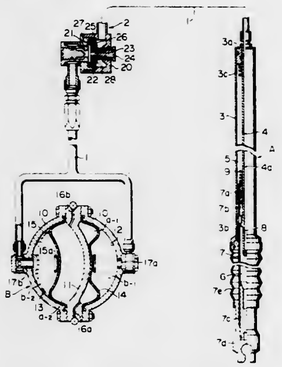
Watanabe Masae, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Dec. 11, 1975, Ser. No. 639,778

Claims priority, application Japan, Dec. 12, 1974, 49-142788

Int. Cl.² B60G *13/00*

U.S. Cl. 267—64 R 5 Claims



1. Shock absorbing oleo assembly which comprises telescopically extensible strut means defining therein oil chamber means of variable volume, pressure accumulator means, said accumulator means comprising a housing, said housing having a pair of oil compartments therein, each of said compartments being separated by a partition and each of said compartments being in communication without any restriction with said oil chamber means in the strut means, at least two separated gas compartments in said housing, a pair of pressure responsive wall means in said housing which separate the gas compartments from said oil compartments, and each of which is exposed to its respective oil compartment, said gas compartments being respectively charged at different gas pressures, means for holding the pressure responsive means in the gas compartment of higher pressure against movement when oil pressure in the oil chamber means is below a predetermined value so that the gas pressure in the gas compartment of the higher pressure does not have influence on the oil pressure.

4,049,252

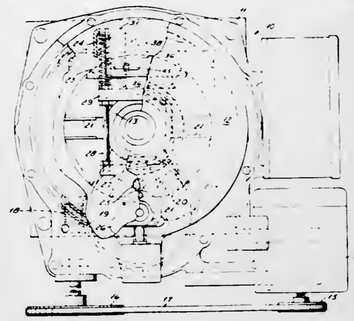
INDEX TABLE

Theodore F. Bell, c/o Norbell Corp., 400 Fentress Blvd., Daytona Beach, Fla. 32014

Filed Feb. 4, 1976, Ser. No. 655,203

Int. Cl.² B23Q *1/04*

U.S. Cl. 269—57 11 Claims



1. In an index table, the combination comprising

a base,

a table mounted about an axis for rotation on the base,

means for indexing said table to bring successive points of said table into predetermined positions,

spaced locating means fixed on said table at circumferentially spaced points,

radial locking means on said base movable radially inwardly to engage said locating means and to lock said table relative to said base and movable radially outwardly to disengage said table from said base,

and means operable upon rotation of said table to move said radial locking means radially inwardly and outwardly,

pump means operable upon radial movement of said radial locking means to provide oil under pressure for lubricating portions of said table.

4,049,253

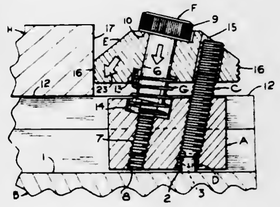
TOE CLAMP

George I. Mandel, 4146 Krolop Road, Castro Valley, Calif. 94546

Filed Nov. 26, 1976, Ser. No. 745,042

Int. Cl.² B23Q *3/02*

U.S. Cl. 269—137 3 Claims



1. A toe clamp comprising:

a. a nut slidable in an elongated groove in a milling machine table top, the groove having a cross section in the shape of an inverted T;

b. a work engaging member having a bore downwardly

inclined from the vertical and facing toward the adjacent edge of a work piece supported by the table top;

c. a clamping screw having an upper portion received in said bore and a lower portion threaded into said nut, the head of said clamping screw moving said work engaging member downwardly and against the adjacent edge of the work piece when said clamping screw is tightened; and

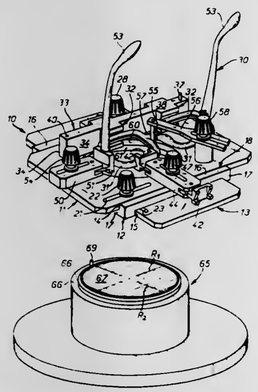
d. means for interconnecting said nut with said work engaging member and including a guide screw having its lower portion threaded into said nut and its upper portion received in an opening in said work engaging member that is slightly larger than the diameter of the guide screw, said guide screw's axis paralleling the inclined axis of said clamping screw.

4,049,254

SUPPORTING AND POSITIONING PLATE ASSEMBLY FOR SPECTACLE FRAMES

Jean Marie Godot, Brunoy, France, assignor to Essilor International Cie Generale d'Optique, France

Filed July 13, 1976, Ser. No. 704,790
Claims priority, application France, July 24, 1975, 75.23087
Int. Cl.[2] B25B *5/14*
U.S. Cl. 269—156 **25 Claims**



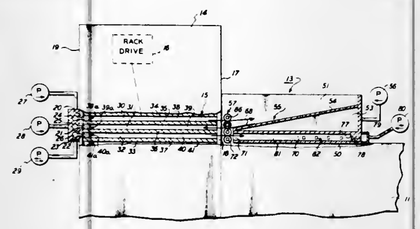
1. A supporting and positioning plate adapted for the controlled positioning of a spectacle frame, comprising fastening means adapted to hold a spectacle frame, a bed plate, a tray mounted for sliding in a first direction on the bed plate, a base on which said bed plate is in turn mounted for sliding in a second direction perpendicular to the first-mentioned direction locking means for locking the elements in position provided between said tray, said bed plate, and said base, a positioning pedestal, complementary engagement means being provided between the said pedestal and the base of the plate, and the base, bed plate, and tray being provided with mutually corresponding cavities which leave the upper face of the pedestal visible, and around which are disposed the associated spectacle frame fastening means, the upper face of the pedestal being provided with reference axes.

4,049,255

APPARATUS FOR FEEDING DOCUMENTS TO AND FROM A COPIER

Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 8, 1976, Ser. No. 664,603
Int. Cl.[2] B65H *5/22, 9/04*
U.S. Cl. 271—3 **9 Claims**



1. Apparatus for posing documents on a transparent plate, comprising:

a. a rack having a plurality of pockets with aligned openings;

b. means for moving any pocket of the rack to a first location and to a second location;

c. fluidic means for drawing a document into any pocket stationed at said first location;

d. fluidic means for selectively ejecting or drawing into any pocket stationed at said second location a document; and

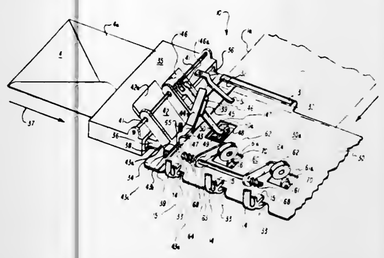
e. a document handler including means for feeding a document to any pocket located at said first location, and means cooperating with the plate for moving a document ejected from a pocket at the second location onto the plate and for feeding a document on the plate to said pocket at the second location, said means for feeding a document to any pocket located at said first location including an inclined platform, a gate located adjacent the bottom end of the inclined platform, and means for lubricating the top surface of the inclined platform, whereby documents placed on the platform slide towards said bottom end.

4,049,256

DOCUMENT ALIGNMENT ASSEMBLY

John Allen Church; Paul Feinstein, Jr.; Ronald Eugene Hunt, all of Austin; Louis Marion McDaniels, Round Rock, and Paul Francis Munch, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 7, 1976, Ser. No. 693,820
Int. Cl.[2] B65H *5/26, 9/16*
U.S. Cl. 271—9 **7 Claims**



1. Alignment apparatus for aligning separate sets of documents wherein at least one of said sets includes documents such as conventional envelopes, said apparatus disposed at the intersection of transversely oriented first and second transport paths along which said sets of documents are respectively transported for aligning respective ones of said documents in a document engaging means of a transport assembly with said document engaging means positioned substantially perpendicular to said first one of said transport paths, comprising:

a. document guide edge means disposed in an orientation substantially perpendicular to said document engaging means and parallel to said first transport path;

b. a document support plate defining respective first and second passageways in communication with said first and second transversely oriented transport paths, respectively; and

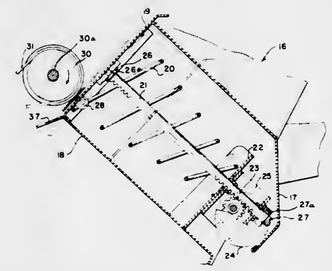
c. means for advancing a document from either of said sets of documents along said support plate simultaneously toward said document guide edge means and said document engaging means, thereby to accurately align said documents with said document engaging means.

4,049,257

DOCUMENT FEEDER APPARATUS

Richard Frystak, Park Ridge, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed May 4, 1976, Ser. No. 683,112
Int. Cl.[2] B65H *1/12, 1/18, 3/52*
U.S. Cl. 271—114 **10 Claims**



1. A sheet feeder apparatus comprising:

a frame;

sheet support means adapted to support a stack of sheets and moveable within said frame;

a pivotable arm mounted on said frame for engaging the stack of sheets, said pivotable arm normally in a first position and being moveable to a second position;

coil spring drive means operatively associated with said sheet support means for urging said sheet support means toward said pivotable arm;

a brake means connected to said sheet support means for preventing motion of said sheet support means within said frame toward said pivotable arm means, said brake means comprising:

rack means connected at one end thereof to said sheet support means;

pinion means engaging said rack means;

an electric motor connected to said pinion means, said electric motor having sufficiently high torque when inoperative to overcome said coil spring drive means urging of said sheet support means toward said pivotable arm when said pivotable arm is in said second position; and

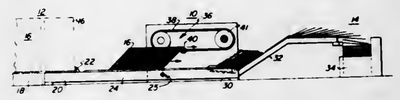
a switch for operating said brake means, said switch being closed when said pivotable arm means is in said first position and open when said pivotable arm is in said second position, whereby said sheet support means may be depressed within said frame and loaded with a stack of documents which is urged by said coil spring drive means toward and into engagement with said pivotable arm means for feeding, which pivots said pivotable arm from said first position into second position thereby to activate said brake means until a portion of the sheets are fed and said pivotable arm pivots again to said first position.

4,049,258

METHOD OF AND APPARATUS FOR FEEDING SHEETS

Joseph A. Zeblisky, Jersey City, N.J., assignor to General Corrugated Machinery Co., Inc., Palisades Park, N.J.

Filed Aug. 4, 1976, Ser. No. 711,617
Int. Cl.[2] B65H *1/30*
U.S. Cl. 271—151 **4 Claims**



1. The method of feeding sheets such as flat corrugated paperboard sheets used to be formed into packaging cases from a stack of horizontal sheets into a horizontally shingled array of the desired faced orientation toward an exit such as a hopper which comprises:

feeding the stack of sheets onto the entrance of a conveyor;

tilting the stack of sheets to a first posture wherein they are not yet in the horizontally shingled array, but are resting on their edges with the faces of the sheets and the conveyor forming an acute angle facing the exit;

supporting the face of the sheet in the stack closest to the exit such that all the sheets resting on their edges are supported in the first posture to thereby maintain the acute angle facing the exit;

moving the sheets while supported on their edges in the first posture toward the exit; and

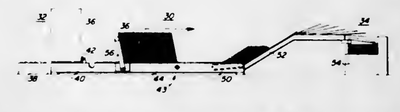
subsequently dropping the sheets from the first posture and into a second posture wherein the sheets are in the horizontally shingled array on the conveyor shingled toward the exit to thereby deliver them to the exit.

4,049,259

METHOD OF AND APPARATUS FOR FEEDING SHEETS

George A. Ventz, Clifton, N.J., assignor to General Corrugated Machinery Co., Inc., Palisades Park, N.J.

Filed Aug. 4, 1976, Ser. No. 711,479
Int. Cl.[2] B65H *1/30*
U.S. Cl. 271—151 **32 Claims**



1. The method of feeding sheets such as flat corrugated, paperboard sheets used to be formed into packaging cases from a stack of horizontal sheets into a horizontally shingled array of the desired faced orientation toward an exit such as a hopper which comprises:

feeding the stack of sheets onto the entrance of a conveyor;

tilting the stack of sheets to a first posture wherein they are resting on their edges so that the sheets form an acute angle with the conveyor, but are not in the horizontally shingled array;

supporting the face of the sheet in the stack which makes the acute angle with the conveyor to thereby support all the sheets on their edges in the first posture;

moving the sheets while supported on their edges in the first posture toward the exit; and

subsequently dropping the sheets from the first posture and into a second posture wherein the sheets are in the hori-

zontally shingled array on the conveyor shingled toward the exit to thereby deliver them to the exit.

5. Apparatus having an entrance and an exit for feeding a stack of horizontal sheets to deliver the same toward the exit in a shingled fashion comprising:

a conveyor;

means for delivering the stack of horizontal sheets to the entrance and onto the conveyor;

means associated with the conveyor for moving the stack of horizontal sheets into a position in which the sheets form a group resting on the edges of the sheets and wherein one end of the group of sheets forms an acute angle with the conveyor such that the sheets forms an acute angle with the conveyor such that the sheets will be delivered to the exit in the desired faced orientation;

support means for supporting the group of sheets at the end thereof forming an acute angle with the conveyor to preclude the sheets from falling to a horizontal posture on the conveyor until a first predetermined condition has been reached;

moving means for moving the support means toward and away from the exit;

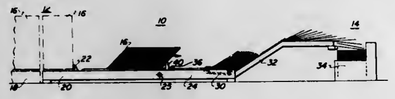
actuating means for actuating the moving means to move the support means toward the exit when the first predetermined condition has been reached to thereby move the group of sheets to a position wherein its leading sheet rests against the trailing sheet of the previous group and for actuating the moving means to move the support means toward the entrance when a second predetermined condition has been reached to await delivery of the next stack of horizontal sheets.

4,049,260

APPARATUS FOR FEEDING SHEETS

Andrew M. Szymborski, Mountainside, N.J., assignor to General Corrugated Machinery Co., Inc., Palisades Park, N.J.

Filed Aug. 4, 1976, Ser. No. 711,480
Int. Cl.² B65H *1/30*
U.S. Cl. 271—151 **6 Claims**



1. Apparatus having an entrance and an exit for receiving a stack of horizontal sheets such as flat, corrugated paperboard sheets at the entrance and feeding them to thereby deliver the same toward the exit in a shingled fashion comprising:

a conveyor;

means for delivering the stack of horizontal sheets to the conveyor;

means associated with the conveyor for moving the stack of sheets into a position in which the sheets form a group resting on the edges of the sheets and wherein the faces of the group of sheets and the conveyor form an acute angle facing the exit such that the sheets will be delivered to the exit in the desired faced orientation;

support means for supporting the group of sheets at the leading end of the group to preclude the sheets from falling to a horizontal posture onto the conveyor until a first predetermined condition has been reached, said support means being movable between a first position when it is below the level of the conveyor and the sheets are free to drop onto the conveyor and a second position when it is above the level of the conveyor and supports the sheets on their edges;

moving means for moving the support means toward and away from the exit;

actuating means for actuating the moving means to move the support means toward the exit while supporting the sheets on their edges when a second predetermined condition has been reached and for actuating the moving means to move the support means toward the entrance below the level of the conveyor when the first predetermined condition has been reached;

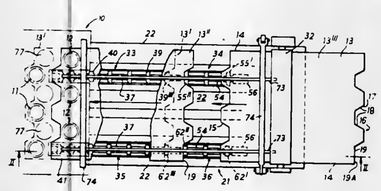
the leading sheet resting against the trailing sheet of the previous group when the first predetermined condition has been reached.

4,049,261

FEEDER FOR FEEDING SHEETS HAVING A RECESSED PROFILE END EDGE

Jozef Tadeusz Franek, Chorleywood, and Paul Porucznik, St. Albans, both of England, assignors to Metal Box Limited, England

Filed Aug. 30, 1976, Ser. No. 718,816
Int. Cl.² B65H *9/10*
U.S. Cl. 271—269 **7 Claims**



1. Sheet feeding apparatus comprising fixed support means defining a sheet path for supporting in its own plane along said path a sheet of material having an end edge with a recessed profile defined by at least one abrupt discontinuity intermediate between the ends of the end edge; sheet-advancing means adjacent said support means and having a main pusher element; means for moving said sheet-advancing means along said path, said main pusher element having a profile adapted to engage in a recess of the sheet edge; means restraining said main pusher element laterally whereby to prevent lateral movement of the sheet; and top restraint means overlying said path for engaging the top surface of the sheet to restrict movement thereof to movement in said plane, said sheet-advancing means having steadying means for engaging the sheet end edge so that, by virtue only of said steadying means engaging the sheet end edge, the sheet is prevented from slewing away at an angle with said path in said plane, said steadying means comprising an auxiliary pusher element spaced from said main pusher element in a direction having a component transverse to said path, said auxiliary pusher element having a transverse sheet-engaging face but being free of any non-transverse sheet engaging face, whereby the sheet is located transversely of said path by said main pusher element only, said sheet-advancing means further comprising means for moving said main and auxiliary pusher elements simultaneously and in parallel paths.

4,049,262

USER-ACTUATED SIMULATED MOTORCYCLE RIDE

Jere P. Cunningham, Jr., 1190 Central Ave., Memphis, Tenn. 38104

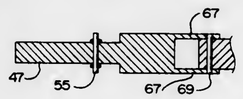
Filed Apr. 14, 1976, Ser. No. 677,019
Int. Cl.² A63G *31/00*; G09B *9/04*
U.S. Cl. 272—1 R **10 Claims**

1. A user-activated device for simulating the ride of a motorcycle, said user-activated device comprising:

a. base means for being supported on a supporting surface;

b. body means having a shape substantially similar to a motorcycle for supporting the user of said user-activated device, said body means having an elongated slot provided substantially transversely through said body means and extending substantially lengthwise of said body means with the midportion of said slot higher than either end thereof; and

c. attachment means for movably attaching said body means to said base means, said attachment means including a substantially inverted U-shaped guide member having a normally horizontally extending midportion for extending substantially transversely through said slot of said body means and including a normally vertically extending end portion extending from each end of said midportion, said attachment means including resilient supporting means for movably and resiliently attaching said vertically extending end portions to said base means to thereby movably attach said body means to said base means for allowing the user of said user-activated device to selectively rotate said body means a limited amount and to selectively move said body means up and down a limited amount and back and forth a limited amount thereby allowing the user of said user-activated device to selectively cause said user-activated device to simulate the ride of a motorcycle, said attachment means normally providing the sole support of said body means above said base means.

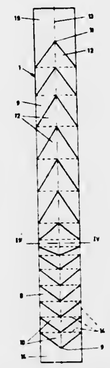


4,049,263

DIVING BOARD

Dirk J. Gerritsen, Eext, and Marcus Kuipers, Annen, both of Netherlands, assignors to N. V. Tramposafe, Eext, Netherlands

Filed Mar. 18, 1975, Ser. No. 559,646
Claims priority, application Netherlands, Mar. 18, 1974, 7403632
Int. Cl.² A63B *5/10*
U.S. Cl. 272—66 **6 Claims**



1. A diving board for a swimming pool, said diving board being of the cantilever type adapted to have its rear end attached to a stationary support and adapted to rest on an adjustable fulcrum at a fulcrum area between its front and rear ends, said diving board comprising a primary layer substantially extending over its full length, said layer having a low density and an upper surface and a lower surface, at least one of said surfaces being provided with a stack of flat layers of reinforcing material over at least a portion of said surface at both sides of said fulcrum area, said layers of reinforcing material including wire-sheet, the length of each of said wire-sheet layers of said stack successively diminishing from the front end and the rear end of the diving board towards the most rearward portion of the fulcrum area, said wire-sheet layers being bonded to one another and to said surface of the primary layer by a binding material.

4,049,264

LOOP-THE-HOOP EXERCISER

Cressie E. Holcombe, Jr., 1613 Blackwood Drive, Knoxville, Tenn. 37921

Filed Feb. 2, 1976, Ser. No. 654,582
Int. Cl.² A63B *5/20*
U.S. Cl. 272—74 **5 Claims**



1. An exercising unit to be fastened to a user's body for orbiting a rigid circular hoop over and under the body during jumping actions while pivoting said hoop about a portion thereof maintained at a fixed point relative to the body, this oribiting being substantially without benefit of arm or hand manipulations, which comprises:

a base plate to fit against the body of a user;

means associated with said base plate to attach said base plate to said user's body;

a single beam extending substantially perpendicular to said base plate with a first end of said beam fastened to said base plate;

a cylindrical housing member rigidly attached to a second end of said beam, said housing member being provided with a transverse cylindrical open passageway having an axis substantially horizontal when said exercising unit is in use;

a rigid circular hoop member threaded through said passageway, said hoop member having a circular cross section less than the diameter of said passageway and a major diameter dimension sufficient to permit a portion of said hoop member diametrically opposite from a hoop portion within said passageway to orbit over and under said user's body during jumping actions while said hoop member pivots on said axis of said passageway; and

connecting means associated with at least one of said hoop and housing members to interconnect said hoop member with said housing member for rotation therebetween.

4,049,265

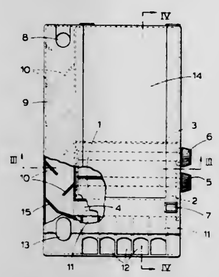
QUESTION AND ANSWER GAME

Thomas Barnet Mackie, Kirkcaldy, Scotland, assignor to Thomas Salter Limited, Kirkcaldy, Scotland

Filed May 5, 1976, Ser. No. 683,626
Claims priority, application United Kingdom, Oct. 29, 1975, 44588/75
Int. Cl.² G09B *3/00*
U.S. Cl. 273—1 R **7 Claims**

6. A toy for playing a question and answer game, comprising a housing having a ball inlet therein at the upper end thereof and a plurality of ball outlets at the lower end thereof, an intermediate chamber arranged in said housing, an inlet channel arranged along one side of said housing for guiding a ball placed in said ball inlet to said intermediate chamber, a plurality of baffle means arranged in said inlet channel, a plurality of

exit channels, each of said exit channels being associated with one of said outlets, a flexible belt having a plurality of ball passageways therethrough, each passageway corresponding to one of said exit channels, and two spindles within the housing,



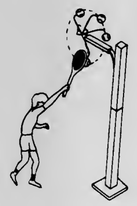
attached to opposite ends of said flexible belt, each spindle including a turning knob on an end thereof external to said housing, whereby a ball passageway can be shifted selectively into communication with an exit channel.

4,049,266

SPORT PRACTICE APPARATUS

Robert J. Feiler, 2 Oriole Place, Portchester, N.Y. 10573

Division of Ser. No. 537,678, Dec. 30, 1974, Pat. No. 3,948,517.
This application Jan. 23, 1976, Ser. No. 651,678
Int. Cl.[2] A63B *61/00*
U.S. Cl. 273—29 A **4 Claims**



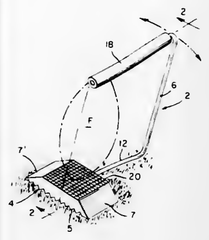
1. An apparatus for practicing strokes comprising:
a substantially vertical upstanding support member having a base;
a substantially horizontal second support member; means adjustably mounting said second support member to said upstanding first member adjacent the upper end thereof;
an elongated wire;
said wire having means rotatably attaching one of its ends to said second support member adjacent the outer free end thereof, such that said wire is rotatable about the longitudinal axis of said second support member in a vertical plane;
a ball;
said ball being mounted on the other end of said wire and being suspended below said second support member whereby being struck on the exercise of a stroke will cause said ball and wire to travel in said vertical plane around the longitudinal axis of said second support member;
a guide member;
said guide member being a pair of elongated resilient arms, each of said arms being attached to said second support member and extending substantially verically upwards therefrom, one of said arms being positioned on one side of said vertical plane of travel of said ball and wire and the other arm being positioned on the opposite side of said second vertical plane of travel of said ball and wire, the upper end of each of said arms being bent towards said second vertical plane of travel to define a path through which said wire may pass when said ball is struck, whereby when said ball is hit correctly said wire will travel through said path without touching said arms and if said ball is hit incorrectly at least one of said arms will be touched by said wire.

4,049,267

FOOTBALL PLACE-KICKING DEVICE

Charles Phelps Forrest, 1306 St. Stephens Road, Mobile, Ala. 36603

Filed July 26, 1976, Ser. No. 709,005
Int. Cl.[2] A63B *67/00*
U.S. Cl. 273—55 B **8 Claims**



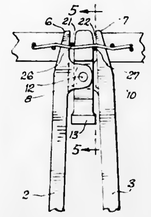
1. A football place-kicking device comprising:
a. a base adapted to support the lower end of a football;
b. an upright arm mounted on said base for pivotal movement in a vertical plane relative to said base;
c. a rigid upper arm and a rigid lower arm, each having one of its ends attached to said upright arm and each extending substantially horizontally from said upright arm, said lower arm portion having its other end frictionally attached to said base so as to allow said upright arm to pivot in a vertical plane; and
d. a semi-rigid ball-engaging arm mounted on the other end of said upper arm portion, said ball-engaging arm being adapted to be deformed for engagement with the upper end of a football when supported on said base, for holding said footall in a substantially upright position.

4,049,268

RACKET STRING CLAMP

Lynn L. Ray, P.O. Box 4034, San Diego, Calif. 92104

Filed Dec. 20, 1976, Ser. No. 752,035
Int. Cl.[2] A63B *51/14*
U.S. Cl. 273—73 A **9 Claims**



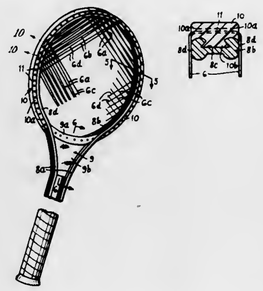
1. In the stringing of a racket, a clamping device for holding the tension of a string by attaching said string to an adjacent string which comprises:
two levers each having at one end a substantially flat clamping jaw; means for rockingly linking said levers together near said clamping jaws;
resilient means for closing said clamping jaws; and spacer means operatively associated with said linking means so as to be floatingly held between said clamping jaws so that a pair of adjacent parallel strings can be held between said spacer means and respective ones of said clamping jaws.

4,049,269

RACKETS

Robin Michael Blackburne, Ardsheal Cottage, Paget 6-20, Bermuda

Filed Mar. 6, 1975, Ser. No. 556,188
Claims priority, application United Kingdom, Mar. 6, 1974, 10120/74; May 31, 1974, 24294/74
Int. Cl.[2] A63B *51/06*
U.S. Cl. 273—73 D **9 Claims**



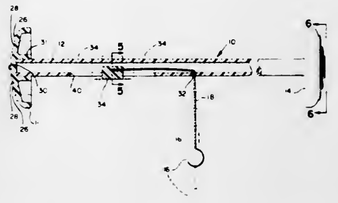
1. A games racket comprising a handle intended to be held in the hand, and carrying a head having an open marginal frame defining a central opening, across which extends tensioned stringing carried by the head, the stringing being composed of a first group of generally parallel string portions, and a second group of generally parallel string portions extending generally perpendicular to, and interwoven with, the string portions of the first group, the thickness of the frame in a direction generally normal to the plane of the stringing being substantially greater than the thickness of the stringing, the frame including a structural marginal frame part defining the central opening, and a separate flexible but substantially incompressible, elongate member having an upper portion and a lower portion and formed from a relatively hard synthetic plastics material, extending substantially continuously, at least from one side of the handle, around the outer peripheral surface of said frame part to the other side of the handle, and overlying said outer peripheral surface, said frame part and said lower portion of the elongate member having at least one interfitting projection and recess, said elongate member being formed with a plurality of stringing-receiving apertures distributed around a major proportion of the peripheral extent of the frame, said apertures being spaced from the outer periphery of said upper portion of the elongate member, and extending continuously between and opening into, opposite side surfaces of said elongate member which are spaced apart in said direction, said elongate member, in the zones thereof provided with said apertures, having a thickness in said direction approximating the thickness of said frame part, and at least the outer peripheral surface of said upper portion of the elongate member, over substantially its entire length, being relatively smooth, uninterrupted, and devoid of projections, said tensioned stringing carried by the head passing through said apertures, and being disposed in two generally parallel planes separated by a distance approximating the thickness of the frame in said direction.

4,049,270

TETHERED BALL AND SHAFT GAME DEVICE

Adrian W. McCall, 80 Gaywood Place, Moraga, Calif. 94556, and William L. Kellogg, 2912 Bayview Drive, Alameda, Calif. 94501

Filed Apr. 22, 1976, Ser. No. 679,154
Int. Cl.[2] A63B *67/00*
U.S. Cl. 273—95 A **4 Claims**



4. A ball and staff game device comprising: an elongated staff with distally spaced opposite ends; a pair of enlarged end pads connected to the opposite ends of the staff for horizontal support of the staff; a line of predetermined length having first and second ends; a ball, wherein the first end of the line is connected to said ball and the second end of the line is connected to said staff, said line having a substantial segment pendant from the staff approximately midpoint along the staff; and, a line adjustment means connected to said second end of the line for adjusting the length of the segment of line pendant from the staff, wherein said staff comprises a hollow tube, said tube having a longitudinal slot along a portion of said staff and an aperture proximately displaced from said slot, and wherein said line adjustment means includes a stop mechanism engageable with said slot and moveable with respect to said slot to a plurality of positions on said slot said line being connected to said stop mechanism and passed through said hollow tube and out said aperture.

4,049,271

TARGET BOARD SAIL GAME

Richard A. Fonti, 11 Beckford St., Beverly, Mass. 01915

Filed Aug. 9, 1976, Ser. No. 712,756
Int. Cl.[2] A63B *65/10, 67/06*
U.S. Cl. 273—95 R **3 Claims**

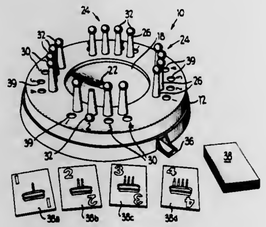


1. In a game comprising a planar target board having a fibrous surface with appropriate scoring designations thereon, a missile adapted for sailing toward and adherence to said board including a circular disc portion, a circular peripheral rim formed integrally with and extending at an angle from and completely around the circumferance of said disc portion, said rim being positioned asymmetrically with respect to the plane of said disc portion, and a strip of fabric hook tape secured to and extending around the outer surface of said rim.

4,049,272
GAME DEVICE

Jeffrey D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 13, 1976, Ser. No. 658,025
Int. Cl.[2] A63F 9/14
U.S. Cl. 273—95 R 7 Claims



1. A game apparatus, comprising:
a base support;
a plurality of playing objects coded for use by multiple players of the game;
means on said base support defining a receptacle for determining the first of said playing objects to be received therein;
a plurality of playing positions on said base support about said receptacle;
a plurality of upstanding standards at each playing position for positioning on top thereof a plurality of said coded playing objects; and
said objects being of a physical character so as to be capable of being blown off of its respective standard by the air exhalation by players of the game from the top of the standards toward the receptacle.

4,049,273
LACROSS STICK AND PREFORMED NETTING THEREFOR

Robert B. Pool, 564 Charleston Road, Willingboro, N.J. 08046

Continuation of Ser. No. 347,709, April 4, 1973, abandoned. This application Mar. 26, 1975, Ser. No. 562,217
Int. Cl.[2] A63B 59/02
U.S. Cl. 273—96 D 4 Claims

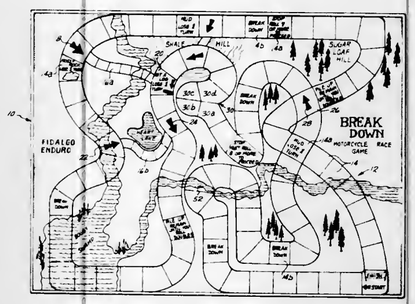


1. The unassembled combination of a lacrosse stick head comprising a V-shaped frame and a separate preformed netting adapted to extend throughout the area within the boundaries of said frame; said frame having a pair of diverging side walls joined at a jointure and an outer end member connecting the outer ends of the side wall members to form a closed net area of substantially triangular form, said netting being of elongated form having one end of the netting of substantially the same width as the inside edges of the frame at the outer end of the sidewall members and the remaining portion of the net of greater width than the remaining portion of the net area extending between the sidewall members toward the juncture of the two side walls of the frame and means for tightly lacing the edge of the above mentioned end of the netting to the outer end member and the outer ends of the side walls and means for attaching the edge of the remainder of the netting to the remaining portions of the diverging side walls of the frame to a point adjacent the juncture of the side wall members, thereby automatically forming a pocket in the netting adjacent the jointure of the two side wall members when the head and netting are assembled.

4,049,274
MOTORCYCLE TEAM RACING GAME

Cecil F. Jevons, 2706 J Ave., Anacortes, Wash. 98221

Filed Mar. 4, 1976, Ser. No. 663,778
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—134 CA 12 Claims

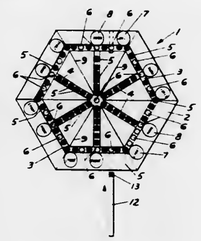


1. A game to simulate team racing, such as cross-country motorcycle team racing, where each player is able to operate selectively members of the player's team along a race course, while maintaining a predetermined order of the team members, with an element of chance to simulate delays and hazards of racing, and with elements of strategy by which the player can attempt to maximize progress of the player's own team members and minimize progress of team members of another player, said game comprising:
a. a board having a representation of an obstacle encumbered race course, such as a cross-country motorcycle course, said race course being divided along its length into increments of travel, such as squares,
b. a plurality of sets of markers, such as figures of a motorcycle team, each set having identification means, such as a color coding, to identify the markers of that set belonging to a particular player,
c. said board having turn delay indicating means, such as breakdown squares, natural hazard squares or racing obstacle squares, to indicate a delay in progress of a marker encountering the delay indicating means by loss of one or more turns,
d. chance means, such as dice, operable by a player to provide by chance a numerical value to determine the extent of progress of a selected marker along said race course, and
e. a plurality of sets of turn delay counters, such as breakdown counters, said sets of counters corresponding to related sets of markers, with each set of counters having an individual counter for each marker of its related set of markers, so that as play progresses, it is possible to count off the number of turns that are lost as a result of a marker encountering said delay indicating means, and to associate the delay in turns with a particular marker of a particular player.

4,049,275
BOARD GAME APPARATUS

Carl W. Skelton, 1105 Running Brook Drive, Shreveport, La. 71108

Filed Sept. 23, 1976, Ser. No. 725,848
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—134 AE 10 Claims

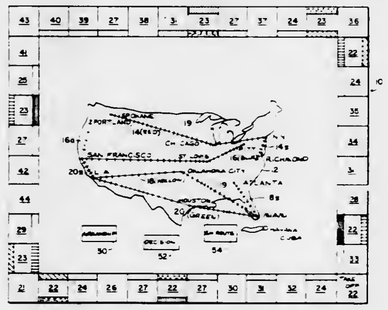


1. A board game apparatus comprising:
a. a game board having marked spaces constituting a track extending about said game board to define a prescribed route of traversal of said game board;
b. at least one slot in said game board beneath selected ones of said marked spaces on said game board;
c. a plurality of player tokens, each containing a magnet, for traversing said path or track; and
d. a plurality of challenge sticks, each containing a magnet in one end thereof, for insertion in said at least one slot for magnetically influencing said magnet in said player tokens when said player tokens are on said selected ones of said marked spaces.

4,049,276
BOARD GAME APPARATUS

Richard A. Hole, 3850 Abbotsford Road, Rockford, Ill. 61107

Filed Sept. 27, 1976, Ser. No. 727,244
Int. Cl.[2] A63F 3/04
U.S. Cl. 273—134 AC 6 Claims



1. A game for at least two players comprising in combination:
a. a game board displaying a geographical area with a plurality of locations connected by color coded airplane flight routes, an equal number of checkpoints being provided on each flight route, a similarly color coded alternate flight route being additionally provided for each said flight route, checkpoints in turn being provided for each alternate flight route;
b. a strip provided on said game board along its border edges, said strip being divided into a plurality of individual units, a number inscribed in each unit, said number corresponding to a predetermined set of instructions as set forth in a legendary table therefor, a minority of said units being randomly color coded consistent with the color coding of said airplane flight routes, each color being represented equally;
c. a chance number indicator means;
d. at least two color coded miniature aircraft, said aircraft being movable between checkpoints from point of departure to point of destination along said airplane flight routes and alternate flight routes similarly color coded;
e. at least two color coded board markers, said markers being movable from one individual unit to another provided on said strip, pursuant to the number indicated by said chance number indicator means, said number inscribed in said individual unit providing the basis for the gain or loss of score points or the movement of said aircraft between checkpoints in accordance with the instructions set forth in said legendary table; and
f. a first set of a plurality of cards designated as Airmanship Cards and relating solely to the gain or loss of score points; a second set of a plurality of cards designated as Decision Cards and relating to the gain or loss of score points or the movement of said aircraft between checkpoints; a third set of a plurality of cards designated as Enroute Cards and relating to the gain or loss of score points or the movement of said aircraft between checkpoints, said first, second, and third set of cards being selectable in accordance with the instructions set forth in said legendary table.

4,049,277
BUBBLE FREE DIE AGITATOR

Ernest R. Carlsson, Jr., Huntington; Henry Delach, Bethpage, and Henry Hinz, Huntington, all of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.

Filed Sept. 4, 1975, Ser. No. 610,355
Int. Cl.[2] A63F 9/04; B65D 1/04
U.S. Cl. 273—145 C 6 Claims



1. A die agitating amusement device comprising, a closed liquid tight container having opposed first and second end portions, said second end portion having a substantially flat transparent section therein; a liquid impervious partition member in said container located adjacent said first end portion thereof, said partition extending across the entire crossection of said container thereby dividing the container into first and second chambers, with the first chamber being of greater volume than the second chamber and located between the second end portion of the container and said partition; said second chamber being located opposite said first chamber between said partition and said first end portion of the container, said partition member having a centrally located extension portion which extends into said second chamber towards said first end portion of the container and an opening in said extension portion providing the sole fluid communication between said chambers, an opaque liquid filling said first chamber and a portion of said second chamber, the volume of liquid

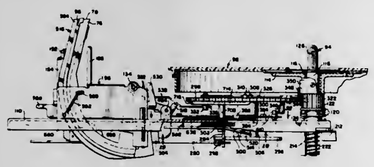
in said container being selected to entirely fill said first chamber and a portion of the second chamber to keep said opening immersed in liquid regardless of the position of the container whereby any air in said second chamber accommodates expansion of the liquid while the first chamber remains completely filled with liquid and any gas bubble defined by such air remains trapped in the container in said second chamber upon tilting or inversion of the container; and a buoyant die member located in said first chamber and having indicia formed thereon in a color contrasting with the color of said liquid whereby said indicia can be read through said second end portion of the container when said second end portion is above said first end portion but said buoyant member is blocked by said partition when said first end portion is above said second end portion.

4,049,278

AUTOMATIC RECORD CHANGER

James T. Dennis, 3900 SE. 29th St., Oklahoma City, Okla. 73115

Filed Jan. 9, 1974, Ser. No. 432,089
Int. Cl.[2] G11B *17/16*
U.S. Cl. 274—10 R **14 Claims**



1. In an automatic record changer, a rotatable turntable, means for rotating said turntable, a record supporting spindle positioned at the center of said turntable for supporting records having a relatively small centering aperture, said spindle having means defining a record supporting shelf on which a stack of small centering aperture records may be placed, a record supporting platform positioned to support the edge of the bottom record of a stack of records seated on said shelf, means for ejecting the bottom record of a stack of records seated on said shelf and supported on said platform, a record hold down member arranged to engage the top record of a stack of records supported on said platform, and at last record sensing member operable independently of said hold down member and movable in a generally vertical plane, means operable during the record changing cycle for moving said sensing member into engagement with the outer edge of a record held on said platform by said hold down member, and means responsive to inward of said sensing member when no record is positioned on said platform for de-energizing said turntable rotating means.

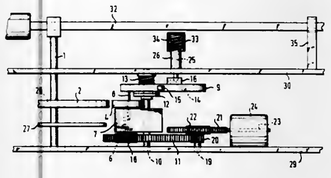
4,049,279

CONTROL DEVICES FOR PICK-UP ARMS OF RECORD PLAYERS

Gustav Klein, Lahr, Germany, assignor to Geratewerk Lahr GmbH, Lahr, Germany

Filed Oct. 20, 1976, Ser. No. 734,132
Claims priority, application Germany, Oct. 20, 1975, 2546921
Int. Cl.[2] G11B *17/06*
U.S. Cl. 274—15 R **16 Claims**

1. A control device for a pick-up arm of a record player, said device comprising:
   a. a power take-off element (2) disposed on a vertical spindle of a pick-up arm;
   b. a shaft of rotation;
   c. a sun wheel mounted on said shaft for rotation therewith;
   d. drive means for rotating said sun wheel;
   e. a rotatable support means consisting of an element and a bar non-rotatably connected to each other with said bar being mounted on said shaft and rotatable independently thereof;
   f. a clutch mounted on said shaft and connecting said element to said shaft to rotation therewith and thereby serving to rotate said bar with said element;
   g. at least one planet wheel means in engagement with said sun wheel (11) and mounted to said rotatable support means about said shaft of rotation whereby, on rotation of said sun wheel (11), said rotatable support means with said planet wheel means mounted thereon will also rotate until



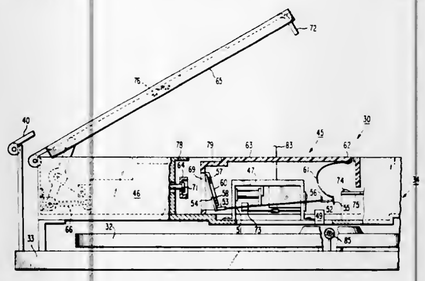
said planet wheel means is brought into contact with said power take-off element (2) whereupon said clutch (12) will slip and said planet wheel means will rotate about its said axis of rotation and, through frictional contact with said power take-off element (2), will rotate said vertical spindle and thus swivel said pick-up arm; and
   h. lifting means responsive to said rotation of said rotatable support means to raise said pick-up arm before said planet wheel means is brought into contact with said power take-off element.

4,049,280

PICKUP CARTRIDGE

Marvin Allan Leedom, South Brunswick Township, Middlesex County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 16, 1976, Ser. No. 667,308
Claims priority, application United Kingdom, Sept. 18, 1975, 38458/75; Nov. 28, 1975, 49109/75
Int. Cl.[2] G11B *3/02*
U.S. Cl. 274—37 **11 Claims**



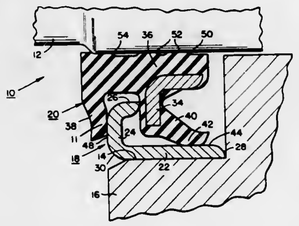
1. A pickup cartridge for a video disc player comprising:
A. a stylus arm unit including:
   a. a stylus;
   b. a stylus arm carrying said stylus at one end therof;
   c. a connector plate; and
   d. a compliant member securing said connector plate to the other end of said stylus arm;
B. a cartridge having walls defining a protective enclosure for said stylus arm unit; and
C. means, including a flexible diaphragm secured to said connector plate, for flexibly suspending said connector plate within said cartridge at a first angular orientation with respect to said cartridge such that said compliant member is unstressed when said stylus arm occupies a retracted position within the confines of said cartridge while said connector plate is held in said first angular orientation;
said connector plate being adapted to be rotated when said cartridge is mounted in said player to a second angular orientation such that said compliant member is also unstressed when said stylus projects outside the confines of said cartridge while said connector plate is held in said second angular orientation.

4,049,281

UNITIZED DUAL LIP SEAL METHOD

Dean R. Bainard, Clover, S.C., assignor to Garlock Inc., Rochester, N.Y.

Division of Ser. No. 512,205, Oct. 7, 1974, Pat. No. 3,963,248.
This application Jan. 28, 1976, Ser. No. 652,901
Int. Cl.[2] F16J *15/34*
U.S. Cl. 277—1 **3 Claims**



1. A method for sealing the space between a housing bore and a shaft extending therethrough comprising positioning a wear sleeve onto one of said bore and shaft with said sleeve having a radial flange extending toward the other of said bore and shaft and having a cylindrical flange connected to the distal end of said radial flange, positioning an elastomeric member on the other of said bore and shaft, said member having an auxiliary radial portion including an auxiliary sealing lip extending radially toward the wear sleeve on one side of said flange and a main radial portion including a main sealing lip extending radially toward said wear sleeve on the other side of said flange, positioning said auxiliary sealing lip into contact with the outside radial surface of said flange, whereby a pocket for contaminate does not form and whereby water drainage is encouraged to wash sludge away from the auxiliary sealing lip, and positioning the distal end of said cylindrical flange in contact with said main radial portion when said auxiliary sealing lip is in contact with the outside radial surface of said radial flange, whereby said cylindrical flange ensures that said auxiliary sealing lip will always be in contact with said outside radial surface of said radial flange.

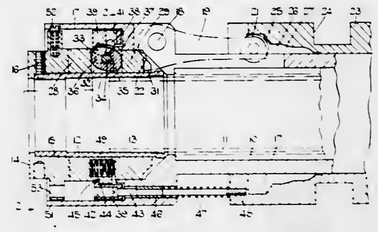
4,049,282

COLLET ACTUATING MECHANISMS

Norman Yearsley, Kenilworth, England, assignor to Wickman Machine Tool Sales Limited, Coventry, England

Filed June 16, 1976, Ser. No. 696,541
Claims priority, application United Kingdom, June 20, 1975, 26276/75
Int. Cl.[2] B23B *31/20, 31/10*
U.S. Cl. 279—50 **5 Claims**

1. A collet actuating mechanism comprising a hollow work spindle tube with an internal frusto conical surface at an operative end thereof, a collet tube co-axial with and slidably engaged within the work spindle tube, the collet tube having a collet threadably engaged with its end, the collet having a complimentarily frusto conical external surface engagable with the work spindle, the end of the collet being divided into a number of segments to that it can contract inwards to grip a work piece, a toggle mechanism to perform axial sliding movement between the work spindle tube and collet tube, a sleeve slidable around the work spindle tube to cause the toggles to act between the slidable tube and an assembly including springs reacting against a nut fixed relatively to the collet tube, spring means acting on one of a pair of axially relatively movable elements which, in turn, act on the toggle and on the fixed



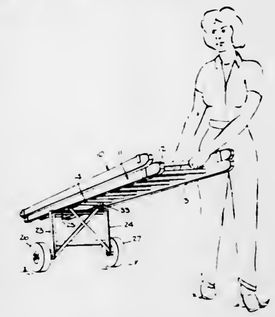
abutment on the collet tube, respectively, and adjustable cam means also acting between said elements and arranged to alter the effective between the toggle and said abutment, the arrangement being such that the collet will grip work pieces of varying diameter with substantially the same gripping force.

4,049,283

LADDER CADDY

Malcolm J. Brookes, 30 E. 68th St., New York, N.Y. 10021; James A. Sheridan, Box 295-A, Rte. 1, Englishtown, N.J. 07726, and Douglas M. Spranger, 23 Fiske Place, Brooklyn, N.Y. 11215

Division of Ser. No. 547,801, Feb. 7, 1975, Pat. No. 3,991,852.
This application Apr. 29, 1976, Ser. No. 681,602
Int. Cl.[2] B62B *1/26*
U.S. Cl. 280—47.13 R **3 Claims**



1. A caddy for transporting a ladder wheel-barrow style, said ladder having rungs extending between a pair of rails, said ladder comprising:
   A. a wheeled carriage having a raised bridge member which is at right angles to the direction of movement;
   B. a pair of transverse pieces having a channel formation mounted at spaced positions of said bridge, said pieces having a length substantially equal to the space between said rails; and
   C. a pair of clips received within the channels at opposite ends of each piece and secured thereto, said clips extending slightly beyond said ends to provide a forward set of clips and a rear set of clips, the outer faces of said clips being positioned directly adjacent said rails when said clips engage adjacent rungs of the ladder, each clip in at least one set being formed of a resilient plastic block having flat outer faces and being cut to define a pair of spring jaws which are forced apart when applied to a rung of the

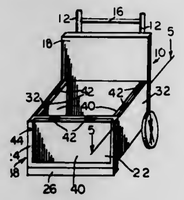
ladder, the sets being spaced apart to engage adjacent rungs on the ladder, and the distance between corresponding clips on the piece being substantially equal to the distance between the rails on the ladder whereby the outer faces of the clips are positioned directly adjacent said rails, said carriage being formed by a pair of legs whose tops are interconnected by said bridge member.

4,049,284

COMBINATION HAND TRUCK AND GARDEN CART

Ronald Capper, 1219 Chateau Drive, San Jose, Calif. 95120

Filed Apr. 26, 1976, Ser. No. 679,886
Int. Cl.² B62B *1/04*
U.S. Cl. 280—47.18 **9 Claims**



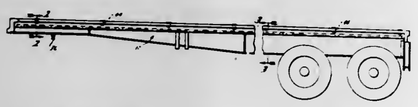
1. A handcart comprising:
- a carrying frame including two longitudinal members having respective handles, said members being coextensively juxtaposed with one another in a longitudinal direction and at least one crossbar rigidly connecting said members;
- a back panel attached to said carrying frame, said longitudinal members, said crossbar and said back panel substantially defining a plane;
- at least one wheel rotatably supporting said frame;
- a load-supporting plate having four sides, one of said sides being attached to said frame for said load-supporting plate to be disposed transversely to said plane;
- a front panel hingedly attached to one of said four sides opposite said one side of said load-supporting plate;
- two side panels hingedly attached to the remaining sides of said load-supporting plate, respectively, said side panels and said front and back panels being lockable to one another, respectively, to form a substantially box-shaped container open at the top thereof for carrying loads, said side panels being symmetrically foldable on top of said load-supporting plate, and said front panel being foldable on top of the folded side panels and lockable thereto so as to form a substantially flat platform for carrying a load; and
- three extension panels for said front panel and said side panels, respectively, said extension panels being displaceable in an upward direction therefrom for forming an elongated box-shaped container open at the top thereof.

4,049,285

ALUMINUM PLATFORM TRAILER

George Chleger, Birmingham, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Filed Nov. 24, 1975, Ser. No. 634,356
Int. Cl.² B62D *21/02*
U.S. Cl. 280—106 T **8 Claims**



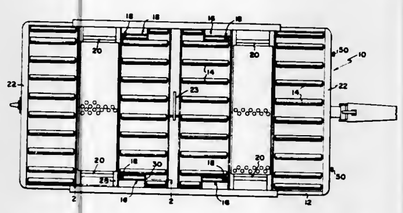
1. A platform trailer having a platform constructed from a plurality of floor boards at least two of which are of different types of extrusions joined in alternately disposed relation, the floor board of one type having spaced top and bottom panels joined by angularly disposed webs forming a triangle, the base of which forms said top panel and the apex therebelow being connected to the center of said bottom panel, the other type of floor board has top and bottom panels constructed from a central upright triangle and two inverted triangles transversely outward thereof with the side webs of said inverted triangles forming triangles with the webs of said one type of floor boards to have the top and bottom panels of the platform spaced by the angularly disposed webs when the said one and other types of floor boards are in aligned abutted, welded relation.

4,049,286

LATCH ASSEMBLY FOR CONTAINERIZED BAGGAGE TRAILER

George W. Francis, Jr., Saginaw, Mich., assignor to Saginaw Products Corporation, Saginaw, Mich.

Filed Jan. 12, 1976, Ser. No. 648,586
Int. Cl.² B60P *7/00*
U.S. Cl. 280—179 R **9 Claims**



9. In a containerized baggage trailer or the like having a platform adapted to support a baggage container, and latch means engageable with a baggage container on said platform for restraining said container against both lateral and vertical movement relative to said platform; the improvement comprising first and second latch members independently mounted upon said platform for movement between respective retracted positions below the surface of said platform and operative positions projecting above the surface of said platform wherein said latch members are engageable wth surfaces of a baggage container to restrain the container against lateral and vertical movement on said platform, an actuator member mounted on said platform for selectively locating said latch members in both their respective retracted and operative positions, said actuator member being movable between an actuated position wherein said actuator member retains both of said latch members in their respective operative positions, an intermediate position wherein said actuator member retains only one of said latch members in its operative position, and a release position wherein said actuator member retains neither of said latch members in their operative position.

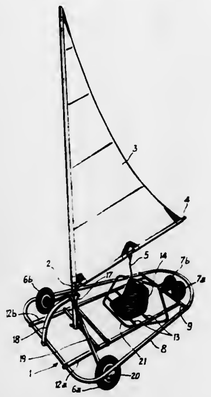
4,049,287

SAIL VEHICLES

Jean-Paul Dudouyt, Villa Atogebea-Avenue des Oeillets, 40150 Hossegor, France

Filed Apr. 6, 1976, Ser. No. 674,240
Claims priority, application France, Apr. 14, 1975, 75.11531
Int. Cl.² B62B *15/00*
U.S. Cl. 280—213 **6 Claims**

1. A wind propelled sail vehicle comprising a frame, said frame arranged to support therewithin a pair of rotatable front wheels and a pair of rotatable rear wheels arranged for steering said sailing apparatus, a triparite body having a forwardly extending portion and oppositely downwardly extending portions which are connected to the front wheels, said tripartite body further including a head which comprises a sleeve portion serving to support a mast for a sail, a seat positioned rearwardly of said mast, and steering means for said rear



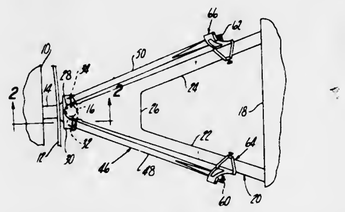
wheels arranged to be moved from an inoperative position so that a rider may enter or leave said seat to an operative position for steering said sailing apparatus when the rider is in the seat.

4,049,288

TRAILER HITCH

David A. Young, Plymouth, Mich., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed Aug. 11, 1976, Ser. No. 713,334
Int. Cl.² B60D *1/04*
U.S. Cl. 280—406 A **5 Claims**



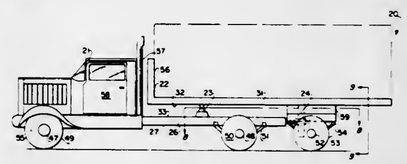
1. A trailer hitch having a ball for use with a socket of a trailer tongue to provide an articulated joint between an automobile on which the hitch is mounted and a trailer on which the trailer tongue is mounted, comprising a pair of substantially vertial-axis pivot means mounted adjacent to said ball at laterally opposite sides thereof, a pair of normally straight spring rods having angular end portions rotatably mounted in said pivot means for lateral pivotal movement of said rods, a pair of generally vertically disposed flexible suspension members having the corresponding ends thereof attached to the free ends of said rods, and means for mounting on the trailer tongue above said rods engaged by said flexible suspension members for bending said spring rods, said pivot means and said angular end portions having cooperating means preventing axial displacement of said angular end portions, the cooperating means of each pivot means and its associated angular end portion including a cicumferentially extending groove near the terminal end of said end portion, a transverse opening in the associated pivot means having an axis extending tangentially through said groove, and a removable retaining clip having a leg extending through said opening and said groove for preventing axial displacement of the angular end portion relative to its associated pivot means, each said angular end portion having a circumferentially extending groove which extends partially around its circumference sufficient to allow said lateral pivotal movement and at a location the same as that of the angular end portion of the other spring rod so that said spring rods are interchangeable.

4,049,289

COMPOSITE AUTOMOTIVE VEHICLE, COMPONENTS THEREOF, AND A METHOD OF CONSTRUCTING AND USING THE SAME

Rodger E. Deckrow, 3838 Seaman Road, Alma, Mich. 48801

Filed June 28, 1976, Ser. No. 700,076
Int. Cl.² B62D *53/06*
U.S. Cl. 280—423 R **29 Claims**



1. A composite automotive vehicle comprising
- an automotive draft vehicle comprising a chassis, the chassis including front axle means, rear axle means, first frame means extending between the said front and rear axle means, and first suspension means carried by the said front and rear axle means for supporting the first frame means,
- a load platform comprising a chassis, the chassis including tag axle means, second frame means extending from the said tag axle means to a point forward thereof, and second suspension means carried by the said tag axle means for supporting the second frame means,
- primary coupler means for coupling the load platform to the automotive draft vehicle, the primary coupler means including first cooperating coupling means carried by the said first frame means between the front and rear axles and second cooperating coupling means carried by said second frame means forward of the tag axle, the said first and second coupling means cooperating to effectively couple the load platform to the draft vehicle whereby the load platform may be pulled by the draft vehicle,
- the said first cooperating coupling means including a first coupler member and the said second cooperating coupling mens including a second coupler member, the said first and second coupler members including cooperating universal connecting means for universally connecting the said first and second coupler members whereby the draft vehicle and load platform at the point of coupling with the said primary coupler means are capable of dynamic relative articulated movement around the longitudinal roll and pitch axes and substantial relative lateral movement therebetween is prevented,
- secondary coupler means for coupling the load platform to the automotive draft vehicle, the secondary coupler means including third cooperating coupling means carried by the said first frame means and fourth cooperating coupling means carried by the said second frame means, the third and fourth coupling means cooperating to effectively couple the load platform to te draft vehicle at a point behind the said rear axle and prevent substantial relative lateral movement therebetween,
- the said primary coupler means and the said secondary coupler means being positioned substantially along the longitudinal centerlines of the load platform and draft vehicle and being effective to couple the load platform to the draft vehicle substantially along the longitudinal centerlines thereof,
- the said primary coupler means and the said secondary coupler means being effective to prevent substantial lat-

eral movement between the draft vehicle and the load platform whereby the load platform may be pulled by the draft vehicle with the said tag axle tagging true behind the said rear axle, and

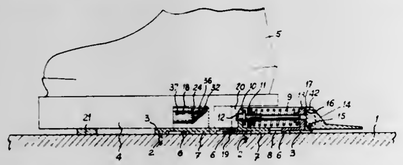
the said primary coupler means and the said secondary coupler means being effective to allow dynamic relative movement between the load platform and the draft vehicle around the longitudinal roll axis and pitch axis thereof while preventing substantial relative lateral movement therebetween.

4,049,290

SKI-BINDING

Georges Pierre Joseph Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

Filed Sept. 8, 1975, Ser. No. 611,419
Claims priority, application France, Sept. 11, 1974, 74.30734
Int. Cl.² A63C 9/08
U.S. Cl. 280—613 **7 Claims**



1. A safety binding for a ski boot comprising:
a baseplate adapted to be mounted to a ski;
a supporting element integral with said boot;
two arms pivotally mounted to said baseplate and being arranged symmetrically relative to the longitudinal axis of said ski; each arm including a retaining jaw extending over the plane of said baseplate and cooperating with a lateral edge of said supporting element;
a resilient element mounted on said baseplate;
a movement transmitting element inter-connecting said resilient element and said jaws of said arms;
said resilient element acting through said movement transmitting element to apply said jaws against said supporting element and to allow a safety release of said jaws from said supporting element in the event of an abnormally high load applied by said boot;
said arms rotating about a vertical axis and simultaneously moving longitudinally relative to said baseplate to allow clamping or release of said jaws;
said transmitting element moving longitudinally in relation to the baseplate,
each articulated arm:
rotating about a vertical axis which is fixed in relation to the transmitting element, and
pivoting slidingly about a supporting point which is fixed in relation to the baseplate and comprising a ramp upon which said supporting slides; said ramp being located between boot-retaining jaw and said vertical axis of rotation fixed in relation to the transmitting element;
said resilient element being in the form of a spring arranged along the longitudinal axis of th ski:
one end of said spring bearing against a shoulder integral with the baseplate, and
the other end of said spring bearing against a shoulder integral with said transmitting element.

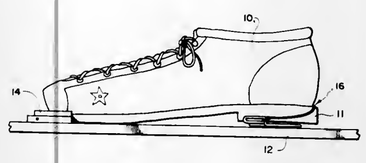
4,049,291

COMBINATION REMOVABLE RELEASE SKI BINDING

Denis M. Nunan, P.O. Box 397, Breckenridge, Colo. 80424

Filed Mar. 24, 1976, Ser. No. 669,880
Int. Cl.² A63C 9/086
U.S. Cl. 280—614 **4 Claims**

1. A ski binding conversion for mounting on cross country skis having a boot toe clamping piece for holding the toe of the boot while the heel is raised, comprising:
a. plate means for attachment to a ski positioned to permit a boot heel to rest thereon; said plate means having overhanging flanges on opposed sides thereof each said overhanging flange defining a groove;
b. spring clamp means having resiliently deformable opposed sides arranged to extend around said plate with said



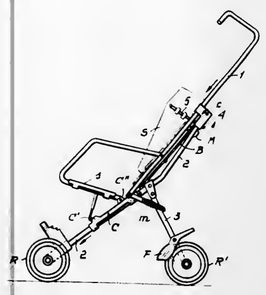
opposed sides under said flanges, and having heel clamp attachment means depending from said opposed sides;
c. adjustable means mounted in the groove under each said flange to vary the depth of the groove in relation to said spring means to vary release strength; and
d. removable boot heel clamp means arranged to be removably secured to said heel clamp attachment means for securing a boot heel to said spring clamp means.

4,049,292

BABY CARRIAGE FOLDABLE IN WIDTH AND SHORTENABLE IN HEIGHT SO AS TO BE EASILY CARRIED ON A PERSON'S ARM LIKE AN UMBRELLA

Giuseppe Perego, Arcore (Milan), Italy, assignor to Perego-Pines S.p.A., Italy

Filed Jan. 9, 1976, Ser. No. 647,876
Claims priority, application Italy, July 25, 1975, 25753/75
Int. Cl.² B62B 7/08
U.S. Cl. 280—642 **7 Claims**



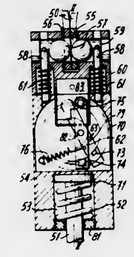
1. A foldable baby carriage comprising, in combination, a pair of laterally spaced elongated handles; respective upper sleeves slidable on said handles; a pair of elongated front legs having their upper ends secured to said respective upper sleeves; a pair of elongated rear legs each pivotally connected to an intermediate portion of a respective front leg; respective wheels on the lower ends of said front and rear legs; respective means interconnecting each rear leg to the lower end of the adjacent handle to move the rear legs toward the front legs when the carriage is folded and to maintain the rear legs extended when the carriage is erected; respective lower sleeves slidable on the lower portions of said front legs; an X-frame, formed by a pair of elongated arms pivotally interconnected intermediate their ends, each arm having its upper end pivotally connected to the upper sleeve slidable on one handle and its lower end pivotally connected to the lower sleeve slidable on that front leg connected to the upper sleeve slidable on the other handle; operating means interconnecting said upper sleeves for conjoint displacement along the respective handles to contract and expand said X-frame, with said lower sleeves being displaced along the respective front legs, to selectively erect or collapse said foldable baby carriage; a foldable seat; and means connecting opposite sides of said foldable seat to elements of said foldable baby carriage for folding and unfolding therewith.

4,049,293

SEAT BELT SECURITY RELEASE MECHANISM

Michel Bouju, Case Postale 2286, Lausanne, Switzerland

Filed Mar. 29, 1976, Ser. No. 671,039
Claims priority, application Switzerland, July 17, 1975, 9478/75; Nov. 4, 1975, 14233/75
Int. Cl.² B60R 21/10
U.S. Cl. 280—744 **6 Claims**



1. In a security release mechanism for connection between a safety seat belt and an anchoring means to produce automatic opening of the belt after a given time following an impact, comprising a belt attachment member, a first piece having a slot for receiving said member, means for locking said member in said slot, and means including a spring submitted to the belt tension transmitted by said attachment member for controlling delayed disengagement of said locking means to release said member after said tension has exceeded a given value, the improvement wherein said locking means comprises two balls disposed in housings in said first piece adjacent part of said slot which receives said member, said member having an opening which faces said housings when said member is located in said slot, at least one of said balls being movable away from the other into its housing, and at least one retractable abutment normally holding said movable ball against the other ball in said opening of said member to lock said member in said slot, said delayed-disengagement control means comprising means for retracting said abutment to allow said movable ball to move away from the other to free said belt attachment member.

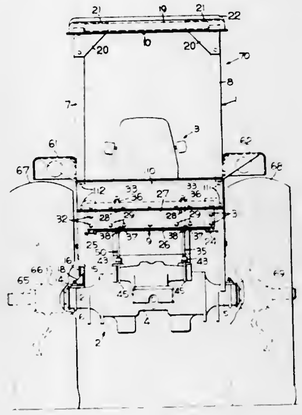
4,049,294

NARROW BASE PROTECTIVE FRAME

Ralph R. Atherton, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 22, 1975, Ser. No. 643,318
Int. Cl.² B62D 25/06
U.S. Cl. 280—756 **10 Claims**

1. A tractor having a narrow base protective frame comprising, a tractor including a rear drive assembly housing and a rear axle housing extending to each side of said rear drive assembly housing, a rear drive axle extending from each rear axle housing, a rear drive wheel mounted on each drive axle for adjustably moving axially to vary the tread widths of said drive wheels, means defining a tapered structure from the top to the bottom in a transverse direction for protecting an occupant, said means including a tapered upright column mounted on each of said rear axle housings, each of said upright columns being tapered with a narrower bottom than top as viewed in transverse cross-section, a base integral with said tapered upright column defining a width no wider than to accommodate bolting of the column and base to the rear axle housing, a crossbeam and reinforcing means connected between the upper ends of said tapered upright columns, a cross-member



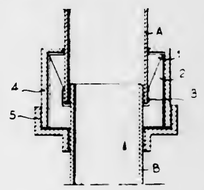
connecting the lower portion of said columns forming an integral structure with said columns, means integrally fastening said cross-member to each of said tapered columns and reinforcing said tapered upright columns across their width fore and aft and a portion of their length, with reinforcement of the protective frame around the operator station of the tractor for operator safety in the event of rollover of the tractor.

4,049,295

COUPLINGS FOR METAL TUBES

Eugéne Piers, 168 Blvd. Magenta, 75010 Paris, France

Filed Apr. 13, 1976, Ser. No. 676,379
Claims priority, application France, June 27, 1975, 75.20236
Int. Cl.² F16L 55/00
U.S. Cl. 285—9 M **1 Claim**



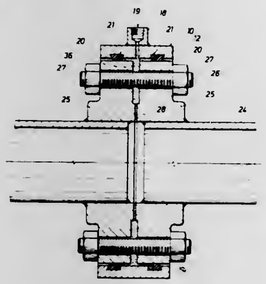
1. A fluid-tight saftey coupling for metal tubes comprising a male conical metal element fixed to a first tube and a female conical metal element fixed to a second tube, said male and female metal elements having surfaces constituting cones of identical pitch, both of said elements being permanent magnets, the female element being formed with a cylindrical recess coaxial with the said female element and located at the narrow end of said female element to receive the end of said first tube therein, in overlapping relation to the end of said second tube.

4,049,296

LEAK REPAIR CLAMP

George W. Harrison, Alvin, Tex., assignor to Team, Inc., Alvin, Tex.

Filed May 3, 1976, Ser. No. 682,485
Int. Cl.[2] F16L *55/16*
U.S. Cl. 285—15 1 Claim



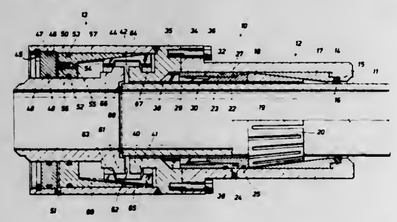
1. A leak repair clamp for pipe and pipe flanges and the like, comprising a frame having a plurality of frame segments positionable in end-to-end relation about the pipe, each segment having spaced parallel annular recesses about its inner periphery and a flange on each end, a deformable self-sealing seal member having a base portion which is dove-tailed shape and a flexible sealing tip portion for bending over in order to extend toward the other sealing tip portion when sealed about the pipe extending inwardly from said base portion, retaining means connected to each segment for retaining the base portion of a seal member within each recess by a fastener which is threadably connected to the recess on the inner side of the base portion so as to underlie at least a portion of the bent-over sealing tip portion, the recess and retaining means having tapered end walls which form a dove-tailed channel with the bottom wall of the recess to fit tightly against the end and bottom walls of the base portion of the seal member, and means for connecting the frame segments to one another with the end faces of said flanges being brought into metal-to-metal sealing engagement when positioned in end-to-end relation about the pipe, so as to clamp the frame about the pipe and thereby cause the sealing tip portions of the seal members to be deformed into sealing engagement about the pipe on opposite sides of the leak as the frame is so clamped.

4,049,297

PIPE COUPLING APPARATUS

Bobby J. Reneau, P.O. Box 14, Bellaire, Tex. 77401

Filed Dec. 15, 1975, Ser. No. 640,576
Int. Cl.[2] F16L *35/00*
U.S. Cl. 285—24 9 Claims



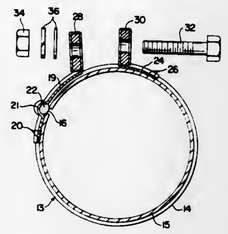
1. For use in connecting a first pipe to a second pipe, a coupling apparatus which comprises:
an elongated cylindrical housing adapted to telescope over the end of a first pipe;
pipe clamping means carried in said housing for clamping and holding the end of the first pipe;
a second housing enclosing a pipe segment adapted to be joined to a second pipe which is to be connected to the first pipe;
means for axially aligning said first and second housings with one another;
an encircling shoulder fixedly connected to said first housing;
a parallel encircling shoulder fixedly attached to said second housing;
lock means for grasping said shoulders and pulling said shoulders toward one another, said lock means drawing the end of the first pipe against the pipe segment to axially communicate them;
said lock means including;
a collet means for clamping the pipe, said collet means centering the pipe at a specified location;
a seal means around the pipe sealing the pipe against leakage along said first housing;
a facing and mating surface on the pipe segment for abutting and joining the pipe segment to the first pipe; and
means for actuating said collet means.

4,049,298

COMPRESSION COUPLING

Sam J. Foti, Lyndhurst, Ohio, assignor to The Federal Metal Hose Corporation, Painesville, Ohio

Filed Oct. 16, 1975, Ser. No. 623,058
Int. Cl.[2] F16L *25/00*
U.S. Cl. 285—177 9 Claims



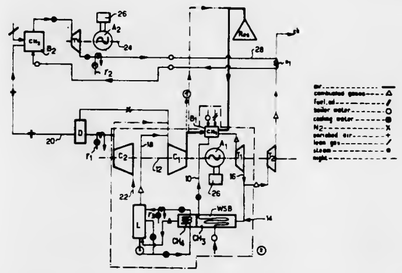
1. A compression coupling for fitting around cylindrical objects, which comprises:
a circumferentially extensible, annular sleeve for extending around the cylindrical objects and having a gap therein extending parallel to the longitudinal axis;
a relatively thin jacket member attached at one end to the sleeve, the jacket member extending over the gap and having an axially extending conformable wrinkle formed therein over the gap, said wrinkle being adapted to receive a sealant radially outside the sleeve; and
means for clamping the other end of the jacket member to the sleeve on the opposite side of the gap from which the jacket member is attached to the sleeve, whereby when clamped the wrinkle is substantially conformed to the circumference of the annular sleeve and the sealant is forced radially inwardly and pressed into the gap.

4,049,299

ANTI-POLLUTING POWER PLANT USING COMPRESSORS AND GAS TURBINES

Georges Alfred Rigollot, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Continuation-in-part of Ser. No. 450,067, March 11, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,814
Claims priority, application France, Mar. 12, 1973, 73.08724
Int. Cl.[2] F01D *15/10*
U.S. Cl. 290—52 13 Claims



1. A versatile electric power generating plant operative during normal and peak power demand periods and also during no power demand periods comprising in combination: first and second continuously operating compressors having matched operating characteristics; supply means for selectively supplying said first compressor during normal and peak power demand periods with recycled combusted gases for pressurizing same; means for selectively supplying said second compressor also during normal and peak power demand periods with air for pressurizing same; first and second boilers having first and second combustion chambers, respectively, supplied with pressurized recycle combusted gases and air from said first and second compressors, respectively, during normal and peak power demand periods; an air storage tank supplied with pressurized air to store the same, means for connecting said second compressor in series with said first compressor and said first compressor with said air storage tank for pressurizing said tank with air during no power demand periods; means for supplying pressurized air from said air storage tank to said first combustion chamber during normal and peak power demand periods; first and second turbines respectively connected to the outputs from said first and second combustion chambers; first and second alternators respectively connected to said first and second turbines for drive thereby during normal and peak power demand periods, at least said first compressor, turbine and alternator being coupled to a common shaft for drive of said first compressor by said first alternator during no power demand periods and for drive of said first compressor and said first alternator by said first turbine during normal and peak power demand periods; and recycle means for receiving at least a portion of the output of said first turbine for supply of a part of said recycled gas by said supply means to said first compressor.

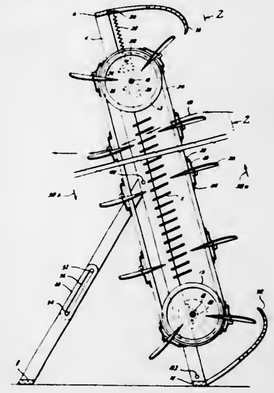
4,049,300

FLUID DRIVEN POWER PRODUCING APPARATUS

Daniel J. Schneider, 608 Durango Circle South, Irving, Tex. 75062

Continuation in part of Ser. No. 483,092, June 24, 1974, abandoned. This application Mar. 31, 1976, Ser. No. 672,246
Int. Cl.[2] F03D *5/02*
U.S. Cl. 290—54 37 Claims

1. An apparatus for use in converting the kinetic energy of an accelerated fluid into mechanical or electrical energy and which comprises:
a. a housing;
b. two substantially parallel axles detachably supported by said housing and capable of rotation within the housing;
c. two substantially parallel wheels positioned on each of said axles and the wheels on one axle being in substantially the same vertically extending planes as the wheels on the other axle;
d. two belts, one of which connects the two wheels in one plane and the other belt connects the other two wheels in the other plane; and



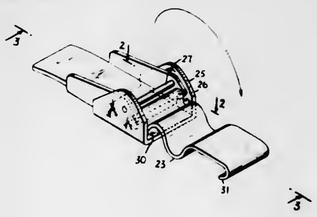
e. a series of foils fluid dynamically designed to have a high lift configuration, each one of which is detachably connected at the opposite ends thereof respectively to the two belts, wherein (d) and (e) taken together form two stages, a first drive stage and a second return stage of said apparatus, further wherein the foils are fluid dynamically designed, spaced and oriented within the apparatus such that all of the flow of fluid entering the second stage on operation of the apparatus is made up of fluid which has interacted dynamically with the foils of the first stage.

4,049,301

TOGGLE LATCH

Peter Schenk, West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Continuation of Ser. No. 480,391, June 18, 1974, abandoned. This application Dec. 10, 1975, Ser. No. 639,422
Int. Cl.[2] E05C *19/14*
U.S. Cl. 292—113 5 Claims



1. A toggle latch for joining together two members comprising:
a fixed engageable keeper element adapted to be secured to one of the members;
a lever assembly adapted to be secured to the other member; said lever assembly including a bracket, an operating lever

secured to the bracket by a fixed pivot at an intermediate portion of the lever and a drawbar secured to one end of the lever beyond the fixed pivot by means of a movable pivot;

the opposite end of the lever forming a handle;

the movable pivot being positioned relative to the fixed pivot so that when the drawbar is engaged with the keeper and the handle is shifted to the latched position the movable pivot and portion of the drawbar connected and adjacent thereto will be shifted around and into a latched position behind and above the fixed pivot with the remainder of the drawbar extending outwardly from the underside of the fixed pivot and the drawbar being substantially obscured from view by the handle and lever;

spring means on the lever assembly to facilitate engagement of the drawbar and the keeper element and shifting of the lever assembly to the latched position where the members are maintained in tight joined condition;

the spring means being in the drawbar which is a substantially rigid member and is corrugated to provide sufficient resilience for the necessary axial play required to assure proper engagement between the drawbar and the keeper element and latching of the assembly;

one of the corrugations in the drawbar being positioned so that when the assembly is in the latched position the one corrugation will partially surround the fixed pivot in relatively close proximity thereto and provide additional support for the latch in the latched position by being in position to quickly engage the fixed pivot upon an excess of tension applied to the drawbar; and

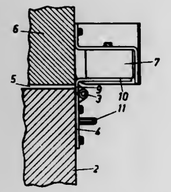
the corrugations being shallow and the fixed pivot being positioned with a minimum clearance between the underside of the fixed pivot and the base of the bracket and the one corrugation can pass therebetween so as to form a compact toggle latch with a pleasing visual appearance.

4,049,302

SAFETY LOCK MECHANISM

Henry Veine Andersson, and Sven Vilhelm Eriksson, both of Goteborg, Sweden, assignors to AB Telekontroll, Goteborg, Sweden

Filed Dec. 9, 1975, Ser. No. 639,161
Claims priority, application Sweden, Dec. 12, 1974, 7415589
Int. Cl.² E05C *19/16*
U.S. Cl. 292—201 **4 Claims**



1. An improved safety lock mechanism for a door having a door leaf part and a door frame part separated by a gap, comprising:

a bolt pivotally mounted on one of said door parts adjacent said gap so as to be able to swing into a door-locking position wherein it bridges said gap, said bolt having an angular configuration and being comprised of a first section and a substantially longer second section, the first and second sections being rigidly connected together essentially at right angles, when in the door-locking position the first section being essentially parallel to the surface of the one door part and located closer to the surface of the one door part than is the second section, the first section extending across the gap toward said other door part;

an electromagnet provided with an interruptable supply of current and being mounted on the other of said door parts so as to be able to retain said bolt in the door-locking position, the surface of attraction of said electromagnet being directed toward said one door part and being positioned so as to extend outwardly away from the other door part essentially at right angles to said other door part, the second section of the bolt extends essentially at right angles outwardly away from the other door part along the surface of attraction of said electromagnet when the bolt is in the door-locking position; and

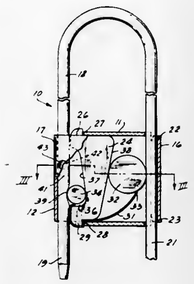
release means, connected to the other of said door parts and intercepting the first section of said bolt when in its door-locking position, for pressing against the first section of said bolt upon the application of a force on the door leaf to open the door, said release means securely locking the door closed when current is supplied to said electromagnet and urging the bolt to pivot into a position releasing said door upon the interruption of current supplied to said electromagnet.

4,049,303

CABLE LOC WITH DIMPLE ALONG FIXED END OF CABLE TO ASSURE INTEGRITY OF SEAL

George Irwin, Fremont, and Gary Butler, LaGrange, both of Ind., assignors to Brammall, Inc., Angola, Ind.

Filed Mar. 3, 1976, Ser. No. 663,355
Int. Cl.² G09F *3/00*
U.S. Cl. 292—307 R **3 Claims**



1. A cable lock and seal device comprising,

a body member with a pair of parallel orifices on opposite sides thereof,

a cam member in said body member and formed with first and second inclined surfaces on opposite sides thereof,

a spring means in said body member,

a first disc mounted in said body member on one side and engageable with said spring member and said first inclined surface,

a second disc mounted in said body member on the opposite side and engageable with said second inclined surface,

a cable with a first end extending into one of said pair of orifices and held in said body member between said second disc and said body member,

an indentation formed in said body member to lock said first end of said cable to said body member,

the second end of said cable receivable into the other of said pair of orifices and locked against one direction motion between said first disc and said body member, and

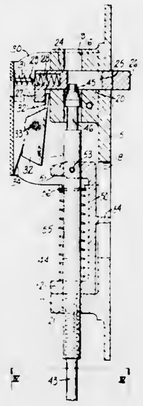
wherein said second disc and said indentation lock said one end of said cable to the body member to prevent it from moving in either direction relative to said body member.

4,049,304

SELF-LATCHING FLUSH BOLT

William B. Imhoff, Springdale, Conn., assignor to Leigh Products, Inc., Coopersville, Mich.

Filed Dec. 13, 1976, Ser. No. 749,703
Int. Cl.² E05C *1/12*
U.S. Cl. 292—333 **7 Claims**



1. A self-latching flush bolt for use in the inactive door of a pair of swinging doors comprising, a bolt mechanism frame adapted for mounting in the edge of a door and including a flat plate and upper and lower bearing blocks extending inward from said plate, the plate being traversed by a vertically elongated slot, the upper block being traversed by intersecting vertical and horizontal bores and the lower block being traversed by a vertical bore aligned with the vertical bore in the upper block, a trigger slidably mounted in said horizontal bore, the trigger having a slot adapted to be moved into and out of register with the vertical bore in the upper block, and a bolt assembly having a bolt at one end adapted for installation adjacent a top or bottom edge of the door, a head at the other end and a rod-like element connecting the bolt to the head, means retaining the head within said last named vertical bore for vertical reciprocation therein between positions corresponding to engaged and disengaged positions of the bolt, and the head being engageable with an edge of said trigger slot to retain the bolt in disengaged position.

4,049,305

CAB DOOR LATCH MECHANISM

Ture R. Zetterlund, Naperville, and Arthur A. Amberg, Plainfield, both of Ill., assignors to International Harvester Company, Chicago, Ill.

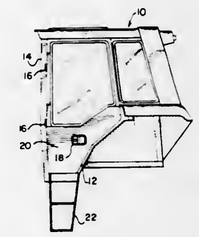
Filed Aug. 20, 1976, Ser. No. 716,482
Int. Cl.² E05C *3/26*
U.S. Cl. 292—336.3 **2 Claims**

1. A door latch mechanism for a tractor cab with a door having inside and outside walls and having one end pivotally attached to said cab, said mechanism including, in combination:

an engagement catch mounted on said door opposite said pivotal door attachment, said catch including; a pivotally mounted disengagement arm located between said inside and outside walls;

an external handle mounted on said outside wall between said latch and said pivotal door attachment, said external handle including; pivotal activator means for disengaging said catch and pivoting said door, and a pivotally mounted push lever operably connected to said activator means and said catch;

an internal handle mounted on said inside wall between said external handle and said catch, said internal handle including; a pivotal paddle handle, and a pivotally mounted extension operably connected to said paddle handle and said catch;



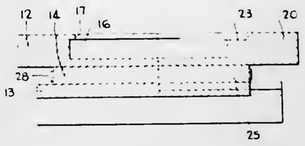
rod means connecting said push lever, said catch and said extension, said rod means including; a one way lever mounted on said extension, and a rod pivotally connected to said one way lever, said catch and said push lever.

4,049,306

HOLDER FOR SHOE POLISH CONTAINERS

Alfred A. Caputi, 61 Sterling Ave., Buffalo, N.Y. 14206

Filed May 10, 1976, Ser. No. 684,764
Int. Cl.² A47L *23/28*
U.S. Cl. 294—34 **2 Claims**



1. In a holder for a circular container for shoe polish or the like having an annular flange thereabout and a circular cover, a body member and a clamp member, said members having co-planar upper surface portions, said clamp member and said body member having cooperating guide formations for movement of said clamp member upper surface portion toward and away from abutment with said body member upper surface portion, said body member having a handle formation at its under side, and resilient means urging said clamp member upper surface portion toward said body member upper surface portion, said upper surface portions having complementary generally semi-circular recesses for jointly receiving and clamping opposite sides of the periphery of a circular container therein.

4,049,307

EXTRACTOR DEVICE

Walter C. Potts, 4525 A St., Lincoln, Nebr. 68510

Filed Apr. 30, 1976, Ser. No. 682,115
Int. Cl.² B66C *1/44*
U.S. Cl. 294—99 R **9 Claims**

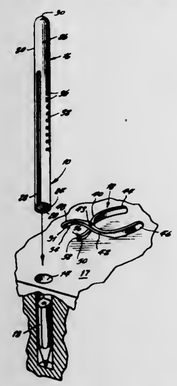
1. An extractor device adapted to remove an elongated element from a confined opening, which comprises:

a. an elongated housing having first and second ends, a wall, and a longitudinally placed bore therethrough, said well of said housing having a pair of longitudinally aligned rows of apertures therein, said elongated element adapted to be received into said bore of said housing;

b. a plier-like member including a pair of arms pivotally joined together at their centers, each said arm having a jaw and a handle end; and

c. a pin member included on an inner face of each said jaw

end, an aperture of one of said rows for receiving one of said pin members, a corresponding aligned aperture of the



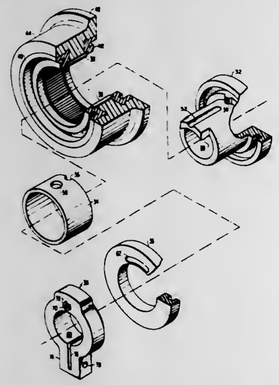
other of said rows for receiving the other of said pin members.

4,049,308

SYNTHETIC FLANGED CARRIER ROLLER

Donald E. Martin, Waukesha, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Nov. 24, 1975, Ser. No. 634,705
Int. Cl.[2] B60B *17/00*
U.S. Cl. 295—8 **19 Claims**



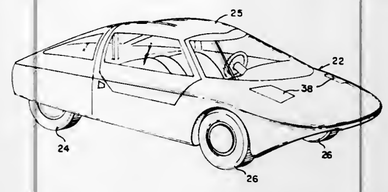
1. A carrier roller comprising an integral roller tire subassembly, said integral roller tire subassembly comprising:
   a. a bearing;
   b. a left-hand axial insert abutting a portion of the left-hand axial face and the outer radial (circumferential) face of said bearing, having an axial opening therein, and made from a synthetic material which is resilient relative to said bearing;
   c. a right-hand axial insert abutting a portion of the right-hand axial face and the outer radial (circumferential) face of said bearing, having an axial opening therein, and made from a synthetic material which is resilient relative to said bearing;
   d. a roller tire made from a moldable material which is resilient relative to said bearing and said inserts, said roller tire abutting the remainder of the outer radial (circumferential) face of said bearing, the remainder of the right-hand axial face and the radially outer (circumferential) face of said left-hand axial insert, and the remainder of the left-hand axial face and the radially outer (circumferential) face of said right-hand axial insert, whereby said roller tire is molded around said inserts and said bearing, said inserts hold said bearing in position in the assembled carrier roller, and the relative resiliency of said roller tire prevents overload on and consequent damage to said bearing both from initial assembly and shock loads during use;
   e. means for preventing relative movement of said molded roller tire and said left-hand axial insert; and
   f. means for preventing relative movement of said molded roller tire and said right-hand axial insert.

4,049,309

AUTOMOTIVE VEHICLE

Michael R. Seal, Bellingham, Wash., assignor to Board of Trustees Western Washington State College, Bellingham, Wash.

Filed Feb. 6, 1976, Ser. No. 655,865
Int. Cl.[2] B62D *35/02, 37/02*
U.S. Cl. 296—1 S **8 Claims**



1. An aerodynamically efficient structure for an automobile vehicle comprising:
   a chassis,
   forward and rearward wheels supporting the chassis, a body enclosure carried on said chassis, said body enclosure having an underside, and a downwardly and forwardly inclined, uninterrupted smooth top surface including a front closue, windshield and passenger compartment, and a rearwardly and downwardly inclined rear closure.
   said rearward wheels each having a diameter greater than the forward wheel and connected to said chassis so as to provide a forwardly and downwardly inclined slope to the chassis and underside of the body enclosure whereby the entire chassis and body enclosure has an inclination to increase downward pressure on the vehicle forward end and reduce aerodynamic drag,

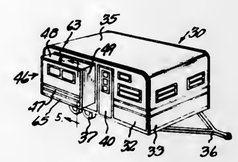
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4,049,310

RECREATIONAL VEHICLE WITH EXPANSIBLE SECTION

Perry E. Yoder, 602 Middlebury St., Goshen, Ind. 46526

Filed Dec. 22, 1975, Ser. No. 642,681
Int. Cl.[2] B62D *33/08*
U.S. Cl. 296—26 **6 Claims**



1. A recreational vehicle having a body including a floor and a side wall having an opening, an extension unit having an outer wall, a top wall, a floor and opposite end walls and

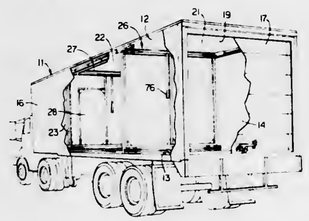
shiftable in said body opening between a retracted position with its outer wall substantially flush with said vehicle side wall and an extended position projecting outwardly from said vehicle side wall, means for limiting outward movement of said extension unit, means for sealing said vehicle at said opening in the extended and retracted positions of said extension unit, a plurality of rollers supporting the floor of said extension unit at a plurality of points spaced laterally and longitudinally of the vehicle to accommodate movement between cantilevered extended position and retracted position, and means for guiding movement of said extension unit and preventing downward tilting of the outer part of said unit when in cantilevered extended position, some of said rollers being located adjacent the vehicle side wall to support a central portion of the floor of the extension unit, struts secured to and extending below inner corners of the floor of the extension unit toward said vehicle floor and each journaling a roller, said guide means including tracks carried by the floor of said extension unit engaging the rollers located adjacent to the vehicle side wall and having configurations complementary to the configurations of the rollers engaged thereby.

4,049,311

BULKHEAD DOOR

Alfred T. Dietrich, and Gerald W. Galbreath, both of Marion, Ohio, assignors to Overhead Door Corporation, Dallas, Tex.

Filed Jan. 19, 1976, Ser. No. 650,464
Int. Cl.[2] B62D *33/04*
U.S. Cl. 296—24 R **22 Claims**



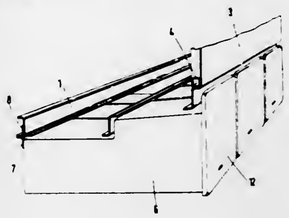
1. In a storage structure having wall means defining a storage compartment therein, said wall means including opposed top and bottom walls and a pair of opposed side walls, and a bulkhead door assembly for dividing said compartment into subcompartments, said bulkhead door assembly including panel means extending transversely across said compartment, the improvement wherein said bulkhead door assembly comprises:
   a pair of track means fixedly mounted on said wall means in spaced and substantially parallel relationship;
   a pair of support mechanisms mounted on said panel means adjacent one edge thereof for supporting said panel means on said track means, each said support mechanism including
      a. roller carriage means disposed in rolling engagement with said track means,
      b. hinge means pivotally connecting said panel means to said carriage means for permitting pivotal movement of said panel means about an axis which is disposed closely adjacent and extends substantially parallel to said one edge, and
      c. releasable latch means coacting between said panel means and said track means for fixedly locking said one edge of said panel means relative to said track means to prevent displacement of said carriage means along said track means;
   a pair of releasable locking mechanisms mounted on said panel means adjacent a further edge thereof which is disposed opposite and substantially parallel to said one edge, said locking mechanisms including locking means movable supported on said panel means and engageable with said track means when said panel means is in a stored position wherein it is disposed closely adjacent and substantially parallel to one of said walls; and
   lock means fixedly associated with said wall means and engageable with said movable locking means for fixedly holding said panel means in an operational position wherein it extends transversely across said compartment and is disposed in a substantially vertical orientation.

4,049,312

STORAGE ARRANGEMENT FOR VEHICLES

Per-Olof Bertil Rudbeck, Katrineholm, Sweden, assignor to Saab-Scania, Scania Division, Sweden

Filed June 30, 1975, Ser. No. 591,529
Claims priority, application Sweden, July 8, 1974, 74089343
Int. Cl.[2] B62D *25/20;* B60R *9/00*
U.S. Cl. 296—28 A **6 Claims**



1. In a bus-type motor vehicle of the kind having storage space which is accessible from outside the vehicle through at least one pivotal openable flap, an improved storage compartment which comprises:
   a. at least one insert unit, said unit (i) being generally box shaped and (ii) having at least one open side,
   b. attachment means associated with each said unit for removably supporting each unit in said storage space, said attachment means (i) being detachable, from said vehicle, and (ii) being arranged so as to locate and readily removably support each unit beneath the floor of said vehicle with said open side thereof lying in a place coinciding with one of the side walls of the vehicle body so that its open side will be closed by a pivotal openable flap, when the latter is in a closed position,
   c. the number of insert units provided determining the usable storage space of the compartment and having dimensions chosen to conform to a modular system,
   d. said at least one openable flap being arranged so as to conform to the external shape of said vehicle body when said flap is in its closed position,
   e. said openable flap being arranged in said modular system,
   f. any portion of said space designated for said insert units but not occupied by said units being covered by at least one cover plate which is (i) fixedly located and (ii) covering said portion, said cover plate being arranged in said modular system so as to conform to the external shape of said vehicle body.

4,049,313

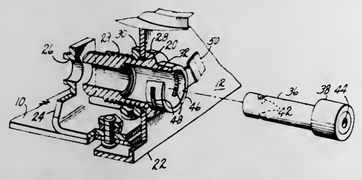
LOCKING RECEPTACLE FOR ELECTRIC METER BOX OR THE LIKE

George A. Lundberg, Pompton Lakes, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Jan. 12, 1976, Ser. No. 648,193
Int. Cl.[2] E05C *19/18;* B65D *33/34*
U.S. Cl. 292—307 R **4 Claims**

1. In an electric meter box having an open side and a cover for said open side hinged to the box at one edge, an assembly for receiving a locking member of the type having an enlarged

head at one end and an elongated body with expansible locking projections near the other end, said assembly comprising a bushing mounted (for mounting) in said cover near the edge opposite said hinged edge, said bushing having an aperture with an outer portion sized to receive the enlarged head of the locking member and an inner portion sized to receive the body of the locking member and a bracket mounted in the housing,



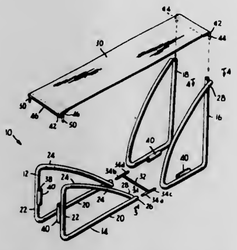
said bracket having an aperture aligned with the bushing aperture to receive the end of the body of the locking member and being so positioned that the locking projections can lock behind the bushing when the cover is tightly closed, the end of the body extending sufficiently far beyond the rear of the bracket that the cover cannot be opened without removal of the locking member from said bracket.

4,049,314

MULTI-USE FURNITURE

Andrew W. McGaffin, 282 Western Hut Road, Belmont, Lower Hut, Wellington, New Zealand

Filed Mar. 24, 1976, Ser. No. 669,851
Int. Cl.² A47C *13/00*
U.S. Cl. 297—130 **11 Claims**



1. A convertible piece of furniture including four separate and independent frame elements each of which comprises a generally right triangularly shaped frame member having a long base, a short leg and a hypotenuse leg; means for releasably and selectively securing said frame members together in generally aligned pairs with the pairs located in spaced parallel relation to each other; a flexible sling and means secured to said sling for securing the sling to said spaced parallel pairs of frame elements; said means for releasably and selectively securing said frame members together comprising means for (i) securing the long bases of said frame elements together adjacent their apices with said hypotenuse leg; and (ii) securing the hypotenuse legs together adjacent their apices with said long base.

4,049,315

CHAIR HAVING INDEPENDENT SEAT AND BACK

John D. Jacobson, 411 Temple St., New Haven, Conn. 06511

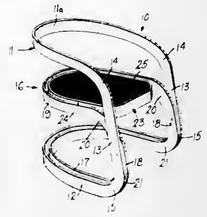
Filed Dec. 13, 1976, Ser. No. 750,114
Int. Cl.² A47C *1/12*
U.S. Cl. 297—447 **8 Claims**

1. A chair comprising:

seat support means having a lower portion adapted to contact a floor and an elevated portion supported in cantilevered fashion;

seat means having a periphery adapted to be supported by said seat support means;

spacer means adapted to be connected to said elevated portion and said periphery at preselected discrete points thereof to support said means at a preselected height above the floor;



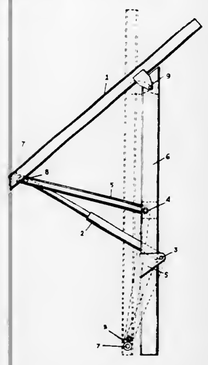
back means comprising back support means adapted to contact a floor and an elevated back portion supported in cantilevered fashion above said seat means by said back support means; and further spacer means adapted to be connected to said back support means and said lower portion of said seat support means at preselected points thereof.

4,049,316

LIFTING MECHANISMS FOR TRUCK BODIES

Marino Paneda Ordonez, Ca de Oviedo-Pumarin, Gijon, Spain

Filed Jan. 29, 1976, Ser. No. 653,583
Int. Cl.² B60P *1/16*
U.S. Cl. 298—22 B **5 Claims**



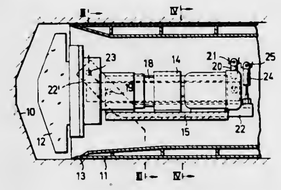
1. A lifting mechanism for truck bodies and the like in combination with a pair of laterally spaced longitudinal stationary frame members, a dump frame including a pair of laterally spaced longitudinal track members pivotally connected to said stationary frame members adjacent one end thereof, said longitudinal track members disposed in a plane immediately above and parallel to the plane of said longitudinal stationary frame members, a rectangular frame stabilizer assembly positioned between and spanning substantially the entire lateral distance between said stationary frame members, an X-brace on said rectangular frame stabilizer assembly and extending the length thereof, a pair of pivot connections connecting the opposite sides of the inner end of said rectangular frame stabilizer assembly to a medial portion of said pair of laterally spaced stationary frame members, a pair of connectors on the opposite sides of the outer end of said rectangular frame stabilizer assembly engaged for sliding movement in said pair of laterally spaced longitudinal track members, the said opposite end of the rectangular frame stabilizer assembly spanning substantially the entire lateral distance between said longitudinal track members, at least one extensible lift cylinder pivotally connected at one end between and in the plane of said stationary frame members and pivotally connected at the opposite end to the outer end of said rectangular frame stabilizer assembly in the plane of the longitudinal track members in the lowered position, said lift cylinder positioned beneath said X-brace of said rectangular frame in the lowered position, whereby upon extension of said extensible lift cylinder said dump frame is moved about its pivot connection with said stationary frame members from a horizontal position to a raised dump position.

4,049,317

TUNNEL DRIVING APPARATUS

Hans Gunter Follert, Dortmund, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Westphalia, Germany

Filed Jan. 22, 1976, Ser. No. 651,613
Claims priority, application Germany, Feb. 3, 1975, 2504370
Int. Cl.² E01G *3/04*
U.S. Cl. 299—33 **11 Claims**



1. In a tunnel driving apparatus including a hollow tubular protective shield and a cutting head mounted on a movable undercarriage within the protective shield for detaching material from a mine working face to effect driving of a tunnel, improved means for supporting and for selectively positioning the undercarriage, said improved means comprising:

a. rocker arm means extending longitudinally within the hollow protective shield, said rocker arm means being pivotally attached near its front end to the protective shield by a transversely extending first pivot means;

b. first ram means pivotally attached at one of its end to the protective shield and pivotally attached at the other of its ends near the rear end of said rocker arm means, said first ram means being selectively actuated to pivot said rocker arm means about the transversely extending first pivot means;

c. longitudinal support means for mouting the undercarriage for slidable movement thereon, said longitudinal support means extending longitudinally within the hollow protective shield and being pivotally attached near its front end to said rocker arm means by a transversely extending second pivot means.

d. second ram means pivotally attached at one of its ends to the protective shield and pivotally attached at the other ot its ends near the rear end of said longitudinal support means, said second ram means being selectively actuated to pivot said longitudinal support means about the transversely extending second pivot means;

e. said first ram means actuation raising and lowering the transversely extending axis of the second pivot means relative to the longitudinal axis of the protective shield; and

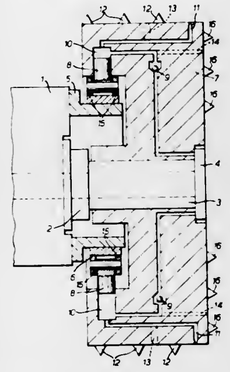
f. said second ram means actuation angularly altering the angle of the longitudinal axis of the cutting head relative to the longitudinal axis of the protective shield.

4,049,318

MINING MACHINE WITH CAM-OPERATED WATER JET PUMP

Harry James Fruin, Staincross, England, assignor to Dresser Europe S.A., Brussels, Belgium

Filed Oct. 28, 1975, Ser. No. 626,544
Claims priority, application United Kingdom, Nov. 1, 1974, 47442/74
Int. Cl.² E21C *25/60*
U.S. Cl. 299—81 **22 Claims**



1. A mining machine adapted to work a mine face comprising: a non-rotational stationary portion, a rotary part rotatably mounted on the said stationary portion for rotation relative thereto, said rotary part including a liquid outlet orifice constructed such that liquid passes therethrough as a jet, passage means for providing a passage for a liquid through the rotary part to the orifice, said orifice being constructed to provide a jet of liquid, a pump means operatively connected to the rotary part for rotation therewith, a cam bearing fixedly mounted on the said stationary portion and positioned to act directly upon the pump means such that the pump means is operated directly in response to rotation of the rotary part, relative to the stationary part, for supplying the liquid in said passage means to the orifice with a pressure which varies continuously to reach a maximum value periodically, whereby the jet is directed at the material being mined at least some of the times the jet is at or near its maximum pressure.

4,049,319

WHEEL CONSTRUCTION

Richard S. Hartung, Bedford, Pa., assignor to Hedstrom Co., Bedford, Pa.

Filed Mar. 18, 1976, Ser. No. 668,189
Int. Cl.² B60B *37/00*
U.S. Cl. 301—1 **6 Claims**

1. A wheel assembly comprising

A. a shaft,

B. at least one tab projecting radially out from the shaft and extending along the shaft so as to present an edge facing one end of the shaft,

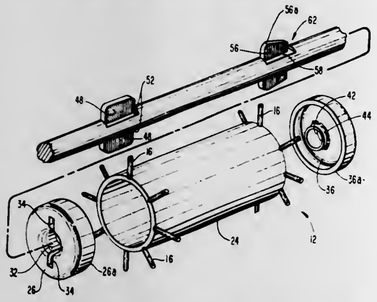
C. a wheel including a wheel hub composed of a tube whose bore cross-section is appreciably larger than that of the shaft and first and second end caps secured to the opposite ends of the tube,

D. means defining axial aligned openings in the end caps to accommodate the shaft,

E. a lip extending around the opening in at least the second end cap, said lip projecting into the hub, and

F. at least one slot contiguous with the opening in the first end cap, said slot being arranged and adapted to permit passage of the tab when said one end of the shaft is in-

serted through the openings in the first and then the second end caps, said shaft being positioned axially in the hub



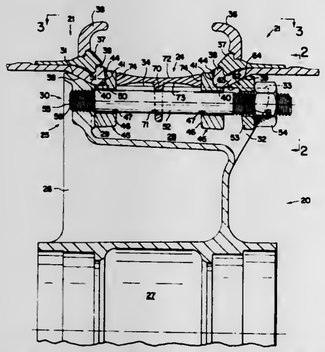
so that said tab edge has sliced into the lip around the opening in the second end cap thereby rotatively locking the hub to the shaft.

4,049,320

VEHICLE WHEELS, SPACERS AND DUAL RIMS

Robert A. DeRegnaucourt, Centerville; John C. Hall, Moraine, and Freddie R. Caudill, Dayton, all of Ohio, assignors to Dayton-Walther Corporation, Dayton, Ohio

Filed July 9, 1975, Ser. No. 592,506
Int. Cl.² B60B *23/10*
U.S. Cl. 301—13 SM **4 Claims**



1. A combination of dual inner and outer tire carrying rims separated by spacers and seated and locked by fastening assemblies on a vehicle wheel,

said wheel having a plurality of spaced-apart felloe portions, each said felloe portion having an outwardly opening pocket thereon, the axially inner end of each said pocket terminating at a radially directed surface substantially perpendicular to the rotational axis of said wheel and providing a mounting location for an elongated axially projecting component of said fastening assemblies, each said radially directed surface intersecting a radially inclined felloe surface, the axially outer end of each said pocket having spaced-apart axially directed wing portions providing for outwardly facing dual axially oriented surfaces extending substantially parallel to the rotational axis of said wheel,

each said rim having a rim base edge portion with a radially inclined axially inner surface intersecting an axially oriented radially inner surface intersecting a radially directed axially outer surface and a plurality of clamp lugs integrally secured to said radially directed axially outer surface, each said clamp lug having a radially inwardly directed leg portion substantially perpendicular to the rotational axis of each of said rims with a bore therein for receiving said elongated axially projecting component of said fastening assemblies,

each said spacer being non-compressible and comprising an individual element for each said wheel felloe portion with a bore therein for receiving said elongated axially projecting component of said fastening assemblies and being retained thereby between said rims,

each said fastening assembly comprising a threaded fastener and a clamp element supported by said threaded fastener, each said clamp element having lateral wing portions providing downwardly facing dual axially oriented surfaces, an axially inwardly directed member and a radially outer portion with a radially inclined surface,

whereby, said rims when separated by said spacers are seated and locked on said wheel solely by tightening of each said fastening assembly,

said radially inclined axially inner surface of said inner rim base edge portion being in mating engagement with each said radially inclined felloe surface, and said radially directed leg portion of one of said inner rim clamp lugs being in mating engagement with each said radially directed pocket surface,

the axially inner end of each said spacer being in mating engagement with said radially directed leg portion of one of said inner rim clamp lugs, the axially outer end of each said spacer being in mating engagement with said radially directed leg portion of one of said outer rim clamp lugs,

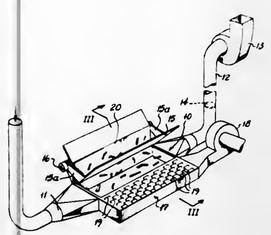
said radially inclined surface on each said clamp element on each said fastening assembly being in mating engagement with said radially inclined axially inner surface of said outer rim base edge portion, said downwardly facing dual axially oriented surfaces on said lateral wing portions of each clamp element on each said fastening assembly being in mating engagement with said outwardly facing dual axially oriented surfaces on said axially outer end of said felloe pocket and said axially inwardly directed member on each said clamp element on each said fastening assembly being in mating engagement with said radially directed leg portion of one of said outer rim clamp lugs.

4,049,321

WASTE COLLECTION SYSTEMS

Keith Brian Bunting, Hazel Grove, England, assignor to Simon Container Machinery Limited, Stockport, England

Filed Feb. 9, 1976, Ser. No. 656,200
Claims priority, application United Kingdom, Feb. 20, 1975, 7256/75
Int. Cl.² B65G *53/40*
U.S. Cl. 302—41 **7 Claims**



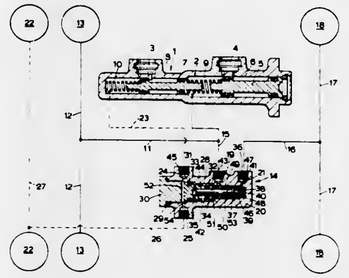
1. Apparatus for the removal of waste material produced from a manufacturing operation comprising a box into which the waste material may be fed, said box having a top opening through which said waste material may be introduced, lid means for the box mounted to be movable between a box-open position wherein it uncovers said opening and a box-closed position wherein it closes said opening, means whereby said lid means in box-closed position accummulates waste material and whereby said accummulated waste material is introduced through said opening into said box when said lid means is moved from box-closed to box-open position, and means for establishing a current of conveying air through said box when said lid means is in said box-closed position.

4,049,322

VEHICLE BRAKING SYSTEMS

Glyn Phillip Reginald Farr, Leek Wootton, England, assignor to Girling Limited, Birmingham, England

Filed July 30, 1976, Ser. No. 710,221
Claims priority, application United Kingdom, Aug. 14, 1975, 33850/75
Int. Cl.² B60T *8/26, 8/22*
U.S. Cl. 303—6 C **8 Claims**



1. A pressure reducer valve assembly for a vehicle braking system comprising a housing, said housing having means defining first and second inlets for connection to first and second pressure spaces of a master cylinder and means defining an outlet for connection to a rear wheel brake, said housing being provided with a bore, a valve member positioned in said bore, a valve seat of which opposite sides communicate with said first inlet and said outlet, resilient means urging said valve member away from said seat, a pressure responsive member for controlling the position of said valve member, pressure at said first inlet acting on said pressure responsive member so as to urge said valve member towards said seat, abutment means for said resilient means, and means for controlling the position of said abutment means in response to the difference in pressure at said first and second inlets, means being provided for transmitting increase of pressure in said first pressure space up to a threshold value by said reducer valve assembly directly to said outlet to said rear wheel brake, said means transmitting said increases in pressure at pressures above said threshold value at a reduced rate, and said pressure reducer valve being responsive to the difference in pressure between said first and second inlets connected to said pressure spaces and including means for reducing said threshold value upon failure of the pressure at said second inlet.

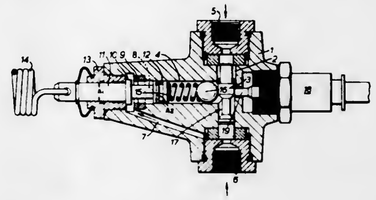
4,049,323

BRAKE PRESSURE CONTROL VALVES WITH FLUID PRESSURE RESPONSIVE VALVE

Wolfgang Hess, Koblenz, Germany, assignor to Girling Limited, Birmingham, England

Filed Feb. 19, 1975, Ser. No. 550,996
Claims priority, application United Kingdom, Feb. 20, 1974, 7802/74
Int. Cl.² B60T *8/18, 8/26*
U.S. Cl. 303—6 C **5 Claims**

1. A pressure control valve assembly for use in vehicle braking system having separate pressure circuits, comprising a fluid pressure responsive valve adapted to be inserted in one of said circuits for controlling the flow of pressure fluid therein, the valve having a valve closure member and a cooperating valve seat, spring means urging said valve to an open position, a pressure differential responsive member adapted to be subjected at opposed ends respectively to the pressures in said circuits and normally occupying a first position, and force varying means having an operative connection with said spring means and with said pressure differential responive member for varying the force with which the spring means acts on said valve, and therefore the pressure at which said valve responds, when said pressure differential responsive member is moved from its first position to a second position in response to a



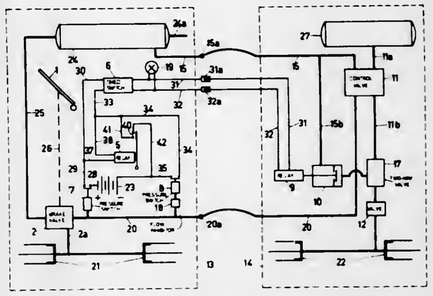
pressure differential in said circuits, said force varying means comprising an adjustable abutment which is movable between a normal position and an actuated position in direct consequence of actuating movement of said pressure differential responsive member, means defining a first bore within which said abutment is movable and means defining a second bore extending transversely to said first bore within which said pressure differential responsive member is movable.

4,049,324

ELECTRO-PNEUMATIC EMERGENCY BRAKE CONTROL SYSTEM FOR A VEHICLE TRAIN

Eduard Cermak, Haydnstrasse 6, 71 Heilbronn, Germany

Filed Nov. 17, 1975, Ser. No. 632,397
Claims priority, application Germany, May 28, 1975, 2420665
Int. Cl.² B60T *13/16*
U.S. Cl. 303—7 **4 Claims**



1. A brake system for a vehicle train including a tractor and a trailer which comprises:

a. a source of high pressure connected through a control line to operate a pneumatic brake system in a tractor vehicle and in a trailer vehicle,

b. an electric circuit which, when closed, electrically opens a valve to supply high pressure air directly to the brake system in said trailer vehicle,

c. a fast-acting pressure switch on said tractor vehicle and in said electric circuit, said fast-acting switch acting responsive to a particular pressure in said control line to close said electric circuit,

d. a slow-acting pressure switch on said tractor vehicle and in said electric circuit, said slow-acting pressure switch acting responsive to a pressure in said control line that is

lower than said particular pressure to open said electric circuit, and

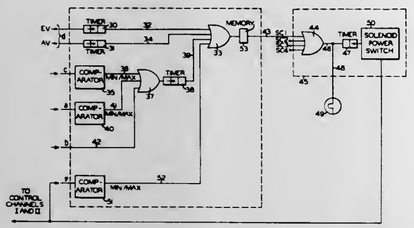
e. means actuated when both said fast-acting switch and said slow-acting switch are closed to by pass said slow-acting switch.

4,049,325

SAFETY CIRCUIT ARRANGEMENT FOR WHEEL ANTI-SKID BRAKE CONTROL SYSTEM

Erich Reinecke, Beinhorn, Germany, assignor to WABCO Westinghouse GmbH, Hannover, Germany

Filed June 18, 1976, Ser. No. 697,337
Claims priority, application Germany, Aug. 5, 1975, 2534904
Int. Cl.² B60T *8/00*
U.S. Cl. 303—92 **5 Claims**



1. An anti-skid control system for the fluid pressure operated brakes of a road vehicle having at least two wheels, comprising:

a. first and second electronic control channels for a first and second one of said wheels, respectively, each said control channel being of integrated circuit construction formed on separate integrated circuit chips;

b. said first control channel including:

i. means for evaluating the dynamic behavior of said first wheel; and

ii. a safety circuit for monitoring preselected fault conditions of said second control channel;

c. said second control channel including:

i. means for evaluating the dynamic behavior of said second wheel; and

ii. a safety circuit for monitoring preselected fault conditions of said first control channel;

d. modulator valve means for influencing the fluid brake pressure at the brakes of a respective one of said first and second wheels in response to output signals from said first and second control channels; and

e. power supply means for normally providing a source of electrical energy to activate said first and second control channels, said power supply means being cut off from said first and second control channels when any of said preselected fault conditions of either of said first and second control channels is detected by said safety circuit thereof to deactivate said first and second control channels and thereby inhibit operation of said anti-skid brake control system.

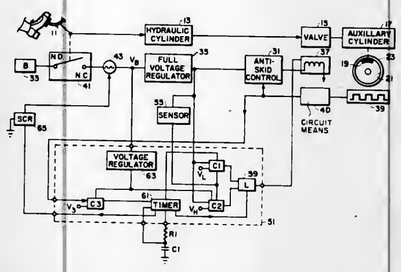
4,049,326

FAIL SAFE CIRCUIT FOR AN ANTI-SKID CONTROL APPARATUS

Don W. Zobel, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 14, 1975, Ser. No. 631,804
Int. Cl.² B60T *8/08*
U.S. Cl. 303—92 **2 Claims**

1. In the anti-skid control apparatus for an automobile brake system adapted to operate with the brake system of an automobile and prevent it from skidding with an actuable valve operatively coupled to a brake shoe for applying brake force against a wheel of the automobile in motion to slow it down and an anti-skid control circuitry controlling the operation of the actuable valve for applying brake forces against the wheel in a controlled manner to avoid skidding, said anti-skid control circuitry including means for sensing the rate of deceleration of the moving wheel and providing an output signal when the rate exceeds a predetermined rate indicative of skidding conditions and means for deactuating the valve to release the brake shoe in response to the output signal to prevent skidding, the improvement which comprises fail safe circuitry for actuating the valve when the brake shoe is released by said anti-skid control circuitry for a predetermined time period whereby the



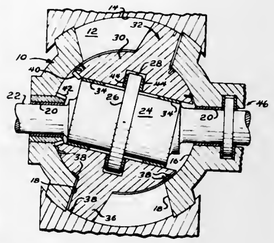
brake shoe is prevented from being released for more than said time period, said fail safe circuitry including an R-C timer adapted to have applied thereto a regulated voltage, said timer including a timing capacitor coupled to the regulated voltage and through additional circuitry providing an actuating signal to the valve when the voltage stored in said timing capacitor reaches a predetermined value, and semiconductor means coupled across said timing capacitor for discharging said capacitor before the voltage stored therein reaches the predetermined value when the regulated voltage dips below a predetermined amount.

4,049,327

THRUST BEARING

Alexander Goloff, East Peoria, and Frank E. Keske, Chillicothe, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 3, 1975, Ser. No. 628,024
Int. Cl.² F16C *32/00*
U.S. Cl. 308—161 **11 Claims**



1. A thrust bearing comprising:

first and second relatively rotatable members;

one of said members including a thrust collar;

the other of said members including a groove receiving said thrust collar; and

means defining a bearing surface at the interface of said thrust collar and said groove;

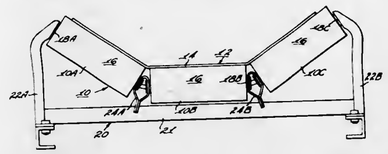
said collar, groove and bearing surface being constructed and arranged such that clearance between the parts may vary in the radial direction.

4,049,328

SUBASSEMBLY CARTRIDGE FOR SEALING AND ADJUSTING BEARING ASSEMBLIES

Ralph C. Ouska, Hinsdale, and Francois X. Bertaud, Aurora, both of Ill., assignors to Stephens-Adamson, Inc., Aurora, Ill.

Filed May 25, 1976, Ser. No. 689,938
Int. Cl.² F16C *33/72*
U.S. Cl. 308—187.1 **19 Claims**



1. A combined bearing sealing and adjusting subassembly for use with an idler roll assembly comprising a stationary shaft and a rotatable idler roll which rotates relative to said stationary shaft upon a tapered roller bearing assembly, said roller bearing assembly comprising an outer race carried by said rotatable idler roll, an inner race mounted on said shaft and tapered rollers interposed between said outer and said inner races, said subassembly comprising a sleeve member adapted to be coaxially positioned upon said shaft, seal means forming part of said subassembly for the purpose of normally preventing egress of lubricant from the bearing assembly or the ingress of foreign matter into the bearing assembly, an axially inwardly extending retaining portion formed on the axially inner end of said sleeve member, a plastically and elastically deformable collapsible spacer member adapted to be retained by said retaining portion of said sleeve member, said spacer member being characterized by the fact that it is plastically deformable to absorb manufacturing clearances of said idler roll assembly within a predetermined range of travel of said spacer member and is also elastically deformable over the same range, and that for any plastic deformation within a given range of travel for which the spacer member is designed, a substantially constant elastic deformation is available, the elastic deformation characteristic of said spacer member serving to provide a predetermined adjustment of the tapered roller bearing assembly, said sleeve member being movable axially inwardly relative to said idler roll assembly along said shaft whereby to plastically and elastically deform said spacer member, means defining a bearing surface for said spacer member interposed between the axially inner end of said spacer member and said inner race of said roller bearing assembly, and means carried by said sleeve member and adapted to cooperate with means on said shaft whereby to permit a predetermined axially outward movement of said sleeve member along said shaft subsequent to the deformation of said spacer member whereby to permit a controlled release of a predetermined proportion of the elastic deformation of said spacer member and thus whereby to control the adjustment of said tapered roller bearing assembly.

4,049,329

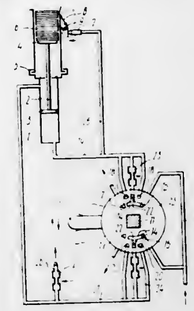
AUTOMATIC DEVICE FOR MAINTAINING THE LEVEL OF A STACK OF PLATES

Ivan Alexandrovich Kolosov, ulitsa Astrakhanskaya, 118, kv. 54, Saratov, U.S.S.R.

Filed Sept. 9, 1976, Ser. No. 721,709
Claims priority, application U.S.S.R., Sept. 10, 1975, 2172467
Int. Cl.² A47F *1/00*
U.S. Cl. 312—71 **1 Claim**

1. An automatic device for maintaining the level of a stack of plates, mainly of the storage-battery type, in feeding devices of automatic assembly machines, comprising:

a source of fluid under pressure; a mechanism for lifting the stack made in the form of a conventional pneumatic cylinder with both chambers thereof communicating through conduits with said compressed-fluid source; a replaceable magazine with a stack of plates mounted on said cylinder; and a control system for maintaining the level of a stack of plates including a distributing valve having a member with T-grooves made on one of its end faces, said grooves placing said conduits in communication with said compressed-fluid source; throttles placed in said conduits; stack-level sensing means in the form of a nozzle and a baffle, said baffle being adapted to engage the uppermost plate of the stack in said replaceable magazine and said nozzle being connected by its inlet to one of said conduits



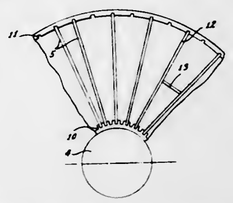
and thereby to one chamber of said cylinder; another nozzle connected to another of said conduits and thereby connected to the other chamber of said cylinder, said nozzles thus providing for simultaneous discharge therethrough of the compressed fluid from both chambers of said cylinder to the atmosphere, as said baffle, associating with one of said nozzles, interacts with the uppermost plate of the stack, the level of said stack in said replaceable magazine being thereby automatically maintained.

4,049,330

STORAGE FACILITY

Wilhelm Schlapp, Schulstr. 8, D-6392 Neu-Anspach 1, Germany

Filed Mar. 24, 1976, Ser. No. 669,807
Int. Cl.² A47B *63/00*; A47F *1/00*
U.S. Cl. 312—186 **7 Claims**



1. Storage facility for papers, files, forms or other objects, comprising:

a hollow storage drum being open on at least one side and including at least two concentric surfaces with means for insertion of partitions at opposite sides;

variably positionable and removable, radially extending partitions inserted in the means of the two surfaces for compartmentizing the interior of the drum;

means for mounting the drum for rotation on a horizontal axis;

an enclosure having at least one slot for access to a compartment of the drum when aligned with the slot;

means connected to the drum for driving the drum;

encoding indicia on the drum for identifying compartments thereof;

scanning means for reaching the indicia and providing reading signals representative thereof;

input means for providing select signals identifying compartments; and

comparing means connected to be responsive to the reading signals and the select signals and controlling the means for driving to stop the drum in a particular position upon agreement of the compartments as identified by the indicia as read and by the input means.

4,049,331

WORK DESK CONSTRUCTION

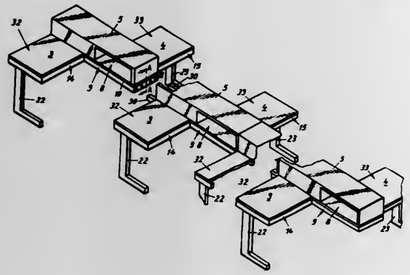
Karl Gutmann, Jr., Unterkirnach, Germany, assignor to Karl Gutmann KG., Germany

Filed Aug. 2, 1976, Ser. No. 710,367

Claims priority, application Germany, Aug. 16, 1975, 2536460

Int. Cl.² A47B *53/00, 87/00*

U.S. Cl. 312—203 **12 Claims**



1. A work desk construction particularly for typists, comprising a longitudinally extending rectangular first support frame having a pair of longer sides joined by a pair of narrow edges and defining a flat top case support, second and third laterally offset transverse frames each having a pair of longer sides joined by a pair of narrow edges and connected into said first frame at spaced locations from each longitudinal end of said first frame and extending transversely outwardly in respective opposite directions from said first frame at longitudinally offset locations with the longer sides of said second and third transverse frames extending substantially parallel to said first support frame narrow edges, a support leg connected to each of said second and third transverse frames adjacent the outer transverse ends thereof and comprising the sole support for all of said frames, a box-like case of substantially the same dimensions as said first frame supported on said first frame, and a desk plate of substantially the same dimensions as the portion of said transverse frames which extend laterally outwardly from said longitudinal frames overlying and supported upon respective ones of said laterally outwardly extending portions of said transverse frames.

4,049,332

IRONING BOARD CABINET

Bettie M. Boudreaux, 839 Claiborne Towers, 119 S. Claiborne Ave., New Orleans, La. 70112

Filed Dec. 12, 1975, Ser. No. 640,016

Int. Cl.² A47B *77/08, 83/00*

U.S. Cl. 312—237 **4 Claims**

1. An ironing board cabinet comprising:

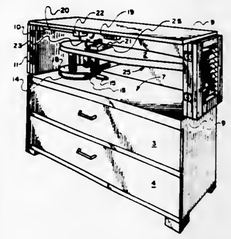
a structure defining a horizontally extended, box-like, generally open space located at the front and at the upper level of the cabinet;

door means located along the front of said open space for closing off said open space, said door means comprising doors hinged to open laterally out from the center front of said open space to the side ends of said open space to expose said open space;

a 90° pivot mount located to one side of said open space near one end thereof;

a horizontally 90° swingable ironing board secured by said pivot mount to and near one end of the bottom side of said box-like open space, the length and width of the ironing board being completely containable within said open space when said ironing board is located therein; and

electrical circuitry located in the cabinet including an electrical switch, a light, an iron plug outlet, and a source of electrical power, all electrically connected together, said electrical switch being deactivated by being depressed



and being located in the front portion of said open space, said door means activating said switch when said door means are moved from the closed position to the open position, said switch being electrically connected to said electrical power source, said light and said iron plug outlet so that when said door means is opened, the switch is activated, thereby activating the light and said iron plug outlet, said light being located at the top and at the front of said open space and focused to place light on the operational area of said ironing board when the door means is opened and the ironing board is pulled out of said open space 90° to its operating position.

4,049,333

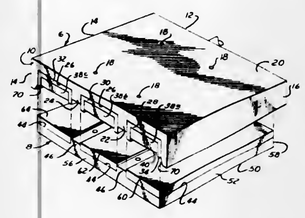
MAGNETIC RADIO MOUNTING BRACKET

Dewey K. Wallace, 812 Wateka, Richardson, Tex. 75080

Filed Mar. 31, 1976, Ser. No. 672,186

Int. Cl.² H01R *11/30*

U.S. Cl. 339—12 R **10 Claims**



1. Means for detachably and electrically connecting an electronic device in a vehicle comprising: a first support arranged for attachment to a vehicle; first, second and third magnetic means attached to the support; power means attached to the first magnetic means; ground means attached to the second magnetic means; antenna signal means attached to the third magnetic means; a second support arranged for attachment to an electronic device; first, second, and third magnetically attracting means attached to the second support; said first, second, and third magnetic means being arranged for attachment to the respective first, second and third magnetically attracting means to provide electrical connection therebetween corresponding to the electrical connections to the first, second, and third magnetic means; first, second, and third electrical connector means connected to the first, second and third magnetically attracting means, means connecting the first, second, and third connector means to a power supply, ground and antenna signal connections in the electronic device.

10. Means for detachably and electrically connecting an electronic device in a vehicle comprising: a first support arranged for attachment to the vehicle; a second support member arranged for attachment to an electronic device; at least three magnetic means attached to the first support; at least three magnetically attracting means attached to the second support arranged to contact the magnetic means to detachably attach the first and second support members together; signal conductor means connected to one of the magnetic means and the vehicle; signal conductor means connected between one of the magnetically attracting means and the electronic device; electrical power connection means attached to two of the magnetic means and arranged for attachment to the electrical system in the vehicle; and electrical power connection means attached to two of the magnetically attracting means aligned with the two corresponding magnetic means and arranged for attachment to the electrical supply means in the electronic device.

4,049,334

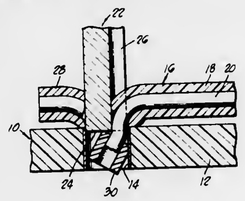
WIRE PREPARATION AND TERMINATION MEANS AND METHOD

Dennis C. Siden, Portola Valley, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 28, 1976, Ser. No. 653,010

Int. Cl.² H01R *9/08*

U.S. Cl. 339—97 R **18 Claims**



1. A termination assembly for an insulated conductor comprising

a circuit board having a termination hole therein with which an insulated conductor is to be terminated;

an elongate pin sized to fit, in interference, in said receiving termination hole, said pin being of generally uniform transverse cross-section along the length thereof and having a first channel extending longitudinally along a side thereof, said first channel having a first cross-sectional dimension smaller than the diameter of the insulated conductor and sized for interference fit with the cross-section of the conductor when stripped of insulation.

4,049,335

SEALED BATTERY THREADED STUD TERMINATION

Victor J. Julian, 2400 Bellvue, Westchester, Ill. 60153, and Kenneth A. Julian, 769 Oakwood Drive, Westmont, Ill. 60559

Filed Jan. 10, 1977, Ser. No. 727,405

Int. Cl.² H01R *11/26*

U.S. Cl. 339—224 **10 Claims**

1. A termination for connecting an electric cable to a shouldered terminal stud of a battery, comprising

a tubular conductive member surrounding a portion of said cable,

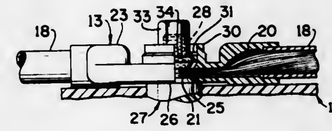
said tubular member having top and bottom flat surfaces,

said surfaces and said cable being provided with aligned holes therethrough for receiving said stud,

a plastic cover molded directly over said tubular member

and having top and bottom openings aligned with said holes,

said bottom opening being sufficiently large to receive at least the upper portion of the shoulder on said stud, and



fastening means disposed in said top opening for engaging said stud and holding said bottom flat surface tightly against said shoulder.

4,049,336

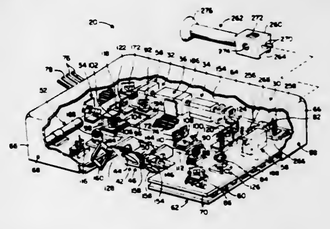
PULSED HOLOGRAPHIC SYSTEM HAVING INDEPENDENT UNIVERSAL BEAM ADJUSTMENT

Jerold L. Jacoby, Long Beach; William S. Tierney, Palos Verdes Peninsula; James E. Wright, Long Beach, and Pravin G. Bhuta, Torrance, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed July 24, 1975, Ser. No. 598,901

Int. Cl.² G03H *1/02*; G02B *7/02*; G03B *5/06*

U.S. Cl. 350—3.5 **30 Claims**



1. A holographic recording unit comprising;

a mounting base,

holographic recording means on said base including means for producing coherent holographic scene and reference beams, directing said scene beam outwardly from said recording unit along an external scene beam path to illuminate a subject situated in said path, and directing said reference beam along a reference beam path, and means for positioning a holographic recording medium in holographic recording relation to said beam paths wherein the medium is disposed for illumination both by said reference beam and by reflected scene beam light from the subject, and means for adjusting said beam paths and positioning means in unison in such a way as to maintain a fixed relation between said beam paths and the recording medium.

4,049,337

REFLEX REFLECTING SYSTEM FOR ROAD SURFACE MARKING

Ludwig Eigenmann, Vacallo, Cantin Ticino, Switzerland

Continuation-in-part of Ser. No. 428,909, Dec. 27, 1973, Pat. No. 3,964,821. This application May 19, 1976, Ser. No. 687,698

Claims priority, application Italy, Dec. 28, 1972, 33710/72

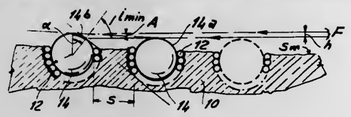
The portion of the term of this patent subsequent to June 22, 1993, has been disclaimed.

Int. Cl.² G02B *5/128*

U.S. Cl. 350—105 **8 Claims**

1. On a marked road roadway pavement, a traffic-regulating

indicium including a layer of material having a upwardly facing surface the entire extent of which is approximately planar, wherein a substantial surface area of said surface includes a discrete number of reflective aggregates partially embedded in said layer, at least a part of said aggregates comprising each a substantially spherical transparent element having an exposed portion projecting upwardly of said surface and another portion projecting downwardly from said surface, said element having an index of refraction such that rays impinging said exposed portion at large angles of incidence are at least partially refracted into said element towards said another portion, and comprising further a layer of transparent binder substance outwardly surrounding said another portion of said element, and reflecting means for the reflection of rays re-



fracted into said element associated with said other portion of said element and spaced from the same by said binder substance, provided that:

a. said transparent element consists of a transparent polymeric substance the index of refraction (n_1) of which is comprised between 1.45 and 1.68,

b. said reflecting means consist of transparent beads partially embedded into said layer of binder substance and having a reflective coating on their part-spherical portions spaced from the associated element, said beads consisting of a transparent material the index of refraction (n_3) of which is comprised between 1.60 and 1.95; and

c. the ratio (n_3/n_2) of the index of refraction (n_3) of said beads relatively to the index of refraction (n_2) of said binder substance is comprised between 1.135 and 1.385.

4,049,338

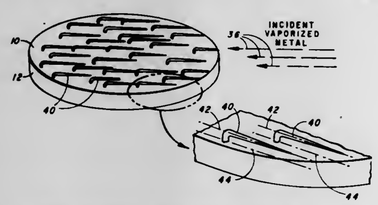
LIGHT POLARIZING MATERIAL METHOD AND APPARATUS

Robert E. Slocum, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 525,232, Nov. 19, 1974, Pat. No. 3,969,545, which is a continuation-in-part of Ser. No. 337,046, March 1, 1973, abandoned. This application May 3, 1976, Ser. No. 682,285

Int. Cl.² G02B *5/30*

U.S. Cl. 350—152 **4 Claims**



1. A light polarizer comprising a transparent substrate of sheet material having a surface which is microscopically smooth to eliminate shadowing effects and having a plurality of nucleating sites distributed randomly throughout the microscopically smooth surface, and a plurality of particles each having one end attached to a nucleating site and an elongated body unattached to the surface and oriented substantially in one given direction, the plurality of particles forming a plurality of side by side essentially parallel whiskers having a length at least as long as one wavelength of incident light to be transmitted and a diameter and separation less than the wavelength of light to be polarized whereby a discontinuous film is formed which acts as a polarizer for both reflected and transmitted light.

4,049,339

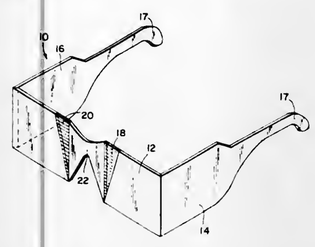
MOVIE VIEWING EYEGLASSES

Antoine Ledan, 417 E. 93rd St., Brooklyn, N.Y. 11212

Filed Feb. 20, 1976, Ser. No. 659,717

Int. Cl.² G02C *7/16*; G02B *27/02*

U.S. Cl. 351—45 **5 Claims**



1. A pair of eyeglasses for use in viewing a movie screen to provide depth simulation comprising:

a frame formed from opaque material, having a nose piece,

a temple formed from opaque material hingedly connected to each end of said frame, and

a pair of transparent, triangular lenses in the plane of said frame on opposite sides of said nosepiece spaced from the ends of said frame connected to said temples.

4,049,340

FILM WIND-UP ARRANGEMENT FOR MOTION-PICTURE CAMERAS

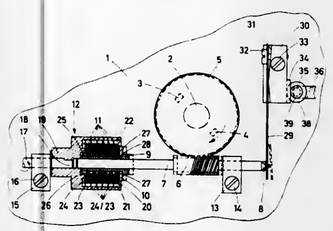
Fritz Krumbein, Stuttgart-Mohringen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 25, 1976, Ser. No. 661,335

Claims priority, application Germany, Mar. 5, 1975, 2509492

Int. Cl.² G03B *1/00*

U.S. Cl. 352—166 **15 Claims**



1. In a motion-picture camera, in combination, a prime mover; a film wind-up member; and a torque-equalizing clutch arrangement coupling the film wind-up member to the prime mover for transmitting torque to the latter, the clutch arrangement including automatic wind-up torque regulating means operative for continually maintaining the wind-up torque transmitted to and exerted by the film wind-up member substantially constant at a preselected value throughout the whole film wind-up operation by automatically disengaging the clutch arrangement when the wind-up torque begins to exceed the preselected value and automatically reengaging the clutch arrangement when the wind-up torque then begins to fall below the preselected value, so as to establish transmission of an intermittent wind-up torque having an average value which is substantially constant and equal to the preselected value, the

automatic wind-up torque regulating means including a worm wheel connected to and driving the film wind-up member, a worm screw driving the worm wheel and driven by the disengageable part of the clutch arrangement, the worm screw being so mounted that as it drives the worm wheel it simultaneously tends to move in a direction causing the disengageable part of the clutch arrangement to become disengaged, and biasing means for exerting upon the worm screw a force counteracting the tendency to move in such direction.

4,049,341

FILM CARRIER FOR MICROFILM READER

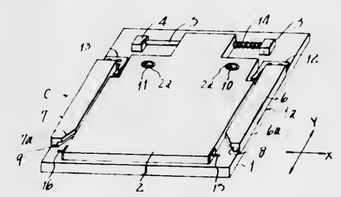
Shiro Toriumi, Machida, and Seiichi Yamagishi, Tokyo, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 16, 1976, Ser. No. 677,654

Claims priority, application Japan, Apr. 23, 1975, 50-56224

Int. Cl.² G03B *1/48, 21/14*

U.S. Cl. 353—23 **13 Claims**



1. A carrier device for a microfilm reader comprising:

a base plate for receiving thereon a microfilm, said base plate having a forward border

a transparent holding plate having a forward end and being pivoted for swinging about a transverse axis proximate its forward end to the forward border of said base plate, for holding the microfilm tight on the base plate when said holding plate is in closed substantially superimposed position relative to said base plate, said base plate and said holding plate being movable as a unit in a planewise direction,

a pair of guide members fixed on both sides of the base plate and each having a slant notch and a groove running diagonally forwardly inwardly to converge in the direction of movement of the microfilm insertion, said groove running parallel with said slant notch and formed along the bottom of said slant notch, said guide members controlling the sidewise positioning of the microfilm on the base plate upon insertion of the microfilm fed between said base plate and said holding plate.

4,049,342

MICROFICHE CARTRIDGE AND TRANSPORT APPARATUS

Guy Head Hearon, Malibu, Calif., assignor to Dymat Photomatrix Corporation, Santa Monica, Calif.

Filed June 7, 1976, Ser. No. 693,524

Int. Cl.² G03B *23/08*; B65H *29/00, 5/00*

U.S. Cl. 353—27 R **2 Claims**

1. A microfiche cartridge and transport apparatus for moving a selected microfiche onto a receiving platen of a microfiche viewer, including, in combination:

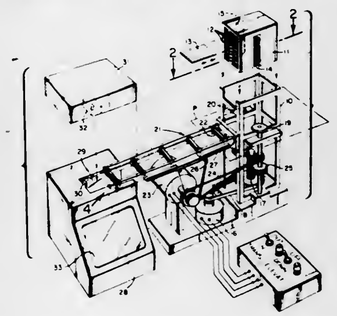
a. an open top frame structure;

b. a box shaped cartridge having a series of elongated rectangular pockets in a stacked array, one above the other, with exposed front openings, each pocket being dimensioned to receive in its front opening a single microfiche, opposite sides of said box shaped cartridge having vertical cut-out channels intersecting opposite sides of said pockets to expose opposite edge portions of each microfiche when stored in the pockets, said box shaped cartridge being receivable in the open top of said frame for guided movement in an up and down direction;

c. a first reversible motor means for raising and lowering said cartridge within said frame in discrete increments corresponding to the vertical spacing between adjacent pockets;

d. friction wheels mounted for rotation about vertical axes and lying in a horizontal plane on opposite sides of said frame, peripheral portions of said wheels being received in said cut-out channels to engage the opposite edges of a microfiche contained in a pocket positioned in said horizontal plane;

e. a conveyor means including drive rollers supported by said frame at the front opening of that pocket in said horizontal plane, said conveyor means extending at its far end to said platen and including a return transport initiat-



ing means in the form of a friction roller overlying but not normally engaging a trailing edge portion of a microfiche when fully positioned on said platen; and,

f. a second reversible motor means for rotating said friction wheels, drive rollers and said friction roller whereby energization of said first motor means to move said cartridge in an up or down direction positions a selected pocket and its associated microfiche in said horizontal plane, energization of said second motor means in one direction transporting said microfiche from said pocket onto said conveyor means and onto said platen, and energization of said second motor means in a reverse direction causing said friction roller to engage said microfiche and feed it back onto the main portion of said conveyor means for return to said pocket by said main drive rollers and friction wheels.

4,049,343

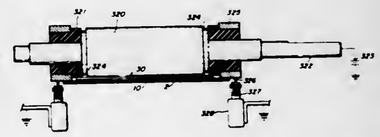
COMBINATION IMAGING AND GROUNDING ROLLER

Herman A. Hermanson, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 24, 1975, Ser. No. 571,174

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 P **4 Claims**



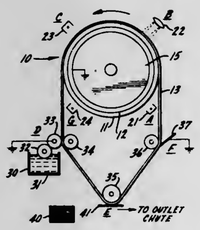
1. A photoelectrophoretic apparatus having in combination

a. an injecting web electrode;

b. a blocking web electrode which is narrower in width than said injecting electrode;

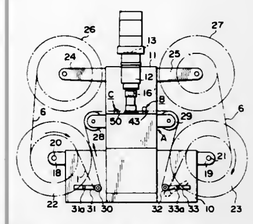
c. means for deposition of a thin film of ink on at least one of said electrodes;
d. means for synchronous advancement of said electrodes;
e. means for confining of said ink film between said electrodes in an imaging zone;
f. means for support of said web electrode in said imaging zone, said support means comprising a roller having a first conductive surface in contact with that portion of the blocking electrode substantially corresponding to the imaging zone and a second conductive surface in contact with that portion of the injecting electrode substantially outside of the imaging zone, each of the conductive surfaces in contact with the blocking web electrode and the injecting web electrode being electrically biased so as to create an electric field across the layer of ink confined between said electrodes; and
g. means for projection of image information onto the confined layer of ink concurrent with the application an electric field across said ink layer.

4,049,344
ELECTROSTATIC IMAGING SYSTEM
George R. Simpson, Rochester; Robert W. Gundlach, Victor, both of N.Y., and Gordon C. Butler, Welwyn Garden City, England, assignors to Xerox Corporation, Stamford, Conn.
Filed Mar. 10, 1975, Ser. No. 557,213
Int. Cl.² G03G *13/10, 13/22*
U.S. Cl. 355—10 **17 Claims**



9. An apparatus for electrostatically reproducing a selected image comprising:
a rotatable photoconducting drum;
endless interposer means belted about said drum and adapted to movably contact portions thereof;
first charge means for applying a first charge of a selected polarity to an area of said drum;
optical means for applying a light and shadow representation of said selected image to said area to said drum;
second charge means for applying a second charge of opposite polarity from said first charge, to a portion of said interposer means in contact with said area of said drum, the second charge being retained on the interposer according to the light and shadow representation and the first charge effectively transferring from the photoconducting drum to the interposer when the interposer moves out of contact with the drum;
development fluid dispensing means adapted to pass a quantity of development fluid corresponding to said light and shadow representation applied by said optical means to said portion of said interposer means when moved out of contact with said drum;
a pressure roller, adapted to urge said interposer means into contact with a copy medium for transferring said development fluids thereto;
discharge means adapted to remove residual charges of said first charge from said drum prior to the application of another light and shadow representation on said area of said drum; and
means for removing excess development fluid from said interposer means after said image is reproduced on a copy medium.

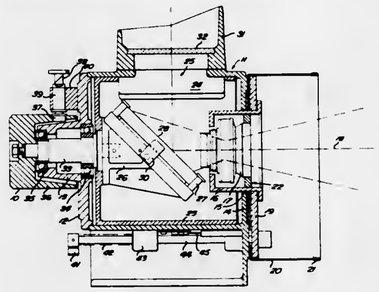
4,049,345
APPARATUS FOR EXPOSING A PHOTOSENSITIVE BELTLIKE MATERIAL
Osamu Tanabe, Hikone; Hisao Nishizawa, Shiga, and Kazuo Hata, Kameoka, all of Japan, assignors to Dainippon Screen Seizo Kabushiki-Kaisha, Kyoto, Japan
Filed Mar. 31, 1976, Ser. No. 672,383
Claims priority, application Japan, Apr. 3, 1975, 50-39798
Int. Cl.² G03B *27/52, 27/32*
U.S. Cl. 355—41 **5 Claims**



1. Apparatus for exposing an image onto a photosensitive beltlike material, said appartus comprising:
a light source to illuminate an original pattern block,
an optical system to cast and focus an image of said pattern block,
exposure control means to control the focusing and the exposing of said optical system,
conveying means to intermittently convey said beltlike material onto the focal plane of said optical system,
detecting means, being subject to a lateral movement of said beltlike material, to detect its amount of movement, thereby controlling said conveying means,
supporting means to support and position said beltlike material at said focal plane,
first rotating member having both said beltlike material and a beltlike protecting means wound therearound in advance,
a second rotating member,
a third rotating member having another beltlike protecting means wound therearound in advance, and
a fourth rotating member;
said fourth rotating member being adapted to receive said beltlike protecting means wound off from the first member, and said second rotating member member being adapted to receive both said beltlike material from the first member and another beltlike protecting means from the third member.

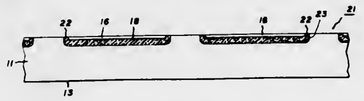
4,049,346
CAMERA PROJECTOR WITH TURRET
Cecil Alfred Austin, Crawley, England, assignor to Pictorial Machinery Limited, Crawley, England
Filed May 13, 1976, Ser. No. 686,079
Claims priority, application United Kingdom, May 23, 1975, 22826/75
Int. Cl.² G03B *27/70, 13/28*
U.S. Cl. 355—45 **8 Claims**

1. A photographic copying machine including a camera, an image projector and an image viewer mounted at respective locations, a lens system which is common to said camera, said projector and said viewer, and adjustable means, including a mirror mounted to be selectively movable between three positions in each of which said mirror is disposed in the path of light passing through said lens system and couples a respective



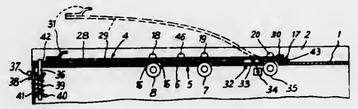
one of said camera, said projector and said viewer with said lens system.

4,049,347
SCRATCH-RESISTANT MASK FOR PHOTOLITHOGRAPHIC PROCESSING
Carlyle F. Smith, Jr., Cayuga, N.Y., assignor to General Electric Company, Auburn, N.Y.
Filed Mar. 24, 1976, Ser. No. 669,720
Int. Cl.² G03B *27/28*
U.S. Cl. 355—133 **3 Claims**



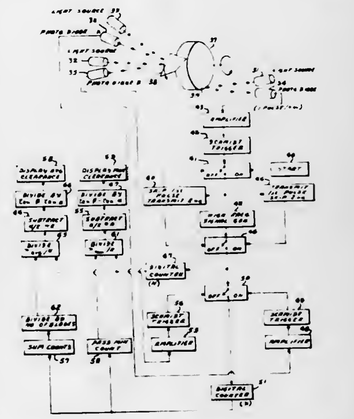
1. A photomask comprising a glass substrate having depressions formed in a major surface thereof and opaque ceramic masking material fused to said substrate in said depressions, wherein only a narrow peripheral portion of each body of said masking material is coplanar with said major surface, the remaining portion of the exposed surface of each of said bodies of masking material being depressed beneath the plane of said major surface.

4,049,348
PHOTOCOPYING APPARATUS
Yves Cormier, 17 rue Charles Morance, 72000 Le Mans, France
Filed Dec. 19, 1975, Ser. No. 642,604
Claims priority, application France, Dec. 23, 1974, 74.42435
Int. Cl.² G03B *27/62*
U.S. Cl. 355—50 **8 Claims**



1. Photocopying apparatus having an inlet end and an outlet end, said apparatus serving to duplicate open books and linearly traveling single sheets comprising a horizontally arranged guide plate, laterally spaced longitudinally extending guide means disposed adjacent to said guide plate, an exposure window associated with said guide plate, primary rotatable feed rollers spaced inwardly of said inlet end of said apparatus, secondary rotatable feed rollers in proximity to said exposure window, a linearly movable carriage element having oppositely disposed lateral edges, means associated with said longitudinally extending guide means adapted to engage said lateral edges of said carriage, carriage retention control means positioned in proximity to said outlet end of said apparatus, and microswitch means in proximity to said primary feed rollers serving to close a circuit to cause said primary and secondary rollers to begin rotation.

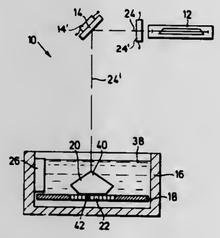
4,049,349
DEVICE FOR MEASURING ROTOR TIP CLEARANCE IN OPERATING TURBOMACHINERY
Arthur J. Wennerstrom, 215 Mar-Ken Drive, Dayton, Ohio 45405
Filed June 30, 1976, Ser. No. 701,453
Int. Cl.² G01C *3/08*; G01P *3/48*
U.S. Cl. 356—4 **1 Claim**



1. Apparatus for measuring in an operating turbomachine clearance between a casing and blade tips of a revolving rotor having a circumferential direction and an axis of rotation, the said casing having a radius R from the said axis, the said apparatus comprising:
a. a pair of sensors comprising a first light source emitting a beam of light cooperating with a first light detector, and a second light source emitting a beam of light cooperating with a second light detector;
b. the said pair of sensors positioned circumferentially in spaced-apart relationship in the said casing where the said blade clearance is to be measured, and having equal axial coordinates with respect to the said axis of rotation, and the said light emitting sources angled to one another measured in a plane of revolution of said rotor containing both light beams and separated by a determined distance *d*;
c. means for detecting a revolution of the said revolving rotor;
d. a high frequency generator providing a stable frequency of pulses;
e. means cooperating with the said pair of sensors and the said high frequency generator providing a digital count *n* of pulses between the intercept of a blade with the said first light beam and the intercept of the blade with the said second light beam;
f. means cooperating with the said means for detecting a revolution of the revolving rotor and the said high frequency generator providing a digital count N of pulses occurring during the said revolution;
g. means for dividing the said *n* count by the said N count and providing a quotient of *n*/N;

h. means for subtracting from the quotient n/N the distance d divided by 2π times the said casing radius R and providing a digital output; and
i. means for displaying the said digital output.

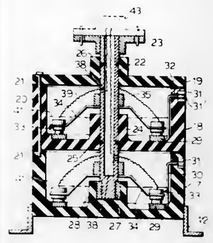
4,049,350
PROCESS AND APPARATUS FOR DETECTING INCLUSIONS
Gernot Klaus Brück, Cologne, Germany, assignor to DIHACO Diamanten Handels Compagnie Est., Mauren, Fla.
Filed Sept. 12, 1975, Ser. No. 612,925
Claims priority, application Germany, Sept. 18, 1974, 2444644
Int. Cl.² G01N *21/32*
U.S. Cl. 356—30 **26 Claims**



13. Apparatus for detecting the presence and size of inclusions which scatter light in stones, comprising:
a container into which the stone to be examined in insertable with a predetermined alignment;
an immersion liquid having a refractive index substantially equal to the refractive index of the stone for the wavelength of the incident beam, contained within the container in sufficient quantity to fully immerse the stone;
a light source for producing a light beam with a cross-section of the same order of magnitude as the smallest inclusions to be detected and which scatter light from said beam;
an adjusting device for aligning the beam in a particular direction relative to the stone when inserted in the container;
a moving device for relatively moving the stone and the beam to scan the light beam across the stone; and
means responsive to the intensity of unscattered light from said light beam to the exclusion of light scattered by inclusions for measuring the intensity of said unscattered light with respect to each relative position of the beam and the stone during the scan caused by said moving device.

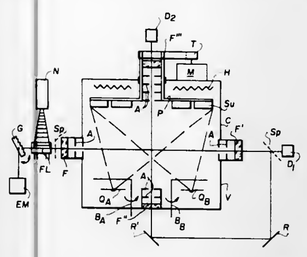
4,049,351
CONTACT MEANS FOR A WEATHER RESISTANCE AND SOLAR RADIATION TESTER
Shigeru Suga, Yoyogi 5-20-2, Shibuya, Tokyo, Japan
Filed Mar. 29, 1976, Ser. No. 671,701
Int. Cl.² G01N *21/24*; H01R *39/02, 39/08*
U.S. Cl. 356—72 **4 Claims**

1. In a weather resistance and solar radiation tester having a specimen rotating frame rotatable on a shaft around a light source and having a light receiving element on the specimen rotating frame having leads extending through the shaft and a meter for indicating the amount of light received by said light receiving element, improved contact means for electrically connecting the leads to the meter, said contact means comprising a rotating shaft connected to said shaft for the specimen rotating frame, upper and lower cases surrounding said rotating shaft and in which said rotating shaft is rotatably journaled and defining two separate compartments spaced along said rotating shaft and sealed from each other, said cases being of electrically insulating material, a metal ring fixed in the bottom of each case and a lead extending from each ring out through the respective case for connection to the meter, a plate spring in each compartment fixed to said rotating shaft, at least one contact piece on said plate spring in each compartment and in sliding contact with said metal rim therein and held in contact by said plate spring, one of said leads extending through said rotating shaft into one compartment and being electrically connected to the contact piece therein and the other of said



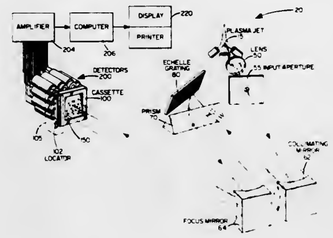
leads extending through said rotating shaft and into the other compartment and being electrically connected to the contact piece therein, and an electrically insulating liquid in each compartment covering said rings and contact pieces therein, whereby deterioration of the resistance value of the contact means is avoided by elimination of the contamination due to contact wear.

4,049,352
METHOD AND APPARATUS FOR DETERMINING THE RATE OF FLOW OF PARTICLES IN A VACUUM DEPOSITION DEVICE
Marcel Lardon, Maienfeld, Switzerland, and Hans Pulker, Triesen, Liechtenstein, assignors to Balzers Patent und Beteiligungs AG, Liechtenstein
Filed Oct. 3, 1975, Ser. No. 619,528
Claims priority, application Switzerland, Oct. 9, 1974, 013668/74
Int. Cl.² G01N *21/00*; B05C *11/00*
U.S. Cl. 356—73 **5 Claims**



1. A method of determining the rate of flow of particles in a vacuum deposition device comprising the steps of establishing a current of particles in the device, directing a first laser beam through the current, measuring the attenuation of the first laser beam due to absorption by the particle current and therefrom determining the vapor density within the current, determining the first laser beam absorption wavelength by observing the beam after it has passed through the current, passing a second laser beam through the current in a direction different from the first laser beam direction and determining the second laser beam absorption wavelength after it has passed through the current, deriving the difference of absorption wavelengths of the two laser beams as an indication of the velocity of the current, and determining the rate of flow of the particles by using the relationship that the rate of flow of the particles is equal to the said vapor density times the said velocity.

4,049,353
SPECTROMETRIC SYSTEM AND CASSETTE
Danilo V. Missio, Belmont, Mass., assignor to SpectraMetrics, Incorporated, Andover, Mass.
Filed Aug. 11, 1976, Ser. No. 713,436
Int. Cl.² G01J *3/38, 3/02*
U.S. Cl. 356—85 **17 Claims**



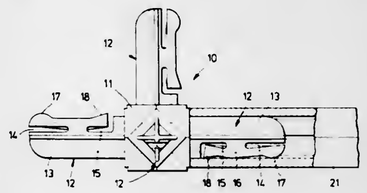
1. A cassette for use in a spectrometer system, the cassette adapted to receive spectral energy on its face surface and to transmit such energy therethrough and to a detector adjacent the back surface, which cassette comprises:
a. a face mask plate having at least one inlet opening therein to receive spectral energy, the face plate adapted to be placed in the focal plane of a spectrometer;
b. a back plate spaced apart from and generally parallel to the face plate and having at least one outlet opening therein to transmit spectral energy received by the inlet opening to a detector, the outlet opening being nonaligned with the inlet opening; and
c. optical transmitting means within the cassette which comprises,
i. a first reflecting mirror adjacent the inlet opening and positioned to receive spectral energy and to direct angularly the received energy, and
ii. a second reflecting mirror adjacent the outlet opening and positioned to receive the spectral energy from the first mirror and to transmit the received energy to the outlet opening, whereby spectral energy from a spectrometer focal plane is directed through nonaxially aligned inlet and outlet openings of a cassette to a detector.

4,049,354
TOOTHBRUSH WITH DENTIFRICE ATTACHMENT
James L. O'Rourke, 6351 Memorial, Detroit, Mich. 48228
Continuation-in-part of Ser. No. 506,009, Sept. 16, 1974, Pat. No. 3,936,200. This application Jan. 9, 1976, Ser. No. 646,501
Int. Cl.² B43K *5/14*; B43M *11/06*
U.S. Cl. 401—134 **2 Claims**



1. A toothbrush comprising a brushing unit, an elongated cartridge unit having a chamber adapted to contain a dentifrice, said cartridge unit having a head at one end and an elongated spine along one side of said chamber to facilitate gripping said cartridge unit, said chamber being defined at least in part by squeezable wall, said brushing unit including a shank portion having a head at one end provided with bristles, a coupler at the other end of said shank portion releasably connected to said one end of said cartridge unit, passage means from said chamber including passages through said one end of said cartridge unit, said coupler, said shank portion and said head to convey dentifrice to said bristles when forced from said chamber by the squeezing of said wall, and a check valve in said spine for said chamber adapted to close when said wall is squeezed and to open and admit air to said chamber when said wall is released after squeezing, said check valve being located in a wall of said cartridge unit and when open providing direct communication between the dentifrice in said chamber and the ambient air surrounding said cartridge unit through said spine.

4,049,355
PIPE COUPLING
Takashi Kawazu, No. 10-4, 5-chome, Nakano-cho, Miyakojima, Osaka, Japan
Filed Mar. 26, 1976, Ser. No. 671,001
Claims priority, application Japan, May 19, 1975, 50-61404
Int. Cl.² F16B *7/00*
U.S. Cl. 403—172 **2 Claims**

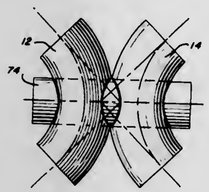


1. A pipe coupling comprising:
a. a base portion having faces equal in diameter to the pipe (**11**);
b. a plurality of insertion legs with a free end rounded, each of said insertion legs (**12**) being integral with and extending outwards from the base portion;
c. equally spaced integral ridges (**13**) longitudinally extending on said legs so as to provide a friction fit in the inner perphery of a pipe to be connected, at least one of the ridges being given an elasticity by means of opposing slots (**14, 15**) longitudinally provided below the ridge and defined by a web portion (**16**) supporting the ridge on the leg, said slots giving elasticity to the end portions of the ridge;
d. a round outer projection (**17**) on said ridge adjacent the outwards end portion and an outer upward slant (**18**) extending towards the inner end of said ridge, the extremity of the slant defining a sharp point for preventing the removal of the insertion leg out of a pipe and wherein a belt insertion hole is provided in the base portion.

4,049,356
DOUBLE-SIGMOID CONNECTOR
Henry Howard George, Louisville, and Ronald Joseph Billings, Fern Creek, both of Ky., assignors to Chemetron Corporation, Chicago, Ill.
Filed Apr. 22, 1976, Ser. No. 679,098
Int. Cl.² F16B *1/00*
U.S. Cl. 403—173 **5 Claims**

1. In a double-sigmoid connector comprising a pair of arcuate elbows joined to each other at their outer peripheral midsections, an improvement wherein a pipe extends through an opening in the outer peripheral midsection of each elbow and is joined to each elbow so as to join said elbows to each other and wherein said pipe has alongitudinal central axis and each

elbow has opposite ends respectively defining central axes intersecting the axis of said pipe at a point and wherein the



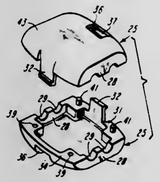
points where the axes defined by the ends of said elbows intersect the axis of said pipe are spaced from each other.

4,049,357

SLIDING COUPLING DEVICE FOR A LANYARD OR THE LIKE

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 30, 1976, Ser. No. 682,126
Int. Cl.² F16G *11/00*
U.S. Cl. 403—209 **9 Claims**



1. A coupling device for connecting a first flexible cord section of a lanyard or the like with a second flexible cord section, said device comprising a pair of housing sections disposed in opposing adjacent relation, said housing sections including means defining an internal cavity therebetween and having opposite corresponding end portions each defining a set of spaced openings extending to and connected by said cavity, said openings being constructed for receiving said cord sections and providing for relative sliding movement of at least one of said cord sections, each of said housing sections including a projecting integral hook-like clip portion disposed adjacent one side of said housing section, each of said housing sections including means defining a through aperture extending from said cavity adjacent the opposite side of said housing section for receiving said projecting clip portion of the other said housing section, and each said clip portion projecting from its corresponding said housing section across said cavity and into said aperture of the other said housing section and engaging said other housing section to fasten said housing sections together with said cord sections disposed therebetween within said openings.

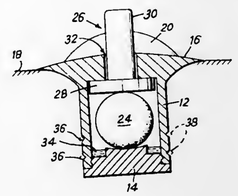
4,049,358

VISIBLE MARKERS FOR ROAD SURFACES

Mendel King, 46 Primley Park Ave., and Raymond Brannan, 42 Ramshead Drive, both of Leeds, England

Filed Feb. 23, 1976, Ser. No. 660,225
Claims priority, application United Kingdom, Sept. 4, 1975, 36535/75
Int. Cl.² E01F *9/00*
U.S. Cl. 404—11 **9 Claims**

1. A light-reflective road marker comprising:
1. an outer tubular member closed at its base and adapted in a roadway, the upper part having a flange extending outwardly to lie on the surface of the roadway,
2. at least one reflector held in a translucent plastic casing mounted for reciprocation in the upper part of the tubular member with its reflective surface against the inside of the casing in a plane of the long axis of the tubular member, and



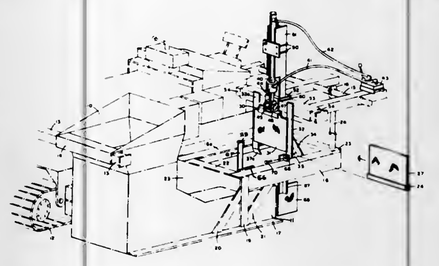
3. spring means within the tubular member arranged to bias the reflector casing upwardly to allow retraction of the casing into the tubular member under pressure of a vehicle tire,
said spring means being a solid spherical ball made of silicone rubber, and said casing is a polycarbonate resin sealing said reflector hermetically therewith so that entry of moisture is prevented.

4,049,359

INSERTION OF COMPRESSIBLE SHEETS IN CONCRETE

Terry David Koch, Telford, Pa., assignor to Inno-Cept Corporation, Lansdale, Pa.

Filed Aug. 2, 1976, Ser. No. 710,714
Int. Cl.² E01C *19/52, 23/02*
U.S. Cl. 404—89 **10 Claims**



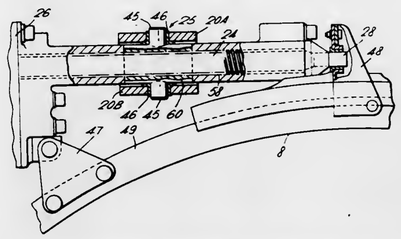
1. The combination with a slip form concrete curb laying machine having a framework and, carried thereby, a hopper for receiving freshly mixed concrete and a chute therefrom having an opening for discharging the concrete in an upstanding shape, of a compressible sheet inserting apparatus supported by said machine and comprising a holder for releasibly retaining a compressible sheet of fibrous material beyond and above the discharge opening and perpendicular to the chute length, power actuated means for moving said holder vertically downwardly to force a sheet through the deposited concrete and paddle plates disposed as lengthwise extensions of the opposite sides of the chute and below said holder to bear against the opposite sides of the concrete and overcome bulging of the concrete as the sheet is inserted.

4,049,360

VARIABLE STATOR VANE ACTUATING MECHANISM

Leonard Stanley Snell, Bristol, England, assignor to Rolls-Royce (1971) Limited, England

Filed Apr. 19, 1976, Ser. No. 678,120
Claims priority, application United Kingdom, May 1, 1975, 18118/75
Int. Cl.² F03B *15/06*
U.S. Cl. 415—149 R **3 Claims**



1. In a turbo-machine having a casing and a compressor with at least one row of stator vanes which are angularly adjustable, a mechanism comprising a beam connected at one end to the casing through a universal joint and a pivot offset therefrom, a beam driving member, means mounting said member for movement in a straight line tangent to an imaginary circle, which is coaxial with the compressor casing, an actuator for driving said beam driving member along said straight line, means pivotally connecting said beam to said beam driving member at a position remote from the end of the beam, which is connected to the casing through said universal joint and said pivot, said pivot being offset from said universal joint so as to enable the beam to move in the direction of its own longitudinal length relative to said casing by motion at the pivot and at the universal joint and to enable the beam simultaneously to move by motion at the universal joint when the beam driving member is driven along said straight line by the actuator, a ring, and means connecting the beam through universal joints to said ring, and means connecting said ring to the stator vanes whereby movement of the driving member causes variation of the angles of the stator vanes.

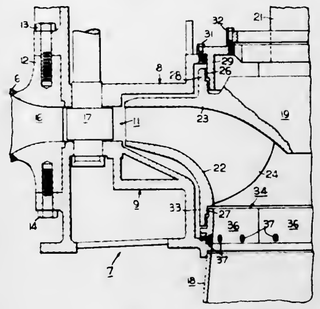
4,049,361

RUNNER SEALS FOR HYDRAULIC TURBINES

Selim A. Chacour, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 575,736, May 8, 1975, abandoned. This application Sept. 24, 1976, Ser. No. 726,450
Int. Cl.² F01D *11/00;* F16J *15/50*
U.S. Cl. 415—170 A **3 Claims**

1. A water turbine comprising:
a vertically disposed runner composed of vertically spaced crown and band elements connected together by a plurality of runner vanes, said runner having a radially disposed intake and a vertically disposed discharge opening; an annular stationary discharge ring disposed adjacent to and beneath said band element and defining an opening therethrough coaxial with said runner discharge opening; a stationary head cover disposed adjacent to and above said crown element; a draft tube connected to said discharge ring and defining a water passageway coaxial with said discharge ring opening and vertically spaced from the end of said runner defining said discharge opening; an annular substantially axially directed first sealing surface formed on the radially inner facing surface of the lower end of said band element; a throat ring releaseably connected to the lower end of said discharge ring providing a radially inner facing surface mating with said draft tube and said runner discharge opening to form a surface continuation of said water passageway; and an annular substantially axially outer facing surface of said throat ring cooperating with said first sealing surface to form therebetween a restricted water passage, all radially outer facing surfaces



of said runner being spaced from any surface of said stationary structure a distance greater than the distance between the surfaces forming said restricted water passage.

4,049,362

WIND-DRIVEN ROTOR ASSEMBLY

Arthur E. Rineer, P.O. Box 115, Beulah, Mich. 49617

Filed June 21, 1976, Ser. No. 698,489
Int. Cl.² F03D *3/06*
U.S. Cl. 416—119 **1 Claim**



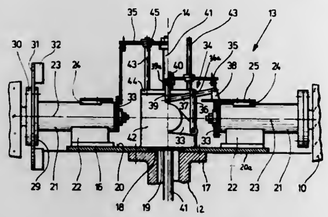
1. A wind-driven power generator having a normally vertical column mounted in a base structure for rotation about the axis of said column, and including a plurality of articulating airfoils each secured at the upper extremity thereof to a transverse plate fixed with respect to said column, said generator also including means operative to convert rotative torque from said column to usable power, wherein the improvement comprises:
a triangular panel constituting each of said airfoils, one corner of said panel being pivotally connected to a lower portion of said column, the edge of said panel opposite from said corner being pivotally connected to said transverse plate, said panel edge being disposed at an annular relationship with respect to a line connecting said corner and edge pivotal connection such that said edge engages said plate on rotation of said panel with respect to said plate in one direction, and said edge extends to engage said column on rotation of said panel with respect to said plate in the opposite direction to establish a limited sector of freedom of movement of said panel.

4,049,363

AXIAL FLOW FAN WITH ADJUSTABLE BLADES

Jan Baumann, Essen-Bredeney, and Franz Petter, Herne, both of Germany, assignors to Gea Luftkuhlergesellschaft Happel GmbH & Co. KG, Bochum, Germany

Filed June 27, 1975, Ser. No. 591,062
Claims priority, application Germany, July 13, 1974, 2433727
Int. Cl.[2] B63H *3/02*
U.S. Cl. 416—157 B 40 Claims



1. In an axil flow fan, a combination comprising a hub rotatable about a first axis and including a substantailly circular plate-like base having a substantially smooth and flat side normal to said axis; means for rotating said base; a plurality of hollow housings affixed to said base at said side thereof and each having a second axis normal to said first axis; a plurality of blades, one for each of said housings, each of said blades having a shank journalled in the respective housing and being turnable about the respective second axis; and means for turning said shanks, including an elongated pusher having an axis coinciding with said first axis and extending through said base, means for moving said pusher axially, displacing means affixed to said pusher at said side of and being rotatable with said base, a lever rigid with each of said shanks, and a discrete power train connecting each of said levers with said displacing means so that axial movements of said pusher in first and second directions respectively result in clockwise and counterclockwise angular displacements of said shanks, including a linkage disposed in a plane which is parallel to said first axis, and including a first double link articulately connected with the respective lever, a second double link articulately connected with said displacing means, and a second lever having a first arm articulately connected with the respective housing, a second arm articulately connected with said respective second double link and an intermediate portion articulately connected with the respective first double link.

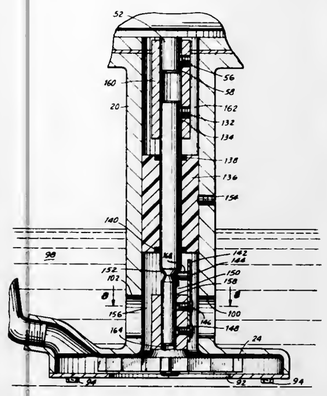
4,049,364

REMOVABLE IMPELLER ASSEMBLY FOR PRINTING PRESS CENTRIFUGAL PUMP

Joseph Ross, Brooklyn, and Ernest F. Fuchs, Middle Village, both of N.Y., assignors to Ace Envelope Manufacturing Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 484,429, July 1, 1974, Pat. No. 3,947,152. This application Feb. 13, 1976, Ser. No. 657,963
Int. Cl.[2] F04B *39/14*
U.S. Cl. 417—360 8 Claims

1. A centrifugal pump apparatus comprising
a motor assembly, and
an impeller assembly,
said motor assembly comprising
an extended motor shaft, and
motor shaft extending means
for extending the length of said motor shaft,
said extended motor shaft being rotationally coupled to said motor shaft and in coaxial alignment therewith,
said impeller assembly comprising
a housing having an upper portion and a lower portion, and
an impeller,
coupling means disposed within said upper housing portion for releasably securing said impeller to said extended motor shaft and for providing concomitant rotational movement of said impeller with said extended motor shaft,
said motor shaft and said extended motor shaft extending into said upper housing portion,
said coupling means including alignment means for longitudinally and laterally aligning said impeller within said lower housing portion and for positioning said extended motor shaft and said impeller in coaxial alignment,
ink barrier means for preventing the flow of ink along part of



the length of said extended motor shaft and along an adjacent void within said upper housing portion,
said coupling means comprising a flattened surface on said extended motor shaft,
said flattened surface being disposed in a plane parallel to the longitudinal axis of said extended motor shaft,
said impeller having a hub portion with an opening therein, said flattened surface being engageable within said opening, said opening having a mating flattened surface therein, and said mating flattened surface being capable of engaging said flattened surface.

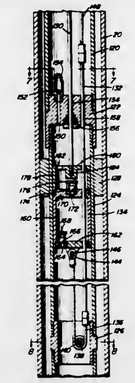
4,049,365

OIL WELL PUMP WITH PLUNGER PULL DOWN AND DESANDING ASSEMBLY

Virgil H. Sparks, Sr., Box 2084, Bakersfield, Calif. 93303

Filed Sept. 13, 1974, Ser. No. 505,929
Int. Cl.[2] F04B *21/04;* F01B *9/00*
U.S. Cl. 417—554 6 Claims

1. A pump adapted for use in an oil well for pumping heavy crude oil comprising a vertically disposed pump barrel having a lower end in communication with a production zone and an upper end communicating with storage facilities at ground level, a plunger reciprocally mounted in the pump barrel and including a pump rod string extending to ground level for actuation, said barrel and plunger including valve means for pumping fluid from a production zone to ground level, and pull down means connected to said plunger for exerting a downward force on the plunger and pump rod string connected thereto to facilitate downward movement thereof when pumping heavy crude oil, said pull down means including a tension member extending downwardly from the plunger, and means disposed externally of the barrel to exert a force on said tension member for pulling the plunger and pump rod string downwardly, said means disposed externally of the barrel including a weight attached to the plunger, said weight being disposed in a chamber below the barrel isolating it from the fluid being pumped, said chamber being closed with the weight closely fitting therein, said weight being connected to the plunger by said tension member in the form of a polish rod, said chamber including light weight oil in the interior thereof and said weight including passages therein to enable vertical



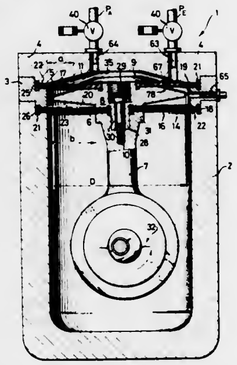
reciprocation of the weight in the chamber without restriction and a packing in the upper end of the chamber sealing said polish rod.

4,049,366

DIAPHRAGM PUMP

Erich Becker, Glocklehofweg 13, 7812 Bad Krozingen, Germany

Filed Jan. 20, 1976, Ser. No. 650,761
Claims priority, application Germany, Jan. 23, 1975, 2502566
Int. Cl.[2] F01B *19/00;* F16J *3/02;* F04B *45/04;* 417 *437;569;412;402*
U.S. Cl. 417—569 13 Claims



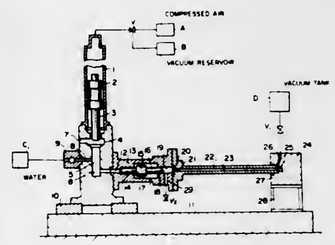
1. A diaphragm pump, especially a vacuum pump for gas, comprising pump housing means; a working diaphragm extending transversely through said pump housing means and defining at one side of said working diaphragm within said pump housing means a pumping chamber; fluid inlet and outlet means communicating with said pumping chamber; a safety diaphragm extending transversely through said pump housing means spaced from the opposite side of said working diaphragm and defining with the latter and part of said pump housing means a fluid-tightly enclosed space; drive means comprising a connecting rod having a substantially mushroom-shaped head positively connected to central portions of said diaphragms, said head extending between said diaphragms and being constructed to support a portion of said working diaphragm around said central portion of the latter and to contact said safety diaphragm over a smaller area than said working diaphragm while keeping said diaphragms separated through a small distance from each other, said head having an outer periphery closely adjacent to the inner periphery of said housing part and a volume to fill a major portion of said enclosed space, said diaphragms having a neutral position in which said diaphragms are substantially unstressed and located in two parallel planes and the central portions of said diaphragms being moved by said drive means to opposite sides of said neutral position so that the working diaphragm performs a suction stroke for sucking gas at an inlet pressure through said fluid inlet into said pumping chamber and a compression stroke for discharging gas at an outlet pressure through said fluid outlet, both of said diaphragms are in stressed condition during movement away from said neutral position; and means for maintaining in said enclosed space a pressure which is smaller than said inlet pressure to thereby dampen vibration of said working diaphragm during operation of said pump.

4,049,367

APPARATUS FOR GENERATING SHOCK WAVES BY MEANS OF A SUPERSONIC PROJECTILE

Hiroshi Tominaga, Yokohama; Kazuo Yasunami, Amagasaki; Shinroku Saito, Yokohama; Masanobu Takamatsu, Yokohama, and Akira Sawaoka, Yokohama, all of Japan, assignors to Tokyu Sharyo Seizo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1973, Ser. No. 404,043
Claims priority, application Japan, Oct. 6, 1972, 47-100511
Int. Cl.[2] B01J *3/06*
U.S. Cl. 425—77 6 Claims



1. An apparatus for generating shock waves, comprising a first vertical cylinder connectable selectively at its upper end to a source of compressed gas or to a vacuum source, a first hammer fitting slidably within said first cylinder, a first cylindrical plunger coaxial and integral with the lower end of said first hammer, a hydraulic pressure chamber communicating with said first cylinder and having an axial hole dimensioned and disposed to receive said first plunger slidably with minimum clearance, said hydraulic pressure chamber having a vent hole means above said axial hole for establishing a liquid level in said hydraulic pressure chamber when liquid is transferred in excess into said hole, a piston chamber having first and second coaxial cylindrical ends, said first cylindrical end being hydraulically connected with said pressure chamber, a piston fitting slidably within said first and second ends, said piston being continuously reciprocable within said piston chamber, said second cylindrical end and the end of said piston therein forming a gas chamber fillable with a gas of low molecular weight, said second end of said piston chamber having an exit vent, a diaphragm blocking said exit vent and being selected to burst at predetermined pressure on compression said low molecular weight gas by said piston, a barrel having an elongated bore therethrough connected removably at one end thereof to said piston chamber at said vent, said bore at said one end and said other end of said piston chamber being gastightly connected when said diaphragm is burst, said barrel being adapted for holding a projectile slidably in said bore at said one end

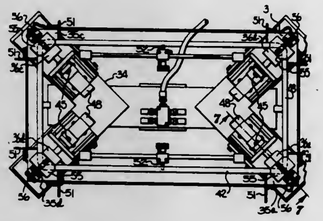
thereof, and a holder for holding a workpiece at the other end of said barrel, said holder being vented.

4,049,368

APPARATUS FOR MANUFACTURING FURNITURE

Erich Grachten, Detmold, Germany, assignor to Burris Industries, Inc., Lincolnton, N.C.

Division of Ser. No. 549,519, Feb. 13, 1975. This application Apr. 22, 1976, Ser. No. 679,099
Int. Cl.² B29C *27/00*
U.S. Cl. 425—502 **5 Claims**



1. Apparatus for manufacturing furniture by joining panels and making corners, the apparatus comprising baseplate means for defining lower terminal ends of mold cavities, a plurality of outer corner mold portions each having an inwardly facing concave surface and being mounted on said baseplate means for cooperation therewith in defining a mold cavity, a plurality of inner corner mold portions each having an outwardly facing convex surface and being mounted on said baseplate means for cooperation therewith in defining a mold cavity, pairs of said outer and inner corner mold portions being mounted for receiving therebetween end portions of two panels which have generally parallel generally planar major faces and generally planar end surfaces bounding edges of the major faces, each said pair of mold portions cooperating with received panels for defining a mold cavity bounded by the respective end surfaces of the two panels and by said cooperating mold portions and said baseplate means, and clamping means for moving one mold portion of each said pair of mold portions relative to the other mold portion of the respective pair of securing panels in mold cavity defining relation therewith.

4,049,369

PHOTOFLASH LAMP AND MULTILAMP UNIT WITH ELECTROSTATIC PROTECTION

John W. Shaffer, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Montoursville, Pa.

Filed Dec. 29, 1975, Ser. No. 644,351
Int. Cl.² F21K *5/02*
U.S. Cl. 431—95 R **12 Claims**



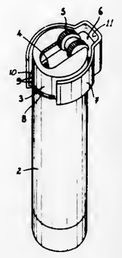
1. A photoflash lamp comprising
an hermetically sealed, light-transmitting envelope;
a quantity of metallic combustible material in filamentary form located within said envelope;
a combustion-supporting gas in said envelope;
and ignition means disposed in said envelope in operative relationship with respect to said filamentary combustible material, said ignition means including a pair of lead-in wires extending into one end of said envelope in a spaced relationship, a mass of primer material bridging said lead-in wires within said envelope, and a conductive wire electrically connected to one of said lead-in wires within said envelope and projecting toward the other end of said envelope to assure contact with said filamentary combustible material, whereby said combustible material is electrically connected to said one of the lead-in wires to thereby reduce the susceptibility of said lamp to inadvertent ignition from electrostatic discharges, said conductor wire having a diameter less than the diameter of the connected lead-in wire.

4,049,370

CIGARETTE LIGHTER WITH PRESALE TAMPER PROTECTION

Guy Neyret, Francheville, France, assignor to Societe Anonyme dite: Etablissements Genoud & Cie, Venissieux, France

Filed Sept. 18, 1975, Ser. No. 614,649
Claims priority, application France, Sept. 24, 1974, 74.32782
Int. Cl.² F23Q *25/00*
U.S. Cl. 431—144 **1 Claim**



1. A lighter comprising:
an elongated housing having a cylindrical head and formed with a cylindrical reservoir containing a supply of fuel;
a burner on said head;
valve means on said head between said burner and said reservoir and having a laterally projecting lever actuatable for feeding said fuel to said burner;
a striker wheel on said head above said lever for igniting fuel issuing from said burner; and
a shield extending around part of said head and formed with a channel open parallel to said housing and receiving said projecting lever and preventing actuation thereof, said shield comprising a pair of arc-segmental aprons extending around said head to opposite sides of said channel coaxial with said head and secured by spaced-apart webs to said housing, said webs being integral with said housing and said aprons, said shield having an inwardly directed lip immediately underlying said projecting lever.

4,049,371

PIPE INSULATION

Glen Virgil Pribble, Malvern, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 15, 1976, Ser. No. 666,547
Int. Cl.² F27B *9/14*
U.S. Cl. 432—234 **3 Claims**

1. Pipe insulation comprising a plurality of units, each unit comprising:
a. a generally circular piece of insulating material having a generally circular hole in the center thereof thereby forming an annular disc and having a portion of the annulus of the disc omitted, said omitted portion having sides which are parallel to each other and which are tangent to the periphery of said hole and which extend outwardly to the periphery of said disc,
b. a piece of insulating material integral with and extending outwardly from one face of said disc in the area bonded by extensions of the parallel sides of said omitted portion and on the opposite side of said hole from said omitted portion,

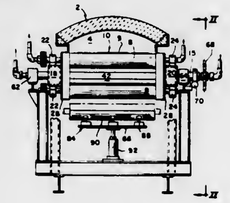
c. the thickness of said disc and said outwardly extending piece on the face thereof being of equal thickness, and
d. said plurality of units being positioned on a pipe in pairs such that each unit of each pair has said outwardly extending piece extending into said omitted portion of the other unit of said pair and including means for holding said units and pairs in position.

4,049,372

APPARATUS FOR SUPPORTING AND REMOVING A WORK SUPPORTING ROLL

William M. Bloom, Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed May 4, 1976, Ser. No. 683,103
Int. Cl.² F27D *3/00, 7/00*; F27B *9/28*
U.S. Cl. 432—246 **9 Claims**



1. Apparatus for supporting and removing a work supporting roll from a furnace comprising a rotatable shaft assembly, spaced apart bearings for supporting said rotatable shaft assembly about an axis parallel to that of the work supporting roll, a first pair of spaced apart bearings mounted on said shaft for rotatably supporting said work supporting roll, a second pair of spaced apart bearings mounted on said shaft diametrically opposed to said first pair for rotatably supporting a spare work supporting roll, a water cooled shield supported by said shaft assembly between said work supporting rolls, said water cooled shield having a water cooling chamber and insulation surrounding said cooling chamber and extending the length thereof, said shield having circular segmental side portions having a radius extending from the axis of said shaft assembly a distance substantially equal to that from the axis of said shaft assembly to the outermost part of said rolls, and means for rotating said shaft assembly.

4,049,373

APPARATUS FOR PRODUCING COMPACT POLYCRYSTALLINE INP AND GAP INGOTS

Klaus Zeuch, Eckental, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 11, 1976, Ser. No. 665,879
Claims priority, application Germany, Mar. 11, 1975, 2510587
Int. Cl.² F27B *14/10*
U.S. Cl. 432—265 **6 Claims**



1. An apparatus for use in producing compact polycrystalline InP, GaP and GaAs ingots of defined geometric form comprising an elongated reaction boat having a plurality of melting pots, each of the shape of a single crystal melting crucible in which said ingots are to be further processed, formed therein, said plurality of melting pots arranged in a line and, a canal between each two adjacent melting pots extending over essentially the full height thereof, whereby said melting pots can be filled with indium or gallium, the reaction boat disposed in zone melting apparatus, heated in a narrow zone in an atmosphere staurated with phosphorous or arsenic and the zone moved from one end to the other to form ingots in succession with free indium or gallium migrating to the other end and available for reuse.

4,049,374

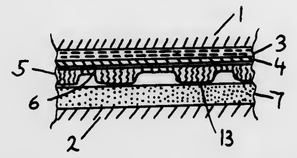
SIMULTANEOUS TRANSFER PRINTING AND EMBOSSING OR SURFACE TEXTURING METHOD

Thomas Rejto, 19 Homestead Road, Greenwich, Conn. 06830

Continuation-in-part of Ser. No. 597,562, July 21, 1975. This application Jan. 17, 1977, Ser. No. 759,887

Int. Cl.[2] D06P *1/00;* **B44C** *1/24*

U.S. Cl. 8—2.5 A **5 Claims**



1. A method of printing in color onto a sheet containing thermoplastic fibers a replica of a first pattern and of simultaneously embossing in relief into that sheet a second pattern without substantially affecting the first pattern as so printed, said method comprising the steps of

a. superposing

i. a heat transfer printing sheet bearing a vaporizable or sublimable dye according to a first pattern, the dye having a high affinity for the material of said sheet containg thermoplastic fibers and a strong volatility and penetrating strength,

ii. an embossing sheet the material of which is permeable to said dye and has no affinity or retention properties for said dye, said embossing sheet having in the face thereof remote from said printing sheet a design in relief according to said second pattern, and

iii. said sheet containing thermoplastic fibers,

b. applying heat and pressure to the superposed sheets to cause migration of said dye through the material of said embossing sheet and into said sheet containing thermoplastic fibers and to cause reproduction in the latter, in relief, of said second pattern, and

c. separating said sheets one from another.

4,049,375

PROCESS FOR DYEING SYNTHETIC FIBERS FORMED FROM AROMATIC POLYESTERS AND NEW MONOAZO DYESTUFFS USEFUL FOR SUCH DYEING

Jacques Pierre Edmond Pechmeze, Paris, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Nov. 7, 1975, Ser. No. 630,055

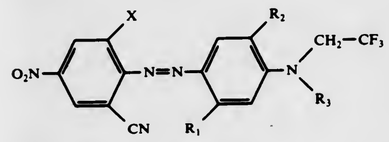
Claims priority, application France, Nov. 21, 1974, 74.38248

Int. Cl.[2] C09B *27/00, 29/08;* **D06P** *1/02*

U.S. Cl. 8—41 C **6 Claims**

1. Process for dyeing synthetic fibers based on aromatic polyesters by means of a water-insoluble monoazo dyestuff whereby the dyed fibers are fast to light, said dyestuff having the formula:

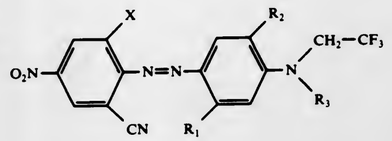
(I)



wherein X represents a radical selected from the group consisting of hydrogen, chlorine, bromine, cyano, nitro, and lower alkylsulphonyl, R_1 represents a radical selected from the group consisting of hydrogen, chlorine, bromine, lower alkyl, lower alkoxy and acylamino, R_2 represents a radical selected from the group consisting of hydrogen and lower alkoxy and R_3 represents a radical selected from the group consisting of lower alkyl, β-hydroxyethyl, β-cyanoethyl, β-acetoxyethyl and β-(β-acetoxyethoxy)ethyl.

3. Polyester fiber dyed with a dyestuff of the formula

(I)



wherein X represents a radical selected from the group consisting of hydrogen, chlorine, bromine, cyano, nitro, and lower alkylsulphonyl, R_1 represents a radical selected from the group consisting of hydrogen, chlorine, bromine, lower alkyl, lower alkoxy and acylamino, R_2 represents a radical selected from the group consisting of hydrogen and lower alkoxy and R_3 represents a radical selected from the group consisting of lower alkyl, β-hydroxyethyl, β-cyanoethyl, β-acetoxyethyl and β-(β-acetoxyethoxy)ethyl, wherein said dyed polyester fiber is fast to light.

4,049,376

DYED COPOLYESTERS AND METHOD OF MAKING

Alain Yves Le Pape, Rouen, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Oct. 6, 1976, Ser. No. 729,749

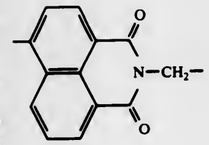
Claims priority, application France, Oct. 23, 1975, 75.32448

Int. Cl.[2] D06P *3/52;* **D06L** *67/02*

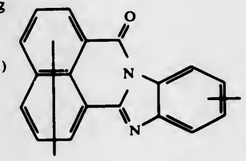
U.S. Cl. 8—162 R **4 Claims**

1. A dyed copolyester wherein the macromolecular chain of the copolyester comprises a unit selected from those of the formulae:

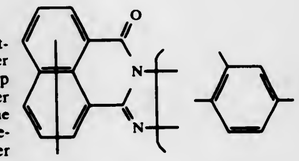
(II)



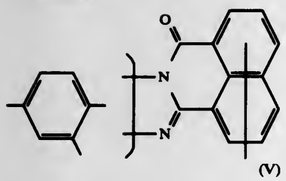
(III)



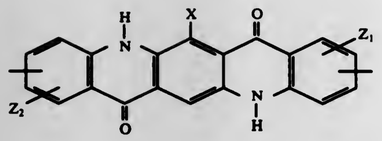
(IV)



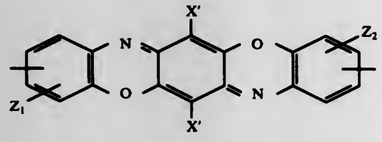
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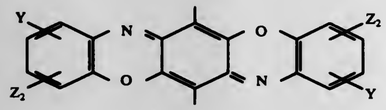
(V)



(VI)



(VII)



where X is hydrogen or hydroxy, X' is halogen, Y is alkoxy, Z_1 is hydrogen, halogen, alkyl or alkoxy and Z_2 is hydrogen or acylamino.

4,049,377

DYEING AND PRINTING OF CELLULOSIC FIBERS OR MIXTURES OF CELLULOSIC FIBERS WITH SYNTHETIC FIBERS

Hermann Schwab, and Adolf Blum, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed June 1, 1976, Ser. No. 691,496
Claims priority, application Germany, June 27, 1975, 2528743
Int. Cl.² D06P *1/613*
U.S. Cl. 8—169 **6 Claims**

1. An improved process for dyeing or printing water-swellable cellulose fibers and mixtures of said cellulosic fibers with synthetic fibers by contacting the fibers throughout with a dye liquor or a print paste which contains, as essential ingredients, water in an amount sufficient to swell the cellulosic fibers, a water-insoluble disperse dye and a solvent for the disperse dye selected from the group consisting of boric esters of polyalkylene oxides, and heating the contacted fibers to effect fixation of the dye wherein the improvement comprises adding 0.5 to 5% by weight, based on the dyeing liquor or print paste, of a condensate of an aliphatic monocarboxylic acid of from 8 to 20 carbon atoms and a primary or secondary hydroxyalkylamine of up to 6 carbon atoms, which condensate may be ethoxylated with up to 20 moles of ethylene oxide per mole of condensate.

4,049,378

DYESTUFF PREPARATIONS

Hermann Perrey, Krefeld; Jurgen Schulze, Opladen; Hans Jurgen Rosenkranz; Hans Rudolph, both of Krefeld, and Reinhold Hornle, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 18, 1975, Ser. No. 550,763
Claims priority, application Germany, Feb. 18, 1974, 2407743; Mar. 4, 1974, 2410185
Int. Cl.² C09B *67/00*; D06P *1/645*
U.S. Cl. 8—87 **3 Claims**

1. Dyestuff preparations for dyeing textile materials from organic water-immiscible solvents, which are characterised in that they contain

a. dyestuffs having a particle size of less than 10μ and which are sparingly soluble or insoluble in tetrachloroethylene;

b. dispersing agents of the formula

$$R^7[—NHCO—(O—CHR^8—CH_2)_z—R^9]_m$$

wherein

R^7 denotes an alkyl or aryl radical which contains one or two isocyanuric acid radicals and is optionally substituted by methyl groups, such as remains after removing *m* isocyanate groups from a corresponding *m*-functional isocyanate,

m is the number 3 or 4,

R^8 denotes hydrogen or methyl,

z represents the numbers 0–30 and

R^9 denotes O-alkyl or O-CO-alkyl, in each case with 8–20 C atoms in the alkyl radical, or O-phenylalkyl with 6–15 C atoms in the alkyl radical,

with the proviso that *z* represents 1–30 if R^9 denotes O—CO—alkyl or O-phenylalkyl; and

c. an organic solvent comprising phthalic acid C_1-C_8-dialkyl ester.

4,049,379

COMPLEX BASIC ZIRCONIUM SALTS AND ALUMINUM SALTS

Hans Erdmann, Heidelberg, and Franz-Friedrich Miller, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 579,885, May 22, 1975. This application July 19, 1976, Ser. No. 706,765
Claims priority, application Germany, May 30, 1974, 2425970
Int. Cl.² C14C *3/02*
U.S. Cl. 8—94.26 **10 Claims**

1. In a process for tanning skins and hides by treating the delimed and pickled skins and hides with an acid aqueous solution of a mineral tanning agent at a pH which is from 4.2 to 4.6 at the end of the treatment, the improvement which comprises using as the mineral tanning agent a complex salt of empirical formula

$$[(ZrO)_a(Al)_b(OH)_c(R)_d(X)_e]\ H_f,$$

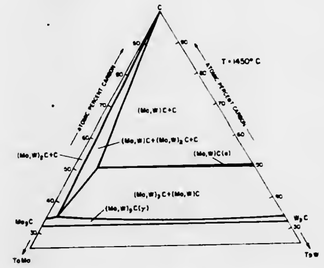
in which R is a monocarboxylic acid radical of 1 to 4 carbon atoms, X is chloride or half of sulfate, *a* and *b* are independently of each other from 1 to 9, *c* is from 0 to ((4*a*+3*b*)-0.333(*a*+*b*)) and *d* is from 0.333 (*a*+*b*) to ((4*a*+3*b*)-0.333 (*a*+*b*)), provided *c*+*d* is from 0.333 (*a*+*b*) to (4*a*+3*b*), *f* is (4*a*+3*b*)-(*c*+*d*) and *e* is 2*a*.

4,049,380

CEMENTED CARBIDES CONTAINING HEXAGONAL MOLYBDENUM

Stephen Wei Hong Yih; Samuel Austin Worcester, Jr., both of Albany, and Erwin Rudy, Beaverton, all of Oreg., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed May 29, 1975, Ser. No. 581,787
Int. Cl.² C22C *29/00*
U.S. Cl. 428—539.5 **2 Claims**



1. A composition of material comprising sintered carbide-binder metal alloys in which the carbide comprises a hexagonal monocarbide phase which is a solid solution of tungsten monocarbide and molybdenum monocarbide of stoichiometric composition containing between 10 and 100 mole percent molybdenum monocarbide, and in which the binder is selected from the metals of the iron group and from the additional group consisting of molybdenum, tungsten, chromium, copper, silver and aluminum, with the iron group consisting between 3 and 50 weight percent of the composition and the additional group comprising between 0 and 10 weight percent of the composition.

2. A composition of material comprising sintered carbide-binder metal alloys, in which the carbide comprises a hexagonal monocarbide phase which is a solid solution of tungsten monocarbide and molybdenum monocarbide of stoichiometric composition containing between 10 and 100 mole percent molybdenum carbide and a cubic carbide phase selected from the group consisting of titanium carbide, tantalum carbide, vanadium carbide, niobium carbide and hafnium carbide, with the cubic carbide comprising up to 85 weight percent of the total carbide phase, and in which the binder is selected from the iron group and from the additional group consisting of molybdenum, tungsten, chromium, copper, silver and aluminum, with the iron group comprising between 3 and 50 weight percent of the composition and the additional group comprising between 0 and 10 weight percent of the composition.

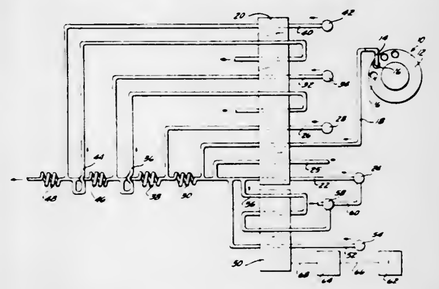
4,049,381

APPARATUS AND METHOD OF FLUID SAMPLE ANALYSIS

Donald A. Burns, Putnam Valley, N.Y.; Michael J. Brand, Bryan, Tex., and Alexander M. Saunders, Bedford Village, N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Mar. 23, 1976, Ser. No. 669,785
Int. Cl.² G01N *31/00, 33/16*
U.S. Cl. 23—230 R **10 Claims**

1. A method of preparing a concentration gradient, comprising the steps of: flowing a first liquid from a source in a stream along a first conduit to fill said conduit; continuing said flow of said first liquid along said first conduit subsequent to said filling step; and removing a portion of said first liquid from said stream through a second conduit coupled to said first conduit and at a controlled varying rate and concurrently adding a second liquid to said stream through a third conduit coupled to said first conduit and at a controlled varying rate, the junction of said third and first conduits being downstream from the junction of said second and first conduits, said rates of removal



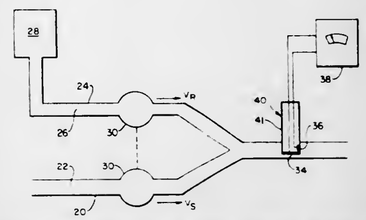
from and addition to said stream in said first conduit being the same.

4,049,382

TOTAL RESIDUAL CHLORINE

James W. Ross, Jr., Hull, and Albert A. Diggens, Newton, both of Mass., assignors to Orion Research Incorporated, Cambridge, Mass.

Filed Feb. 16, 1977, Ser. No. 768,953
Int. Cl.² G01N *33/18, 27/52*
U.S. Cl. 23—230 R **9 Claims**



1. A method of monitoring the total residual chlorine in solutions, comprising the steps of:

continuously mixing with a sample stream of the solution, a reagent stream comprising a disassociated complex of alkali metal ion and iodide ion, and an excess amount of iodide ion, said iodide ion completely reacting with all the residual chlorine to form iodine; and

continuously measuring in the resulting mixed stream of solution and reagent, the electric potential developed between a first and second electrode, each placed in contact with the mixture, the first having a noble metal oxidation-reduction element reflecting the ratio of iodine to iodide concentration, the second having an iodide sensitive membrane reflecting the iodide concentration whereby the concentration of iodine is determined.

4,049,383

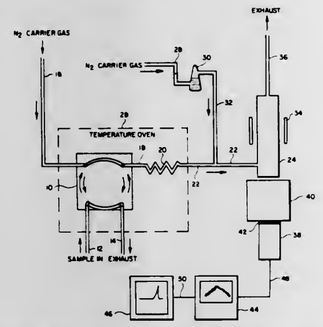
METHOD OF DETECTING GASEOUS CONTAMINANTS

C. Shepherd Burton, San Rafael; Alan B. Harker, and William W. Ho, both of Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 6, 1977, Ser. No. 757,277
Int. Cl.² G01N *21/58, 21/26*
U.S. Cl. 23—232 E **10 Claims**

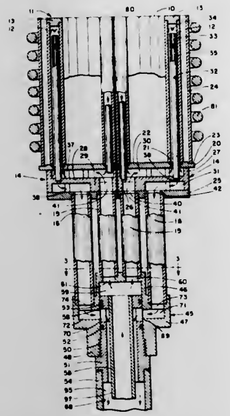
1. A method of measuring the concentration of a selected constituent of a gaseous mixture containing said constituent in amounts of less than about 10 ppm comprising the steps of:

a. separating a sample of the gaseous mixture into its various constituent parts;
b. sequentially introducing the constituent parts into a reaction zone and reacting said constituent parts with metastable mercury atoms to form an excited mercury-selected constituent complex, which decays emitting light having a characteristic wavelength;



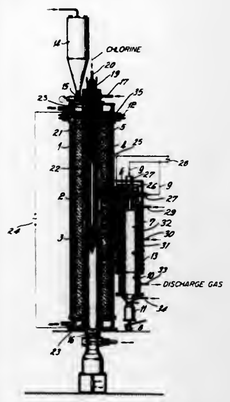
c. providing a light intensity measuring means for selective measurement of the light intensity of the characteristic wavelength emitted by decay of the mercury-selected constituent complex;
d. measuring the intensity of the emission resulting from the decay of said excited mercury-selected constituent complex; and
e. determining the concentration of the selected constituent as a function of said measured intensity.

4,049,384
COLD CRUCIBLE SYSTEM
Joseph F. Wenckus, Needham; Wilson P. Menashi, Lexington, and Roger A. Castonguay, Salem, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.
Filed Apr. 14, 1975, Ser. No. 567,714
Int. Cl.[2] B01D *9/00;* **B01J** *17/18, 17/20*
U.S. Cl. 23—273 SP **15 Claims**



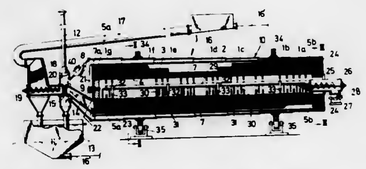
1. A cold crucible, comprising in combination
a. two complementary semicircular assemblies each comprising a plurality of contacting linear copper tubes arranged to form a semiannular wall, each of said tubes having a fluidtight cap at one end thereof, said linear copper tubes in each of said assemblies being affixed to a semicircular compartmentalized fluid distribution means, each said distribution means having upper and lower walls defining therebetween a separate fluid inlet manifold and a separate fluid discharge manifold; said semiannular assemblies when maintained in close but spaced relationship defining a cylindrical configured container for which said upper wall of said fluid distribution means forms the bottom;
b. in each of said copper tubes a concentric open-ended, smaller-diameter copper tube having one end in fluid communication with said fluid discharge manifold and having the other end terminating a short distance from said cap to form a passage therebetween, each of said open-ended tubes defining within said copper tube an annular fluid passage in fluid communication with said fluid inlet manifold; and
c. separate vertically extending inlet fluid conduits to introduce a cooling fluid into said fluid inlet manifold of each of said assemblies and separate vertically extending discharge fluid conduits to withdraw said fluid from said fluid discharge manifold of each of said semiannular assemblies whereby said cooling fluid is caused to flow upwardly through each of said annular fluid passages and downwardly through each of said smaller-diameter copper tubes to provide essentially uniform cooling around said crucible, said separate means to introduce and to withdraw said fluid for one of said assemblies being separate and distinct from the other of said assemblies, whereby said cylindrically configured container can not provide a dead short to an rf field maintained around said crucible.

4,049,385
APPARATUS FOR CARRYING OUT CHLORINATING REACTIONS
Josef Bohnenstingl; Manfred Laser, both of Julich; Günter Lossmann, and Helmut Gebhard, both of Bonn, all of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung
Continuation of Ser. No. 428,327, Dec. 26, 1973, abandoned.
This application Dec. 29, 1975, Ser. No. 644,888
Claims priority, application Germany, Dec. 22, 1972, 2262881
Int. Cl.[2] B01J *8/08;* **H05B** *3/62*
U.S. Cl. 23—277 R **4 Claims**



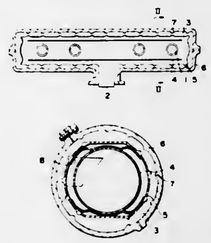
1. An apparatus for carrying out chlorinating reactions which includes in combination: a shaft furnace comprising a vertical graphite tube having a resistance heating zone, a supply for material to be chlorinated connected to the upper part of the shaft furnact to feed material to said tube, means for feeding chlorine, a graphite shell surrounding said tube, condenser means communicating with said furnace and having an integral tubular adapter piece connecting said condenser means to said furnace, said condenser means and adapter piece being made of graphite with said adapter piece being fixed to said graphite shell at one end and extending outwardly from said furnace to its integral connection to said condenser means on the other end, a withdrawal outlet for the reaction product, a gas tight steel casing surrounding said shell and said condenser means and said adapter piece, said adapter piece extending horizontally outwardly from said shell, said condenser means depending from said adapter piece, and means to heat said adapter piece and incorporated therewith, said adapter piece forming a support for said condenser means.

4,049,386
APPARATUS FOR EXTRACTING COMPONENTS OF SOLIDS BY MEANS OF A LIQUID
Arthur Jules Gillain, Brussels, Belgium, assignor to Ateliers Belges Reunis, Petit-Enghien, Belgium
Filed Oct. 22, 1975, Ser. No. 624,911
Claims priority, application Netherlands, Oct. 23, 1974, 7413897
Int. Cl.[2] B01D *11/02, 33/06*
U.S. Cl. 23—269 **12 Claims**



1. Apparatus for extracting components of solids, by means of a liquid contacting the solids in counter-current flow, comprising:
a rotating drum which comprises an outer casing, impervious to the liquids, having the shape of a body of revolution, an inner casing substantially impervious to the liquid, concentrically arranged inside the outer casing, having also the shape of a body of revolution, and defining a central axial channel, the axial length of the drum being much greater than the diameter of the outer casing, a plurality of radial walls, angularly spaced from one another, pervious to the liquid, extending axially along said drum, substantially between the inner casing and the outer casing, said radial walls and said inner and outer casings substantially defining generally axial compartments for the solids, said compartments extending substantially from one end to the other of the drum and having, along a cross section at right angle to the drum axis, the general shape of a truncated circle sector the apex of which merges with the drum axis;
solids supply means for supplying a portion of solids to said compartments at one end of said drum;
removal means for removing another portion of solids from said drum at the other end of said drum;
liquid supply means for supplying liquid into the part of said compartments situated underneath the longitudinal axis of said drum, at said other end thereof; and
overflow means for allowing the liquid to overflow out of said drum at said first end of said drum.

4,049,387
EXHAUST GAS PURIFIER
Kazumasa Futamura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Apr. 12, 1976, Ser. No. 676,191
Claims priority, application Japan, July 29, 1975, 50-104996[U]
Int. Cl.[2] F01N *3/10;* **B01J** *1/14*
U.S. Cl. 23—277 C **3 Claims**

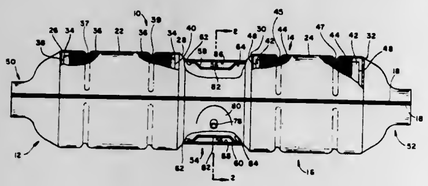


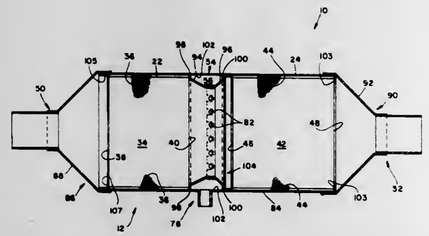
1. An exhaust gas purifier comprising:
an outer shell surrounding an inner shell defining a reburning chamber,
a support casing surrounding and spaced from said outer shell,
a heat insulating material in the space between said outer shell and support casing,
a network of elongated outwardly directed projections formed on the outer surface of the outer shell, a network of elongated inwardly directed projections on the inner surface of the support casing, the projections of both of said networks being positioned diametrically opposite each other,
the projections on each of said support casing and outer shell forming pockets which partially receive and substantially inhibit displacement of said insulating material during normal use of said purifier.

4,049,388
CENTER AIR MANIFOLD FOR CATALYTIC CONVERTER
George Edward Scheitlin, and Richard Frederick Little, both of Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.
Filed July 12, 1976, Ser. No. 704,240
Int. Cl.[2] B01J *8/00;* **F01N** *3/15*
U.S. Cl. 23—288 FB **5 Claims**

1. In a catalytic converter for combustion product comprising a shell defining first and second longitudinally spaced apart shell portions, said shell having an interior wall, a first substrate containing a reducing catalyst, the first substrate dispoed in the first shell portion, a second substrate containing an oxidizing catalyst, the second substrate disposed in the second shell portion, said shell further having an inlet for introducing combustion product into the first shell portion and an outlet for exhausting combustion product from the second shell portion, and a third passageway providing communication between the first and second shell portions, means for introducing air into the combustion product flowing longitudinally through the third passageway and means for providing access to the air introducing means through the shell, the inprovement wherein the air introducing means comprises at least one channel section, the at least one channel section being formed to extend perimetrally substantially completely about the interior wall of the shell generally transversely to combustion product flow through the third passageway, the at least one channel section including upstream and downstream edge portions for engaging the interior wall of the shell and an intermediate portion extending between the upstream and downstream edge por-

tions for defining between the channel section and the shell interior wall a manifold, said manifold including a plurality of





apertures opening inwardly for directing a plurality of streams containing air from the manifold into the combustion product.

4,049,389

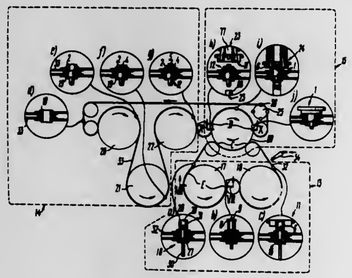
METHOD AND APPARATUS FOR ASSEMBLING AEROSOL VALVE

Ijus Iosifovich Grinberg, ulitsa Zavodskaya, 4a, kv. 42; Evgeny Kuzmich Zhukov, ulitsa Fevralskaya, 1, kv. 14, both of Klimovsk Moskovskoi oblasti, and Lev Nikolaevich Koshkin, 3 Samotechnay pereulok, 23, kv. 54, Moscow, all of U.S.S.R.

Filed Apr. 13, 1976, Ser. No. 676,655

Int. Cl.[2] B23P *23/00*

U.S. Cl. 29—157.1 R **10 Claims**



1. A method for assembling an aerosol valve made up of a number of components comprising a valve body with a central hollow wherein are disposed a spring and a stem, a sealing disk formed from a resilient material which has a central bore and is disposed on said stem and said valve body, a valve cap with a central aperture and a cavity, the diameter of said aperture exceeding that of the bore of said sealing disk and said cavity accommodating said sealing disk and a top portion of said valve body; said valve cap is rigidly attached to said valve body by deforming the valve cap; said method including the following steps:

forming from said components a first vertical "sealing disk-valve cap" set in a sequence defined by:

aligning said sealing disk by means of its bore;

constraining the ability of said sealing disk to move downwards,

placing said valve cap on said sealing disk; and

forming from said components a second vertical "valve body-spring-stem" set in a sequence defined by:

disposing said valve body vertically, hollow upwards,

fitting said spring into the hollow of said valve body,

placing said stem on said spring accommodated in the hollow of said valve body;

assembling said first and second vertical sets into said aerosol valve by

relieving the sealing disk of said first set from said aligning,

gripping said first set by means of the bore of said sealing disk from the top through the aperture in said valve cap and transferring said first set while retaining its original orientation into a position coaxially with said second set by placing said first set above said second set,

bringing said first and second sets one towards the other so as to place all said components into the specified position relatively to each other in said valve, and

attaching said valve body to said valve cap by deforming said valve cap, assuring thereby the assembling of all said components into an integral structure of the valve.

4,049,390

METHOD FOR EXTRUSION OF COAL CONTAINING BODY

Anthony H. Furman, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 524,577, Nov. 18, 1974, Pat. No. 3,989,433. This application Aug. 2, 1976, Ser. No. 710,925

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.[2] C10L *5/00, 5/22*

U.S. Cl. 44—10 R **3 Claims**

1. In a method for the extrusion of a cohesive continuous, rod-like coal-containing body wherein a mixture containing powdered coal and a binder is fed into an extruder barrel structure adjacent one end thereof, said mixture is moved through said barrel structure by the rotation of an extruder screw disposed therein and is forced at the outer end thereof through die means, said die means having the internal configuration of the wall thereof in the shape of a right circular cylinder whereby said mixture is consolidated into the desired continuous, rod-like cohesive body and after discharge from said die means, said continuous body is subdivided, the improvement comprising the steps of:

a. providing for uninterrupted containment of said mixture during consolidation thereof to form the rod-like body in said die means and

b. simultaneously applying at least four controllably varied forces at a common station along said die means the magnitude of which forces is automatically controlled, each of said forces being applied into the die volume against the outer surface of said rod-like body via a separate discontinuity in said wall shortly before discharge thereof from said die means, said simultaneous force applications occurring subsequent to said uninterrupted containment along an axial length substantially shorter than the axial length of said uninterrupted containment.

4,049,391

PROCESS FOR REFUSE DISPOSAL AND HEAT RECOVERY THEREFROM

Paul G. Marsh, Hamilton, Ohio, assignor to Black Clawson Fibreclaim, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 456,041, April 1, 1974, which is a division of Ser. No. 203,295, Nov. 30, 1971, Pat. No. 3,830,636, which is a continuation-in-part of Ser. No. 94,084, Dec. 1, 1970, Pat. No. 3,736,223, which is a continuation-in-part of Ser. No. 14,431, Feb. 26, 1970, abandoned, and a continuation-in-part of Ser. No. 99,554, Dec. 18, 1970, Pat. No. 3,714,038. This application May 13, 1976, Ser. No. 685,784

The portion of the term of this patent subsequent to Jan. 30, 1990, has been disclaimed.

Int. Cl.[2] C10L *5/00*

U.S. Cl. 44—10 R **10 Claims**

1. A process for producing lump fuel from refuse which comprises,

a. adding water to refuse to form a pulpable mixture,

b. pulping said mixture to disintegrate the refuse,

c. extracting from the pulped refuse a slurry containing combustible particles having predetermined dimensions,

d. separating non-combustible particles from said extracted slurry,

e. concentrating said slurry by removal of water therefrom to form a concentrate of said combustible particles, and

f. forming said concentrate into lumps.

4,049,392

METHOD FOR EXTRUSION OF COAL CONTAINING BODY

Anthony H. Furman, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 524,576, Nov. 18, 1974, Pat. No. 4,025,262. This application July 26, 1976, Ser. No. 708,536

The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.

Int. Cl.[2] C10L *5/00, 5/22*

U.S. Cl. 44—10 R **4 Claims**

1. In a method for the extrusion of a cohesive, continuous, rod-like coal-containing body wherein a mixture containing powdered coal and a binder is fed into an extruder barrel structure adjacent one end thereof, said mixture is moved through said barrel structure by the rotation of an extruder screw disposed therein and is forced at the outer end thereof through die means of substantially constant cylindrical configuration internally whereby said mixture is consolidated into the desired continuous, rod-like cohesive body and thereafter said continuous body is subdivided after discharge from said die means, the improvement comprising the steps of:

a. controllably infinitely varying within a preselected range the extent of internal surface area of said die means available for contact with the consolidating mixture passing through said die means during continuous extrusion therethrough of the consolidating mixture and

b. continuously discharging therefrom a substantially constant diameter rod-like body by maintaining the internal configuration of said die means cylindrical.

4,049,393

COLORED PETROLEUM-DERIVED PRODUCT

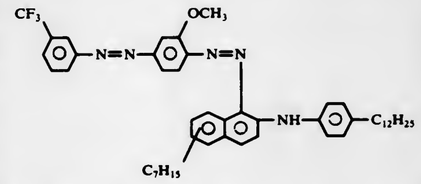
Richard B. Orelup, Upper Saddle River, N.J., assignor to Morton-Norwich Products, Inc., Chicago, Ill.

Division of Ser. No. 524,528, Nov. 18, 1974, which is a division of Ser. No. 313,591, Dec. 8, 1972, Pat. No. 3,862,120. This application Sept. 2, 1975, Ser. No. 609,397

Int. Cl.[2] C10L *1/10*

U.S. Cl. 44—59 **2 Claims**

1. A colored petroleum-derived product selected from the group consisting of gasoline, diesel oils, motive oils, heating or fuel oils, lubricating oils, kerosene, jet fuels and naphthas having dissolved therein a disazo colorant corresponding to the formula



said disazo colorant being highly resistant to removal from said petroleum-derived product by the commonly used adsorbents including carbon black, charcoal, clay and silica.

4,049,394

CONTROL SYSTEM FOR A COAL GASIFICATION PLANT

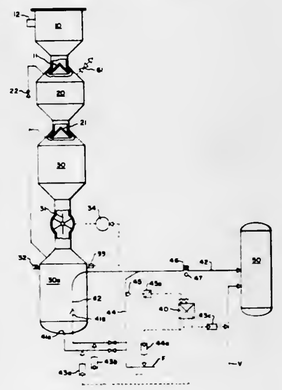
Paul Gernhardt, Bochum; Wolfgang Grams, Wanne-Eickel; Wilhelm Danguillier, and Siegfried Pohl, both of Bochum, all of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Dec. 1, 1976, Ser. No. 746,244

Claims priority, application Germany, Dec. 4, 1975, 2554565

Int. Cl.[2] B01J *3/00*; C10J *3/50*

U.S. Cl. 48—62 R **12 Claims**



1. In an apparatus including a reactor to gasify fine-particle fuels under pressure, a main pressure tank having a level controller to maintain a desired fine-particle fuel level therein while such fuel and a partial quantity of vehicle gas are delivered therefrom by a fuel-feed conduit for introduction into said reactor, a vehicle-feed conduit coupled to said fuel-feed conduit for introducing the major portion of vehicle gas to convey said fine-particle fuel into said reactor, and conduit means to feed a gasification agent into said reactor, the combination therewith of a control system to maintain a predetermined volumetric ratio between said fine-particle fuel and said gasification agent during feeding into said reactor, said control system comprising:

first measuring means responsive to absorption of electromagnetic radiation by said fine-particle fuel in said fuel-feed line for producing a fuel-feed signal corresponding to the volumetric amount of fuel conducted by said fuel-feed line per unit of time,

second measuring means responsive to the volumetric amount of vehicle gas conducted by said vehicle-feed conduit to produce a vehicle gas-feed signal,

computing means responsive to said fuel-feed signal and said vehicle gas-feed signal to produce a control signal according to the following expression

$$U_1 \cdot (U_2 - U_r)$$

for all values of U_2 greater than U_r, where U_1 corresponds to the reciprocal of said fuel-feed signal, U_2 corresponds to said vehicle gas-feed signal, and U_r is a predetermined comparison signal constant,

first control valve means responsive to said control signal to vary the volumetric amount of vehicle gas introduced into said pressure tank for loosening and discharging fine-particle fuel into said fuel-feed conduit, and

second control valve means responsive to said control signal to vary the volumetric amount of gasification agent fed by said conduit means into said reactor.

4,049,395

METHOD FOR TREATING RAW MATERIAL WITH A TREATING GAS

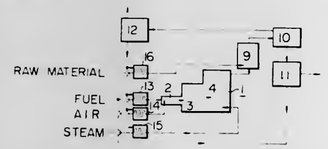
Shozo Ito, Ichikawa, Japan, assignor to Mifuji Iron Works Co., Ltd., Japan

Division of Ser. No. 546,737, Feb. 3, 1975, and a continuation-in-part of Ser. No. 823,746, May 12, 1969, abandoned. This application Sept. 18, 1975, Ser. No. 614,617

Claims priority, application Japan, May 15, 1968, 43-32170; June 20, 1968, 43-42258

Int. Cl.² C10J *3/00*; C01B *2/14*

U.S. Cl. 48—197 R **12 Claims**



1. A method for treating raw material with a treating gas comprising the successive steps of:

a. mixing, in a mixing chamber, liquid or gaseous fuel and air or oxygen gas in sufficient quantities to obtain complete combustion of said fuel;

b. ejecting the mixed fuel gas from said mixing chamber into a combustion chamber;

c. completely burning said mixed fuel gas within said combustion chamber to generate a substantially inert burnt gas containing less than 2% by volume of free oxygen gas;

d. introducing said burnt gas from said combustion chamber directly into a conditioning chamber having an inner volume of at least 1¼ times that of said combustion chamber without passing said burnt gas through any flow restriction;

e. introducing at least one additional gas selected from the group consisting of steam, reducing gas, oxidizing gas or inert gas at a specified flow rate into said conditioning chamber simultaneously with the introducing of burnt gas thereinto and uniformly mixing the additional gas with said burnt gas to prepare a uniform treating gas having a desired uniform temperature determined solely by the temperatures of said additional and burnt gases without employing any other heating medium and a desired uniform composition;

f. introducing said treating gas from said conditioning chamber into a treating chamber separated from said conditioning chamber; and

g. treating a raw material selected from the group consisting of hydrocarbonaceous materials, carbonous materials, metal ores or metal oxides with said treating gas in said treating chamber to obtain a treated raw material product of uniform quality.

4,049,396

MOLDED ABRASIVE ARTICLE COMPRISING NON-FOAMED, FRIABLE POLYURETHANE AND PROCESS

Maurice Arthur Frederick Hiles, Welwyn, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 356,232, May 30, 1973, abandoned. This application Aug. 26, 1975, Ser. No. 607,809

Int. Cl.² C09K *3/14*

U.S. Cl. 51—295 **29 Claims**

1. A molded abrasive-containing article comprising a dispersion of abrasive particles in an unfoamed polyurethane substrate containing a multivalent metal borate, said substrate becoming friable at a temperature below its softening point.

4,049,397

PROCESS FOR THE PREPARATION OF GRANULATED ABRASIVES FROM FUSED OR SINTERED REFRACTORY INORGANIC HARD SUBSTANCES HAVING A HIGH GRAIN TOUGHNESS

Gerd-Edzard Bockstiegel, Troisdorf; Manfred Neidhardt, Siegburg; Gerhard Rehfeld, Aachen, and Werner Umlauf, Niederkassel, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Apr. 16, 1975, Ser. No. 568,642

Claims priority, application Germany, Apr. 27, 1974, 2420551

Int. Cl.² C09K *3/14*

U.S. Cl. 51—309 A **10 Claims**

1. A process for preparing an abrasive composition which consists essentially of crushing an alumina block or lump having an alumina content of 40–100% by weight and a zirconium content of 0–60% by weight to obtain a crushed mass; subjecting said mass to a grain shaping treatment by blasting the crushed material in an apparatus having at least one baffle plate; ball milling the crushed mass employing a grinding medium of balls whose diameter is between 3 and 8 cm. while revolving the ball mill at a rate of between 8 and 40 rpm, the weight of the milling medium being between 1.0 and 4.0 that of the weight of the crushed mass while carrying out the ball milling for a period of between 0.5 and 4.0 hours and thereafter separating particles from the so ball milled composition which have a particle size of 8-24 mesh from the balance of the material.

4,049,398

SEPARATING OXYGEN FROM THE AIR BY MEANS OF DISSOLVING AIR IN A NONMAGNETIC, INERT LIQUID AND THEN PARAMAGNETICALLY COLLECTING THE OXYGEN FROM THE LIQUID

Vesper A. Vaseen, 9840 W. 35th Ave., Wheatridge, Colo. 80033

Filed May 28, 1976, Ser. No. 691,037

Int. Cl.² B03C *1/00*

U.S. Cl. 55—3 **1 Claim**

1. An improvement in the Art and Science of recovering or concentrating oxygen from air by first absorbing or dissolving air in either fluorocarbon or silicone liquid, under pressure in order to increase the quantity of dissolved oxygen per unit of volume, then passing the oxygen saturated fluorocarbon or silicone liquid through or between the North and South Poles of a high intensity magnetic field; which by the paramagnetic qualities of oxygen causes the oxygen to collect at the magnetic poles of the electromagnet and form bubbles of pure oxygen which releases for collection and use.

4,049,399

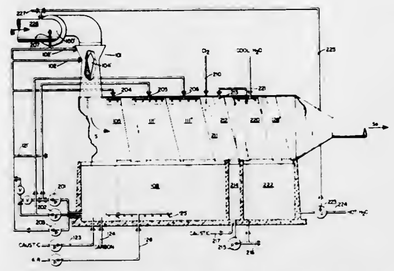
TREATMENT OF FLUE GASES

Aaron Joseph Teller, Westboro, Mass., assignor to Teller Environmental Systems, Inc., Worcester, Mass.

Continuation-in-part of Ser. No. 564,771, April 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 463,652, April 25, 1974, Pat. No. 3,957,464. This application Jan. 26, 1976, Ser. No. 652,634

Int. Cl.² B01D *53/06, 53/34*

U.S. Cl. 55—73 **37 Claims**



1. A process for treating an effluent gas containing entrained particulates a portion of which are below 1 micron in size, acid gas components, and a compound selected from the group consisting of H_2S, lower alkyl mercaptans, lower alkyl sulfides and lower alkyl disulfides, said gas having a temperature above 150° F., which comprises:

a. initiating nucleation of the particulates in a first enclosure by treating the gas to increase its turbulence and to increase its humidity substantially to saturation at a temperature above about 150° F. to about 212° F. under substantially adiabatic conditions, the pressure drop of said gas in said first enclosure being less than about 20 inches of water;

b. passing said saturated gas which is at a temperature above about 150° F. to about 212° F. in a substantially horizontal path through a second enclosure containing packing;

c. passing a scrubbing liquor comprising an aqueous alkaline slurry of activated, oxygenated carbon downwardly over said packing under laminar flow conditions;

d. exhausting said gas from said second enclosure; and,

e. collecting at least a portion of said liquid after passage through said packing and recirculating said liquid portion to said packing, said recirculating liquid portion containing at least about 15% non-volatile material by weight.

4,049,400

AIR PURIFYING APPARATUS

R. Jackson Bennett, 807 Garber Road, North Muskegon, Mich. 49445, and Daniel F. Connors, 25 E. Broadway, Muskegon Heights, Mich. 49441

Filed Apr. 7, 1976, Ser. No. 674,368

Int. Cl.² B03C *3/08*

U.S. Cl. 55—139 **13 Claims**

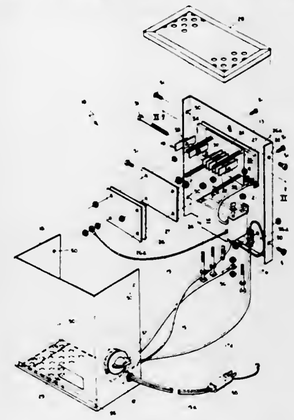
1. An air purifying apparatus comprising:

a conductive central plate having a substantially planar side and edge surfaces and a planar end surface, said end surface being substantially perpendicular to both said side and edge surfaces for carrying an electrical charge of a first polarity capable of attracting airborne particle impurities;

a substantially planar dielectric layer having a first surface butting against and contacting said planar end surface and generally perpendicular to said side and edge surfaces of said central plate;

a substantially planar conductive backing plate oriented in a plane parallel to said dielectric layer, perpendicular to said side and edge surfaces of said central plate, and butting against and engaging a second side of said dielectric layer, which second dielectric layer side is opposite to the side contacted by said central plate, said backing plate carrying an electric charge of a second polarity which is opposite from said first polarity and capable of attracting airborne particle impurities whereby an electric field is created between said central plate and said backing plate for producing ozone adjacent said end surface of said central plate where that end surface butts against said first surface of said dielectric layer; and

means for applying an electrical voltage to said central plate and backing plate to provide said central plate and backing plate with opposite polarity electrical charges, respectively, and an electrical field between said plates.



4,049,401

APPARATUS FOR SEPARATING SUSPENSIONS OF LIQUIDS IN GAS

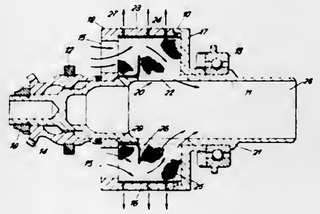
Stanley Smith, near Bristol, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Feb. 4, 1976, Ser. No. 655,098

Claims priority, application United Kingdom, Feb. 10, 1975, 5518/75

Int. Cl.² B01D *19/00*

U.S. Cl. 55—184 **8 Claims**



1. Apparatus capable of separating a suspension of a liquid in a gas comprising

a rotatable chamber having a packing within the chamber comprising a relatively rigid matrix adapted to avoid collapse under centrifugal forces on rotation of the chamber and having interstices defining plural flow passages pervious to the liquid and gas and which provide for both axial and radial movement of the suspension therethrough,

an inlet at one end of the chamber for admitting said suspension to the chamber,

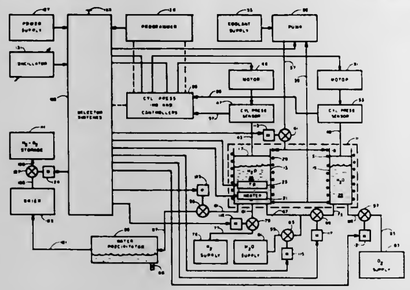
an outlet for liquid in a radially outer part of the chamber,
an outlet for gas in a radially inner part of the chamber at the other end thereof, and
means for promoting axial movement of the suspension through the chamber.

4,049,402

GAS MIXING DEVICE

Charles B. Fortson, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 6, 1975, Ser. No. 629,730
Int. Cl.² B01D *19/00*
U.S. Cl. 55—208 **4 Claims**



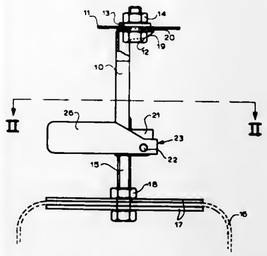
1. Apparatus for preparing a breathable mixture of hydrogen and oxygen gases in a predetermined ratio for use in deepsea diving, said apparatus comprising:
a first cylinder defining a first chamber holding a predetermined first volume of water;
a second cylinder defining a second chamber holding a second predetermined volume of water;
a first piston operable in said first cylinder for varying the volume of said first chamber between a chamber volume greater than said first volume of water and a lesser chamber volume equal to said first volume of water;
a second piston operable in said second cylinder for varying the volume of said second chamber between a chamber volume greater than said second volume of water and a lesser chamber volume equal to said second volume of water;
means for introducing a predetermined quantity of gaseous hydrogen into said first chamber while operating said first piston to vary the volume thereof from said lesser chamber volume to said greater chamber volume;
means for introducing a predetermined quantity of gaseous oxygen into said second chamber, in said predetermined ratio to said hydrogen in said first chamber, while operating said second piston to vary the volume thereof from said lesser chamber volume to said greater chamber volume;
piston drive means, coupled to said first and second pistons, for moving said pistons in said cylinders so as to reduce the volumes of said first and second chambers, respectively, to said lesser chamber volumes, whereby said hydrogen and said oxygen form first and second solutions with said first and second volumes of water, respectively;
refrigeration means, associated with said first and second cylinders, for cooling said water as said solutions are formed;
mixing means, connected to said first and second cylinders, for mixing said first and second solutions to form a third solution containing both said hydrogen and said oxygen in said predetermined ratio;
heating means, associated with one of said cylinders, for heating said third solution; and
precipitator means, connected to said mixing means and said one of said cylinders, for separating said breathable mixture from said third solution.

4,049,403

DEVICE FOR SUSPENSION OF AIR FILTER BAGS

Poul Werner Udengaard, Hellerup; Orla Mosevang; Finn Erling Thomsen, both of Hjallerup, and Erik Paul Eklund, Kongerslev, all of Denmark, assignors to H. Moldow A/S, Bagsværd, Denmark

Filed Apr. 2, 1976, Ser. No. 673,048
Claims priority, application Denmark, Apr. 4, 1975, 1440/75
Int. Cl.² B01D *46/02*
U.S. Cl. 55—378 **6 Claims**



1. A device for suspending a filter bag in an air filtration plant, comprising:
an elongated screw for attachment to the bag end,
a socket receiving said screw and having means adapted to be attached to and dependent from a supporting member,
a segment pivotally carried by said socket and having a plurality of teeth engageable with the threads of said screw, said segment being received through an opening in said socket, and
means carried by said socket for yieldingly biasing said segment for movement of its teeth through the opening into engagement with said screw thread enabling axial movement of said screw in one direction with said segment yielding against the bias of said biasing means to the passage of said screw in said one direction and preventing movement of said screw relative to said socket in the opposite axial direction, said engagement between said screw and said teeth lying on one side of a line normal to the axis of said screw and passing through both said pivot and the axis of said screw when said segment both enables and prevents movement of said screw relative to said socket in the opposite axial directions respectively.

4,049,404

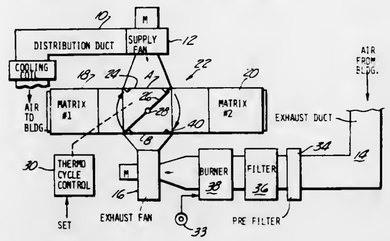
VENTILATION SYSTEM WITH THERMAL ENERGY RECOVERY

Arthur C. W. Johnson, Troy, Mich., assignor to Combustion Research Corporation, Pontiac, Mich.

Filed July 31, 1975, Ser. No. 600,620
Int. Cl.² B01D *53/04*
U.S. Cl. 55—387 **8 Claims**

1. A forced air, non-recirculating ventilation system for an enclosure in which a thermal energy gradient relative to outside ambient air temperature has been produced by the expenditure of energy, said system comprising:
first means defining a distribution duct from an outside air source to said enclosure;
first air-flow-forcing means operatively associated with said first duct for producing a substantially continuous, unidirectional flow of substantially exclusively outside air to said enclosure;
second means defining an exhaust duct from said enclosure to the outside air source;

second air-flow-forcing means operatively associated with said second duct for producing a substantially continuous, unidirectional flow of inside air from said enclosure substantially completely to the outside;
first and second matrices of thermal energy absorbing material, each being characterized by a high surface area to volume ratio and low hydraulic resistance;
housing means for said matrices and arranged for air flow therethrough, to and from outside air;



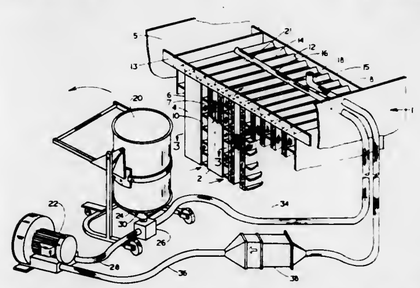
and valve means connecting said housing means to said first and second duct means for alternately reversely hydraulically connecting the duct means to respective matrices thereby to draw outside air into said enclosure to ventilate same through one matrix while complementally exhausting inside air from said enclosure through the other matrix.

4,049,405

FILTER MATERIAL CHARGING APPARATUS FOR FILTER ASSEMBLY FOR RADIOACTIVE CONTAMINANTS

Jesse M. Goldsmith, and Alex O'Nan, Jr., both of Louisville, Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Sept. 26, 1975, Ser. No. 617,248
Int. Cl.² B01D *46/32*
U.S. Cl. 55—479 **8 Claims**



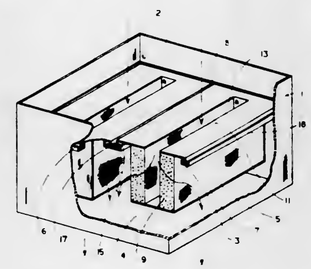
1. In combination a filter assembly for removal of radioactive contaminants in a gas stream including a housing having a fluid inlet and outlet and at least one filter bed being provided with adsorptive filter material therein in fluid communication with the fluid inlet and outlet, said at least one filter bed having spaced vertically extending foraminous sides and impervious ends for receiving adsorptive material therein, the upper portion of the spaced sides and ends defining an inlet for receiving said adsorptive material therein, an adsorptive charging apparatus for adding said adsorptive material to said housing comprising: a tank having a downwardly projecting lower portion terminating in an opening, said tank opening being in fluid communication with opposed first and second conduit means, said first conduit means being in flow communication with said inlet for receiving said adsorptive material therein, and said second conduit means coupling in fluid flow communication with a blower means to the tank opening, said first conduit means being spaced above said at least one filter bed a preselected distance, said first conduit means having one aperture therein disposed above said at least one filter bed, said at least one filter bed having baffle members along the top thereof, said baffle members being of inverted V-shaped cross section and positioned at an angle to horizontal of at least 30°, the apex of said baffle members being spaced from and aligned with the aperture in said first conduit means, the edges of said baffle members being aligned with the upper extreme edge of said foraminous sides, the edges of adjacent baffle members defining openings therein to receive filter material therethrough.

4,049,406

FLUID FILTER HOUSING AND ASSEMBLY

Richard D. Rivers, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Apr. 23, 1976, Ser. No. 679,516
Int. Cl.² B01D *53/04, 27/00, 35/00*
U.S. Cl. 55—484 **8 Claims**



1. A fluid filter housing and assembly comprising: a housing having a flow-through inlet and a flow-through outlet therein;
said housing having a channel of U-shaped cross section with an open top extending along the inner periphery of said flow-through inlet, and including fluid filtering material therein; and,
a replaceable filter assembly disposed within said housing in flow-through communication with said inlet and said outlet, said filter assembly having a continuous downwardly extending member along the outer periphery thereof, said member being received by said U-shaped channel whereby gases passing around said filter assembly pass through said filtering material in said U-shaped channel.

4,049,407

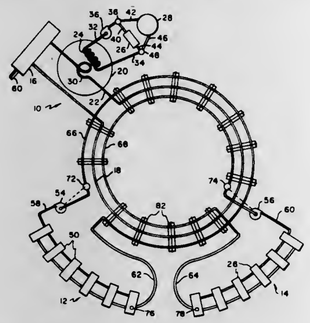
SOLAR ASSISTED HEAT PUMP SYSTEM

Edward W. Bottum, 9357 Spencer Road, Brighton, Mich. 48116

Filed Aug. 18, 1976, Ser. No. 715,306
Int. Cl.² F25B *27/00*
U.S. Cl. 62—2 **11 Claims**

1. A heating system for a building structure comprising a heat pump system picking up heat primarily from the outside air and at least one solar energy system and one air convector energy system, said heat pump system including a compressor, evaporator coil, condenser and necessary auxiliary components connected together in operative relationship, said evaporator coil being buried in the ground exteriorally of the building structure to be heated, said condenser having an outlet for connection to the building structure for transfer of heat energy thereof, said solar energy system including a solar collector structure, heat transfer coil and means for circulating a heat transfer medium therebetween, all connected together in oper-

ative relationship, said air convector energy system including an air convector structure, heat transfer coil and means for circulating a heat transfer medium therebetween, said heat transfer coils being buried in the ground exteriorally of the building structure to be heated and adjacent to the evaporator coil, said heat transfer coil connected to the solar collector structure being effective to transfer heat to the surrounding



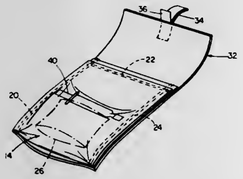
mass of earth during periods of sunlight and also to transfer heat to the evaporator coil, said heat transfer coil connected to the convector structure being effective to transfer heat to the surrounding mass of earth during periods when the air is warmer than the earth and also to transfer heat to the evaporator coil, said evaporator coil being effective to draw heat from the surrounding mass of earth and also to draw heat from the heat transfer coils.

4,049,408

DISPOSABLE COLD PACK FOR BLOOD SPECIMEN

Harish A. Patel, Crystal Lake, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 556,721, March 10, 1975, abandoned. This application July 6, 1976, Ser. No. 703,104
Int. Cl.[2] F25D *5/02*
U.S. Cl. 62—4 **11 Claims**



1. A disposable cold pack for cooling and storing a container filled with a sample of freshly drawn blood comprising

a temperature regulation means which comprises the elements of a first sealed flexible envelope of plastic material,

a supply of dry solid ammonium nitrate disposed within said first envelope,

a second sealed and frangible envelope containing a supply of water disposed within said first envelope and arranged to be broken by pressure applied externally to said first envelope to release said supply of water into said supply of ammonium nitrate within said first sealed envelope to activate said cold pack,

the weight ratio of ammonium nitrate to water being from 1.24:1 to 1.26:1, the total weight of ammonium nitrate and water being from 180 to 200 grams, the elements of said temperature regulating means cooperatively functioning, upon the breaking of said second envelope, to cool said sample to a temperature low enough to avoid composition changes therein, but high enough to avoid freezing thereof, for a period of at least 45 minutes,

said cold pack being adapted to be folded around said sample container with the container in contact with said first envelope.

9. A disposable cold pack for cooling and storing a container filled with a sample of freshly drawn blood comprising

A. a temperature regulation means which comprises the elements of a single sealed flexible outer envelope of plastic material,

B. an outer insulating layer of flexible foam plastic material engaging the outer face of said outer envelopes and secured thereto, said insulating layer extending fully across the face of said first envelope and substantially beyond at least one margin of said envelope to form a flexible flap,

C. a supply of dry solid ammonium nitrate disposed within said outer envelope,

D. an inner sealed and frangible envelope containing a supply of water disposed within said outer envelope and arranged to be broken by pressure applied externally to said outer envelope to release said supply of water into said supply of ammonium nitrate within said outer sealed envelope to activate said cold pack,

the weight ratio of ammonium nitrate to water being from 1.24:1 to 1.26:1 and the total weight of ammonium nitrate and water being from 180 to 200 grams,

a closure member secured to said insulation layer flap at the margin thereof remote from said outer envelope for releasably maintaining said cold pack in folded position with said insulation layer outermost extending completely around the outer circumference of said folded cold pack,

said cold pack being adapted to be folded around said sample container with the container in contact with said outer envelope for the elements of said temperature regulation means cooperatively functioning to chill said blood sample rapidly and to maintain it at a temperature of 28° to 40° F. for at least 45 minutes after activation in room temperature surroundings.

10. A disposable cold pack for cooling and storing a container filled with a sample of freshly drawn blood comprising

a first sealed flexible envelope of plastic material,

an outer insulating layer of flexible foam plastic material engaging the outer face of said outer envelope and secured thereto, said insulating layer extending fully across the face of said first envelope,

A. temperature regulation means comprising the elements of a supply of dry solid ammonium nitrate disposed within said first envelope,

B. a second sealed flexible envelope of plastic material disposed outside of and adjacent the first,

C. a supply of water disposed within said second envelope, the weight ratio of ammonium nitrate to water being from 1.24:1 to 1.26:1 and the total weight of ammonium nitrate and water being from 180 to 200 grams,

D. means connecting said first and second envelopes to permit mixing of the contents of the two envelopes, said elements of said temperature regulation means cooperatively functioning, upon said mixing, to chill said sample to a temperature low enough to avoid composition changes therein, but high enough to avoid freezing thereof, for a period of at least 45 minutes, and

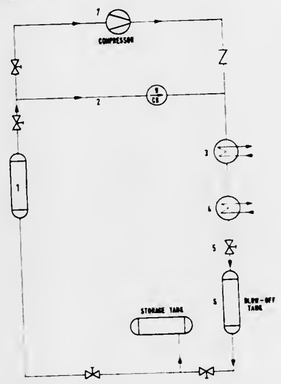
means for releasably sealing said connecting means to maintain the contents of the two envelopes separate.

4,049,409

METHOD FOR TRANSFERRING A HIGHLY COMPRESSED GAS FROM A REACTOR TO A STORAGE TANK WITH CONDENSATION OF THE GAS

Rudolf Rothe, Bremen, and Johann Kohler, Barrien, both of Germany, assignors to HAG Aktiengesellschaft, Bremen, Germany

Filed Mar. 8, 1976, Ser. No. 664,886
Claims priority, application Germany, Mar. 25, 1975, 2513169
Int. Cl.[2] F25T *1/00*; F17C *7/02*
U.S. Cl. 62—9 **4 Claims**



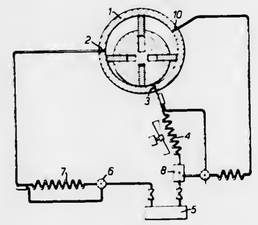
1. A method for transferring a highly compressed gas from a reactor into a storage tank with condensation of the gas which comprises at first liquefying and cooling the gas to a temperature below the storage temperature; expanding the liquefied gas in a blow-off tank; transferring the expanded liquefied gas into the storage tank; and after the pressure in the reactor has dropped to about the pressure in the storage tank exhausting any gas remainder portion in the reactor with a compressor and subjecting same to liquefying and cooling with subsequent expansion of said remainder portion in said blow-off tank; and transferring said expanded liquefied gas remainder portion to said storage tank.

4,049,410

GAS COMPRESSORS

Allan Sinclair Miller, Redbrook, Lower Dinedor, Hereford, England

Continuation-in-part of Ser. No. 492,930, July 29, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 668,853
Int. Cl.[2] F25B *31/00*; B25B *41/00*
U.S. Cl. 62—197 **3 Claims**



1. A refrigeration system including a positive displacement single stage rotary compressor with means providing a plurality of suction and compression chambers; means for injecting a single fluid only, that being the refrigerant gas in a liquid state, into an intermediate position on the compression side; a gas feedback circuit from the output of the compression side to said intermediate position, said circuit including means for liquifying gas from said output, means for positively ensuring that the supply of liquid is provided substantially only when the compressor is in operation and ceases when the compressor stops, a temperature sensor between said output and the liquifying means, and a valve responsive to said sensor between the liquifying means and said intermediate position, the sensor having a closed chamber containing fluid that is substantially directly influenced by the superheated gas from said output whereby it exerts a pressure directly related to the superheat temperature on a control member of said valve, and the valve having adjustment means whereby the valve can be set to maintain a desired degree of superheat of gas discharged from said output; a motor for driving the compressor, directly coupled thereto; means including a pump driven by and directly coupled to the motor for distributing a liquid coolant over said motor; and a heat exchanger in contact with the motor coolant through which gas in a liquid state is passed before being injected into said compressor, thereby to cool the coolant.

4,049,411

FORMING LEVEL AIR CONDITIONING SYSTEM

David M. Long, Pittsburgh, Pa., and Joseph B. Dent, Jr., Lexington, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 23, 1976, Ser. No. 707,985
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—2 **15 Claims**



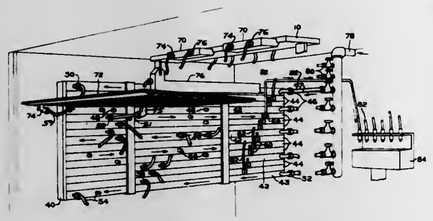
6. In a method of forming glass fibers comprising attenuating glass streams into fibers through a bushing and collecting the resulting fibers, the improvement comprising directing conditioned air to said bushing from opposing sides of said bushing at a level with said bushing and perpendicular to said bushing, to thereby direct substantially all of said conditioned air in a horizontal direction, said air being directed in sufficient amount and at sufficient velocity to produce a net positive air pressure in an area containing said bushing while providing flow of conditioned air to said bushing at the tips of bushing on opposing sides thereof at velocities of between about 50 and 150 feet per minute (15.24 and 45.72 meters per minute), and venting the air to a zone having a lower pressure.

4,049,412

METHOD AND APPARATUS FOR FORMING GLASS FIBERS

Joseph B. Dent, Jr.; Walter L. Martin, Jr., and Howard M. Bennett, all of Lexington, N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 23, 1976, Ser. No. 707,986
Int. Cl.² C03B *37/02*
U.S. Cl. 65—2 **10 Claims**



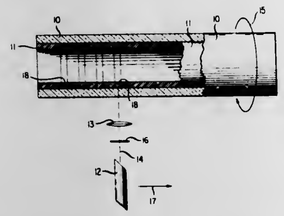
1. In a method of forming glass fibers comprising attentuating filaments through bushing tips in a bushing containing molten glass, the improvement comprising cooling both the environment surrounding and below the bushing and elements disposed in the fiber forming region adjacent the bushing by passing a cooling fluid through a pair of cooling manifolds, said manifolds being located on side partitions separating adjacent bushings, said manifolds being below the bushing on said partitions, said manifolds having inlet sections and outlet sections for flowing fluid in opposite directions, connecting said manifolds to said elements in fluid transfer relation, passing said fluid from the manifolds through said elements in a first direction to thereby cool said elements, returning said fluid from said elements to said manifolds, and flowing said fluid through said manifolds in the opposite direction to thereby cool said environment.

4,049,413

METHOD FOR MAKING OPTICAL FIBERS WITH VARIATIONS IN CORE DIAMETER

William George French, Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 21, 1976, Ser. No. 697,931
Int. Cl.² C03B *37/00*
U.S. Cl. 65—3 A **12 Claims**



1. A method for producing clad optical fibers with diameter variations in the transmitting core, but with uniform overall diameter, comprising:

etching grooves around a cylindrical glass starting member, which grooves are approximately perpendicular to the axis of the starting member and with a periodicity between 0.5/R mm and 50/R mm;

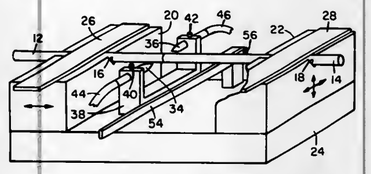
depositing additional glass on the etched starting member to form a glass member of uniform overall diameter; and drawing the structure so formed into a fiber.

4,049,414

METHOD AND APPARATUS FOR SPLICING OPTICAL FIBERS

Roy E. Smith, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 28, 1975, Ser. No. 599,853
Int. Cl.² C03B *37/00*; C03C *27/00*
U.S. Cl. 65—4 B **12 Claims**



2. A method of splicing glass optical fibers comprising the steps of

aligning the end portions of said fibers so that the axes thereof are substantially parallel and the endfaces thereof are in contact,

disposing said fibers between the ends of a pair of spaced, rod-shaped electrodes,

generating an electric arc between the ends of said electrodes, said arc passing through the junction of said fiber endfaces and producing a sufficient amount of heat to melt the endfaces of said fibers, thereby causing said fibers to fuse, and

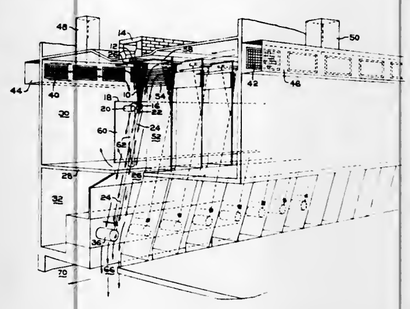
moving said electrodes in a direction perpendicular to the axes of said fibers so that the central portion of said arc moves along said fiber junction.

4,049,415

APPARATUS FOR FORMING GLASS FIBERS

Joseph B. Dent, Jr., Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 23, 1976, Ser. No. 707,967
Int. Cl.² C03B *37/02*
U.S. Cl. 65—11 W **1 Claim**



1. In an apparatus for forming glass fibers strands comprising a first level having therein a bushing having bushing tips through which filaments are attenuated, means for providing an air stream across the bushing, means for applying a binder and/or size to the filaments, means for gathering the filaments into a unified strand and a back shield member behind said means for applying the binder and/or size and said means for gathering the filaments, a second level having therein a means for collecting said strand and a floor separating said first level and said second level, said floor having an opening provided therein through which a majority of said air stream is aspirated downwardly with said filaments and said strand through said opening, the improvement wherein said back shield includes an opening therein extending upwardly from said floor, said opening being of a sufficient height to vent the portion of said air stream which strikes the floor of said first level and thus does not pass through said opening downwardly with said strand and to allow said portion of said air stream to be aspirated back into said air stream to thereby prevent return of said portion of said air stream to the region directly below the bushing and thereby prevent turbulent air flow below the bushing.

4,049,416

METHOD OF JOINING A METAL PART HAVING A COPPER SURFACE AND A GLASS PART

Herman Bloem, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1975, Ser. No. 633,625
Claims priority, application Netherlands, Dec. 19, 1974, 7416556
Int. Cl.² C03G *27/02*
U.S. Cl. 65—32 **4 Claims**

1. A method for joining a metal part, of which at least the surface consists of copper, to a glass having a coefficient of expansion suitable for joining to the metal part which comprises the sequential steps of: providing a basic mixture of glass which includes at least one material selected from the group consisting of chromium and copper compounds, the total quantity of materials from said group being between 0.2 and 5% by weight calculated as Cr_2O_3 and CuO respectively; providing a copper exterior surface; holding the copper exterior surface in abutting relationship to said basic mixture of glass; oxidizing the copper exterior surface abutting said mixture of glass in an oxidizing atmosphere at substantially the lowest possible temperature for said oxidizing atmosphere and then heating both said mixture of glass and said exterior surface in a non-oxidizing atmosphere.

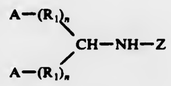
4,049,417

ALICYCLIC ALKYLENE POLYAMINE MICROORGANISM AND ALGAE GROWTH INHIBITORS

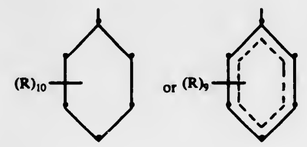
Bruce E. Witzel, Westfield; Nathaniel Grier, Englewood, both of N.J.; Richard A. Dybas, Center Square, Pa., and Robert A. Strelitz, Edison, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 572,592, April 28, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,612
Int. Cl.² A01N *9/20*; A61K *31/13*; C07C *87/40, 87/45*
U.S. Cl. 71—67 **25 Claims**

1. A compound having the formula:



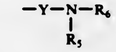
where A is alike or different cyclohexyl or cyclohexenyl of the formula:



where each R is either hydrogen or, C_1 to C_6 alkyl, and the dashed line indicates a single olefinic bond;

each *n* is alike or different and is the integer 0 or 1;

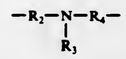
each R_1 is alike or different and is C_1 to C_4 alkylene;



R_5 is hydrogen, aminoethyl, aminopropyl, C_1 to C_4 hydroxyalkyl, or C_2 to C_4 dihydroxyalkyl; and

R_6 is hydrogen, C_1 to C_4 hydroxyalkyl or C_2 to C_4 dihydroxyalkyl;

(a) when Y is



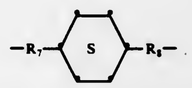
R_2 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

R_3 is hydrogen, C_1 to C_4 alkyl, C_2 to C_4 aminoalkyl, C_1 to C_4 hydroxyalkyl, or C_2 to C_4 dihydroxyalkyl;

R_4 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

or when R_3 and R_6 taken together are ethylene, R_4 is also ethylene, and R_5 is aminoethyl, aminopropyl, or aminohydroxypropyl;

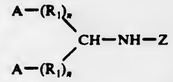
(b) when Y is



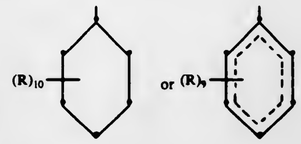
R_7 is R_2, methylene, or a chemical bond between the cyclohexylene moiety and a first nitrogen; R_8 is R_4, methylene, or a chemical bond between the cyclohexylene moiety and a second nitrogen or;

(c). when Y is $-R_2-$, then R_2, R_5 and R_6 are as previously defined, and acid addition salts thereof.

25. A composition for inhibiting the growth of susceptible microorganisms and algae comprising an effective growth inhibiting amount of the compound of the formula:



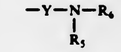
Where A is cyclohexyl or cyclohexenyl of the formula:



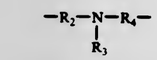
where each R is either hydrogen or C_1 to C_6 alkyl, and the dashed line indicates a double bond;

each *n* is alike or different and is the integer 0 or 1;

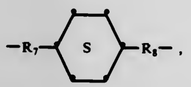
each R_1 is alike or different and is C_1 to C_4 alkylene;



R_5 is hydrogen, aminoethyl, aminopropyl, C_1 to C_4 hydroxyalkyl, or C_2 to C_4 dihydroxyalkyl; and
R_6 is hydrogen, C_1 to C_4 hydroxyalkyl or C_2 to C_4 dihydroxyalkyl;
(a) when Y is



R_2 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;
R_3 is hydrogen, C_1 to C_4 alkyl, C_2 to C_4 aminoalkyl, C_1 to C_4 hydroxyalkyl, or C_2 to C_4 dihydroxyalkyl;
R_4 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;
or when R_3 and R_6 together are ethylene, R_4 is also ethylene, and R_5 is aminoethyl, aminopropyl, or aminohydroxypropyl;
(b). when Y is



R_7 is R_2, methylene, or a chemical bond between the cyclohexylene moiety and a first nitrogen; R_8 is R_4, methylene, or a chemical bond between the cyclohexylene moiety and a second nitrogen or;
(c). when Y is $—R_2—$, R_2, R_5 and R_6 are as previously defined; and acid addition salts thereof and a carrier.

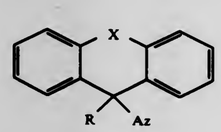
4,049,418

METHOD OF REGULATING PLANT GROWTH

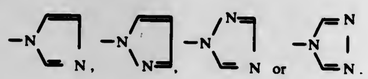
Helmut Tiemmler; Wilfried Draber; Karl Heinz Büchel, all of Wuppertal, and Klaus Lürssen, Grosskoenigsdorf, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 19, 1975, Ser. No. 614,987
Claims priority, application Germany, Oct. 9, 1974, 2448060
Int. Cl.² A01N 9/22
U.S. Cl. 71—76 **21 Claims**

1. A method of regulating the growth of plants, which comprises applying to the plants or a habitat thereof an effective amount of a 5-azolyl-[a,d]-dibenzocycloheptene compound of the formula



in which
X is a —CH═CH— or $CH_2—CH_2$— group,
R is alkyl of from 1 to 4 carbon atoms, alkoxycarbonyl of from 1 to 4 carbon atoms in the alkyl moiety, or phenyl, wherein the phenyl radical may be substituted by up to 3 substituents selected from alkyl of from 1 to 4 carbon atoms, halogen, haloalkyl of up to 2 carbon atoms and up to 5 carbon atoms and
Az is an azole radical selected from the formulas



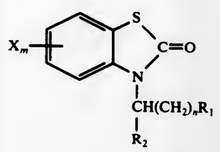
4,049,419

USE OF BENZOTHIAZOLINE COMPOUNDS AS PLANT GROWTH REGULANTS

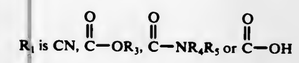
John J. D'Amico, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 576,512, May 12, 1975, Pat. No. 3,993,468. This application Feb. 26, 1976, Ser. No. 660,741
Int. Cl.² A01N 9/12
U.S. Cl. 71—76 **20 Claims**

7. A method for reducing the stature of soybean plants which comprises treating said soybean plants with a stature reducing amount of a compound of the formula



wherein X is halo; *m* is 0 or 1;



and agriculturally acceptable salts thereof; R_2 is H, CN, lower alkyl or



R_3 is lower akyl; R_4 and R_5 are independently H, alkyl or when taken together with the nitrogen molecule form a heterocyclic having up to 8 carbon atoms, inclusive; and *n* is 0 or 2; provided that R_2 is



only when R_1 is



and *n* is 0.

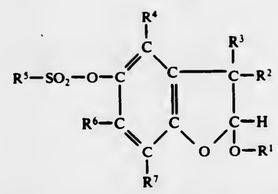
4,049,420

CERTAIN SULFONIC ACID ESTERS OF CERTAIN 2,3-DIHYDRO-2-HYDROCARBONOXY-BENZOFURAN-5-OLS AND THEIR USE AS HERBICIDES AND PLANT GROWTH CONTROLLERS

Peter Stuart Gates, Cambridge, England, assignor to Fisons Limited, London, England

Filed May 21, 1975, Ser. No. 579,726
Claims priority, application United Kingdom, May 31, 1974, 24350/74
Int. Cl.² A01N 9/28; C07D 307/83
U.S. Cl. 71—88 **23 Claims**

1. A compound of the formula



wherein R^1 represents a branched chain alkyl group of 4 to 10 carbon atoms wherein at least the 2-position is branched or cyclohexyl,
R^2 and R^3 are the same or different and each represents a hydrogen atom or an alkyl group of 1 - 6 carbon atoms,
R^4, R^6 and R^7 are the same or different and each represents a hydrogen or halogen atom or an alkyl or alkoxy group of 1 - 4 carbon atoms, and
R^5 represents an alkyl group of 1 - 6 carbon atoms, an alkyl group of 1 - 6 carbon atoms substituted by halogen or alkoxy of 1 - 6 carbon atoms, phenyl, or phenyl substituted by halogen or alkyl of 1 - 4 carbon atoms.

13. A plant growth control composition which comprises an effective amount of a compound according to claim **1** in admixture with at least one member selected from the group consisting of an inert carrier therefor and a surface active agent, said composition being suitable for application to plants or to the locus at which plants are growing or are to grow.

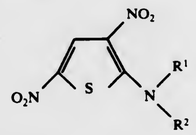
4,049,421

BACTERICIDAL, FUNGICIDAL AND HERBICIDAL 2-(N,N-DIALKYLAMINO)-3,5-DINITROTHIOPHENES

Leroy H. Edwards, Napa, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 566,568, April 9, 1975, Pat. No. 3,978,083. This application June 25, 1976, Ser. No. 699,780
Int. Cl.² A01D 9/12
U.S. Cl. 71—90 **6 Claims**

1. A method for controlling the growth of undesirable vegetation which comprises applying to the vegetation or the growth medium thereof an herbicidally effective amount of the compound of the formula



wherein R^1 and R^2 individaully are methyl or ethyl.

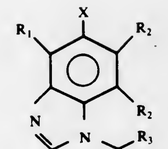
4,049,422

HERBICIDAL MORPHOLINOBENZIMIDAZOLES

Kelvin Kei-Wei Shen, Fountain Valley, and Wayne Stuart Belles, Orange, both of Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

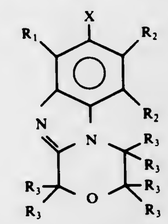
Filed Mar. 29, 1976, Ser. No. 671,452
Int. Cl.² A01N 9/22; C07D 498/04
U.S. Cl. 71—92 **18 Claims**

1. The method for controlling weed growth which comprises applying to the locus of said weeds a phytotoxic amount of a compound of the formula



wherein X is selected from the group consisting of halo-lower alkyl, lower alkylsulfonyl, halo-lower alkylsulfonyl, halo and lower alkyl, R_1 represents hydrogen, lower alkyl or halo, each R_2 is selected from hydrogen, halo, lower alkyl, lower alkoxy, cyano, amino and nitro, and each R_3 is selected from hydrogen and lower alkyl.

10. A compound of the formula



in which X is selected from the group consisting of trifluoromethyl, lower alkylsulfonyl, halo-lower alkylsulfonyl and branched chain alkyl of 3 to about 6 carbon atoms, R_1 is hydrogen, lower alkyl or halo, each R_2 is selected from hydrogen, halo, lower alkyl, lower alkoxy, cyano, amino and nitro and each R_3 is selected from hydrogen and lower alkyl.

4,049,423

N-DIMETHYLPROPYNYL-α-METHOXY-α-(3,5-DIMETHYLPHENOXY)ACETAMIDE HERBICIDE

Don R. Baker, Orinda, Calif., and Francis H. Walker, Mill Valley, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed June 30, 1975, Ser. No. 591,721
Int. Cl.² A01N 9/20
U.S. Cl. 71—118 **1 Claim**

1. The method of controlling undesirable vegetation which comprises applying to the area where control of said vegetative growth is desired, an herbicidal amount of N-dimethylpropynyl-α-methoxy-α-(3,5-dimethylphenoxy)acetamide.

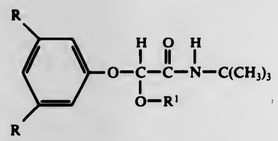
4,049,424

N-T-BUTYL-2-(3,5-DICHLORO OR DIMETHYL PHENOXY)-2-ALKOXY AMIDE HERBICIDES

Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed June 30, 1975, Ser. No. 591,687
Int. Cl.² A01N 9/20
U.S. Cl. 71—118 **5 Claims**

1. The method of controlling undesirable vegetation which comprises applying to the area where control of said vegetative growth is desired an herbicidal amount of a compound having the formula



in which R is halogen or alkyl having 1 to 4 carbon atoms and R^1 is alkyl having 1 to 4 carbon atoms.

4,049,425

PROCESS FOR THE MANUFACTURE OF ALUMINUM

Servaas Middelhoek; Gerhardus Santing, both of Arnhem, and Nicolaas Dost, Bennekom, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 15, 1976, Ser. No. 667,046

Claims priority, application Netherlands, Mar. 21, 1975, 7503385

Int. Cl.² C22C *1/02*

U.S. Cl. 75—135 **8 Claims**

1. In the process for the manufacture of aluminum alloys by reducing an oxidic aluminum-containing material at high temperature with carbon, the improvement which comprises carrying out the reduction in the presence of a catalyst metal selected from the group consisting of iron, nickel, cobalt a mixture thereof at a temperature between 1000° C and 1950° C.

4,049,426

COPPER-BASE ALLOYS CONTAINING CHROMIUM, NIOBIUM AND ZIRCONIUM

W. Gary Watson, Cheshire, and John F. Breedis, Trumbull, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 4, 1976, Ser. No. 728,977

Int. Cl.² C22F *1/08*

U.S. Cl. 75—153 **20 Claims**

1. A copper base alloy which exhibits a combination of high strength and high electrical conductivity, said alloy consisting essentially of 0.05 to 1.25% by weight chromium, 0.05 to 1.0% by weight zirconium, 0.05 to 1.5% by weight niobium, balance copper.

4,049,427

NON-PRECIOUS DENTAL ALLOY

Ricardo Guerra, 112 Bellevue Ave., Oceanside, N.Y. 11572

Filed Oct. 8, 1976, Ser. No. 730,704

Int. Cl.² C22C *19/05*

U.S. Cl. 75—171 **3 Claims**

1. An alloy suitable for dental prosthetic work consisting essentially of, by weight: 14–21% chromium, 8–12% cobalt, 1–1.5% molybdenum, 1–1.5% aluminum, 0.9–1.4% beryllium, 0.8– 1.2% iron, 0.3–0.4% copper, 0.3–0.4% silicon, 0.03–0.05% manganese, balance nickel.

4,049,428

METAL POROUS ABRADABLE SEAL

Raymond John Elbert, Middleburg Heights, and Ernest Gilbert Farrier, Parma, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 128,182, March 25, 1971, abandoned. This application Jan. 28, 1977, Ser. No. 763,535

Int. Cl.² B22F *1/02, 7/02*

U.S. Cl. 75—208 R **10 Claims**

1. A process for producing a metal porous abradable structure comprising the steps:

a. depositing a coating of a binder material onto a substrate to produce a tacky surface layer sufficient to secure metal particles sprinkled thereon against the force of gravity when said layer is inverted,

b. depositing metal particles onto said tacky binder layer to produce a metallic monolayer thereon;

c. repeating the steps (a) and (b) at least once to produce a multilayer deposit of particles secured in the binder; and

d. heating said deposited multilayer in the as-deposited state at a temperature and for a time period sufficient to substantially remove the binder and to sinter the metallic particles together thereby forming a porous abradable structure.

4,049,429

FERRITIC ALLOYS OF LOW FLOW STRESS FOR P/M FORGINGS

Stephen James Donachie, New Windsor, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 345,981, March 29, 1973, Pat. No. 3,864,809. This application Mar. 7, 1974, Ser. No. 448,883

Int. Cl.² C22C *33/02*

U.S. Cl. 75—246 **6 Claims**

1. A consolidated age-hardenable powder metallurgical alloy steel in the ferritic condition particularly adapted for PM/hot forging and characterized by (a) low flow stress, (b) good impact strength, (c) high resistance to fatigue and (d) good flowability such as to fill complex dies, said steel being formed from about 0.7% to about 1% nickel, 1.4% to 2% copper, 0.15% to 0.35% molybdenum, up to 0.02% carbon, up to 0.1% silicon, up to 0.15% manganese, and the balance essentially iron.

4,049,430

PRECIPITATION HARDENABLE STAINLESS STEEL

Lewis P. Myers, Reading, Pa., assignor to Carpenter Technology Corporation, Reading, Pa.

Filed Aug. 18, 1976, Ser. No. 715,619

Int. Cl.² C22C *38/06, 38/42*

U.S. Cl. 75—124 **18 Claims**

1. A chromium-nickel stainless steel alloy capable of being age hardened to a hardness of at least 44 Rockwell C with an essentially martensitic microstructure having no more than about 10% retained austenite and nor more than about 3% ferrite and in that condition having a 0.2% yield strength of at least about 200,000 psi, an ultimate tensile strength of at least about 210,000 psi, a notch tensile strength at least equal to its ultimate tensile strength, an impact strength in the longitudinal direction of at least 15 ft-lb and at least 5 ft-lb in the transverse direction, said alloy in weight percent consisting essentially of about

	w/o
Carbon	up to 0.05
Manganese	up to 0.5
Silicon	up to 0.5
Phosphorus	up to 0.04
Sulfur	up to 0.02
Chromium	10.5–12
Nickel	8.5–9.5
Copper	2.1–3.0
Aluminum	0.7–0.93
Boron	up to 0.01
Columbium	0.20–0.55
Nitrogen	up to 0.04

and the balance essentially iron and incidental impurities.

4,049,431

HIGH STRENGTH FERRITIC ALLOY

William C. Hagel, Ann Arbor, Mich.; Frederick A. Smidt, Springfield, Va., and Michael K. Korenko, Richland, Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 30, 1976, Ser. No. 728,361

Int. Cl.² C22C *38/22, 38/24, 38/26*

U.S. Cl. 75—126 C **3 Claims**

1. A high strength ferritic alloy having Laves phase precipitation as the primary ferritic alloy strengthener consisting essentially of from about 9% to about 13% by weight chromium, from about 4% to about 8% by weight molybdenum, from about 0.2% to about 0.8% by weight niobium, from about 0.1% to about 0.3% by weight vanadium, from about 0.2% to about 0.8% by weight silicon, from about 0.2% to about 0.8% by weight manganese, from 0.04% to about 0.12% by weight carbon, a maximum of about 0.05% by weight nitrogen, a maximum of about 0.02% by weight sulfur, a maximum of about 0.02% by weight phosphorus, and the balance iron, wherein said alloy will swell less than 5% at the fluence of 2.2 $\times$ 10^{23} n/cm² (E > 0.1 MeV) and wherein said alloy exhibits 100 hour stress rupture strength in the range of about 30 ksi at 650° C.

4,049,432

HIGH STRENGTH FERRITIC ALLOY-D53

William C. Hagel, Ann Arbor, Mich.; Frederick A. Smidt, Springfield, Va., and Michael K. Korenko, Richland, Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 30, 1976, Ser. No. 728,362

Int. Cl.² C22C *38/44, 38/46, 38/54*

U.S. Cl. 75—128 F **3 Claims**

1. A high strength ferritic alloy consisting of from about 0.2% to about 0.8% by weight nickel, from about 2.5% to about 3.6% by weight chromium, from about 2.5% to about 3.5% by weight molybdenum, from 0.1% to about 0.5% by weight vanadium, from about 0.1% to about 0.5% by weight silicon, from about 0.1% to about 0.6% by weight manganese, from about 0.12% to about 0.20% by weight carbon, from about 0.02% to about 0.1% by weight boron, a maximum of about 0.05% by weight nitrogen, a maximum of about 0.02% by weight sulfur, a maximum of about 0.02% by weight phosphorous, and the balance iron.

4,049,433

METHOD FOR THE HOMOGENEOUS DISTRIBUTION OF ALLOYS IN MOLTEN STEEL USING OIL AND WATER MIXTURES

J. Barry Hemphill, Mount Lebanon Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 1, 1976, Ser. No. 728,685

Int. Cl.² C22C *33/04*

U.S. Cl. 75—129 **4 Claims**

1. In the addition of alloy additive fragments to a massive molten metal bath, said addition being effected under conditions in which the degree of stirring of said bath is ineffective in achieving a homogeneous distribution of the additives within the bath,

the improvement for significantly improving the homogeneity of said distribution, which comprises, prior to the addition of the additive to the molten bath, applying an aqueous mixture to said fragments so as to provide an aqueous film thereon, said mixture consisting essentially of 2 to 30 weight percent oil dispersed in water.

4,049,434

BRAZING ALLOY

Mieczyslaw Herman Sloboda, and John Sidney Hatswell, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Continuation of Ser. No. 542,865, Jan. 21, 1975, abandoned. This application Oct. 5, 1976, Ser. No. 729,720

Claims priority, application United Kingdom, Jan. 24, 1974, 3343/74

Int. Cl.² C22C *9/04, 30/02*

U.S. Cl. 75—134 C **2 Claims**

1. A razing alloy consisting essentially of 33 wt.% wt.% zinc, 25 wt.% silver, 2wt.% manganese, 2 wt.% nickel and 38 wt.% copper, said allow melting in the range 710–810° C and being characterized by its resistance to cracking on cooling when used to braze the joint between a steel shank and carbide cutting tip of a rock drill.

2. A brazing alloy consisting essentially of 38 wt.% zinc, 2 wt.% manganese, 2 wt.% wt.% cobalt and 58 wt.% copper, said alloy melting in the range 890°–930° C and being characterized by its resistance to cracking on cooling when used to braze the joint between a steel shank and carbide cutting tip of a rock drill.

4,049,435

METHOD FOR OBTAINING A LUMP PRODUCT

Valery Efimovich Lotosh, ulitsa Chkalova, 34, and Vladimir Demyanovich Steblyak, ulitsa Shmidta, 76, kv. 32, both of Sverdlovsk, U.S.S.R.

Filed Apr. 22, 1976, Ser. No. 679,359

Int. Cl.² C22B *1/08*

U.S. Cl. 75—3 **5 Claims**

1. A method for preparing a strengthened pelleted ore product, which comprises an ore of less than 1 mm in size with a hydraulic binder, simultaneously homogenizing and activating the mixture, pelleting the mixture to obtain green pellets, steaming the green pellets at a temperature of 60°–250° C and a relative humidity of 70–100%, heat treating the pellets at a first temperature of 70–100° C until the free moisture content of the pellets is 2-5%, and adjusting to a second heat treatment temperature of from at least 100° to 900° C until the free moisture content of the pellets is 0.01 to 1.0% thereby obtaining a strengthened ore pellet product.

4,049,436

BORON ALLOYED IRON POWDER FOR FILLER METALS

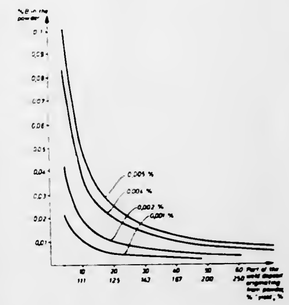
Gert H. von Scheele, Arild, Sweden, assignor to Hoganas AB, Hoganas, Sweden

Filed June 23, 1975, Ser. No. 589,449

Claims priority, application Sweden, June 24, 1974, 7408230

Int. Cl.² C22C *33/02, 38/32*

U.S. Cl. 75—.5 R **8 Claims**



1. Iron based weld filler powder to be used either in the as

condition or diluted with a boron free unalloyed iron powder as a raw material in the production of filler metals such as stick electrodes, agglomerated fluxes, flux cored wires, characterized in that it contains boron within the limits 0.03% and 0.07%.

4,049,437

PROCESS OF SEPARATION, PARTICULARLY OF A SOLID PHASE, FROM A MATRIX IN LIQUID PHASE

Jean Driole; Colette Allibert; Etienne Bonnier, all of Grenoble, and Alain Wicker, Limours, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed July 14, 1976, Ser. No. 705,029
Claims priority, application France, July 18, 1975, 75.22556
Int. Cl.² C22B *4/00, 7/00*
U.S. Cl. 75—10 R **9 Claims**

1. In a process of establishing separate phases in a mixture by cooling thereof from a relatively high temperature under which the mixture is maintained as a substantially homogenous melt, a method of accelerating said cooling to a lower temperature at which the separate phases coexist within a liquid matrix, comprising the steps of: generating an oscillating magnetic field; and applying said magnetic field to substantially the entire mass of the mixture during said cooling thereof until at least one of the separate phases is formed within a predetermined zone of the liquid matrix.

4,049,438

NON-FERROUS METAL RECOVERY FROM DEEP SEA NODULES

Ramamrithan Sridhar, Mississauga; John Stuart Warner, Oakville, and Malcolm Charles Evert Bell, Sudbury, all of Canada, assignors to The International Nickel Company, Inc., Del.

Filed Feb. 14, 1975, Ser. No. 549,978
Claims priority, application Canada, Mar. 11, 1974, 194558/74; Aug. 2, 1974, 206227/74
Int. Cl.² C21B *1/00*
U.S. Cl. 75—21 **31 Claims**

1. A process for recovering at least one non-ferrous metal value selected from the group consisting of nickel, cobalt, copper or molybdenum, which non-ferrous metal value is present as an oxide, from a manganiferous oxide material which process comprises selectively reducing said non-ferrous metal values and then smelting the manganiferous oxide material to produce a first molten alloy containing a preponderant part of the non-ferrous metal values and a first manganese-containing slag, separating the first molten alloy from the first manganese-containing slag, blowing the separated molten first alloy with a free-oxygen-containing gas to oxidize and slag most of the manganese contained in the first molten alloy and to form a second molten alloy further depleted in manganese and a second manganese-containing slag, separating the second molten alloy from the second manganese-containing slag, and then sulfiding the second molten alloy to facilitate separation and recovery of the non-ferrous metal values.

4,049,439

METHOD PRODUCING SLAG BALLAST

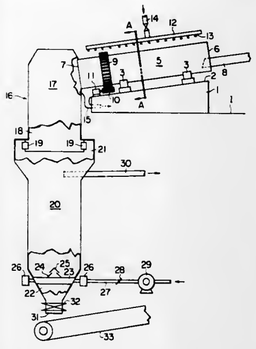
Kunio Nakamura, and Mitsuo Takahashi, both of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 29, 1975, Ser. No. 645,291
Claims priority, application Japan, Dec. 30, 1974, 50-2403
Int. Cl.² C21B *3/04*; C22B *7/04*
U.S. Cl. 75—24 **8 Claims**

1. A method of producing slag ballast having a low S^{2-} ion concentration by cooling molten slag containing a high proportion of sulfur and which is obtained in metal smelting processes, which method comprises:

a. introducing molten slag into the upper end of an inclined revolving cylindrical body having an external peripheral cooling surface;

b. cooling the said external peripheral surface for cooling the slag at a cooling rate in excess of 20° C/min. until solidification of the slag takes place for reducing the S^{2-} ion concentration of the cooled slag to a level not exceeding 5 ppm;



c. moving the solidified slag forward and tumbling the slag in the revolving cylindrical body as it is being cooled for crushing the slag; and

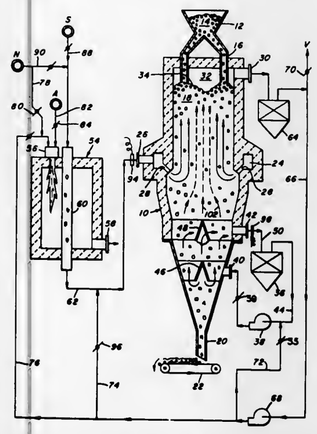
d. discharging the cooled, broken and lumpy slag from the revolving cylindrical body through the lower end thereof.

4,049,440

METHOD FOR PRODUCING METALLIC IRON PELLETS

Donald Beggs, Charlotte, N.C., assignor to Midrex Corporation, Charlotte, N.C.

Continuation-in-part of Ser. No. 578,477, May 19, 1975. This application Sept. 8, 1975, Ser. No. 611,099
Int. Cl.² C21B *13/00*
U.S. Cl. 75—35 **19 Claims**



1. A method for producing a metallized product comprising:

a. establishing a gravitational flow of particulate metal oxide material by charging the particulate metal oxide material to the upper portion of a generally vertical furnace having an upper reducing zone and a lower cooling zone, and removing the metallized product from the bottom of the furnace;

b. introducing a reducing gas to the gravitational flow of material at a temperature sufficient to promote a reducing reaction between said reducing gas and said material at a first inlet intermediate the ends of the furnace;

c. causing said reducing gas to move countercurrent through the gravitational flow of material, react with and reduce a substantial portion of the metal oxide and form a top gas;

d. removing said top gas from the upper portion of the furnace;

e. cooling said top gas;

f. introducing a cooling gas into a second inlet near the lower end of said furnace;

g. removing a portion of said cooling gas from said furnace at a location intermediate said first and second inlets;

h. cooling the removed portion;

i. introducing the cooled removed portion to said second inlet to form a recirculating circuit including the cooling zone;

j. adding cooled top gas to said recirculating circuit; and

k. causing a second portion of said cooling gas, in an amount substantially equal to the amount of cooled top gas added to said recirculating circuit, to flow upwardly through the gravitational flow of material, become heated thereby, and to flow into and act as a reducing gas in the reducing zone;

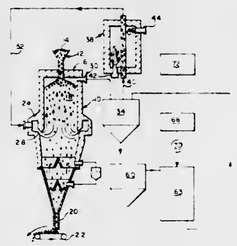
whereby, that portion of said cooling gas flowing upwardly through the gravitational flow of material has a greater reducing potential than the spent top gas, and is thus an effective reductant.

4,049,441

METHOD OF EXTENDING THE LIFE OF A CATALYST IN A PROCESS OF PRODUCING METALLIC IRON PELLETS

Charles M. Jaco, Jr., Clover; Wallace C. Menear, Georgetown, and Donald W. Clark, North Litchfield Beach, all of S.C., assignors to Midrex Corporation, Charlotte, N.C.

Filed Mar. 4, 1976, Ser. No. 663,949
Int. Cl.² C21B *13/00*
U.S. Cl. 75—35 **3 Claims**



1. In a method of producing metallic iron pellets by direct reduction of particulate iron oxide material with hot reducing gas in a reducing furnace having a reducing zone therein, removing reacted sulfur-containing gas, cooling said reacted gas in a cooler-scrubber, reforming said reacted gas into an effective reductant, and reintroducing gas to the reducing zone as reducing gas, the improvement comprising adding a sulfur-removing reagent comprising an aqueous solution of zinc chromate having a free metallic ion which forms an insoluble precipitate with sulfur to cooling water, and contacting said reacted gas with said reagent-containing water in said cooler-scrubber, whereby a substantial portion of sulfur is removed from said gas by said reagent.

4,049,442

COMPOSITION FOR DESULFURIZING IRON MELTS

Alfred Freissmuth, Trostberg; Walter Heinl, Garching; Herbert Knahl, and Erich Pfluger, both of Trostberg, all of Germany, assignors to Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft, Trostberg, Germany

Filed Jan. 6, 1976, Ser. No. 646,778
Claims priority, application Germany, Jan. 8, 1975, 2500497
Int. Cl.² C21C *7/00*
U.S. Cl. 75—55 **8 Claims**

1. Composition for desulfurizing iron melts in torpedo ladles, comprising a mixture of calcium carbide and diamide line in which the content of diamide lime is from more than 40% by weight up to 70% by weight of the mixture.

4,049,443

METHOD OF FABRICATION OF AN ALLOY CONTAINING AN ALKALI METAL AND/OR AN ALKALINE-EARTH METAL

Andre Hatterer, Riedisheim; Claude Oberlin, Avon, and Pierre Strobel, Mulhouse, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 487,540, July 11, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,858
Claims priority, application France, July 31, 1973, 73.28045
Int. Cl.² C22B *26/10*
U.S. Cl. 75—66 **17 Claims**



1. A method of producing an alloy containing an alkali metal, an alkali-earth metal and a metal co-component alloyable thereiwth, comprising:

confining at least one alkali metal nitride, at least one alkali-earth metal nitride and at least one metallic co-component of the alloy to be formed in a reaction chamber;

thermally decomposing, substantially in a vacuum, said alkali metal nitride and said alkali-earth metal nitride in said chamber to a mixture of said alkali and alkali-earth metals, and

melting said mixture of metals thereby forming a substantially homogeneous alloy.

4,049,444

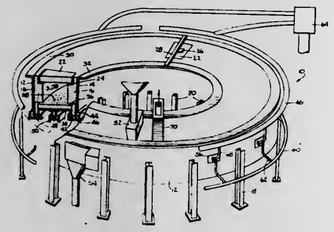
PROCESS FOR TREATMENT OF LATERITIC ORES

Malcolm Charles Evert Bell, Sudbury, and Ramamritham Sridhar, Mississauga, both of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,549
Claims priority, application Canada, Nov. 5, 1973, 185029
Int. Cl.² C22B *23/00*
U.S. Cl. 75—82 **18 Claims**

1. In a thermal upgrading process for treating nickeliferous

lateritic ores containing a silicate to limonite ratio of at least about 1:4 which comprises: forming agglomerates of the particulate nickeliferous lateritic ore, a reducing agent and a reagent containing at least one member selected from the group consisting of alkali metal compounds and alkaline earth metal compounds; heating said agglomerates to reduce nickel values in the ore to metallic nickel and to coalesce the reduced nickel values into ferronickel particles; the improvement comprising: employing said reducing agent in the agglomerates in an amount of up to about 12% by weight, said reducing agent containing at least about 1% by weight liquid hydrocarbon, the amount of reducing agent based on the weight of the ore, utilizing said reagent in a small but effective amount for improved nickel recovery up to about 10%; establishing a shallow bed of the agglomerates on a movable hearth; moving the shallow bed of agglomerates successively and rapidly through a confined space having a preheating zone and a reducing zone having an atmosphere at least reducing to nickel oxide while subjecting the agglomerates to a temperature of between about 1295° and about 1320° C for a period of up to about 30 minutes to partially melt the agglomerates, to reduce nickel values to metallic nickel, and to coalesce the reduced nickel values into ferronickel particles; thereby permitting continuous treatment of said nickeliferous lateritic ore containing a substantial silicate fraction at temperatures above the softening temperature of the agglomerates and achieving a nickel recovery of at least over 80%.



4,049,445

METHOD FOR THERMAL TREATMENT OF NICKEL ORE

Horst Weigel, Cologne, Germany, and Anton Spitz, deceased, late of Cologne, Germany, by Barbara Wilhelmine Spitz nee Schürmann, legal representative, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Nov. 6, 1975, Ser. No. 629,321
Claims priority, application Germany, Nov. 12, 1974, 2453564
Int. Cl.² C22B *23/02*
U.S. Cl. 75—82 **9 Claims**

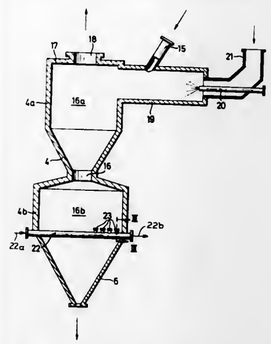
1. The method of thermally processing lateritic nickel ore which comprises:

preheating the ore in a preheating zone;

feeding the preheated ore to a heating zone and then to a reduction zone;

supplying a reducing gas to said reduction zone;

feeding the reducing gas from the reduction zone and a fuel/air mixture to said heating zone whereby the still combustible reduction gases are burned in direct contact with the ore and the temperature of the ore is raised by the hot gases to a selected reduction temperature; and



conducting the hot, burned reduction gases and fuel/air mixture to said preheating zone for preheating the ore.

4,049,446

ENERGIZED LIQUID DEVELOPERS FOR DEVELOPING ELECTROSTATIC IMAGES

Kenneth A. Metcalfe, 1 Corona Avenue, Lockleys, South Australia 5032; Clive Westgarth Wilson, 23 Bowden Grove, Oaklands Park, South Australia 5045, and Denton Field, 23 Nyonga Avenue, Croydon Park, South Australia 5008, all of Australia

Division of Ser. No. 401,966, Sept. 28, 1973, abandoned. This application Feb. 9, 1976, Ser. No. 656,822
Claims priority, application Australia, Oct. 4, 1972, 691/72
Int. Cl.² G03G *13/10*
U.S. Cl. 96—1 LY **2 Claims**

1. A method of developing electrical field images which comprises applying a developer to a base material having a coating comprising a photosensitive medium and a resin having embedded therein particulate conductive particles or a medium which increases the conductivity in the proportion by weight of 100 to 500 grams of resin to 0.5 to 2 grams of conductive material to form a membrane capable of sustaining a latent electrostatic image, said developer being an energized liquid developer comprising in separate co-existence within an insulating liquid of (a) toner particles of relatively low dielectric constant arranged due to their electrical characteristic to deposit on selected image areas and (b) movement-inducing high dielectric constant metallic powder particles which have a rapid charge exchange with other particles and adjacent surfaces to cause the said high dielectric particles to oscillate between other particles and the said surfaces whereby by collisions of said particles and the toner particles to introduce random agitation of particles in the liquid and by the presence of the photoconductive particles in the photosensitive base, and the metallic particles in the carrier liquid of the developer, agitation is enhanced at the interface between the liquid and the photoconductor due to charge exchange between the fixed conductive particles in the photoconductor and the moving metal particles in the developer liquid, maintaining said body of developer itself quiescent except for the random particle movement, said toner particles being colored resin particles, said metal powders being selected from the group consisting of aluminum, bronze powder, zinc powder, aluminum powder, copper powder, intermetallic compound powder, tin powder, iron powder, and chromium powder.

4,049,447

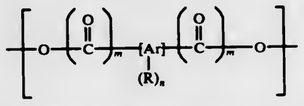
IMAGING SYSTEM

Jack C. Azar, Rochester; Thomas A. Hoffend, Webster, both of N.Y., and Burton B. Jacknow, Monte Sereno, Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 211,131, Dec. 22, 1971, abandoned. This application Feb. 12, 1976, Ser. No. 657,504
Int. Cl.² G03G *9/08, 13/08, 13/22*
U.S. Cl. 96—1 SD **23 Claims**

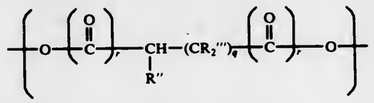
1. A finely divided particulate toner composition consisting essentially of a colorant and an amorphous, low-melting polyester exhibiting a softening temperature of at least about 45° C, fusing at temperatures ranging from about 100° to about 130° C and exhibiting a resistivity of at least about 10^{15} ohm - cm.), wherein the polyester contains within the polymer chain at least about 30 mole percent of at least one divalent radical selected from the group consisting of:

a. an arylene radical represented by the formula:



wherein [AR] is an arylene radical containing from 6 to about 18 carbon atoms, R is selected from the group of radicals consisting of hydrogen, alkyl containing from 1 to about 4 carbon atoms, halo, sulfo and alkali metal salts thereof, nitro, cyano, lower alkoxy, amino, thio lower alkoxy and $-N(R')_p$ wherein each R' can be independently hydrogen or lower alkyl and p is an integer of 2 or 3, each m is independently a number from 0 to 1 and n is a number from 0 to 3, and

b. an alkylene radical having no center of symmetry represented by the structural formula:



wherein R'' is an alkyl radical containing from 1 to about 4 carbon atoms, each R''' is independently hydrogen or R'', q is a number from 1 to about 10 and each r is independently a number from 0 to 1; and when the radical having no center of symmetry is at least about 30 mole percent of said arylene, the balance of the polyester is aromatic or aliphatic comonomer or both, and when the radical having no center of symmetry is at least about 30 mole percent of said alkylene, the balance of the polyester is at least about 20 mole percent aromatic comonomer, and additional aromatic comonomer or aliphatic comonomer or both.

4,049,448

PROCESS FOR PRODUCING AN ELECTROPHOTOGRAPHIC MATERIAL IN WHICH A PINHOLE-FILLING DISPERSION IS EMPLOYED

Satoru Honjo, and Masaaki Takimoto, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 368,789, June 11, 1973, Pat. No. 3,911,170. This application July 8, 1975, Ser. No. 594,176
Claims priority, application Japan, June 9, 1972, 47-57398
Int. Cl.² G03G *5/00*
U.S. Cl. 96—1.5 R **21 Claims**

1. In a process for producing an electrophotographic light-sensitive material comprising coating a paper support with an electroconductive layer and a photoconductive layer on the opposite side of said electroconductive layer, and directly coating on said paper support at least one film-forming resin layer, wherein said film-forming resin layer can be said electroconductive layer, the improvement which comprises bringing at least one film-forming resin layer directly coated on the support into contact with a pinhole-filling dispersion comprising a volatile liquid and a finely dispersed substance selected from the group consisting of a white or black pigment, a plastic particle or a pigment coated with a plastic therein, said liquid easily penetrating into the interior of the paper support through pinholes in said film forming resin layer and carrying said finely dispersed substance into said pinholes, whereby said finely dispersed substance fills and seals said pinholes which permit the penetration of said liquid and which exist in the surface of said film-forming resin layer which is itself capable of substantially completely preventing penetration of said liquid into said paper support and wherein the rate of penetration of said pinhole-filling dispersion is from about 2 × 10^{-4}mm³ to about 60 × 10^{-4}mm³/second.

4,049,449

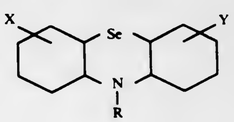
METHOD FOR FORMING AN ELECTROPHOTOGRAPHIC MEMBER

Dana G. Marsh, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 22, 1976, Ser. No. 754,132
Int. Cl.² G03Q *5/08*
U.S. Cl. 96—1.5 R **2 Claims**

1. A method for preparing an electrophotographic imaging member comprising the steps of:

a. providing a layer of a solid phase dispersion on a conductive substrate, said dispersion comprising an organoselenium compound which is represented by the structural formula



wherein

R has from 1 to about 20 carbon atoms and may be alkyl, aryl substituted alkyl, amino derivatives of alkyl and aryl substituted alkyl;

aryl, alkyl substituted aryl, amino substituted aryl, alkylamino substituted aryl, arylamino substituted aryl, alkylcarbonyl, arylcarbonyl, and aminosubstituted derivatives of alkylcarbonyl and arylcarbonyl; and

X and Y are independently selected from the group consisting of H and alkyl and perfluoroalkyl having from 1 to about 4 carbon atoms in an electrically insulating polymeric binder matrix; and

b. subjecting said layer to sufficient thermal energy or electromagnetic radiation to which said organoselenium compound is responsive to decompose at least a substantial amount of said organoselenium compound whereby elemental selenium and a carbazole derivative are deposited within said layer.

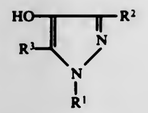
4,049,450

4-HYDROXYPYRAZOLE DEVELOPING AGENTS

Richard B. Greenwald, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 30, 1976, Ser. No. 671,741
Int. Cl.² G03C *5/54, 5/38, 5/30, 1/48*
U.S. Cl. 96—29 R **23 Claims**

1. A method of developing a silver halide emulsion which comprises treating an exposed silver halide emulsion layer carried on a support with an aqueous alkaline processing composition of a silver halide developing agent of the formula



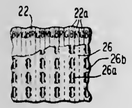
wherein R^1 is selected from hydrogen and hydroxy and R^2 and R^3 each is selected from phenyl, 2-thienyl and alkyl.

4,049,451

METHOD FOR FORMING A COLOR TELEVISION PICTURE TUBE SCREEN

Harold Bell Law, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 14, 1972, Ser. No. 217,885
Int. Cl.² G03C *5/00*
U.S. Cl. 96—36.1 **2 Claims**



1. A method of manufacturing a fluorescent screen for use in a colour picture tube wherein photosensitive substances coated on the inner surface of the panel of the tube are exposed to light emanated from a source of light through a plurality of parallel stripe shaped perforations of a colour selecting member each of which is divided into a plurality of slit shaped sections by means of bridges extending at substantially right angles with respect to the longitudinal direction of said perforation thereby forming a fluorescent screen including a plurality of parallel stripes of three colour phosphors, said perforations extending over substantially the entire length of one side of said colour selecting member, improvement in which said fluorescent screen is formed by projecting the exposure light emanated from a linear light source upon said photosensitive substances through said divided slit shaped sections, said linear light source being positioned parallel to said perforations and having an effective length sufficient to expose continuous stripes corresponding to said perforations on said photosensitive substances including the regions behind said bridges.

4,049,452

REVERSE-PRINTING METHOD FOR PRODUCING CATHODE-RAY-TUBE-SCREEN STRUCTURE

Edith Mayaud Nekut, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 23, 1975, Ser. No. 570,618
Int. Cl.² B05D *3/06*
U.S. Cl. 96—36.1 **9 Claims**

1. A method for preparing a luminescent-screen structure of a cathode-ray tube, the steps comprising,

a. coating a support surface with a film of a polymeric material whose solubility is altered when it is exposed to radiant energy, said film containing about 5 to 8 weight percent of at least one member of the group consisting of diol alkanes having the molecular formula

$$HO-CH_2-(CH_2)_m-CH_2-OH$$

where m is an integer in the range of 2 to 5 and diol ethers having the molecular formula

$$HO-CH_2-(CH_2-O-CH_2)_n-CH_2-OH$$

where n is an integer in the range of 1 to 5,

b. exposing said film to an image in the form of radiant energy until the solubility of the irradiated regions thereof is selectively altered, thereby producing in said film regions of greater solublity and regions of lesser solubility,

c. removing those regions of said film with greater solubility thereby baring the areas of the support surface underlying said regions of greater solubility, while retaining those regions of said film of lesser solubility,

d. coating said bare areas of said support surface and said retained film regions with a composition containing particles of screen-structure material,

e. and then removing at least a portion of said retained film regions and the overcoating composition thereon, while retaining the overcoating composition coated on said support surface.

4,049,453

COMPOSITE DEVELOPER-ETCH COMPOSITION FOR CHROMIUM-PLATED LITHOGRAPHIC PRINTING PLATES

Vincent A. Pagliaro, and Richard G. Walters, both of Racine, Wis., assignors to Printing Developments, Inc., New York, N.Y.

Division of Ser. No. 567,521, April 14, 1975, Pat. No. 4,022,619. This application June 14, 1976, Ser. No. 695,369
Int. Cl.² G03C *5/00, 5/24*
U.S. Cl. 96—36.3 **6 Claims**

1. A single step process for both developing and etching a chromium-plated lithographic printing plate having a light exposed photosensitive resist gum coating thereon which comprises treating said plate with a composite developer-etch composition comprising an aqueous solution of from about 16% to about 22% by weight of aluminum chloride, from about 20% to about 26% by weight of a water-soluble chloride other than aluminum chloride, from about 2.2% to about 4.0% by weight of 85% strength phosphoric acid, from about 0.6% to about 1.4% by weight of an acid-stable water-soluble alkali metal or alkali earth metal hypophosphite reducing agent and the balance water; said composition having a specific gravity at 70° F. of from about 1.4 to about 1.5.

4,049,454

COLOR RADIOGRAPHY

Marcel Karel Van Doorselaer, Gravenwezel, and Romain Henri Bollen, Hove, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Aug. 26, 1975, Ser. No. 607,937
Claims priority, application United Kingdom, Sept. 3, 1974, 38487/74
Int. Cl.² G03C *7/00, 1/76, 1/92*
U.S. Cl. 96—55 **19 Claims**

1. A photographic material, which comprises on both sides of a film support at least one silver halide emulsion layer incorporating at least one colour coupler that is capable of forming with an oxidized p-phenylenediamine type colour developing agent a dye, said colour coupler(s) being present in an amount sufficient to allow by exposure and colour development with a p-phenylene diamine developing agent to obtain a spectral density in the material of at least 2.0 with respect to visual filter light, the aggregate amount of silver halide in said material being equivalent to an amount of silver nitrate in the range of 5 g to 1.3 g of silver nitrate per sq.m., the silver halide grain size distribution being such that at least 50% by weight of the silver halide at both sides of the support has a mean grain size smaller than 0.55 μm.

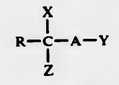
4,049,455

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

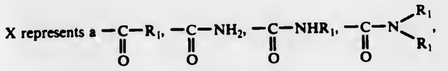
Shoji Kikuchi; Ryosuke Satoh; Takaya Endo, and Katsunori Kato, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed July 26, 1976, Ser. No. 708,298
Claims priority, application Japan, Aug. 15, 1975, 50-99274
Int. Cl.² G03C *1/48, 1/06*
U.S. Cl. 96—76 R **6 Claims**

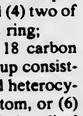
1. A light-sensitive silver halide photographic material having a support and at least a silver halide emulsion layer coated thereon, said material containing a development inhibitor releasing compound which forms substantially a colorless compound and simultaneously releases a development inhibitor on reaction with an oxidation product of a color developing agent and has the following formula:



wherein A represents a sulfur or selenium atom;

X represents a  ,

 ,  ,  , —COOR$_1$, —CN or



radical, wherein R_1 represents (1) a saturated or unsaturated aliphatic radical having up to 18 carbon atoms, (2) an aryl radical selected from the group consisting of phenyl and naphthyl, or (3) a 5–6 membered heterocyclic radical, and (4) two of R_1 can form together a 5–6 membered heterocyclic ring;

R represents (1) an alkyl radical having up to 18 carbon atoms, (2) an aryl radical selected from the group consisting of phenyl and naphthyl, (3) a 5–6 membered heterocyclic radical, (4) a -A-Y radical, (5) a halogen atom, or (6) a -O-W radical, wherein W represents an alkyl radical having up to 5 carbon atoms, an aryl radical selected from the group of a phenyl and naphthyl, a lower acyl radical having up to 5 carbon atoms or a 5–6 membered heterocyclic radical;

Z represents a halogen atom;

Y represents a radical forming a development inhibitor with the sulfur or selenium atom and is selected from the group consisting of a heterocyclic mercapto compound, an aromatic mercapto compound, a heterocyclic seleno compound and an aromatic seleno compound when the thioether or selenoether bond is split off.

4,049,456

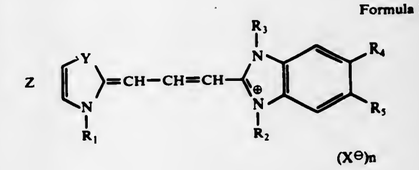
LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Takeo Koitabashi, and Hideo Akamatsu, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

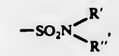
Filed Apr. 7, 1976, Ser. No. 674,599
Claims priority, application Japan, Apr. 14, 1975, 50-45466
Int. Cl.² G03C *1/14*
U.S. Cl. 96—84 R **15 Claims**

1. A light-sensitive silver halide color photographic material comprising a support and a red sensitive layer which comprises, in the layer, at least one of the sensitizing dyes represented by the following formula I, at least one of the sensitizing dyes represented by the following formula II and at least one compound represented by the following formula III:

Formula I:

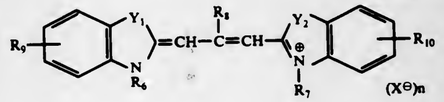


wherein Z is the non-metalic atoms necessary to form a benzene or naphthalene ring which may have substituents selected from the group consisting of lower alkoxy, halogen, lower alkyl, and phenyl; Y is sulfur or selenium; R_1 and R_2 are individually alkyl, sulfoalkyl, carboxyalkyl, alkoxyalkyl, hydroxyalkyl or aralkyl and at least one of R_1 and R_2 is carboxyalkyl or sulfoalkyl; R_3 is alkyl, acyloxyalkyl, aryl or aralkyl; R_4 is hydrogen or halogen; R_5 is halogen, —COOR',



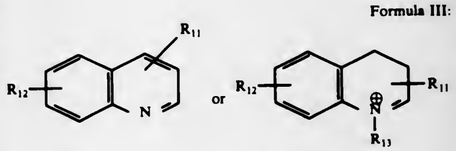
—CF_3 or —SO_2CF_3 (in which R' is alkyl of 1 to 4 carbon atoms); X is an anion and n is 0 or 1, and an inner salt is formed when n is 0;

Formula II:



wherein Y_1 and Y_2 are individually sulfur or selenium; R_6 and R_7 individually represent a substitutent selected from the same group as defined in R_1 and R_2, R_8 is lower alkyl; R_9 and R_{10} are individually hydrogen, halogen, alkyl, alkoxy or aryl; X is an anion and n is 0 or 1, and an inner salt is formed when n is 0;

Formula III:



wherein R_{11} and R_{12} are individually selected from the group consisting of hydrogen, halogen, lower alkyl, alkoxy, aryl, aralkyl, cyano, amino, lower alkyl-substituted amino, carbonylalkyl, sulfoalkyl, acyloxyalkyl or hydroxyalkyl; R_{13} is lower alkyl, aralkyl, hydroxyalkyl, carboxyalkyl, sulfoalkyl or lower alkoxy alkyl; X is an anion; and n is 0 or 1, provided that an inner salt is formed when n is 0.

4,049,457

PHOTOSENSITIVE COMPOSITION OF POLYNITRATE ESTER, AROMATIC AMINES AND ORGANIC ESTERS

John F. Rice, Nashua, N.H.; Albert P. Yundt, Medfield, Mass., and Kenneth J. Quest, Milford, N.H., assignors to Bard Laboratories, Inc., Amherst, N.H.

Continuation of Ser. No. 560,566, March 20, 1975, abandoned. This application Oct. 27, 1976, Ser. No. 735,951
Int. Cl.[2] G03C 1/00, 1/68
U.S. Cl. 96—88 10 Claims

1. A photosensitive imaging system suitable for producing an image in response to electromagnetic radiation, consisting essentially of a molecularly intimate admixture of at least one basic, aromatic amine, an organic acid having a pKa of from about 0.1 to 3.5, and an oxidizer for the basic aromatic amine, said oxidizer consisting essentially of a polymer polynitrate ester, the aromatic amine comprising a compound of the following formula:



wherein R is an aromatic nucleus substituted either directly or by nitrogen or oxygen bonds with members of the group of hydrogen, halogen, alkyl, aryl and alkaryl groups, and X and Y are selected from the group of hydrogen, hydroxyl, provided that X and Y are not both hydroxyl, alkyl, aryl and alkaryl groups, such that said aromatic amine is relatively basic, such basicity not being substantially nullified by salt or amide formation.

4,049,458

PHOTOGRAPHIC SILVER HALIDE MATERIAL CONTAINING 2-EQUIVALENT YELLOW COUPLERS

Immo Boie, Cologne, and Dieter Lowski, Bergheim Erft, both of Germany, assignors to AGFA-Gevaert, A.G., Germany

Continuation-in-part of Ser. No. 476,388, June 5, 1974. This application Aug. 13, 1975, Ser. No. 604,311
Int. Cl.[2] G03C 1/40
U.S. Cl. 96—100 N 4 Claims

1. In a light sensitive color photographic material containing at least one silver halide emulsion layer and a 2-equivalent yellow coupler having an activated open-chain ketomethylene coupler structure in which one hydrogen of the methylene group is substituted by a nitrogen of a heterocyclic group which group is photographically relatively inert except that it is split off during chromogenic development, the improvement according to which the splittable group is a monocyclic pyrrole, 1,2-diazole, 1,3-diazole or 1,2,3-triazole group attached to the coupling position of the yellow coupler.

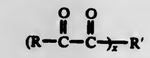
4,049,459

ORGANIC VOLUME PHASE HOLOGRAPHIC RECORDING MEDIUM

Allen Bloom, East Windsor, and Robert Alfred Bartolini, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

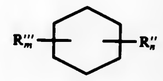
Filed Feb. 26, 1976, Ser. No. 661,521
Int. Cl.[2] G03C 1/68, 1/76
U.S. Cl. 96—115 R 5 Claims

1. In a medium for recording permanent volume phase holograms consisting essentially of a cured transparent polymer containing a soluble α-diketone being capable of intermolecular hydrogen atom abstraction and which has the formula



wherein R and R′ independently are selected from the group consisting of methyl, branched-chain alkyl and cyclic hydrocarbon groups wherein the carbon atoms are part of an aromatic or aliphatic ring and R and R′ together can form part of an aromatic or aliphatic ring; and x is an integer of 1 or 2; and said α-diketone being present in an amount sufficient to cause a change in the index of refraction when illuminated by a spatially modulated coherent light beam having a wavelength corresponding to the absorption band wavelength tail of said α-diketone, the improvement which comprises:

utilizing as said cured transparent polymer a vinyl benzene polyester polymer wherein said polymer is a reaction product of an unsaturated polyester and a vinyl benzene which has the formula



wherein R″ is a vinyl or an alkyl substituted vinyl group, R‴ is a C_{1-5} alkyl group, n is an integer of 1–3, and m is an integer of 0–2; whereby sensitivity is increased.

4,049,460

ROACH BAIT COMPOSITION

David J. Broadbent, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Mar. 25, 1976, Ser. No. 670,477
Int. Cl.[2] A01N 17/14
U.S. Cl. 106—15 R 10 Claims

1. A bait composition comprising an intimate mixture of:

a. from about 20 to 54.75% by weight of a non-repellent binder;

b. from about 79.75 to 45% by weight of a food attractant selected from the group consisting of dry dog food, maltose, brown sugar, or mixtures thereof; and

c. from about 0.25 to 5% by weight of 0,0-diethyl-0-(3,5,6-trichloro-2-pyridyl) phosphorothioate.

4,049,461

UNFIRED, REFRACTORY, BASIC BRICKS AND COMPOSITIONS AND THEIR METHOD OF MANUFACTURE

Günther Lorenz Mortl, Villach; Eckhart Werthmann, and Günther Zoglmeyr, both of Radenthein, all of Austria, assignors to Osterreichisch-Amerikanische Magnesit Aktiengesellschaft, Radenthein, Austria

Filed Mar. 27, 1973, Ser. No. 345,315
Claims priority, application Austria, Mar. 31, 1972, 2814/72
Int. Cl.[2] C04B 35/04, 35/52
U.S. Cl. 106—56 8 Claims

1. A process of producing an unfired, refractory, basic composition consisting essentially of refractory material of either magnesia, dolomite, lime or mixtures thereof, together with a carbonaceous binder and elementary carbon by mixing the refractory material with the carbonaceous binder and the elementary carbon, which comprises using an amount of elementary carbon in dependence on the Fe_2O_3 content of the refractory material so that elementary carbon is used, based on the weight of the refractory material, in an amount of from 0.8 to at most 1.5% if the Fe_2O_3 content is below 0.5%, in an amount of from 1.05 to not over 1.75% if the Fe_2O_3 content is 0.5 to 2.5%, in an amount of from 1.3 to at most 2.0% if the Fe_2O_3 content is above 2.5 to 4.5%, and in an amount of from 1.8 to not more than 2.5% if the Fe_2O_3 is above 4.5%.

4,049,462

CHEMICAL FIXATION OF DESULFURIZATION RESIDUES

Eugene P. Cocozza, Washingtonville, N.Y., assignor to Wehran Engineering Corporation, Middletown, N.Y.

Filed Feb. 12, 1976, Ser. No. 657,424
Int. Cl.[2] C04B 1/00
U.S. Cl. 106—85 35 Claims

1. Method for the chemical fixation of industrial desulfurization residues containing calcium and sulfur which result from the sulfur constituent removal treatment of gaseous effluent of basic manufacturing processes which comprises:

admixing said desulfurization residues with an alkaline argillaceous and calcarious calcination stack dust and adjusting the pH of the resulting admixture with an inorganic acid to a value in the acid pH range below 7 in the presence of sufficient water to provide a mass of workable consistency, and;

drying the pH adjusted mass to constant weight to produce an enviornmentally stable and leach resistant hardened solid product.

4,049,463

METHOD FOR PRODUCING A PURE CERIUM OXIDE

Leo Hafner, Althofen, Austria, assignor to Treibacher Chemische Werke Aktiengesellschaft, Treibach, Austria

Filed July 21, 1976, Ser. No. 707,381
Claims priority, application Austria, July 25, 1975, 5803/75
Int. Cl.[2] C09C 1/00
U.S. Cl. 106—288 B 8 Claims

1. A method of improving the brightness of a cerium oxide, comprising the steps of adding a boron compound to a cerium salt or a mixture of cerium salts selected from the group consisting of cerium oxalate, cerium carbonate and cerium oxide hydrate, and then calcining the mixture in the presence of air, the boron compound being capable of producing B_2O_3 on calcining and being added in an amount to provide, calculated as B_2O_3, 0.05% to 5%, by weight, of the boron compound, based on the weight of cerium oxide.

4,049,464

METHOD OF PRODUCING LOW-CARBON, WHITE HUSK ASH

Alexander Tutsek, Gottingen, and Peter Bartha, Bovenden, both of Germany, assignors to Refratechnik GmbH, Gottingen, Germany

Continuation of Ser. No. 562,098, March 26, 1975, abandoned. This application Sept. 2, 1976, Ser. No. 720,089
Claims priority, application Germany, Apr. 4, 1974, 2416291
Int. Cl.[2] C04B 31/00
U.S. Cl. 106—288 B 7 Claims

1. In a method of producing low-carbon, white rice husk ash suitable for the production of building materials, and more particularly refractory building materials, in which method, for purposes of removing volatile constituents and for purposes of transforming the fixed carbon into a gaseous compound, the rice husks are heated to a temperature below the crystallization temperature of the SiO_2 of the rice husks, whereupon the resultant husk ash is heat-treated at a temperature above the crystallization temperature of the SiO_2 for the purposes of obtaining a uniform SiO_2 crystal structure, the improvement comprising: the first step of heating the rice husks to a first relatively low separation temperature within the range of from 200° to 450° C. in the absence of air, exclusively for separating the volatile constituents that are capable of after-burning; subsequently the second step of heating the rice husks free of volatile constituents to a gasification temperature in the range of from 450° to 550° C. while feeding an oxidizing agent thereto for transforming the fixed carbon into a gaseous phase prior to heat treatment; and the third step of subsequently heating the thus obtained rice husk ash to a heat treatment temperature in the range of from 700° to 800° C.

4,049,465

CONCRETE ADDITIVE AND METHOD OF APPLYING STUCCO CEMENT

Richard E. Dwyer, 173 Adams St., Dedham, Mass. 02026

Filed Apr. 5, 1976, Ser. No. 673,474
Int. Cl.[2] C04B 7/351, 13/26
U.S. Cl. 106—314 6 Claims

1. A concrete additive comprising, by dry volume approximately,

four parts protein, and

one part calcium cyanamide.

4,049,466

LEVULOSE CONTAINING SWEETENING COMPOSITIONS

Raoul Guillaume Phillipe Walon, Brussels, Belgium, assignor to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 303,581, Nov. 3, 1972, abandoned, which is a continuation of Ser. No. 42,587, June 1, 1970, abandoned. This application Jan. 21, 1974, Ser. No. 435,388
Int. Cl.[2] C13K 11/00
U.S. Cl. 127—29 10 Claims

1. A solid sweetening composition comprising from about 10 to about 50 weight percent levulose and from about 50 to about 70 weight percent of a starch hydrolysate having a high degree of water solubility, having a dextrose equivalent between about 1 and about 25 and a polysaccharide content, having a degree of polymerization greater than 4, of at least about 60 weight percent, provided the polysaccharide content of the total composition having a degree of polymerization greater than 4 is at least about 40 weight percent.

4,049,467

METHOD AND COMPOSITIONS FOR REMOVAL OF HARD SURFACE MANGANESE ION-DERIVED DISCOLORATIONS

Fred Kurt Rubin, Leonia, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,521
Int. Cl.[2] B08B 3/08; C02B 5/06
U.S. Cl. 134—2 26 Claims

1. A method for removing manganese ion-derived discolorations from hard surfaces comprising:

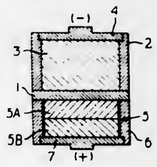
treating said discolored hard surfaces, in the presence of water, with a sufficient amount to remove said discoloration of a hydroxy compound selected from the group consisting of dihydroxy maleic acid, dihydroxy tartaric acid, the alkali metal salts of said acids, and mixtures thereof.

4,049,468

SOLID ELECTROLYTE CELL

Yuzuru Ito, Sendai, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jan. 29, 1975, Ser. No. 545,222
Claims priority, application Japan, Nov. 16, 1973, 48-129014
Int. Cl.[2] H01M 13/00
U.S. Cl. 429—193 6 Claims



1. A solid electrolyte cell comprising, and anodic-active

material, a cathodic-active material and a solid β-alumina electrolyte juxtaposed therebetween and in contact therewith, wherein said cathodic-active material is a compound of the class having water of crystallization included therein.

4,049,469

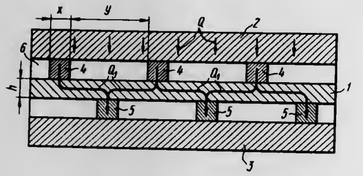
FILM THERMOELEMENT

Nikolai Vasilievich Kolomoets, ulitsa Kastanaevskaya 61, kv. 22; Zinovy Moiseevich Dashevsky, ulitsa Marxa-Engelsa 15, kv. 52; Vladimir Isaakovich Granovsky, ulitsa Bazhova 15, korpus 1, kv. 84; Igor Aronovich Shmidt, Leningradsky prospekt 24, kv. 41, and David Mendelevich Gelfgat, ulitsa Nagornaya 49, korpus 18, kv. 58, all of Moscow, U.S.S.R.

Continuation of Ser. No. 588,780, June 20, 1975, abandoned. This application July 6, 1976, Ser. No. 702,618

Int. Cl.² H01L *35/04*

U.S. Cl. 136—225 **2 Claims**



1. A film thermoelement comprising: branches; a film of a semiconductor material in each said branch; a plurality of contact strips applied onto one side of said film and forming gaps therebetween; another plurality of contact strips applied onto the other side of said film and forming gaps therebetween said another plurality of contact strips being displaced with respect to said first plurality of contact strips; a hot thermal bus in direct contact with said first plurality of contact strips; and a cold thermal bus in direct contact with said other plurality of contact strips.

4,049,470

REFINING NICKEL BASE SUPERALLOYS

Claudia J. Burton, Clinton, N.Y., assignor to Special Metals Corporation, New Hartford, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,297

Int. Cl.² C22F *1/10*

U.S. Cl. 148—3 **6 Claims**

1. In a process for producing a low iron, nickel base superalloy, which process includes the steps of preparing a superalloy melt containing, by weight, at least 60% nickel, no more than 1% iron, and more than 0.0004% selenium; casting said melt; and heat treating the cast metal; the improvement comprising the steps of maintaining said melt in contact with a calcium and/or magnesium bearing substance for a period of time sufficient to allow for reaction between selenium, and calcium and/or magnesium, and a lowering of said melt's selenium content to a level below 0.0003%, said selenium removal being carried out in a substantially oxygen free atmosphere, said reacted selenium accumulating as slag on the surface of said melt, said selenium-bearing slag being separated from said melt prior to solidification of said melt.

4,049,471

TECHNIQUE FOR STABILIZING CONTACT RESISTANCE OF GOLD PLATED ELECTRICAL CONTACTS

Donald Eldridge Koontz, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 26, 1976, Ser. No. 708,553

Int. Cl.² C22F *1/14*

U.S. Cl. 148—13 **5 Claims**



1. Technique for stabilizing the resistance of gold plated electrical contacts which comprises immersing the contact in a boiling oxidizing agent for a time period ranging from 1–3 minutes, the reduction products of the oxidizing agent being water soluble at elevated temperatures.

2. Technique in accordance with claim 1 wherein stabilization is effected prior to thermal aging.

4,049,472

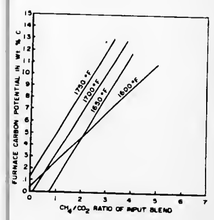
ATMOSPHERE COMPOSITIONS AND METHODS OF USING SAME FOR SURFACE TREATING FERROUS METALS

Edward J. Arndt, Lenhartsville, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 22, 1975, Ser. No. 643,348

Int. Cl.² C21D *1/48*; B23K *35/34*; C01B *2/00*

U.S. Cl. 148—16 **19 Claims**



1. A gaseous mixture prepared at ambient temperature suitable for injecting into a ferrous metal treating furnace maintained at a temperature in excess of 1500° F wherein ferrous metal parts are heated in a furnace atmosphere created by the gas mixture injected into the furnace, the atmosphere being variable to perform a treatment selected from the group consisting of carburizing, decarburizing, neutral hardening and carbonitriding, said mixture consisting essentially of 62 to 98% by volume substantially pure nitrogen;

1.5 to 30% by volume natural gas being substantially methane;

0.2 to 15% by volume substantially pure carbon dioxide;

the natural gas and carbon dioxide being present in a ratio of 0.5 to 15.0 natural gas/carbon dioxide; and

0.0 to 10% by volume substantially pure ammonia.

4,049,473

METHODS FOR CARBURIZING STEEL PARTS

Raymond L. Davis, II, Newtown Square, Pa., and Robert I. Beck, Somerset, N.J., assignors to Airco, Inc., Montvale, N.J.

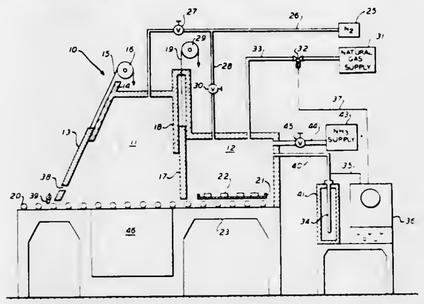
Filed Mar. 11, 1976, Ser. No. 665,844

Int. Cl.² C21D *1/48*

U.S. Cl. 148—16.5 **14 Claims**

1. A method of carburizing steel workpieces in the work

chamber of a vestibule furnace while avoiding explosion hazards without the use of a carrier gas such as endothermic or purified exothermic gas, comprising the steps of heating said work chamber to a temperature of at least 1350° F, introducing an inert gas into the vestibule of said furnace at a flow rate of less than 50% of the carrier gas flow rate recommended for said furnace to maintain the oxygen content in the vestibule below levels at which combustion is supported while supplying a gaseous carbon source to said work chamber without a



carrier gas for carburizing said workpieces without utilization of a carrier gas for said carbon source with the inert gas in said vestibule being effective to increase the residence time of said gaseous carbon source in said work chamber such that a substantial reduction in the consumption of said gaseous carbon source required for carburizing atmospheres is obtained as compared to the consumption of said gaseous carbon source required for carburizing atmospheres when said carrier gas is utilized in carburizing said workpieces.

4,049,474

ALUMINUM-BASED ALLOY

Evegny Dmitrievich Zakharov, Elokhovsky proezd, 5/50, kv. 4a, Moscow; Gennady Lvovich Shneider, ulitsa Marshala Birjuzova, 28, kv. 145, Odintsovo Moskovskoi oblasti; Viktor Dmitrievich Valkov, ulitsa Srednyaya Pervomaiskaya, 19, kv. 145, Moscow; Viktor Pavlovich Kapitonov, ulitsa Marshala Birjuzova, 40, kv. 90, Moscow; Petr Grigorievich Miklyaev, Bobruiskaya ulitsa, 18, korpus 1, kv. 50, Moscow; Vladimir Alexandrovich Lebedev, ulitsa Gamaleya, 2, kv. 41, Moscow; Vera Ivanovna Kholnova, ulitsa Gorkogo, 40, kv. 13, Moscow; Stanislav Alexeevich Shesterikov, Frunzenskaya naberezhnaya, 26, kv. 55, Moscow, and Vasily Mikhailovich Bobrovsky, ulitsa Nedelina, 8, kv. 49, Moscow, all of U.S.S.R.

Filed July 25, 1975, Ser. No. 599,131

Int. Cl.² C22C *21/10*

U.S. Cl. 148—32.5 **2 Claims**

1. A bulky aluminum-based alloy product having high strength and plasticity in short transverse direction and relatively low internal stress, the alloy consisting essentially of, measured as weight percent:

zinc: 6.5 – 7.6;

magnesium: 1.6 – 2.2;

copper: 0.8 – 1.2;

cobalt: 0.05 – 0.2;

zirconium: 0.05 – 0.3; and

the balance comprising aluminum and up to 0.3 weight percent iron, up to 0.3 weight percent silicon, up to 0.05 weight percent chromium, and up to 0.05 weight percent manganese, the bulky product having been subjected to solution treatment with cooling and hardening in boiling water.

4,049,475

$SECo_5$-PERMANENT MAGNET JOINED TO AT LEAST ONE IRON MASS AND METHOD OF FABRICATING SUCH A PERMANENT MAGNET

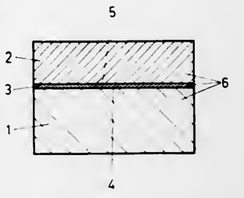
Jaroslaw Houska, Niederrohrdorf, Switzerland, assignor to BBC Brown Boveri & Company, Limited, Baden, Switzerland

Filed May 11, 1976, Ser. No. 685,260

Claims priority, application Switzerland, May 22, 1975, 6571/75

Int. Cl.² H01F *1/02*

U.S. Cl. 148—101 **5 Claims**



1. An $SECo_5$-permanent magnet composite of said permanent magnet bonded to at least one piece of iron wherein there is provided between said permanent magnet and the iron piece a metallic intermediate layer comprising Cu, Ag, Au or alloys thereof, or an alloy selected from the group consisting of: Cu Au (70/30), Cu Au Ni (62/35/3), Cu Au (62.5/37.5), Cu Ag (95/5), Au Ni (82/18), Cu Sn Ag (85/8/7), Cu Au Ag (55/42/3), Au Cu Ag (58/40/2), Cu Ag (60/40), Au Cu Ag (75/20/5), Au Cu (81.5/18.5), Pt Sn (70/30), Ni FeP (56/33/11), Ti Ni (70/30), Cu Si (97/3), Cu Mg (85/15), Ni P (89/11), Cu Ti (76/24), Cu Zn (60/40), Cu Zn Sn (59/39/2), Cu Zn (42/58), Cu Zn (54/46), Ag Cu Zn (5/55/40), Ag Cu Zn (12/48/40), Ag Cu Cd Zn (12/50/5/33), Ag Cu Zn (20/44/36) or mixtures thereof, wherein the numbers in parenthesis refer to the proportions by weight of the respective alloy components and having a thickness equal to or less than 50 μm which is hard-soldered to both the permanent magnet and the iron piece, and wherein SE is an element having an atomic number of 58–71 or mixtures thereof.

4,049,476

METHOD OF MANUFACTURING A SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WHICH INCLUDES AT LEAST ONE V-GROOVE JFET AND ONE BIPOLAR TRANSISTOR

Noboru Horie, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Sept. 29, 1975, Ser. No. 617,641

Claims priority, application Japan, Oct. 4, 1974, 49-113854

Int. Cl.² H01L *21/22, 21/306, 29/76*

U.S. Cl. 148—175 **4 Claims**

1. A method of manufacturing a semiconductor integrated circuit device which includes at least one junction field-effect transistor and at least one bipolar transistor, comprising the steps of:

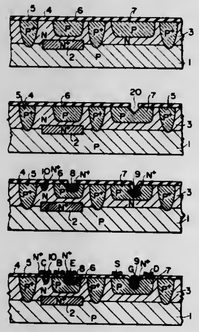
a. preparing a semiconductor substrate, having one principal surface with a plurality of isolated regions of a first conductivity type, extending thereinto from the one principal surface;

b. simultaneously diffusing an impurity of a second conductivity type, opposite said first conductivity type, from said one principal surface into one of said isolated regions and into another of said isolated regions in order to form a first semiconductor region for a base region of said bipolar transistor in the one isolated region and to form a second semiconductor region for a channel region of said junction field-effect transistor in the other isolated region, thereby forming said first and second semiconductor regions having the same depth;

c. etching a selected part of said second semiconductor

region in order to form a groove within said second semiconductor region; and

d. diffusing an impurity of said first conductivity type simultaneously from said one principal surface into a selected part of said first semiconductor region and into a selected part of said second semiconductor region including the groove portion in order to form a third semiconductor



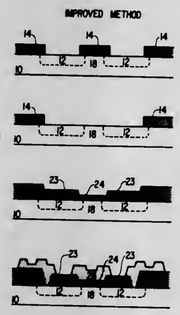
region for an emitter region of said bipolar transistor within said first semiconductor region and to form a fourth semiconductor region for a gate region of said junction field-effect transistor within said second semiconductor region, thereby forming said fourth semiconductor region for the gate region deeper than said third semiconductor region for the emitter region from said one principal surface of the semiconductor substrate.

4,049,477

METHOD FOR FABRICATING A SELF-ALIGNED METAL OXIDE FIELD EFFECT TRANSISTOR

Thomas R. Ligon, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 2, 1976, Ser. No. 663,170
Int. Cl.² H01L *21/22*
U.S. Cl. 148—187 **8 Claims**



1. A method for fabricating a metal oxide semiconductor field effect transistor, the method comprising:

diffusing a phosphorous dopant into both a drain region and a source region of a silicon semiconductor substrate to produce a selected concentration of phosphorous in the drain and source regions;

exposing a channel region of the silicon semiconductor substrate and simultaneously exposing the drain and source regions to an oxidizing medium at a temperature less than 1000° C. to form an oxide layer over the channel region;

forming a gate electrode contacting the oxide layer over said channel region; and

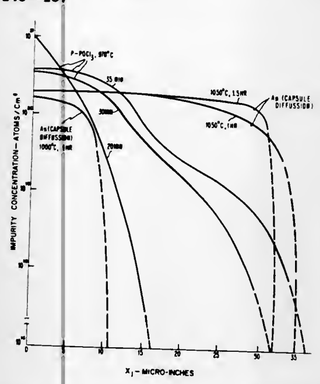
forming openings through the oxide layer to attach electrodes to the drain and source regions.

4,049,478

UTILIZATION OF AN ARSENIC DIFFUSED EMITTER IN THE FABRICATION OF A HIGH PERFORMANCE SEMICONDUCTOR DEVICE

Hitendra N. Ghosh, Poughkeepsie, N.Y.; Madhukar L. Joshi, Essex Junction, Vt., and Tsu-Hsing Yeh, Poughkeepsie, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 142,820, May 12, 1971, abandoned, which is a continuation of Ser. No. 765,327, Oct. 7, 1968, abandoned. This application Dec. 8, 1975, Ser. No. 638,496
Int. Cl.² H01L *21/223, 21/20*
U.S. Cl. 148—187 **4 Claims**



1. The mehtod of forming a high performance PN semiconductor device comprising:

introducing a P-type impurity into a silicon semi-conductor body so as to provide a surface concentration level of greater than about 10^{19} atoms per cm^3;

diffusing arsenic within said P-type region so as to provide a surface concentration level of arsenic of greater than about 10^{20} per cm^3;

continuing said diffusion step until said arsenic forms a substantially square impurity distribution.

4,049,479

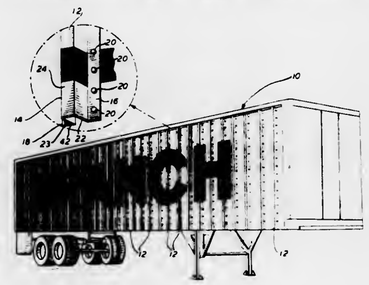
METHOD OF INSTALLING DECALS ON VERTICALLY RIBBED TRAILER BODIES

Stephen J. Siker, 39 Park Ave., Randolph, N.J. 07801

Filed Feb. 28, 1977, Ser. No. 773,056
Int. Cl.² G09F *7/16*
U.S. Cl. 156—71 **3 Claims**

1. Method of applying graphics to a ribbed wall of a trailer body comprising, positioning an undistorted flexible sheet bearing said graphics in a selected location relative to said trailer wall and fixing said flexible sheet in said location by securing a portion of the same to the outer surface of a trailer rib, cutting said sheet to provide a portion which is folded over and affixed to a side wall of said rib, folding over and affixing to another rib side wall another portion of said sheet, cutting

said sheet to provide a separate intermediate portion free of the sheet portion affixed to said rib, and securing the intermediate



portion of the sheet to that portion of the trailer wall which lies between the flange portions of adjacent ribs.

4,049,480

METHOD AND APPARATUS FOR FORMING A JOINT IN A CONFINED SPACE BETWEEN TWO ABUTTING ENDS OF CONDUIT LINERS

C. T. Kutschke, Dallas, Tex., assignor to Nipak, Inc., Dallas, Tex.

Filed Oct. 10, 1975, Ser. No. 621,406
Int. Cl.² B32B *35/00*
U.S. Cl. 156—94 **11 Claims**

1. A method of relining a buried conduit comprising:

excavating to provide access to the conduit;

opening the conduit at the excavation to provide access to the interior of the conduit in two directions;

inserting separate sections of conduit liner through the opening and into the conduit in opposite directions until the ends of the two sections are abutting to thereby reline the conduit;

positioning a cylindrical sleeve with a port through its wall at a point intermediate the ends of said sleeve onto the end of one of said sections;

positioning the ends of said sections in a coaxial abutting arrangement;

overlapping the ends of the sections with adhesive tape to connect the ends of the sections together;

moving the sleeve to a position overlapping the ends of the sections;

connecting the ends of the sleeve to the exterior of the conduit sections by wrapping adhesive tape around the sleeve ends to seal the annular space between the interior of the sleeve and the exterior of the conduit sections;

injecting settable polyurethane foam through the port in the sleeve to fill the annular space between the interior of the sleeve and the exterior of the conduit sections; and

allowing the polyurethane foam to set.

4,049,481

SURFACE TREATMENT METHOD OF COPPERFOIL

Shigeyoshi Morisaki, Ageo, Japan, assignor to Mitsui-Anaconda Electro Copper Sheet Co. Ltd., Tokyo, Japan

Filed June 16, 1976, Ser. No. 696,624
Claims priority, application Japan, Dec. 17, 1975, 50-150365
Int. Cl.² C25D *3/22, 3/30*
U.S. Cl. 156—151 **5 Claims**

1. A method for surface treatment of copper foil used for printed circuit boards comprising the steps of subjecting a nodularized surface of copper foil to electrodeposition thereon of a thin layer of zinc and tin alloy in which the tin content is from about 5 to 20%, and at a thickness of from 0.03μ to 0.15μ, and adhering the alloy-covered surface of the nodularized copper foil thus obtained to a resinous laminate by heat and pressure until a layer of a ternary alloy of zinc, tin and copper is formed between said copper foil and said resinous laminate.

4,049,482

METHOD AND APPARATUS FOR FORMING FLANGES

James W. Webb, 301 Hargett, Clute, Tex. 77531

Filed Feb. 27, 1976, Ser. No. 662,261
Int. Cl.² B65H *81/00*
U.S. Cl. 156—172 **7 Claims**



1. A method for forming flanges of fiberglass reinforced plastic on a tubular member, comprising the steps of:

soaking at least one fiberglass strand with a resin;

mounting the tubular member with a face plate;

rotating the face plate having the tubular member therewith;

directing the resin soaked fiberglass strand to the rotating tubular member;

winding the resin soaked fiberglass strand on the tubular member while the tubular member is rotated to form a plurality of layers;

laterally distributing the resin soaked fiberglass strand on the tubular member between the face plate and an adjustable guide member assembly mounted with the face plate and disposed about the tubular member for forming an annular flange of a predetermined axial cross-sectional width; and

compacting the fiberglass strand on the tubular member by moving a distribution header laterally of the tubular member for providing substantially uniform compacting of the strands and substantially uniform axial cross-sectional height of the flange.

4. An apparatus for forming an annular flange of fiberglass reinforced plastic on a tubular member, comprising:

means for soaking at least one fiberglass strand with a resin;

a face plate for mounting the tubular member therewith;

means for rotating said face plate having the tubular member therewith

a guide member adapted to be positioned about the tubular member and mounted with said face plate;

distribution means with said rotating means for distributing said resin soaked fiberglass strand between said face plate

and said guide member on the tubular member, said distribution means permitting winding and lateral distribution of said resin soaked fiberglass strand on the tubular member while the tubular member is rotated by said rotating means to form an annular flange of a plurality of layers having a predetermined axial cross-sectional width; and

compacting means for compacting said layers of resin soaked fiberglass strands to prevent undesired voids being formed in said plural layers as well as to promote uniform packing density of said fiberglass strand for the annular flange, said compacting means being integral with said distribution means.

4,049,483

PRESSURE SENSITIVE HOT-MELT ADHESIVE SYSTEM

Harry A. Loder, Woodbury, and Charles A. Mathna, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 18, 1976, Ser. No. 742,743

Int. Cl.² B32B *27/06*

U.S. Cl. 156—230 **9 Claims**

5. A hot melt adhesive system having pressure sensitive adhesion at ordinary room temperature conditions which is capable of forming a permanent bond at elevated temperatures comprising a heat-activatable adhesive capable of forming a substantially permanent bond at elevated temperatures having dispersed therein a mixture of discrete tacky elastomeric copolymer microspheres and a tackifying agent which is compatible with said microspheres and capable of increasing the tack thereof, said microspheres consisting essentially of

a. about 90 to about 99.5 percent by weight of one or more oleophilic, water-emulsifiable alkyl acrylate esters, at least one of said esters being selected from the group consisting of iso-octyl acrylate, 4-methyl-2-pentyl acrylate, 2-methylbutyl acrylate, and sec-butyl acrylate and correspondingly

b. about 10 to about 0.5 percent by weight of one or more monomers selected from the group consisting of trimethylamine methacrylimide, trimethylamine p-vinyl benzimide, ammonium acrylate, sodium acrylate, N,N-dimethyl-N-(β-methacryloxyethyl) ammonium propionate betaine, 1,1-dimethyl-1-(2-hydroxypropyl) amine methacrylimide, 4,4,9-trimethyl-4-azonia-7-oxo-8-oxa-9-decene-1-sulphonate, 1,1-dimethyl-1-(2,3-dihydroxypropyl) amine methacrylimide, and maleic anhydride.

9. A process comprising the steps of

a. applying an adhesive coating to a release-coated sheet material, said adhesive coating comprising the adhesive system of claim 5 wherein at least a portion of said microspheres are present at the surface of said adhesive coating;

b. placing an object on the surface of the adhesive coating and burnishing;

c. removing said object, whereby said adhesive coating is transferred to said object;

d. positioning said object on a substrate; and

e. heating said adhesive system to the heat-activation temperature thereof, whereby a substantially permanent bond is effected between said object and said substrate.

4,049,484

VACUUM TRANSFER HEAD AND METHOD OF USE

John Garrick Priest, and Robert Barry Tooth, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

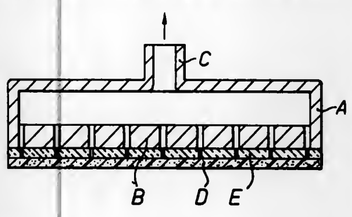
Filed Sept. 8, 1975, Ser. No. 611,245

Claims priority, application United Kingdom, Sept. 13, 1974, 40022/74

Int. Cl.² B29C *17/00*; B25B *11/00*; A47B *97/00*

U.S. Cl. 156—285 **6 Claims**

1. A vacuum head for handling transfers comprising a hollow body having a perforate or porous face, a pipe connection for connecting the hollow body to a source of suction, a layer of perforate or porous heat insulating material applied to the



said face and a layer of porous resilient foam material applied to the layer of heat insulating material.

4,049,485

CORRUGATING MACHINERY

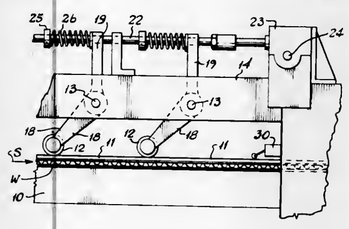
Bjorn Iversen, Wilmslow, England, assignor to Simon Container Machinery Limited, Stockport, England

Filed Feb. 23, 1976, Ser. No. 660,633

Claims priority, application United Kingdom, Mar. 8, 1975, 9742/75

Int. Cl.² B31B *31/00*

U.S. Cl. 156—351 **9 Claims**



1. Apparatus for applying pressure in a controlled manner to a moving web of material, including a plurality of pressure rolls arranged to rest directly or indirectly on said web, means for adjusting the effective weight of said rolls to vary said applied pressure, drive means for said adjusting means, means for sensing the pressure applied by said rolls and providing a signal corresponding to said pressure, means for sensing the speed of movement of said web and providing a signal corresponding to said speed, means for continually comparing said signals from said pressure and speed sensing means and for automatically actuating said drive means accordingly thus to cause the effective weight of said rolls to vary as the speed of the web varies, means for varying the rate at which said effective weight may vary, and means for preselecting an initial positive or negative constant factor of said effective weight.

4,049,486

RUBBER STRIP GUIDE APPARATUS

Virgil E. Henley, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Filed Oct. 15, 1975, Ser. No. 622,577

Int. Cl.² B29H *17/20, 17/36*

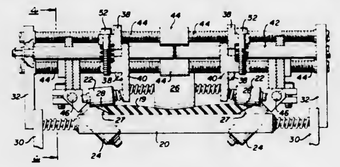
U.S. Cl. 156—405 R **21 Claims**

1. Apparatus suitable for guiding into precise alignment with a tire carcass an uncured, deformable semiplastic rubber strip having at least one tapered side edge surface meeting to form a skived or feathered edge with the upper or lower surface of said strip, examples of said rubber strip being a tire tread strip and a tire sidewall strip, said apparatus comprising:

a. a plurality of support rollers mounted in axially spaced apart and parallel relation for supporting the lower surface of said rubber strip with each support roller being axially movable and resiliently held in the axial direction by springs mounted in compression at the ends of each support roller;

b. a plurality of axially spaced first guide rollers mounted linearly offset from said support rollers, said first guide rollers being mounted for rolling engagement with said tapered side edge surface of said rubber strip adjacent said feathered edge and canted inwardly toward the center of said rubber strip;

c. a plurality of axially spaced second guide rollers mounted linearly offset from the first guide rollers and linearly offset from the support rollers, said second guide rollers being mounted for rolling engagement with said surface of said rubber strip with which said tapered side edge surface



meets to form said feathered edge, said second guide rollers being canted inwardly toward the center of said rubber strip;

d. means for limiting the outward movement of the edge of said rubber strip laterally opposite from said feathered edge;

e. said support rollers being adapted to move axially to accommodate any transverse movement of said rubber strip;

said linearly offset first and second guide rollers thereby limiting the outward movement of said feathered edge of said rubber strip and combining with said support rollers to channel said feathered edge in a weaving motion between said rollers to properly align said rubber strip for application to said tire carcass.

4,049,487

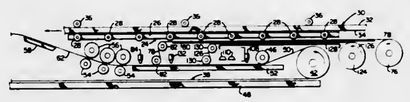
APPARATUS FOR PRODUCING HONEYCOMB PANELING

Bernard P. Kunz, 1609 Cague Drive, NE., Albquerque, N. Mex. 87110

Continuation of Ser. No. 391,678, Aug. 27, 1973, abandoned, which is a continuation-in-part of Ser. No. 166,818, July 28, 1971, abandoned. This application July 21, 1975, Ser. No. 597,409

Int. Cl.² B31D *3/02*

U.S. Cl. 156—436 **1 Claim**



1. Apparatus for producing honeycomb paneling from a continuous length of pre-formed, rigid honeycomb core having open cells therein whose edges form the major faces thereof by applying facing material in its raw state, as a non-rigid web of felted mat material made from glass fibers, to at least the top major face of the core and processing the facing material to its finished state by curing in said apparatus to form a panel skin which is embedded into the core edges, said apparatus comprising:

an elongate, rigid support platen having a planar upper surface and extending generally horizontally from a first upstream end to a second downstream end, the length of said platen generally defining a laminating zone with an entrance station adjacent to the upstream end of said platen and an exit station adjacent to the downstream end;

a honeycomb core transfer unit located upstream of said platen and substantially coplanar therewith and adapted to continuously deliver core material to the laminating zone;

an endless loop belt overlying said platen and trained about upstream and downstream support rollers adjacent to the entrance and exit stations and having an upper pass and a lower pass, said lower pass spaced above and parallel to the platen upper surface;

means to carry and furnish a continuous web of the raw felted facing material to the surface of the upper pass of said belt;

an applicator to deposit liquid resin on the web while it is on the upper pass of the belt;

drive means to cause continuous travel of the core to the entrance station and through the laminating zone and continuous travel of the belt to carry the web around the upstream support roller and along the lower pass thereof into laminating contact with the upper major face of the core while the web is still in its raw state;

means to supply a continuous strip of open mesh woven fabric under tension directly to the side of said web on said belt which is to come into contact with said core adjacent said upstream support roller without said fabric first contacting said upper pass of said belt, said supply means including a reel on a shaft for supporting said fabric and brake means operatively connected to said shaft for applying a frictional force to said shaft to maintain tension on said strip of open mesh woven fabric, to support the lower surface of the web in a planar condition as it comes into contact with the core and to hold it in a planar condition until it is cured in said laminating zone to minimize sagging of the web into the open cells to form an upper panel skin, said fabric being sandwiched between said core and web after lamination; and

means for maintaining the web in pressural contact with the core to cause the web to be imbedded in the edge of the core cells to bond the web and core into a unitary assembly during the period of curing of the web.

4,049,488

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

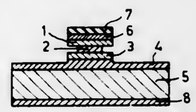
Rudolf Paulus Tijburg, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1976, Ser. No. 675,178

Claims priority, application Netherlands, May 1, 1975, 7505134

Int. Cl.² H01L *21/312*

U.S. Cl. 156—655 **15 Claims**



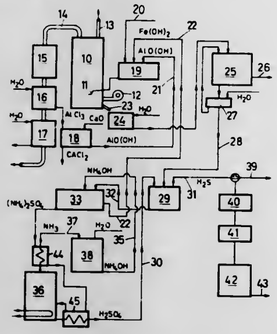
1. A method of manufacturing a semiconductor device having a semiconductor body of $A^{III}B^{V}$ semiconductor material and comprising two adjoining regions of different compositions, one of the regions being etched selectively relative to the other region in a solution of an oxidizing material in water, comprising the steps of providing an etching solution consisting of said oxidizing material and a reducing material which forms a redox system with said oxidizing material, the concentrations of said oxidizing and reducing materials, as well as the pH of the solution, being chosen to be such that the ratio of the relative etching rates of said regions is at least 10:1, and etching said body with said etching solution.

4,049,489

METHOD OF PRODUCING PULP AND BURNING WASTE LIQUOR OBTAINED THEREBY

Anders Vegeby, 1230 NW. 121st St., Seattle, Wash. 98177

Filed Mar. 15, 1976, Ser. No. 666,687
Claims priority, application Sweden, Mar. 19, 1975, 7503106
Int. Cl.² D21C *11/12, 11/04*
U.S. Cl. 162—30 R **6 Claims**



1. In a process for producing pulp, in which a cellulose feed stock is cooked in an aqueous liquor containing sulphur, and the resulting waste liquor is burnt in a furnace in order to recover chemicals which are used for preparing cooking liquor to be recycled in the process, the steps of:

a. introducing an iron compound into the furnace, together with, or in parallel to the waste liquor;

b. reacting said iron compound within the furnace with the sulphur constituent in the burning waste liquor to form a smelt containing an insoluble iron sulphide;

c. removing said smelt from the furnace and dissolving said smelt in an aqueous solution to form a weak liquor for recycling in the process;

d. separating said insoluble sulphide from said solution;

e. reacting said separated iron sulfide with sulphuric acid to produce $FeSO_4$ and H_2S, and separating said $FeSO_4$ and H_2S; and reacting the $FeSO_4$ with NH_4OH to obtain ammonium sulfate, $(NH_4)_2SO_4$, and iron hydroxide, $Fe(OH)_2$, and recycling the latter as the iron compound to be introduced into the furnace.

4,049,490

ELECTRODIALYSIS OF BLEACHING EFFLUENT

Veniamin Petrovich Zaplatin, ulitsa Tupoleva 20a, kv. 34; Vasily Petrovich Svitelsky, ulitsa Voroshilova 20, kv. 104; Lev Ivanovich Galov, ulitsa Armyanskaya 27, kv. 31; Alla Konstantinovna Djukareva, Artillerii pereulok 3, kv. 22; Rozalia Grigorievna Sklyar, Bulvar Lepse 7, kv. 11; Vasily Alexeevich Denisovich, ulitsa Armyanskaya 27, kv. 30; Dmitry Alexeevich Shirokov, ulitsa Raevskogo 5, kv. 2, and Vladimir Alexandrovich Shevchenko, ulitsa Armyanskaya 27, kv. 4, all of Kiev, U.S.S.R.

Filed Feb. 23, 1976, Ser. No. 660,496
Int. Cl.² D21C *9/12, 11/00*
U.S. Cl. 162—37 **3 Claims**

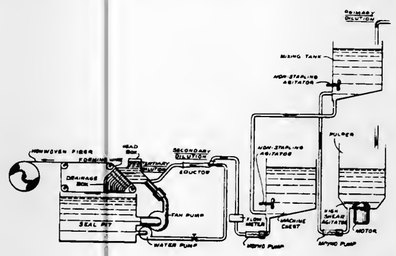
1. In a process for bleaching a cellulose-containing vegetable material which comprises the steps of chlorinating cellulosic material in a chlorination zone followed by ammonia treatment and post bleaching with washing stages between said steps, the improvement which comprises purifying waste waters resulting from said washing stages by subjecting said waste waters to electrodialysis and recovering ammonium chloride from the purified waste waters, treating said cellulosic material with said ammonium chloride prior to the chlorination step and re-using the purified waste waters in the wash stages thereby providing a closed cycle system and eliminating the drainage of polluted wash waters to natural water sources.

4,049,491

VISCOUS DISPERSION FOR FORMING WET-LAID, NON-WOVEN FABRICS

Ralph E. Brandon, Monroe; Charles J. Davis, Goshen; Michael Ring, Warwick, and Roy S. Swenson, Central Valley, all of N.Y., assignors to International Paper Company, New York, N.Y.

Filed Feb. 20, 1975, Ser. No. 551,399
Int. Cl.² D21D *3/00*
U.S. Cl. 162—101 **4 Claims**



1. In a process for diluting a stable, viscous, uniform, air, fiber and water dispersion, which contains about 1% to 10% by volume of entrained air and about 0.03% to 1.0% by weight of staple length fibers, at least about 10% by weight of the fibers having a length to diameter ratio of about 400 to 3000, and which has a nascent viscosity of about 10 to 125 cps., when measured at a shear rate of 30.5 sec.$^{-1}$; with a viscous aqueous diluting medium, which contains about 1% to 10% by volume of entrained air and which has a nascent viscosity of about 5 to 30 cps., when measured at shear rate of 30.5 sec.$^{-1}$; the improvement which comprises:

feeding about one volume of the air, fiber, and water dispersion to the annulus ring of an eductor and feeding about two to twelve volumes of the diluting medium to the center feed of the eductor, just upstream of the vena contracta thereof, whereby the air, fiber and water dispersion is uniformly mixed with and distributed throughout the diluting medium, without undue entangling of the fibers.

4,049,492

SELF-BONDING SYNTHETIC WOOD PULP AND PAPER-LIKE FILMS THEREOF AND METHOD FOR PRODUCTION OF SAME

Donald W. Lare, Hamilton, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 603,328, Aug. 11, 1975, which is a continuation-in-part of Ser. No. 496,095, Aug. 9, 1974, abandoned. This application June 23, 1976, Ser. No. 699,186
Int. Cl.² D21F *11/00*
U.S. Cl. 162—146 **9 Claims**

1. A method for producing synthetic wood pulp comprising refining solid polyolefin fiber in a low molecular weight organic liquid dispersant, miscible both with liquid hydrocarbon and water, under conditions of high shear stress for a period of time sufficient to produce fibrids characterized by having the combination of both film and fiber morphology, then treating said fibrids with a preservative medium comprising a water-soluble surface active agent having hydrophilic properties under conditions of high shear stress sufficient substantially to displace said dispersant and to preserve the film and fiber morphology of said fibrids and transferring said fibrids from said preservative medium into an essentially aqueous medium.

7. In a method for the formation of synthetic paper-like structures comprising forming and then drying a film of an aqueous slurry of polyolefin fibrid, the improvement in which said fibrid comprises partially unfurled fibrids of polyolefin characterized by the combination of both film and fiber morphology said fibrids are produced by refining solid polyolefin fiber in a low molecular weight organic liquid dispersant, miscible both with liquid hydrocarbon and water, under conditions of high shear stress for a period of time sufficient to produce fibrids characterized by having the combination of both film and fiber morphology, then treating said fibrids with a preservative medium comprising a water-soluble surface active agent having hydrophilic properties under conditions of high shear stress sufficient substantially to displace said dispersant and to preserve the film and fiber morphology of said fibrids and transferring said fibrids from said preservative medium into an essentially aqueous medium.

4,049,493

SELF-BONDING SYNTHETIC WOOD PULP AND PAPER-LIKE FILMS THEREOF AND METHOD FOR PRODUCTION OF SAME

Donald W. Lare, Hamilton, Ohio, assignor to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 496,095, Aug. 9, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,328
Int. Cl.² D21F *11/00*
U.S. Cl. 162—157 R **10 Claims**

1. A method for producing synthetic wood pulp comprising refining solid polyolefin fiber in a low molecular weight organic liquid dispersant, miscible both with liquid hydrocarbon and water, under conditions of high shear stress for a period of time sufficient to produce fibrids characterized by having the combination of both film and fiber morphology and treating said fibrids with a preservative medium comprising a water-soluble surface active agent having hydrophilic properties under conditions of high shear stress sufficient substantially to displace said dispersant and to preserve the film and fiber morphology of said fibrids.

4,049,494

VACCINE PRODUCTION PROCESS

L. David Tomei, Buffalo, N.Y., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 4, 1975, Ser. No. 610,472
Int. Cl.² C12K *7/00*; C12B *3/00*; A61K *39/26*
U.S. Cl. 195—1.1 **4 Claims**

1. A process for producing a vaccine comprising maintaining a viable culture of baby hamster kidney cells in a glutamine-free, serum-free, heat-stable medium formulated to meet the nutritional requirements of baby hamster kidney cells and containing only chemically definable ingredients, inoculating said culture with a foot-and-mouth disease virus, cultivating said virus in the cell culture, and recovering a harvest of virus therefrom.

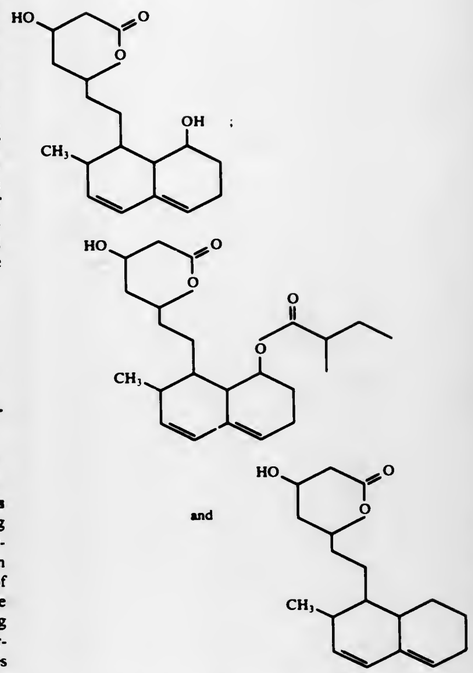
4,049,495

PHYSIOLOGICALLY ACTIVE SUBSTANCES AND FERMENTATIVE PROCESS FOR PRODUCING THE SAME

Akira Endo; Masao Kuroda; Akira Terahara; Yoshio Tsujita, and Chihiro Tamura, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Division of Ser. No. 576,651, May 12, 1975, Pat. No. 3,983,140. This application Dec. 4, 1975, Ser. No. 637,673
Claims priority, application Japan, June 7, 1974, 49-64823
Int. Cl.² C12D *13/02*
U.S. Cl. 195—36 R **5 Claims**

1. A process for the production of substances, ML-236A, ML-236B and ML-236C having the formulae, respectively,



and

which comprises cultivating an ML-236-producing microorganism belonging to the genus *Penicillium* in a culture medium under aerobic condition and recovering said ML-236 substances from the cultured broth.

4,049,496

RAPID SEPARATION OF PLASMA CREATINE KINASE ISOENZYMES

Philip D. Henry, 832 Bricken, Kirkwood, Mo. 63122

Continuation-in-part of Ser. No. 690,556, May 27, 1976, abandoned. This application Dec. 9, 1976, Ser. No. 749,064
Int. Cl.² C07G *7/02*; C12K *1/00*
U.S. Cl. 195—66 R **14 Claims**

1. An in vitro method for effecting rapid separation of the MM and MB creatine kinase isoenzymes in blood plasma or serum and for determining the relative activities of the thus separated isoenzymes comprising the steps of

contacting a blood plasma or serum sample and a buffer of low ionic strength with an ion exchange support comprising porous glass beads having a stationary phase coupled to the surfaces thereof through an intermediate coupling agent;

incubating the resultant mixture to effect MB isoenzyme adsorption by said support;

separating the supernatant liquid fraction containing the MM isoenzyme from said support;

washing the support to effect removal of residual MM;

adding a buffered solution of a strong electrolyte to said support to effect desorption of the MB isoenzyme therefrom;

separating the supernatant liquid fraction containing the MB isoenzyme from said support; and

assaying the MM and MB activity in the respective liquid fractions thus obtained.

4,049,497

PRODUCTION OF ANTIBIOTICS NEOTHRAMYCIN A AND NEOTHRAMYCIN B

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Masa Hamada, Hoya; Shinichi Kondo, Yokohama; Masaaki Ishizuka, and Hiroshi Naganawa, both of Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

Division of Ser. No. 659,319, Feb. 19, 1976, which is a continuation-in-part of Ser. No. 556,985, March 10, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,470

Claims priority, application Japan, Mar. 12, 1974, 49-2767; Oct. 15, 1975, 50-123256

Int. Cl.² C12D *13/9/14*

U.S. Cl. 195—80 R **21 Claims**

1. The process for producing the antibiotic neothramycin complex which comprises culturing a neothramycin-producing strain of Streptomyces having the identifying characteristics of A.T.C.C. 31123 under submerged aerobic conditions in a nutrient medium containing a carbon source and a nitrogenous nutrient until a substantial amount of neothramycin is produced by said organism in said untrient medium.

4,049,498

METHODS FOR THE PREPARATION OF SEMI-SYNTHETIC AMINOCYCLITOL AMINOGLYCOSIDE ANTIBIOTICS

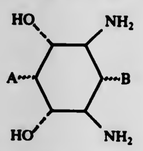
Marvin Joseph Weinstein, East Brunswick; Peter John Lovell Daniels, Cedar Grove; Gerald Howard Wagman, East Brunswick, and Raymond Thomas Testa, Verona, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 476,638, June 5, 1974, Pat. No. 4,011,390, which is a continuation-in-part of Ser. No. 443,052, Feb. 15, 1974, abandoned. This application Dec. 15, 1976, Ser. No. 750,944

Int. Cl.² C12D *9/20*

U.S. Cl. 195—96 **9 Claims**

1. A process for producing Antibiotics Mu-1, Mu-2, Mu-4, Mu-5 and Mu-6 which comprises fermenting *Micromonospora inyoensis* strain 1550F-1G in an aqueous nutrient medium, adding to the fermentation a compound of the formula:



wherein A is a member selected from the group consisting of hydrogen, amino, hydroxy and (C_1–C_8) alkoxy, B is a member selected from the group consisting of hydrogen and hydroxy, wherein the wavy lines connecting A and B to the ring nucleus denote that such groups may be in any of the possible stereoisomeric forms, with the proviso that when B is hydrogen and A is hydroxy, A must be cis to the hydroxyl groups adjacent thereto and with the further proviso that when A is amino, it must be trans to the hydroxy groups adjacent thereto, continuing the fermentation until a composition of matter having substantial antibacterial activity is produced and isolating an antibiotic therefrom.

4,049,499

MICROBIAL MEDIUM HAVING FLUORESCENT GROWTH INDICATOR

Cyrus A. Lepp; Robert D. Mason, both of Painted Post, and William S. Ramsey, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed July 1, 1976, Ser. No. 701,894

Int. Cl.² C12K *1/06, 1/10*

U.S. Cl. 195—100 **9 Claims**

1. A microbial growth medium comprising a semi-solid, gel-like, polar material having incorporated therein 8-anilino-1-naphthalene sulfonic acid or a salt thereof in a quantity sufficient to permit the fluorimetric detection of microbial growth.

4,049,500

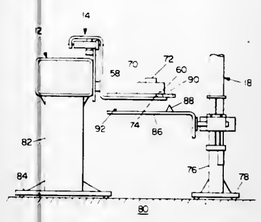
MANUFACTURING MACHINE

Lawrence J. Kamm, 1515 Chatswort Blvd., San Diego, Calif. 92107

Continuation of Ser. No. 468,760, May 10, 1974, Pat. No. 3,998,316. This application Apr. 29, 1976, Ser. No. 681,692

Int. Cl.² B65G *17/46*

U.S. Cl. 198—345 **1 Claim**



1. Apparatus for automatically manipulating a workpiece, comprising, in combination:

conveyor means for transporting a workpiece supporting platen to a work station at which the workpiece is to be manipulated,

first support means for securing the conveyor means to a floor,

second support means independent of the first support means for securing the work station to the floor at a location horizontally offset from the conveyor means,

carriage means for supporting and transporting the platen, the carriage means including a pair of arms which extend under the platen,

means for movably attaching the carriage means to the conveyor means in such a manner that the pair of arms are centilevered towards the work station,

elevator means for lifting the platen vertically from the conveyor means, the elevator means being secured to the second support means such that the elevator means is cantilevered towards the conveyor means so that it can rise between the pair of arms of the carriage means to engage the underside of the platen,

first alignment means for precisely positioning the platen relative to the work station, the first alignment means including at least two precision tapered pins on the elevator means and two mating precision alignment holes on the platen, and

second alignment means for precisely positioning the platen relative to the conveyor means, the second alignment means including at least two additional precision tapered pins on the conveyor means and two additional mating precision alignment holes on the platen.

4,049,501

DEVICE FOR SPOTTING WITHIN TOLERANCE APPARATUS ASSOCIATED WITH THE COKE OVEN CHAMBERS OF A BATTERY

Carl G. Lindgren, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Feb. 11, 1975, Ser. No. 549,076

Int. Cl.² C10B *41/00; G08B 21/00*

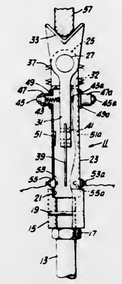
U.S. Cl. 202—239 **4 Claims**

1. Apparatus for aligning a movable powered first structure with a coke oven battery at one or more preselected spotting locations and within a spotting tolerance, comprising:

a. an alignment bar mounted in a selected location on said coke oven battery;

b. a support rod mounted to said movable powered first structure and carrying a tubular housing;

c. a feeler arm pivotally mounted to said tubular housing and having a portion extending outwardly thereof and another portion extending inwardly thereof, said outwardly extending portion being adapted to coact with said alignment bar;



d. electrical contactors positioned oppositely in said tubular housing and connected in circuitry with said powered first structure; and

e. means resiliently biasing said feeler arm with respect to said tubular housing.

4,049,502

METHOD OF AND APPARATUS FOR DISTILLING OF LIQUIDS

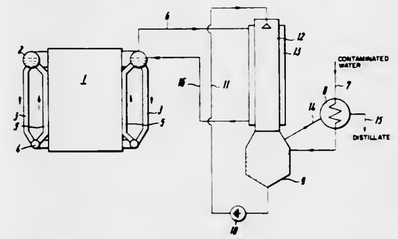
Günther Nagels, Bramstedt, Wesermunde, Germany, assignor to Klockner-Werke AG, Duisburg, Germany

Filed Sept. 13, 1974, Ser. No. 505,950

Claims priority, application Germany, Sept. 14, 1973, 2346276; June 26, 1974, 2430711

Int. Cl.² B01D *3/02*

U.S. Cl. 203—10 **9 Claims**



7. A method of supplying heat to a distillation installation for distilling liquids, especially water and aqueous solutions, comprising the steps of cooling a furnace with cooling water by indirect heat exchange; employing the amount of steam which develops during said cooling step as a heat carrier from the furnace to the distillation installation; sensing deviations of the steam amount from a reference value; introducing into the distillation installation an amount of auxiliary steam which depends on the sensed deviations; recovering at least a part of the heat content of the steam and auxiliary steam by condensing the same by indirect heat exchange in the distillation installation; utilizing the recovered heat content in the distillation installation for evaporating volatile components from the liquids undergoing distillation therein; recirculating a part of the condensate, which is obtained in said heat recovering step, from the distillation installation to the furnace for replenishing the supply of the cooling water; and charging the remainder of the condensate from the distillation installation for use as boiler fed water.

4,049,503

ELECTROCHEMICAL GAS DETECTION

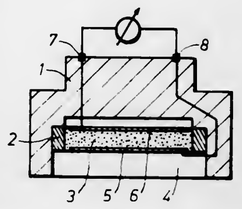
Wolf-Jürgen Becker; Wolfram Breuer, both of Leverkusen, and Jacques Deprez, Frechen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 24, 1975, Ser. No. 598,601

Claims priority, application Germany, July 27, 1974, 2436261

Int. Cl.² G01N *27/46*

U.S. Cl. 204—1 T **54 Claims**



1. In an electrochemical gas detector for measuring traces of a component of a gas mixture comprising a cell comprising two electrodes and an organic electrolyte between and in contact with said electrodes, an outer closing circuit connected to said electrodes for flow of an electric current through the electrolyte and the outer closing circuit, said outer closing circuit including measuring means responsive to flow of current in the outer closing circuit, means for introducing a gas mixture into said cell, said cell being adapted for contacting the gas mixture with the electrolyte for changing the electrochemical equilibrium at one of the electrodes for generation of an electrical current in the outer closing circuit, the improvement which comprises said electrolyte consisting essentially of an anhydrous organic gel.

28. Process of measuring the concentration of a reactable component in a gas which comprises contacting the gas with the electrolyte of a detector cell according to claim 1 for reaction of said component to an extent proportional to the concentration of said component in the gas for generation of electric current in said closing circuit to an extend proportional to the concentration of said component in the gas, and measuring an effect on said current as a measure of the concentration of said component in the gas.

4,049,504

METHOD OF PRODUCING LITHOGRAPHIC PRINTING PLATES

Simon L. Chu, Dobbs Ferry, and Eugene Golda, Monsey, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Feb. 23, 1976, Ser. No. 660,569

Int. Cl.² C25D *11/08, 11/12*

U.S. Cl. 204—38 A **10 Claims**

1. A method of producing a lithographic printing plate which comprises applying a lithographically acceptable photosensitive coating to an aluminum sheet, at least one surface of which sheet has been anodized by treatment thereof with an electric current under anodizing conditions in an aqueous electrolyte comprised of a combination of sulfuric and phosphoric acids as the electrolyte.

4,049,505
PHOTOCONDUCTORS FOR ELECTROSTATIC IMAGING SYSTEMS

Arun K. Chatterji, 5409 Fieldstone Drive, Raleigh, N.C. 27609

Continuation-in-part of Ser. No. 512,332, Oct. 14, 1974, abandoned, which is a division of Ser. No. 443,689, Feb. 19, 1974, which is a division of Ser. No. 259,953, June 5, 1972, Pat. No. 3,792,964. This application Apr. 12, 1976, Ser. No. 676,400

Int. Cl.² C25D *3/66, 5/00*

U.S. Cl. 204—38 R **7 Claims**

1. The method of producing an alloyed photoconductor, comprising

applying a layer of photoconductive material to a substrate, and

diffusing an alloying metal into said layer by an electrolytic process, including

placing the alloying metal and said layer in a heated, molten fluoride salt bath as the anode and cathode, respectively,

applying a DC voltage across said anode and said cathode, and

conducting said electrolytic process in an inert atmosphere.

4,049,506
METHOD FOR COATING BONDING TOOLS AND PRODUCT

Denis K. Gilding, Mountain View, Calif., assignor to Tribotech, Redwood City, Calif.

Division of Ser. No. 502,537, Sept. 3, 1974, Pat. No. 3,986,653. This application June 25, 1976, Ser. No. 699,683

Int. Cl.² C25D *11/00;* B23K *3/02*

U.S. Cl. 204—38 R **7 Claims**

1. A method for bonding a silicone layer to the surface of a microstructural bonding tool for holding a bonding wire against a surface to which the wire is to be bonded during application of energy thereto, which tool comprises an elongate tool body having a wire guide opening and a bonding surface at the end thereof, the method comprising treating the surface of the hard metal substrate to form pendant groups of the general formula, —OM wherein M is hydrogen or a cation having a valence of one, and contacting the treated surface with a silane of the general formula $(R)_nSi(X)_{4-n}$ wherein n varies from 0 to 3, R is an aliphatic or aromatic group and X is a halogen group or alkoxy radical.

4,049,507
ELECTRODEPOSITING METHOD

Shin-Ichi Tokumoto; Eiji Tanaka; Kenji Ogisu, and Tadao Fujita, all of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 15, 1975, Ser. No. 613,513

Claims priority, application Japan, Sept. 18, 1974, 49-107500

Int. Cl.² C25D *3/66*

U.S. Cl. 204—39 **4 Claims**

1. In the method of electrodepositing titanium onto a cathode immersed in a fused salt bath electrolyte by passing an electrolyzing current between an anode also immersed in said electrolyte and said cathode while intermittently interrupting said electrolyzing current and effecting relative movement between said cathode and said electrolyte; and in which the speed of said relative movement, the density of said electrolyzing current, the frequency at which said electrolyzing current is intermittently interrupted and the duty ratio of the periods during which said electrolyzing current is passed and interrupted, respectively, are parameters affecting the electrodeposition of the titanium on said cathode; the improvement of rotating said cathode so as to effect said relative movement, and substantially changing at least said speed of relative movement periodically in a repeating cycle between a first value and a substantially different second value throughout the time during which titanium is being electrodeposited on the cathode.

4,049,508
TIN-NICKEL PLATING

Ronald J. Morrissey, Cranston, R.I., assignor to Technic, Inc., Cranston, R.I.

Continuation-in-part of Ser. No. 549,357, Feb. 12, 1975, abandoned. This application May 12, 1976, Ser. No. 685,654

Int. Cl.² C25D *3/60*

U.S. Cl. 204—43 S **1 Claim**

1. An aqueous electroplating bath for plating an alloy consisting substantially of 65 weight percent tin and 35 weight percent nickel, said bath consisting, per gallon of bath, of

a. ½ gallon of an aqueous solution containing about 20–22 ounces per gallon of said solution of nickel in the form of nickel sulfamate, and

b. ½ gallon of an aqueous solution containing about ½ pound of stannous fluoride and about 1 pound of either ammonium bifluoride or ammonium fluoride,

said plating bath incorporating a buffering agent consisting of ammonium sulfamate which is formed in situ on mixing of solutions A and B, to give a pH in the range of 4.0 to 5.5.

4,049,509
PLATING

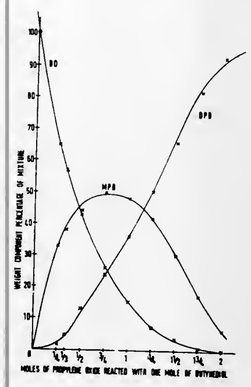
Tony Eugene Such, Wythall; Apoloniusz Wyszynski, Sutton Coldfield, and Barrie Sydney James, Aston, all of England, assignors to W. Canning & Company Limited, Birmingham, England

Continuation-in-part of Ser. No. 500,524, Aug. 26, 1974, abandoned, which is a continuation of Ser. No. 254,426, May 18, 1972, abandoned. This application Mar. 29, 1976, Ser. No. 671,498

Claims priority, application United Kingdom, May 16, 1972, 1379025/72

Int. Cl.² C25D *3/12*

U.S. Cl. 204—49 **12 Claims**



1. A plating additive consisting essentially of:

a. about 45.5 to about 50 parts of monopropoxylated 2-butyne-1, 4diol;

b. about 11.5 to about 33.5 parts of dipropoxylated 2-butyne-1, 4-diol; and

c. about 42.5 to about 17 parts of 2-butyne-1, 4-diol,

all parts by weight based on 100 parts of the three components.

4,049,510
BATHS AND ADDITIVES FOR THE ELECTRODEPOSITION OF BRIGHT ZINC

William E. Roseberg, Strongsville, Ohio, assignor to Columbia Chemical Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 593,310, July 7, 1975, Pat. No. 3,988,219, and Ser. No. 610,251, Sept. 4, 1975, Pat. No. 4,007,098. This application Oct. 26, 1976, Ser. No. 735,420

Int. Cl.² C25D *3/22*

U.S. Cl. 204—55 R **35 Claims**

1. A zinc brightener additive comprising, from about 1 percent to about 99 percent by weight of a polymeric amine selected from the class consisting of;

a linear aliphatic amine polymer prepared by reacting from about 50 percent to about 200 percent of a stoichiometric amount of an epihalohydrin selected from the class consisting of epichlorohydrin and epibromohydrin with a linear aliphatic polyamine selected from the class consisting of a compound having at least two primary amine groups, two secondary amine groups, one primary and one secondary amine group,

said amine groups separated by two through six methylene groups or alkyl substituted methylene groups,

an aminated polyepichlorohydrin prepared by reacting polyepichlorohydrin with an amine selected from the group consisting of secondary aliphatic amines and secondary alicyclic amines at a temperature of from about 110° C to about 170° C, the amount of said amines is such so that between 50 percent to 100 percent of the chloro groups in said polyepichlorohydrin is reacted,

a polyethylenimine having the repeating unit:

$$\left(\text{N}-\text{CH}_2-\text{CH}_2\right)_y$$
(with R)

where R is hydrogen, methyl, ethyl, propyl, isopropyl, hydroxyethyl, 2-hydroxypropyl, 3-hydroxypropyl, 2-aminoethyl, 2-aminopropyl, and 3-aminopropyl, and y is about 10 to about 100, and combinations thereof, and

including from about 99 percent to about 1 percent by weight of a propylene oxide-ethylene oxide block copolymer having a molecular weight of more than 500, said block copolymer prepared by the sequential addition of propylene oxide and ethylene oxide, in either order, to a residue of any organic compound containing a plurality of active hydrogen atoms.

15. An aqueous acid zinc eletroplating bath for producing a bright electrodeposition of zinc, containing zinc ions, comprising;

having dissolved therein from about 0.5 to about 10 grams/-liter of a polymeric amine selected from the class consisting of,

a linear aliphatic amine polymer prepared by reacting from about 50 percent to about 200 percent of a stoichiometric amount of an epihalohydrin selected from the class consisting of epichlorohydrin and epibromohydrin with a linear aliphatic polyamine selected from the class consisting of a compound having at least two primary amine groups, two secondary amine groups, one primary and one secondary amine group, said amine groups separated by two through six methylene groups or alkyl substituted methylene groups,

an aminated polyepichlorohydrin prepared by reacting polyepichlorohydrin with an amine selected from the group consisting of secondary aliphatic amines and secondary alicyclic amines at a temperature of from about 110° C to about 170° C, the amount of said amines is such so that between 50 percent to 100 percent of the chloro groups in said polyepichlorohydrin is reacted,

a polyethylenimine having the repeating unit:

$$\left(\text{N}-\text{CH}_2-\text{CH}_2\right)_y$$
(with R)

where R is hydrogen, methyl, ethyl, propyl, isopropyl, hydroxyethyl, 2-hydroxypropyl, 3-hydroxypropyl, 2-aminoethyl, 2-aminopropyl, and 3-aminopropyl, and y is about 10 to about 100, and combinations thereof, and

including from about 1 to about 10 grams/liter of a propylene oxide-ethylene oxide block copolymer having a molecular weight of more than 500, said copolymer prepared by sequential addition of propylene oxide and ethylene oxide, in either order, to a residue of any organic compound containing a plurality of active hydrogen atoms.

4,049,511
PROTECTIVE MATERIAL MADE OF CORUNDUM CRYSTALS

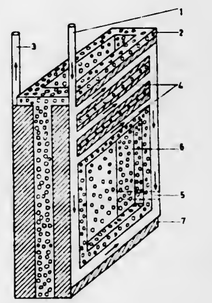
Hanspeter Alder, Flurlingen, and Hans Boving, Corcelles, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed May 18, 1976, Ser. No. 687,636

Claims priority, application Switzerland, May 30, 1975, 6979/75

Int. Cl.² C25C *3/06*

U.S. Cl. 204—67 **14 Claims**



1. In a process for forming a compact crust in the electrolysis of aluminum in a molten electrolyte, for use in protecting a surface portion of an object against both chemical nd electrical reactions, the steps comprising:

forming a molten salt charge comprising an aluminum oxide content in excess of the eutectic composition of said charge;

placing said surface portion in contact with said charge; and

cooling said surface portion sufficiently to precipitate at least part of the aluminum oxide onto said surface portion in the form of corundum crystals, whereby said crust is formed.

4,049,512
CATHODE STRUCTURE FOR ELECTROLYTIC APPARATUS EMPLOYING IMPELLERS

Albert E. Tolle, Jr., 4553 Arrowhead, Baton Rouge, La. 70808

Filed Oct. 31, 1975, Ser. No. 627,599

Int. Cl.² C25D *17/12, 21/10*

U.S. Cl. 204—212 **5 Claims**

1. An apparatus for electrolytically extracting metal from salts in a solution on a continuous basis comprising:

a. tank means containing

i. electrically non-conductive conduit means connected thereto for conveying said solution from holding tank means to said tank means, a portion of said conduit

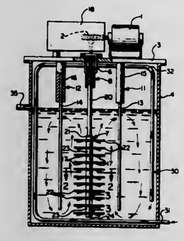
means being located above the surface of the solution contained in said tank means to prevent electrical contact between said tank means and said holding tank means, and

ii. drain outlet means located a distance beneath said portion of said conduit means to prevent said portion of said conduit means from being totally immersed in said solution,

b. an electrically conductive shaft means extending into said solution in said tank means,

c. a plurality of annular spacer means mounted on said shaft means,

d. a plurality of electrically conductive cathode member means rigidly mounted along said shaft means and main-



tained in spaced relation along the length thereof by said spacer means, said cathode member means being mounted so that the principal planes of said cathode member means are perpendicular to said shaft means, said cathode member means having impeller means connected thereto for circulating said solution about said cathode member means,

e. means for rotating said shaft means and said circular cathode member means,

f. at least one elongated anode member means extending into said solution in said tank means adjacent the peripheral edges of said cathode member means, and

g. means for applying a DC voltage between said cathode member means and said anode member means.

4,049,513

TREATMENT OF CELL ANODES

Norman W. Meyers, Islington, Canada, assignor to Erco Industries Limited, Islington, Canada

Filed Mar. 8, 1976, Ser. No. 664,588

Claims priority, application United Kingdom, Mar. 17, 1975, 11048/75

Int. Cl.² C25B *11/10, 1/26;* C21D *1/00;* C22C *5/04*

U.S. Cl. 204—290 F **5 Claims**

1. A method of treatment of an electrode having an anodic platinum-iridium alloy surface which has deteriorated in use in the electrolysis of sodium chloride solution to form sodium chlorate and gaseous by-products to the extent that a volume of oxygen of about 3½ to 4% is present in said gaseous by-products, which comprises subjecting said electrode surface to an elevated temperature of from about 350° to about 550° C for a time period of from about 5 minutes to about 5 days to provide an electrode having an improved platinum-iridium alloy surface which when used in said electrolysis results in a volume of oxygen of about 1 to 2% in said gaseous by-products.

4,049,514

ZINC HYDROMETALLURGICAL PROCESS

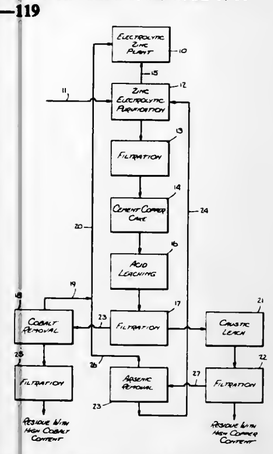
George M. Freeman; John E. Dulson, both of Timmins, and Monica F. Morris, Richmond, all of Canada, assignors to Texasgulf Canada Ltd., Stamford, Conn.

Filed May 13, 1976, Ser. No. 686,064

Claims priority, application Canada, Mar. 11, 1976, 247665

Int. Cl.² C25C *1/16;* C22B *3/00*

U.S. Cl. 204—119 **19 Claims**



1. In a process for electrowinning zinc metal wherein copper, cadmium and cobalt contaminants are removed from the impure electrolyte prior to electrolysis, including the formation of a cement copper cake residue fraction, the improvement comprising:

a. subjecting said cement copper cake to an acid leach followed by an alkali addition to extract substantial amounts of zinc, cadmium and coablt in solution and provide a copper-enriched residue;

b. precipitating cobalt from the extraction solution of step (a);

c. separating the precipitated cobalt from the solution in step (b);

d. subjecting said copper-enriched residue of step (a) to a caustic leach to extract arsenic in solution therefrom and provide a copper-enriched cement copper cake product;

e. reacting the arsenic-containing solution from step (d) with a copper salt to form copper arsenate residue and leave a zinc-containing solution;

f. treating said impure electrolyte with said copper arsenate residue to remove said contaminants.

4,049,515

LASER ISOTOPE SEPARATION BY MULTIPLE PHOTON ABSORPTION

C. Paul Robinson; Stephen D. Rockwood; Reed J. Jensen; John L. Lyman, and Jack P. Aldridge, III, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 22, 1975, Ser. No. 570,924

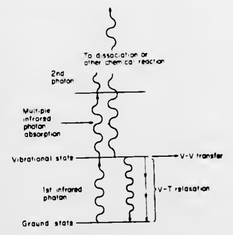
Int. Cl.² B01J *1/10*

U.S. Cl. 204—157.1 R **12 Claims**

1. A method for obtaining elemental values enriched in a particular isotope of said element which comprises

a. obtaining a fluid comprising first molecular species containing two or more isotopes of said element, said first molecular species having, in the presence of sufficiently intense laser radiation, a density of vibrational levels sufficient to allow multiple photon absorption to higher vibrational levels from a first lower vibrational level by absorption of photons of the same energy as can excite said first molecular species to said first lower vibrational level;

b. irradiating said fluid with infrared laser radiation of a frequency which selectively excites to a first lower vibrational level those molecules of said first molecular species containing a particular isotope of said element, said infrared laser radiation having an intensity sufficient to pro-



duce multiple photon absorption from said first lower vibrational level to a plurality of higher vibrational levels thereby producing a vibrational state at which said molecules containing said particular isotope undergo chemical reaction; and

c. separating the reaction products of said chemical reaction from said fluid.

4,049,516

PHOTOCHEMICAL PROCESS FOR THE PRODUCTION OF HALOGENO-ALKANES

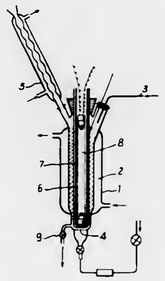
Michel Gellato, Billere; Jean-Louis Seris, and Jeannine Suberloco, both of Pau, all of France, assignors to Societe Nationale Elf Aquitaine, Paris, France

Filed July 7, 1975, Ser. No. 593,182

Claims priority, application France, July 11, 1974, 74.24174

Int. Cl.² B01J *1/10;* B01K *1/00*

U.S. Cl. 204—158 HA **13 Claims**



1. A photochemical process for producing halogeno-alkanes obtained by reacting ethylenic compounds with bromhydric acid, wherein polymers are prevented from forming and from depositing on the lamp-holder, by performing the reaction in the halogeno-alkane to be obtained, and in the presence of an excess amount of bromhydric acid sufficient to saturate the reaction medium.

4,049,517

PROCESS FOR PREPARING CHLORINATED POLYMER OR COPOLYMER OF VINYL CHLORIDE

Terufumi Adachi, and Tatsuro Oda, both of Shinnan, Japan, assignors to Tokuyama Sekisui Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 2, 1975, Ser. No. 573,830

Claims priority, application Japan, May 18, 1974, 49-55794

Int. Cl.² C08F *8/18*

U.S. Cl. 204—159.18 **5 Claims**

1. A process for preparing a chlorinated polymer or copolymer of vinyl chloride which comprises varying the quantity of ultraviolet rays irradiated to a unit amount of the polymer or copolymer in accordance with the progress of the chlorination reaction to control the reaction rate within the range of from 0.75 –0.25 mole/hour/kilogram of the polymer or copolymer until the rate of substitution of chlorine attains at least 1.6 moles/kilogram of the polymer or copolymer, the polymer or copolymer being chlorinated in an aqueous suspension absent any solvent for the polymer or copolymer and under irradiation of ultraviolet rays.

4,049,518

MULTI-STEP RADIATION PROCESS OF PRODUCING POLYOXYMETHYLENES

Akihiko Ito, Takasaki; Akira Shimizu, Tokyo, and Koichiro Hayashi, Neyagawa, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation-in-part of Ser. No. 381,445, July 23, 1973, abandoned, which is a continuation of Ser. No. 144,308, May 17, 1971, abandoned, which is a continuation of Ser. No. 788,637, Jan. 2, 1969, abandoned. This application Aug. 15, 1974, Ser. No. 497,647

Claims priority, application Japan, Feb. 8, 1968, 43-7457

Int. Cl.² C08G *2/02*

U.S. Cl. 204—159.21 **11 Claims**

1. A multi-step process of producing polyoxymethylenes by the solid state polymerization of trioxane, which comprises:

a. irradiating trioxane with 5×10^4 to 2×10^6 R of ionizing radiation at a first temperature at which no polymerization of trioxane takes place.

b. then causing polymerization of the irradiated trioxane by raising said first temperature to a second temperature which is at least 15° C above said first temperature at which polymerization of trioxane takes place, said polymerization being effected in the presence of 0.01 to 10% by weight based on the weight of the trioxane of alkyl acetal and

c. thereafter again irradiating the polymerized product thus obtained with a dose from 5×10^4 to 10^6 R and

d. further polymerizing the irradiated product of (c).

4,049,519

CARBONATE REDUCTION

Walter John Sloan, 214 Jupiter Road, North Star, Newark, Del. 19711

Filed Oct. 6, 1976, Ser. No. 730,086

Int. Cl.² B01D *13/02*

U.S. Cl. 204—180 P **14 Claims**

1. A process for the removal of carbonate ions from solutions, comprising the steps of:

1. providing electrolytic cell having at least three compartments with two cation permselective membranes separating the cell into anodic, cathodic and carbonate removal compartments;

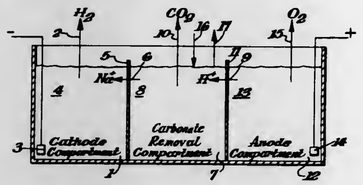
2. adding an acidic solution to the anodic compartment;

3. adding an electrolytically conductive solution to the cathodic compartment of the electrolytic cell;

4. adding the solution containing carbonate ions to the carbonate removal compartment located between the anodic and cathodic compartments of the electrolytic cell;

5. applying energy, as direct electrical current by the use of

the anode and the cathode in the electrical cell, to cause hydrogen ions present in the acidic solution to leave the anodic compartment, pass through the adjacent cation permselective membrane, and enter the carbonate removal compartment holding the solution containing carbonate ions, neutralizing any causticity, and converting carbonate ions to bicarbonate ions which, in turn, are



converted to carbonic acid which decomposes to water and carbon dioxide; and

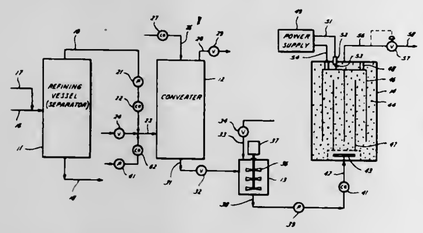
6. concomitantly, causing cations, because of the applied electrical potential, to leave the carbonate removal compartment, enter the cathodic compartment by passing through the second cation permselective membrane, and mix, in the cathodic compartment, with the electrolytically conductive solution.

4,049,520

COLOR IMPROVEMENT PROCESS FOR ORGANIC LIQUID

Oliver Wagner, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Mar. 19, 1976, Ser. No. 668,561
Int. Cl.² B03C *5/00*
U.S. Cl. 204—186 **27 Claims**



1. A process for the hydrogenation and purification of a substance selected from the group consisting of fats, animal oils and vegetable oils comprising:

a. refining said substance to remove gross impurities;

b. forming a mixture of the refined product of step (a), a finely divided hydrogenation catalyst and a finely dispersed solid adsorbent adapted to remove color bodied in an atmosphere substantially devoid of oxygen-containing gases;

c. hydrogenating the refined product of step (a) with hydrogen in the presence of said hydrogenation catalyst and said solid adsorbent, and at elevated temperatures, thereby producing a hydrogenated product carrying the entrained hydrogenation catalyst and the solid adsobent; and

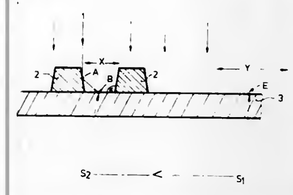
d. in an atmosphere substantially devoid of oxygen-containing gases, subjecting the product of step (c) to electrofiltration for the substantially complete removal of the hydrogenation catalyst and solid adsobent from said hydrogenated product, thereby providing a solids-free, color improved hydrogenated product.

4,049,521

CATHODE SPUTTERING METHOD FOR THE MANUFACTURE OF ETCHED STRUCTURES

Ursula Convertini, Borstel; Heinz Dimigen, Hamburg, and Holger Lüthje, Halstenbek, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 7, 1976, Ser. No. 693,491
Claims priority, application Germany, June 13, 1975, 2526382
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 E **8 Claims**



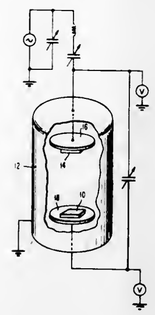
1. A cathode sputtering method for the manufacture of etched structures in substrates covered with etching masks, in which the etching mask leaves exposed areas of different sizes on the substrate and in which said substrates are arranged on a cathode in a sputtering space and a gas discharge is initiated and maintained between the cathode and an anode, characterized in that the ratio of the distance d between anode and substrate to the average free path length of the atoms of the sputtered material, that is d/λ, is at least 1, and is adjusted so that the etching rates in the small and large areas of the layer to be etched are substantially equally large.

4,049,522

LOW COERCIVITY IRON-SILICON MATERIAL, SHIELDS, AND PROCESS

Norman George Ainslie, Croton-on-Hudson; Robert Douglas Hempstead, Yorktown Heights; Swie-In Tan, Bedford Hills, all of N.Y., and Erich Philipp Valstyn, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1976, Ser. No. 662,198
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 M **3 Claims**



1. A substrate having deposited thereon a thin film of iron-silicon made by the process comprising the steps of:

placing a substrate upon the anode of an R.F. sputtering chamber,

placing a target of iron-silicon containing about 4% to 7% silicon upon the cathode of said sputtering chamber,

spacing said cathode and said anode about ½ inch to 2 inches apart,

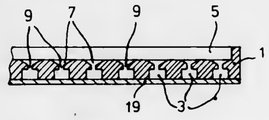
impressing an R.F. potential greater than 1200 volts upon said cathode for sputtering material from said target of iron-silicon at a rate greater than 150A/min onto said substrate to a thickness greater than ¼ micron upon the said substrate, while maintaining a bias between about minus 2.5 and minus 60 volts upon the anode and the substrate to be coated, and maintaining a temperature at the anode above 250° C, in an evacuated atmosphere of argon as a sputtering gas at a pressure above 10 microns, stopping the deposition of iron-silicon upon said substrate by removing potential from said target and said substrate after a layer of iron-silicon has been deposited upon said substrate.

4,049,523

METHOD OF AND DEVICE FOR PROVIDING THIN LAYERS BY CATHODE SPUTTERING

Ralf-Dieter Boehnke, and Waldemar Götze, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 10, 1976, Ser. No. 694,842
Claims priority, application Germany, June 18, 1975, 2527184
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 R **4 Claims**



1. In a method of providing thin layers on a substate by cathode sputtering from a compressed powder target in a vacuum, the improvement wherein any gases adsorbed in the compressed powder target are removed therefrom through surface pores including pores in the bottom surface of the target.

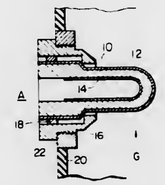
3. A supporting dish for supporting a compressed powder target, the bottom surface and side surfaces of said dish having apertures extending normal to the surfaces, in which the apertures on the surfaces adapted to face the target are formed as funnels which change into neck portions and emerge into parallel extending ducts which are provided on the surfaces of the supporting dish remote from the powder target.

4,049,524

OXYGEN SENSOR WITH NONCATALYTIC ELECTRODE

Kimmochi Togawa, Yokohama; Hiroshi Takao, Kamakura; Kazuo Matoba, and Katsuhiro Kishida, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jur 30, 1976, Ser. No. 701,185
Claims priority, application Japan, July 8, 1975, 50-83088
Int. Cl.² G01N *27/30, 27/46*
U.S. Cl. 204—195 S **10 Claims**



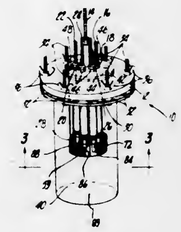
1. In an oxygen sensor for sensing the difference in oxygen concentration between two gases, the sensor having a layer of solid oxygen-ion electrolyte, a first electrode layer formed on one side of the electrolyte layer to be exposed to a gas subject to measurement and a second electrode layer formed on the opposite side of the electrode layer to be exposed to a reference gas, both the first and second electrode layers being permeable to gas, the improvement comprising said first electrode layer being made of a material comprising carbon silicide as a sole conductive component thereof.

4,049,525

CORROSION TEST CELL

Daniel Ronan Dutton, Woodhaven, and Thomas Carl Musolf, Southgate, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 14, 1976, Ser. No. 732,540
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 C **4 Claims**



1. A corrosion test cell assembly suitable for determining the electrochemical corrosion parameters of metals in corrosive liquid environments comprising;

a. an electrically non-conductive vessel for receiving an electrolyte solution,

b. an electrically non-conductive cover member adapted to be secured to said vessel,

c. a plurality of metallic rods supported in said cover member in electrical isolation, both ends of said rods extending axially from said cover member, one end of each rod having terminal connector means thereon and supported within said vessel, the other end of each of said rods being connectable to suitable electrical conducting means, one of said rods being centrally located in said cover member, the remaining rods being arranged symmetrically around said central rod,

d. a reference electrode secured to said terminal means of said centrally located rod and adapted to be supported within an electrolyte solution in said vessel,

e. at least one of said terminal means of one of the remaining rods adapted to secure a test electrode thereon and supportable within an electrolyte solution in said vessel,

f. an auxiliary electrode surrounding said reference electrode and said metal rods,

g. insulating fluid seals encircling said terminal means and adapted to be engaged in fluid tight relationship between said terminal means and electrodes secured thereon,

h. said electrical conducting means providing circuits with said electrodes during said determination of electrochemical corrosion parameters.

4,049,526

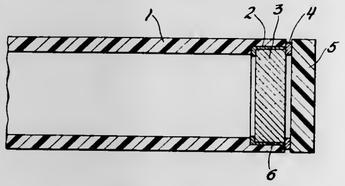
EXTENDED-LIFE ELECTRODE

James I. Maurer, St. Clair Shores, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Sept. 16, 1976, Ser. No. 723,821
Int. Cl.² G01N *27/30*
U.S. Cl. 204—195 M **2 Claims**

1. An extended-life electrode suitable for measuring the concentration of fluoride ion in an aqueous solution comprising an insulating electrode shell having an aperture therein, a fluoride sensitive membrane adapted to cover said aperture, a layer of slow-setting cement located between the membrane

and the perimeter of the shell aperture and adherent to both the membrane and shell and means for isolating the slow-setting



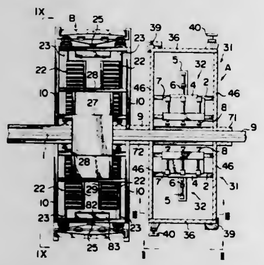
cement layer from the solution comprising a cyanoacrylate glue adhered to the membrane and the shell.

4,049,527

ELECTRODEPOSITED METAL PLATE PEELING-OFF MACHINE

Takeshi Harimoto, and Keisuke Nishiyama, both of Shimonoseki, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Jan. 3, 1977, Ser. No. 756,187
Claims priority, application Japan, Jan. 8, 1976, 51-1879; Jan. 8, 1976, 51-1880
Int. Cl.² C25C *7/08;* C25D *1/20*
U.S. Cl. 204—198 **3 Claims**



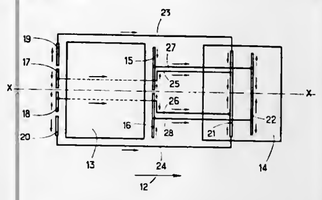
1. In the electrodeposited metal plate peeling off machine equipped with a hammering apparatus, a peeling off apparatus and a transfer means installed throughout the foregoing two apparatuses for the purpose of intermittently transferring a cathode plate composed of the electrodeposited metal plates and the base plate holding said electrodeposited metal plates thereon from the hammering apparatus to the peeling off apparatus, a peeling off machine which is characterized in that said hammering apparatus comprises a hammering means accommodated in a sound insulating box of entirely closed type construction built of sound insulating materials except for the provision of longitudinal slits formed on the confronting two side walls thereof perpendicular to the direction of progress of the transfer means for the purpose of passing cathode plates to be transferred, and said peeling off apparatus is equipped with nozzle pipes having a slit-like nozzle, respectively, fronting on the upper part of the electrodeposited metal plate as a prescribed distance and disposed substantially parallel thereto, coupled with a blower to supply a low-pressure gas to said nozzle pipe continuously.

4,049,528

METHOD AND A DEVICE FOR THE SUPPLY OF ELECTRIC CURRENT TO TRANSVERSE IGNEOUS ELECTROLYSIS TANKS TO MINIMIZE EFFECTS OF MAGNETIC FIELDS

Paul Morel, Le Vesinet, and Jean-Pierre Dugois, Saint Jean-de-Maurienne, both of France, assignors to Aluminum Pechiney, Lyon, France

Filed Mar. 26, 1976, Ser. No. 670,898
Claims priority, application France, Sept. 18, 1975, 75.29181
Int. Cl.² C25C *3/06, 3/00*
U.S. Cl. 204—243 M **7 Claims**



1. A method for supplying electric current to transverse igneous electrolysis tanks which minimizes the effects of magnetic fields and applies to rectangular tanks connected in series for flow of electrical current from cathode of one tank to anode of the next tank comprising on the one hand a crucible of which the bottom constituting the cathode is formed from sealed carbon blocks on metal bars parallel to the small side of the tank, and on the other hand an anode formed from carbonaceous anodic blocks suspended from one or the other of the two metal cross pieces parallel to the large side of the tank, this method being characterized in that one anode cross piece of the downstream tank is supplied with current by conductors connected to the ends of the cathode bars on the downstream side of the downstream tank, the other anode cross piece of the downstream tank being supplied with current by one set of conductors connecting the other anode cross piece with one set of cathode bars from the upstream side and another set of conductors connecting another set of cathode bars from the upstream side of the upstream tank, one set of conductors passing about the outside of the upstream tank while the other set of conductors pass underneath the upstream tank whereby the magnetic fields created by the different supply conductors cancel one another out.

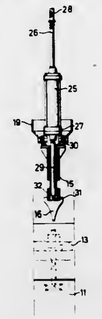
4,049,529

APPARATUS WITH CRUST PIERCING AND GAS FEEDING MEANS FOR USE WITH ELECTROLYTIC FURNACES

Franz Golla, Lunen, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Filed July 9, 1976, Ser. No. 703,947
Claims priority, application Germany, July 10, 1975, 2530831
Int. Cl.² C25C *3/14, 7/00*
U.S. Cl. 204—246 **7 Claims**

1. Apparatus for use with an electrolytic furnace producing aluminium; said apparatus comprising at least one tool-carrying means disposed above a bath of the furnace containing molten aluminium, means for raising and lowering said tool-carrying means to break up the crust formed on the molten aluminium during operation of the furnace, nozzle means for discharging gas carried by said tool-carrying means and means for raising and lowering said nozzle means in relation to the



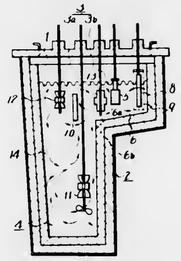
tool carrying means whereby the nozzle means can inject gas into the molten aluminium.

4,049,530

ELECTROLYZER

Shin-Ichi Tokumoto; Eiji Tanaka; Kenji Ogisu, and Masahisa Enomoto, all of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 26, 1975, Ser. No. 617,185
Claims priority, application Japan, Sept. 30, 1974, 49-112537
Int. Cl.² C25D *21/10, 21/02;* C25C *3/00, 7/00*
U.S. Cl. 204—273 **9 Claims**



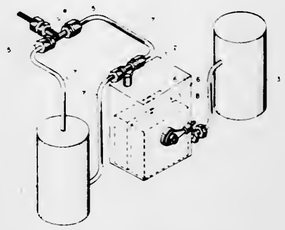
1. An electrolyzer comprising a vessel containing an electrolyte, said vessel having a first portion having a cooling means for maintaining a relatively low temperature in which the electrolyte therein is maintained at a relatively low temperature and a second portion having a heating means for maintaining a relatively high temperature in which the electrolyte therein is maintained at a relatively high temperature, cathode and anode electrodes immersed in the electrolyte in said first portion of the vessel, and a plurality of stirring members disposed in said cooling and electrolyte sections of said first and second portions for producing circular flows of the electrolyte within said first and second portions, respectively, of the vessel and within said vessel as a whole between said first and second portions so as to achieve substantially continuous electrolysis, said vessel being relatively deep at one side and relatively shallow at the other side, said second portion being defined at the bottom of said relatively deep side, said cooling section being defined at the top of said relatively deep side and at said relatively shallow side, and said electrolyte section being defined by said relatively shallow side.

4,049,531

ELECTROLYTIC HYPOCHLORITE GENERATOR

Stephan C. Ban, 9009 Mears St., Fairfax, Va. 22030

Filed July 19, 1976, Ser. No. 706,360
Int. Cl.² C25B *1/26, 15/08*
U.S. Cl. 204—275 **9 Claims**



1. An electrolytic hypochlorite generating system comprising:

a container of metallic chloride salt, an electrolytic cell containing a pair of electrodes,

means to provide a stable trickling flow of water to an upper portion of said container,

means to withdraw a saturated salt solution from lower end of said container,

means to mix a second trickling flow of water with said solution and drip the mixture into said electrolytic cell,

means to supply electrical power to said eletrodes including electrical connectors distinct from said electrodes and formed of carbon impregnated with a water repellant material, and

means to withdraw a hypochlorite solution from a lower portion of said electrolytic cell.

4,049,532

ELECTRODES FOR ELECTROCHEMICAL PROCESSES

Lucien Clerbois, Vilvoorde; Louis Degueldre, Brussels, both of Belgium; Christian Biver, Hagen, Luxembourg; Albert Degols, Berg, and Yves Gobillon, Brussels, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Continuation of Ser. No. 258,539, June 1, 1972, abandoned. This application Sept. 23, 1974, Ser. No. 508,391
Claims priority, application Luxembourg, June 2, 1971, 63263; May 4, 1972, 65296
Int. Cl.² C25B *11/10*
U.S. Cl. 204—290 F **12 Claims**

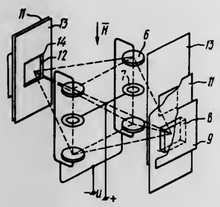
1. In an electrode for electrochemical processes having an electrically conductive and relatively inert support at least the surface layer of which is of titanium or a titanium alloy, and an at least partial coating for said support, said coating being a protective and electrocatalytic layer obtained by heating on said support, in an oxidizing atmosphere at a temperature between 350° and 800° C, a coating composition consisting essentially of at least one thermally decomposable compound of iridium in a liquid vehicle, said iridium compound decomposing during the heating of the coating composition to provide said iridium in a metallic and/or oxide state, and at least one thermally decomposable compound of a non noble element selected from the group consisting of lithium, boron, beryllium and gallium in an atomic ratio iridium/non noble element of 1/4 to 8/1, said thermally decomposable compound of the non noble element decomposing during the heating of the coating composition to an oxide of the non noble element.

4,049,533

DEVICE FOR PRODUCING COATINGS BY MEANS OF ION SPUTTERING

Vyacheslav Mikhailovich Golyanov, ulitsa Rogova, 2, kv. 163, and Alek Platonovich Demidov, ulitsa Rogova, 3, kv. 8, both of Moscow, U.S.S.R.

Filed Sept. 10, 1975, Ser. No. 611,918
Int. Cl.² C23C *15/00*
U.S. Cl. 204—298 **14 Claims**



1. A device for producing films by means of ion sputtering of substances in an ionized gas atmosphere, comprising: a vacuum discharge chamber comprising cooling means, a magnetic field source means, a vacuum evacuation system and an inert gas supply means; at least two pairs of cathodes arranged in the chamber, the geometrical centers of flat sputterable surfaces of the cathodes being equally spaced from each other in each pair of cathodes and being found in parallel plane, each pair of cathodes having an anode equally spaced from the cathodes forming each respective pair, all anodes of all of the pairs of cathodes being located in a plane parallel to the planes in which the cathodes are found at least one holder adapted to hold articles to be coated arranged in the plane in which all of the anodes are located at the point of convergence and overlapping of atomic beams of sputtered material from all of the cathodes; and a power source of all of the cathodes and anodes of the chamber.

11. A device for producing films by means of ion sputtering of substances in an ionized gas atmosphere, comprising: a vacuum discharge chamber comprising cooling means, a magnetic field source means, a vacuum evacuation system and an inert gas supply means; two pairs of cathodes arranged in the chamber, the geometrical centers of flat sputterable surfaces of the cathodes being equally spaced from each other in each pair of cathodes and being found in parallel planes, each pair of cathodes having an anode equally spaced from the cathodes forming each respective pair, all anodes of all of the pairs of cathodes being located in a plane parallel to the planes in which the cathodes are found, the geometrical centers of the cathodes being found at four apexes of the lattice base of an imaginary octahedron; two holders, each of the holders adapted to hold an article located at each of the distal apexes of the octahedron opposite the lattice base; and a power source of all of the cathodes and anodes of the chamber.

4,049,534

ELECTROPHORECTIC APPARATUS FOR ELUTION FROM PREPARATIVE GELS

Israel Posner, Caracas, Venezuela, assignor to E-C Apparatus Corporation, St. Petersburg, Fla.

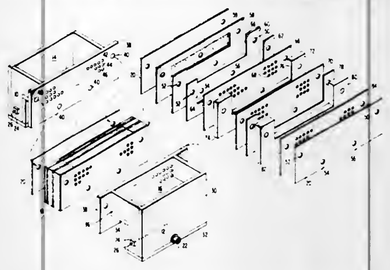
Filed Apr. 12, 1976, Ser. No. 676,178
Int. Cl.² G01N *27/28*
U.S. Cl. 204—299 R **9 Claims**

1. An apparatus for elution electrophoresis of components separated by analytical electrophoresis comprising:

a. a plurality of compartments containing a buffer solution;

b. electrode means disposed within each compartment; and

c. a plurality of recovery cells disposed between said compartments, said cells separated from each other and the compartments by dialysis membranes, each of said recovery cells having three sections, a first section holding buffer solution, a second section containing a gel having



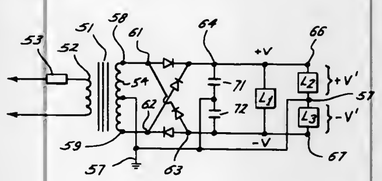
the component to be eluded, and a third section for recovering the elution.

4,049,535

ELECTRICAL TREATER WITH A.C-D.C. ELECTRICAL FIELDS

Joseph D. Winslow, Jr., Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 22, 1975, Ser. No. 643,224
Int. Cl.² C10G *33/02*
U.S. Cl. 204—305 **12 Claims**



1. An electrical treater system for resolving water-in-oil emulsion by grading a.c.-d.c. electrical fields, comprising:

a. vessel means having emulsion inlet means, and oil phase and water phase outlet means;

b. electrode means mounted within said vessel means arranged to be in the flow path of fluid moving between said emulsion inlet means and oil phase outlet means, and said electrode means including first and second sets of electrodes insulated from said vessel means and adapted for simultaneous energization by an external power source to d.c. potentials relative to each other and a.c. potential components above ground for resolving the emulsion into a treated oil phase and a coalesced water phase;

c. said external power source including power transformer means connectable to an a.c. source of current for providing elevated a.c. potentials at end terminals of a secondary in electrical isolation to the a.c. source of current and earth ground, and said secondary having a center tap connected to earth ground with a floating full wave rectifier bridge connected at opposite arm junctions to the end terminals of said secondary and at the remaining arm junctions as positive and negative d.c. source terminals to said first and second sets of electrodes, respectively;

d. said electrode means including a grounded electrode disposed in spaced relations to said first and second sets of electrodes and arranged to be upstream from said sets of electrodes relative to the direction of flow of the emulsion; and

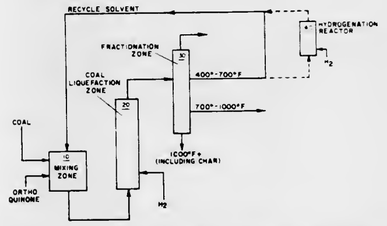
e. control means for maintaining a body of treated oil phase about said first and second sets of electrodes and extending toward said grounded electrode, whereby emulsion within said vessel means is subjected to grading a.c.-d.c. electrical fields during resolution and substantial unbalance in d.c. current demand in said first and second sets of electrodes fails to disrupt the a.c.-d.c. electrical fields.

4,049,536

COAL LIQUEFACTION PROCESS

Karl W. Plumlee, and Lonnie W. Vernon, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed May 17, 1976, Ser. No. 686,813
Int. Cl.² C10G *1/06*
U.S. Cl. 208—10 **15 Claims**



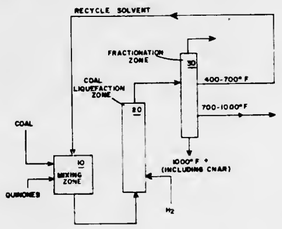
1. A process for liquefying a particulate coal feed to produce useful petroleum-like liquid products, which comprises: (a) admixing said coal feed, a solvent, and an ortho-quinone compound to form a coal liquid slurry, and then (b) contacting said coal liquid slurry with molecular hydrogen in a liquefaction zone at temperature and pressure sufficient to hydroconvert and liquefy the coal to form a liquid product mixture.

4,049,537

COAL LIQUEFACTION PROCESS

Karl W. Plumlee, and Lonnie W. Vernon, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed May 17, 1976, Ser. No. 686,814
Int. Cl.² C10G *1/06*
U.S. Cl. 208—10 **14 Claims**



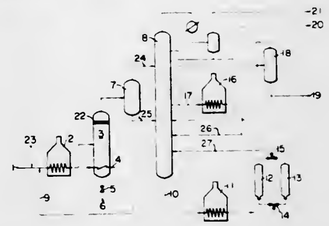
8. A process for liquefying a particulate coal feed to produce useful petroleum-like liquid products, which comprises: (a) admixing said coal feed, a non-donor solvent, and a quinone compound, or admixture of quinone compounds, to form a coal liquid slurry, and then (b) contacting said coal liquid slurry with molecular hydrogen in a liquefaction zone at temperature and pressure sufficient to hydroconvert and liquefy the coal.

4,049,538

PROCESS FOR PRODUCING HIGH-CRYSTALLINE PETROLEUM COKE

Kiyoshige Hayashi, Tokyo; Mikio Nakaniwa, Ohme; Nobuyuki Kobayashi, Ichihara; Minoru Yamamoto, Ichihara, and Yoshihiko Hase, Ichihara, all of Japan, assignors to Maruzen Petrochemical Co. Ltd., Tokyo, Japan

Filed Sept. 15, 1975, Ser. No. 613,541
Claims priority, application Japan, Sept. 25, 1974, 49-110316
Int. Cl.² C10G *9/14*
U.S. Cl. 208—50 **6 Claims**



1. A process for producing a high-crystalline petroleum cole from a petroleum feedstock which comprises the steps of:

heating the petroleum feedstock in a tube heater to a temperature of 430°–520° C under a pressure of 4–20 Kg/cm²G and in the presence of a small proportion of a basic compound selected from the group consisting of hydroxides and carbonates of alkali and alkaline-earth metals;

maintaining the feedstock in the tube heater at that temperature for 30–500 seconds to effect cracking and soaking thereof;

introducing the feedstock thus heat-treated into a high-temperture flashing column, where a flash distillation is effected at high-temperative temperature of 380°–480° C under a pressure of 0–2 Kg/cm²G;

continuously removing non-crystalline substances contained in the feedstock as pitch from the bottom of the flashing column;

fractionating in a fractionating column the distillate from the flashing column into cracked gas, gasoline, gas oil and heavy residue; and

introducing the heavy residue, after heating to a temperature required for the subsequent delayed coking, into a coking drum, where it is subjected to delayed coking at a temperature of 430°–460° C under a pressure of 4–20 Kg/cm² G for at least 20 hours, thereby forming a high-crystalline petroleum coke having a coefficient of thermal expansion in the direction parallel to the extrusion of less than 1.0×10^{-6}° C over 100°–400° C when measured in the form of an extruded graphite artefact thereof.

4,049,539

TWO-STAGE PROCESS FOR UPGRADING NAPHTHA

Tsoung Y. Yan; Tracy J. Huang, and Werner O. Haag, all of Trenton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed June 13, 1975, Ser. No. 586,850
Int. Cl.² C10G *39/00*
U.S. Cl. 208—65 **10 Claims**

1. A process for upgrading a naphtha feed stock comprising the stages of (1) reforming said feed stock at from about 100° to about 300° F by contacting said feed stock with an alumina catalyst containing a platinum group metal selected from Group VIII of the Periodic Table and also containing from about 5 to about 15% by weight of halogen and (2) subjecting the effluent to a further reforming stage employing a platinum-containing alumina catalyst having therein less than about 1% by weight of chlorine, at a temperature of from about 850° to

about 1000° F, at a pressure of from about 50 to about 1000 psig and at an LHSV of from about 0.5 to about 10.

4,049,540

PROCESS FOR THE THERMAL CRACKING OF HEAVY OILS WITH A FLUIDIZED PARTICULATE HEAT CARRIER

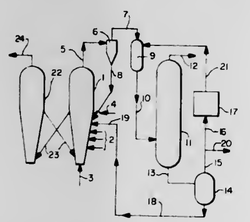
Tetsuo Ueda; Shigeo Yoshioka; Yoshihiko Shohji; Tsunemitsu Tanaka, all of Yokohama; Yukio Kikuchi; Nobuo Fujita, both of Tokyo; Norio Kaneko, and Toshiharu Tanemoto, both of Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co. Ltd. and Mitsubishi Petrochemical Company Limited, Tokyo, both of Japan

Filed Mar. 4, 1976, Ser. No. 663,818

Claims priority, application Japan, Mar. 8, 1975, 50-27599; Mar. 11, 1975, 50-28684

Int. Cl.² C10G 9/32

U.S. Cl. 208—127 **6 Claims**



1. In a process for the thermal cracking of heavy oils with a fluidized bed of a particulate heat carrier wherein (a) a fluidized bed of the particulate heat carrier is formed in a reactor by fluidization with fluids comprising a heavy oil feed and steam; (b) said heavy oil is thermally cracked at a temperature of 700° to 850° C to form a cracked oil product; (c) the cracked oil product together with particulate heat carrier escaping from the reactor is passed through a cyclone to remove a major portion of the particulate heat carrier therefrom; (d) the particulate heat carrier removed from the cracked oil product in the cyclone is returned to the reactor; (e) the cracked oil product containing the remaining portion of said particulate heat carrier is quenched to provide a cracked oil having the remaining particulate heat carrier suspended therein; and (f) said cracked oil is fractionated to provide a relatively high boiling oil containing the particles of the heat carrier suspended therein; the improvement comprising: locating the cyclone for separating the particulate heat carrier from the cracked oil product outside the reactor; returning the portion of the particulate heat carrier removed in the cyclone to the reactor at a position which is below the position where said heavy oil is fed into the reactor; separating said high boiling oil and said remaining portion of particulate heat carrier in a gravitational separator wherein the high boiling oil is separated into two portions, one containing relatively coarse particles of the particulate heat carrier densely suspended therein and the other containing relatively fine particles of the particulate heat carrier suspended therein, and returning said relatively coarse particles of the particulate heat carrier to said fluidized bed.

4,049,541

PROCESS FOR CONTROLLING THE SIZE OF COKE PARTICLES WITHIN A FLUIDIZED BED

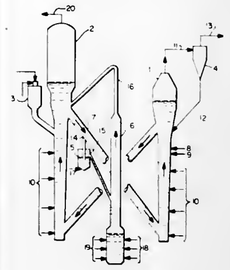
Tetsuo Nakagawa, Fujisawa; Nobuo Matsuda, Kawasaki; Kazumitsu Mitani, Tokyo, and Toshiharu Tanemoto, Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co. Ltd. and Mitsubishi Petrochemical Company Limited, both of Japan

Filed Mar. 5, 1976, Ser. No. 664,389

Claims priority, application Japan, Mar. 11, 1975, 50-28601

Int. Cl.² C10G 9/32

U.S. Cl. 208—127 **4 Claims**



1. In a process for the thermal cracking of heavy residual oil or crude oil with a fluidized bed of a particulate coke heat carrier in a system comprising a fluidized bed reaction zone for cracking said heavy residual oil or crude oil and a heating zone for heating said particulate coke heat carrier and wherein heavy residual oil or crude oil is thermally cracked at a high temperature by means of a fluidized bed consisting of coke particles and steam under conditions which maintain a positive coke balance in the system such that an amount of coke is formed that is greater than an amount of coke lost during operation of said process; particulate coke from the fluidized bed reaction zone is circulated to said heating zone wherein it is heated and said heated particulate coke heater carrier is returned to said fluidized bed reaction zone; the improvement for controlling the coke balance and the size of the particles of said particulate coke heat carrier in a range adapted for continuous operation comprising: withdrawing a portion of the particulate coke heated in the heating zone from a position intermediate said heating zone and said reaction zone; providing a storage zone for receiving said withdrawn particulate coke, the particles of the particulate coke heat carrier being maintained in a fluidized state in the storage zone by means of a gas introduced thereinto; passing a controlled amount of the withdrawn particulate coke to a pneumatic classifier wherein the particles of the particulate coke are classified into relatively coarse particles and relatively fine particles; contacting the relatively coarse particles with an oxygen-containing gas to cause partial combustion thereof thereby reducing the particle size and, thereafter, returning said sizereduced particles with said relatively fine particles and the flue gas resulting from the combustion of the coarse particles to the heating zone.

4,049,542

REDUCTION OF SULFUR FROM HYDROCARBON FEED STOCK CONTAINING OLEFINIC COMPONENT

Kirk R. Gibson, El Cerrito; Thomas R. Hughes, Orinda, and Robert L. Jacobson, Pinole, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 4, 1976, Ser. No. 729,244

Int. Cl.² C10G 23/02

U.S. Cl. 208—213 **10 Claims**

1. A process for reducing the combined-sulfur content of a normally liquid hydrocarbon feedstock boiling below about 300° C and containing an olefinic hydrocarbon component, comprising contacting a mixture of said feedstock and hydrogen gas with a catalyst comprising copper metal, said contacting being effected without materially hydrogenating said olefinic component and under conditions including:

a. a hydrogen partial pressure in the range of from about 0.2 to about 20 atmospheres;

b. a temperature in the range of from about 120° C to 400° C; and

c. at a liquid hourly space velocity in the range of from about 0.1 to 15.

4,049,543

METHOD FOR THE SEPARATION OF A MIXTURE OF PETROLEUM ACIDS FROM PETROLEUM DISTILLATES CONTAINING SUCH A MIXTURE

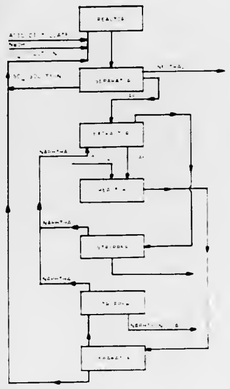
Carl Arne Bergholm, Nynashamn, Sweden, assignor to AB Nynas-Petroleum, Stockholm, Sweden

Filed Mar. 19, 1975, Ser. No. 559,854

Claims priority, application Sweden, Mar. 19, 1974, 7403685

Int. Cl.² C10G 17/00, 19/00

U.S. Cl. 208—263 **15 Claims**



1. The method which comprises

a. providing a liquid petroleum distillate containing a mixture of petroleum acids, at least 10% of the petroleum acids having a molecular weight less than 260 and at least 50% of the acids having a molecular weight of more than 260,

b. treating said petroleum distillate in at least one reaction zone with the combination consisting of:

1. an aqueous solution of sodium hydroxide, and

2. sodium sulfate in an amount equal to 10 – 15% by weight of the aqueous solution of sodium hydroxide,

said treatment being carried out at a temperature of at least 85° C,

to thereby form a reaction mixture containing

a first phase consisting of neutral petroleum distillate,

a second heavier phase consisting of an aqueous mixture containing sodium salts of the petroleum acids, and

a third still heavier phase consisting of an aqueous solution of sodium sulfate, and

c. separating said first, second and third phases from one another.

4,049,544

METHOD AND DEVICE FOR SEPARATING PARTICLES

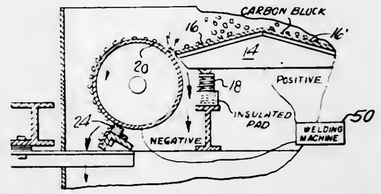
Henry Neil Turner, 95-3rd St. NE., Graysville, Ala. 35073

Continuation-in-part of Ser. No. 539,169, Jan. 7, 1975, abandoned. This application Apr. 28, 1976, Ser. No. 681,173

Int. Cl.² B07B 13/00

U.S. Cl. 209—45 **5 Claims**

1. A method of separating a mixture of conductive particles and non-conductive particles including the steps of feeding said mixture onto an inclined carbon block, vibrating the block providing the block with an electrical potential of one polarity sufficient to weld, feeding these particles over a drum, rotating



the drum, providing the drum with an opposite electrical potential, and scraping the conductive particles off of the drum at a point remote from the area of particle feeding.

4,049,545

CHEMICAL WASTE WATER TREATMENT METHOD

Peter J. Horvath, Cottage Grove, Oreg., assignor to Rocky Carvalho, Salem, Oreg.

Filed July 8, 1976, Ser. No. 703,549

Int. Cl.² C02B 1/20

U.S. Cl. 210—28 **6 Claims**



1. A method of treating waste water, having a pH below 9.0 and containing nitrifying bacteria and in excess of 200 mg/l total solids, selected from the group consisting essentially of municipal sewage and industrial, commercial and agricultural process waters containing organic wastes and mixtures thereof, said method comprising the following sequential steps:

a. mixing an amount of said waste water with an amount of an alkaline coagulant aid effective to obtain a mixture having a pH of at least about 9 but less than 11 and thereby killing said nitrifying bacteria by means of said rise in pH level, said coagulant aid being selected from the group consisting essentially of portland cement, lime, sodium silicate and mixtures thereof;

b. adding to said mixture an acidifying precipitating agent, selected from the group consisting essentially of salts of aluminum, salts of ferric iron, copper sulfate, sulfuric acid and hydrochloric acid, and mixtures thereof, in an amount effective to lower the pH of the mixture by about 1 pH unit and thereby causing suspended solids contained in the mixture to be collected into aggregates;

c. separating said aggregated solids from said mixture;

d. adding to the resultant mixture, remaining after the separation of said aggregated solids, an acidifying precipitating agent selected from said group of precipitating agents in an amount effecting to further lower the pH of the mixture by about 1 pH unit to a pH no lower than about 6 and no higher than about 8.5, and thereby causing suspended solids contained in the mixture to be collected into further aggregates;

e. separating said further aggregated solids from the mixture;

f. adding to the resultant mixture, remaining after said multiple separations of aggregated solids, an amount of an oxidizing and disinfecting agent effective to oxidize at

least a portion of the remaining solids in the mixture and convert them to a filterable state;

g. filtering the mixture so as to separate said oxidized solids from the mixture; and

h. adding to the filtered mixtured an amount of a second oxidizing and disinfecting agent effective to lower the B.O.D. level of the mixture to below 20 mg/l.

4,049,546
DECOLORIZATION OF EFFLUENTS FROM PULP MILLS

Steven L. Rock, Ambler, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 522,653, Nov. 11, 1974, abandoned. This application Mar. 23, 1976, Ser. No. 669,563
Int. Cl.² B01D *15/06*
U.S. Cl. 210—30 R **9 Claims**

1. Process for removing lignin and lignin by-product color bodies from an unbleached kraft pulp mill stream which comprises passing said stream at a pH of 6–8.5 through a mass or bed of macroreticular aliphatic weak anion exchange resin possessing high pk_a value of between about 5.0 and about 10.0 in the free base form, thereby removing the lignin and lignin by-product color bodies on to the resin.

4,049,547
USE OF CHELATING AGENTS FOR ENHANCING THE SETTLING OF SLIMES

Martin Hamer, Skokie, and Othmer F. Batzer, Libertyville, both of Ill., assignors to International Minerals & Chemical Corporation, Libertyville, Ill.

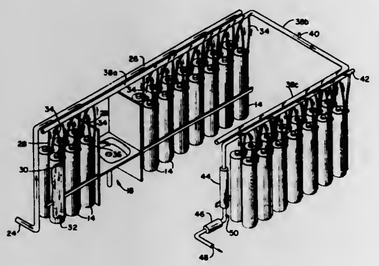
Filed Apr. 8, 1976, Ser. No. 674,799
Int. Cl.² B01D *21/01*
U.S. Cl. 210—54 **13 Claims**

1. A process for settling finely-divided waste slime solids from a phosphate ore processing operation including colloidal argillaceous material from an aqueous suspension thereof which comprises adding to said suspension, in an amount effective to enhance the settling of said solids, at least one chelating agent of the group consisting of malic acid, tartaric acid, nitrilotriacetic acid and N,N,N¹,N¹-ethylenediaminetetraacetic acid, said amount being at least about 20 pounds per ton of suspended solids, and settling the solids from the suspension.

4,049,548
MOBILE DEMINERALIZER

Richard C. Dickerson, 1416 Rust Drive, Virginia Beach, Va. 23455

Filed May 20, 1976, Ser. No. 688,147
Int. Cl.² B01D *29/02*; C02C *1/70*
U.S. Cl. 210—96 R **12 Claims**

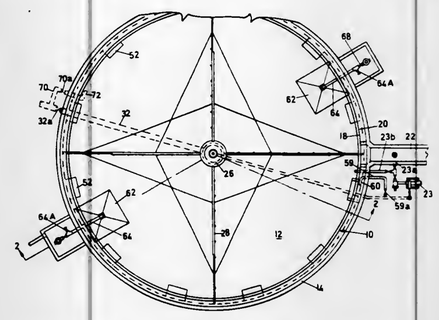


1. A mobile demineralizer, comprising a power driven vehicle, having a driver's area a set of primary demineralizing cylinders arranged together in an adjacent upright parallel configuration in said vehicle, a set of secondary demineralizing cylinders comprising a smaller number than said set of primary cylinders, arranged together in an adjacent upright parallel configuration in said vehicle, said primary and secondary cylinders each having a top inlet and a bottom outlet being individually detachable and containing a mixture of strong acid, strong base demineralizing resin, inlet means adapted to be connected to a source of raw water under pressure for supplying water to the inlets of said primary cylinders in parallel, a carryover pipe, means for connecting the outlets of said prmary cylinders to the inlet of said carryover pipe in parallel, intermediate probe means for producing an electrical output indicative of the concentration of ions in the water located in the carryover pipe, means for connecting the outlet of said carryover pipe to the inlets of said secondary cylinders in parallel, filter means for removing any of the demineralizing resin found in the water, means for connecting the outlets of said secondary cylinders in parallel to the input of said filter means, and discharge outlet means connected to receive the output of said filter means for providing a continuous supply of demineralized water, said continuous supply of demineralized water being maintained during removal and replacement of individual exhausted cylinders.

4,049,549
LIQUID CONDITION AND SETTLING TANKS

Richard Pierpoint Moore, Palonyra, Blackreef Road, Germiston, Transvaal, South Africa

Continuation of Ser. No. 117,017, Feb. 19, 1971, abandoned. This application June 12, 1973, Ser. No. 369,213
Int. Cl.² B01D *21/06*
U.S. Cl. 210—104 **7 Claims**

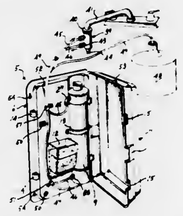


1. A liquid conditioning and settling tank comprising a base, a cylindrical wall surrounding the base, a series of spaced vanes located about the cylindrical wall and projecting radially inwardly from the wall a portion of the way up the wall, means for feeding liquid to be treated into a lower portion of the tank, means to rotate the liquid circumferentially in the tank below the vanes in a predetermined direction, and velocity reducing take-off means for removing from the tank treated liquid at the upper surface of the liquid, the vanes being inclined from the vertical in the direction of rotation of the liquid and having exposed lower edges whereby the rotating liquid impinging on the vanes is deflected downward with substantially no upward component, said means to rotate the liquid comprising an inlet projecting through the wall below the inclined vanes and directed tangentially of the wall.

4,049,550
WATER FILTRATION MODULE

Louis Obidniak, 3115 Ramezay St., Ville de Laval, Quebec, Canada

Filed Sept. 3, 1976, Ser. No. 720,349
Int. Cl.² B01D *35/02*
U.S. Cl. 210—152 **11 Claims**

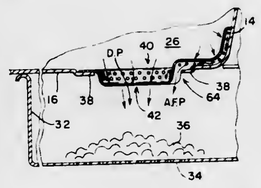


1. A water filtration apparatus for the separation of impurities from a water supply comprising a casing having a base member and a cover member hinged to said base member, a filtration module and a sterilization tank both mounted on said base member, a quick connector adapted for attachment to a raw water tap, the said connector having a raw water inlet and an outlet drain, and a valve controlling the flow of water through the said drain, a pair of hose connections, one hose connection leading from the raw water inlet of said connector to the top of the said filtration module and the other hose connection leading from the lower portion of the filtration unit to the outlet drain of the said connector, and a purified water hose connection leading from the bottom of the filtration unit, the free end thereof adapted to be directed to a purified water receiving vessel and/or to the said sterilization tank, the said sterilization tank adapted to be filled with filtered water and the said quick connector when not connected to a source of raw water is maintained under filtered water in said sterilization tank to thereby prevent the passage of air through the said hose connections to the said filtration unit and to prevent bacteria contamination.

4,049,551
SAFETY DEVICE FOR OPEN RECEPTACLE

Karl G. Otzen, Brookfield, Wis., assignor to Safety-Kleen Corporation, Elgin, Ill.

Filed Mar. 12, 1975, Ser. No. 557,884
Int. Cl.² B01D *35/14*; E03F *5/14*
U.S. Cl. 210—163 **3 Claims**

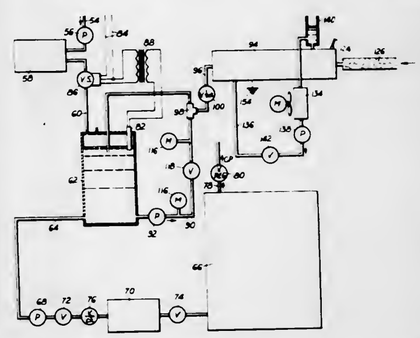


1. A safety device adapted for freely removable reception in the drain outlet opening of a liquid receptacle having a generally horizontally extending bottom wall portion, a drain outlet opening therein, and generally vertically extending side wall portions, said safety device including means for locating said device within said outlet opening, a generally horizontally extending, perforated first wall portion lying parallel to the plane of said drain outlet opening, said first wall portion providing a direct drain path from said receptacle interior, and a second wall portion cooperating with said receptacle walls to define an alternate drain flow path from said receptacle interior, said second wall portion being contoured so as to include a first part attached to and extending generally upwardly from said first wall portion, a second part lying generally parallel to said bottom receptacle wall and a third part lying generally parallel to at least one of said receptacle side walls, said second and third parts of said contoured wall including marginal portions with edges adapted to engage said bottom and side walls respectively, said contoured wall further including a plurality of openings in each of said parts thereof, said openings providing plural paths of communication between said receptacle interior and said alternate drain flow path-defining means.

4,049,552
OZONE GENERATING SYSTEM

John H. Arff, Portland, Oreg., assignor to Oregon Patent Development Company, Portland, Oreg.

Continuation-in-part of Ser. No. 508,400, Sept. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 343,790, March 22, 1973, abandoned. This application Nov. 17, 1975, Ser. No. 632,383
Int. Cl.² C02B *1/38*
U.S. Cl. 210—192 **5 Claims**



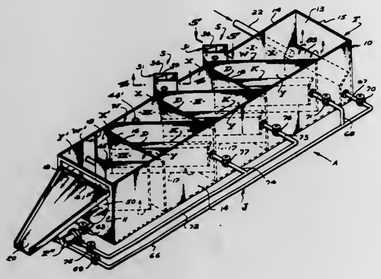
1. An ozone generating system comprising a housing having a closed interior with a removable end wall, a hollow casing in said housing including means to receive a coolant, the interior of said casing being isolated in sealed relation from the interior of said housing, a forced cooling system associated with said inner casing for circulating a coolant therethrough, at least one open-ended tubular portion extending through said inner casing, said tubular portion being formed of electrically conducting metal, at least one glass ozone generating tube having a diameter smaller than said tubular portion, an electrically conducting silver coating on the interior surface of said tube, a conductor leading into said tube for admitting high voltage into said tube, an electrically conducting band secured to said conductor and engageable with the coating around the interior of said tube, said ozone generating tube being removably supported in said tubular portion by axial movement thereof, spacer means holding said ozone generating tube centered in said tubular portion in circumferentially spaced relation thereto whereby said ozone generating tube upon a high voltage input being applied thereto operates with the metal in said tubular portion to provide ozone, the space between said ozone generating tube and said tubular portion communicating with the interior of said housing, and inlet and outlet means in said housing for receiving inlet air and discharging generated ozone, respectively.

4,049,553

WATER POLISHING MEANS FOR REMOVING OIL AND OTHER FLOTSAM FROM WATER

George B. Stebbins, 938 Fairbrook Lane, and James F. Stebbins, 2910 Shakespeare Drive, both of San Marino, Calif. 91108

Filed Apr. 12, 1976, Ser. No. 675,733
Int. Cl.[2] B03D *1/26*
U.S. Cl. 210—195 R 6 Claims



1. Water polishing apparatus, comprising:

an elongate tank with upstream and downstream ends, opposed side walls, and a bottom wall;

an inlet at the upstream end of the tank for introducing a fluid and flotsam mixture into the tank to provide a mean fluid level in the upper portion thereof;

a fluid outlet at the downstream end of the tank;

a plurality of longitudinally spaced, vertical dams extending transversely of the tank and dividing it into longitudinallyspaced zones, said dams having upper, substantially horizontal edges spaced below the mean fluid level in the tank;

a vertical weir in each zone extending from one side wall to the other and dividing the zones into upstream and downstream sections, each of said weirs having an upper portion projecting above the mean fluid level in the tank, and a lower edge spaced above the bottom wall, said weir being angularily positioned relative to the longitudinal axis of the tank and converging with a side wall at an acute angle to provide a collecting corner at the upstream side of the weir for receiving flotsam;

skimming means at at least one of said collecting corners for removing flotsam from the surface of the fluid;

scavenging means at one of the collecting corners downstream of a zone containing skimming means, for removing fluid and flotsam from the fluid surface, and including at least one pipe having an open upper end beneath the upper surface of the fluid in the tank, a fluid storage container, and first pump means between said pipe and the storage container for causing a mixture of air fluid and flotsam to flow from the fluid surface to the storage container; and

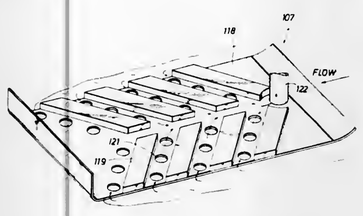
a delivery system between the storage container and at least one of the zones for transporting said mixture to said zone for dispersion therein.

4,049,554

OIL SPILL CLEANUP SYSTEM

Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 492,556, July 29, 1974, Pat. No. 3,966,614, which is a continuation of Ser. No. 292,028, Sept. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 225,987, Feb. 14, 1972, abandoned. This application Mar. 15, 1976, Ser. No. 666,854
Int. Cl.[2] E02B *15/04*
U.S. Cl. 210—242 S 5 Claims



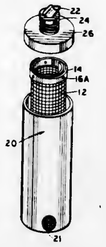
1. Apparatus for removing oil from the surface of a body of water comprising a skimming head of a single floating flexible non-absorbent perforated sheet which conforms with waves and is upturned at least at one end to permit the waves to pass thereunder and allows buoyant forces to percolate oil upward through the perforations in the sheet and flow unassisted along the upper surface of the sheet through flow directing floats to a collection region provided with means to withdraw oil from the upper surface of the sheet.

4,049,555

REUSABLE FILTER APPARATUS

Charley F. Matherne, Harvey, La., assignor to Lawrence Peska Associates, Inc., New York, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,177
Int. Cl.[2] B01D *35/00, 46/04*
U.S. Cl. 210—409 2 Claims



1. Apparatus comprising a reusable flexible screen filter element and its cleaning means, the periphery of said filter element being secured to resilient frame means, said filter being resiliently windable on itself for insertion into said cleaning means, the cleaning means comprising a cylindrical container having an inlet port and an outlet port to pass a cleaning fluid through said filter and to clean said filter after which said filter may be removed and reused, removable cap means on said container for inserting and removing said filter from said container and for sealing said container after said filter is inserted therein, said inlet port comprising an opening in the top of said container, said outlet port comprising an opening in the bottom of said container, said cap comprising a removable closure fitting over said inlet port, chamber means in said closure for holding a cleaning composition, said chamber means comprising a cylindrical side wall extending into a bottom wall having perforations therein, said chamber being placed proximate said inlet port and adapted to hold a cleaning composition for application to said screen filter element when a fluid is passed into said inlet port, through said container and out of said outlet port.

4,049,556

FOAM FIRE EXTINGUISHING AGENT

Hiroaki Tujimoto, Osaka; Tatuya Maki, Nara; Sadao Suganuma, Tokyo, and Taketora Sano, Kawasaki, all of Japan, assignors to Nippon Chemical Industrial Co., Ltd., Tokyo and Yamato Shokaki Co., Ltd., Osaka, both of Japan

Filed Jan. 20, 1976, Ser. No. 650,645
Int. Cl.[2] A62C *1/00*
U.S. Cl. 252—3 9 Claims

1. A foam fire extinguishing agent comprising about 0.3 to about 50% by weight of one or more alkyl acid phosphates and/or one or more salts thereof, about 0.05 to about 10% by weight of one or more amphoteric surface active agents, about 0.001 to 0.3% by weight of one or more fluorocarbon-type surface active agents, and as the balance of said agent an aqueous solution, said one or more amphoteric surfactants being selected from the group consisting of compounds represented by the formula:

$$R'-\underset{\displaystyle X'}{\overset{}{\underset{|}{N}}}-CH_2CH_2COOM.$$

wherein R' is an aliphatic hydrocarbon group containing 4 to 18 carbon atoms; X' is a hydrogen atom, an aliphatic hydrocarbon group containing 1 to 18 carbon atoms or a CH_2CH_2COOM group; and M is a hydrogen atom, a sodium atom, a potassium atom, an NH_4 group, a (C_1-C_6)alkylamino group or a (C_1-C_6)alkanolamino group; and said one or more fluorocarbon-type surfactants being selected from the group consisting of $C_8F_{17}-OC_6H_4SO_3Na$, $C_8F_{17}SO_2N(C_2H_5)CH_2.COOK$, $(C_2F_5)_2(CF_3)C{\cdot}CH=C(CF_3)SO_3NH_4$ and $[C_8F_{17}-SO_2NH(CH_2)_3{\cdot}N(CH_3)_3]I$.

4,049,557

FABRIC CONDITIONING COMPOSITIONS

Harold Eugene Wixon, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 272,388, July 17, 1972, abandoned. This application Oct. 23, 1974, Ser. No. 517,577
Int. Cl.[2] D06M *9/00*
U.S. Cl. 252—8.8 13 Claims

1. A fabric conditioning detergent composition comprising in softening amounts a substituted alkanediamine fabric softener compound or mixture of compounds having the formula:

$$R_1-NH-(CH_2)_x-NH-R_2$$

wherein R_1 contains about 10 to 20 carbon atoms and is selected from the group consisting of 1-hydroxy methyl alkyl and 2-hydroxy alkyl, R_2 is H or R_1, and x is an integer from 2 to 12 and a detergent, said detergent being selected from the group consisting of soap, non-soap anionic detergents, and non-ionic detergents, and alkaline builder salts.

4,049,558

FREE FLOWING PHOSPHATE ESTER COMPOSITIONS FOR POST ADDITION TO DETERGENTS

Hjorth Rasmussen, Copenhagen, Denmark, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 378,882, July 13, 1973, abandoned. This application Apr. 22, 1976, Ser. No. 679,304
Claims priority, application France, July 25, 1972, 72.26687
Int. Cl.[2] C11D *1/34, 1/37, 3/12;* D06M *13/37*
U.S. Cl. 252—8.9 4 Claims

1. A free flowing particulate phosphate ester composition useful as an additive for particulate detergents to impart to them laundry softening properties which comprises a homogeneous mixture of 0.1 to 4 parts of $R^1O(CH_2CH_2O)_mPO(OM)_2$ wherein R^1 is a higher alkyl of 14 to 20 carbon atoms, m is from 1 to 6 and M is an alkali metal or ammonium, 0.1 to 3 parts of $[R^1O(CH_2CH_2O)_m]_2$-POOM, 0.1 to 2 parts of $R^2OPO(OM)_2$ wherein R^2 is alkyl of 6 to 10 carbon atoms and 0.1 to 1 part of $(R^2O)_2POOM$, said mixture of phosphate esters having a melting point and/or softening point lower than 45° C. and from 0.1 to 5 parts of finely divided silica, having a surface area of oven ten square meters per gram with the amount of silica present being from 5 to 100% the total amount of the mentioned phosphate esters.

4,049,559

COMPOSITION FOR SECONDARY AND TERTIARY OIL RECOVERY

Nathaniel Grier, Englewood, N.J.; Richard A. Dybas, Center Square, Pa., and Robert A. Strelitz, Edison, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 620,721, Oct. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 540,620, Jan. 13, 1975, abandoned. This application May 18, 1976, Ser. No. 687,580
Int. Cl.[2] E21B *43/22;* A01N *9/20;* A61L *13/00*
U.S. Cl. 252—8.55 D 4 Claims

1. A premix for incorporation into displacing and driving fluids used for injection into oil-bearing strata during oil production subsequent to primary recovery which comprises at least 0.0005% by weight of 1-[1,5-di-(3,3-dimethylnorborn-2-yl)-3-pentyl]-1,5,9-triazanonane, and acid addition salts thereof, at least .05% by weight of a hydrocarbon solvent soluble surfactant, and a hydrocarbon solvent, fluid at ambient temperature.

4,049,560

DETERGENT ADDITIVES

Alan Michael Dominey, Oxford, England, assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed June 27, 1975, Ser. No. 590,852
Claims priority, application United Kingdom, July 5, 1974, 29969/74
Int. Cl.[2] C10M *1/40*
U.S. Cl. 252—33.3 16 Claims

1. A process for preparing an overbased magnesium detergent having a total base number of about 200 to 250, which is useful in lubricating oil, said process comprising blowing carbon dioxide into a refluxing reaction mixture until reaction substantially ceases, said reaction mixture comprising:

a. 15 to 40 wt. % of a member selected from the group consisting of: sulphurised C_8-C_{60} hydrocarbyl substituted phenol, C_6-C_{60} hydrocarbyl substituted thiophenol, and C_6-C_{60} hydrocarbyl substituted phenol or thiophenol mixed with a sufficient amount of elemental sulfur to sulfurize said phenol or thiophenol;

b. 5–15 wt. % of a member selected from the group consisting of: alkaryl sulphonic acid having a molecular weight of about 300 to 700; alkali metal and alkaline earth metal salts of said sulphonic acid, and alkali metal and alkaline earth metal sulfate salts of the reaction product of sulphuric acid with a member selected from the group con-

sisting of: cracked wax of 20 to 30 carbon atoms, C_8 to C_{25} olefin, and C_8 to C_{25} alcohol;

c. 5–15 wt. % of an alcoholic material selected from the group consisting of: ethylene glycol, diethylene glycol, C_1 to C_5 monohydric alkanol, and C_2 to C_6 alkoxy alkanol;

d. 2–15 wt. % of active magnesium oxide having a surface area of at least 80 square meters/gm;

e. at least 0.1 wt. % of a member selected from the group consisting of: C_1 to C_{18} aliphatic or aromatic, saturated or unsaturated, mono or polycarboxylic acid; anhydrides thereof; and ammonium and Group I and Group II metal salts of said C_1 to C_{18} carboxylic acids; and

f. at least 10 wt. % of a diluent oil.

4,049,561

LUBRICANT COMPOSITIONS

Bruce W. Hottes, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 15, 1976, Ser. No. 677,360
Int. Cl.² C10M *1/48*
U.S. Cl. 252—46.7 **9 Claims**

1. A lubricating composition comprising a major portion of lubricating oil or grease, and a minor portion, from about 0.2% to about 10% by weight of an extreme pressure additive, said additive comprising one part of (A) a partial amide derived from a C_1–C_{20} primary or secondary amine of a di- or tricarboxylic acid of from 18 to 80 carbon atoms, from 0.5 to 2 parts of (B) a thioether having a molecular weight in the range of 100 to 10,000 and a minimum sulfur content of 5% by weight, and from 0.5 to 2 parts of (C) a hydrocarbyl phosphate having a molecular weight in the range of 100 to 10,000.

4,049,562

EXTREME PRESSURE LUBRICANT COMPOSITIONS

Bruce W. Hottes, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 15, 1976, Ser. No. 677,331
Int. Cl.² C10M *1/26, 1/38, 1/46*
U.S. Cl. 252—46.7 **9 Claims**

1. A lubricating composition comprising a major portion of lubricating oil or grease, and a minor portion, from about 0.2% to about 10% by weight of an extreme pressure additive, said additive comprising one part of (A) a partial C_1–C_{10} alcohol ester of a di- or tricarboxylic acid of from 18 to 80 carbon atoms, from 0.5 to 2 parts of (B) a thioether having a molecular weight in the range of 100 to 10,000 and a minimum sulfur content of 5% by weight, and from 0.5 to 2 parts of (C) a hydrocarbyl phosphate having a molecular weight in the range of 100 to 10,000.

4,049,563

JET ENGINE OILS CONTAINING EXTREME PRESSURE ADDITIVE

Merwyn L. Burrous, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 371,198, June 18, 1973, abandoned. This application May 12, 1975, Ser. No. 576,405
Int. Cl.² C10M *1/20*
U.S. Cl. 252—49.9 **4 Claims**

1. A composition of matter comprising a major portion of a synthetic lubricating oil consisting of an ester of a C_4–C_{12} monocarboxylic acid and a polyol selected from pentaerythritol, dipentaerythritol, tripentaerythritol, trimethylol propane, trimethylol methane, trimethylol butane, neopentylglycol, or mixtures thereof and from 4 to 8 weight percent of a soluble methyl phenyl polysiloxane having a kinematic viscosity of 20 to 2,000 centistokes at 25° C.

4. A lubricating oil composition for jet engines consisting essentially of a major portion of a synthetic base oil consisting of mono- and di-pentaerythritol esters of C_5 to C_{10} straight and branched chain hydrocarbon monocarboxylic acid or mixtures thereof, from 4 to 8 weight percent of methyl phenyl silicone having a kinematic viscosity of 75 to 500 centistokes at 25° C, from 0.5 to 5 weight percent of a phosphate antiwear agent, from 0.5 to 5 weight percent of a secondary aryl amine antioxidant and from 0.01 to 0.5 weight percent of 1,4-dihydroxy anthraquinone a metal deactivator.

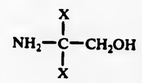
4,049,564

OXAZOLINE DERIVATIVES AS ADDITIVES USEFUL IN OLEAGINOUS COMPOSITIONS

Jack Ryer, East Brunswick; James Zielinski, Somerset; Harold N. Miller, Millington, all of N.J., and Stanley J. Brois, Wantage, England, assignors to Exxon Research & Engineering Co., Linden, N.J.

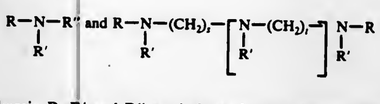
Continuation-in-part of Ser. No. 455,250, March 27, 1974, abandoned, and a continuation-in-part of Ser. No. 530,235, Dec. 6, 1974, abandoned. This application Jan. 23, 1975, Ser. No. 543,240
Int. Cl.² C10M *1/32*
U.S. Cl. 252—51.5 A **10 Claims**

1. A composition comprising a major amount of a liquid hydrocarbon of the class consisting essentially of fuels and lubricating oils and a minor but dispersing amount of a liquid hydrocarbon soluble derivative of the oxazoline reaction product of a substantially saturated aliphatic hydrocarbyl substituted C_4–C_{10} mono-unsaturated dicarboxylic acid material selected from the group consisting of acids, acid anhydrides and esters having at least about 8 carbon atoms in said hydrocarbyl group with from at least 1 to about 2 mole equivalent, per moel equivalent of said dicarboxylic acid material, of a 2,2-disubstituted-2-amino-1-alkanol having 2 to 3 hydroxy groups and containing a total of 4 to 8 carbons, and which is represented by the formula:



wherein X is an alkyl or hydroxyl alkyl group, with at least one of the X substituents being a hydroxyl alkyl group of the structure $-(CH_2)_nOH$ wherein n is 1 to 3, said reaction conditions being at a temperature of from about 140° to 240° C. for from ½ to 24 hours whereby at least one carboxylic acyl group is converted into an oxazoline ring, said reaction product being derivatized by reaction with a member of the group consisting of:

a. an aliphatic, saturated amine containing 2 to 60 carbon atoms and 1 to 12 nitrogen atoms and of the general formulae:



wherein R, R′ and R″ are independently selected from the group consisting of hydrogen; C_1 to C_{12} straight or branched chain alkyl radicals; C_1 to C_{12} alkoxy substituted C_2 to C_6 alkylene radicals; C_2 to C_{12} hydroxy or amino alkylene radicals; and C_1 to C_{12} alkylamino substituted C_2 to C_6 alkylene radicals; s is 2 to 6 and, t is 0 to 10; and,

b. a polyol selected from the group consisting of diethylene glycol, pentaerythritol, trimethylol propane, ethylene glycol, propylene glycol, glycol ethyl ether and diethylene glycol ethyl ether.

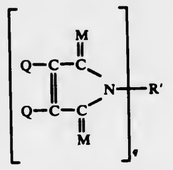
4,049,565

SUBSTITUTED MALEIMIDE LUBRICANT ADDITIVES AND LUBRICANT COMPOSITIONS MADE THEREWITH

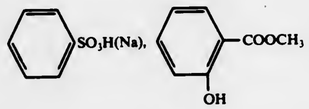
John C. Nnadi, Lagos, Nigeria, and Phillip S. Landis, Woodbury, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 31, 1975, Ser. No. 627,726
Int. Cl.² C10M *1/32*
U.S. Cl. 252—51.5 A **18 Claims**

1. A compound of the formula:

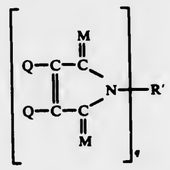


wherein Q is hydrogen or R-Ar-O wherein Ar is selected from the group consisting of phenyl, naphthyl, resorcinyl and anthryl, R is a polyalkylene group having a number average molecular weight of from 500 to 3000, only one Q being hydrogen, R′ is hydrogen, alkyl, alkylene, aminoalkylene hydroxyalkyl, hydroxyalkylene, aryl,

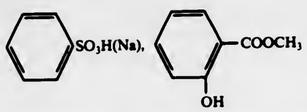


or
alkyl-substituted aryl, q is 1 or 2 and M is oxygen.

10. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or a grease thereof and a detergency amount of a compound of the formula:



wherein Q is hydrogen or R-Ar-O wherein Ar is selected from the group consisting of phenyl, naphthyl, resorcinyl and anthryl, R is a polyalkylene group having a number average molecular weight of from 500 to 3000, only one Q being hydrogen, R′ is hydrogen, alkyl, alkylene, aminoalkylene hydroxyalkyl, hydroxyalkylene, aryl,



or alkyl-substituted aryl, q is 1 or 2 and M is oxygen.

4,049,566

MAGNETIC COATING COMPOSITION

Gregorio Brilovich, and Irvin F. Masserant, both of San Jose, Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Filed June 4, 1976, Ser. No. 693,208
Int. Cl.² B05D *3/14, 5/12;* H01F *1/00*
U.S. Cl. 252—62.54 **4 Claims**

1. A magnetic coating composition comprising a dispersion of magnetic particles in a solution of an epoxy resin having an average of between one and three epoxy groups per molecule and having an epoxy equivalent in the range about 400 to 4,000 and containing an organic acid selected from the group consisting of formic, acetic and propionic acids in amount equal to from 2 to 20% by weight of the contained magnetic particles.

4,049,567

SILVER HALIDE ACTIVATED PHOTOCHROMIC PLASTICS

Nori Y. C. Chu, Southbridge, and Peter G. Piusz, Longmeadow, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Mar. 17, 1976, Ser. No. 667,686
Int. Cl.² G03C *1/02*
U.S. Cl. 252—300 **24 Claims**

1. A photochromic plastic element comprising a plurality of photosensitive silver halide particles less than 1000 A in particle size containing activating ions which act as hole traps, said particles being dispersed within a cast, shape-retaining, light-transmissive matrix comprising at least one polymer having the ability to inhibit ripening of silver halide particles produced in solution, said matrix containing an effective amount of a plasticizer to produce an environment suitable for repetitive activations and deactivations of the silver halide particles.

4,049,568

NON-DRIPPING HEAT RESISTANT DYE PENETRANT

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 444,432, Feb. 21, 1974, Pat. No. 3,915,885, and Ser. No. 444,433, Feb. 21, 1974, Pat. No. 3,915,886, and a continuation-in-part of Ser. No. 521,730, Nov. 7, 1974, Pat. No. 3,939,092, and a continuation-in-part of Ser. No. 535,262, Dec. 23, 1974, Pat. No. 3,981,185. This application May 23, 1975, Ser. No. 580,442
The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.
Int. Cl.² C09K *11/06;* G01N *19/08, 21/16*
U.S. Cl. 252—301.19 **16 Claims**

1. A heat resistant biodegradable dye penetrant composition for use in non-destructive testing for detecting cracks and flaws and metallurgical conditions in the surface of an object, which comprises (1) a biodegradable nonionic surfactant selected from the group consisting of (a) straight chain, primary, aliphatic oxyalkylated alcohols, wherein said alcohols can contain from 8 to 20 carbon atoms and the oxyalkyl groups are a mixture of ethylene oxide and propylene oxide groups, and (b) ethoxylates of linear secondary aliphatic alcohols, with the hydroxyl groups randomly distributed, the linear aliphatic portion of said alcohols being a mixture of alkyl chains containing in the range from 10 to 17 carbon atoms, and containing an average of from 3 to 12 moles of ethylene oxide, (2) a small amount of dye based on said surfactant and soluble in said surfactant, said dye being present in an amount ranging from about 0.1 to 15 parts, per 100 parts, by weight of said surfactant, and (3) an amount of silica sufficient to convert said dye penetrant composition into a gel.

3. A dye penetrant composition as defined in claim 1, and said silica being powdered silica present in an amount ranging from about 1 to about 6 parts, to 1 part by volume of the sum of said surfactant and said dye.

4,049,569

PROCESS AND APPARATUS FOR PRODUCING AN INERT GAS

Johannes W. Graat, Overasselt, Netherlands, assignor to Smit Nijmegen B.V., Nymegen, Netherlands

Continuation-in-part of Ser. No. 487,424, July 10, 1974, abandoned. This application Sept. 26, 1975, Ser. No. 617,226
Claims priority, application Germany, May 17, 1974, 2424064; Sept. 26, 1974, 2445900
Int. Cl.² C01B *31/20*
U.S. Cl. 252—372 7 Claims

1. In a process for the production of an inert gas wherein liquid or gaseous hydrocarbons are burnt with air and the hot combustion gases are subsequently spray cooled, the improvement which comprises:

a. carrying out said burning in an elongated combustion zone surrounded by a cooling jacket;

b. spray cooling the hot combustion gases immediately after combustion in a spray cooling zone contiguous to the combustion zone which spray cooling zone is a cross-sectional continuation of the combustion zone, said spray cooling being carried out with a plurality of spray nozzles spaced around the periphery of said spray cooling zone;

c. feeding said cooling jacket with cooling water which flows therethrough to said spray cooling step; and

d. cooling and scrubbing the gases from the spray cooling zone with an aqueous medium at a temperature in the vicinity of the freezing point.

4,049,570

METHOD AND APPARATUS FOR REMOVING VAPORS AND AEROSOLS FROM GASES PRODUCED IN A GASIFICATION PLANT

Paul Gernhardt, Bochum; Wolfgang Grams, Wanne-Eickel; Siegfried Pohl, and Wilhelm Danguillier, both of Bochum, all of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Aug. 4, 1975, Ser. No. 601,266
Claims priority, application Germany, Oct. 5, 1974, 2447563
Int. Cl.² C01B *2/02*; C10B *49/14*
U.S. Cl. 252—373 6 Claims

1. In a process for removing vapors or aerosols from the product of high temperature gasification of solid fuel or a mixture of solid and liquid fuels wherein the fuel is fed into a gasification chamber of the type including a melting chamber therein having a slag bath at the bottom thereof, and wherein a mixture of gases and solids is discharged from the top of the gasification chamber at a temperature within the range of 800° C to 1000° C and slag is normally discharged from the bottom of the gasification chamber, the improvement comprising the steps of:

separating said mixture after discharge from the gasification chamber into a gas phase including aerosols and into a solid phase which essentially includes flue coke,

separately cooling at least down to a temperature within the range of 300° C to 100° C both the gases and the solids after separation thereof,

combining the cooled gases and the cooled solids for a period of 1 to 10 seconds within a chamber for the absorption of aerosols by the flue coke from the gases,

separating flue coke including the absorbed aerosols from the remaining gases consisting cheifly of carbon monoxide and hydrogen,

discharging said remaining gases,

returning the flue coke including the absorbed aerosols to said melting chamber for gasification of the flue coke, and

discharging aerosols together with slag from the bottom of said gasification chamber.

4,049,571

MANUFACTURE OF A CATALYST COMPOSITION CONTAINING ZINC AND NICKEL OR COBALT

Axel Nissen, Leimen; Werner Fliege, Otterstadt, and Dieter Voges, Mannhein, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 21, 1976, Ser. No. 688,763
Claims priority, application Germany, June 7, 1975, 2525506
Int. Cl.² B01J *31/04, 23/80*
U.S. Cl. 252—430 8 Claims

1. An improved process for the manufacture of a catalyst essentially containing nickel and/or cobalt and zinc oxide and suitable for the synthesis of ketones by aldol condensation of low molecular weight aldehydes or ketones with low molecular weight ketones and hydrogenation of the intermediate α, β-unsaturated ketones formed at a temperature above about 150° C in the liquid phase, which process comprises treating a catalyst composition containing a catalytically active amount of zinc oxide and a catalytically active amount of at least one of nickel and cobalt or at least one of a hydrogen-reducible compound of nickel or cobalt at about 50° to 160° C with a solution or suspension at a concentration of 0.1 to 50% of at least one zinc salt of an aliphatic or aromatic hydrocarbyl carboxylic acid having 2 to 20 carbon atoms.

4,049,572

CATALYST AND METHOD OF MANUFACTURE AND USE THEREOF

Walter M. Douglas, Streamwood, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 24, 1976, Ser. No. 660,899
Int. Cl.² B01J *31/12*; C09B *47/04*
U.S. Cl. 252—431 N 13 Claims

1. A method of manufacturing a catalyst which comprises reacting a 4-sulfophthalic acid compound with a metal salt, an ammonium donor, and a compound selected from the group of benzene-1,2-dicarboxylic acid and derivatives thereof, in aqueous solution by heating to 250° to 325° C for one-half to 10 hours.

4,049,573

ZEOLITE CATALYST CONTAINING OXIDE OF BORON OR MAGNESIUM

Warren W. Kaeding, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 5, 1976, Ser. No. 655,330
Int. Cl.² B01J *21/02, 27/14, 29/06*
U.S. Cl. 252—432 10 Claims

1. A catalyst composition comprising a crystalline aluminosilicate zeolite, said zeolite having a silica to alumina ratio of at least about 12, a constraint index within the approximate range of 1 to 12, and having combined therewith:

1. between about 0.25 and about 25 percent by weight of boron oxide; or
2. between about 0.25 and about 5 percent by weight of boron oxide in combination with between about 2 and about 15 percent by weight of magnesium oxide; or
3. between about 0.25 and about 10 percent by weight of phosphorus oxide in combination with between about 0.25 and about 25 percent by weight of boron oxide or magnesium oxide, or
4. between about 0.25 and about 10 percent by weight of phosphorus oxide in combination with between about 0.25 and about 5 percent by weight of boron oxide and between about 2 and about 15 percent by weight of magnesium oxide.

4,049,574

CATALYST AND PROCESS FOR PREPARING MALEIC ANHYDRIDE FROM C_4 HYDROCARBONS

Ralph O. Kerr, and Bruno J. Barone, both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 473,489, May 28, 1974, Pat. No. 3,980,585. This application Mar. 17, 1976, Ser. No. 667,624
Int. Cl.² B01J *27/18*
U.S. Cl. 252—437 3 Claims

1. An improved vanadium-phosphorus-oxygen catalyst complex for the oxidation of n-C_4 hydrocarbons to produce maleic anhydride consisting essentially of active components in the atom ratio, vanadium 1:phosphorus 0.90 to 1.3:copper 0.005 to 0.3:Me 0.005 to 0.25 wherein Me consists essentially of Pd and further containing as an active component an alkali or alkaline earth metal in the atom ratio of 0.001 to 0.1 per atom of V.

2. An improved vanadium-phosphorus-oxygen catalyst complex for the oxidation of n-C_4 hydrocarbons to produce maleic anhydride consisting essentially of active components in the atom ratio, vanadium 1:phosphorus 0.90 to 1.3:copper 0.005 to 0.2:Me 0.005 to 0.25 wherein Me consists essentially of Hf and further containing as an active component an alkali or alkaline earth metal in the atom ratio of 0.001 to 0.1 per atom of V.

3. An improved vanadium-phosphorus-oxygen catalyst complex for the oxidation of n-C_4 hydrocarbons to produce maleic anhydride consisting essentially of active components in the atom ratios vanadium 1:phosphorus 0.90 to 1.3:copper 0.005 to 0.3:Me 0.005 to 0.25 wherein Me consists essentially of Th.

4,049,575

PROCESS OF PRODUCING ANTIMONY-CONTAINING OXIDE CATALYSTS

Yutaka Sasaki; Akimitsu Morii, both of Yokohama; Yoshimi Nakamura, Kawasaki; Kiyoshi Moriya, Kanagawa, and Hiroshi Utsumi, Yokohama, all of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed July 31, 1975, Ser. No. 600,683
Claims priority, application Japan, Aug. 1, 1974, 49-87539
Int. Cl.² B01J *21/02, 27/02, 27/16*
U.S. Cl. 252—439 22 Claims

1. A process for producing a catalyst comprising an antimony-containing oxide which comprises the steps of (A) calcining a mixture of metal oxides containing, as essential components, an oxide of antimony and an oxide of at least one metal selected from the group consisting of iron, cobalt, nickel, manganese, uranium, tin and copper, said calcining being at temperatures of from about 500° C to about 1000° C; (B) impregnating with or spraying onto said calcined mixture of metal oxides (*a*) an aqueous solution or a suspension containing (1) at least one compound of a metal selected from the group consisting of molybdenum, vanadium and tungsten, said metal compound being thermally convextible to an oxide of said metal, and (2) a tellurium compound, said tellurium compound being thermally convertible to a tellurium oxide, or (*b*) an aqueous solution or a suspension containing said metal compound (1) and an aqueous solution or a suspension containing said tellurium compound (2); (C) drying said impregnated or sprayed mixture of metal oxides; and (D) calcining said dried mixture of metal oxides at a temperature of from about 400° C to about 850° C, where said calcining (D) is at a temperature lower than said calcining (A).

4,049,576

PLATINUM-PALLADIUM CATALYST FOR SELECTIVE HYDROGENATION OF AROMATICS AND OLEFINS IN HYDROCARBON FRACTIONS

Stephen M. Kovach, and George D. Wilson, both of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 511,985, Oct. 4, 1974, Pat. No. 3,943,053. This application Nov. 3, 1975, Ser. No. 628,066
Int. Cl.² B01J *27/06, 23/56*
U.S. Cl. 252—441 6 Claims

4. A hydrogenation catalyst consisting of between about 0.2 and about 1.0 percent by weight each of platinum and palladium in a mole ratio of platinum to palladium of between about 1 to about 2 and about 1 to 6 and between about 1.2 to about 2.5 percent by weight of chlorine as chloride.

4,049,577

CATALYST FOR MAKING ACROLEIN

David L. Childress, Angleton; William V. Hayes, and Richard L. Poppe, both of Clute, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 15, 1975, Ser. No. 640,616
Int. Cl.² B01J *21/04, 23/78, 23/84, 27/20*
U.S. Cl. 252—443 9 Claims

1. An improved catalyst for the oxidation of a lower olefin containing 3 to 6 carbon atoms to the analogous unsaturated aldehyde which consists essentially of oxides of cobalt, iron, bismuth, molybdenum and potassium wherein the atomic ratios of the metals are within the ranges

$$Co_{4.5\text{-}7.0}Fe_{1.2}Bi_{1.2}Mo_{15}K_{0.05\text{-}0.2}.$$

4,049,578

HYDROCARBON CONVERSION CATALYST

William J. Reagan, Yardley, Pa., and Nai Y. Chen, R.D. Titusville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 477,240, June 7, 1974, Pat. No. 3,981,825. This application June 11, 1976, Ser. No. 695,230
Int. Cl.² B01J *21/04, 23/42, 23/46, 23/72*
U.S. Cl. 252—455 R 11 Claims

1. A reforming catalyst comprising a solid porous alumina support containing platinum and iridium or platinum, iridium and copper, said catalyst being prepared by the process of applying to said support a dimethylsulfoxide solution containing soluble compounds of the metals, selected from the group consisting of metal salt, metal acid, metal ammine and metal ammine halide, drying the resulting solids and calcining.

4,049,579

DEHYDROGENATION CATALYST

Harold E. Manning, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Continuation of Ser. No. 593,725, July 7, 1975, abandoned, which is a division of Ser. No. 515,328, Oct. 16, 1974, abandoned. This application July 6, 1976, Ser. No. 702,947
Int. Cl.² B01J *21/02, 21/06, 21/10, 23/21*
U.S. Cl. 252—455 R 4 Claims

1. A dehydrogenation catalyst consisting essentially of (1) $MgCr_2O_4$+silicon oxide, (2) $MgCr_2O_4$—silicon oxide+Al_2O_3 or (3) $MgAl_xCr_{2-x}O_4$ + silicon oxide, the atomic ratio of Al:Cr being from 0.0004 to 1.2:1, x is a number of from more than 0 up to less than 1 and wherein there is 0.03 to 0.08 mol of silicon per mol of $MgCr_2O_4$.

4,049,580

METHOD FOR PRODUCING SUPPORTED RANEY NICKEL CATALYST

Laurance L. Oden; Philip E. Sanker, both of Albany, and James H. Russell, Corvallis, all of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 23, 1976, Ser. No. 707,973
Int. Cl.² B01J *21/04, 23/74*
U.S. Cl. 252—466 J 12 Claims

1. A process for making a Raney nickel catalyst comprising:

dipping a nickel support or substrate into a bath comprising molten aluminum;

removing the support from the bath of molten aluminum, the said support now being coated with a layer of aluminum to form a specimen;

heat treating the specimen in the absence of oxygen at a temperature of from about 700° to 1133° C; and

quenching the heat treated specimen at a temperature of from about 640° to 854° C in the absence of oxygen to form $NiAl_3$ as a solid phase coating on the substrate; and leaching the coated substrate with sodium hydroxide solution to produce a supported Raney nickel catalyst.

4,049,581

METHOD FOR PREPARING HYDROCARBON CONVERSION CATALYST USING ACID AMIDE SOLUTIONS TO IMPREGNATE A TIN COMPONENT

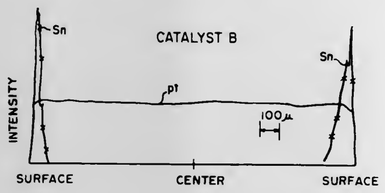
Takuji Itoh, Sayama; Eiichiroh Nishikawa, Ohi; Tadashi Miura, Ohi, and Takashi Yamahata, Ohi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1975, Ser. No. 561,930

Claims priority, application Japan, Mar. 30, 1974, 49-36404

Int. Cl.² B01J *23/96, 23/92;* **C10G** *35/08*

U.S. Cl. 252—466 PT **17 Claims**



1. In a method for preparing a hydrocarbon conversion catalyst comprising a refractory inorganic oxide carrier, 0.01 to 3 weight % of a Group VIII noble metal component, a tin component and 0.1 to 3 weight % of a halogen component by the procedure of impregnating said carrier with a solution or solutions containing said metal and halogen components, the improvement which comprises a step of impregnating the said carrier with a solution comprising from about 0.01 to 2 weight % of a soluble compound of tin in a solvent comprising an acid amide selected from the group consisting of primary amides, secondary amides, tertiary amides and mixtures thereof and washing and drying the impregnated carrier.

4,049,582

METHOD FOR PRODUCING A SUPPORTED CATALYST

Henry Erickson, Park Forest, and John Mooi, Hazelcrest, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 562,107, March 26, 1975, Pat. No. 3,974,255, which is a continuation of Ser. No. 340,348, March 12, 1973, abandoned. This application Mar. 25, 1976, Ser. No. 670,494

Int. Cl.² B01J *21/04, 23/42, 23/44*

U.S. Cl. 252—466 PT **7 Claims**

1. A method for producing a supported metal-containing catalyst comprising a first magnesium alumina spinel support, and disposed as a coating on said first magnesium aluminate spinel support, a mixture comprising second magnesium aluminate spinel and at least one catalytically active metal component sufficient to promote at least one of the following: (a) the oxidation of at least a portion of the hydrocarbon and carbon monoxide contained in the exhaust gases of an internal combustion engine and (b) the chemical reduction of at least a portion of the nitrogen oxides contained in the exhaust gases of an internal combustion engine, said metal being less basic than magnesium, which comprises:

1. forming an aqueous slurry comprising magnesium aluminate spinel precursor, and at least one compound of said metal, said precursor being derived from contacting in an aqueous medium a soluble inorganic magnesium salt and a soluble salt having aluminum in the anion to precipitate a first spinel precursor, the amount of water in said slurry being such as to allow said slurry to be applied to said support as a film of desired uniformity and thickness;
2. contacting said support with said aqueous slurry to form a coated support including a metal-containing film of desired thickness and uniformity on said support; and
3. treating said coated support at a temperature and for a time sufficient to calcine said material and form said supported metal-containing catalyst.

4,049,583

METAL OXIDE CATALYTIC COMPOSITIONS HAVING PEROVSKITE CRYSTAL STRUCTURES AND CONTAINING METALS OF THE PLATINUM GROUP

Alan Lauder, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 463,988, April 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 405,052, Oct. 10, 1973, Pat. No. 3,897,367. This application May 24, 1976, Ser. No. 689,385

The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.

Int. Cl.² B01J *21/04, 23/10, 23/58, 23/74.*

U.S. Cl. 252—466 PT **12 Claims**

1. A compound having the perovskite-type ABO_3 crystal structure wherein

1. the sites of Type A are occupied by cations of at least two different metals each occupying at least 1% of the Type A cation sites and having an ionic radius between 0.8 and 1.65 A; and
2. from about 1% up to about 20% of the sites of Type B are occupied by ions of platinum group metals and the remaining sites of Type B are occupied by ions of non-platinum group metals having ionic radii between about 0.4 and 1.4 A.;

4,049,584

SUPPORTED RUTHENIUM CATALYST AND PROCESS FOR PREPARING IT

Oskar Weissel, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 6, 1976, Ser. No. 646,827

Claims priority, application Germany, Jan. 24, 1975, 2502894

Int. Cl.² B01J *23/64*

U.S. Cl. 252—470 **10 Claims**

1. A supported ruthenium catalyst comprising ruthenium supported on a support comprising an hydroxide, hydrated oxide or oxide of chromium and an hydroxide, hydrated oxide or oxide of manganese.

4,049,585

DETERGENT COMPOSITIONS CONTAINING INTERNAL VICINAL DISULFATES

David Clinton Heckert, Oxford, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 537,513, Dec. 30, 1974, abandoned, and Ser. No. 537,512, Dec. 30, 1974, abandoned. This application Dec. 11, 1975, Ser. No. 639,933

Int. Cl.² C11D *1/16, 3/06*

U.S. Cl. 252—531 **6 Claims**

1. An automatic dishwashing detergent composition consisting essentially of:

a. from about 3% to about 10% of an internal vicinal disulfate having the formula

$$R-(CH_2)_x-\underset{\displaystyle OSO_3M}{\underset{|}{CH}}-\underset{\displaystyle OSO_3M}{\underset{|}{CH}}-(CH_2)_y-R'$$

wherein x and y are integers from 2 to 16 inclusive; the sum of $x + y = 10$ to 18; R is hydrogen; R' is selected from the group consisting of hydrogen and COOM; and wherein M is a cation selected from the group consisting of alkali metal, alkaline earth metal, ammonium and alkanolammonium cations, and

b. from about 10% to about 60% of a water soluble detergent builder salt selected from the group consisting of alkali metal polyphosphates, carbonates, bicarbonates, silicates, citrates, nitrilotriacetates and mixtures thereof.

4,049,586

BUILDER SYSTEM AND DETERGENT PRODUCT

Everett J. Collier, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 27, 1974, Ser. No. 509,865

Int. Cl.² C11D *3/065*

U.S. Cl. 252—532 **12 Claims**

1. A particulate detergent product consisting essentially of:

a. from about 0.5% to about 50% by weight of dry admixed calcium carbonate particles having a mean diameter of from about 0.01 to about 0.50 micron;

b. from about 5% to about 70% by weight of a builder selected from the group consisting of the alkali metal carbonates, bicarbonates, and sesquicarbonates and mixtures thereof;

c. from about 5% to about 70% by weight of alkali metal pyrophosphate; and

d. from about 5% to about 40% by weight of a water-soluble detergent selected from the group consisting of anionic, nonionic, zwitterionic, and ampholytic detergents and mixtures thereof.

4,049,587

LATEX FROTHING AGENT USED IN MAKING AN ELASTOMERIC LATEX FOAM

Daniel Charles Straka, Sewickley, Pa., assignor to ARCO Polymers, Inc., Philadelphia, Pa.

Filed Oct. 1, 1976, Ser. No. 728,687

Int. Cl.² C08J *9/30*

U.S. Cl. 260—2.5 L **2 Claims**

1. In a method of preparing cellular elastomer comprising the steps of modifying an elastomer latex by adding thereto a frothing agent, whipping air into the thus modified latex to provide a froth, depositing said froth on an advancing strip to provide a froth coated strip, advancing said froth coated strip through a heated curing zone to volatilize water and steam therefrom and to provide a cellular elastomer on said strip, the improvement which consists of using as said frothing agent a latex frothing agent useful for entraining air in a froth of aqueous latex dispersion of an elastomer, said aqueous solution containing about 70% water and about 25% magnesium di(lauryl sulfate), about 2.5% polyalkoxyglycerol having about eight alkoxy groups per hydroxyl group and about 2.5% of a quatenary dihydroimidazole derivative, there being a fatty acid carbon chain attached as the only carbon-carbon linkage for the carbon between the nitrogens of the dihydroimidazole ring, the quatenary nitrogen partaking of the nature of a quatenary sodium glycinate having at such quatenary nitrogen both an alkhydroxy group and said dihydroimidazole ring, the dry surfactants of the frothing agent having a concentration which is from about 0.25% to about 1% of the dry elastomer content of the latex.

4,049,588

TREATMENT OF VULCANIZED RUBBER

Timothy Charles Philip Lee, and William Milns, both of Shrewsbury, England, assignors to Gould Inc., Rolling Meadows, Ill.

Division of Ser. No. 431,623, Jan. 8, 1974. This application Dec. 9, 1975, Ser. No. 639,515

Int. Cl.² B29H *19/00;* **B02C** *7/00*

U.S. Cl. 260—2.3 **19 Claims**

1. A method of converting vulcanized rubber into finely-divided vulcanized rubber comprising:

1. contacting the vulcanized rubber with a liquid effective to swell the rubber and thereby weaken it,
2. comminuting the weakened material into particles of said vulcanized rubber, at least 90% of said particles having a particle size less than 20 microns, said particles further being characterized by the property of separating out from an admixture with water,
3. removing said liquid from the comminuted material, and
4. recovering the comminuted material in the form of a fine powder.

4,049,589

POROUS FILMS OF POLYTETRAFLUOROETHYLENE AND PROCESS FOR PRODUCING SAID FILMS

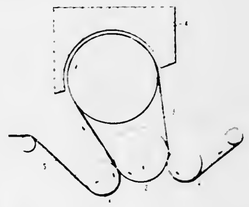
Isamu Sakane, Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 452,575, March 19, 1974, abandoned. This application Sept. 30, 1975, Ser. No. 620,077

Claims priority, application Japan, Mar. 19, 1973, 48-30832; Mar. 19, 1973, 48-30833; Mar. 19, 1973, 48-30834

Int. Cl.² C08J *9/24*

U.S. Cl. 260—2.5 M **10 Claims**



1. In a process for preparing a porous film of polytetrafluoroethylene having the steps of forming an article from an unsintered polytetrafluoroethylene mixture containing a liquid lubricant; stretching the article at least uniaxially while maintaining the temperture of the sheet during stretching at below 327° C, the absolute speed of the sheet being between 1 cm/min and 20 m/min at a stretch ratio of 10 to 100% of the initial length, and then heating the article to a temperature of at least 327° C, the improvement being in said heating step and comprising, providing a moving mirror-surface endless belt positioned over a cooling roll and a heating roll, said rolls rotating whereby each portion of said belt consecutively contacts a portion of the periphery of the heating roll and the cooling, roll, urging the stretched sheet against said endless belt at a first position thereof where said belt is in contact with said cooling roll, peeling off the sheet from said endless belt at a second position thereof where said belt is in contact with said cooling roll, said second position being downstream from said first position in the direction of movement of said belt and being separated therefrom by the path of said belt around a portion of the periphery of said heating roll, whereby said stretched sheet adhered to said belt passes over said heating roll for continuous sintering between adhering to and peeling from said endless belt.

7. A porous film of polytetrafluoroethylene produced by the process set forth in claim 1.

4,049,590

MANUFACTURE OF POLYURETHANE COMPOSITIONS

Georg Falkenstein, Neustast; Dieter Stein, Limburgerhof; Franz Haaf, Bad Duerkheim; Gerhard Heinz, Weisenheim, and Ernst Schoen, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Nov. 24, 1975, Ser. No. 634,878
Int. Cl.² C08G *18/04, 18/14*
U.S. Cl. 260—2.5 BE **16 Claims**

1. A method for the manufacture of polyurethanes which comprises:

I. mixing

1. a polyhydroxy compound (B) having a molecular weight of from about 500 to 7000 and a hydroxyl number of from 20 to 1000 and selected from the group consisting of polyether-polyols and polyester-polyols, with

2. an aqueous polymer dispersion containing a crosslinked particulate polymer (C) having a particle size of from 500 to 5000 A and a gel content of not less than 5% and comprising homopolymers, copolymers, graft polymers or mixtures thereof, said crosslinked polymer (C) being obtained by the emulsion or suspension polymerization of

a. unsaturated compounds selected from the group consisting of styrene, α-methylstyrene, vinyl-toluene, o-, p- and m-ethylstyrene, tert.-butylstyrene, o-chlorostyrene, 2,4-dichlorostyrene, o-bromostyrene, acrylonitrile, methacrylonitrile, vinyl chloride, vinylidene chloride, vinyl bromide, vinyl acetate, vinyl propionate, vinyl pivalate, esters of acrylic acid, methacrylic acid, itaconic acid, maleic acid, fumaric acid and crotonic acid with aliphatic or cycloaliphatic alcohols of 1 to 10 carbon atoms, lauryl acrylate, lauryl methacrylate, vinyl-glycol, but-2-ene-1,4-diol, butenol, allyl alcohol, esters of acrylic acid, substituted acrylic acids, crotonic acid, fumaric acid and itaconic acid with straight-chain or branched polyhydric alcohols of mean molecular weights from 50 to 6000, in which at least one OH group of the polyhydric alcohol is not esterified, unsaturated copolymerizable polyols with mean molecular weights of from 200 to 6000, acrylamide, methacrylamide, butadiene, isoprene, piperylene and chloroprene, and

b. crosslinking agents incorporated in the polymerized form in an amount of from 0.1 to about 20% by weight and selected from the group consisting of divinylbenzene, diallyl maleate, diallyl fumarate, diallyladipate, allyl acrylate, allyl methacrylate, diacrylates and dimethacrylates of polyhydroxyalcohols and butadiene,

wherein said homopolymers and copolymers have a glass transition temperature of from 40° to 130° C and said graft polymers have two glass transition temperatures, one of from −40° to 90° C and the other of from 40° to 130° C;

II. removing the water from the mixture to produce a dispersion of 1 to 40% by weight of polymer(s) (C) in 99 to 60% by weight of polyhydroxy compound (B); and

III. reacting the resultant mixture of (B) and (C) with an organic polyisocyanate (A) to form the polyurethanes, the ratio of the NCO equivalent of polyisocyanate to radicals of said mixture (B) and (C) which are reactive with isocyanato radicals being in the range of about 0.7–1.3:1.

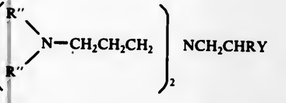
4,049,591

FOAMS AND ELASTOMERS PREPARED IN THE PRESENCE OF HIGH TERTIARY AMINE CONTENT POLYURETHANE CATALYSTS

Edward E. McEntire, and George P. Speranza, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,548
Int. Cl.² C08G *18/14, 18/18, 18/48*
U.S. Cl. 260—2.5 AC **8 Claims**

1. A method for producing a polyurethane which comprises reacting an organic polyisocyanate with an organic polyester polyol or polyether polyol in the presence of a catalytic amount of a compound having the following structural formula:



where R″ is lower alkyl, R is hydrogen or lower alkyl and Y is selected from the group consisting of CN, $CONH_2$, CO_2R', $CONR'_2$ and COR′ where R′ is independently hydrogen, lower alkyl or aryl.

6. The method of claim 2 wherein a flexible polyether polyurethane foam is provided which comprises reacting in the presence of a blowing agent said organic polyisocyanate with a polyether polyol formed by the addition of a polyhydric alcohol having a functionality of from 2 to about 4 with an alkylene oxide of 2 to 4 carbon atoms in the presence of said catalyst, said organic polyisocyanate being employed in an amount sufficient to provide 0.4 to 1.5 mol equivalents of isocyanato groups per mol equivalent of hydroxyl groups, said polyether polyol having a molecular weight within the range of about 2000–7000.

4,049,592

BIODEGRADABLE HYDROPHILIC FOAMS AND METHOD

Nelson Samuel Marans, Silver Spring, and Alan Ricky Pollack, Bethesda, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 597,258, July 18, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,295
Int. Cl.² C08G *18/14*
U.S. Cl. 260—2.5 AD **6 Claims**

1. A method of preparing biodegradable foam structures having three-dimensional networks, said method comprising, foaming a first component comprising isocyanate capped hydroxyester polyol having a reaction functionality of at least 2 with a second component comprising aqueous reactant wherein the H_2O Index Value is about 1,300 to 78,000, the hydroxyester linkages in said polyol formed by condensation of an aliphatic hydroxy carboxylic acid with the hydroxyl groups of (a) an essentially linear polyether, or (b) a monomeric low molecular weight aliphatic alcohol containing from 3 to 8 hydroxyl groups per mole.

4,049,593

INORGANIC SUBSTANCE COMPOSITION AND PROCESS FOR PRODUCING SAME

Hiroshi Sato; Munehiro Okumura; Fujio Itani; Shouji Fujii; Tsutomu Kakuda, and Hiroshi Nakatui, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 428,193, Dec. 26, 1973, abandoned. This application Oct. 19, 1976, Ser. No. 733,919
Claims priority, application Japan, Dec. 29, 1972, 47-1565
Int. Cl.² C08J *3/12*
U.S. Cl. 260—2.5 E **10 Claims**

1. An inorganic substance composition comprising about 95% by weight of a finely divided inorganic substance and about 5% by weight of a fiber forming organic linear high molecular weight synthetic polymeric material; said inorganic substance composition being in the form of fine fibrous-like, flake-like or sliver-like structures and having a specific surface area of at least 10 m^2/g and a porous structure containing a plurality of fine, irregular voids therein, the wall forming each void being less than 5 micron in thickness.

4,049,594

PROCESS FOR PREPARING EXPANDABLE STYRENE POLYMER PARTICLES

Toshiki Ikeda, Shiga; Fumito Yamai, Kusatsu, and Tomohiko Ishida, Shiga, all of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Oct. 29, 1975, Ser. No. 626,868
Claims priority, application Japan, Oct. 31, 1974, 49-126187
Int. Cl.² C08J *9/18*
U.S. Cl. 260—2.5 B **8 Claims**

1. In a process for preparing expandable styrene polymer particles wherein styrene polymer particles are dispersed in water in the presence of a suspending agent and an expanding agent is added to the suspension to impregnate the particles, the improvement comprising employing magnesium oxide in an amount from about 0.2 to about 1.0% by weight of the polymer particles as the suspending agent.

4,049,595

BLOCK COPOLYMER COMPOSITIONS

Richard J. G. Dominguez, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 23, 1976, Ser. No. 679,591
Int. Cl.² C08K *5/01*; C08L *7/00*
U.S. Cl. 260—5 **10 Claims**

1. A polymeric composition comprising:

a. 100 parts by weight of a block copolymer having at least two monoalkenyl arene polymer end blocks A and at least one elastomeric conjugated diene mid block B, each block A having an average molecular weight between about 5,000 and about 125,000 and each block B having an average molecular weight between about 15,000 and about 250,000, said blocks A comprising 8-65% by weight of the copolymer;

b. 5–125 parts by weight of a high impact polystyrene resin containing from about 1–35 weight percent elastomeric component, said high impact polystyrene having a weight average molecular weight of over about 70,000;

c. 5–175 parts by weight of a hydrocarbon rubber extending oil; and

d. 0–250 parts by weight of a finely divided filler.

4,049,596

CORROSION RESISTANT AQUEOUS AND SOLVENT-BASED PRIMER COMPOSITIONS CONTAINING SYNERGISTIC BLENDS OF ZINC BORATE AND BARIUM METABORATE PIGMENTS

Andrew Traister, Pittsburgh, and Glenn Troup, Sarver, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 3, 1975, Ser. No. 628,695
Int. Cl.² C09D *3/66, 3/80, 5/08*
U.S. Cl. 260—18 EP **10 Claims**

1. A corrosion resistant primer composition comprising:

a. a film forming resin vehicle blend consisting essentially of:

1, from about 60 percent to about 80 percent by weight solids of an acrylic polymer latex and from about 20 percent to about 40 percent by weight solids of an alkyd resin, styrene-allyl alcohol ester adduct or a polymerized dehydrated castor oil; or

2. from about 85 percent to about 95 percent by weight solids of an epoxy ester resin and from about 5 to about 15 percent by weight solids of a chlorinated paraffin; and

b. a pigment blend consisting of from 10 to 95 percent by weight of zinc borate and from 5 to 90 percent by weight of barium metaborate, wherein said zinc borate has the formula:

$$2\,ZnO \cdot 3\,B_2O_3 \cdot (H_2O)_x$$

wherein x is from 3.3 to 3.7 and wherein the ratio of said pigment blend to said resin vehicle solids is from about 40:100 to about 90:100.

4,049,597

GLASS FIBER SIZING COMPOSITION

Donald L. Motsinger, Forest City, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 513,208, Oct. 9, 1974. This application May 13, 1976, Ser. No. 685,842
Int. Cl.² C08J *3/20*
U.S. Cl. 260—18 EP **6 Claims**

1. A glass fiber sizing composition comprising a pheolic epoxy resin; the reaction product of a partial ester of a polycarboxylic acid containing 1 or more unesterified carboxyl group with a compound containing more than one epoxy group; a dual emulsifier system; one emulsifier being a polyethylene glycol, the second emulsifier consisting essentially of the reaction product of propylene glycol and ethylene oxide; a saturated fatty triglyceride; and a silane coupling agent.

4,049,598

AMINO-POLY(AMIDAZOLINE-AMIDE)

Dwight E. Peerman, Minnetonka; Dale G. Swan, St. Louis Park, and H. Gordon Kanten, Minneapolis, all of Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed July 6, 1976, Ser. No. 703,035
Int. Cl.² G08G *69/26*
U.S. Cl. 260—18 N **9 Claims**

1. An amino-poly(imidazoline-amide) having a total amine number of at least 75 and a tertiary amine number of at least 50, formed as the reaction product at a temperature and time sufficient to provide said tertiary amine number of

a. from about 20–50 equivalent percent of azelaic acid,

b. up to about 20 equivalent percent of another, different, aliphatic, dicarboxylic acid having from 6 to 12 carbon atoms,

c. up to not more than 6 equivalent percent of a dimeric fat acid,

d. up to not more than 10 equivalent percent of a monomeric, monocarboxylic fatty acid having from 16–22 carbon atoms,

e. about 25–40 equivalent percent of diethylene triamine and

f. about 15–30 equivalent percent of an alkylene diamine having 2–6 carbon atoms wherein the sum of said equiva-

lents percent total 100 and the sum of amine equivalents percent is at least about equal to the carboxyl equivalent percent and the equivalent percent of diethylene triamine is at least about equal to the equivalent percent of said diamine, provided further that where a mixture of said dimeric fat acid and said monomeric fatty acid is employed the total equivalent percent of said mixture shall not exceed 11 equivalent percent.

4,049,599

HIGH SOLIDS POLYESTERS CAPABLE OF DISSOLVING IN AN ORGANIC SOLVENT

Joseph C. Lott, Manchester, Mo., assignor to Grow Chemical Corporation, New York, N.Y.

Filed Jan. 9, 1976, Ser. No. 647,663
Int. Cl.[2] C09D *3/52, 3/64*
U.S. Cl. 260—22 M **7 Claims**

1. A composition of matter comprising a polyester capable of dissolving in an organic solvent, having a solids content of at least 75% by weight, (on a pigment, filler and catalyst-free basis), at a viscosity of X-Z on the Garner scale, prepared by reacting an aromatic polycarboxylic acid, anhydride, or a functionally acid esterifiable derivative thereof, an aliphatic polycarboxylic acid, anhydride or a functionally acid esterifiable derivative thereof, an aliphatic polyol and a monofunctional fatty acid to an acid number less than about 10, and then reacting the product of that reaction with an aromatic or aliphatic polycarboxylic acid, anhydride or a functional acid esterifiable derivative thereof to an acid number greater than 10 and less about 60, wherein the total reactants have a hydroxyl/carboxyl ratio of greater than 1; the amount of monofunctional fatty acid employed ranges from about 20 to about 50% of the total number of acid equivalents of the reactants, and the amount of aromatic polycarboxylic acid reacted in the first step ranges from about 20% to about 50% of the total number of acid equivalents of the reactants.

5. The composition of claim 1 further comprising an organic solvent soluble cross-linkable nitrogenous composition wherein the components are present on a weight basis as:

0.5 - 5:1 Polyester:Nitrogenous Composition

4,049,600

WELDABLE CORROSION RESISTANT PRIMER MATERIAL

Kanti D. Patel, Plymouth, Mich., assignor to Mortell Company, Kankakee, Ill.

Filed July 8, 1975, Ser. No. 594,122
Int. Cl.[2] C09D *3/58, 3/66, 5/08*
U.S. Cl. 260—22 EP **11 Claims**

1. A weldable, corrosion preventative primer material comprising:

a binding agent and drying time control agent selected from the group consisting of long oil alkyds, medium oil alkyds, short oil alkyds and epoxy esters;

between 15 and 39% by weight of a paraffinic oil;

between 7.2 and 16.4% by weight of pigment comprising iron oxide;

between 1.5 and 2.09% by weight of calcium oxide;

between 0.20 and 0.24% by weight of a composition of diethylene glycol and boron trifluoride;

an epoxy resin; and

a viscosity control agent.

4,049,601

MOISTURE-RESISTANT POLYURETHANE-BASED PRESSURE-SENSITIVE ADHESIVES

Ralph L. Anderson, Columbia, S.C., assignor to Anchor Continental, Inc., Columbia, S.C.

Division of Ser. No. 443,917, Feb. 19, 1974, Pat. No. 3,940,513.
This application Oct. 1, 1975, Ser. No. 618,512
Int. Cl.[2] C08L *93/00*
U.S. Cl. 260—24 **9 Claims**

1. A moisture-resistant, polyurethane-based, pressure-sensitive adhesive comprising a substantially uniform mixture of: (1) the reaction-product of 1.7 to 1.1 equivalents of an aromatic polyisocyanate and 1 equivalent of polyols of molecular-weight between 1500 and 5000 and hydroxyl number between 30 and 100; (2) the reaction-product of 1.7 to 1.1 equivalents of an aromatic polyisocyanate and 1 equivalent of a liquid hydroxylated elastomer of hydroxyl number between 20 and 60 in the amount of between 6 and 25 percent of the combined weight of the products of (1) and (2); (3) compatible tackifying resins in the amount of 40 to 150 percent of the combined weight of the products of (1) and (2) and selected from the class consisting of (a) the methyl, triethylene glycol and diethylene glycol esters of rosin, tall oil, hydrogenated rosin and stabilized rosin and (b) the glycerol and pentaerythritol esters of rosin, tall oil, hydrogenated and stabilized rosin; the proportions of the resins of (a) and (b) being between 10 and 40 percent of the combined weight of (a) and (b) resins; (4) active polyurethane catalyst in the amount of between 0.3 and 3 per cent of the combined weight of (1) and (2).

4,049,602

WHITE NON-PIGMENTED HOT MELT POLYOLEFIN ADHESIVES

Kenneth H. Albers, and Robert E. Holliday, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,326
Int. Cl.[2] C08L *51/06, 93/00*
U.S. Cl. 260—27 R **11 Claims**

1. An adhesive composition capable of being used as a hot melt adhesive comprising a blend of styrenated amorphous polyolefin having a styrene content of about 1 to 90 percent by weight and a melt viscosity at 190° C. of at least 10 centipoise prepared by polymerizing styrene in the presence of an amorphous polyolefin having a melt viscosity at 190° C. of from about 100 to about 500,000 centipoise with a peroxide catalyst at a temperature of about 160° C. to about 300° C. and about 10 to 50 weight percent of the adhesive composition of at least one tackifying resin selected from the group consisting of hydrocarbon resins, polyterpene resins and rosin esters.

4,049,603

ADHESION OF GLASS FIBERS TO RUBBER

Otto C. Elmer, Akron, Ohio, assignor to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 523,645, Nov. 13, 1974, Pat. No. 3,955,033.
This application Jan. 12, 1976, Ser. No. 648,439
Int. Cl.[2] C08L *91/06, 61/12*
U.S. Cl. 260—28.5 R **10 Claims**

1. A composition of matter consisting essentially of an aqueous alkaline dispersion of 100 parts by weight of a rubbery vinyl pyridine copolymer, from about 8 to 75 parts by weight of a water soluble, heat reactable o-cresol-formaldehyde-resorcinol resin,

and from about 250 to 1100 parts by weight of water, the mol ratio of the o-cresol to the resorcinol being from about 1:1 to 1:5 and the mols of formaldehyde being in excess of the total mols of the o-cresol and resorcinol in the resin.

4,049,604

EMULSION POLYMERIZATION METHOD FOR PREPARING AQUEOUS DISPERSIONS OF ORGANIC POLYMER PARTICLES

Donald S. Morehouse, Jr., Midland, Mich., and Frank Harold Bolton, deceased, late of Ann Arbor, Mich., by Kathryn M. Bolton, administratrix, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 805,908, March 10, 1969, abandoned. This application June 8, 1970, Ser. No. 44,592
Int. Cl.[2] C08L *25/06*
U.S. Cl. 260—29.6 RW **5 Claims**

1. An emulsion polymerization method for preparing an aqueous dispersion of normally solid organic polymeric particles, said method comprising dispersing an oil phase comprising at least one monovinylidene aromatic carbocyclic monomer in an aqueous phase containing from about 0.5 to about 4 weight percent based on total monomer of a stabilizing emulsifier selected from the group consisting of water-soluble anionic surfactant, watersoluble non-ionic surfactants and mixtures thereof, and from about 0.2 to about 2 weight percent based on total monomer of a polymer of at least 20 weight percent of a sulfo ester of an α-methylene carboxylic acid and up to 80 weight percent of at least one ethylenically unsaturated monomer copolymerizable therewith selected from a group consisting of monovinylidene aromatic carbocyclic monomer, acrylate esters and acrylonitriles, said total monomer being capable of polymerization to form a water-insoluble polymer, and (2) subjecting the dispersion to emulsion polymerization conditions comprising free-radical type catalyst, temperature in the range from about 60° to about 100° C and agitation of the dispersion.

4,049,605

PROCESS FOR THE POLYMERIZATION OF ACRYLONITRILE

Toshiyuki Kobashi; Masahiko Ozaki; Kenichi Ono, and Noboru Abe, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Aug. 12, 1975, Ser. No. 604,043
Claims priority, application Japan, Aug. 13, 1974, 49-92911
Int. Cl.[2] C08F *20/44*
U.S. Cl. 260—29.6 AN **9 Claims**

1. A process for the catalytic polymerization of acrylonitrile or a monomer mixture containing above 75% by weight of the mixture of acrylonitrile and at least one other ethylenically unsaturated compound, characterized in that the polymerization is conducted at a temperature above 120° C. under the internal pressure generated in a closed polymerization system or under external pressure above the vapor pressure generated in the polymerization system under such polymerization conditions wherein water is present in the system in a range of 5 to 20 percent by weight based on the total weight of the monomer(s) and water to produce an acrylonitrile polymer in a substantially molten state, said polymerization being conducted in the presence of an oil-soluble radical generating agent as a catalyst whose decomposing temperature to obtain a half-life period of 10 hours is about 80° C. selected from the group consisting of di-tert-butyl diperoxyphthalate, tert-butyl hydroperoxide, di-tert-butyl peroxide, 2,5-dimethyl-2,5-di-tert-butyl peroxyhexine, 4-azobis-4-cyanopentanoic amide and 1-azobis-1-cyclohexanecarbonitrile.

4,049,606

PREPARATION OF A MANNICHED POLYACRYLAMIDE QUARTERNARIES THEREOF

Wood E. Hunter, Lombard, and Theodore P. Sieder, Sauk Village, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed July 16, 1976, Ser. No. 705,973
Int. Cl.[2] C08L *61/20*
U.S. Cl. 260—29.4 UA **12 Claims**

1. An improved method for the preparation of a cationically modified acrylamide polymer, said cationically modified polymers generally being prepared by admixing together:

a. an acrylamide polymer;

b. a lower aliphatic aldehyde containing 1-3 carbon atoms; and

c. a lower alkyl secondary amine containing 2-6 carbon atoms; in a mole ration of amide groups on said acrylamide polymer to *b* and *c* above of from 1.0:0.5:0.5 to 1.0:1.5:1.5, the improvement comprising:

A. Preparing a 5-40% by weight aqueous solution of a water soluble acrylamide polymer;

B. Adjusting the pH of said aqueous solution of a water soluble acrylamide polymer to between 4.5-5.5;

C. Adding to the aqueous solution of the acrylamide polymer with mixing, an aqueous solution of a water soluble lower aliphatic aldehyde containing 1-3 carbon atoms in a mole ratio of aldehyde to amide functionality present on said acrylamide polymer of 0.5:1 to 1.1:1 whereby an aqueous acrylamide-aldehyde solution is prepared;

D. Adding to said aqueous acrylamide-formaldehyde solution with mixing a lower aliphatic secondary amine containing 2-6 carbon atoms in a mole ratio of the lower aliphatic aldehyde added to said acrylamide polymer in step C to amine of 1.0:1.0 to 1.0:1.2, whereby the secondary amine is reacted with the acrylamide-aldehyde solution and a stable cationically modified acrylamide polymer is formed; and then,

E. Recovering an aqueous solution of cationically modified acrylamide polymer.

4,049,607

HEAT CONVERTIBLE COATING COMPOSITIONS

Wellington Franklyn Berghoff, Madison, Conn., assignor to ISIS Chemicals, Inc., Stamford, Conn.

Filed Aug. 18, 1972, Ser. No. 281,626
Int. Cl.[2] C08L *61/20*
U.S. Cl. 260—29.4 UA **7 Claims**

1. A heat convertible coating composition consisting essentially of water and, as the essential film-forming polymer ingredient in solution in said water, a partially neutralized water soluble tertiary alkanol amine salt of a copolymer, dissolved in a sufficient amount of solvent, to dissolve said salt, said alkanol amine being selected from the group consisting of dimethyl amino ethanol, triethanolamine, dimethyl aminopropanol, tripropanol amine and diethylamino ethanol, said copolymer consisting of C_2-C_8 alkyl acrylate and 8 - 15% acrylic acid with from 0 - 5% acrylamide and 5 - 10% of hydroxethyl acrylate or hydroxypropyl acrylate and having a molecular weight of 20,000 to 200,000 and an acid number of 95 - 120, said partially neutralized tertiary alkanol amine salt having from 61 - 65% of the stoichiometric amount of tertiary alkanol amine required for complete neutralization of all of the carboxyl groups of said copolymer, said solvent for said 61 - 65% neutralized copolymer salt solution selected from the group consisting of ethylene glycol monoethyl ether, ethylene glycol monoethyl ether acetate, ethylene glycol monobutyl ether butanol and mixtures of these, and a cross-linking, water-soluble and alcohol-soluble film-forming aminoplast selected from the group consisting of melamine-formaldehyde resin condensate, urea-formaldehyde resin condensate, guamidine-formaldehyde resin condensate and the methanol and ethanol modified forms of the aforesaid condensates, and wherein all but the alcohol or ester solvent in the volatile phase is water.

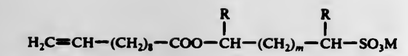
4,049,608

FUNCTIONAL MONOMERS AND COPOLYMERS THEREOF

Robert Steckler, Crofton; Fred Robinson, Columbia, and Robert F. Farmer, III, Gaithersburg, all of Md., assignors to Alcolac Inc., Baltimore, Md.

Division of Ser. No. 498,090, Aug. 16, 1974, abandoned. This application July 19, 1976, Ser. No. 706,206
Int. Cl.[2] C08L *33/14*
U.S. Cl. 260—29.6 SQ **4 Claims**

1. In an aqueous emulsion polymerization process wherein an ethylenically unsaturated monomer is copolymerized in an aqueous emulsion containing a copolymerizable surfactant as a stabilizer for the thus obtained latex; the improvement which comprises, employing as said copolymerizable surfactant an ester of undecylenic acid with a hydroxyalkane sulfonic acid, said ester having the formula:



wherein:

R represents a member of the group consisting of hydrogen, methyl and ethyl;

M represents a cation selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, ammonium and amino; and

m represents an integer of from 0 to 4, provided however that the total number of carbon atoms in the group:



is from 2 to about 6.

4,049,609

PROCESS FOR MODIFYING UNSATURATED POLYESTER SYSTEMS

Juan E. Aguirre, Hackensack, N.J., assignor to Sintetica Americana, Inc., Hackensack, N.J.

Continuation-in-part of Ser. No. 518,071, Oct. 25, 1974, abandoned. This application Nov. 12, 1975, Ser. No. 630,975

Int. Cl.² C08L *63/12, 67/06*

U.S. Cl. 260—29.6 NR **18 Claims**

1. A process for modifying an unsaturated polyester resin system to provide a curable, stable water-in-oil emulsion system, comprising:

reacting said polyester resin system with a hydrolized source of hypochlorite ion, while maintaining during the duration of said reaction a pH of at least 4, whereby said reaction is predominantly one of chlorohydration to yield said curable emulsified system; said source of hypochlorite ion being an aqueous solution having an available chlorine content in the range of from 2.5 to 15%, which is added to said polyester resin system in quantities such that the original resin system comprises about 15 to 70% by weight of the resultant modified system.

4,049,610

PIGMENT PREPARATIONS

Wilhelm Bunge; Wolf-Dieter Last; Rudolf Saitner, and Karlheinz Wolf, all of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 543,118, Jan. 22, 1975 abandoned. This application Jan. 19, 1976, Ser. No. 650,466

Claims priority, application Germany, Jan. 22, 1974, 2402839

Int. Cl.² C08F *45/36*

U.S. Cl. 260—31.2 N **11 Claims**

1. Process for the pigmentation of a synthetic macromolecular material comprising incorporating into said macromolecular material a pigment preparation comprising an inorganic or organic pigment in the amount of from 3 to 80% by weight of said preparation, a carbodiimide resin pigment vehicle in the amount of from 0.5 to 85% by weight of said preparation, and an organic solvent free from amino groups in the amount of from 0 to 75% by weight of said preparation, wherein additional functional groups on said carbodiimide resin comprise urethane, ester, ether or hydroxyl groups or a combination thereof.

4,049,611

MODIFIED POLYESTER POLYBLENDS AND PREPARATION THEREOF

John William Hirzy, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 19, 1975, Ser. No. 633,207

Int. Cl.² C07C *69/34*; C08K *5/11, 5/12*

U.S. Cl. 260—31.6 **31 Claims**

1. Polyblend comprising (a) an alcohol terminated polyester, (b) a coupled polyester derived from a partially alcohol terminated polyester, and (c) a coupled polyester derived from a non-terminated polyester, said polyblend having a molecular weight below about 12,000 and containing from about 10 percent to about 40 percent (b) and (c) combined.

4,049,612

METAL PHOSPHINATES AS SMOKE RETARDANTS FOR POLYVINYL HALIDES

Stanley R. Sandler, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Nov. 28, 1975, Ser. No. 636,175

Int. Cl.² C08J *3/20*

U.S. Cl. 260—31.8 R **11 Claims**

9. A process of preparing a smoke retardant polyvinyl halide resin comprising mixing a polyvinyl halide resin with a sufficient amount to reduce smoking of a metal phosphinate having one, two, three or four phosphinate groups per coordination center and selected-from the respective formulae:

a. MX, MaX, Ma_2X, Ma_3X, $M(AA)X$, $M(AA)_2X$,

b. MX_2, MaX_2, Ma_2X_2, $MabX_2$, $M(AA)X_2$,

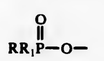
c. MX_3, MaX_3, Ma_2X_3, $MabX_3$, $M(AA)X_3$ or

d. MX_4

wherein

M is a metal selected from the group consisting of beryllium, magnesium, calcium, strontium, barium, titanium, zirconium, antimony, bismuth, chromium, molybdenum, tungsten, manganese, iron, ruthenium, cobalt, rhodium, iridium, nickel, palladium, platinum, copper, silver, zinc, cadmium, mercury, aluminum, tin, lead and mixtures thereof.

X is a phosphinate group having the structure



wherein

R and R_1 are independently selected from the group consisting of an aliphatic group of 1 to 20 carbons, a cycloaliphatic group of 3 to 20 carbons, an aromatic group of 6 to 12 carbons and said aliphatic, cycloaliphatic or aromatic group can have a substituted group thereon the substituted group being selected from the class consisting of a halogen, ether, hydroxyl, alkoxyl, ketone and ester; R can also be hydrogen;

a and *b* are independent unidentate groups selected from the clas consisting of oxy, alkoxy, hydroxyl and halide; and

AA is a bidentate ligand selected from the group consisting of acetylacetonate, picolinate, 8-hydroxyquinolinate, dimethyl glyoximate and glycinate.

10. The process of claim 9 wherein the polyvinyl halide resin contains a plasticizer.

4,049,613

POLYETHERIMIDE COMPOSITES

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 7, 1976, Ser. No. 720,583

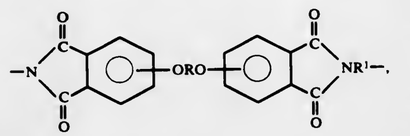
Int. Cl.² C08L *79/08*

U.S. Cl. 260—37 N **4 Claims**

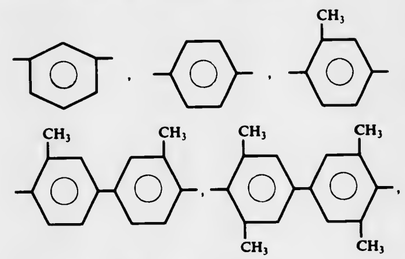
1. Polyetherimie-carbon fiber composites comprising,

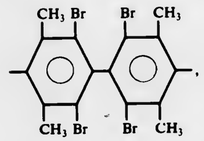
A. from 40% to 85% by weight of carbon fiber having a tensile strength of at least 100,000 psi at 25° C, and an elastic modulus of at least 2×10^6 psi at 25° C and,

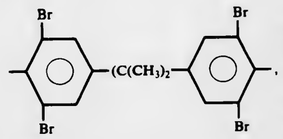
B. from 15% to 60% by weight of polyetherimide, having terminal nitro aromatic groups, consisting essentially of chemically combined units of the formula,



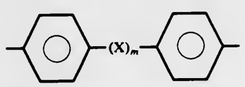
where R is selected from the class consisting of,



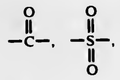




and (b) divalent organic radicals of the general formula,



where X is a member selected from the class consisting of divalent radicals of the formulas, C_nH_{2n}—,



—O—, and —S—, where *m* is 0 or 1, *y* is a whole number from 1-5, and R^1 is a monovalent organo radical selecred from the class consisting of C(1-8) alkyl radicals, and organic radicals having from 6-20 carbon atoms, selected from the class consisting of aromatic hydrocarbon radicals and halogenated derivatives thereof.

4,049,614

PIGMENTED POLYCARBONATES

Arthur L. Baron, and John V. Bailey, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 623,694, Oct. 20, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 734,949

Int. Cl.² C08K *3/36*

U.S. Cl. 260—37 PC **8 Claims**

1. A method for improving the surface properties of articles molded from a pigmented polycarbonate in molds having radical contours and fine interstices, the improvement comprising blending 0.01 to 3% by weight of silica having a particle size between about 1 and 50 millicrons into a polycarbonate resin containing sufficient pigment to opacify said polycarbonate resin when molded into an article.

4,049,615

PROCESS FOR THE DISTORTION-FREE COLORATION OF POLYOLEFINS WITH ORGANIC PIGMENTS

Anton Elsener, Birsfelden; Hans Harald Gehrt, Therwil; Bernhard Medinger, Aesch, and Volkhard Wiese, Prattein, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 489,222, July 17, 1974, abandoned. This application Feb. 19, 1976, Ser. No. 659,440

Claims priority, application Switzerland, July 30, 1973, 11052/73

Int. Cl.² C08K *9/04*

U.S. Cl. 260—39 P **4 Claims**

1. In the process for preparing shaped, distortion-free dope colored high density polyethylene or polypropylene with organic pigments, the improvement comprising using an organic pigment which is coated with a cured melamine-formaldehyde resin.

4,049,616

PREPARATION OF GRAFT, BLOCK AND CROSSLINKED UNSATURATED POLYMERS AND COPOLYMERS BY OLEFIN METATHESIS

Kenneth W. Scott, Cuyahoga Falls, and Nissim Calderon, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 524,730, Nov. 18, 1974, Pat. No. 4,010,224, which is a division of Ser. No. 435,405, Jan. 21, 1974, abandoned, which is a division of Ser. No. 259,881, June 5, 1972, Pat. No. 3,891,816, which is a division of Ser. No. 882,270, Dec. 4, 1969, Pat. No. 3,692,872. This application Oct. 26, 1976, Ser. No. 735,237

Int. Cl.² C08K *3/04*; C08L *23/00*

U.S. Cl. 260—42.32 **3 Claims**

1. A crosslinking reaction wherein a mixture consisting

A. a multicyclic multiolefin crosslinking comonomer possessing at least two interconnected unsaturated alicyclic rings that contain 4, 5, 7, 8, 9, 10 and 12 carbon atoms, and each of said rings possesses at least one —CH=CH— grouping, and said multicyclic multiolefin being free of non-aromatic conjugation; and

B. at least one alicyclic unsaturated compound selected from the group consisting of:

1. alicyclic compounds corresponding to the formula:



wherein:

a. Q is a fragment which comprises a sequence of at least 6 carbon atoms situated in linear succession between the methylidene carbons which constitute the double bond;
b. the carbon atoms in the linear succession of Q may be interconnected by both carbon-carbon single bonds and carbon-carbon double bonds;
c. any of the carbon atoms in the linear succession of Q may be substituted by at least one member from the group of alkyl, aryl, alkenyl, aralkyl, alkaryl, cycloalkyl, cycloalkenyl, bicycloalkyl and bicycloalkenyl radicals;
d. any of said carbon atoms in the linear succession of Q may be constituents of aromatic rings and alicyclic rings; and
e. said alicyclic unsaturated hydrocarbon contains no conjugated double bonds; and

2. alicyclic compounds corresponding to the formula:



wherein:

a. P is a fragment which comprises a sequence of at least 2 and not more than 3 carbon atoms situated in linear succession between and methylidene carbons which constitute the double bond;
b. the carbon atoms in linear succession of P are connected by carbon to carbon single bonds;
c. any of the carbons in the linear succession of P may be substituted by at least one substituent member from the group of alkyl, aryl, alkenyl, aralkyl, alkaryl, cycloalkyl, cycloalkenyl, bicycloalkyl and bicycloalkenyl radicals;
d. any of said carbons in linear succession of P may be constituents of aromatic rings and alicyclic rings, and
e. said alicyclic unsaturated hydrocarbon compound contains no conjugated double bonds

is exposed to a catalyst capable of inducing ring-opening polymerization and olefin metathesis reaction, said catalyst which will convert 2-pentene into 2-butene and 3-hexene at temperatures lower than about 100° C., leading to a predominantly crosslinked polymeric substance, said process being carried out in the presence of (a) carbon black filler, (b) antioxidant, and (c) extending oil.

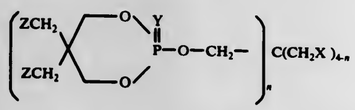
4,049,617

REACTIVE FLAME RETARDANTS

James A. Albright, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jan. 19, 1976, Ser. No. 650,172
Int. Cl.² C08K *5/51, 5/52*
U.S. Cl. 260—45.8 R **13 Claims**

1. A compound of the formula:



wherein each Z is independently selected from the group consisting of hydrogen and halogen; wherein each X is independently selected from the group consisting of hydrogen, halogen, and hydroxyl, provided that at least one X is hydroxy; wherein Y is selected from the group consisting of oxygen and sulfur; and wherein *n* is an integer from 1 to 3.

7. A polymeric composition comprising a polymer selected from the group consisting of polyurethane and polystyrene polymers and a flame retarding amount of a compound according to claim 1.

4,049,618

POLYVINYL CHLORIDE COMPOSITION CONTAINING FERROCENE SMOKE SUPPRESSANT ADDITIVES

John J. Kracklauer, Boulder, Colo., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 227,254, Feb. 17, 1972, abandoned. This application Sept. 5, 1974, Ser. No. 486,717
Int. Cl.² C08J *3/20*
U.S. Cl. 260—45.75 P **8 Claims**

1. A polyvinyl chloride plastic containing as a smoke suppression additive a dicyclopentadienyl iron compound incorporated in said plastic in chemically uncombined form and in smoke reducing effective amounts of about from 0.1 to about 1.0%, by weight, based on the polyvinyl chloride polymer content of said plastic, and wherein said dicyclopentadienyl iron compound is selected from the group consisting of dicyclopentadienyl iron, monoalkyldicyclopentadienyl iron; dialkyldicyclopentadienyl iron, monoalkanoyldicyclopentadienyl iron; dialkanoyldicyclopentadienyl iron; the dimer and polymer reaction products of dicyclopentadienyl iron, and alkyl substituted derivatives thereof, with aldehydes or ketones; and mixtures thereof, and wherein as used with respect to said dicyclopentadienyl iron compounds, the terms alkyl and alkanoyl refer to alkyl groups and alkanoyl groups having from one to eight carbon atoms.

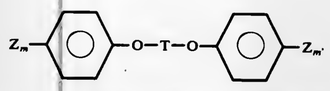
4,049,619

PLASTIC COMPOSITIONS

Arnold L. Anderson, Antioch, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 330,796, Feb. 8, 1973, abandoned. This application Feb. 9, 1976, Ser. No. 656,223
Int. Cl.² C08K *5/05*
U.S. Cl. 260—45.75 B **26 Claims**

1. A plastic composition comprising a three component system consisting of (1) a polysulfone, (2) a bis-phenoxy compound, which functions as a flame retardant for said composition, having the formula



wherein (*a*) Z is bromine; (*b*) *m* and *m'* are independent and are integers having a value of from 1 to 5 with the proviso that the bromine atom content is from 6 to 10 bromine atoms; and (*c*) T is a straight or branched chain carbon group having from one to four carbon atoms, and (3) a flame retardant enhancing agent.

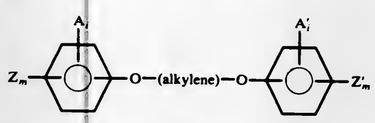
4,049,620

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 8, 1973, Ser. No. 330,853
Int. Cl.² C08L *77/06*
U.S. Cl. 260—45.75 R **15 Claims**

1. A plastic composition comprising nylon and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; m is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

4,049,621

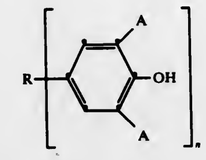
TEXTILE FIBER

Russell Gilkey, Kingsport; Samuel D. Hilbert, Jonesboro, and Thomas H. Wicker, Jr., Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 8, 1975, Ser. No. 603,224
Int. Cl.² C08K *5/11, 5/13, 5/35*
U.S. Cl. 260—40 **4 Claims**

1. A textile fiber comprised of an admixture of

A. a polyetherester of
  1. terephthalic acid, and
  2. a diol component comprised of
    a. ethylene glycol, and
    b. from 6 to 12 weight percent, based on the weight of the polyester, of poly(oxyethylene)glycol having a molecular weight in the range of 200–600,
B. from 50 to 200 weight parts per million, based on the weight of the polyetherester, cobaltous aluminate,
C. from 0.01 to 0.16 weight percent, based on the weight of the polyetherester, of a stabilizer effective to reduce oxidative degradation of the polyester corresponding to the structure



n is from 1 to 4,

R is a radical selected from the group consisting of
  1. neopentanetetrayltetrakis[oxy(3-oxotrimethylene)],
  2. phosphinylidynetrioxy,
  3. 2,4,6-trimethyl-1,3,5-benzenetriyltrimethylene,
  4. alkylene having 1 to 5 carbon atoms,
  5. alkyl having 1 to 12 carbon atoms,
  6. (2,4,6-trioxo-1,2,3,4,5,6-hexahydro-s-triazine-1,3,5-triyl)tris(3-oxotrimethylene),
  7. [3-octadecyloxy)-3-oxopropyl], and

A is a monovalent radical selected from the group consisting of
  1. tertiary alkyl having 4 to 8 carbon atoms,
  2. alkyl having 8 to 22 carbon atoms, and
  3. secondary alkyl having 12 to 24 carbon atoms, and

D. a whitening agent which is
  1. from 0.5 to 4.0 weight parts per million, based on the weight of the polyetherester, of a thermaliy stable, organic compound characterized by having a high reflectance in the range of 400 to 500 nm and strong absorbance in the range of 550 to 650 nm, or
  2. from 100 to 400 weight parts per million, based on the weight of the polyetherester, of a thermally stable, organic compound having a fluorescence emission spectrum in methylene chloride in the range of 425 to 445 nm.

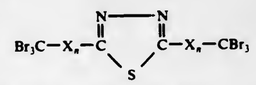
4,049,622

SELF-EXTINGUISHING THERMOPLASTIC MOLDING COMPOSITIONS

Helmut Fleig, Mannheim; Helmut Hagen, Frankenthal; Herbert Naarmann, Wattenheim, and Klaus Penzien, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 18, 1976, Ser. No. 715,640
Claims priority, application Germany, Oct. 9, 1975, 2545223
Int. Cl.² C08J *9/00*; C08K *5/46*
U.S. Cl. 260—2.5 HB **7 Claims**

1. A thermoplastic molding composition comprising a styrene homopolymer or a styrene copolymer containing a flameproofing amount of an organic bromine compound of the general formula



where X is a divalent aliphatic aromatic, cycloaliphatic or araliphatic radical of up to 12 carbon atoms and *n* is 0 or 1.

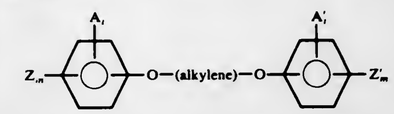
4,049,623

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 8, 1973, Ser. No. 330,803
Int. Cl.² C08L *63/00*
U.S. Cl. 260—45.95 G **14 Claims**

1. A plastic composition comprising epoxy resins and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

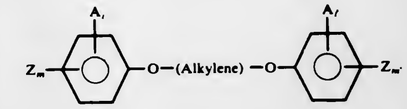
4,049,624

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 8, 1973, Ser. No. 330,806
The portion of the term of this patent subsequent to Sept. 20, 1994, has been disclaimed.
Int. Cl.² C08L *25/04*
U.S. Cl. 260—45.95 G **14 Claims**

1. A plastic composition comprising polystyrenes and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

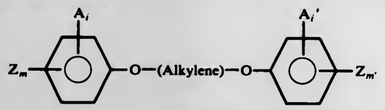
4,049,625

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 8, 1973, Ser. No. 330,807
The portion of the term of this patent subsequent to Sept. 20, 1994, has been disclaimed.
Int. Cl.[2] C08L *75/04*
U.S. Cl. 260—45.95 G 14 Claims

1. A plastic composition comprising polyurethanes and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

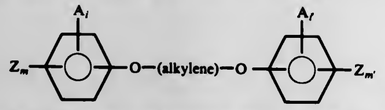
4,049,626

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 8, 1973, Ser. No. 330.851
The portion of the term of this patent subsequent to Sept. 20, 1994, has been disclaimed.
Int. Cl.[2] C08L *69/00*
U.S. Cl. 260—45.95 G 14 Claims

1. A plastic composition comprising polycarbonate (having incorporated therein an effective amount of a flame retardant which is a bis-phenoxy compound) and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

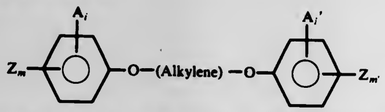
4,049,627

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 8. 1973, Ser. No. 330,852
The portion of the term of this patent subsequent to Sept. 20, 1994, has been disclaimed.
Int. Cl.[2] C08L *81/06*
U.S. Cl. 260—45.95 G 14 Claims

1. A plastic composition comprising polysulfones and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

4,049,628

POLYESTERS AND PROCESS FOR THEIR PREPARATION

Jean Weiss, Moval, and Alain Zalmanski, Chantilly, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Feb. 6, 1973, Ser. No. 330,117
Claims priority, application France, Jan. 12, 1972, 72.00903
Int. Cl.[2] C08G *63/54*
U.S. Cl. 260—47 UA 1 Claim

1. Unsaturated polyesters comprising the reaction product of maleic acid with the polyhalogenated polyphenyl which is itself a reaction product of decachlorodiphenyl with a polyethyleneglycol, the polyesters possessing about 60 to 98% fumaric acid groups and from about 40 to 2% maleic acid groups.

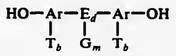
4,049,629

SOLUTION POLYCONDENSATION METHOD

Joseph A. Pawlak, Cheektowaga; Anthony L. Lemper, Amherst, and Victor A. Pattison, Clarence Center, all of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,644
Int. Cl.[2] C08G *63/22, 63/18*
U.S. Cl. 260—47 C 8 Claims

1. In the solution polymerization process for the preparation of linear aromatic polyesters by reacting an organic diacid halide with a hydroxyl containing component in the presence of a catalyst, the improvement which comprises adding a hydroxyl-containing component comprising a mixture of a bisphenol and a glycol, to the diacid halide wherein the diacid halide is terephthaloyl chloride, isophthaloyl chloride or a mixture thereof, and wherein the hydroxyl-containing component is 15–85 85 mol percent of a glycol of 2–20 carbon atoms and a bisphenol of the formula



in which Ar is aromatic, each T is independently selected from the group consisting of halogen, G or OG, each G is independently selected from the group consisting of alkyl, aryl, haloaryl, haloalkylaryl, alkylaryl, cycloalkyl, halocycloalkyl, and haloalkyl, E is a bivalent alkylene, haloalkylene, cycloalkylene, halocycloalkylene, arylene, haloarylene, —O—, —S—, —SO—, —SO_2—, —SO_3—, —CO—,



or GN<, *m* is 0 to the number of replaceable hydrogen atoms on E, each *b* is 0 to the number of replaceable hydrogen atoms on Ar, and *d* is 0 or 1.

4,049,630

PROCESS FOR PREPARATION OF S-TRIAZINE PREPOLYMERS

Rudolf Sundermann, Leverkusen; Rolf Pütter, Dusseldorf, and Ernst Grigat, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 13, 1975, Ser. No. 631,560
Claims priority, application Germany, Dec. 3, 1974, 2457081
Int. Cl.[2] C08G *73/06*
U.S. Cl. 260—47 R 21 Claims

1. Process for the preparation of s-triazine prepolymers which comprises

a. condensing a hydroxy compound which has 2 or more alcoholic hydroxyl groups corresponding to the formula

$$HO—A—(OH)_z \quad (I)$$

in which

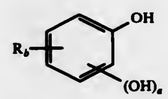
A denotes an aliphatic, cycloaliphatic or aromatic radical and

z denotes an integer which is smaller by at least the number 1 than the number of carbon atoms of the radical A which are capable of substitution

with more than 1/3 mol of cyanuric chloride per hydroxyl group at a temperature in the range of 0° to 250° C;

b. condensing the resulting condensation product with an aromatic hydroxy compound selected from the group consisting of compounds corresponding to the formulae

(II)

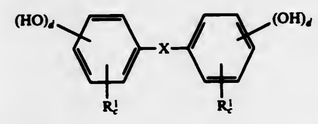


in which

R denotes hydrogen, halogen, alkyl or phenyl, and it is not necessary for several radicals R to be identical, or two radicals R which are substituents on adjacent carbon atoms can also form, conjointly with these, a carbocyclic or heterocyclic 5-membered or 6-membered ring,

a represents one of the numbers 1, 2, or 3 and *b* represents 5-*a* and

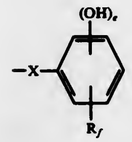
(III)



in which

X represents oxygen, the sulfonyl group (SO_2), the carbonyl group (CO), a CH_2 chain with up to 6 carbon atoms which is optionally substituted by lower alkyl radicals, phenyl, a cycloaliphatic or aromatic 5-membered or 6-membered ring or a single bond and

R^1 has the meaning indicated above for R or represents the grouping



in which

X and R have the abovementioned meaning,

e represents one of the numbers 1, 2, or 3,

f represents 5-*e*,

c represents 5-*d*,

d denotes one of the numbers 1, 2, or 3 in such a way that more than 1 hydroxyl group equivalent of the aromatic hydroxy compound is used per unconverted chlorine atom of the condensation product obtained from (a) at a temperature in the range of 0° to 250° C; and

c. thereafter reacting the free hydroxyl groups of the condensation product obtained from (b) with cyanogen halide and in the presence of a base selectd from the group consisting of alkali metal hydroxide, alkali metal carbonate, alcoholate and tertiary amine in amounts which correspond to a molar ratio of phenolic hydroxyl groups to cyanogen halide to base in the range of 1:1:1 to a slight excess of cyanogen halide at a temperature in the range of −40° to +65° C.

4,049,631

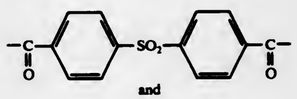
ISOPHTHALIC ACID/P,P-SULFONYLDIBENZOIC ACID/ETHYLENE GLYCOL/NEOPENTYL GLYCOL POLYESTER COMPOSITIONS AND CONTAINERS MADE THEREFROM

Santos W. Go, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 22, 1975, Ser. No. 643,283
Int. Cl.[2] C08G *63/68*
U.S. Cl. 260—75 S 4 Claims

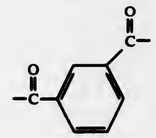
1. A linear copolyester which can be melted and molded to a clear container, the repeating units of said polyester consisting essentially of

(a)



and

(b)



and

c. —O—CH_2—CH_2—O—

and

d. —O—CH_2—$C(CH_3)_2$—CH_2—O—,

said polyester having an oxygen permeability of less than 15 cc.ml/100 in.[2].day.atm. and a glass transition temperature in excess of 72° C., said (a) and (b) units and said (c) and (d) units respectively being the units formed by reactively combining polyester forming precursors thereof in an amount of at least one mole of the precursors of said (c) and (d) units per mole of precursors of said (a) and (b) units and wherein the precursors of said units in forming said polyester by said reactive combining are in a molar ratio of said (b) unit precursor to said (a) unit precursor of about 80:20 to about 20:80 and a molar ratio of said (c) unit precursor to said (d) unit precursor of about 80:20.

4,049,632

CHAIN EXTENDING POLYURETHANES WITH A LARGE EXCESS OF WATER

Alan B. Magnusson, and Howard S. White, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed July 14, 1976, Ser. No. 705,117
Int. Cl.[2] C08G *18/10, 18/30, 18/82*
U.S. Cl. 260—75 NE 6 Claims

1. A method of producing a polyurethane-urea elastomer resistant to textile fiber dressing solvents which comprises the steps of:

a. reacting a prepolymer having terminal isocyanate groups obtained by reacting

1. a diisocyanate selected from the group consisting of xylylene diisocyanate, toluene diisocyanate, diisocyanato cyclohexyl methane and isophorone diisocyanate; with

2. a difunctional, hydroxy-terminated polyester of equivalent weight 480–540,

without solvent, in a low-intensity mixer with:

b. water,

wherein the quantity of said water is 3–20 times greater than necessary to react with said terminal isocyanate groups.

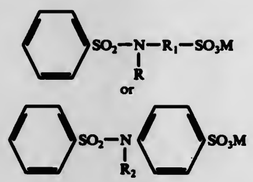
4,049,633

METHOD FOR IMPROVING DISPERSE DYEABILITY OF POLYESTERS AND PRODUCT THEREOF

Harold Roy Panton, Jr., Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed Sept. 22, 1976, Ser. No. 725,909
Int. Cl.² C08G 63/70, 63/18
U.S. Cl. 260—75 T 12 Claims

1. A method for improving the disperse dyeability of a film or fiber forming polyester which comprises dispersing in the polyester a compound of the formula



(1)

or

(2)

wherein R is benzyl or phenethyl, R_1 is ethylene or propylene, R_2 is hydrogen or lower alkyl and M is an alkali metal.

4,049,634

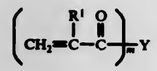
IN-AIR CURABLE RESIN COMPOSITIONS

Keizo Ko, Misao; Naomitsu Takashima; Shigeru Shiokawa, both of Fujisawa, and Rokuro Fujita, Chigasaki, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Japan

Filed July 25, 1975, Ser. No. 598,941
Claims priority, application Japan, July 31, 1974, 49-87086
Int. Cl.² C08L 63/00; C08G 63/12
U.S. Cl. 260—75 UA 18 Claims

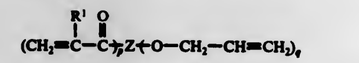
1. A liquid in air-curable resin composition comprising

A. an unsaturated oligomer having a number average molecular weight of 500 to 4000 and containing at the end of the molecule at least two member selected from the group consisting of acryloyl and methylacryloyl groups, and at least one ethylenically unsaturated double bond in the oligomer chain which oligomer is expressed by the following formula:



wherein R^1 is a hydrogen atom or a methyl group, Y represents an ethylenically unsaturated polyepoxide or polyester oligomer residue containing up to 15 acyl structural units derived from ethylenically unsaturated monomers bonded to each other through —O— or —COO—, and *m* is a number of from 2 to 10 and

B. an oligomer having a number average molecular weight of 500 to 4000 which contains at the ends of the molecule at least two member selected from a group consiting of acryloyl and methacryloyl groups, and at least one pendant allyloxy group in the oligomer chain, said oligomer having an allyloxy group equivalent of not more than 500 and being free from an ethylenic internal double bond in the oligomer chain, said oligomer being expressed by the following formula



wherein R^1 is a hydrogen atom or a methyl group, Z represents an oligomer residue defined as Y but not containing an ethylenic internal double bond, *p* is a number of from 2 to 10, and *q* is a number of from 1 to 15,

the weight ratio of (A) to (B) being 8:2 to 2:8.

4,049,635

PRODUCTION OF TETRAMETHYLENE TEREPHTHALATE POLYMERS USING 225° TO 248° C. POLYCONDENSATION TEMPERATURE

James W. Cleary, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 19, 1976, Ser. No. 649,951
Int. Cl.² C08G 63/14
U.S. Cl. 260—75 R 8 Claims

1. A process for preparing a polyester comprising; transesterifying 1,4-butanediol and at least one dialkyl benzenedicarboxylate consisting of 80 to 100 mole percent of at least one dialkyl terephthalate and 0–20 mole percent of at least one ester selected from dialkyl phthalates and dialkyl isophthalates, each of said alkyls of said dialkyl benzenedicarboxylate being selected from alkyl groups having 1 to 4 carbon atoms, by contacting said 1,4-butanediol and said at least one dialkyl benzenedicarboxylate with a transesterification and polycondensation catalyst consisting essentially of a tetraalkyl titanate of the formula $Ti(OR)_4$ wherein R is an alkyl group having 1 to 6 carbon atoms, said contacting being carried out at a temperature within a range of 130° C. to 248° C. at substantially atmospheric pressure; and thereafter subjecting the resulting mixture in a melt state to a temperature within the range of 225° to 248° C. and reduced pressure for a time within the range of 2 to 8 hours to effect polycondensation, said temperature during said polycondensation at no time exceeding 248° C.

4,049,636

THERMALLY STABLE POLYURETHANE ELASTOMER USEFUL IN MOLDING FLEXIBLE AUTOMOBILE EXTERIOR BODY PARTS

Chung-Ling Mao, Sandy Hook, and Francis X. O'Shea, Naugatuck, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,212
Int. Cl.² C08G 18/04
U.S. Cl. 260—77.5 CR 4 Claims

1. A thermally stable polyurethane elastomer which is a reaction product of: (a) a poly(oxypropylene)poly(oxyethylene) glycol of molecular weight of from about 1500 to about 4000 and containing from 15% to 50% oxyethylene groups by weight; (b) a graft polyol of molecular weight from about 2500 to about 4500, prepared by the in situ polymerization of ethylenically unsaturated monomeric material in a glycol selected from the group consisting of (i) poly(oxypropylene) glycol, (ii) poly(oxypropylene)-poly(oxyethylene) glycol containing less than 15% by weight oxyethylene groups, and (iii) a mixture of poly(oxypropylene) glycol and poly(oxypropylene)-poly(oxyethylene) glycol containing less than 15% by weight oxyethylene groups, the amount of polymerized monomer in the graft polyol being from 5 to 50% by weight; (c) methylenebis(4-phenylisocyanate); and (d) 1,4-butanediol; the ratio of (a)/(b) being from about 90/10 to 10/90 by weight, the NCO/OH equivalents ratio being from 0.95 to 1.1, and the molar ratio of (d) to (a) plus (b) being from 6/1 to 12/1, said elastomer having a hardness of about 40 to 55 Shore D, an elongation of greter than 300%, an ultimate tensile strength of at least 3,000 psi and a Die C tear strength of at least 500 pli, said elastomer displaying improved thermal stability as evidenced by its ability to retain at least twice as much of its original tensile strength, after exposure to a temperature of 400° F. for 20 minutes, as a similar elastomer in which (a) contains 10% or less of oxyethylene groups or in which (a) is omitted.

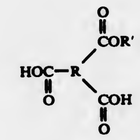
4,049,637

POLYMER PREPARED FROM HYDRAZINE AND TRICARBOXYLIC ACID DERIVATIVES AND METHOD OF PREPARATION

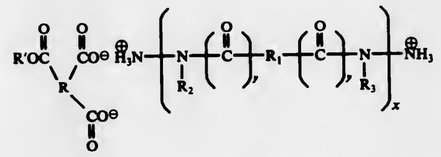
Karl F. Schimmel, Verona, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 628,611, Nov. 4, 1975, which is a division of Ser. No. 511,337, Oct. 2, 1974, Pat. No. 3,969,566, which is a division of Ser. No. 369,629, June 13, 1973, Pat. No. 3,882,086.
This application Nov. 16, 1976, Ser. No. 742,310
Int. Cl.² C08G 73/08, 73/10
U.S. Cl. 260—78 TF 2 Claims

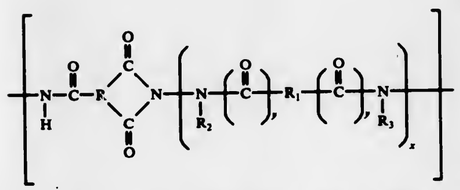
1. The method of producing a high temperature polymer comprising mixing a tricarboxylic monoanhydride with a monofunctional alcohol and heating at reflux the mixture so formed to thereby form an ester-acid having the structural formula:



mixing said ester acid with a sufficient amount of a member selected from the group consisting of a hydrazine and a hydrazide, to thereby form a polysalt having the structural formula:



and heating said polysalt at a temperature sufficient to form a high temperature resistant polymer having the structural formula:



where R is a trivalent organic radical having at least two carbon atoms; R_1 is a divalent organic radical having at least two carbon atoms; R_2 and R_3 are selected from the group consisting of alkyl, aryl, aralkyl, cycloalkyl, and hydrogen radicals and *x* and *y* are either 1 or 0.

4,049,638

MANUFACTURE OF POLYLACTAMS WITH INITIAL PRESSURES ABOVE VAPOR PRESSURES OF STARTING MATERIALS

Helmut Doerfel, Heidelberg, and Claus Cordes, Weisenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Sept. 2, 1975, Ser. No. 609,693
Claims priority, application Germany, Sept. 12, 1976, 2443566
Int. Cl.² C08G 69/16
U.S. Cl. 260—78 L 13 Claims

1. A process for the continuous production of a solid polyamide by continuously transporting a mixture of one or more lactams and from 1 to 15% based on lactam of water through a number of successive reaction zones under polyamide-forming conditions, which comprises:

a. heating the mixture of starting materials in the first reaction zone to a temperature of from 210° to 330° C at minimum pressures of at least 20 atm. and which pressures are above the respective vapor pressures of the starting materials and prevent the formation of a vapor phase in said first reaction zone, said heating being effected for from 5 minutes to 2 hours until the polymerizable mixture has been polymerized to a conversion of at least 70%, but not to completion, said polymerizable mixture occuring in said first reaction zone under plug flow conditions, and transferring said polymerizable mixture to a next zone;

b. adiabatically reducing the pressure of the polymerizable mixture in the second zone to pressures of from 1 to 11 atm and then transferring to and immediately heating in a third reaction zone, with the application of heat and evaporation of the major portion of the water at the said pressure obtained by pressure reduction or at a pressure which is lower than said pressure, said heating being carried out for less than 10 minutes but long enough to ensure evaporation of the major portion of the water at temperatures of from 250° to 350° C, and transferring the polymerizable mixture to a next zone;

c. separating the polymerization mixture from the steam in a fourth reaction zone and polymerizing to completion in a further reaction stage to increase the molecular weight of the solid polyamide.

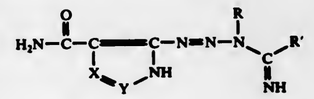
4,049,639

5-AMIDO IMIDO TRIAZENE TRIAZOLES AND PYRAZOLES WITH PHOTOGRAPHIC AND ANTIMYCOTIC UTILITY

József Schawartz; Maria Hornyák; Éva Majorszki; Erzsebet Kovacsovics; Ágoston Dávid, and Gábor Horváth, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Budapest, Hungary

Continuation-in-part of Ser. No. 302,724, Nov. 1, 1972, abandoned. This application Feb. 13, 1975, Ser. No. 549,761
Claims priority, application Hungary, Nov. 19, 1971, CI 1190
Int. Cl.² C07C 107/00, 107/04; G03C 5/30
U.S. Cl. 260—140 19 Claims

1. A compound of the formula:



wherein:

X is —CH= or nitrogen;

Y is =CH— or nitrogen;

R is C_1 to C_6 alkyl, C_3 to C_6 cycloalkyl, phenyl or halophenyl; and

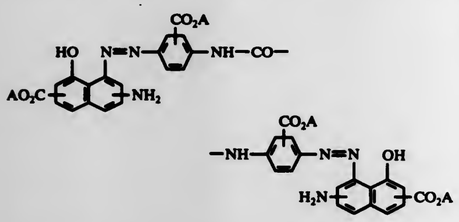
R′ is phenyl or phenyl substituted by C_1 to C_6 alkoxy or C_1 to C_6 alkyl, or is C_1 to C_6 alkyl.

4,049,640
SUBSTITUTED BISNAPHTHYLAZO DIPHENYL UREIDO COMPLEMENT INHIBITORS

Ransom Brown Conrow, Pearl River; Seymour Bernstein, New City, and Norman Bauman, Nanuet, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 12, 1975, Ser. No. 640,100
Int. Cl.[2] C07C *107/08;* C09B *43/14;* A61K *31/655*
U.S. Cl. 260—175 3 Claims

1. A compound selected from those of the formula:



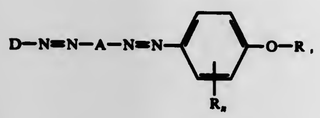
wherein A is H, Na or K, with the proviso that A is identical in the same compound.

4,049,641
OPTIONALLY SUBSTITUTED SULFOPHENYL-AZO-NAPHTHYLENE-AZO-PARA-ALKOXYPHENYL DYES

Martin Studer, Bettingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 344,935, March 26, 1973, Pat. No. 3,951,590, which is a continuation of Ser. No. 45,546, June 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 743,054, July 8, 1968, abandoned. This application Dec. 18, 1975, Ser. No. 642,192
Claims priority, application Switzerland, July 27, 1967, 10645/67
Int. Cl.[2] C09B *43/00*
U.S. Cl. 260—191 10 Claims

1. A compound of the formula



wherein

D is sulfophenyl or substituted sulfophenyl wherein each substituent is independently alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, nitro, chloro or bromo,

A is 1,4-naphthylene, substituted 1,4-naphthylene, 1,4-(5,6,7,8-tetrahydronaphthylene) or substituted 1,4-(5,6,7,8-tetrahydronaphthylene), wherein each substituent of substituted 1,4-naphthylene and substituted 1,4-(5,6,7,8-tetrahydronaphthylene) is independently lower alkyl, lower alkoxy, chloro or bromo,

each

R is independently alkyl of 1 to 4 carbon atoms, and

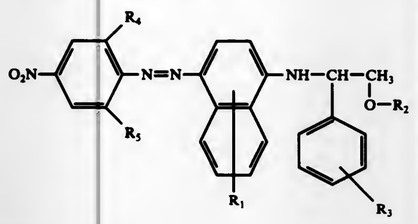
n is 0, 1 or 2.

4,049,642
PHENYL-AZO-NAPHTHYL DYES HAVING A 2-ACYLOXY, ALKOXY OR HYDROXY-1-ARYLETHYLAMINO GROUP IN THE 4-POSITION OF THE NAPHTHALENE RING

Wolfgang Groebke, Oberwil, and Klaus Körte, Therwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 538,376, Jan. 3, 1975, abandoned. This application July 12, 1976, Ser. No. 704,718
Claims priority, application Switzerland, Jan. 11, 1974, 352/74
Int. Cl.[2] C09B *29/06, 29/28;* D06P *3/24, 3/52*
U.S. Cl. 260—196 28 Claims

1. A compound of the formula



wherein each of

R_1 and R_3 is independently hydrogen, hydroxy, chloro, bromo, C_{1-4}alkyl, C_{1-4}alkoxy, (C_{1-4}alkyl)- carbonyl, (C_{1-4}alkoxy)carbonyl, (C_{1-4}alkyl)- carbonylamino or (C_{1-4}alkoxy)carbonylamino,

R_2 is hydrogen, (C_{1-4}alkyl)carbonyl, (C_{1-4}alkoxy)- carbonyl, benzoyl, C_{1-4}alkyl or C_{1-4}alkyl monosubstituted by C_{1-4}alkoxy, phenoxy, benzyloxy, halo or hydroxy,

R_4 is nitro or cyano, and

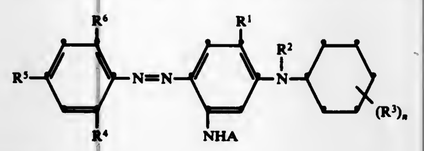
R_5 is chloro or bromo.

4,049,643
PHENYLAZO COMPOUNDS FROM CYCLOHEXYLAMINOACYLANILIDES

Max A. Weaver, James M. Straley, and William H. Moore, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 514,964, Oct. 15, 1974, abandoned, and a continuation-in-part of Ser. No. 833,743, June 16, 1969, abandoned. This application Feb. 23, 1976, Ser. No. 660,287
Int. Cl.[2] C09B *29/08, 29/26;* D06P *1/04, 3/52*
U.S. Cl. 260—207.1 8 Claims

1. A water-insoluble azo compound having the formula



wherein

A is formyl; lower alkanoyl; lower alkanoyl substituted with chlorine, bromine, cyano, lower alkoxy, hydroxy, lower alkylsulfonyl, phenyl, lower alkylphenyl, lower alkoxyphenyl or halophenyl; benzoyl; benzoyl substituted with lower alkyl, lower alkoxy, chlorine or bromine; cyclohexylcarbonyl; lower alkoxycarbonyl; lower alkoxycarbonyl substituted with hydroxy or cyano;

R^1 is hydrogen, lower alkyl, or lower alkoxy;

R^2 is hydrogen, lower alkyl; or lower alkyl substituted with cyano, lower alkanoyloxy, or cyclohexyl;

R^3 is lower alkyl and

n is 0, 1, 2 or 3;

R^4 is hydrogen, chlorine, bromine, cyano, lower alkanoyl, lower alkoxycarbonyl, lower alkylsulfonyl or trifluoromethyl;

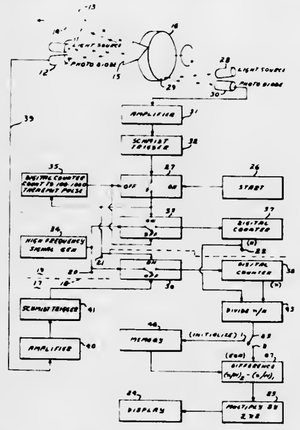
R^5 is nitro, lower alkylsulfonyl, thiocyanato, or sulfamoyl; and

R^6 is hydrogen, chlorine, bromine, formyl, lower alkanoyl, lower alkoxycarbonyl, trifluoromethyl, lower alkylsulfonyl, sulfamoyl, carbamoyl, cyano, or nitro.

4,049,644
DEVICE FOR MEASURING TIP DEFLECTION OF ROTATING BLADES

Arthur J. Wennerstrom, 215 Mar-Ken Drive, Dayton, Ohio 45405

Filed June 23, 1976, Ser. No. 699,902
Int. Cl.[2] G01D *5/36;* H01J *39/12*
U.S. Cl. 250—233 4 Claims



1. Apparatus for measuring the change of circumferential position of a location on the tip of a blade having a radius of rotation of a rotor of a turbomachine between a first condition of operation of the turbomachine and a second condition of operation of the turbomachine comprising:

a. means for detecting revolutions of the said rotor;

b. means for detecting the passage of a blade past a given location;

c. a high frequency signal generator generating a signal of a uniform train of pulses;

d. means cooperating with the said means for detecting revolutions and the said signal generator for providing an output "N" representative of the numerical number of pulses per revolution;

e. means cooperating with the said means for detecting revolutions and the means for detecting the passage of a blade and the said signal generator for providing an output "*n*" of a numerical number of pulses representative of the position of the said location on the blade;

f. means for dividing the said output *n* by the said output N and providing an output representative of the ratio of *n*/N;

g. means for providing an output representative of the difference in the value of the ratio of *n*/N between the said first condition of operation and the said second condition of operation of the turbomachine;

h. means for providing a product output of the multiplication of the said difference output and 2π times the numerical value of the said radius of the said blade tip; and

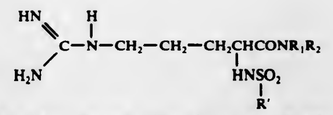
i. means for digitally displaying the said product output.

4,049,645
N^2-NAPHTHALENESULFONYL-L-ARGININE DERIVATIVES, AND THE PHARMACEUTICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF

Shosuke Okamoto, Kobe; Ryoji Kikumoto; Kazuo Ohkubo; Shinji Tonomura, all of Tokyo; Yoshikuni Tamao; Tohru Tezuka, both of Yokohama, and Akiko Hijikata, Kobe, all of Japan, assignors to Mitsubishi Chemical Industries Limited and Shosuke Okamoto, both of Tokyo, Japan

Continuation-in-part of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Mar. 29, 1976, Ser. No. 671,568
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-23268; Feb. 26, 1975, 50-23635; Mar. 5, 1975, 50-26768; Mar. 11, 1975, 50-29357; Mar. 11, 1975, 50-29358
Int. Cl.[2] C07D *223/04, 225/02;* A61K *31/395, 31/445;* C07D *295/10, 211/08;* A61K *31/18, 31/04*
U.S. Cl. 260—239 B 10 Claims

1. N^2-naphthalenesulfonyl-L-arginine amides having the formula



or the acid addition salts thereof with a pharmaceutically acceptable acid, wherein R_1 and R_2 are members selected from the group consisting of hydrogen and a hydrocarbon selected from the group consisting of alkyl, aryl, cycloalkyl, respectively containing not more than 10 carbon atoms, and aralkyl and cycloalkylalkyl, respectively containing not more than 15 carbon atoms, or R_1 and R_2 together are polymethyleneiminyl of 3-10 carbon atoms, optionally substituted by 1 or 2 alkyl groups containing not more than 10 carbon atoms; and R' is a member selected from the class consisting of 5, 6, 7, 8-tetrahydro-1-naphthyl, 5,6,7,8-tetrahydro-2-naphthyl, 1-naphthyl, 2-naphthyl, 1-naphthyl substituted with one member selected from the class consisting of halogen, nitro, cyano, hydroxy, alkyl containing not more than 10 carbon atoms, 2-naphthyl substituted with one member selected from the class consisting of halogen, nitro, cyano, hydroxy and alkyl containing not more than 10 carbon atoms.

4,049,646
PROCESS FOR THE MANUFACTURE OF LACTAMS

Herbert Furkert, Grosskonigsdorf, Germany, assignor to Davy Powergas GmbH, Cologne, Germany

Filed June 9, 1972, Ser. No. 261,220
Claims priority, application Germany, June 18, 1971, 2130037
The portion of the term of this patent subsequent to Sept. 25, 1990, has been disclaimed.
Int. Cl.[2] C07D *201/04*
U.S. Cl. 260—239.3 A 17 Claims

1. In a process for manufacturing a lactam which includes rearranging a cycloalkanone-oxime with sulfuric acid or to form said lactam, completely neutralizing the rearrangement mixture with ammonia to form ammonium sulfate, and separating said lactam and said ammonium sulfate, the improvement which comprises:

a. forming said ammonium sulfate into finely divided particles;

b. burning said particles at a temperature of 850° – 1250° C. to form an SO_2-containing gas;

c. oxidizing said SO_2-containing gas to form sulfuric acid; and

d. recycling at least a portion of said sulfuric acid to the cycloalkanone-oxime rearrangement step.

4,049,647

BIS PIPERIDYL CARBOXYLATES

Brian Holt, Royton, and Donald Richard Randell, Stockport, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

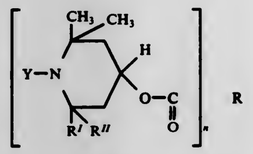
Division of Ser. No. 310,031, Nov. 28, 1972, abandoned. This application May 14, 1975, Ser. No. 577,534

Claims priority, application United Kingdom, Nov. 30, 1971, 55487/71; June 17, 1972, 28458/72; July 28, 1972, 35473/72

Int. Cl.² C07D *401/12*

U.S. Cl. 542—426 **3 Claims**

1. A compound having the formula:



wherein R^I and R^{II} are the same or different and each is a straight or branched alkyl group, having from 1 to 4 carbon atoms, or R^I or R^{II}, together with the carbon atom to which they are attached form a cycloalkyl group having from 5 to 12 carbon atoms; Y is an alkyl group, having from 5 to 20 carbon atoms, alkenyl having from 7 to 9 carbon atoms, *n* is 2, R is alkylene having from 1 to 20 carbon atoms, cycloalkylene having from 5 to 12 carbon atoms, arylene, vinylene, propenylene, p-xylylene, the group $—CH_2CH_2SCH_2CH_2—$ or R is absent; and a salt thereof selected from phosphate, carbonate, sulfate, chloride, acetate, stearate, maleate, citrate, tertrate, oxalate, benzoate and substituted carbamate.

4,049,648

PG-TYPE, 1,9-LACTONES

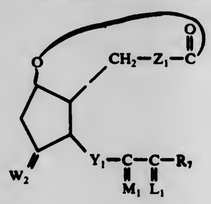
Gordon L. Bundy, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 589,724, June 23, 1975, abandoned. This application Mar. 29, 1976, Ser. No. 670,522

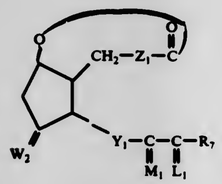
Int. Cl.² C07D *313/00*

U.S. Cl. 542—426 **90 Claims**

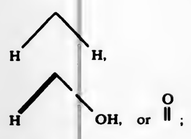
1. A prostaglandin-type, 1,9-lactone of the formula



or



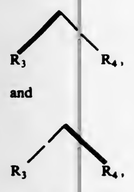
wherein W_2 is



wherein L_1 is



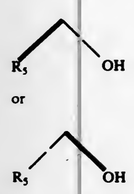
or a mixture of



and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro, only when the other is hydrogen or fluoro;

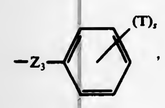
wherein M_1 is



or

wherein R_5 is hydrogen or methyl;

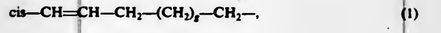
wherein R_7 is $—(CH_2)_m—CH_3$, wherein m is one to 5, inclusive, cis—CH=CH—CH_2—CH_3, or



wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, *s* is zero, one, 2, or 3, and Z_3 is oxa or methylene, with the provisio that not more than two T's are other than alkyl, and the further proviso that Z_4 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different;

wherein Y_1 is trans—CH=CH—, $—CH_2CH_2—$, cis—CH=CH—, or —C≡C—; and

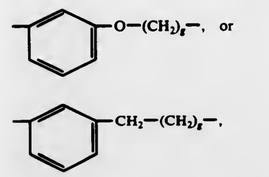
wherein Z_1 is



(1)



(2)



wherein *g* is one to 3, inclusive.

4,049,649

PYRIDINE-CONTAINING INDICATOR DYE

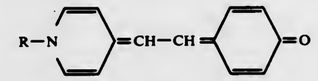
Francois A. Lavallee, Willoughby Hills, Ohio; Donald G. Le Grand, Burnt Hills, and George L. Gaines, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 574,725, May 5, 1975, Pat. No. 4,013,414. This application June 28, 1976, Ser. No. 700,256

Int. Cl.² C09B *17/02*

U.S. Cl. 542—400 **2 Claims**

1. An acid-base indicator dye which comprises a soluble organic nitrogen compound having the general formula



wherein R is an aliphatic hydrocarbon radical having 12 to 20 carbon atoms, said acid-base indicator dye producing a color change when dissolved in an organic solvent so that the color change shifts to longer wavelengths with increasing polarity of the solvent.

4,049,650

1-[[[5-(SUBSTITUTED PHENYL)-2-OXAZOLYL]METHYLENE]AMINO]-2,4-IMIDAZOLIDINEDIONES

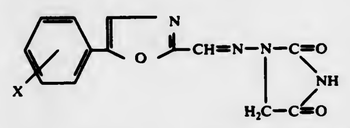
Ralph L. White, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,296

Int. Cl.² C07D *405/06*

U.S. Cl. 542—400 **11 Claims**

1. A compound of the formula:



wherein X represents hydrogen, 4-halo, 3,4-dichloro, 4-nitro, 4-methoxy, 4-methyl or 3-trifluoromethyl.

and

4,049,651

ALKOXY AND ALKYLTHIOALKYLUREIDO CEPHALOSPORINS

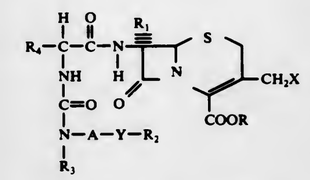
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 19, 1976, Ser. No. 678,001

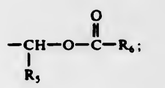
Int. Cl.² C07D *501/36*

U.S. Cl. 544—21 **18 Claims**

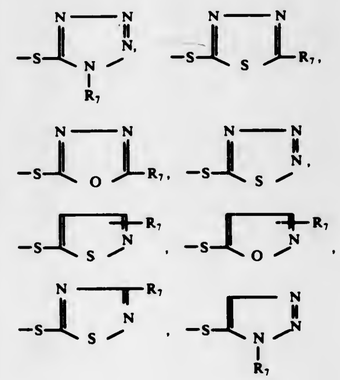
1. A compound of the formula

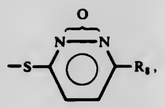


wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl)silyl, trihaloethyl, an alkali metal ion, an alkaline earth metal ion, dibenzylamine, N,N-dibenzylethylenediamine, methylamine, triethylamine, N-ethylpiperidine, or



R_1 is in the α-configuration and is hydrogen or methoxy; R_2 is lower alkyl; Y is O or S; R_3 is hydrogen or lower alkyl; A is straight or branched chain alkylene of 1 to 6 carbons; R_4 is phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, and hydroxy, or a substituted or unsubstituted heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl, and 3-furyl wherein said heterocyclic substituent is attached at an available carbon atom and is halogen or lower alkyl of 1 to 4 carbons; R_5 is hydrogen or lower alkyl; R_6 is lower alkyl; and X is a heterothio selected from the group consisting of





wherein R_7 is hydrogen or lower alkyl of 1 to 4 carbons and R_8 is hydrogen, lower alkyl of 1 to 4 carbons, methoxy, hydroxy, or halogen.

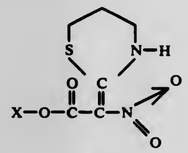
4,049,652

ESTERS OF NITRO(TETRAHYDRO-2H-1,3-THIAZIN-2-YLIDENE)ACETIC ACID

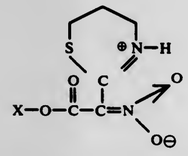
Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed July 19, 1976, Ser. No. 706,311
Int. Cl.[2] C07D *279/06*
U.S. Cl. 544—54 **2 Claims**

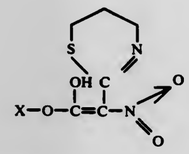
1. A resonance hybrid in which the significant forms are represented by the formulae



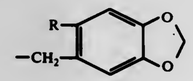
and



and the enol form represented by the formula



wherein X represents the moiety



wherein R represents hydrogen, middle halogen, cyano, nitro or alkyl of from one to three carbon atoms.

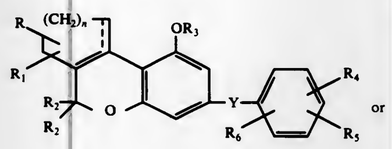
4,049,653

HETEROCYCLIC ESTERS OF ALKYLPHENYL BENZOPYRANS

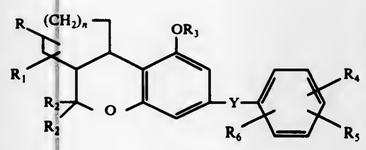
Martin Winn, Deerfield, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 348,371, April 5, 1973, abandoned. This application Feb. 13, 1974, Ser. No. 442,033
Int. Cl.[2] C07D *295/00*
U.S. Cl. 544—150 **5 Claims**

1. A compound of the formula

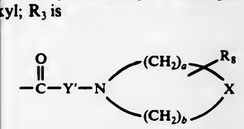


I



II

wherein n is 1 or 2; each R and R_1 are the same or different members of the group consisting of hydrogen or loweralkyl; R_2 is loweralkyl; R_3 is



with Y' being a straight or branched chain alkylene group having from one to eight carbon atoms, a is an integer from 1 to 4, b is an integer fro 1 to 4, X is O; R_8 is hydrogen or loweralkyl; Y is a straight or branched chain alkylene group having from one to ten carbon atoms; and each R_4 and R_5 and R_6 are the same or different members of the group consisting of hydrogen, halo, trifluoromethyl or loweralkyl; and the pharmaceutically acceptable salts thereof.

4,049,654

2,3,5-TRIALKYLSUBSTITUTED HYDROXYBENZYL ISOCYANURATES

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 400,604, Sept. 25, 1973, abandoned. This application July 23, 1975, Ser. No. 598,295
Int. Cl.[2] C07D *251/34*
U.S. Cl. 544—221 **2 Claims**

1. The compound 2,4,6-tris(5-tert.-butyl-2,3-dimethyl-4-hydroxybenzyl) isocyanurate.

2. The compound 2,4,6-tris{(5-(1,1,3,3-tetramethylbutyl)-2,3-dimethyl-4-hydroxybenzyl) isocyanurate.}.

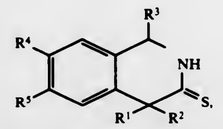
4,049,655

1,4-DIHYDRO-2H-ISOQUINOLINE DERIVATIVES

Rudolf Kunstmann, Hofheim, Taunus, and Joachim Kaiser, Bad Soden, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 515,659, Oct. 17, 1974, Pat. No. 3,980,655. This application Apr. 23, 1976, Ser. No. 679,784
Claims priority, application Germany, Oct. 20, 1973, 2352702; Sept. 14, 1974, 2444109
Int. Cl.[2] C07C *413/06*; A61K *31/535*
U.S. Cl. 424—248.5 **4 Claims**

1. A 1,4-dihydro-2H-isoquinoline compound of the formula



and physiologically tolerated salts thereof, wherein R^1 is hydrogen or straight-chain or branched alkyl of 1–6 carbon atoms; R^2 is morpholine-loweralkyl; R^3 is pyridyl, phenyl, or phenyl mono- or di-substituted by halo, nitro, amino, alkanoylamino having 1 to 4 carbon atoms or alkyl having 1 to 4 carbon atoms; and R^4 and R^5, which may be the same or different, are hydrogen or alkoxy having 1 to 4 carbon atoms.

4. A method for treating arrhythmia in a patient suffering therefrom which comprises administering an anti-arrhythmically effective amount of a compound as in claim **1.**

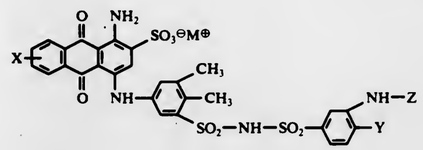
4,049,656

FIBRE-REACTIVE ANTHRAQUINONE DYESTUFFS

Peter Hindermann, Bottmingen, and Hubert Meindl, Riehen, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 452,515, March 19, 1974, abandoned, which is a continuation of Ser. No. 269,889, July 7, 1972, abandoned, which is a continuation of Ser. No. 862,013, Sept. 29, 1969, abandoned. This application July 7, 1975, Ser. No. 593,534
Claims priority, application Switzerland, Oct. 3, 1968, 14805/68
Int. Cl.[2] C07D *239/24*
U.S. Cl. 260—256.5 R **5 Claims**

1. A dyestuff of the formula

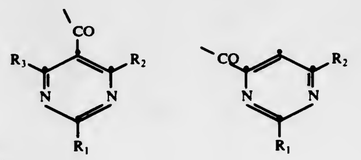


wherein

X and Y represent independently of each other hydrogen or $SO_3^-M^+$,

M^+ represents hydrogen, alkali metal or ammonium, and

Z represents a radical of one of the formulas:



wherein

R_1 represents halogen or lower alkylsulfonyl;

R_2 represents halogen;

R_3 represents hydrogen or halogeno-loweralkyl.

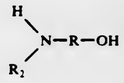
4,049,657

PREPARATION OF N-(AMINOALKYL)PIPERAZINE

Michael E. Brennan; Philip H. Moss, and Ernest L. Yeakey, all of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed June 2, 1975, Ser. No. 583,019
Int. Cl.[2] C07D *295/12, 241/00*
U.S. Cl. 260—268 SY **8 Claims**

1. A process for producing an N-(aminoalkyl)piperazine compound directly from a piperazine compound selected from piperazine and C-(substituted) piperazine wherein the substituents are alkyl radicals having from 1 to 5 carbon atoms and a primary and secondary aminoalkanol compound having a primary hydroxy group of the formula:



wherein R is a branched or straight chain alkyl radical having from 2 to 10 carbon atoms and R_2 is hydrogen or an alkyl radical having from 1 to about 4 carbon atoms, comprising the steps of:

contacting said piperazine compound with said alkanolamine compound in the presence of a catalytically effective amount of a phosphorus-containing substance selected from the group consisting of acidic metal phosphates, phosphoric acids and their anhydrides, or phosphorous acids and their anhydrides, alkyl or aryl phosphate esters, alkyl or aryl phosphite esters, alkyl or aryl substituted phosphorous acids and phosphoric acids, alkali metal monosalts of phosphoric acid, the thioanalogs of the foregoing, and mixtures thereof at temperatures of from about 250° to about 350° C under a pressure sufficient to maintain the mixture essentially in liquid phase; and,

recovering the N-(aminoalkyl)piperazine thus produced from the resultant reaction mixture.

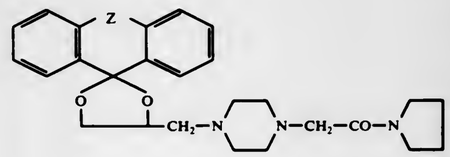
4,049,658

N'-SUBSTITUTED DERIVATIVES OF 4'-(N-PIPERAZINYLMETHYL) SPIRO DIBENZOCYCLOHEPTADI- (OR TRI-) ENE-5, 2'-DIOXOLANE (1',3') THEIR METHOD OF PREPARATION AND THEIR APPLICATION IN THERAPEUTICS

Claude P. Fauran; Guy M. Raynaud; Michel J. Turin, all of Paris, and Janine M. Thomas, Neuilly, all of France, assignors to Delalande S.A., Courbevoie, France

Division of Ser. No. 541,609, Jan. 16, 1975, which is a continuation-in-part of Ser. No. 263,409, June 16, 1972, abandoned. This application Dec. 6, 1976, Ser. No. 748,094
Claims priority, application France, June 18, 1971, 71.22226
Int. Cl.[2] C07D *405/14, 407/14*
U.S. Cl. 260—268 PC **1 Claim**

1. A compound having the formula



wherein Z is $—CH_2CH_2—$, and the pharmacologically acceptable acid addition salts thereof.

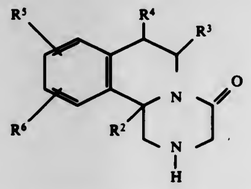
4,049,659

PROCESS FOR THE PREPARATION OF 4-OXO-HEXAHYDRO-PYRAZINOISOQUINOLINE DERIVATIVES

Rolf Pohlke, Darmstadt, Germany, assignor to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Germany

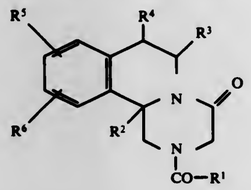
Filed Feb. 27, 1976, Ser. No. 662,009
Claims priority, application Germany, Mar. 1, 1975, 2508947
Int. Cl.² C07D 471/04
U.S. Cl. 260—268 TR **10 Claims**

1. In a process for preparing a 4-oxo-hexahydro-4H-pyrazino-isoquinoline compound of the formula



wherein R^2, R^3 and R^4 are each H or methyl and R^5 and R^6 are each H, methyl or methoxy, as well as the physiologically compatible acid addition salts thereof, the improvement which comprises:

hydrolyzing a 2-acyl-4-oxo-1,2,3,6,7,11b-hexahydro-4H-pyrazino[2,1-]isoquinoline of the formula



wherein R^1 is H, alkyl of 1–5 carbon atoms, phenyl or phenyl substituted by one or more alkyl or alkoxy of up to 4 carbon atoms or by halogen, with an oxygen-containing inorganic acid of pentavalent phosphorus or of hexavalent sulfur or with an acid salt thereof to form said 4H-pyrazino-isoquinoline derivative.

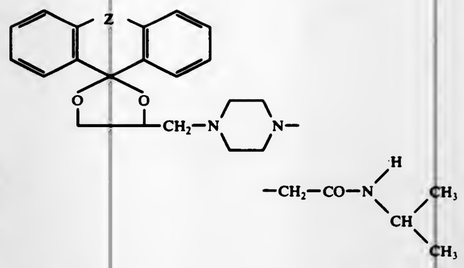
4,049,660

N-SUBSTITUTED DERIVATIVES OF 4 (N-PIPERAZINYLMETHYL) SPIRO DIBENZOCYCLOHEPTADI- (OR TRI-) ENE-5, 2-DIOXOLANE (1,3) THEIR METHOD OF PREPARATION AND THEIR APPLICATION IN THERAPEUTICS

Claude P. Fauran; Guy M. Raynaud; Michel J. Turin, all of Paris, and Janine M. Thomas, Neuilly, all of France, assignors to Delalande S.A., Courbevoie, France

Division of Ser. No. 541,609, Jan. 16, 1975, which is a continuation-in-part of Ser. No. 263,409, June 16, 1972, abandoned. This application Dec. 6, 1976, Ser. No. 748,095
Claims priority, application France, June 18, 1971, 71.22226
Int. Cl.² C07D 405/06
U.S. Cl. 260—268 PC **7 Claims**

1. A compound of the formula



wherein Z is $—CH_2CH_2—$ or $—CH{=}CH$, and the pharmacologically acceptable acid addition salts thereof.

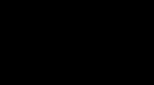
4,049,661

WATER-INSOLUBLE ANTHRAQUINONE DYESTUFFS CONTAINING A HALODIAZINYL GROUP WHICH ARE SOLUBLE IN APROTIC SOLVENTS

Herbert Seiler, Riehen, near Basel, and Paul Dussy, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 412,242, Nov. 2, 1973, Pat. No. 3,974,160, which is a division of Ser. No. 8,422, Feb. 3, 1970, Pat. No. 3,843,624. This application Feb. 23, 1976, Ser. No. 660,403
Claims priority, application Switzerland, Feb. 26, 1969, 2862, July 7, 1969, 10311
Int. Cl.² C07D 239/00; C09B 5/16, 5/44; D06P 3/10
U.S. Cl. 260—256.4 N **4 Claims**

1. A reactive dyestuff, containing no acid, salt-forming, water-solubilizing groups, of the formula



wherein

D represents the radial of an anthraquinone dyestuff which is unsubstituted or substituted only by halogen, cyano, nitro, lower alkyl, lower alkenyl, perfluoro(lower)alkyl, hydroxy(lower)alkyl, cyanoethyl, β,β-dicyanovinyl, lower alkoxy, phenoxy, methylphenoxy, lower alkylthio, phenylthio, lower alkanoyl, lower alkylsulphonyl, phenylsulfonyloxy, dimethylamino, amino, N-(β-cyanoethyl)-ethylamino, diethylamino, methylethylamino, ethylbenzylamino, ethylbutylamino, N-(β-hydroxyethyl)-ethylamino, β-hydroxyethylamino, di(β-hydroxyethyl-)amino, N-(β-cyanoethyl)-β-hydroxyethylamino, di(β-cyanoethyl)amino, anilino, oxyanilino, methylamino, dimethylanilino, methylanilino, lower alkanoylamide, lower alkoxycarbonylamide, benzoylamide, lower alkylsulphonylamide, N-loweralkyl- or N,N-diloweralkyl-lower alkylsulphonylamide, or hydroxy,

Q represents a bridging member $—NX_3—$, —O—, —S—or $—NX_3CO—$, wherein X_3 represents hyrogen or lower alkyl,

R represents diazinyl containing only chlorine, bromine or fluorine substituents, each of which can be split off as anion and which is bound to a ring carbon atom adjacent to a tertiary nitrogen atom,

X_1 represents hydrogen and

X_2 represents alkyl of 8 to 18 carbon atoms, or

X_1 and X_2 represent the same or different alkyl each of which contains from 8 to 18 carbon atoms; or

X_1 represents cyclohexyl or cyclohexyl substituted by lower alkyl, and

X_2 represents alkyl of 1 to 18 carbon atoms, alkyl of 1 to 18 carbon atoms substituted by a member selected from the group consisting of hydroxyl, lower alkoxy, lower alkenyloxy and cyano, lower alkenyl, cyclohexyl or cyclohexyl substituted by lower alkyl.

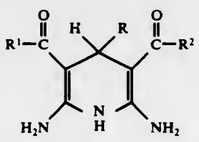
4,049,662

4-QUINOLINE AND ISOQUINOLINE SUBSTITUTED 2,6-DIAMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 454,996, March 27, 1974, Pat. No. 3,950,336, which is a division of Ser. No. 336,483, Feb. 28, 1973, Pat. No. 3,855,231. This application Jan. 28, 1975, Ser. No. 544,837
Claims priority, application Germany, Mar. 6, 1972, 2210687
Int. Cl.² C07D 217/00, 215/50
U.S. Cl. 260—287 D **5 Claims**

1. A compound of the formula:



wherein

R is quinolyl or isoquinolyl unsubstituted or substituted by one or two members selected from the group consisting of lower alkyl, lower alkoxy and halogeno; and

each of R^1 and R^2, taken independently of the other, is lower alkyl, lower alkoxy, lower alkoxy(lower alkoxy), alkenyloxy of 2 to 4 carbon atoms, alkynyloxy of 2 to 4 carbon atoms, amino, lower alkylamino or di(lower alkyl-)amino.

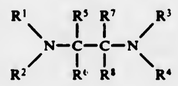
4,049,663

ETHYLENE DIAMINE DERIVATIVES

Norman James Harper, Newcastle-upon-Tyne, and George Bryan Austin Veitch, Wythall, both of England, assignors to Allen & Hanburys Limited, London, England

Division of Ser. No. 518,720, Oct. 29, 1974, Pat. No. 3,975,443, which is a continuation of Ser. No. 289,366, Sept. 15, 1972, abandoned. This application Apr. 30, 1976, Ser. No. 681,853
Claims priority, application United Kingdom, June 6, 1972, 26248/72
Int. Cl.² C07D 211/06
U.S. Cl. 260—293.86 **4 Claims**

1. A compound of the formula:



(I)

wherein

R^1 represents a hydrogen atom; one of the acyl groups, formyl, acetyl, 4-fluorobenzoyl, 2-chloroenzoyl, 3,4-dichloro benzoyl, 2,3,4-trimethoxy benzoyl, 4-nitro-benzoyl, 4-aminobenzoyl; ethoxycarbonyl, methyl or ethyl;

R^2 represents hydrogen or methyl;

R^5 and R^6 represent hydrogen;

R^7 and R^8 together form cyclohexyl; and

R^3 and R^4 together with the adjacent nitrogen atom form a piperidyl group.

4,049,664

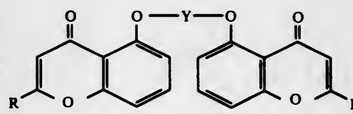
CHROMONE COMPOUNDS

Suminori Umio, Kawanish; Shizuo Maeno, Osaka; Ikuo Ueda, Yao; Yoshinari Sato, Takaishi, and Masaaki Matsuo, Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 213,180, Dec. 28, 1971, Pat. No. 3,965,122. This application Apr. 22, 1976, Ser. No. 679,140
Claims priority, application Japan, Dec. 30, 1970, 45-129469; Dec. 30, 1970, 45-129470
Int. Cl.² C07D 311/22
U.S. Cl. 260—294.8 C **13 Claims**

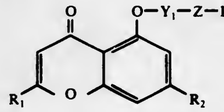
1. A chromone compound selected from the group consisting of

(I)



or

(I')



wherein

R is pyridyl or thienyl,

Y is hydroxy (lower) alkylene,

R_1 is pyridyl or thienyl,

R_2 is hydrogen or lower alkoxy,

Y_1 is lower alkylene or hydroxy (lower) alkylene,

R_3 is hydrogen, lower alkyl, phenyl, carboxyphenyl, methoxycarbonyl-phenyl or benzyl, and

Z is oxygen or sulfur.

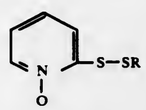
4,049,665

UNSYMMETRICAL DISULFIDES AS ANTIMICROBIAL AGENTS

Miriam Lois Douglass, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 24, 1975, Ser. No. 644,261
Int. Cl.² C07D 213/04
U.S. Cl. 260—294.8 J **6 Claims**

1. An unsymmetrical disulfide compound having the structural formula:



wherein R is a C_1-C_{12} alkyl radical, a C_3–C_{12} alkenyl radical, a substituted or unsubstituted aryl or aralkyl radical selected from the group consisting of phenyl, benzyl or naphthyl which may be substituted by 1 or 2 halo, C_1–C_4 alkyl or alkoxy groups, or a heterocyclic radical selected from the class consisting of furyl, thienyl and pyridyl; and acid addition salts thereof selected from the group consisting of halides, sulfates, nitrates and acetates.

4,049,666

TRICYCLIC BENZODIAZEPINES

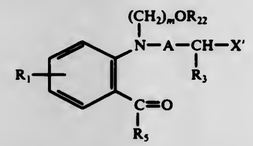
Michael Edward Derieg, Caldwell; James Valentine Earley, Cedar Grove; Rodney Ian Fryer, North Caldwell, and Leo Hearyk Sternbach, Upper Montclair, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 557,438, March 11, 1975, Pat. No. 3,965,151, which is a division of Ser. No. 45,928, June 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 26,068, April 6, 1970, Pat. No. 3,905,965, which is a continuation-in-part of Ser. No. 863,377, Oct. 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 768,909, Oct. 18, 1968, abandoned. This application Apr. 12, 1976, Ser. No. 676,020

Int. Cl.[2] C07D *213/24*

U.S. Cl. 260—294.8 R 1 Claim

1. A compound of the formula



wherein wherein R_1 is hydrogen, nitro, trifluoromethyl, halogen, lower alkyl, lower alkyl mercapto or lower alkoxy; R_3 is hydrogen, or lower alkyl; R_5 is pyridyl; R_{22} is any suitable protecting group selected from the group consisting of the acyl moiety of a lower alkanoic acid and carbobenzoxy; *m* is an integer from 1–7; A is selected from the group consisting of —CH_2— and



and X′ is chlorine, bromine or iodine.

4,049,667

TRICYCLIC BENZODIAZEPINES

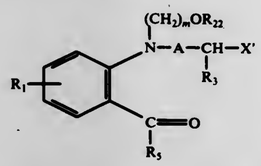
Michael Edward Derieg, Caldwell; James Valentine Earley, Cedar Grove; Rodney Ian Fryer, North Caldwell, and Leo Hearyk Sternbach, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 557,438, March 11, 1975, Pat. No. 3,965,151, which is a division of Ser. No. 45,928, June 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 26,068, April 6, 1970, Pat. No. 3,905,965, which is a continuation-in-part of Ser. No. 863,377, Oct. 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 768,909, Oct. 18, 1968, abandoned. This application Apr. 12, 1976, Ser. No. 675,842

Int. Cl.[2] C07D *213/24*

U.S. Cl. 260—294.8 R 1 Claim

1. A compound of the formula



wherein R_1 is hydrogen, nitro, trifluoromethyl, halogen, lower alkyl, lower alkyl mercapto or lower alkoxy; R_3 is the group -COO-lower alkyl; R_5 is pyridyl; R_{22} is any suitable protecting group selected from the group consisting of the acyl moiety of a lower alkanoic acid and carbobenzoxy; *m* is an integer from 1–7; A is selected from the group consisting of —CH_2— and

and X′ is chlorine, bromine or iodine.

4,049,668

CATIONIC FLUOROCHEMICAL SURFACTANTS

Alex J. Szur, North Plainfield, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Mar. 21, 1975, Ser. No. 560,697

Int. Cl.[2] C07D *213/20*

U.S. Cl. 260—295 R 3 Claims

1. The cationic fluorochemical surfactant having the formula

2,2,3,4,4,4-hexafluorobutyl 11-pyridylundecylate bromide.

4,049,669

PROCESS FOR PREPARING 5-(ALKOXY- AND AMINOETHYL THIO)METHYLTHIAZOLE COMPOUNDS

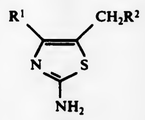
Bing Lun Lam, Haverford; Joseph James Lewis; Robert Lee Webb, both of West Chester, and George Robert Wellman, Warminster, all of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Oct. 29, 1975, Ser. No. 626,812

Int. Cl.[2] C07D *277/40*

U.S. Cl. 260—306.8 R 10 Claims

1. A process for preparing a compound of the formula:

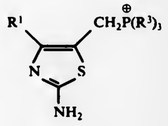


in which:

R^1 is hydrogen or lower alkyl; and

R^2 is methoxy, ethoxy, n-propoxy, n-butoxy, i-butoxy, t-butoxy or —$SCH_2CH_2NH_2$;

comprising reacting a compound of the formula:



in which:

R^1 is defined as above;

R^3 is lower alkyl or phenyl; and

X is halo,

with a compound of the formula R^2—H where R^2 is defined as above in an polar organic solvent and in the presence of a strong base.

4,049,670

N-(2-ETHYLSULFONYL-1,3,4-THIADIAZOL-5-YL)-N-METHYL-N′-METHYLUREA

Carl Metzger, Wuppertal-Elberfeld; Ludwig Eue, and Helmuth Hack, both of Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

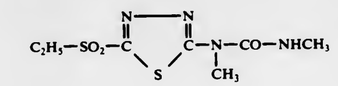
Division of Ser. No. 247,176, April 24, 1972, which is a continuation of Ser. No. 887,368, Dec. 22, 1969, abandoned. This application May 19, 1975, Ser. No. 579,124

Claims priority, application Germany, Dec. 23, 1968, 1816568

Int. Cl.[2] C07D *285/12*

U.S. Cl. 260—306.8 D 1 Claim

1. N-(2-ethylsulfonyl-1,3,4-thiadiazol-5-yl)-N-methyl-N′-methyl urea of the formula



4,049,671

PROCESS FOR PREPARING N-CYANOGUANIDINES

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, and George Raymond White, Harpenden, all of England, assignors to SmithKline & French Laboratories Limited, Welwyn Garden City, England

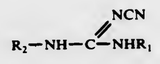
Filed Aug. 20, 1975, Ser. No. 606,268

Claims priority, application United Kingdom, Sept. 2, 1974, 38258/74

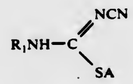
Int. Cl.[2] C07D *233/64, 277/38, 249/08, 211/94, 211/96, 211/82, 261/08, 263/32*

U.S. Cl. 548—342 8 Claims

1. In a process for the preparatin of a cyanoguanidine of the formula:



wherein R_1 is lower alkyl and R_2 is a grouping of structure Het-$(CH_2)_m$Z(CH_2)n — wherein Het is an imidazole, pyridine, thiazole, isothiazole, oxazole, isoxazole, triazole or thiadiazole ring, which ring is optionally substituted by lower alkyl, hydroxyl, halogen or amino; Z is sulphur, oxygen or a methylene group; and *m* is 0, 1 or 2 and *n* is 2 or 3, such that the sum of *m* and *n* is from 2 to 4; in which an isothiourea of the formula:



wherein R_1 and A, which may be the same or different, are lower alkyl, is treated with an amine of formula R_2NH_2 wherein R_2 has the same significance as hereinabove, the improvement wherein the reaction is carried out using a suitable heavy metal salt.

4,049,672

4-METHYL-5-IMIDAZOLYLMETHYLTHIOETHYLAMINE AND -S-METHYLISOTHIOUREA

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to SmithKline & French Laboratories Limited, Welwyn Garden City, England

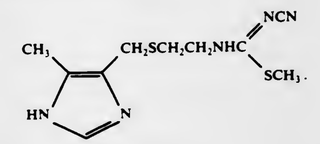
Division of Ser. No. 450,957, March 14, 1974, Pat. No. 3,950,333, which is a continuation-in-part of Ser. No. 290,584, Sept. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,451, Feb. 29, 1972, abandoned. This application Mar. 17, 1976, Ser. No. 667,738

Claims priority, application United Kingdom, Mar. 9, 1971, 6352/71

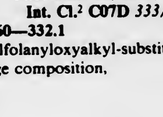
Int. Cl.[2] C07D *233/64*

U.S. Cl. 548—342 2 Claims

1. A compound of the formula:



2. A compound of the formula:



4,049,673

PREPARATION OF FERROUS HEMOGLOBIN AND ENZYMATIC DIGESTION PRODUCTS THEREOF ACTIVE FOR ABSORPTION OF CARBON MONOXIDE

Israel Herbert Scheinberg, 5447 Palisade Ave., Bronx, N.Y. 10471

Continuation-in-part of Ser. No. 151,153, June 8, 1971, abandoned, and Ser. No. 102,869, Dec. 30, 1970, Pat. No. 3,693,327, which is a continuation-in-part of Ser. No. 85,057, Oct. 29, 1970, abandoned. This application Sept. 25, 1972, Ser. No. 292,011

Int. Cl.[2] C09B *47/00*

U.S. Cl. 260—314 21 Claims

1. Method of producing ferrous hemoglobin from an aqueous solution of hemoglobin wherein said solution is to be exposed to a limited quantity of oxygen during production of said ferrous hemoglobin, comprising the steps of adding during agitation of said solution a buffer under conditions such as to maintain said solution at a pH between about 6.0 and 8.5 both locally and overall, and during addition of reductant and adding to said solution a quantity of an effective reductant sufficient to substantially prevent the inactivation of said hemoglobin for the absorption of CO by said limited quantity of oxygen.

4,049,674

SULFOLANYL-BEARING ORGANOSILICONE POLYMERS

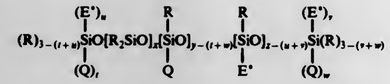
Bernard Kanner, West Nyack, and Bela Prokai, Mahopac, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 592,129

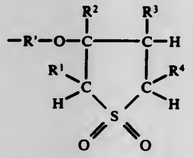
Int. Cl.[2] C07D *333/48;* C08J *9/00*

U.S. Cl. 260—332.1 45 Claims

1. A sulfolanyloxyalkyl-substituted organosiloxane having the average composition,



wherein: R is alkyl having from one to ten carbon atoms; E* is hydrogen or a polyoxyalkylene block; Q is a sulfolanyloxyalkyl group having the formula,



where R′ is bivalent alkylene of two to eight carbon atoms, and R^1, R^2, R^3 and R^4 are independently hydrogen or alkyl of one to four carbon atoms;

t, *u*, *v*, *w*, the sum t+u and the sum *v*+*w* are independently zero or one, and each of the sums *t*+*w* and *u*+*v* is independently zero, one or two; *x* is zero or a positive number having an average value up to about 200; *y* has an average value value from about 2 to about 100; and *z* has an average value from about 2 to about 30.

4,049,675

SULFOLANYLOXY ALKYL-POLYALKYL-SILOXANES

Bernard Kanner, West Nyack, and Bela Prokai, Mahopac, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

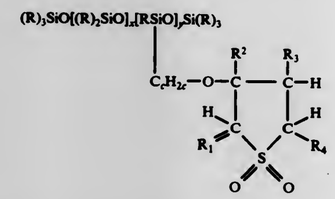
Filed June 30, 1975, Ser. No. 592,128

The portion of the term of this patent subsequent to Sept. 14, 1993, has been disclaimed.

Int. Cl.² C07D *333/48*; C08J *9/00*

U.S. Cl. 260—332.1 **11 Claims**

1. Sulfolanyloxyalkyl-polyalkylsiloxanes having the average composition,



wherein:

R is alkyl of one to four carbon atoms;

c has a value from two to eight;

x has an average value from about 0.5 to about 10;

y has an average value from about 0.5 to about 10; and R′, R^2, R^3 and R^4 are independently hydrogen or alkyl having from one to four carbon atoms

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4,049,676

SULFOLANYLOXYALKYL CYCLIC POLYSILOXANES

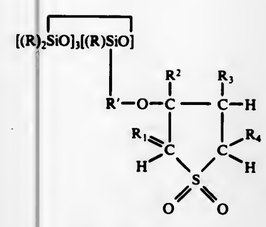
Curtis Louis Schilling, Jr., Croton-on-Hudson, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 592,092

Int. Cl.² C07D *333/48*; B01F *17/00*

U.S. Cl. 260—332.1 **6 Claims**

1. Sulfolanyloxyalkylheptaalkylcyclotetrasiloxanes having the general formula,



wherein: —R′— is bivalent alkylene of two to eight carbon atoms; R is alkyl of one to ten carbon atoms; and R^1, R^2, R^3 and R^4 are independently hydrogen or alkyl of one to four carbon atoms.

4,049,677

STEREOSPECIFIC TOTAL STEROIDAL SYNTHESIS VIA SUBSTITUTED C/D-TRANS INDANONES

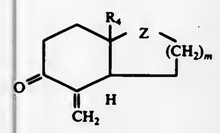
Zoltan George Hajos, Upper Montclair, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.J.

Division of Ser. No. 482,711, June 24, 1974, Pat. No. 3,984,473, which is a division of Ser. No. 765,023, Oct. 4, 1968, Pat. No. 3,897,460. This application July 14, 1976, Ser. No. 705,309

Int. Cl.² C07D *317/72*

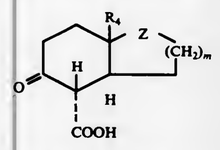
U.S. Cl. 260—340.9 AS **1 Claim**

1. A process for the preparation of a compound of the formula



wherein R_4 is hydrogen or lower alkyl; Z is lower alkylenedioxymethylene; *m* is an integer having the value of 1 or 2,

which comprises dissolving a compound of the formula



wherein R_4, Z and *m* are as defined above

in a dimethylsulfoxide solvent and then adding to the reaction mixture formaldehyde in the presence of a compound selected from the group consisting of a primary amine and secodary amine and salts thereof.

4,049,678

9-DEOXY-PGD-TYPE, 1,15-LACTONES

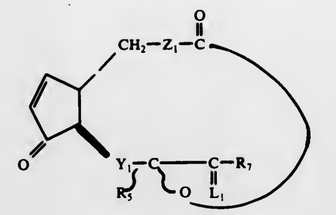
David C. Peterson, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

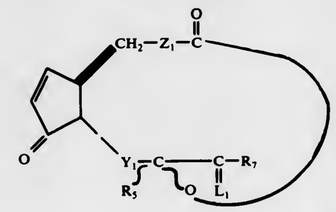
Filed Mar. 29, 1976, Ser. No. 670,525

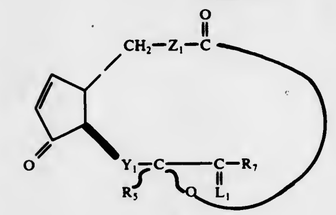
Int. Cl.² C07D *313/00*

U.S. Cl. 260—343.41 **41 Claims**

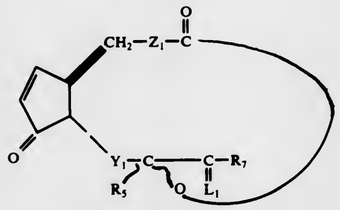
1. A prostaglandin-type, 1,15-lactone of the formula







or



wherein L_1 is



or a mixture of

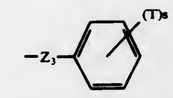


and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro, only when the other is hydrogen or fluoro; wherein R_5 is hydrogen or methyl;

wherein R_7 is $—(CH_2)_m—CH_3$, wherein *m* is one to 5, inclusive, cis—CH=CH—CH_2—CH_3, or



wherein

T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, *s* is zero, one, 2, or 3, and Z_3 is oxa or methylene, with the proviso that not more than two T's are other than alkyl, and the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different;

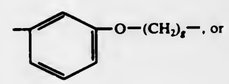
wherein Y_1 is trans—CH=CH—, $—CH_2CH_2—$, cis—CH=CH—, or —C≡C—; and

wherein

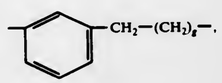
Z_1 is

1. cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
2. cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
3. cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
4. —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
5. —$(CH_2)_3$—$(CH_2)_g$—CF_2—,
6. —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,

(7)



(8)



wherein *g* is one to 3, inclusive.

4,049,679

INSECTICIDAL O,S-DIHYDROCARBYL-N-HALOACYLPHOSPHOROAMIDOTHIOATES AND S,S-DIHYDROCARBYL-N-HALOACYLPHOSPHOROAMIDODITHIOATES

Philip S. Magee, Ignacio, Calif., assignor to Chevron Research Company, San Francisco, Calif.

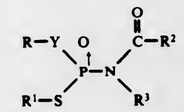
Continuation-in-part of Ser. No. 13,846, Feb. 24, 1972, Pat. No. 3,716,600, which is a continuation-in-part of Ser. No. 810,383, March 25, 1969, abandoned. This application Dec. 21, 1972, Ser. No. 317,316

The portion of the term of this patent subsequent to Feb. 13, 1990, has been disclaimed.

Int. Cl.² C08M *3/00*, *9/02*

U.S. Cl. 260—402.5 **8 Claims**

1. A compound of the formula



wherein R and R^1 individually are alkyl, alkenyl or alkynyl of up to 6 carbon atoms and R^2 is haloalkyl of 1 to 18 carbon atoms and of 1 to 4 fluorine, chloride or bromine atoms, R^3 is hydrogen or alkyl of 1 to 6 carbon atoms and Y is oxygen or sulfur.

4,049,680
AMIDE WAXES

John Blachford, Westmount, Canada, assignor to H. L. Blachford Limited, Canada

Filed Dec. 3, 1974, Ser. No. 529,102
Claims priority, application Canada, Dec. 20, 1973, 188624
Int. Cl.[2] C11C *3/00*; C07C *103/10*; C08L *91/00*
U.S. Cl. 260—404.5 24 Claims

1. A process for preparing organic amide waxes having at least two amide groups of formula —CO—NH— per molecule derived from reaction between carboxylic acid groups and isocyanate groups, which comprises heating to an elevated temperature at least one monocarboxylic acid of the formula R_1—COOH wherein R_1 is a linear or branched, saturated or unsaturated aliphatic hydrocarbon radical of 5 to 21 carbon atoms, introducng to the acid at least one organic isocyanate having the general formula

NCO-R_2—A

wherein R_2 is selected from the group consisting of straight chained, branch chained and cyclic aliphatic hydro-carbon radicals of at least 6 carbon atoms, and aromatic hydrocarbon radicals; wherein the aliphatic or aromatic hydrocarbon radical may be unsubstituted or substituted with one or more of lower alkyl of 1 to 8 carbon atoms, lower alkoxy of 1 to 8 carbon atoms, aryl and halogen; and A is selected from —NCO and —Alk—(NCO—R_3—CH_2—)$_n$—R_4—NCO wherein Alk is a single bond or an aliphatic hydrocarbon radical of 1 to 4 carbon atoms, *n* is 0 or more and R_3 and R_4 which may be the same or different are selected from the same group as R_2 and may be the same or different as R_2, and reacting the acid and isocyanate together with elimination of carbon dioxide, said acid and isocyanate being reacted in amounts such that the number of carboxlic acid groups is at least approximately equal to the number of isocyanate groups, and the carboxylic acid groups are in an excess up to completion of amide group formation.

4,049,681
PROCESSES FOR THE SEPARATION OF POTASSIUM SALTS OF PERFLUOROALKANOIC ACIDS FROM AQUEOUS SOLUTIONS THEREOF

Peter Dietrich; Gunter Engler, both of Berlin; Armin Ferse; Harald Grimm, both of Dresden; Udo Groes, Berlin; Klaus Lunkwitz, Dresden; Dietrich Prescher, Berlin; Jürgen Schulze, Berlin, and Astrid Wallbraun, Berlin, all of Germany, assignors to Akademie der Wissenschaften der D D R, Berlin-Adlershof, Germany

Filed Dec. 18, 1975, Ser. No. 641,919
Int. Cl.[2] C09F *7/00*; C11C *3/00*
U.S. Cl. 260—408 13 Claims

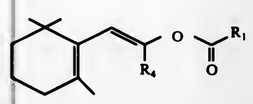
1. A process for the separation of a potassium salt of a perfluoroalkanoic acid having at least 1 and at most 12 carbon atoms per molecule or a mixture of potassium salts of a homologous mixture of the said perfluoroalkanoic acids from an aqueous solution that also contains a substantial proportion of one or more water-soluble salts of inorganic acids, which process comprises extracting at room temperature the said aqueous solution with an organic solvent that is at least partially miscible with water and in which potassium salts of the said perfluoroalkanoic acids are soluble, the said organic solvent being selected from the group consisting of alkanols having at least 3 and at most 5 carbon atoms per molecule, ketones having at least 3 and at most 7 carbon atoms per molecule, N,N-dimethylformamide, and dimethyl sulfoxide, and subsequently recovering the potassium salt of the perfluoroalkanoic acid or mixture of potassium salts of the homologous mixture of perfluoroalkanoic acids from the extract.

4,049,682
PROCESSES FOR PREPARING ENOL ESTERS

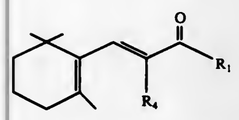
Alan Owen Pittet, Atlantic Highlands; Erich Manfred Klaiber, Neptune; Manfred Hugo Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y., and Joaquin Vinals, Red Bank, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 662,820, March 1, 1976, Pat. No. 4,000,329, which is a continuation-in-part of Ser. No. 620,355, Oct. 7, 1975, Pat. No. 4,000,090, which is a continuation-in-part of Ser. No. 507,412, Sept. 19, 1974, Pat. No. 3,940,499. This application Sept. 15, 1976, Ser. No. 723,528
Int. Cl.[2] C09F *5/08*, *7/10*
U.S. Cl. 260—410 6 Claims

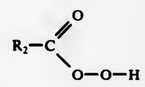
1. A process for producing an enol ester having the following structure in a "trans" isomeric form:



wherein R_1 is C_1-C_{11} alkyl, and R_4 is hydrogen or methyl comprising the step of reacting betaionone or a higher alkyl homologue thereof having the structure:



with a peralkanoic acid or m-chloroperbenzoic acid having the formula:



wherein R_2 is hydrogen, methyl, ethyl or m-chlorophenyl at a temperature in the range of from −10° C up to about 75° C in the presence of

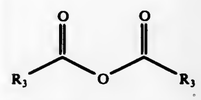
i. A buffer selected from the group consisting of alkali metal salts of lower alkanoic acids and alkali metal carbonates; and

ii. A solvent selected from the group consisting of methylene chloride, acetic acid, formic acid, propionic acid, benzene, cyclohexane, formamide and chloroform,

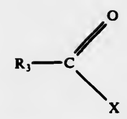
and substantially in the absence of solvents reactive with (i) said peralkanoic acid or (ii) said m-chloroperbenzoic acid, thereby forming the said enol ester.

2. The process of claim 1, wherein R_1 is methyl and R_4 is hydrogen.

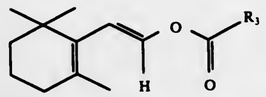
3. The process of claim 2 comprising the additional step of reacting the resulting enol ester with an acylating agent which is one of an alkanoic acid anhydride having the formula:



or an acyl halide having the general formula:



in the presence of paratoluene sulfonic acid or an alkali metal acetate thereby forming a compound having the formula:



wherein X is chloro or bromo and wherein R_3 is C_2-C_{11} alkyl, said reaction being carried out at a temperature in the range of from 100° up to 200° C over a period of from 3 up to 10 hours, the mole ratio of alkanoic acid anhydride: enol ester being greater than 1; the mole ratio of enol ester:paratoluene sulfonic acid catalyst or alkali metal acetate catalyst being from 1:0.01 up to 1:0.5.

4,049,683
METHOD OF PREPARING LABELLED VEGETABLE OIL

Hiroyuki Okamoto, Akashi; Yoshio Tsuda, Kyoto, and Kazumasa Yokoyama, Suita, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed June 3, 1975, Ser. No. 583,293
Claims priority, application Japan, Nov. 6, 1974, 49-127701
Int. Cl.[2] C11C *3/10*
U.S. Cl. 260—410.7 10 Claims

1. A method for preparing a labelled oil comprising transesterifying a vegetable oil in the presence of an inert gas at a reaction temperature of 260° to 320° C. for 30 to 60 minutes with at least one of the chemically-same fatty acids labelled with ^{14}C or ^{3}H as those constituting said vegetable oil, and recovering the labelled oil which is formed, the molar ratio of the labelled fatty acid to the vegetable oil being from 1:100 to 1:10,000.

4,049,684
PROCESS FOR THE SEPARATION OF FAT FROM ANIMAL SKINS

Archie Rae McFarland, Sandy, Utah, assignor to Beehive Machinery Inc., Sandy, Utah

Filed Sept. 8, 1975, Ser. No. 611,314
Int. Cl.[2] C11B *1/06*
U.S. Cl. 260—412 10 Claims

1. A process of producing a fat product and a separate gelatin product from the skins of slaughtered animals without the application of heat, comprising comminuting said skins in substantially raw condition to provide fragments no greater than about two inches in maximum dimension; applying screw pressure to the fragments against one side of a perforated plate with sufficient force to dislodge solid fat from the fragments and to force the dislodged fat through the perforations of said plate substantially free of skin material; collecting the so-dislodged and so-forced fat at the opposite side of said plate; and separately collecting, as gelatin stock, the residual skin material that remains at the said one side of said plate.

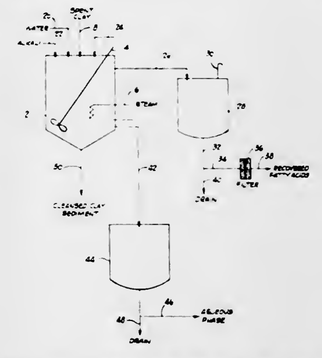
2. A process in accordance with claim 1, wherein the perforated plate is in the form of a tubular conduit, the fragments of comminuted skin are fed into the conduit adjacent to one end thereof, a conveyor screw within the conduit carries the skin fragments from the said one end of the conduit toward the opposite end thereof during the pressing procedure; and the residual skin material is discharged substantially free of fat at the opposite end of the conduit.

10. A process in accordance with claim 2, wherein the residual skin material is compacted adjacent the opposite end of the conduit immediately prior to discharge.

4,049,685
PROCESS FOR CLEANSING SPENT CLAY

Gary W. Smith, Lynn Haven; Dwight E. Leavens, Panama City, and Louis Ray Sims, Pensacola, all of Fla., assignors to Sylvachem Corporation, Jacksonville, Fla.

Filed Feb. 25, 1976, Ser. No. 661,257
Int. Cl.[2] C11B *13/04*
U.S. Cl. 260—412.5 6 Claims



1. In a process for cleansing fatty acids from spent crystalline clay wherein said spent clay is slurried and, in at least a primary wash stage, washed with aqueous alkali at elevated temperature for forming a cleansed clay sediment and recovering fatty acid, the improvement which comprises:

establishing and maintaining the mixture of aqueous phase and fatty acid in said primary wash stage at a pH between about 5 and about 6.5.

3. The process of claim 1 wherein said fatty acid is fluent at the conditions of the primary wash stage and monomeric, polymeric, a distilled tall oil, or a mixture of two or more of these fatty acids.

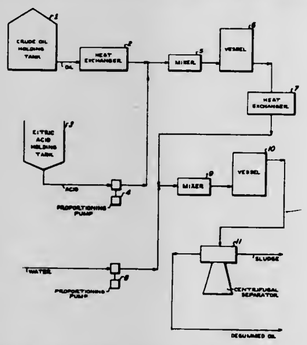
4,049,686
DEGUMMING PROCESS FOR TRIGLYCERIDE OILS

Hendrik Johan Ringers, Rotterdam, and Jacobus Cornelis Segers, Nieuwerkerk, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 10, 1976, Ser. No. 665,526
Claims priority, application United Kingdom, Mar. 10, 1975, 9862/75
Int. Cl.[2] C11B *3/04*
U.S. Cl. 260—424 16 Claims

1. A process for removing phosphatides from triglyceride oils which are substantially liquid at 40° C comprising the steps of dispersing an acid or acid anhydride in the oil, said acid or acid anhydride having a pH of from 0.5 to 7 as measured at 20° C in a one molar aqueous solution and said oil being at a temperature of from 20° to 100° C; adjusting the temperature of the mixture to the range of from the lowest temperature at which the oil remains a liquid to 40° C; dispersing from 0.2 to 5 per-

cent by weight of water in the mixture; maintaining the temperature of the mixture of oil, acid and water from 5 minutes to



several days; and, thereafter separating an aqueous sludge containing the phosphatides from the oil.

4,049,687

PROCESS FOR THE SEPARATION OF TRIGLYCERIDES IN AN AQUEOUS SYSTEM

Johannes Henricus Maria Rek, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 508,772, Sept. 24, 1974, abandoned, which is a continuation of Ser. No. 334,533, Feb. 22, 1973, abandoned. This application Dec. 9, 1975, Ser. No. 639,153
Claims priority, application United Kingdom, Feb. 24, 1972, 8647/72; Feb. 24, 1972, 8648/72; Sept. 12, 1972, 42393/72; Sept. 12, 1972, 42397/72
Int. Cl.² C11B 7/00, 3/00
U.S. Cl. 260—428 4 Claims

1. A process for the separation of a mixture of liquid and crystalline fatty acid triglycerides of different melting points, the process comprising the steps in the following order:

a. contacting the glyceride mixture, at a temperature at which all the triglycerides thereof are liquid, with a mixture of oil-soluble and water-soluble surface-active agents which is sufficient to decrease the surface-tension at the triglyceride-aqueous interface of the triglycerides in contact with water to a value below 0.5 dyne/cm at the separation temperature, said oil-soluble surface-active agent selected from the group consisting essentially of oleoyl, linoleoyl and linolenoyl monoglycerides and the water-soluble surface-active agent selected from the group consisting essentially of an alkali metal decyl sulphate, an alkali metal salt of a C_{6-10} saturated fatty acid or a C_{12-22} unsaturated fatty acid;
b. crystallizing the triglycerides at the temperature at which separation is effected and the liquid and crystalline fatty acid triglycerides to be separated coexist;
c. contacting the mixture of triglycerides and surface-active agents at the separation temperature with sufficient water to form a dispersion of the crystalline fraction in the water added in the form of about 1 to about 15% of an inorganic salt solution;
d. separating the liquid triglyceride fraction and the water containing the dispersed crystalline fraction, and
e. recovering the crystalline fraction therefrom, the oil-soluble surface-active agent and the water-soluble surfaceactive agent.

4,049,688

PROCESS FOR SEPARATING ESTERS OF FATTY ACIDS BY SELECTIVE ADSORPTION

Richard W. Neuzil, Downers Grove, and Armand J. deRosset, Clarendon Hills, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 2, 1976, Ser. No. 710,817
Int. Cl.² C11C 1/08
U.S. Cl. 260—428 29 Claims

1. A process for separating an ester of an unsaturated fatty acid from a mixture comprising an ester of an unsaturated fatty acid and an ester of a saturated fatty acid which process comprises contacting at a temperature within the range of from about 20° C. to about 200° C. and a pressure within the range from about atmospheric to about 500 psig. said mixture with an adsorbent comprising a X or Y zeolite containing at exchangeable cationic sites at least one cation selected from the group consisting of cations of metals of Group IA of the Periodic Table of Elements and combinations thereof thereby selectively adsorbing said ester of an unsaturated fatty acid and thereafter recovering said ester of an unsaturated fatty acid.

4,049,689

METHOD FOR THE PREPARATION OF ALKYL TIN HALIDES

François Verbeek, Harmelen; Eric J. Bulten, Bilthoven, and Jan W. G. van den Hurk, Leusden, all of Netherlands, assignors to Commer S.r.l., Lodi (Mi), Italy

Filed Nov. 21, 1975, Ser. No. 634,255
Claims priority, application Netherlands, Nov. 22, 1974, 7415247
Int. Cl.² C07F 7/22
U.S. Cl. 260—429.7 11 Claims

1. A method for the preparation of alkyl tin halides by heating at raised temperature a reaction mixture of metallic tin and an alkyl halide under the influence of a liquid acid amide compound and of iodine and/or iodide as a catalyst, wherein the alkyl halide is fed in such a way gradually to the gas space over the reaction mixture that the reaction proceeds at substantially atmospheric pressure and no more than a few centimeters mercury overpressure, and the liquid acid amide compound is present in quantities of 0.65 to 2.3 mol per gram atom of tin.

4,049,690

METHOD OF PREPARING β-CHLOROETHYLTRICHLOROSILANE

Claus-Dieter Seiler, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Dec. 2, 1975, Ser. No. 636,880
Claims priority, application Germany, Dec. 24, 1974, 2461480
Int. Cl.² C07F 7/08, 7/12
U.S. Cl. 260—448.2 E 6 Claims

1. In a process for the hydrochlorination of vinyltrichlorosilane with HCl to prepare β-chloroethyltrichlorosilane wherein the reaction is carried out in the presence of a Lewis acid catalyst at an elevated temperature, the improvement which comprises carrying out the process at a temperature between 30° and 65° C, at a pressure of 740–790 mm Hg while employing a concentration of catalyst in the range of 1.0 to 15% by weight, based upon the amount of vinyltrichlorosilane charged.

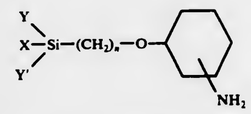
4,049,691

AROMATIC AMINO SILANES AND THEIR POLYMERS

Francois Meiller, Palaiseau, France, assignor to Rhone-Progil, Courbevoie, France

Continuation of Ser. No. 494,780, Aug. 5, 1974, abandoned. This application Sept. 20, 1976, Ser. No. 725,097
Claims priority, application France, Aug. 17, 1973, 73.29950
Int. Cl.² C07F 7/10
U.S. Cl. 260—448.2 N 9 Claims

1. Polymers and copolymers formed of monomers at least one of which is an aromatic amino silane having the formula



in which n is an integer with a value from 2 to 4, X represents a linear or branched alkoxy group having 1 to 8 carbon atoms, Y and Y', which may be identical or different from each other, represent a group selected from the group consisting of methyl, ethyl, phenyl, and a linear or branched alkoxy group having from 1 to 8 carbon atoms, other groups present in a copolymer being derived from monomers in the form of organo silanes having from 1 to 3 alkoxy groups attached to the silicon atom and associated with methyl, ethyl or phenyl groups on the silicon atom.

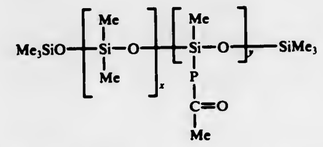
4,049,692

STABILIZED BLOOD SEPARATING COMPOSITION

Anthony R. Zine, Jr., Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 16, 1974, Ser. No. 532,946
Int. Cl.² C07F 7/08
U.S. Cl. 260—448.2 B 4 Claims

1. In a thixotropic composition useful as a chemical and physical barrier between serum and clot portions of separated blood, the composition comprising a gel-like material having a specific gravity within the range of about 1.030 to 1.090 and consisting of a dimethylsiloxane silicone fluid having an inert siliceous filler dispersed therein, the improvement which comprises the addition of a network former in a quantity sufficient to maintain the viscosity of the composition within the range of 200,000 to 600,000 centistokes for prolonged periods of time, the network former consisting of a polysiloxane-polyoxyalkyl copolymer represented by the following formual



where the monomeric units are randomly distributed and
Me represents $-CH_3$;
x represents a number between 80 and 120;
y represents a number between 8 and 12;
P represents a polyoxyalkyl side chain represented by the formula

$$+CH_2-CH_2-O)_m(CH_2-CH_2-CH_2-O)_n-$$

where the monomeric units are randomly distributed and
m represents a number between 20 and 30; and
n represents a number between 1 and 30.

4,049,693

2-CHLORO-3-((4-(2,2-DICHLORO-1,1-DIFLUOROETHOXY)PHENYL)SULFONYL)PROPANENITRILE

George A. Burk, Bay City; Christian T. Goralski, and Craig E. Mixan, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 10, 1977, Ser. No. 758,284
Int. Cl.² C07C 121/75
U.S. Cl. 260—465 F 1 Claim

1. 2-Chloro-3-((4-(2,2-dichloro-1,1-difluoroethoxy)phenyl)-sulfonyl)propanenitrile.

4,049,694

3-(4-(((TRICHLOROETHENYL)THIO)PHENYL)SULFONYL)-2-PROPENENITRILE

George A. Burk, Bay City; Christian T. Goralski, and Craig E. Mixan, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 10, 1977, Ser. No. 760,220
Int. Cl.² C07C 121/70
U.S. Cl. 260—465 G 1 Claim

1. The compound 3-(4-(((trichloroethenyl)thio)phenyl)sulfonyl)-2-propenenitrile.

4,049,695

3-((3-TRIFLUOROMETHYL)PHENYL)SULFONYL)-2-PROPENENITRILE

George A. Burk, Bay City; Christian T. Goralski, and Craig E. Mixan, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 10, 1976, Ser. No. 749,483
Int. Cl.² C07C 121/70
U.S. Cl. 260—465 G 1 Claim

1. The compound 3-((3-(trifluoromethyl)-phenyl)sulfonyl)-2-propenenitrile.

4,049,696

3-((4-(2,2-DICHLORO-1,1-DIFLUOROETHOXY)-PHENYL)SULFONYL)-2-PROPENENITRILE

George A. Burk, Bay City; Christian T. Goralski, and Craig E. Mixan, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 10, 1977, Ser. No. 758,281
Int. Cl.² C07C 121/75
U.S. Cl. 260—465 F 1 Claim

1. The compound 3-((4-(2,2-dichloro-1,1-difluoroethoxy)-phenyl)sulfonyl-2-propenenitrile.

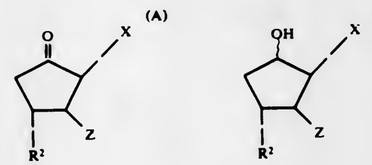
4,049,697

(DL)-13-SUBSTITUTED SULFINYL-PROSTAGLANDIN-LIKE COMPOUNDS AND METHODS OF MAKING

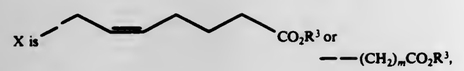
Karl G. Untch, Los Altos, Calif., and Gilbert J. Stork, New York, N.Y., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 476,362, June 5, 1974, Pat. No. 3,970,685. This application Apr. 5, 1976, Ser. No. 673,846
Int. Cl.² C07C 177/00
U.S. Cl. 560—118 3 Claims

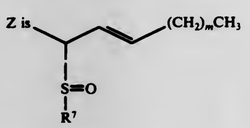
1. The (dl) compounds of the formulas:



wherein
R^2 is hydrogen or hydroxyl;



in which
R^3 is hydrogen or alkyl containing from one through three carbon atoms, and m is a whole integer from two through eight;



wherein R^7 is alkyl containing from one through six carbon atoms, cycloalkyl containing from five through seven carbon atoms, chloromethyl, trichloromethyl, trifluoromethyl, chlorodifluoromethyl, dichlorofluoromethyl, β-chloroethyl, α-chloroethyl, or α-chloro-β-trichloroethyl, and m is defined as above; and the wavy line (ξ) represents the α or β configuration or mixtures thereof; and the non-toxic, pharmaceutically acceptable salts of the compounds of Formulas (A) and (B) when R^3 is hydrogen.

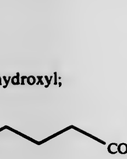
4,049,698

PROCESS FOR PRODUCING METHYLENE MALONIC ESTERS

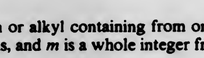
Gary Fred Hawkins, and Robert Lee Gass, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1976, Ser. No. 711,924
Int. Cl.² C07C *69/74, 67/30*
U.S. Cl. 560—127 **8 Claims**

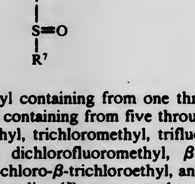
1. A process comprising
A. reacting an ester of malonic acid having the formula



with formaldehyde and a diene having the formula

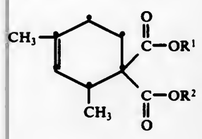


in the presence of a catalyst selected from primary, secondary and tertiary amines at about reflux temperature to form a compound having the formula



wherein R^1 and R^2 are the same or different and each represents alkyl of 1 to about 10 carbon atoms, cyclohexyl or alkenyl of 2 to about 4 carbon atoms and each R^3 is the same or different and represents hydrogen, methyl or ethyl.

8. A compound having the formula



wherein R^1 is allyl and R^2 is methyl.

4,049,699

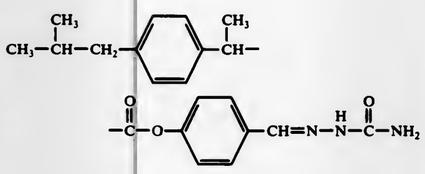
IBUPROFEN P-HYDROXYBENZALDEHYDE SEMICARBAZONE ESTER

Anthony A. Sinkula, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed June 17, 1976, Ser. No. 696,891
Int. Cl.² C07C *133/08*
U.S. Cl. 560—105 **1 Claim**

1. Ibuprofen p-hydroxybenzaldehyde simicarbazone ester formula II:

II



4,049,700

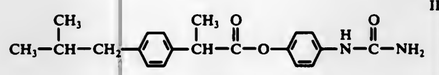
IBUPROFEN P-HYDROXYPHENYLUREA ESTER

Anthony A. Sinkula, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed June 17, 1976, Ser. No. 696,947
Int. Cl.² C07C *127/19*
U.S. Cl. 560—105 **1 Claim**

1. Ibuprofen p-hydroxyphenyurea ester having the formula II:

II



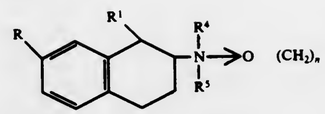
4,049,701

BENZOBICYCLOALKANE AMINES

Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 553,418, Feb. 26, 1975, Pat. No. 3,957,872, which is a division of Ser. No. 421,375, Dec. 3, 1973, abandoned, which is a division of Ser. No. 262,849, June 14, 1972, Pat. No. 3,836,670, which is a continuation-in-part of Ser. No. 200,517, Nov. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 94,983, Dec. 3, 1970, abandoned. This application Dec. 15, 1975, Ser. No. 640,521
Int. Cl.² C07C *67/08*
U.S. Cl. 560—130 **4 Claims**

1. A compound of the formula:



wherein R is aliphatic carboxylic acyloxy of from 2 to 4 carbon atoms; R^1 is lower alkyl or phen(lower)-alkyl; R^4 is lower alkyl; R^5 is lower alkyl; and n is an integer from 2 to 6; and the pharmaceutically non-toxic addition salts thereof.

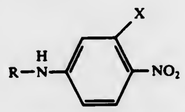
4,049,702

γ-GLUTAMYL-4-NITROANILIDE COMPOUNDS

Erich Bernt, Munich; Wolfgang Gruber, Garatshausen; Erich Haid; Fritz Stahler, both of Tutzing; August Wilhelm Wahlefeld, Weilheim, and Gunter Weimann, Tutzing, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Division of Ser. No. 419,455, Nov. 27, 1973, Pat. No. 3,979,447. This application June 23, 1975, Ser. No. 589,653
Claims priority, application Germany, Dec. 5, 1972, 2259512; July 3, 1973, 2333798
Int. Cl.² C07C *143/67*
U.S. Cl. 260—501.12 **7 Claims**

1. γ-Glutamyl-4-nitroanilide compound of the formula



wherein R is a γ-glutamyl radical and X is a sulfonic acid group or a thiosulfonic acid group and alkali, alkaline earth, ammonium and amine salts thereof.

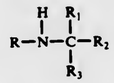
4,049,703

PROCESS FOR THE PRODUCTION OF PURIFIED CAMPHORSULFONIC ACID SALTS

David R. Buss, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 18, 1969, Ser. No. 851,084
Int. Cl.² C07C *143/00*
U.S. Cl. 260—503 **7 Claims**

1. In a process of purifying an aqueous solution of a camphorsulfonic acid salt which comprises (a) mixing at a pH of 3–6 a dilute aqueous solution of the camphorsulfonic acid salt and a solution consisting of a water-immiscible organic solvent and a secondary amine that is liquid at room temperature, soluble in the organic water-immiscible solvent, and is the



wherein R is an aliphatic group having from 10 to 14 carbon atoms and R_1, R_2 and R_3 are each alkyl and wherein the combined carbon atoms in R_1, R_2 and R_3 total from 11 to 14, (b) separating the organic water-immiscible phase from the mixture, (c) mixing the organic water-immiscible phase with a volume of water that is less than half the original aqueous solution volume at a pH above 9 to form a second two-phase mixture, and (d) separating the aqueous phase from said two-phase mixture to provide a purified concentrated aqueous solution of the salt; the improvement consisting of sulfuric acid to control the pH of the mixture formed in Step (a).

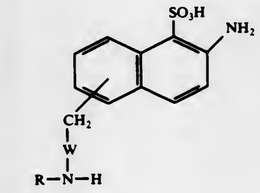
4,049,704

2-AMINO-1-SULFONAPHTHALENE CONTAINING ACYLAMINOMETHYL SUBSTITUENT

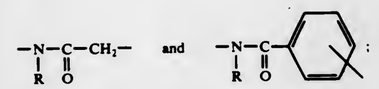
Horst Jäger, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 376,184, July 3, 1973. This application Feb. 9, 1976, Ser. No. 656,251
Claims priority, application Germany, July 3, 1972, 2232541
Int. Cl.² C07C *143/52, 143/56;* C09B *29/00, 63/00*
U.S. Cl. 260—507 R **3 Claims**

1. Aminonaphthalenesulphonic acid, which in the form of the free acid, corresponds to the formula



wherein
R is hydrogen or lower alkyl; and
W is a direct bond or a bridge member selected from the group consisting of



in which the N atoms of the bridge member is attached to $-CH_2-$ group in the formula.

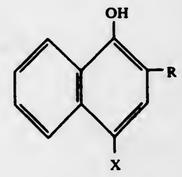
4,049,705

2-ALKYL-1-NAPHTHOL-4-SULFONIC ACIDS

Gregory Wayne Schwing, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 1, 1976, Ser. No. 672,724
Int. Cl.² C07C *143/30*
U.S. Cl. 260—512 C **2 Claims**

1. A compound of the formula



wherein
R is alkyl of 11 to 14 carbon atoms, and
X is $-SO_3H$.

4,049,706

SELECTIVE OXIDATION OF CHRYSANTHEMYL ALCOHOL

Augustine I. Dalton, Jr., Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sept. 24, 1975, Ser. No. 616,405
Int. Cl.² C07C *51/26, 45/00*
U.S. Cl. 260—514 H **14 Claims**

1. In a method of producing chrysanthemyl aldehyde comprising selectively converting chrysanthemyl alcohol to the

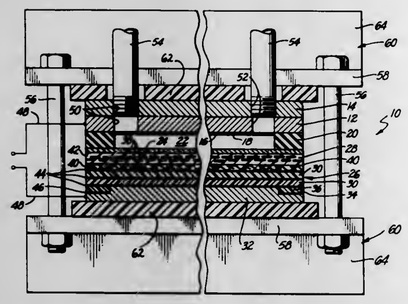
corresponding aldehyde, the improvement which comprises contacting at a temperature in the range of 75° to 150° C the reactant alcohol dissolved in organic solvent, said alcohol being present in a range of about 2 to about 5% by weight of said solvent, with oxygen-containing gas in the presence of an amount of noble metal catalyst comprising about 10% platinum on carbon to provide a platinum metal/alcohol weight ratio of about 15% to 30% and recovering high yields of chrysanthemyl aldehyde.

11. In a method of producing chrysanthemic acid which comprises selectively oxidizing chrysanthemyl alcohol to chrysanthemic acid, the improvement which comprises oxidizing at a temperature in the range of 75° to 150° C chrysanthemyl alcohol dissolved in organic solvent, said alcohol being present in a range of about 2 to about 5% by weight of said solvent, with free oxygen in the presence of an amount of supported noble metal catalyst comprising about 10% platinum on carbon to provide a platinum metal/alcohol weight ratio of about 15% to 30% to obtain a reaction product predominating in chrysanthemyl aldehyde, separating the obtained aldehyde product from the noble metal catalyst, and subjecting the same to further oxidation selectively to form chrysanthemic acid.

4,049,707
APPARATUS FOR FLUID TREATMENT BY CORONA DISCHARGE

Joseph William Harter, Los Angeles, and Stuart Wallace Beitzel, Santa Monica, both of Calif., assignors to O-3 Company, Los Angeles, Calif.

Filed Feb. 20, 1976, Ser. No. 659,929
Int. Cl.² C01B *13/11*
U.S. Cl. 250—531 20 Claims



1. An apparatus for use in treating a fluid by corona discharge so as to produce a product, said apparatus having first and second electrodes which are spaced from one another, a dielectric means located between said electrodes and spaced from said first electrode so as to define a gap between said dielectric means and said first electrode, sealing means surrounding the periphery of said gap and inlet and outlet means for use in circulating a fluid through said gap between said electrodes in which the improvement comprises:
- said dielectric means consisting of at least one layer of a first dielectric material exposed to said gap and at least one layer of a second dielectric material located between said first dielectric material and said second electrode,
- said layers and said dielectric means fitting closely against one another and against said second electrode so that there are no voids between said layers and between said dielectric means and said second electrode,
- said first dielectric material including overlapping, flat, plate-like particles of an inert, inorganic dielectric composition,
- said second dielectric material being different from said first dielectric material so as to minimize the possibility of flaws in said first and second dielectric materials being located adjacent to one another.

4,049,708
FLUORODESULFURIZATION OF ALKYL MERCAPTANS OR ALKYL DITHIANES

Janos Kollonitsch, Westfield, and Stephen Marburg, Metuchen, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 4, 1976, Ser. No. 663,586
Int. Cl.² C07C *101/10*; A61K *31/195*
U.S. Cl. 260—534 C 8 Claims

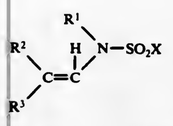
1. The process for fluorodesulfurization of a reactant compound selected from the group consisting of D-cysteine, 2-deutero-D-cysteine, DL-cysteine, 2-deutero-DL-cysteine, L-cysteine, 2-deutero-L-cysteine, and 3-mercapto-D-valine, which comprises dissolving or suspending the compound in liquid hydrogen fluoride, liquid hydrogen fluoride containing boron trifluoride or liquid hydrogen fluoride containing antimony pentafluoride at −80° to 15° C. and introducing a molecular excess of a halogenating agent which is molecular fluorine, molecular chlorine, fluoroxyperfluoroalkanes of 1–4 carbon atoms, fluoroxytrifluoromethane, N-chloro-succinimide, or t-butyl hypochlorite, and recovering the product thereby produced.

4,049,709
VINYL-SUBSTITUTED SULFAMIC ACID HALIDES

Gerhard Hamprecht, Mannheim, and Siegfried Kersten, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 22, 1976, Ser. No. 735,218
Claims priority, application Germany, Nov. 28, 1975, 2553461
Int. Cl.² C07C *143/86*
U.S. Cl. 260—543 R 4 Claims

1. Sulfamic acid halides of the formula



I

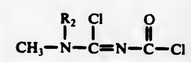
where R^1 is an aliphatic or cycloaliphatic radical, R^2 and R^3 may be identical or different and each is hydrogen, halogen or an aliphatic radical and X is halogen.

4,049,710
NOVEL CARBAMIMIDOYL CHLORIDES AND THEIR USE IN THE SYNTHESIS OF HERBICIDAL TRIAZINEDIONES

Stanley Tocker, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 24, 1976, Ser. No. 661,004
Int. Cl.² C07C *125/03*
U.S. Cl. 260—544 C 2 Claims

1. A compound of the formula:



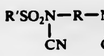
where R_2 is alkyl of 1 through 4 carbon atoms.

4,049,711
N-CYANOSULFONAMIDES

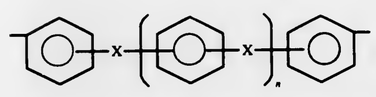
Raymond J. Kray, Berkeley Heights, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 439,487, Feb. 4, 1974, Pat. No. 3,944,526.
This application Feb. 26, 1976, Ser. No. 661,468
Int. Cl.² C07C *125/08*
U.S. Cl. 260—551 C 8 Claims

1. A bis-N-cyanosulfonamide of the formula



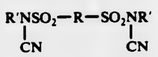
wherein
- R′ is selected from the group consisting of phenyl, p-chlorophenyl, p-tolyl, 2-naphthyl, 2-anthracenyl, alkyl of 1 to 8 carbon atoms, cyclopentyl, cyclohexyl and trifluoromethyl, and
- R is a divalent radical selected from the group consisting of phenylene, xylylene, diphenylene, naphthylene; any of said phenylene, xylylene, diphenylene and naphthylene substituted by chloro, bromo or fluoro groups; and



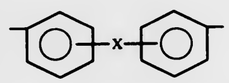
wherein

wherein n is zero to five and X is oxa, methylene, phenylimido, thio, sulfonyl, carbonyl or 2,2-propylidene.

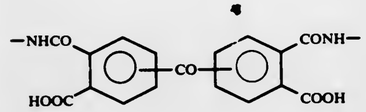
7. A bis-N-cyanosulfonamide of the formula



wherein
- R′ is phenyl, and
- R is a divalent radical selected from the group consisting of phenylene, xylylene, diphenylene, naphthylene; any of said phenylene, xylylene, diphenylene and naphthylene substituted by chloro, bromo or fluoro groups; and



where X is oxa, methylene, phenylimido, thia, sulfonyl, carbonyl, 2,2-propylidene,

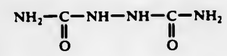


4,049,712
METHOD FOR MANUFACTURING HYDRAZODICARBONAMIDE

Jean-Pierre Schirmann, Brignais, and Francis Weiss, Pierre-Benite, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

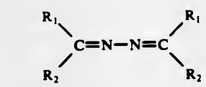
Filed June 23, 1972, Ser. No. 265,749
Claims priority, application France, June 25, 1971, 71.23198
The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.
Int. Cl.² C07C *133/02*; C01B *21/16*
U.S. Cl. 260—554 5 Claims

1. A method for preparing hydrazodicarbonamide



(I)

which comprises reacting at between about 50° and 150° C for a period of about 2–7 hours at atmospheric or subatmospheric pressure, urea, sulfuric acid, water and an azine of the formula



(II)

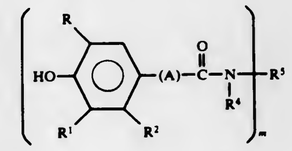
wherein R_1 is hydrogen or a C_1–C_6 alkyl, R_2 is a C_1–C_6 alkyl, and wherein said alkyl is straight or branched or a cycloalkyl, or R_1 and R_2 of both the >C=N— moieties together form a straight or branched chain alkylene radical of from 3 to 5 carbon atoms, distilling off during the course of reaction substantially all the ketone or aldehyde formed, and recovering the hydrazodicarbonamide which forms from the reaction medium, wherein the amounts of reactants used per mol of azine are about 2–10 mols urea, about 2–10 mols of water and about 1–10 mols of sulfuric acid.

4,049,713
ESTERS AND AMIDES OF TRISUBSTITUTED HYDROXYPHENYLALKANOIC ACIDS

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 490,835, July 23, 1974, Pat. No. 3,984,460, which is a continuation-in-part of Ser. No. 400,745, Sept. 25, 1973, abandoned. This application May 3, 1976, Ser. No. 682,237
Int. Cl.² C07C *103/26*
U.S. Cl. 260—559 R 18 Claims

1. A compound having the formula



wherein
- R is a branched alkyl of 3 to 8 carbon atoms,
- R^1 and R^2 are alkyl of 1 to 3 carbon atoms,
- R^4 is hydrogen or alkyl of 1 to 4 carbon atoms,
- R^5 is, when m is 1, alkyl of 1 to 18 carbon atoms, or when m is 2, alkylene of 2 to 12 carbon atoms or 3,6-dioxa-1,8-octamethylene,
- A is a straight chain alkylene of 1 to 3 carbon atoms, and
- m is an integer of 1 to 2.

4,049,714

N-PHENYL AMIDINES

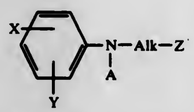
Yao Hua Wu, and Walter G. Lobeck, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 466,753, May 3, 1974, abandoned, which is a continuation-in-part of Ser. No. 255,701, May 22, 1972, Pat. No. 3,816,454, which is a continuation-in-part of Ser. No. 47,589, June 18, 1970, abandoned. This application Sept. 2, 1975, Ser. No. 609,885

Int. Cl.[2] C07C *123/00*

U.S. Cl. 260—564 R 6 Claims

1. A compound selected from the group consisting of N-phenyl amidines of Formula I



Formula I

and pharmaceutically acceptable acid addition salts of compounds of Formula I wherein

Alk is alkylene having 1 or 2 carbon atoms;

X and Y are independently selected from the group consisting of hydrogen, halogen, trifluoromethyl, lower alkoxy of from 1 to 4 carbon atoms inclusive, lower alkyl of from 1 to 4 carbon atoms inclusive;

Z is phenyl; and

A is —CH=N—R^1

wherein

R^1 is lower alkyl of from 1 to 4 carbon atoms inclusive.

4,049,715

3-[2-(4-ANISIDINO)PHENYL]-1-PHENYL-1-PROPIOPHENONES AND PROPANOLS

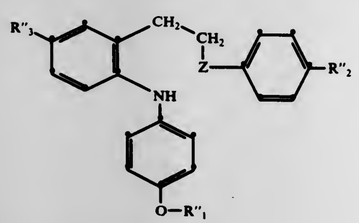
Malcolm R. Bell, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 402,162, Oct. 1, 1973, Pat. No. 3,994,902, which is a division of Ser. No. 156,070, June 23, 1971, Pat. No. 3,819,637. This application July 3, 1975, Ser. No. 593,166

Int. Cl.[2] C07C *93/14*

U.S. Cl. 260—571 7 Claims

1. A compound of the formula



where R''_1 is lower-alkyl or benzyl;

R''_2 is hydrogen, lower-alkoxy or halo;

R''_3 is hydrogen or lower-alkoxy;

and Z is carbonyl or hydroxymethylene.

4,049,716

COMPOSITIONS BASED ON POLYAMINES WITH ETHER GROUPS

Paul Collet, Saint-Fons, France, assignor to Rhone-Poulenc Industries, Paris, France

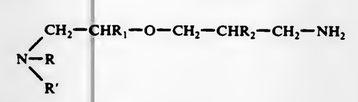
Filed Apr. 5, 1976, Ser. No. 673,993

Claims priority, application France, Apr. 18, 1975, 75.12135; Dec. 24, 1975, 75.39690

Int. Cl.[2] C07C *91/02, 91/06, 91/40, 93/02*

U.S. Cl. 260—573 6 Claims

1. Compositions based on polyamines with ether groups, characterized in that they contain at least one of the polyamines with ether groups of the formula:



(I)

in which formula:

R_1 and R_2 are similar or different and represent a hydrogen atom or methyl radical,

R represents one of the following radicals:

$-CH_2-CHR_1-O-CH_2-CHR_2-CH_2-NH_2$

$-CH_2-CHR_1-OH$

$-CH_2-CHR_2-CH_2-NH_2$

and

R' represents one of the following radicals:

$-CH_2-CHR_1-O-CH_2-CHR_2-CH_2-NH_2$

$-CH_2-CHR_1-OH$

$-CH_2-CHR_2-CH_2-NH_2$

C_1–C_4-alkyl or phenyl.

4,049,717

NOVEL 1,2,3,4-TETRAHYDRO-4-OXO-(OXY)-1-NAPHTHYLAMINES AND METHOD OF PREPARATION THEREOF

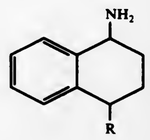
Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 13, 1976, Ser. No. 685,945

Int. Cl.[2] C07C *91/42, 87/66*

U.S. Cl. 260—575 7 Claims

1. A compound of the formula:



wherein R is oxo, hydroxy or alkoxy C_1–C_4; the racemic mixtures and the optical isomers thereof; the cis and trans isomers thereof when R is hydroxy or alkoxy C_1 – C_4; and the halogen acid salts thereof.

4,049,718

SULPHONES

Pierre Chabardes, Sainte Foy les Lyon; Marc Julia, Paris, and Albert Menet, La Mulatiere, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

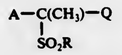
Division of Ser. No. 413,246, Nov. 6, 1973. This application Feb. 10, 1975, Ser. No. 548,787

Claims priority, application France, Nov. 8, 1972, 72.39513

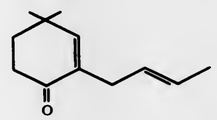
Int. Cl.[2] C07C *147/06*

U.S. Cl. 260—590 C 6 Claims

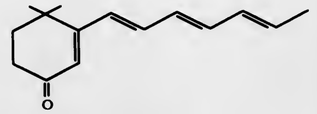
1. A sulphone of the formula:



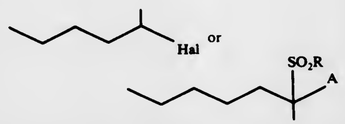
in which R is substituted or unsubstituted aryl, A is



or



and Q is hydrogen or a radical of formula:



where Hal is halogen and R and A are as hereinbefore defined.

4,049,719

PROCESS FOR PREPARING BIS(HYDROXYMETHYL) METHYLPHOSPHINE OXIDE

John Harvey Bright, Kendall Park, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 567,565, April 14, 1975, abandoned. This application Oct. 15, 1976, Ser. No. 732,632

Int. Cl.[2] C07F *9/53*

U.S. Cl. 260—606.5 P 10 Claims

1. In a process for preparing bis(hydroxymethyl)-methylphosphine oxide which comprises heating tris(hydroxymethyl) phosphine to rearrange said tris(hydroxymethyl)phosphine to bis(hydroxymethyl)methylphosphine oxide, the improvement which comprises adding a catalytic amount of a strong non-oxidizing acid, having an ionization constant greater than 10^{-3}, or a source of a catalytic amount of said acid, thereto before heating.

4,049,720

PROCESS FOR PRODUCING β-ISOPROPYL-NAPHTHALENE HYDROPEROXIDE

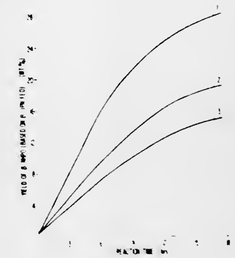
Hirokazu Hosaka; Kenji Tanimoto, both of Minoo, and Hiroshi Yamachika, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

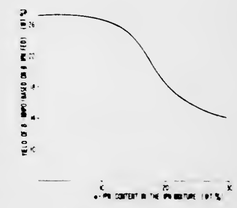
Filed Feb. 21, 1975, Ser. No. 551,812

Claims priority, application Japan, Feb. 21, 1974, 49-21140

Int. Cl.[2] C07C *179/02*

U.S. Cl. 260—610 B 4 Claims





1. In a process for the continuous production of β-isopropylnaphthalene hydroperoxide comprising oxidizing an isopropylnaphthalene mixture containing α- and β-isopropylnaphthalene isomers with molecular oxygen or a molecular oxygen containing gas at a temperature of about 70° to 120° C in an oxidation zone kept neutral to alkaline by adding an alkali selected from hydroxides, carbonates and bicarbonates of sodium and potassium until the isopropylnaphthalene hydroperoxide concentration reaches about 10 to 40% by weight and recycling unreacted isopropylnaphthalene recovered after the oxidation, wherein the α-isopropylnaphthalene content in the isopropylnaphthalene mixture continuously fed to the oxidation zone is controlled to be about 15% by weight or less.

4,049,721

PURIFICATION OF CRUDE 9,9-BIS-(4-HYDROXYPHENYL)-FLUORENE

John E. Corn, Jr., Mt. Vernon, Ind., and Howard J. Klopfer, Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 7, 1976, Ser. No. 720,744

Int. Cl.[2] C07C *37/24*

U.S. Cl. 260—619 A 2 Claims

1. The process for purifying crude 9,9-bis(4-hydroxyphenyl)-fluorene containing phenol as an impurity therein, which process comprises (1) mixing the aforesaid impure fluorene with an amount of methanol sufficient to solubilize all the impurity therein, (2) removing by filtration any solid material present in the aforesaid mixture, (3) adding water to the filtrate, (4) heating the mixture of the water and the filtrate to an

elevated temperature to effect solubilization of the suspended material present in (3), (5) cooling the mixture to precipitate essentially pure 9,9-bis(4-hydroxyphenyl)-fluorene, and (6) separating the latter from the liquid containing the impurity therein.

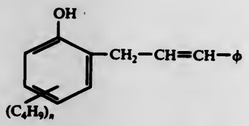
4,049,722

POLYBUTYL-2-CINNAMYLPHENOLS AS INSECT ANTI-PROCREANTS

Leonard Jurd, Berkeley, Calif., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 561,583, March 24, 1975, Pat. No. 3,959,489. This application Oct. 30, 1975, Ser. No. 627,327
Int. Cl.² C07C *37/12;* A01N *9/26*
U.S. Cl. 260—619 R 2 Claims

1. A compound of the structure



wherein *n* is 2 or 3.

4,049,723

METHOD FOR SEPARATION AND RECOVERING HYDROQUINONE

Seiichi Tanaka; Kazuhiro Watari, and Hideki Hayashi, all of Ohtake, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Sept. 17, 1975, Ser. No. 614,156
Claims priority, application Japan, Sept. 20, 1974, 49-107665
Int. Cl.² C07C *39/08*
U.S. Cl. 260—621 A 2 Claims

1. In a method for separating and recovering hydroquinone from a by-product-containing acid-cleavage product obtained by acid-cleavage of an oxidation product of para-diisopropyl benzene in method isobutyl ketone as a solvent, which comprises distilling said by-product-containing acid-cleavage product in the presence of an added aromatic hydrocarbon to remove low-boiling fractions, including the solvent, contacting the resultant hydroquinone-containing distillation bottoms with water, and crystallizing and separating hydroquinone, the improvement wherein

a. the distillation to remove the low-boiling fractions is effected without the addition of water and in the absence of an azeotropic amount of water, and also in the presence of about 15 to 100 parts by weight of an added aromatic hydrocarbon selected from the group consisting of cumene and cymene per 100 parts by weight of the hydroquinone,

b. the contact of the hydroquinone-containing distillation bottoms with water is effected under conditions such that the temperature of said bottoms is about 150 to 190° C, the water is used in an amount of about 100 to 5000 parts by weight per 100 parts by weight of the hydroquinone, and the hydroquinone in the hydroquinone-containing distillation bottoms is extracted into the water, thereby avoiding crystallization of the hydroquinone in the distillation bottoms, and, after the extraction, the mixture resulting from the extraction is separated into an aqueous phase and an oily phase, and the hydroquinone is separated from the aqueous phase.

4,049,724

OSMIUM CATALYZED ORGANIC HYDROPEROXIDE HYDROXYLATION OF OLEFINIC COMPOUNDS

Ming N. Sheng, Cherry Hill, N.J., and Walter A. Mamenlakis, Drexel Hill, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 417,681, Nov. 20, 1973, abandoned. This application Oct. 7, 1975, Ser. No. 620,436
Int. Cl.² C07D *307/89;* C11C *1/00;* C07C *29/02*
U.S. Cl. 260—635 H 7 Claims

1. A method for preparing polyols by the homogeneous catalytic hydroxylation of an olefinic compound selected from the group consisting of lower alkenes, allyl alcohol, oleic acid, and 1,2,3,6-tetrahydrophthalic anhydride by contacting said olefinic compound at a temperature in the range of from 25° to 55° C. with an organic hydroperoxide in an aqueous solution at an initial pH in the range of from 8 to 12 in the presence of a catalytic amount of a water soluble osmium compound in its + 8 valence state as the catalyst and wherein the concentration of osmium is in the range of from 5 ppm to 1000 ppm by weight.

4,049,725

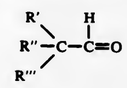
METHOD FOR PREPARING PRIMARY ALCOHOLS HAVING ALKYLS BRANCHED AT THE SECOND CARBON

Auguste Gueant, Lens, and Serge Mercier, Paris, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Apr. 23, 1975, Ser. No. 570,829
Claims priority, application France, Apr. 30, 1974, 74.14962
Int. Cl.² C07C *29/14, 45/08*
U.S. Cl. 260—638 B 10 Claims

1. A method for preparing a primary alkyl alcohol branched at the second carbon atom which comprises reacting over a hydrogenation catalyst which is insensitive to carbon monoxide under the reaction conditions and which does not form metal carbonyls

a. an aldehyde, in the liquid phase, of formula



wherein R′ is H or alkyl and wherein R″ and R‴, and R′ when it is alkyl, are the same or different C_1–C_{20} straight or branched alkyl or alkenyl or wherein R″ and R‴ together may be a methylene or an alkyl-substituted methylene having the formula



wherein R_a and R_b, which can be the same or different, are H or C_1–C_{20} straight or branched alkyl or alkenyl, with

b. a hydrogen/carbon monoxide gas mixture having a molar ratio of about 2/1,

and continuing the reaction until the residual hydrogen/carbon monoxide molar ratio in the gas mixture reaches between about 1/1 and 1.5/1.

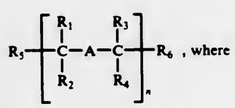
4,049,726

FIRE RETARDANT COMPOUNDS

Hendrik Harm Jannes Oosterwijk, Diepenveen; Ulfert Elle Wiersum, Velp; Eduard Pieter Magré, Heelsum, and Johannes Hendrinus van Dijk, Ede, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 4, 1974, Ser. No. 512,303
Claims priority, application Netherlands, Oct. 5, 1973, 7313979
Int. Cl.² C07C *25/18*
U.S. Cl. 260—649 R 4 Claims

1. A brominated polydiisopropylarylene compound having a molecular structure of the following formula



A is an arylene group, R_1, R_2, R_3 and R_4 are methyl groups or methyl groups substituted with bromine, R_5 and R_6 are bromine or hydrogen, and *n* a whole number of 2 to 10, the number of bromine atoms per molecule in the aliphatic groups being at least 2 and the total bromine content being not more than 70 percent by weight.

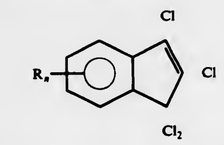
4,049,727

POLYHALOINDENE COMPOUNDS

Samuel Gelfand, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

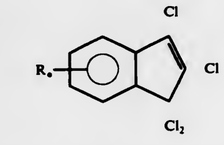
Continuation-in-part of Ser. No. 401,931, Sept. 28, 1973, abandoned. This application Sept. 10, 1975, Ser. No. 612,072
Int. Cl.² C07C *25/14*
U.S. Cl. 260—650 R 12 Claims

1. Compounds of the formula:

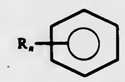


wherein R is independently selected from the group consisting of chlorine, bromine, fluorine, and lower alkyl and *n* is 2 to 4 providing when every R is chlorine, *n* is from 2–3.

5. A process for the preparation of compounds of the formula:



wherein each R is independently halogen or lower alkyl and *n* is 2 to 4, comprising reacting a substituted aromatic of the formula



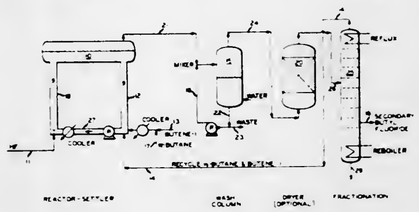
wherein each R is independently selected from the group consisting of chlorine, bromine, fluorine and lower alkyl and *n* is from 2 to 4 providing there is unsubstitution on at least two adjacent carbon atoms of the aromatic, with hexachloropropylene in the presence of a catalytic amount of ferric chloride.

4,049,728

HYDROFLUORINATION PROCESS

Wayne P. Kraus, and Thomas Hutson, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 23, 1976, Ser. No. 669,538
Int. Cl.² C07C *19/08*
U.S. Cl. 260—653.6 9 Claims



1. A process for the production of high purity alkyl fluorides with minimum polymer and heavy oil formation which comprises:

a. hydrofluorinating an olefin with HF in a normal paraffin diluent wherein the normal paraffin contains from 3 to 6 carbon atoms under liquid phase hydrofluorination conditions and a temperature below about 80° F (26.7° C) to produce an effluent comprising alkyl fluoride, unreacted olefin, normal paraffin diluent, and HF;

b. separating said effluent into an HF phase portion and a hydrocarbon phase portion;

c. subjecting the hydrocarbon phase portion of said effluent to fractional distillation conditions at a pressure substantially below atmospheric and a temperature below about 80° F (26.7° C) which is sufficiently low to prevent polymer and heavy oil formation and to separate a first stream comprising alkyl fluoride and a second stream comprising unreacted olefin, and diluent; and

d. recycling said stream containing unreacted olefin and diluent to step (a) for reuse in the process.

4,049,729

CHLORINATION OF BUTADIENE

Kenneth Wayne Otto, Victoria, and Jimmy L. Hatten, Odessa, both of Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 17, 1969, Ser. No. 858,658
Int. Cl.² C07C *21/00*
U.S. Cl. 260—654 H 4 Claims

1. In a process of chlorinating butadiene to produce principally dichlorobutenes by feeding a reactor with a mixture of butadiene vapor and chlorine vapor, the butadiene to chlorine ratio being in excess of one mole of butadiene to one mole of chlorine, recovering the dichlorobutenes from the reactor and recycling unreacted butadiene back to the reactor;

the improvement which consists essentially of feeding the reactor with a mixture of butadiene vapor and chlorine vapor in a mole ratio of from 5:1 to 50:1 butadiene to chlorine, the entering vapor mixture being maintained at a temperature of from 70° to 175° C., maintaining the temperature of the vapor mixture in the reactor at from 70° to 250° C. whereby substantially all of the chlorine is reacted, conducting the product from the reactor to the lowest tray in a multiple tray scrubber-cooler and feeding makeup liquid butadiene to one or more upper trays of the scrubber-cooler, condensing the dichlorobutenes and

separating them from unreacted butadiene while vaporizing the makeup liquid butadiene, the head temperature of the scrubber-cooler being maintained at from 45° to 80° C. by the makeup liquid butadiene and by recycling part of the scrubber-cooler bottom stream through a cooler and back to one or more upper trays of the scrubber-cooler, recycling the unreacted butadiene and the vaporized makeup butadiene from the scrubber-cooler to the reactor and recovering condensed dichlorobutenes.

4,049,730

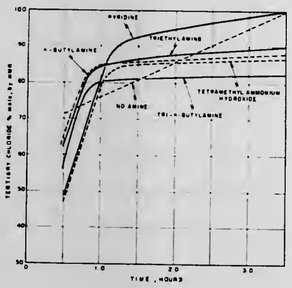
AMINE PROMOTERS FOR HYDROHALOGENATION

Jesse K. Boggs, Seabrook, Tex., assignor to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 171,607, Aug. 13, 1971, Pat. No. 3,852,368. This application Oct. 12, 1973, Ser. No. 406,128

Int. Cl.[2] C07C *17/08*

U.S. Cl. 260—663 **12 Claims**



1. In the liquid phase hydrochlorination of a Type III olefin to produce the corresponding tertiary alkyl chloride by injecting gaseous hydrogen chloride into a liquid reaction medium containing said olefin and from about 20 to about 50 weight percent of a hydrocarbon solvent which boils in the range between about 75 and about 360° F. and is an inert liquid at the hydrochlorination temperature, the improvement which comprises adding from about 0.3 to about 15 weight percent of an amine promoter selected from the group consisting of tributylamine, triethylamine, n-butylamine, tetramethylammonium hydroxide, and pyridine to said medium, injecting said gaseous hydrogen chloride into said medium at a temperature between about 20° and about 100° F. and a pressure between about 0.5 and about 100 psig, and recovering a tertiary alkyl chloride from said reaction medium.

4,049,731

STABILIZED POLYMERIZABLE COMPOSITIONS

Alfred Joseph Restaino, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed July 14, 1975, Ser. No. 595,412

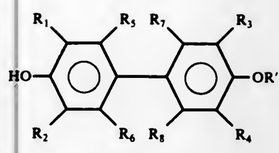
Int. Cl.[2] C10G *9/16*; C08K *5/13*

U.S. Cl. 260—666.5 **9 Claims**

1. A polymerizable composition stabilized against premature polymerization comprising

a. at least about 30 percent by weight based on the total weight of the composition of a vinyl or vinylidene monomer capable of free radical polymerization, and

b. a polymerization inhibitor having the following general formula



wherein

R' is hydrogen or an alkyl group containing from 1 to 4 carbon atoms,

R_1, R_2, R_3 and R_4 are alkyl groups containing from 1 to 5 carbon atoms, and

R_5, R_6, R_7 and R_8 are hydrogen or alkyl groups containing from 1 to 5 carbon atoms provided that only two of these may be a secondary or a tertiary alkyl group.

4,049,732

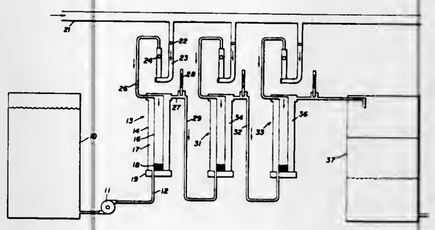
CONTINUOUS TELOMERIZATION PROCESS AND ITS LIQUID PRODUCTS

Ricardo O. Bach, and Robert C. Morrison, both of Gastonia, N.C., assignors to Lithium Corporation of America, Gastonia, N.C.

Filed Sept. 22, 1976, Ser. No. 725,640

Int. Cl.[2] C07C *15/02*

U.S. Cl. 260—668 B **25 Claims**



1. In a continuous process of producing normally liquid telomers wherein a liquid telogen is metalated with an organometal initiator and said metalated telogen is then reacted with at least one gaseous taxogen selected from the group of conjugated dienes and vinyl-substituted aromatic compounds, the steps which comprise forming a solution of said initiator and said telogen, continuously passing said solution to a first reaction zone, continuously passing a controlled stream of said gaseous taxogen through fine apertures into said first reaction zone into direct contact with said initiator solution to effect telomerization of the telogen in said first reaction zone, continuously passing the resulting intermixture containing liquid telomer into a second reaction zone while continuously passing said gaseous taxogen through fine apertures into said intermixture containing liquid telomer to produce additional quantities of telomer.

4,049,733

SYNTHESIS OF DIPHENYLMETHANE USING PHOSPHORIC-SULFURIC ACID CATALYST

Michael Martan, Skokie, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 17, 1975, Ser. No. 623,230

Int. Cl.[2] C07C *15/16*

U.S. Cl. 260—668 C **5 Claims**

1. A process for the preparation of diphenylmethane which comprises reacting dibenzyl ether with benzene at a temperature of from about 50° to about 250° C. and a pressure of from about atmospheric to about 100 atmospheres in the presence of a catalytic amount of a phosphoric acid selected from the

group consisting of polyphosphoric, metaphosphoric, orthophosphoric, pyrophosphoric and hypophosphoric acids, said phosphoric acid catalyst admixed with sulfuric acid.

4,049,734

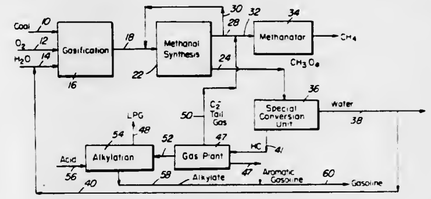
CONVERSION OF COAL TO HIGH OCTANE GASOLINE

William E. Garwood, Haddonfield; Solomon M. Jacob; James C. Kuo, both of Cherry Hill, all of N.J., and John J. Wise, Media, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 8, 1975, Ser. No. 566,149

Int. Cl.[2] C07G *15/00*

U.S. Cl. 260—668 R **7 Claims**



1. A process of converting coal to aromatic gasoline comprising:

reacting coal with oxygen and steam at about 1450° to 1800° F to produce a synthesis gas product comprising carbon oxides, hydrogen and methane;

catalyzing the conversion of said carbon oxides and hydrogen to a product comprising water, C_4^- gas and C_5^+ aromatic gasoline by a catalyst comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least 12 and a constraint index of 1 to 12;

contracting at least the C_2^- portion of said C_4^- gas with a methanation catalyst at about 525° to 1000° F to cionvert such to synthetic natural gas; and

recovering synthetic natural gas, aromatic gasoline and LPG.

4,049,735

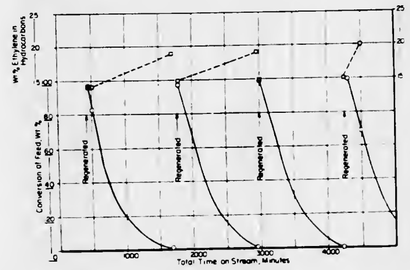
USE OF ELEMENTAL OXYGEN TO INHIBIT ELUTION OF ANTIMONY FROM AN ANTIMONY-ZSM-5 CATALYST

Nai Yuen Chen, R.D. Titusville, N.J., and William Joseph Reagen, Yardley, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 9, 1976, Ser. No. 749,150

Int. Cl.[2] C07C *1/20*

U.S. Cl. 260—668 R **12 Claims**



1. An improved process for producing hydrocarbons, which comprises:

passing to a catalytic conversion zone, under conversion conditions, a feed comprising oxygenated compounds and a co-feed of elemental oxygen, said oxygenated compounds consisting essentially of one or more lower monohydric alcohol having up to four carbon atoms, the ethers derived therefrom, or mixtures of said alcohols and ethers, said co-feed being passed in an amount equal to from 0.1 mol percent to 10 mol percent of said feed, and said catalytic conversion zone containing a catalyst comprising an intimate admixture of an oxide of antimony and a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index from 1 to 12, said antimony oxide constituting at least 1% by weight of said admixture, and recovering from said catalytic conversion zone a mixture comprising light olefins, monocyclic aromatic hydrocarbons and steam.

4,049,736

DEHYDRATION OF α-METHYLBENZYL ALCOHOLS TO FORM MONOVINYLIDENE AROMATIC MONOMERS

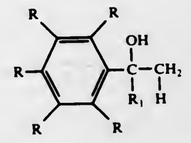
Junior J. Lamson, Bay City; Richard H. Hall, Midland; Edward Stroiwas, Merrill, and Larry D. Yats, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 39,889, May 22, 1970, abandoned. This application Aug. 4, 1975, Ser. No. 601,946

Int. Cl.[2] C07C *15/00, 15/10*

U.S. Cl. 260—669 QZ **12 Claims**

1. A process for preparing an ar-(t-alkyl)styrene by dehydrating an α-alkylbenzyl alcohol represented by the general formula



wherein each R is independently hydrogen, alkyl having from 1 to 12 carbon atoms or halogen provided that an R group is t-alkyl and R_1 is hydrogen or alkyl having 1 to 4 carbon atoms which method comprises a dehydration step of contacting the α-alkylbenzyl alcohol in vapor phase with a silica gel dehydration catalyst consisting essentially of silica gel in the presence of from about 0.03 to about 25 parts by weight of added water per part by weight of alcohol, said dehydration step being carried out at temperatures above 260° up to about 510° C, and subsequent simple distillation step of distilling the dehydration product to obtain the ar-(t-alkyl)styrene in purity greater than about 99 mole percent and containing less than 0.02 mole percent of diolefinic impurity.

4,049,737

PROPYLATION OF TOLUENE

Francis G. Dwyer, West Chester, Pa., and Donald J. Klocke, Somerdale, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,731

Int. Cl.[2] C07C *3/52*

U.S. Cl. 260—671 P **4 Claims**

1. A process for the propylation of toluene with selective production of cymene consisting essentially of vapor phase reaction of toluene and propylene at a temperature between about 400° F. and about 500° F. and a weight hourly space velocity between about 0.5 and about 100 in the presence of a catalyst comprising ZSM-5 crystalline aluminosilicate zeolite, said zeolite having a silica to alumina ratio of at least about 12.

4,049,738

SELECTIVE PRODUCTION OF PARA-XYLENE

Lewis B. Young, Kendall Park, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed July 12, 1976, Ser. No. 704,194
Int. Cl.² C07C 3/52, 15/08; C01B 33/28
U.S. Cl. 260—671 M 9 Claims

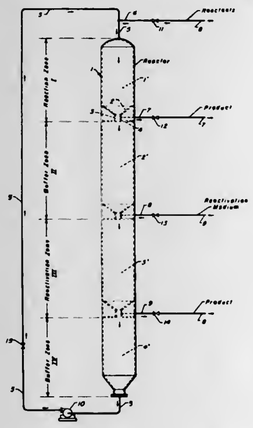
1. A process for the selective production of para xylene which comprises reacting toluene with a methylating agent of a temperature between about 300° C. and about 750° C. in the presence of a catalyst comprising the crystalline aluminosilicate zeolite ZSM-23.

4,049,739

SIMULATED MOVING BED ALKYLATION PROCESS

Robert F. Zabransky, Oak Brook, and Robert F. Anderson, La Grange, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 587,470, June 16, 1975, Pat. No. 4,008,291.
This application Aug. 27, 1976, Ser. No. 718,295
Int. Cl.² C07C 3/52
U.S. Cl. 260—671 R 7 Claims



1. A continuous fixed bed catalytic alkylation reaction and catalyst reactivation process comprising the steps of:

a. providing a crystalline aluminosilicate zeolite catalyst composited with a Group VIII metal hydrogenation agent in a fixed bed containing four zones and having a fluid flow connecting path between said zones to interconnect said zones;

b. arranging said zones in a series and providing fluid flow connecting means between the last zone and the first zone of the series to provide a directional circular flow path through said zones;

c. providing a point between each two successive zones for introducing an inlet stream or withdrawning a product stream;

d. introducing a reactivation stream including alkylatable aromatic hydrocarbon and hydrogen at a first point located between two successive zones (zone II and zone III) to effect catalyst reactivation and to provide alkylatable aromatic hydrocarbon as a continuous component throughout said fixed bed of catalyst;

e. simultaneously withdrawing a first product stream from a second point located between said zone III and the next successive zone in the direction of flow (zone IV);

f. simultaneously introducing reactants consisting essentially of at least one alkylatable aromatic hydrocarbon and at least one olefin into said fixed bed of catalyst at a third point located between said zone IV and the next successive zone in the direction of flow (zone I) and reacting said reactants at a temperature of from about 100° F. to about 400° F. to effect an alkylation reaction, a result of which is deactivation of said catalyst, said alkylation and catalyst reactivation being the principal reactions of the process;

g. simultaneously withdrawing a second product stream from a fourth point located between said zone I and the next successive zone in the direction of flow (zone II); and

h. periodically advancing downstream the points of charging said reactants and said reactivation stream, and the points of withdrawal of said product streams to the next successive point for introducing an inlet stream or withdrawing an outlet stream.

4,049,740

METHOD FOR ACTIVATION OF ALUMINUM CHLORIDE COMPLEX ALKYLATION CATALYST

Yasuhiko Inoue, and Keizo Uyeo, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 399,744, Sept. 21, 1973, abandoned.
This application Oct. 3, 1975, Ser. No. 619,253
Claims priority, application Japan, Sept. 21, 1972, 47-95522
Int. Cl.² C07C 3/56, 3/52; B01J 27/32
U.S. Cl. 260—671 R 7 Claims

1. In a method for the nuclear alkylation of an aromatic hydrocarbon compound in which said aromatic hydrocarbon compound is reacted with an alkyl halide in the presence of a catalytic amount of an aluminum chloride-aromatic hydrocarbon compound complex under reaction conditions which cause nuclear substitution in said aromatic hydrocarbon compound by an alkyl radical to be effected, the improvement which comprises:

A. Separating the aluminum chloride-aromatic hydrocarbon compound complex from the reaction mixture resulting from said nuclear alkylation of an aromatic hydrocarbon compound, and

B. Regenerating said aluminum chloride-aromatic hydrocarbon compound complex by washing at least part of it with a straight chain paraffinic hydrocarbon of 5–24 carbon atoms which is liquid under the washing conditions and in an amount of at least 0.1 part by volume of said paraffinic hydrocarbon per 1 part by volume of aluminum chloride-aromatic hydrocarbon complex to permit the subsequent formation of two separate layers, the lower layer consisting solely of the regenerated aluminum chloride-aromatic hydrocarbon compound complex, said washing being conducted in a temperature range in which isomerization of said paraffinic hydrocarbon will not be effected, separating said lower layer of regenerated aluminum chloride-aromatic hydrocarbon complex and recycling said regenerated catalyst to said alkylation reaction.

5. The method of claim 1, wherein the separated aluminum chloride-aromatic hydrocarbon compound complex is washed with an aromatic hydrocarbon selected from the group consisting of benzene, toluene, xylene, ethyl benzene and diethyl benzene and is separated therefrom prior to the washing with said paraffinic hydrocarbon.

4,049,741

METHOD FOR UPGRADING FISCHER-TROPSCH SYNTHESIS PRODUCTS

James C. Kuo, Cherry Hill; Charles D. Prater, Pitman, both of N.J., and John J. Wise, Media, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,584
Int. Cl.² C07C 1/04
U.S. Cl. 260—676 R 6 Claims

1. A method for upgrading products of Fischer-Tropsch synthesis which comprises,

separating the product effluent of Fischer-Tropsch after cooling to recover a synthetic water phase comprising oxygenates, a normally liquid hydrocarbon light oil phase boiling below about 560° F comprising oxygenates and a normally gaseous phase rich in C_5 hydrocarbons in combination with lower boiling gaseous materials,

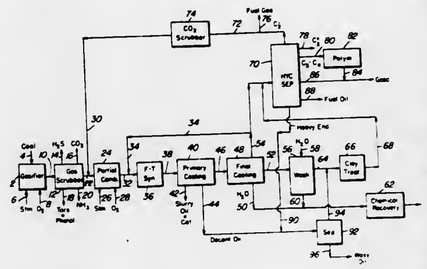
passing the normally liquid hydrocarbon light oil phase boiling below about 560° F without further water washing in contact with a selective crystalline aluminosilicate zeolite that has a pore diameter greater than about 5 Angstroms; a silica-to-alumina ratio of at least 12; a constraint index within the range of 1 to 12; under conversion conditions selected to increase the octane rating of a gasoline product separated therefrom in combination with gaseous components suitable for alkylation,

passing the products obtained from said normally liquid hydrocarbon light oil conversion operation to product separation,

passing the total synthesis gaseous phase rich in C_5 hydrocarbons and comprising a mixture of carbon monoxide, methane, paraffins, olefins and oxygenates in contact with a selective crystalline aluminosilicate zeolite that has a pore diameter greater than about 5 Angstrom units; a silica-to-alumina ratio of at least 12; and a constraint index within the range of 1 to 12 under conversion conditions selected for upgrading hydrocarbon components of said gaseous phase to gasoline boiling compounds and gaseous hydrocarbons suitable for alkylation,

passing the products obtained from said gaseous phase conversion operation to product separation,

separating the products of said catalytic conversion operations to recover gasoline boiling product of improved octane rating, a light fuel oil product higher boiling than said gasoline fraction, a C_3–C_4 net fraction suitable for alkylation and a stream comprising C_2 and lower boiling hydrocarbons.



4,049,742

RECOVERY OF 1,3-BUTADIENE FROM A C_4-HYDROCARBON MIXTURE

Hans-Martin Weitz, Bad Durkheim; Ulrich Wagner, Limburgerhof; Klaus Volkamer, Frankenthal; Eckart Schubert, Ludwigshafen, and Friedhelm Bandermann, Hera, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 23, 1976, Ser. No. 669,710
Claims priority, application Germany, Apr. 15, 1975, 2516362
Int. Cl.² C07C 7/08
U.S. Cl. 260—681.5 R 9 Claims

1. A process for the recovery of 1,3-butadiene, using a selective solvent, from a C_4-hydrocarbon mixture containing 1,3-butadiene, hydrocarbons which are more soluble in the selective solvent than 1,3-butadiene, including higher acetylenes and hydrocarbons which are less soluble in the selective solvent than 1,3-butadiene, which comprises: separating the C_4-hydrocarbon mixture in a first extractive distillation zone into a distillate containing the less soluble hydrocarbons and an extract of 1,3-butadiene, the more soluble hydrocarbons and the selective solvent; removing the selective solvent from the extract to obtain a mixture of 1,3-butadiene and the more soluble hydrocarbons; passing the mixture of 1,3-butadiene and the more soluble hydrocarbons through a second extractive distillation zone to obtain 1,3-butadiene as a distillate and an extract containing the more soluble hydrocarbons including the higher acetylenes and a residue of 1,3-butadiene and the selective solvent; recovering from the extract a stream containing the more soluble hydrocarbons including the higher acetylenes and 1,3-butadiene having a content of acetylenes of from 10 to 60% by weight; subjecting the acetylenes-containing stream to selective catalytic hydrogenation in the presence of hydrogen and a hydrogenation catalyst to selectively hydrogenate the acetylenes; and adding the hydrocarbon stream obtained after hydrogenation to the starting C_4-hydrocarbon mixture.

4,049,743

SELECTIVE OXIDATION OF ACETYLENES

Lewis E. Drehman, and Floyd Farha, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 7, 1976, Ser. No. 703,164
Int. Cl.² C07C 11/02
U.S. Cl. 260—681.5 R 7 Claims

1. A process for the selective removal of acetylenic contaminants or impurities present in hydrocarbon streams which comprises contacting oxygen and a gaseous hydrocarbon stream comprising lower olefins and diolefins contaminated with relatively minor amounts of acetylenic compounds with a catalyst consisting essentially of zinc aluminate promoted with copper, manganese, and a rare earth metal in which each of the promoter metals is present in an amount ranging from about 0.1 to about 20 weight percent based on the weight of zinc aluminate plus metal promoters under oxidation conditions including a temperature and a mole ratio of oxygen to hydrocarbon sufficient to remove a substantial portion of said acetylenic compounds present in said stream without destroying desirable unsaturated hydrocarbons present in the stream treated.

4,049,744

PROCESS FOR MAKING POWDER COATINGS

John Edward Masters, Louisville, Ky., assignor to Celanese Polymer Specialties Company, Louisville, Ky.

Filed Sept. 29, 1975, Ser. No. 617,480
Int. Cl.² C08G 59/18
U.S. Cl. 260—837 R 17 Claims

1. A process for preparing finely divided particles of a complex polyhydroxy polyether resin having a melting point of at least 80° C. which comprises

a. mixing at a temperature of at least 60° C. said resin with water having dissolved or colloidally dispersed therein an inorganic or organic base salt of a polymeric polycarboxylic acid, said acid having an unsalted acid value of at least 50, wherein said polymeric salt is present at about 1 to 25 weight percent based on the weight of said resin;

b. agitating the mixture to form a dispersion having a particle size of about 1 to about 50 microns;

c. reducing the solids content of the dispersion with water;

d. cooling the dispersion below the melting point of the resin;

e. acidifying the dispersion to a pH of about 1 to about 7; and

f. recovering the dispersed particles.

4,049,745

HIGHLY REACTIVE SULPHUR-CONTAINING COATING AGENTS HARDENING UNDER UV-LIGHT

Karl Ernst Schuster, Kerkes; Hans Jurgen Roseakranz, Krefeld, and Hans Rudolph, Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed July 22, 1976, Ser. No. 707,871
Claims priority, application Germany, July 24, 1975, 2533125
Int. Cl.² C08L 63/00
U.S. Cl. 260—837 R 2 Claims

1. A process for the production of a reaction product of a

polyepoxide and an α,β-monoolefinically unsaturated carboxylic acid, wherein at least 60% of the epoxide groups of a polyepoxide with more than one 1,2-epoxide group per molecule are reacted

a. with 0.01 to 0.6 SH-equivalents, based on one epoxide equivalent, of hydrogen sulphide, an aliphatic cycloaliphatic aromatic or araliphatic dithiol or polythiol or with a mixture thereof, and subsequently

b. with 0.99 to 0.4 carboxyl equivalents, based on one epoxide equivalent, of acrylic or methacrylic acid or of a mixture thereof.

4,049,746

INTERMEDIATE COATING COMPOSITIONS AND LONG RUNNING PLANOGRAPHIC PLATES PREPARED THEREWITH

Thaddeus M. Muzyczko, Melrose Park; Ronald A. Frederiksen, Schaumburg, and David L. York, Elgin, all of Ill., assignors to The Richardson Company, Des Plaines, Ill.

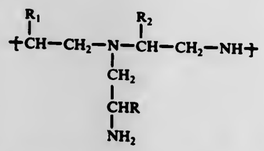
Continuation of Ser. No. 455,635, March 28, 1974, abandoned, which is a continuation of Ser. No. 247,205, April 24, 1972, abandoned, which is a division of Ser. No. 97,394, Dec. 4, 1970, Pat. No. 3,690,880. This application Aug. 22, 1975, Ser. No. 606,990

Int. Cl.² C08L 61/24

U.S. Cl. 260—851 8 Claims

1. A subbase coating composition for photolithographic plates comprising a salt formed from the reaction product of a water soluble polyacrylic resin containing carboxy groupings and a polyalkylenimine-urea-aldehyde resin, said polyacrylic resin being selected from the group consisting of polymers of acrylamide, hydrolyzed acrylamide, acrylic acids and salts thereof, and having a molecular weight range of from 10,000 to 200,000, wherein said polyalkylenimine-urea-aldehyde resin is a product made according to a process which comprises the steps of:

a. heating and reacting a polyalkylenimine resin having the following general formula:



wherein R_1 and R_2 are alike or different and are selected from the group consisting of hydrogen, lower alkyl, water and urea to form from about 10 to about 30 percent of a polyurea reaction product, while water and ammonia are removed;

b. adding thereto and reacting additional urea;

c. methylolating the reaction mixture with an aldehyde to form said polyalkylenimine-urea-aldehyde resin;

wherein said salt is characterized by the reaction of carboxy groups of said polyacrylic resin with the tertiary amino groups of the polyalkylenimine resin.

4,049,747

CROSSLINKED VINYL HALIDE POLYMERS AS FLAME RETARDANT ADDITIVES FOR THERMOPLASTICS

Jung Il Jin, Irvington, and Paul Kraft, Spring Valley, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 512,773, Oct. 7, 1974, Pat. No. 4,022,849, which is a division of Ser. No. 395,684, Sept. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 108,632, Jan. 21, 1971, Pat. No. 3,780,141. This application Nov. 15, 1976, Ser. No. 741,903

Int. Cl.² C08L 75/00

U.S. Cl. 260—859 PV 13 Claims

1. A fire retardant polyblend comprising an intimate admixture of at least one polyurethane resin; and an effective flame retarding concentration of at least one crosslinked copolymer of: (1) at least one vinyl halide selected from the group consisting of vinyl chloride, vinyl bromide and vinyl fluoride present in a concentration of from 50–99% by weight and (2) at least one polyfunctional ethylenically unsaturated monomer, present in a concentration of from about 1–50% by weight.

4,049,748

UNSATURATED POLYESTERS COMBINED WITH ORGANOALUMINUM COMPOUNDS

Wesley T. Bailey, Palos Verdes, Calif., assignor to Chattem Drug & Chemical Company, Chattanooga, Tenn.

Filed Jan. 23, 1976, Ser. No. 651,814

Int. Cl.² C08L 67/06

U.S. Cl. 260—861 31 Claims

1. A sotrage stable substantially anhydrous copolymerizable non-Newtonian liquid unsaturated polyester resin composition, said composition being the reaction product of the following components on an initial 100 weight percent total composition basis:

A. from about 20 to 90 weight percent of an unsaturated polyester resin having a molecular weight ranging from about 1000 to 30000 and comprised of a condensate of at least one polyol with at least one polycarboxylated compound,

B. from about 0.1 to 20.0 weight percent of at least one organoaluminum compound the exact amount of said organ aluminum compound present in any given said composition being such that said composition remains in a liquid condition, and

c. from about 10 to 80 weight percent of a liquid comprising at least one vinyl monomer having a molecular weight ranging from about 100 to 250 and having a boiling point greater than about 100° C.,

said components (A) and (B) being substantially completely dissolved in said component (C), said component (B) first being dissolved in a portion of said component (C) before being blended with a solution of said component (A) in another portion of said component (C), said organoaluminum compound being characterized by:

a. containing at least one aluminum atom per molecule,

b. containing at least one oxygen atom per molecule,

c. containing at least four carbon atoms per molecule at least two of which are bonded directly to one another by one or two bonds in a carbon-to-carbon chain,

d. each said aluminum atom having three bonds and being bonded by at least one of such bonds to one of the carbon atoms in said chain through one of said oxygen atoms intermediately, said carbon atom so bonded having additionally no oxygen atoms double bonded thereto,

e. being soluble in styrene to a weight percentage at least about equal to the weight percentage of such organoaluminum compound is employed in a given such resin composition,

f. having a formula weight of from about 130 to 1000, and

g. causing a cloudy dispersion of alumina particles to form when a 10 weight percent solution of such organoaluminum compound in anhydrous benzene is admixed with benzene saturated with distilled water and the resulting mixture is heated for four hours at 60° C.

4,049,749

PIGMENTABLE LOW-PROFILE POLYESTER MOLDING COMPOSITIONS

Donald H. Thorpe, Williamsville, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Dec. 2, 1975, Ser. No. 636,872

Int. Cl.² C08L 33/12, 67/06

U.S. Cl. 260—862 18 Claims

1. A molding composition comprising

A. a polymerizable unsaturated polyester; and

B. an additive component, present in an amount of about 5 to about 45 parts by weight per 100 parts by weight of polyester component, comprising discrete particles of less than about 50 microns diameter of a cross-linked acrylate polymer characterized by a glass transition temperature of less than about 75° Celsius and which is chemically inert with respect to said polyester component and is swellable but insoluble therein, said acrylate polymer consisting essentially of the reaction product of about 75 to about 95 percent by weight of at least one monoacrylate monomer and about 5 to about 25 percent by weight of at least one polyacrylate monomer.

4,049,750

ONE COMPONENT SHELF STABLE LOW SHRINKAGE STRUCTURAL ADHESIVE SYSTEMS

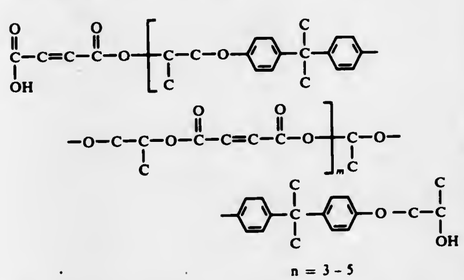
Walter Brenner, 974 Columbus Drive, Teaneck, N.J. 07666

Filed July 29, 1975, Ser. No. 594,459

Int. Cl.² C08L 67/06

U.S. Cl. 260—864 13 Claims

1. A liquid one component structural adhesive composition having controlled viscosity which is stable at ambient temperatures for an extended time period in the presence of oxygen but cures at ambient temperatures in the absence of oxygen or at elevated temperatures in the presence or absence of oxygen to the solid state with low shrinkage said composition comprising a polyester based on the reaction of bisphenol A with fumaric acid having typically the chemical formula configuration



n = 3 - 5

said polymerizable polyester amounting to between 70 - 98% of the adhesive composition, a chemically compatible ethylenically unsaturated organic liquid monomer, a catalyst/inhibitor system containing a peroxide type initiator, accelerators and inhibitors as well as, optionally, thixotropic agents, thickeners, dyes, pigments and other additives which will impart desirable use properties.

4,049,751

EXTRACTION RESISTANT POLYOLEFIN STABILIZERS

Frank Scardiglia, Woodcliff Lake, N.J., and Kornel Dezso Kiss, Yonkers, N.Y., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Apr. 26, 1976, Ser. No. 680,029

Int. Cl.² C08K 5/10, 5/13; C08L 23/12; C08F 255/02

U.S. Cl. 260—876 R 14 Claims

1. A composition of matter which comprises a complex of a hindered phenolic antioxidant and a high molecular weight polymeric nitrogenous complexing agent having complexing group derived from N-vinyl-2-pyrrolidone.

4,049,752

POLYMERIC COMPOSITIONS OF STYRENE AND AMORPHOUS POLYOLEFINS USEFUL IN PREPARING HOT MELT ADHESIVES

Kenneth H. Albers, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,327

Int. Cl.² C08F 255/00, 255/02, 255/04, 255/08

U.S. Cl. 260—878 R 9 Claims

1. A process for preparing polymeric compositions having a styrene content of about 1 to about 90 percent by weight of said compositions which comprises polymerizing styrene in the presence of an amorphous polyolefin having a melt viscosity at 190° C. of from about 100 to about 500,000 centipoise with a peroxide catalyst at a temperature in the range of about 160° to about 300° C.

8. A white, nonpigmented polymeric polyolefin composition comprising an amorphous polyolefin which contains about 1 to 90 percent by weight polymerized styrene, has a melt viscosity at 190° C. of 100 to 500,000 centipoise prepared by polymerizing styrene in the presence of said amorphous polyolefin with a peroxide catalyst at a temperature of about 210° to about 300° C.

4,049,753

COUPLING OF ALKALI METAL-TERMINATED POLYMERS

George A. Moczygemba, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

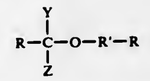
Filed Apr. 19, 1976, Ser. No. 678,096

Int. Cl.² C08F 8/00, 8/02, 8/06, 8/10

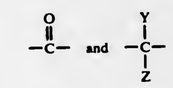
U.S. Cl. 260—880 B 6 Claims

1. A polymer having the structure

(I)



wherein the radicals R, which can be the same or different, are hydrocarbyl radicals with 1 to 7 carbon atoms, R' is a divalent radical selected from the group consisting of



wherein Y is selected from the group of radicals consisting of —OH and —Z, and wherein Z is a homopolymer or copolymer chain of one or more conjugated alkadienes of 4 to 12 carbon atoms per molecule or a copolymer chain of at least one alkadiene of 4 to 12 carbon atoms and at least one monovinyl-substituted arene radical of 8 to 18 carbon atoms per molecule, the vinyl radical being attached to a carbon atom of the arene ring,

with the further provision that at least 160 polymer chains Z are present in 100 molecules of formula (I).

4,049,754
TRIBROMONEOPENTYL PHOSPHORUS REACTIVE FLAME RETARDANTS
Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.
Filed Sept. 23, 1976, Ser. No. 726,077
Int. Cl.² C07F 9/09, 9/11, 9/14, 9/40
U.S. Cl. 260—952 **11 Claims**

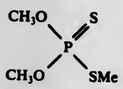
1. Compounds of the formula

$$[(BrCH_2)_3CCH_2O]_2P(O)R$$

wherein R is a functional group selected from the group consisting of $-CH{=}CH_2$, $-CH_2X$, $-OR'OC(O)CH{=}CH_2$, $-OR'OC(O)C(CH_3){=}CH_2$, $-O(R'O)_nH$, $-OH$, Cl and $-NR''R'''$ where R' is a C_1–C_4 alkylene or haloalkylene group, R'' and R''' are the same or different and are selected from the group consisting of hydrogen, lower alkyl, phenyl, hydroxy lower alkyl, and allyl groups, X is selected from the group consisting of chlorine and bromine and *n* is an integer between 1 and 20.

4,049,755
PROCESS FOR PREPARING O,O-DIMETHYLDITHIOPHOSPHORIC ACID AND ALKALINE SALTS THEREOF
Sergio Bianchi, Bresso (Milan); Mario Bornengo, Mestre (Venezia), and Alessandro Frangioni, Mogliano Veneto (Treviso), all of Italy, assignors to Montedison S.p.A., Milan, Italy
Filed Jan. 10, 1975, Ser. No. 539,966
Claims priority, application Italy, Jan. 11, 1974, 19333/74
Int. Cl.² C07F 9/17
U.S. Cl. 260—987 **4 Claims**

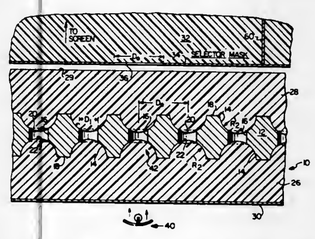
1. Process for the continuous production of a stable alkaline solution of O,O-dimethyldithiophosphoric acid of the formula



in which Me is Na, K or NH_4, in high yield and of a high degree of purity, and while avoiding explosions, said process consisting in reacting highly reactive phosphorus pentasulphide with methanol in an excess of 30% to 70% by weight of toluene with regard to the reacting mass, at a pressure of from 1 to 5 atm., at a temperature of from 60° to 75° C, in the presence of from about 0.01 to about 0.5% by weight, on the methanol weight, of pyridine or of a pyridine base, for an average reaction time of 30 to 60 minutes, and thereafter treating the toluene solution of O,O-dimethyldithiophosphoric acid thus obtained with an aqueous solution of an alkaline hydroxide.

4,049,756
METHOD OF MAKING MICROFICHE LAMINATE HAVING APERTURES WITH DOUBLET LENSES
George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.
Division of Ser. No. 539,458, Jan. 8, 1975. This application Oct. 16, 1975, Ser. No. 622,827
Int. Cl.² B29D 3/00, 9/10, 11/00; B29F 5/00
U.S. Cl. 264—1 **2 Claims**

1. In a method of forming a microfiche laminate having an apertured opaque sheet with facing plano-convex lenses forming a doublet lens in at least one through aperture of said sheet, the steps comprising: forming opposite concavities on opposite sides of an apertured opaque sheet, two of said opposite concavities being contiguous to at least one aperture; disposing transparent thermoplastic sheet material on said opposite sides of said apertured sheet; applying heat and pressure to said



thermoplastic material on said opposite sides causing said material to flow into said concavities and only partially into said apertures to form said facing plano-convex lenses.

4,049,757
PROCESS FOR THE PRODUCTION OF SHAPED BODIES FROM POLYOLEFINS
Gernot Kammel, Erlangen, and Rudolf Wiedenmann, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Apr. 28, 1975, Ser. No. 572,516
Claims priority, application Germany, Apr. 29, 1974, 2420784
Int. Cl.² B01J 1/10
U.S. Cl. 264—22 **8 Claims**

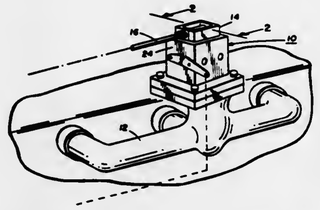
1. A process for the production of shaped bodies and semi-finished products from olefin homopolymers and copolymers crosslinkable by high energy radiation in the presence of a polyfunctional ethylenically unsaturated monomer capable of reducing the radiation dosage for cross-linking said olefin polymer comprising:

a. forming a mixture of said olefin polymer, monomer and from 0.05 to 0.5% based on the weight of the said olefin polymer of at least one heat decomposable organic polymer active radical forming agent;
b. shaping said mixture and heating said mixture during or after shaping at a temperature above the decomposition temperature of said radical forming agent until said agent decomposes and a shaped crosslinkable body is formed whereby oligomerization of said monomer occurs so as to substantially prevent migration of said monomer to the surface of said shaped body; and
c. crosslinking said shaped body with high energy radiation.

4,049,758
FUEL INTRODUCTION DEVICE FOR INTERNAL COMBUSTION ENGINE
Robert Dixon Englert, Corona Del Mar, and Kenneth Ronald Armstrong, Lakewood, both of Calif., assignors to Dresser Industries, Inc., Dallas, Tex.
Division of Ser. No. 384,166, July 30, 1973, abandoned. This application Feb. 26, 1976, Ser. No. 661,557
Int. Cl.² F02M 9/02
U.S. Cl. 261—62 **4 Claims**

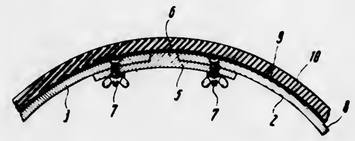
1. In combination with an air-liquid fuel induction device that includes an intake air duct having a converging portion, a variable area throat portion of rectangular cross-section through which a mixture of air and finely divided liquid fuel is passed at sonic velocity and a fuel supply, a fuel dispensing and air flow shaping device including in combination:

a. an elongated distributor body positioned upstream of the throat and extending within said air duct in a direction parallel to the longer axis of the rectangular throat, said distributor body being positioned at an intermediate location within said air duct to divide the flow of air into converging streams;
b. means forming a plurality of displaced fuel openings in said distributor body extending longitudinally therealong, said openings being located within the converging portion of the intake air duct and adapted to discharge fuel therefrom in a plurality of coherent liquid streams for atomization by the converging air streams;
c. means forming an internal passage within said distributor body and connected to said fuel supply communicating with the openings for the passage of liquid fuel;
d. fuel joinder prevention means attached to said distributor body positioned downstream of said openings and spaced



therefrom, said fuel joinder prevention means being spaced along substantially the entire length of said body transversely of the direction of air flow and being effective to minimize joinder between streams of liquid fuel discharged from said openings, and
e. the distributor body having an exterior surface position extending between the fuel openings and the joinder prevention means providing an uninterrupted surface over which fuel flows under conditions of relatively low air velocity moving past said openings.

4,049,759
METHOD AND ARRANGEMENT FOR USE IN LINING ARTICLES, PARTICULARLY MELTING OVENS
Rudolf Florian, Blomberg, Germany, assignor to Dörentruper Sand- und Thonwerke GmbH, Dorentrup, Germany
Filed Mar. 19, 1975, Ser. No. 559,865
Claims priority, application Germany, Mar. 23, 1974, 2414060
Int. Cl.² F27D 1/16
U.S. Cl. 264—30 **12 Claims**



1. A method of lining an article, particularly a melting oven, comprising the steps of assembling a plurality of sections with one another so as to form a mold member with a surface having a configuration corresponding to a face of the article which is to be lined; applying to said surface a parting agent; coating said surface above said parting agent with a hardenable composition in flowable state, said composition being hardenable under conditions such that the configuration of said member retains substantially unchanged, and said composition being hardenable to a hardened state which is maintainable during the rigidification of a lining surface for said article; hardening said composition to said hardened state under said conditions; arranging the coated member and said article relative to one another so that the hardened composition is directed towards said face and is spaced therefrom; admitting said lining substance into the space defined intermediate said face and said hardened composition; disassembling said sections from one another; removing said sections from said hardened composition intact and in such a manner that said hardened composition remains as the sole support for said lining substance at the interior of the latter; and subsequently rigidifying said lining substance located in said space intermediate said face and said hardened composition while said hardened composition supports said lining substance at the interior of the same.

4,049,760
METHOD OF MANUFACTURE OF FOAMED THERMO-PLASTIC EXTRUDED SHAPES
Guy Lozach, Chantilly, France, assignor to Societe Chimique des Charbonnages, Courbevoie, France
Continuation-in-part of Ser. No. 450,838, March 13, 1974, abandoned. This application Mar. 31, 1976, Ser. No. 672,490
Claims priority, application France, Mar. 16, 1973, 73.09609
Int. Cl.² B29D 27/00
U.S. Cl. 264—51 **10 Claims**



1. A method for the extrusion-manufacturing of a diversity of structural foamed thermoplastic material shaped sections of indefinite length and having a density of 0.4 to 0.9 with respect to the corresponding solid thermoplastic material, said method comprising:

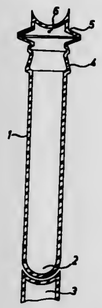
extruding a foamable thermoplastic material from an extruder through a die orifice with an initial shape section the material beginning to expand at the outlet of said die;
modifying the shape-section of the expanding extrudate by partially slowing-down or stopping the expansion in preselected zones of said extrudate immediately at the outlet of said die orifice by differently cooling said zones with a plurality of jets of cooling fluid under pressure and having a temperature lower than the softening temperature of the thermoplastic material, said jets having a peripheral distribution, constituting a fluid shaping device, while permitting the expansion to continue in the non-cooled zones, whereby an extrudate having a shape-section different from that of said initial die shape is formed,
and finally fixing the resulting shape by cooling.

4,049,761
PROCESS FOR THE MANUFACTURE OF ORIENTED HOLLOW ARTICLES MADE OF THERMOPLASTIC MATERIAL
Michel Lorgé, Brussels, and Roger Houba, Gembloux, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium
Filed Mar. 11, 1975, Ser. No. 557,376
Claims priority, application France, Mar. 15, 1974, 74.09380
Int. Cl.² B29C 17/07, 17/12
U.S. Cl. 264—89 **4 Claims**

1. In a process for the manufacture of oriented hollow articles made of thermoplastic material by the steps of:

extruding a continuous hot tubular parison of thermoplastic material;
pre-blowing such parison in a pre-blowing mold to produce preforms having a cylindrical body with a diameter not more than 20% greater than that of the parison;
thermally conditioning the resulting preforms at a temperature sufficient to cause orientation of the thermoplastic material when it is being stretched; and
effecting a final blow-molding of the thermally conditioned preforms, the improvement wherein said step of pre-blowing is carried out by introducing the parison between two half-molds defining a cavity which has the shape of a hemisphere at the location of the base of the preform, each half-mold having, at such location, the shape of a quarter sphere of diameter equal to that of the preform, and hold-

ing the parison tightly between the half-molds in a manner such that the parison presents a portion located outside of the mold cavity adjacent the preform base, and projecting out of the mold to constitute a base flash joined to the resulting preform along a semicircular line, and wherein said process further comprises removing the base flash



from the preform, while the preform is still in the pre-blowing mold, by moving an elongated blade having a semicircular cross section, and a diameter which corresponds to that of the wall of the base of the cavity of the pre-blowing mold, with a reciprocating movement perpendicular to the plane of the base flash.

4,049,762

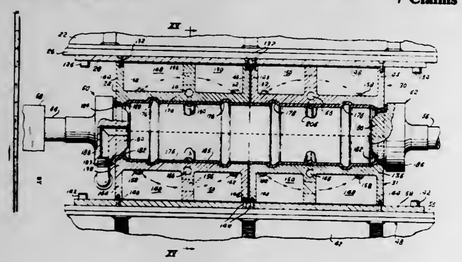
METHOD OF FORMING A PIPE COUPLING

Paul D. Martino, and Norris H. Barbre, both of Weatherford, Tex., assignors to Harsco Corporation, Camp Hill, Pa.

Continuation of Ser. No. 385,232, Aug. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 164,519, July 21, 1971, abandoned. This application Sept. 15, 1975, Ser. No. 613,288

Int. Cl.² B29C *17/07;* B29D *23/03;* B29F *5/00*

U.S. Cl. 264—94 **7 Claims**



1. A method of forming a thermoplastic pipe coupling comprising the steps of: heating a prefabricated thermoplastic tubular member to a soft pliable state; positioning the pliable tubular member in a mold cavity having walls maintained at a temperature to quickly harden a surface of the tubular member moved into contact therewith, the tubular member being positioned such that opposite ends of the tubular member extend beyond ends of the mod cavity; engaging only outer surfaces of the tubular member adjacent ends of the tubular member with mold portions to space walls of the tubular member from a major portion of the surface of walls of the mold cavity; moving seal members into engagement with opposite ends of the tubular member such that force is exerted on surface inside the ends of the tubular member to deform outer surfaces of the tubular member into sealing engagement with surfaces adjacent opposite ends of the mold cavity; urging the seal members into sealing engagement with inner surfaces of the tubular member; delivering pressurized fluid to a pressure actuated cylinder connected to the seal members to maintain constant pressure on said seal members to urge the seal members inwardly and to maintain a constant seal with the ends of the tubular members to compensate for the tendency of the wall of the tubular member to contract in length and thickness due to expansion of the diameter of the tubular member and cooling of the wall of the tubular member; and injecting pressurized fluid into the tubular member to urge walls of said tubular member into conformity with surfaces of the mold cavity.

4,049,763

PROCESS FOR PRODUCING A HIGHLY ORIENTED POLYESTER UNDRAWN YARN

Masatoshi Mineo; Ken-ichiro Oka; Kiyoshi Nakagawa; Hiyoshi Matsuda; Shigeo Ohno, and Yasuo Takagi, all of Mishima, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed July 14, 1975, Ser. No. 595,344

Claims priority, application Japan, July 23, 1974, 49-83777

Int. Cl.² D01D *5/12*

U.S. Cl. 264—176 F **3 Claims**



1. In a process for producing a highly oriented polyester undrawn yarn, in which said yarn is spun from a spinneret to a first take-up, the steps which comprise:

melt-spinning a polyester from a spinneret,

solidifying the melt-spun yarn and taking up the solidified yarn at a take-up velocity from about 2,500 to 4,500 m/min,

wherein the spinning length defined by the distance from said spinneret to said first take-up is within the range from about $(d + 2)/4$ (in meters) to about $(A/1.2)/(Faero/x)$ (in meters),

wherein d is the filament denier of the undrawn yarn, A is the tension (in grams) of the filament in an elongation range under constant tension of a stress-strain curve, $Faero/x$ is the rate of increase of the yarn tension per meter following the yarn solidification point by an air resistance which is equal to $0.229 \times 10^{-4} \cdot D^{0.39} \cdot V^{1.39}$, wherein D is the solidified filament diameter (in cm) and V is the velocity of the solidified filament (in cm/sec),

wherein the filament denier of the undrawn yarn is within the range from about 2 to 6.

4,049,764

METHOD OF FORMING HIGHLY ABSORBENT FILAMENTS AND WEBS HAVING IMPROVED SOFTNESS, WICKING, AND SOLVENT DRYING CHARACTERISTICS

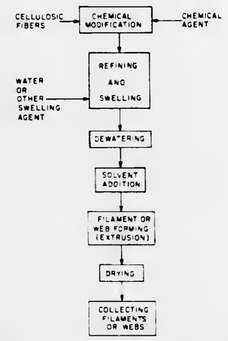
Wayne C. Sigl, Black Creek, and Frederick O. Lassen, Neehah, both of Wis., assignors to Kimberly-Clark Corporation, Neeah, Wis.

Filed Apr. 2, 1975, Ser. No. 564,201

Int. Cl.² D01D *5/08*

U.S. Cl. 264—178 F **7 Claims**

1. In a method of producing filaments and webs of cellulose fibers, which have been transformed by derivitization to increase their hydrophilic character, by extrusion of said fibers from a plasticized fibrous extrudable mass including a swelling medium and solvent drying to remove the swelling medium,



the improvement wherein about 2 to 50% of a polar solvent in the form of pure solvent for the swelling medium being removed by drying or a mixture containing the solvent and up to 90% of a non-solvent by volume is added to said extrudable mass and mixed for a period of from about three to about ten minutes prior to extrusion.

4,049,765

METHOD FOR SETTING END PORTION OF BUNDLE OF THREAD-LIKE BODIES

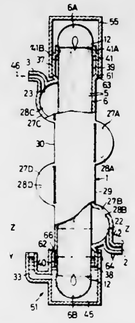
Masahiro Yamazaki, Kamakura, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1976, Ser. No. 679,988

Claims priority, application Japan, May 2, 1975, 50-53614

Int. Cl.² B29C *17/00;* B29D *9/00;* B29C *27/00*

U.S. Cl. 264—261 **11 Claims**



1. A method for setting an end portion of a bundle of thread-like bodies so that capillary action is reduced between said bodies, comprising the steps of:

A. dipping an end portion of a bundle of thread-like bodies into a solidifiable liquid, said bodies being so disposed that capillaries exist between said bodies;

B. contacting at least that part of said bundle which is immediately adjacent said end portion with a polar gas selected from the group consisting of ammonia gas, a primary amine gas and a secondary amine gas and mixtures thereof, said contacting step occuring prior to exposure of that adjacent part to said liquid whereby said gas acts to prevent said capillary action; and

C. permitting said solidifiable liquid to solidify.

4,049,766

PROCESS FOR IMPROVING CRYSTALLINITY IN NYLON 6

Brewster B. Eskridge; Boyce M. Lyon, both of Asheville, N.C., and Eduard H. Boasson, Laag Soeren, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 530,902, Dec. 9, 1974, abandoned, which is a division of Ser. No. 418,487, Nov. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 217,839, Jan. 14, 1972, abandoned. This application Jan. 12, 1976, Ser. No. 648,425

Int. Cl.² D01D *5/12*

U.S. Cl. 264—210 F **7 Claims**

1. A process for the continuous spin-draw-winding of nylon 6 to produce yarn filaments having a mixed beta/alpha crystallinity ratio comprising the steps of spinning continuous filaments of nylon 6, cooling said filaments in air, applying to the filaments an aqueous spin finish emulsion containing from about 3% to about 6% by weight of benzyl alcohol to enhance conversion of the beta hexagonal crystalline form to the alpha monoclinic crystalline form, and immediately thereafter continuously drawing said nylon 6 yarn filaments thereby imparting improved uniformity of dye acceptance to the drawn filaments.

4,049,767

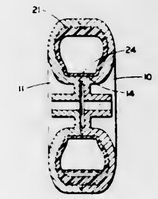
ROTATIONAL MOLDING PROCESS FOR FORMING A CLOSED HOLLOW TOROIDAL ARTICLE

Deepak V. Vaidya, (Sailee) Plot No. 9, Baner Road, Pune, Maharashtra 411007, India

Continuation-in-part of Ser. No. 512,176, Oct. 4, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,082

Int. Cl.² B29C *5/04;* B29H *17/00*

U.S. Cl. 264—257 **13 Claims**



1. A process for molding a closed hollow toroidal article thickest at its outer periphery, which comprises charging one part of a split hollow toroidal mold with a fluent material which can be caused to set to a solid, in a quantity substantially less than that required to fill the mold cavity but sufficient to fill completely the lower arc of the mold cavity when such that the fluent material is in contact with all portions of the cross-sectional periphery of the lowermost radial section of the toroidal mold its axis is horizontal, completely closing the mold, placing the mold with its axis horizontal, slowly rotating the mold on its axis, causing the material to set progressively from the inner surface of the mold until the entire charge of material is solidified, opening the mold, and removing the article.

4,049,768

METHOD FOR EXTENDING THERMOPLASTIC FOAMS HAVING SMOOTH EXTERNAL SKINS

Vinod K. Luthra, East Rochester, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

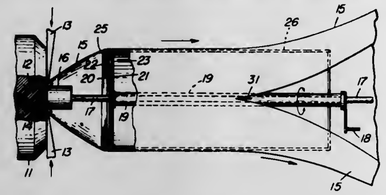
Filed Apr. 9, 1976, Ser. No. 675,384

Int. Cl.² B29D *7/24, 27/00*

U.S. Cl. 264—45.5 **1 Claim**

1. In a method for the surface treatment of extruded tubular thermoplastic foams wherein an internal nozzle and an external

cooling ring are employed to cool the foam surface and form continuous skin layers thereon and wherein the foam tube subsequent to forming is drawn over the cylindrical surface of a forming drum, the improvement which comprises providing



and utilizing an air vent in the face portion of said forming, drum said air vent comprising an orifice having an adjustable baffle whereby the return flow of cooling air from the interior of the extruded tube is controlled resulting in alterations in the characteristics of said skin layers.

4,049,769

SEPARATION OF URANIUM ISOTOPES BY ACCELERATED ISOTOPE EXCHANGE REACTIONS

Masmi Seko; Tetsuya Miyake, both of Tokyo; Kohji Inada, Yokohama; Kazushi Ochi, Yokohama, and Tomio Sakamoto, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 4, 1976, Ser. No. 711,748
Int. Cl.[2] C01G *56/00*
U.S. Cl. 423—7 **25 Claims**

1. In a process for separating uranium isotopes in multiple stages, each stage comprising the step of isotope exchange reaction wherein uranium(VI) and uranium(IV) compounds are contacted in a system containing a mixed solution of said compounds and the step of separating uranium(VI) compound enriched with uranium-235 from uranium(IV) compound after said isotope exchange reaction, uranium(VI) and uranium(IV) compounds to be contacted in each stage after the first stage being formed by reducing a portion of respective uranium(VI) compound enriched with uranium-235 isotope separated in the preceding stage, the improvement which comprises effecting said isotope exchange reaction in each stage in the presence of at least one catalyst dissolved in said mixed solution under acidic conditions wherein the absolute value of the differential redox potential ΔE is not more than one volt and the concentration of the catalyst expressed in moles per liter is in the range between 0.5 times $|\Delta E|$ and three.

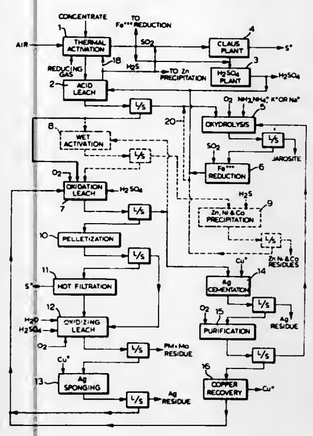
4,049,770

RECOVERY OF COPPER AND ZINC AS SULFIDES FROM COPPER-IRON SULFIDES

Godefridus Maria Swinkels, Roseland; Robert Arthur Furber, Edmonton; Edward Francis Godfrey Milner, Warfield; Roman Michael Genik-Sas-Berezowsky, Edmonton, and Charles Ray Kirby, Roseland, all of Canada, assignors to Sherritt Gordon Mines Limited, Toronto and Cominco Ltd., Vancouver, both of Canada

Division of Ser. No. 408,132, Oct. 19, 1973, Pat. No. 3,964,091. This application Mar. 2, 1076, Ser. No. 663,038
Int. Cl.[2] C01G *3/12, 9/08, 51/00, 53/00*
U.S. Cl. 423—37 **3 Claims**

1. A process for recovery of zinc values contained in thermally activated iron containing copper and zinc sulfides in which said activated sulfides have been subjected to an acid leach in aqueous sulfuric acid to produce a solution of ferrous sulfate and a solids residue containing copper and zinc and separation of said solution containing ferrous sulfate from said solids residue which comprises: reacting said solids residue containing copper and zinc with an acidic copper sulfate solution containing from about 20 to about 100 gpl copper and from about 5 to about 35 gpl sulfuric acid at a temperature in the range of from about 140° to about 200° C. under autogenous pressure whereby copper values are precipitated as a simple copper sulfide with concurrent dissolution of iron and zinc values to form a solution of ferrous sulfate containing said



dissolved zinc values, separating said solution of ferrous sulfate from the simple coppeer sulfides, and reacting said solution with H_2S for precipitation of zinc values therefrom as zinc sulfide.

4,049,771

EXTRACTION PROCESS FOR RECOVERY OF RHENIUM

L. Rita Quatrini, and Martin B. MacInnis, both of Towanda, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation of Ser. No. 510,067, Sept. 27, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,817
Int. Cl.[2] C01G *47/00*
U.S. Cl. 423—49 **2 Claims**

1. In a process wherein an aqueous solution containing a relatively high concentration of molybdenum and a relatively low concentration of rhenium is contacted by selective organic extractant solution to preferentially extract the rhenium therefrom without an appreciable extraction of molybdenum into the organic solution and thereafter the organic and aqueous solutions are separated and the rhenium values are separated from the organic phase, the improvement comprising:

a. providing an organic extractant solution consisting essentially of from at least 0.05% to about 0.1% by volume of a quaternary ammonium compound of the formula $[R_3(CH_3)N]^+A^-$, wherein R is an alkyl group having from about 8 to 10 carbon atoms and A is an anion derived from a mineral acid as the active extracting agent and at least 50% by volume of benzene, and contacting said organic extractant with an aqueous solution containing molybdenum and rhenium values, wherein the ratio of concentration of rhenium to the concentration of molybdenum is from about 1:2000 to about 1:3000 and the concentration of rhenium is below about 50 mg/liter.

b. stripping essentially all of the rhenium value from said extractant after the aqueous solution has been contacted by said extractant and the organic and aqueous solutions have been separated, and

c. Continuously recycling said extractant solution to extract further rhenium values without a substantial loss in extraction capacity.

4,049,772

PROCESS FOR THE RECOVERY OF CHROMIC ACID SOLUTION FROM WASTE WATER CONTAINING CHROMATE IONS

Shunsuke Takada, Yono, and Kazunori Sato, Yokohama, both of Japan, assignors to Tokico, Ltd., Kawasaki, Japan

Continuation of Ser. No. 524,881, Nov. 18, 1974, abandoned. This application Dec. 29, 1976, Ser. No. 755,193
Int. Cl.[2] C01G *37/14*
U.S. Cl. 423—54 **4 Claims**

1. A continuous process for the removal and recovery of chromate anions from a waste water containing chromate anions, other anion impurities and cation impurities, and said process comprising:

passing the waste water through a cation-exchange resin to remove the cation impurities; then

passing the waste water in a flow path through an anion-exchange system comprising at least first and second columns connected together in series, each of said columns being packed with an OH form basic anion-exchange resin;

removing said first column from said flow path when or after the chromate content of the influent to said first column and the effluent from said first column have become substantially equal and diverting said waste water, at the time of the removal of said first column from said flow path, to enter said second column;

eluting absorbed chromate ions from said first column by passing a chromic acid solution containing at least 100 ppm chromate anions through said first column and thereafter passing an aqueous alkali solution through said first column; and

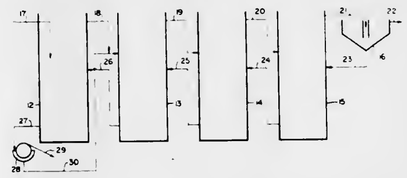
replacing said first column back into said system by connecting it to the effluent end of the last column in series.

4,049,773

PROCESS FOR PRECIPITATION OF ALUMINUM HYDROXIDE FROM ALUMINATE SOLUTION

Gløer Thorvald Mejdell, and Sven Arne Kjølberg, both of Porsgrunn, Norway, assignors to Norsk Hydro A.S., Olso, Norway

Filed Apr. 8, 1976, Ser. No. 675,216
Claims priority, application Norway, Apr. 16, 1975, 751367
Int. Cl.[2] C01F *7/06*
U.S. Cl. 423—127 **10 Claims**



1. A process for continuous precipitation of aluminum hydroxide from an aluminate solution produced by digestion of bauxite in concentrated sodium hydroxide solutions at elevated pressure and temperature with subsequent separation of undissolved components, where the precipitation is carried out in more than one stage and in the presence of seed crystals, and where the precipitated aluminum hydroxide after washing can be transformed to oxide by heating to temperatures over 700° C., while the mother liquor remaining after the precipitation is concentrated by evaporation and returned for reuse in the digestion of bauxite, said process comprising:

passing the aluminate mother liquor counter-current to a feed of aluminum hydroxide crystals through at least two precipitation stages arranged in series;

maintaining in each precipitation stage a lower turbulent zone with a high suspension density, and agitating said zone sufficiently to maintain crystals therein suspension;

maintaining over each turbulent zone a non-turbulent, stagnant liquid layer from which the majority of the crystals settle back into the respective lower turbulent zone;

maintaining the density in the last as well as preceding precipitation stages at a constant level by sending crystal suspension from the lower turbulent zone in all precipitaton stages but the first to the preceding precipitation stage;

removing mother liquor from the upper stagnant zone of all but the last stages and sending such removed mother liquor to the following stage; and

removing coarse crystal suspension from the turbulent zone in said first stage for separation of the crystals for further processing, while returning the remaining mother liquor to the system.

4,049,774

PROCESS FOR REDUCING FORMATION OF GYPSUM SCALE DURNG THE WASHING OF CALCIUM SULPHATE HEMIHYDRATE CRYSTALS

Douglas Charles Harper, Ipswich; Norman Robinson, and Stanislaw Maria Janikowski, both of Felixstowe, all of England, assignors to Fisons Limited, London, England

Continuation-in-part of Ser. No. 300,575, Oct. 25, 1972, abandoned, which is a continuation-in-part of Ser. No. 198,425, Nov. 21, 1971, abandoned. This application Nov. 8, 1974, Ser. No. 522,265
Claims priority, application United Kingdom, Nov. 12, 1970, 53869/70; Jan. 16, 1971, 2225/71; Sept. 24, 1971, 44560/71; Oct. 30, 1971, 50564/71; May 5, 1972, 20966/72; May 5, 1972, 20967/72; May 11, 1972, 22176/72
The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.
Int. Cl.[2] C01B *25/22*
U.S. Cl. 423—167 **10 Claims**

1. In a process for producing phosphoric acid wherein phosphate rock is acidulated with a mineral acid and crystals of calcium sulphate hemihydrate are formed, separated off from the phosphoric acid and thereafter washed, the improvement which comprises washing the calcium sulphate hemihydrate crystals with an aqueous wash liquor which prior to contact with the crystals, contains P_2O_5 in amounts less than 30% and H_2SO_4 in amounts of less than 10 parts by weight per 100 parts by weight of H_3PO_4 present in the aqueous wash liquor and contains from 0.0002 to 1.0% by weight of an additive selected from the group consisting of compounds of the empirical general formula:

$$R^1R^2S(O)_n \qquad I$$

wherein n has a value of 3 or 4 and when n is 3 R^2 is hydrogen and R^1 is an alkyl or aralkyl group and when n is 4 R^1 is an alkyl or aralkyl group and R^2 is hydrogen or an R^1 group; alkylene oxide condensates of an alcohol, phenol or an alkyl phenol and mixtures and salts, esters and amides of said compounds whereby the deposition of calcium sulphate dihydrate scale due to the recrystallisation of the calcium sulphate hemihydrate to calcium sulfate dihydrate is reduced; the total contact time between the calcium sulphate hemihydrate crystals and the wash liquor during washing being less than 10 minutes.

4,049,775

METHOD FOR PURIFYING WASTE AIR FROM SULPHURIC GASES, PARTICULARLY IN THE PRODUCTION OF VISCOSE FIBRES

Janina Majewska; Wiktor Grams; Zbigniew Rybicki, and Jozef Banasiak, all of Lodz, Poland, assignors to Instytut Wlokien Chemicznych, Lodz, Poland

Filed Oct. 10, 1975, Ser. No. 621,626
Claims priority, application Poland, Oct. 15, 1974, 174848
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—224 **9 Claims**

1. A method for purifying waste air simultaneously from hydrogen sulphide, carbon disulphide and sulphur dioxide

comprising contacting said waste air in a closed cycle with an aqueous alkaline solution of an oxidizing agent consisting of (1) an alkali metal hypochlorite in an amount equivalent to at least 0.1 g. of available chlorine per liter (2) hydroquinone in an amount of at least 0.1 g/l and (3) at least 0.005 g/l of a chemisorbent selected from the group consisting of polyglycols having a molecular weight less than 300 and aliphatic amines.

4,049,776

METHOD OF REMOVING HYDROGEN SULFIDE FROM GASES AND LIQUIDS

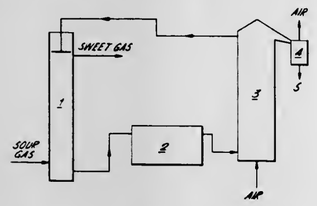
Thomas Nicklin, Bamford, and Dorothy Hughes, Manchester, both of England, assignors to British Gas Corporation, London, England

Filed Aug. 21, 1975, Ser. No. 606,545

Claims priority, application United Kingdom, Aug. 27, 1974, 37418/74

Int. Cl.² B01D *53/34*

U.S. Cl. 423—226 **6 Claims**



1. In a process for the removal of hydrogen sulphide from gases or non-polar liquids by contacting said gas or liquid with an aqueous alkaline liquor comprising a quinone and a compound of a metal having at least two valency states, and in which said liquor contains an impurity selected from the group consisting of sulfonated, hydroxy, and hydroxy sulfonated derivatives of said quinone, the improvement wherein said aqueous alkaline liquor is prepared by adding ferrous or ferric ions to an aqueous solution of said quinone, at a pH of less than 7, to form a complex with said impurity, said complex being selected from ferric ion sulphonated quinones, ferric ion hydroxy quinones and ferric ion sulphonated hydroxy quinones and thereafter adding the acid solution of said complex to an aqueous solution of said compound of a metal having at least two valency states, whereby to form said aqueous alkaline liquor, and whereby said liquor has a pH above pH 7.

4,049,777

METHOD OF WASTE GAS TREATMENT

Rudolf Divivier, Kettwig, and Gotthard Uckert, Essen, both of Germany, assignors to Didier Engineering GmbH, Essen, Germany

Filed May 20, 1976, Ser. No. 688,302

Int. Cl.² B01D *53/34*

U.S. Cl. 423—239 **11 Claims**

1. A method of removing nitrogen oxides from a feed stock containing at least 10% by volume of oxygen and/or at least 12% by volume of oxygen compounds other than the nitrogen oxides, which comprises providing at least two separate beds of a catalyst comprising at least one oxide of the iron group and at least one oxide of the chromium group, and passing the feed stock sequentially through the catalyst beds while simultaneously introducing ammonia into the feed stock prior to passage of the feed stock through each catalyst bed, thus causing the nitrogen oxides to undergo a reduction reaction, said reduction reaction being carried out at a temperature between 260° C and 350° C.

4,049,778

PARTICULATE AMMONIUM NITRATE WITH ADDED FERRIC PHOSPHATE AND CALCIUM SULFATE

Clive Hodgson, Forest Knolls, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 107,426, Jan. 18, 1971, abandoned. This application May 3, 1973, Ser. No. 356,886

Int. Cl.² C01C *1/18*

U.S. Cl. 423—265 **12 Claims**

1. A composition of matter comprising solid particulate ammonium nitrate prepared in situ by mixing with aqueous or molten ammonium nitrate sufficient soluble ferric salt and phosphoric acid in substantially stoichiometric amounts adapted to form ferric phosphate in an amount from 0.3 to 2 weight percent, based on weight of ammonium nitrate, and subsequently prilling or granulating the ammonium nitrate.

4,049,779

CRYSTALLINE SALT MONOMERS FOR STABLE PHOSPHATE GLASSES

Richard C. Ropp, Warren, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 24, 1975, Ser. No. 644,270

Int. Cl.² C01B *15/16, 25/26;* C03C *3/00*

U.S. Cl. 423—309 **19 Claims**

1. A method of preparing a water soluble monobasic phosphate glass precursor having the formula:

$$M(H_2PO_4)_n$$

wherein M is a metal ion selected from the group consisting of aluminum, zinc, cadmium, iron, tin, manganese, lead, nickel, cobalt, gallium, indium and the alkaline earth metals beryllium, magnesium, calcium, strontium and barium, and wherein *n* has a value of 2 or 3 depending on whether M is a divalent or trivalent ion, in essentially pure monobasic form which comprises dissolving a compound supplying said metal ion M in a controlled execess of phosphoric acid to form a stoichiometrically proportioned solution, adding a precipitating agent, effective to precipitate soluble transition metal impurities other than the selected metal ion removing formed insolubles to produce an essentially pure solution, forming a crystal product from the resulting purified solution by evaporation, and washing said crystal product substantially free of phosphoric acid to yield a stoichiometrically proportioned crystalline phosphate salt.

4,049,780

PRODUCTION OF MAGNESIUM SILICATES

Barbara Susan Neumann, Redhill, England, assignor to Laporte Industries Limited, London, England

Continuation-in-part of Ser. No. 415,701, Nov. 14, 1973, abandoned. This application May 18, 1976, Ser. No. 687,499

Claims priority, application United Kingdom, Nov. 14, 1972, 52416/72

Int. Cl.² C01B *33/22, 33/24, 33/32*

U.S. Cl. 423—331 **10 Claims**

1. A process for the synthesis of a hydrous magnesium silicate having an X-ray diffraction pattern indicative of a hectorite structure and having a Bingham Yield Value of from 40 to 250 dynes/cm² and having the general formula

$$[Si_8(Mg_aLi_bH_c)O_{20}(OH)_{4-y}F_y]^{z-}ZM^+$$

wherein *a, b, c, y, z* and M have the values:

a is 4.95 to 5.7
b is from 0 to 1,05
c is from 0 to 2
a+b+c is from 4 to 8
y is from 0 to 4
$z = 12-2a-b-c$
M is Na+ or Li+

comprising the steps of:

a. forming an aqueous suspension of mangesium carbionate by dissolving a suitable water soluble magnesium compound in water, precipitating magnesium carbonate by adding to the resulting solution an aqueous solution of sodium carbonate;
b. adding to a suspension of the freshly precipitated magnesium carbonate a water soluble silicon compound;
c. precipitating silica into the suspension of freshly precipitated magnesium carbonate by recting the water soluble silicon compound with sodium carbonate;

the total time for addition in step (a) and in step (b) being at least 30 minutes,

d. adding during or after step (a) or (b) or (c) lithium or fluorine ions if required by the general formula above;
e. controlling the quantity of magnesium carbonate and silicon precipitated and the quantity of lithium or fluorine ions added to give a Si:Mg:Li:F ratio within the ranges stated in the general formula above;
f. controlling the concentrations of the reactants used in steps (a), (b) and (e) to give a suspension having a concentration of solids at least 5% by weight;
g. maintaining the solids in the wet state;
h. treating the wet solids as a suspension having a concentration of at least 5% by weight in water in the presence of an excess of sodium or lithium ions from 25 to 250% over that providing the cation M in the general formula above by heating it to cause crystal growth of the hydrous magnesium silicate of the above formula for from 1 to 20 hours at a pressure at least equal to atmospheric pressure while maintaining the presence of water in the liquid state; and
i. separating the resulting crystalline hydrous magnesium silicate.

4,049,781

METHOD OF PREPARING LOOSELY AGGREGATED 200-500 MILLIMICRON SILICA

Ellsworth George Acker, Baltimore, and Milton Edward Winyall, Columbia, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 412,359, Nov. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 156,088, June 23, 1971, abandoned. This application Sept. 10, 1975, Ser. No. 612,041

Int. Cl.² C01B *33/12*

U.S. Cl. 423—338 **6 Claims**

1. A method of producing loosely aggregated silica having an average primary particle size in the range of 200 to 500 millimicrons comprising adding an alkali metal silicate solution to an ammoniated gelling solution selected from the group consisting of an ammoniated formic acid solution, an ammoniated acetic acid solution, an ammoniated propionic acid solution and an ammoniated carbonic acid solution, said ammoniated gelling solution containing a substantial excess of ammonia and having a pH of 10 to 11, to form a slurry of said loosely aggregated silica and recovering said loosely aggregated silica.

4,049,782

PROCESS FOR PRODUCING PURE CONCENTRATED AMMONIA

Fritz Wöhler, Frankfurt am Main; Hans-Martin Stönner, Schwalbach, and Paul Wiesner, Oberursel, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 3, 1976, Ser. No. 663,233

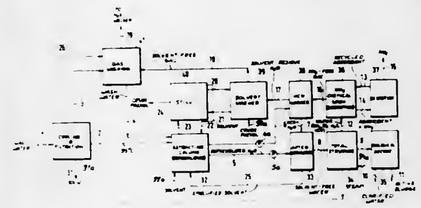
Claims priority, application Germany, Nov. 14, 1975, 2551097

Int. Cl.² C01C *1/02, 1/10;* B01D *19/00*

U.S. Cl. 423—352 **7 Claims**

1. A process for the recovery of pure concentrated ammonia from a gas water resulting from the condensation or washing of coal degasification or coal gasification gases comprising the steps of:

a. filtering said gas water;
b. extracting the filtered gas water of step (a) with di-isopropyl ether as a dephenolating solvent to produce a dephenolated water containing NH_3, HCN and traces of residual solvent and a phenol-laden solvent phase;
c. recovering solvent from phenols of said solvent phase and recycling the recovered solvent to step (b);
d. stripping the dephenolated gas water of step (b) to produce a gas phase containing CO_2, H_2S, HCN, NH_3 and residual solvent;
e. chemically washing ammonia from the gas phase of step (d) to produce a substantially ammonia-free gas phase and an ammonia-laden absorbent phase;
f. separating ammonia from said absorbent of the ammonia-



laden absorbent phase, collecting the separated ammonia product, and recycling said absorbent to step (e);
g. washing HCN from the ammonia-free gas phase of step (e) to produce a gas containing traces of residual solvent;
h. scrubbing residual solvent from the gas of step (g) with circulating phenol to produce a phenol-scrubbed gas and a solvent containing phenol;
i. distilling solvent containing phenol produced in step (h) to separate the solvent thereof from the phenol delivering the solvent to step (b) and returning the phenol to step (h); and
j. afterscrubbing the phenol-scrubbed gas of step (h) at least in part with filtered gas water from step (a).

4,049,783

METHOD OF PRODUCING POLYCRYSTALLINE DIAMONDS

Leonid Fedorovich Vereschagin, Kntuzovsky prospekt, 2/1, kv. 231; Evgeny Nikolaevich Yakovlev, ulitsa Rusakovskaya, 4, kv. 63, both of Moscow; Tatyana Dmitrievna Varfolomeeva, p/o Akademgorodok, ulitsa Shkolnaya, 6, kv. 35, Moskovskaya Oblast, Podolsky Raion; Alexandr Yakovlevich Preobrazhensky, ulitsa Profsojuznaya, 52, korpus 5, kv. 21, Moscow; Vladislav Nikolaevich Slesarev, ulitsa Televidenia, 6/2, korpus 5, kv. 21, Moscow; Vasily Alexandrovich Stepanov, ulitsa Televidenia, 6/2, korpus 2, kv. 32, Moscow, and Ljudmila Efimovna Shterenberg, ulitsa B. Dekabrskaya, 4, kv. 21, Moscow, all of U.S.S.R.

Continuation of Ser. No. 92,405, Nov. 24, 1970, abandoned. This application Jan. 2, 1973, Ser. No. 320,679

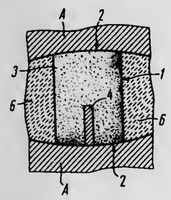
Claims priority, application U.S.S.R., Jan. 4, 1970, 1513780

Int. Cl.² C01B *31/06*

U.S. Cl. 423—446 **5 Claims**

1. A method for producing polycrystalline diamonds which comprises: filling a reaction chamber of a device for developing high pressure and high temperatures and having cooled portions with a carbon material; subjecting the carbon material in the presence of a metal catalyst to the simultaneous action of high pressures of at least 80 kbar and diamond synthesizing temperatures of at least about 1,200° C and approaching the minimum temperature of diamond synthesis with the given metal catalyst for a period of time sufficient to obtain diamond crystallization; maintaining said reaction chamber in thermal contact with said cooled portions so as to effect removal of heat developed therein in the course of diamond crystallization at a rate of not less than 25 cal/min, said metal catalyst having a cross-sectional area of not more than 0.04 of the area of

transverse section of said reaction chamber and being positioned in the carbon material substantially in the center of said



reaction chamber, so as to ensure the growth of polycrystalline fine-grain diamond sample containing mutually intergrown crystallites.

4,049,784

PRODUCTION OF CHLORINE DIOXIDE WITH PRODUCT SLURRY METATHESIS

Willard A. Fuller, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 556,379, March 7, 1975, Pat. No. 3,976,758. This application May 24, 1976, Ser. No. 689,405
The portion of the term of this patent subsequent to Aug. 24, 1993, has been disclaimed.
Int. Cl.² C01B *11/02*
U.S. Cl. 423—478 **24 Claims**

12. In a process for continuously generating a mixture containing chlorine dioxide, chlorine and sulfate wherein

a. an alkali metal chlorate, a chloride and a mineral acid selected from sulfuric acid and mixtures of sulfuric acid and a member of the group consisting of hydrochloric acid and phosphoric acid are continuously reacted in a single vessel generator-evaporator-crystallizer in proportions to generate chlorine dioxide and chorine;

b. the temperature is maintained within a range of from about 50° to about 100° centrigrade;

c. the acidity of the reaction solution is maintained within the range of from about 2 to about 5 normal;

d. the reaction solution is subjected to a vacuum of from about 100 to about 400 millimeters of mercury absolute to effect evaporation of water vapor;

e. chlorine dioxide and chlorine produced by said reaction is withdrawn in admixture with said water vapor, and the reaction is conducted in the presence of at least one catalyst selected from the group consisting of vanadium pentoxide silver ions, manganese ions, dichromate ions and arsenic ions, and

f. neutral alkali metal salt is crystallized within said single vessel generator-evaporator-crystallizer and withdrawn therefrom;

the improvement which comprises

continuously passing the slurry containing neutral alkali metal salt crystals and chlorate values produced in said single vessel generator-evaporator-crystallizer into the top of a metathesis column, in a downward flow;

countercurrently passing a stream of aqueous metathesis solution upwardly through said column at a rate and in amounts sufficient to effect reaction of said solution with said alkali metal salt, converting said alkali metal salt to the salts of the metathesis solution, continuously returning chlorate, chloride and acid values substantially completely to said single vessel generator-evaporator-crystallizer; and

continuously removing the salts of the metathesis solution slurry from the bottom of said metathesis column.

4,049,785

PRODUCTION OF CHLORINE DIOXIDE WITH PRODUCT SLURRY METATHESIS

Willard A. Fuller, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 620,452, Oct. 7, 1975, Pat. No. 3,974,266, which is a division of Ser. No. 556,379, March 7, 1975, Pat. No. 3,976,758. This application May 24, 1976, Ser. No. 689,406
The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.
Int. Cl.² C01B *11/02*
U.S. Cl. 423—478 **13 Claims**

1. In a process for continuously generating a mixture containing chlorine dioxide, chlorine and sulfate wherein

a. an alkali metal chlorate, a chloride and a mineral acid selected from sulfuric acid and mixtures of sulfuric acid and a member of the group consisting of hydrochloric acid and phosphoric acid are continuously reacted in a single vessel generator-evaporator-crystallizer in proportions to generate chlorine dioxide and chlorine;

b. the temperature is maintained within a range of from about 50° to about 100° centigrade;

c. the acidity of the reaction solution is maintained within the range of from about 4 to about 12 normal;

d. the reaction solution is subjected to a vacuum of from about 100 to about 400 millimeters of mercury absolute to effect evaporation of water vapor;

e. chlorine dioxide and chlorine produced by said reaction is withdrawn in admixture with said water vapor, and

f. alkali metal salt is crystallized within said single vessel generator-evaporator-crystallizer and withdrawn therefrom;

the improvement which comprises

continuously passing the slurry containing alkali metal salt crystals and chlorate values produced in said single vessel generator-evaporator-crystallizer into the top of a metathesis column, in a downward flow;

countercurrently passing a stream of aqueous metathesis solution upwardly through said column at a rate and in amounts sufficient to effect reaction of said solution with said alkali metal salt, converting said alkali metal salt to the salts of the metathesis solution, continuously returning chlorate, chloride and acid values substantially completely to said single vessel generator-evaporator-crystallizer; and

continuously removing the salts of the metathesis solution slurry from the bottom of said metathesis column.

4,049,786

PROCESS OF PREPARING PEROXYMONOSULFATE

John S. Chiang, Mercerville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Sept. 13, 1976, Ser. No. 723,188
Int. Cl.² C01B *15/08*
U.S. Cl. 423—513 **3 Claims**

1. A method of preparing a peroxymonosulfate by rapid hydrolysis of a peroxydisulfate with concentrated sulfuric acid, wherein active oxygen losses during said hydrolysis are suppressed, comprising the steps:

a. providing a solution of a soluble peroxydisulfate at a temperature of about 100° F;

b. mixing the peroxydisulfate solution of step (a) with concentrated sulfuric acid in a volume ratio of peroxydisulfate solution to concentrated sulfuric acid of 1 to 0.07 to 1 to 0.15, whereby the heat of solvation of the sulfuric acid initiates the hydrolysis reaction and produces a solution temperature between about 140° to 160° F;

c. maintaining said solution temperature of 140° to 160° F for about 5 to 45 minutes; and

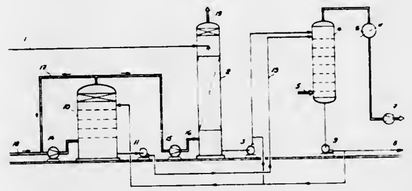
d. rapidly cooling the reaction to about room temperature.

4,049,787

PROCESS FOR SEPARATING SULPHUR IN THE FORM OF HYDROGEN SULPHIDE FROM CLARIFIED GREEN LIQUOR OBTAINED FROM THE COMBUSTION OF WASTE LIQUOR

Hakan Wilhelm Romantschuk, and Tuomo Juhani Vuojolainen, both of Tampere, Finland, assignors to Oy Tampella AB, Finland

Filed Oct. 16, 1974, Ser. No. 515,424
Claims priority, application Finland, Nov. 28, 1973, 733671
Int. Cl.² C01B *17/16*
U.S. Cl. 423—563 **1 Claim**



1. In a process for separating sulphur in the form of hydrogen sulphide from clarified green liquor obtained from the combustion of waste liquor, including the steps of precarbonating green liquor with a carbon dioxide rich gas, adding alkali bicarbonate to said precarbonated green liquor, stripping hydrogen sulphide therefrom producing simultaneously alkali carbonate, and preparing alkali bicarbonate to be used in the process by carbonating said alkali carbonate, the improvement comprising carrying out said hydrogen sulphide stripping step producing simultaneously alkali carbonate directly in the solution in said stripping step without crystallizing said simultaneously produced alkali carbonate, preparing said alkali bicarbonate to be used in the process partly from said alkali carbonate solution and partly from alkali carbonate — alkali sulphide solution obtained in said pre-carbonation step, feeding at least a portion of said alkali carbonate — alkali sulphide solution through said carbonation step to said hydrogen sulphide stripping step, introducing said carbon dioxide rich gas first into said carbonation step and thereafter passing a portion of the gas escaping from said carbonation step back to said carbonation step, and passing another portion into said precarbonation step, and thereafter removing said gas from the process.

4,049,788

THERMAL TRANSFORMATION OF METAL CHLORIDES TO OXIDES IN A FLUIDIZED BED

Herbert Bierbach; Heinz Dittmar; Ernst Heinz, all of Frankfurt am Main; Klaus Hohmann, Neuenhain, and Rolf Reinhack, Schwalbach, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 392,995, Aug. 30, 1973, abandoned. This application Oct. 17, 1975, Ser. No. 623,248
Claims priority, application Germany, Dec. 14, 1972, 2261083
Int. Cl.² C01G *49/02, 53/04, 1/02*
U.S. Cl. 423—592 **2 Claims**

1. A process for the thermal conversion of a metal chloride to a metal oxide comprising the steps of:

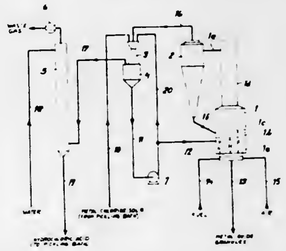
forming a fluidized bed of particles of said metal oxide having height minimum oxygen-containing of 350 mm in a nonfluidized state of the bed within a fluidized-bed chamber;

fluidizing said bed by introducing at the bottom of said chamber of free oxygen-containing fluidizing gas at a velocity so that reaction gases are obtained having a velocity W_G, determined by the relationship $0.34\rho^{0.9} \leqq W_G \leqq 0.56\rho^{0.9}$ where ρ is the density of the metal oxide in g/cm³, and W_G is the velocity in meters/second measured in the empty reactor, the reaction gases being the resulting gases produced by combustion of the fuel with the fluidizing free-oxygen-containing gas, gases produced by evaporation of water or thermal release of water from a feed containing the metal chloride, and gases produced by chemical reaction with the metal chloride;

maintaining said fluidized bed at the height upon fluidization thereof such that the pressure drop across said bed is between 1200 and 2400 mm (water column);

introducing said metal chloride in solution into said bed at a location at least 250 mm above the entrance of the fluidizing gas and below the top of the fluidized bed;

maintaining the fluidized bed at a temperature between the thermal reaction temperature of the metal chloride for formation of the metal oxide and the temperature at which the metal oxide particles sinter together, said metal oxide being selected from the group which consists of iron oxide and nickel oxide, said metal chloride being selected from the group which consists of iron chloride and nickel chloride, said bed having a height in a nonfluidized state of



substantially 350 to 750 mm for the iron; oxide and 350 to 650 mm for the nickel oxide and said temperature ranging between substantially 800° C and 1100° C.;

recovering from said bed an effluent gas containing hydrogen chloride and metal oxide particles;

separating metal oxide particles from said effluent gas in a cyclone and returning the metal oxide particles separated from said effluent gas in the cyclone to said bed below the top of the fluidizing bed; scrubbing the effluent gas flowing separation of oxide particles therefrom in said cyclone, in a venturi scrubber with a liquor containing metal chloride in solution thereby concentrating the metal chloride in said liquor and entraining residual metal oxide particles from said effluent gas, said liquor being fed to said bed from said scrubber; and substantially continuously withdrawing metal oxide granules from said bed at said bottom of said chamber at a rate sufficient to maintain the top of said bed at a constant level, said metal chloride in solution being continuously introduced into said bed.

4,049,789

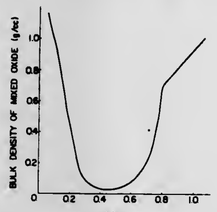
PROCESS FOR PREPARATION OF MIXED OXIDE POWDERS

Toshikatsu Manabe, Ohme; Masao Obta, Kure; Tetsuichi Kudo, Tokyo; Shouji Mochizuki, Hachioji, and Tetsuo Gejyo, Tokyo, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi K.K., both of Tokyo, Japan

Filed June 20, 1975, Ser. No. 588,901
Claims priority, application Japan, July 10, 1974, 49-78314
Int. Cl.² C01G *49/00*; C01F *17/00*; C01G *23/00*
U.S. Cl. 423—593 **5 Claims**

1. A process for the preparation of complex oxide powder having a high specific surface area and a low bulk density which comprises the steps of preparing an aqueous solution of salts of the metallic elements of said complex oxide and nitric acid, said complex oxide being at least one member selected from the group consisting of complex oxides with perovskite crystal structure and complex oxides with K_2MgF_4 crystal

structure, wherein said solution contains said metallic elements in the proportion of the constituent metallic elements of said complex oxide, at least one of said salts being an organic acid salt and said nitric acid being present in said solution in such an amount that a ratio b/a is within a range of from 0.2 to 0.8, wherein a stands for the minimum molar amount of nitric acid



necessary for completely substituting for the organic acid of said organic acid salt and b stands for the molar amount of nitric acid actually added, heating said aqueous solution substantially to dryness to decompose said salts and heating the resulting decomposition product to form the intended complex oxide powder having a uniform composition.

4,049,790

LAYERED MANGANESE COMPOUND OF THE FORMULA $CA_2MN_3O_8$

Harold S. Horowitz, Clark, and John M. Longo, New Providence, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed June 3, 1976, Ser. No. 692,595
Int. Cl.² C01G *45/12*
U.S. Cl. 423—599 **2 Claims**

1. A pure, single phase compound having a monoclinic structure and the approximate parameters $a = 11.01$ A, $b = 5.84$ A, $c = 4.95$ A, $\alpha = 90°$, $\beta = 109.80°$, $\gamma = 90°$ of the formula $Ca_2Mn_3O_8$.

4,049,791

PROLONGED ACTING APPETITE SUPPRESSANT AND ANTI-OBESITY COMPOSITIONS CONTAINING AMPHETAMINE ADIPATE, DEXTROAMPHETAMINE ADIPATE, AMPHETAMINE SULFATE AND DEXTROAMPHETAMINE SULFATE AS THE ACTIVE AGENTS

Louis Cohen, Yonkers, N.Y., assignor to Delco Chemical Company, Inc., Mount Vernon, N.Y.

Continuation-in-part of Ser. No. 481,671, June 21, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,526
Int. Cl.² A61K *9/52;, 9/54, 31/135*
U.S. Cl. 424—20 **11 Claims**

1. The composition in which each dosage unit consists of, per 5 mg of active agent, a synergistic combination of:

d,l-amphetamine adipate	1.25 mg
dextroamphetamine adipate	1.25 mg
amphetamine sulfate	1.25 mg
dextroamphetamine sulfate	1.25 mg.

4,049,792

ANTIPERSPIRANT STICK

Walter Hugh Elsnau, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 373,820, June 26, 1973, abandoned. This application Nov. 14, 1975, Ser. No. 632,128
Int. Cl.² A61K *7/34*
U.S. Cl. 424—66 **7 Claims**

1. A stick antiperspirant composition essentially anhydrous and comprising essentially water-insoluble materials and a water-soluble antiperspirant salt, said composition comprising

A. from about 1% to about 20% of a high melting point water-insoluble wax which has a melting point of from about 150° F. to about 215° F and which is selected from the group consisting of beeswax, spermaceti, carnauba, bayberry, candelilla, montan, ozokerite, ceresin, paraffin, synthetic wax and microcrystalline wax;

B. from about 20% to about 50% of a liquid, non-toxic, non-irritating organic emollient compound having a water-solubility of from about 0.0005% to about 1% at 72° F.; and

C. from about 30% to about 60% of a compound having antiperspirant activity selected from the group consisting of

i. aluminium chlorhydroxide,

ii. aluminium hydroxybromide,

iii. mixtures of aluminum chlorhydroxide and aluminium chloride, and

iv. antiperspirant complexes formed by

a. co-dissolving in water

1. one part $Al_2(OH)_{6-m}X_m$, wherein X is an anion selected from the group consisting of chloride, bromide and iodide and m is a number from about 0.8 to about 1.2;

2. n parts ZrY wherein Y is an anion selected from the group consisting of —O(OH)Cl and OCl_2, and where n has a value of from about 0.16 to about 1.2;

3. p parts neutral amino acid selected from the group consisting of glycine, dl-tryptophane, dl-β-phenylalanine, dl-valine, dl-methionine and β-alanine, and where p has a value of from about 0.06 to about 0.53; and

b. co-drying the resultant mixture at a temperature of from about 100° C. to about 230° C. to a moisture level of from about 0.5% to about 15% by weight, said compound being in impalpable powder form.

4,049,793

PREPARATIONS FOR LOCAL TREATMENT OF ACNE VULGARIS

Helmut Stickl, Starenweg 6, 8033 Krailling, near Munich, Germany

Filed Mar. 10, 1976, Ser. No. 665,717
Claims priority, application Germany, Mar. 14, 1975, 2511258
Int. Cl.² A61K *35/00, 39/40, 39/00, 39/02*
U.S. Cl. 424—115 **11 Claims**

1. A preparation for the local treatment of acne vulgaris comprising, in combination with a suitable vehicle, about 20-40% by weight of an active substance obtained by:

a. growing Coryne bacteria acnes in a liquid growth medium under anaerobic conditions at pH 5.5 to 6.0 with incubation at 35° C for up to 9–16 days until the multiplication peak has passed,

b. separating acne inhibitor acnecine discharged by the growth of said bacteria into said growth medium as an acnecine-containing liquid from said bacteria and other accompanying substances in said growth medium, and

c. concentrating said acnecine-containing liquid into an acnecine concentrate comprising said active substance.

4,049,794

TREATMENT OF INFECTIONS IN ANIMALS

Otto-Christian Straub, Tuebingen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 482,619, June 24, 1974, which is a division of Ser. No. 313,245, Dec. 8, 1972, abandoned. This application Mar. 5, 1976, Ser. No. 664,070
Int. Cl.² A61K *31/00, 45/02, 39/28*
U.S. Cl. 424—167 **5 Claims**

1. A method for prophylaxis and treatment of respiratory and genital infections in animals which comprises administering to the animals an attenuated virus capable of stimulating the natural defense mechanism of a host animal with a detectable non-specific induction of interferon without antigenic effect, wherein said attenuated virus is produced by passing a virus through a plurality of at least 300 tissue cultures to achieve a degree of attenuation such that antigenic effect cannot be detected in the presence of a detectable non-specific induction of interferon in said host animal, and wherein said virus is AUJESZKY/psuedo-rabies virus, AUJESZKY/psueudo-rabies virus—strain S/T, Influenza virus Al, Influenza virus Al—strain FM1 or IPV virus.

4,049,795

TREATMENT OF HEMORRHAGIC SHOCK

Henri Laborit, Paris, France, assignor to Centre d'Etudes Experimentales et Cliniques de Physio Biologie de Pharmacologie et d'Eutonologie, Paris, France

Continuation-in-part of Ser. No. 143,568, May 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 19,532, March 18, 1970, abandoned, which is a continuation of Ser. No. 670,186, Sept. 25, 1967, abandoned. This application May 13, 1974, Ser. No. 469,315
Int. Cl.² A61K *31/70, 31/12*
U.S. Cl. 424—180 **9 Claims**

1. A method of treating shock in humans to reverse the same and elevate blood pressure which comprises intravenously administering to a patient in need thereof a therapeutically effective amount of a pharmaceutically acceptable injectable solution containing from about 200 to 1600 mg of dihydroxyacetone per 100 cc of a pharmaceutically acceptable hypertonic glucose solutions diluent.

4,049,796

AMINO GLYCOSIDE ANTIBIOTICS HAVING ANTIBACTERIAL ACTIVITY

David J. Cooper, Downingtown, Pa.; Jay Allan Waitz, Fairfield, N.J.; Mae Counelis, New York, N.Y., and Jay Weinstein, Bloomfield, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 389,774, Aug. 20, 1973, Pat. No. 3,915,955, which is a continuation-in-part of Ser. No. 48,017, June 22, 1970, abandoned. This application Oct. 1, 1975, Ser. No. 618,647
Int. Cl.² A61K *31/70*
U.S. Cl. 424—180 **5 Claims**

1. A method of treating a bacterial infection which comprises administering to an animal having said infection an antibacterially effective quantity of a member selected from the group consisting of gentamicin B, gentamicin B_1, gentamicin X, a non-toxic pharmaceutically acceptable acid addition salt, and a mixture thereof.

4,049,797

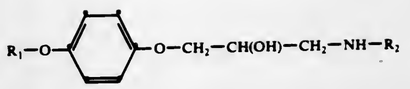
COMPOSITION AND METHOD FOR TREATMENT OF HEART AND CIRCULATORY AILMENTS

Knut A. Jaeggi, Basel; Herbert Schröter, Fullinsdorf, and Franz Ostermayer, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 546,648, Feb. 3, 1975, Pat. No. 3,978,041, which is a continuation-in-part of Ser. No. 421,558, Dec. 4, 1973, abandoned. This application Mar. 22, 1976, Ser. No. 669,078
Int. Cl.² A61K *31/70*
U.S. Cl. 424—180 **4 Claims**

1. A pharmaceutical composition useful as positively inotropic agent in the treatment of insufficiency of the cardiac muscle, comprising a corresponding therapeutically effective amount of a sugar compound of the formula I

(I)



wherein R_1 represents 1-glucopyranosidyl, 2,3,4,6-tetra-O-alkanoylated 1-glucopyranosidyl, the alkanoyl radical of which having up to four carbon atoms, or 2,4-O,O-alkylidene substituted 1-glucopyranosidyl, the alkylidene radical of which having up to four carbon atoms, or 2,4-O-benzylidene substituted 1-glucopyranosidyl, R_2 is isopropyl, tert.-butyl, α-methyl-phenethyl or 1-methyl-3-phenyl-propyl, or a pharmaceutically acceptable salt thereof, together with a pharmaceutically usable excipient.

4,049,798

METHOD FOR THE TREATMENT OF HERPES SIMPLEX

William K. Bottomley, Potomac, Md., assignor to William K. Bottomley, Potomac, Md.; O. J. Brightwell, Sacramento, Calif. and Thomas J. Newell, III, Bethesda, Md.

Continuation of Ser. No. 531,459, Dec. 11, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,742
Int. Cl.² A61K *35/78, 31/365*
U.S. Cl. 424—195 **7 Claims**

1. A method for the treatment of recurrent herpes simplex labialis which comprises administering to a patient suffering therefrom a therapeutically effective amount of a mixture comprising (a) about 50 weight percent L-ascorbic acid and (b) about 50 weight percent citrus bio-flavonoids.

4,049,799

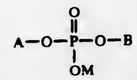
METHOD, COMPOSITION AND COMPOUNDS FOR TREATING EXCESS PROSTAGLANDINS

Bertil Högberg; Hans Fex; Toirsten Perkiev; Sten Veige, all of Helsingborg, and Bo Fredholm, Nyhamnslage, all of Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden,

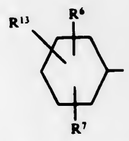
Division of Ser. No. 519,542, Oct. 31, 1974, which is a division of Ser. No. 280,276, Aug. 14, 1972, Pat. No. 3,851,019. This application Aug. 20, 1976, Ser. No. 716,198
Claims priority, application United Kingdom, Aug. 17, 1971, 38579/71; Aug. 17, 1971, 38580/71; Jan. 31, 1972, 4508/72; Jan. 31, 1972, 4509/72
Int. Cl.² C07F *9/09;* A01N *9/36*
U.S. Cl. 424—211 **15 Claims**

1. A novel secondary phosphoric acid ester compound having the general formula

(I)

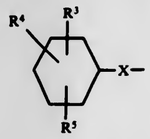


wherein M is selected from the group consisting of hydrogen; and a pharmaceutically acceptable inorganic and organic cations; and wherein A is



wherein one and only one of the substituents R^6, R^7, and R^{13} always represents a group R, located in any of the ortho, meta

and para positions relative to the phosphoric acid ester group, the group R having the formula

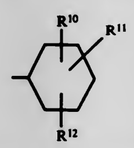


wherein X is selected from the group consisting of:





wherein *q* is selected from the group consisting of zero and one; and wherein Z is selected from the group consisting of: straight saturated hydrocarbon chains having at most 3 carbon atoms; and straight hydrocarbon chains having 2 and 3 carbon atoms and containing one double bond; Z above may be substituted by one substituent selected from the group consisting of: lower alkyl; lower alkenyl; cyclopentyl; cyclohexyl; phenyl; phenyl substituted in m- or p-position by one substituent selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; benzyl; benzyl substituted in m- or p-position by one substituent selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; benzylidene; benzylidene substituted in m- or p-position by one substituent selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; wherein B in the general formula (I) above is selected from the group consisting of: alkyl; having one to eight carbon atoms, inclusive, being at most di-substituted; cycloalkyl, namely cyclopentyl and cyclohexyl, being at most di-substituted; 1- and 2-naphthyl, both naphthyls being at most di-substituted; 2-, 3- and 4-biphenylyl, any biphenylyl being at most di-substituted; and



wherein the substituents in B, when B is alkyl, having one to eight carbon atoms, inclusive; cycloalkyl; naphthyl; or biphenylyl, are selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; wherein R^3, R^4, R^5, R^6, R^7, R^{10}, R^{11}, R^{12}, and R^{13} above are selected from the group consisting of: hydrogen; lower alkyl; lower alkenyl; lower alkoxy; hydroxy; —O—CO—R^{14}; —F; —Cl; —Br; —CF_3; —CO—R^{14}; -NR_2^8; and —$CH_2NH_2^8$; where R^8 is selected from the group consisting of hydrogen and lower alkyl; and where R^{14} is lower alkyl, with the proviso that one of the substituents R^3, R^4, R^5, R^6, R^7, R^{13} and one of the substituents R^{10}, R^{11}, and R^{12} is selected from the group consisting of —NR_2^8, and —$CH_2NR_2^8$; R^8 having the meaning given above; at least one of the substituents R^3, R^4, R^5, r^6, R^7, R^{13}, R^{10}, R^{11}, and R^{12} being selected from the said latter group.

2. A method of treating a living animal body suffering from the actions of an excessive formation and release of endogenous prostaglandin or exposure to exogenous prostaglandin, comprising administration of a therapeutically-effective amount of a compound of claim 1 to said animal body.

4,049,800

METHOD, COMPOSITION AND COMPOUNDS FOR TREATING EXCESS PROSTAGLANDINS

Bertil Högberg; Hans Fex; Torsten Perklev; Sten Veige, all of Helsingborg, and Bo Fredholm, Nyhamnslage, all of Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

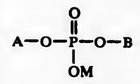
Division of Ser. No. 519,542, Oct. 31, 1974, which is a division of Ser. No. 280,276, Aug. 14, 1972, Pat. No. 3,851,019. This application Aug. 20, 1976, Ser. No. 716,197

Claims priority, application United Kingdom, Aug. 17, 1971, 38579/71; Aug. 17, 1971, 38580/71; Jan. 31, 1972, 4508/72; Jan. 31, 1972, 4509/72

Int. Cl.² C07F 9/09; A01N 9/36

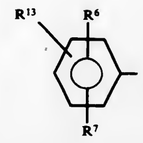
U.S. Cl. 424—211 **16 Claims**

1. A novel secondary phosphoric acid ester compound having the general formula

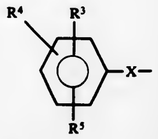


(I)

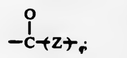
wherein M is selected from the group consisting of hydrogen; and a pharmaceutically acceptable inorganic and organic cations; and wherein A is

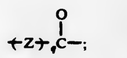


wherein one and only one of the substituents R^6, R^7, and R^{13} always represents a group R, located in any of the ortho, meta and para positions relative to the phosphoric acid ester group, the group R having the formula



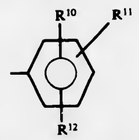
wherein X is selected from the group consisting of:





wherein *q* is selected from the group consisting of zero and one; and wherein Z is selected from the group consisting of: straight saturated hydrocarbon chains having at most 3 carbon atoms; and straight hydrocarbon chains having 2 and 3 carbon atoms and containing one double bond; Z above may be substituted by one substituent selected from the group consisting of: lower alkyl; lower alkenyl; cyclopentyl; cyclohexyl; phenyl; phenyl substituted in m- or p-position by one substituent selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; benzyl; benzyl substituted in m- or p-position by one substituent selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; benzylidene; benzylidene substituted in m- or p-position by one

substituent selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; wherein B in the general formula (I) above is selected from the group consisting of: alkyl; having one to eight carbon atoms, inclusive, being at most di-substituted; cycloalkyl, namely cyclopentyl and cyclohexyl, being at most di-substituted; 1- and 2-naphthyl, both naphthyls being at most di-substituted; 2-, 3- and 4-biphenylyl, any biphenylyl being at most di-substituted; and



wherein the substituents in B, when B is alkyl, having one to eight carbon atoms, inclusive; cycloalkyl; naphthyl; or biphenylyl, are selected from the group consisting of lower alkyl, lower alkoxy, —F, —Cl, —Br, and —CF_3; wherein R^3, R^4, R^5, R^6, R^7, R^{10}, R^{11}, R^{12}, and R^{13} above are selected from the group consisting of: hydrogen; lower alkyl; lower alkenyl; lower alkoxy; hydroxy; —O—CO—R^{14}; —F; —Cl; —Br; —CF_3; —CO—R^{14}; —$CONR_2^8$; —$CH_2CONR_2^8$; —$OCH_2CONR_2^8$; —NR^5—CO—R^{14}; and —CH_2NR^8—CO—R^{14}; where R^8 is selected from the group consisting of hydrogen and lower alkyl; and where R^{14} is lower alkyl, with the proviso that one of the substituents R^3, R^4, R^5, R^6, R^7, R^{13} and one of the substituents R^{10}, R^{11}, and R^{12} is selected from the group consisting of —$CONR_2^8$; —$CH_2CONR_2^8$; —$OCH_2CONR_2^8$; —NR^8—CO—R^{14}; and —CH_2NR^8—CO—R^{14}; R^8, and R^{14} having the meaning given above; at least one of the substituents R^3, R^4, R^5, R^6, R^7, R^{13}, R^{10}, R^{11}, and R^{12} being selected from the said latter group.

2. A method of treating a living animal body suffering from the actions of an excessive formation and release of endogenous prostaglandin or exposure to exogenous prostaglandin, comprising administration of a therapeutically-effective amount of a compound of claim 1 to said animal body.

4,049,801

PHOSPHITE COMPOUNDS AS FUNGICIDAL AGENTS

Jean-Claude Debourge, Lyon; Jean-Michel Gaulliard, Orlienas; Jean Pierre Thiolliere, Lyon; Jean Georges Abblard, Caluire; Guy-Bernard Lacroix, Lyon; Daniel Jean Pillon, Lyon; Jacques Joseph Ducret, Lyon, and Andre Thizy, Lyon, all of France, assignors to Philagro, France

Division of Ser. No. 432,492, Jan. 11, 1974, Pat. No. 3,968,208. This application Sept. 16, 1975, Ser. No. 613,877

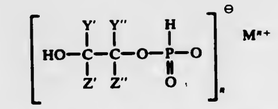
Claims priority, application France, Jan. 12, 1973, 73.01803; Oct. 19, 1973, 73.37994

Int. Cl.² A01N 9/36

U.S. Cl. 424—217 **10 Claims**

1. A fungicidal composition for controlling fungus disease in plants containing a fungicidally effective amount of at least one compound corresponding to the formula;

(II)



in which Y', Y'', Z' and Z'' are the same or different and are selected from the group consisting of hydrogen, alkyl of from 1 to 5 carbon atoms an halogenated alkyl of from 1 to 5 carbon atoms; and M is selected from the group consisting of hydrogen, alkali, alkaline earth metal, iron, copper, zinc, manganese, nickel, cobalt, mercury, ammonium, ethanolammonium, dimethylammonium; diethylammonium and diisopropylammonium; and n is an integer equal to the valency of M; in an agriculturally acceptable carrier.

4,049,802

ZINC SULFADIAZINE AND ITS USE IN THE TREATMENT OF BURNS

Charles L. Fox, Jr., New York, N.Y., assignor to Research Corporation, New York, N.Y.

Filed Mar. 19, 1975, Ser. No. 560,103

Int. Cl.² A61K 31/625; C07D 239/44

U.S. Cl. 424—229 **18 Claims**

1. A composition useful for treating burns consisting essentially of an admixture of silver sulfadiazine and zinc sulfadiazine dispersed as finely divided particles in a water-dispersible hydrophilic carrier, said admixture being present in said composition in an amount to about 10% by weight of said composition and said silver sulfadiazine and said zinc sulfadiazine being present in said composition in an amount of at least 0.1% by weight and 1.0% by weight, respectively, based on said composition.

18. Zinc sulfadiazine.

4,049,803

AUGMENTATION OF BLOOD LEVELS OF ASPIRIN

Val F. Cotty, Westfield; Francis J. Sterbenz, Somerset, and Kenneth J. Melman, Mountainside, all of N.J., assignors to Bristol-Myers Company, New York, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,307

Int. Cl.² A61K 31/615

U.S. Cl. 424—233 **13 Claims**

1. As a composition of matter, a dose of a mixture containing about 10 grains of acetaminophen and about 10 grains of acetylsalicylic acid, said dose being in the form of a powder, solution, slurry or one or more tablets and being adapted for substantially concurrent release of both of said acetaminophen and said acetylsalicylic acid to the body.

4,049,804

NOVEL PREGNANOIC ACID DERIVATIVES

Henry Laurent; Klaus Annen; Rudolf Wiechert, and Helmut Hofmeister, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

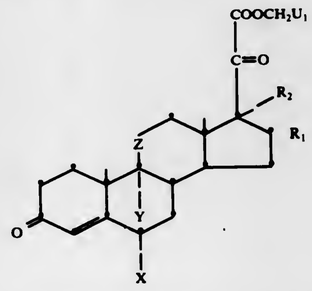
Filed Mar. 19, 1976, Ser. No. 668,394

Claims priority, application Germany, Mar. 21, 1975, 2513558; Mar. 21, 1975, 2513555; Mar. 21, 1975, 2513557; Mar. 21, 1975, 2513556

Int. Cl.² A61K 31/56; C07J 21/00

U.S. Cl. 424—242 **81 Claims**

1. A pregnanoic acid compound of the formula



wherein – – – is a single bond or a double bond; X is hydrogen, fluorine or methyl; Y is hydrogen, fluorine or chlorine; Z is β-hydroxymethylene, β-alkanoyloxymethylene of 1–8 carbon atoms in the alkanoyl, β-fluoromethylene, β-chloromethylene, carbonyl or methylene; R_1 is hydrogen, methyl in the α- or

β-position or methylene and R_2 is hydrogen, hydroxy, alkanoyloxy of 1–8 carbon atoms or benzoyloxy or R_1 and R_2 collectively are alkylidenedioxy of up to 6 carbon atoms; and U_1 is halogen, halogenated alkyl of 1–5 carbon atoms or halogenated phenyl with the provision that when R_2 is hydrogen, U_1 is halogenated phenyl.

71. A topically-effective anti-inflammatory pharmaceutical preparation comprising a compound of claim 1, in admixture with a pharmaceutically acceptable carrier.

4,049,805

STEROIDAL ERYTHROPOIETIC AGENTS AND THERAPEUTIC COMPOSITIONS AND METHODS

Henry A. Strade, Montville, N.J., assignor to Akzona Incorporated, Asheville, N.C.

Continuation-in-part of Ser. No. 618,176, Sept. 30, 1975, Pat. No. 4,004,005. This application June 4, 1976, Ser. No. 693,249
The portion of the term of this patent subsequent to Jan. 18, 1994, has been disclaimed.
Int. Cl.² A61K 31/565
U.S. Cl. 424—243 7 Claims

1. Method for the stimulation of erythropoiesis in humans and other warm-blooded animals in need of such therapy which acomprises administering an amount effective to produce such stimulation of a compound selected from the group consisting of 3β-hydroxy-5β-estrane-17-one, and the 3-esters thereof of inorganic acids and of organic carboxylic acids having 3 to 18 carbon atoms, and the 3-ethers thereof in which the ether group is selected from the group consisting of methoxy, ethoxy, propoxy, benzyloxy and phenylethoxy.

4,049,806

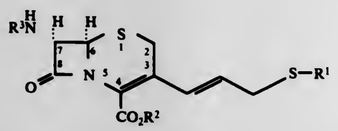
CEPHALOSPORIN TYPE ANTIBACTERIALS

Philip J. Beeby, Melbourne, Australia, assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Aug. 15, 1975, Ser. No. 605,109
Int. Cl.² C07D 501/24
U.S. Cl. 424—246 39 Claims

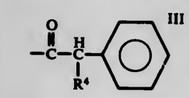
1. A compound selected from the group having the formula:

I



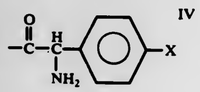
wherein the propenyl double bond is trans; R^1 is 1-methyltetrazol-5-yl; or 1,2,4-triazol-5-yl; R^2 is hydrogen, diphenylmethyl, p-methoxybenzyl, p-nitrobenzyl, o-nitrobenzyl, benzyl, t-butyl, 2,2,2,-trichloroethyl, phenacyl or pivaloyloxymethyl; R^3 is hydrogen or a group having the formulas:

III



and

IV



wherein R^4 is hydrogen, hydroxy, sulfo or carboxy; X is hydrogen or hydroxy; and pharmaceutically acceptable salts of the above compounds wherein R^3 is other than H.

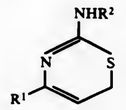
4,049,807

2-AMINO-1,3-THIAZINES THEIR USE AND PREPARATION

Wilfried Paulus, Krefeld; Hans Scheinpflug, Leverkusen, and Hermann Genth, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 28, 1975, Ser. No. 581,526
Claims priority, application Germany, June 1, 1974, 2426653
Int. Cl.² C07D 279/06; A01N 9/12
U.S. Cl. 424—246 33 Claims

1. A 2-amino-1,3-thiazine of the formula



wherein

R^1 is optionally substituted phenyl, naphthyl, thienyl, pyridyl or thiazolyl, and

R^2 is hydrogen, alkyl or alkenyl with up to 18 carbon atoms, or optionally substituted phenyl, naphthyl, thienyl, pyridyl or thiazolyl,

the optional substituents for R^1 and R^2 constituting up to three radicals selected from the group consisting of halogen, nitro hydroxy, or alkyl, halogeno-alkyl or alkoxy with up to 12 carbon atoms.

21. A method for combatting fungi or bacteria which comprises applying to such fungi, bacteria or a habitat thereof a fungicidally or bactericidally effective amount of a thiazine according to claim 1.

4,049,808

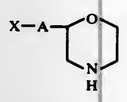
2-PHENYL ETHYL MORPHOLINE COMPOUNDS

Bernard Joseph McLoughlin, and Allen John Guildford, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 567,011, April 10, 1975, Pat. No. 4,010,266.
This application Oct. 22, 1976, Ser. No. 735,124
Claims priority, application United Kingdom, May 7, 1974, 20013/74
Int. Cl.² C07D 265/30; A61K 31/535
U.S. Cl. 424—248.4 8 Claims

1. A morpholine derivative of the formula:

I



wherein A stands for an ethylene ($—CH_2CH_2—$) radical and X stands for a phenyl radical, unsubstituted or substituted by one or two substituents selected from the group consisting of halogen atoms, alkyl and alkoxy radicals of 1 to 6 carbon atoms and phenoxy, unsubstituted or substituted by one or two substituents selected from halogen atoms and alkyl radicals of 1 to 4 carbon atoms; and the pharmaceutically-acceptable acid-addition salts thereof.

8. A method of restoring to normal an abnormal mental state in a warm-blooded animal by sedation which comprises administering thereto an effective amount of a compound of claim 1.

4,049,809

SOLUTION OF A OXAZEPINE FOR ORAL OR PARENTERAL ADMINISTRATION

Bruce Edwin Haeger, Highland Mills; James Elwood Krueger; James Alfred Lowery, both of New City, and Lawrence Ritter, Suffern, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 24, 1976, Ser. No. 734,682
Int. Cl.² A61K 31/495
U.S. Cl. 424—250 8 Claims

1. A solubilized and stabilized solution comprising 2-chloro-11-(4-methyl-1-piperazinyl)-dibenz[b,f][1,4]oxazepine, or a pharmaceutically acceptable acid-addition salt thereof, in about 50% to about 80% v/v aqueous solution of propylene glycol having a pH of from about 5.0 to about 7.0.

4,049,810

COCCIDIOSTATS

Herbert Louis Wehrmeister, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Division of Ser. No. 602,602, Aug. 6, 1975, Pat. No. 4,006,148.
This application May 24, 1976, Ser. No. 689,401
Int. Cl.² A61K 31/47
U.S. Cl. 424—258 12 Claims

1. A method for preventing and/or treating coccidiosis in poultry by administering to the poultry at a concentration of 200 g/ton of feed, 2,5-dichloroquinoline or 2,7-dichloro-3-phenylquinoline.

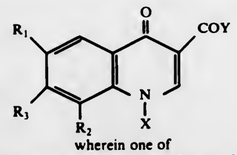
4,049,811

COMPOSITIONS USING CYCLOALKANO-QUINOLONE DERIVATIVES AND THEIR METHOD OF USE

Herbert Berger, Mannheim-Kafertal; Alfred Rhomberg, Mannheim-Neuostheim; Kurt Stach, Mannheim-Waldhof; Wolfgang Vomel, Mannheim, and Winfriede Sauer, Mannheim-Wallstadt, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Division of Ser. No. 504,589, Sept. 9, 1974, Pat. No. 3,966,743, which is a continuation-in-part of Ser. No. 363,211, May 23, 1973, abandoned, Ser. No. 363,235, May 23, 1973, abandoned, and Ser. No. 326,203, Jan. 24, 1973, abandoned, said Ser. No. 363,211, is a continuation of Ser. No. 98,957, Dec. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 843,182, July 18, 1969, abandoned, said Ser. No. 363,235, is a continuation of Ser. No. 119,035, Feb. 25, 1971, abandoned. This application Apr. 12, 1976, Ser. No. 676,269
Claims priority, application Germany, July 23, 1968, 1770951; Mar. 14, 1969, 1912944; Mar. 13, 1970, 2011885; May 25, 1970, 2025363; Sept. 4, 1970, 2043817; Feb. 19, 1972, 2207856
Int. Cl.² A61K 31/47
U.S. Cl. 424—258 39 Claims

1. An anit-bacterial composition comprising a pharmacologically acceptable carrier and, as an active anti-bacterial ingredient, a cycloalkano-quinolone compound having the formula:



wherein one of

R_1 and R_2 represents a member selected from the group consisting of hydrogen, halogen, nitro, amino and lower alkanoyl amino, and the other of R_1 and R_2 taken together with R_3 forms an alkylene bridge containing 3 to 5 carbon atoms,

X is hydrogen or lower alkyl of up to 6 carbon atoms, which may be substituted by a member of the group consisting of halogen, hydroxyl, lower alkanoyloxy, lower alkoxy, phenoxy, benzyloxy, mercapto, lower alkylmercapto, lower carbocyclic arylsulfonyloxy, and lower alkylsulfonyloxy, or X is unsubstituted lower alkenyl including alkadienyl, or lower alkynyl, and

Y is a member selected from the group consisting of hydroxyl and lower alkoxy;

and the non-toxic salts thereof.

4. A method for treating infections of the urinary tract comprising administering to a mammal having such an infection a anti-bacterially effective amount of a composition as claimed in claim 1.

4,049,812

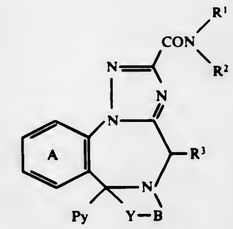
BENZODIAZEPINE CARBOXAMIDES AND PHARMACEUTICAL COMPOSITIONS WITH CENTRAL NERVOUS SYSTEM ACTIVITY

Yutaka Kuwada; Hideaki Natsugari, and Kanji Meguro, all of Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 30, 1975, Ser. No. 572,943
Claims priority, application Japan, May 7, 1974, 49-51033
Int. Cl.² A61K 31/44; C07D 223/16
U.S. Cl. 424—263 21 Claims

1. A compound of the formula (I):

(I)



wherein each R^1 and R^2 represents a hydrogen atom, or an alkyl group having form 1 to 6 carbon atoms, said alkyl group being unsubstituted or substituted by a C_{1-4} alkylamino, hydroxy or C_{1-4} alkoxy group, or R^1 and R^2 together with the nitrogen atom adjacent thereto forming piperidino or pyrrolidino; R^3 represents a hydrogen atom or a lower alkyl group having 1 to 4 carbon atoms; Py represents a pyriduyl group; B represents an ethylene group or ethylene which is substituted by lower alkyl having 1 to 4 carbon atoms; Y represents an oxygen atom; and the ring A is either unsubstituted or substituted by a halogen atom, nitro, lower alkyl having 1 to 4 carbon atoms, lower alkoxy having 1 to 4 carbon atoms, trifluoromethy, or trichloromethyl group.

21. A pharmaceutical composition for use as a muscle relaxant, anticonvulsant, sedative and minor tranquilizer, which comprises a therapeutically effective amount of a compound as claimed in claim 1 together with a pharmaceutically acceptable carrier or diluent.

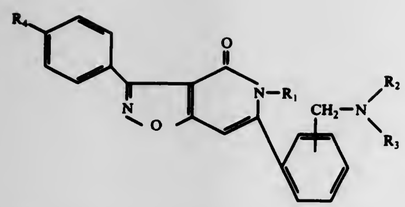
4,049,813

SUBSTITUTED ISOXAZOLO PYRIDINONES

Jeffrey Nadelson, Denville, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed July 15, 1976, Ser. No. 705,702
Int. Cl.² A61K 31/415; C07D 491/04
U.S. Cl. 424—263 7 Claims

1. A compound of the formula



where

R_1 represents straight chain lower alkyl, and

R_2 and R_3 each independently represent hydrogen or lower alkyl, and

R_4 is hydrogen, halo having an atomic weight of about 19 to 36, or lower alkoxy,

or a pharmaceutically acceptable salt thereof.

5. A pharmaceutical composition comprising a hypolipidemically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier therefor.

4,049,814

SUBSTITUTED PHENOXYALKYL QUATERNARY AMMONIUM COMPOUNDS AS ANTIARRHYTHEMIC AGENTS

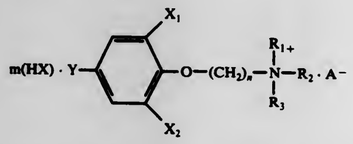
Stanley J. Strycker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 484,525, July 1, 1974, Pat. No. 3,932,664, which is a division of Ser. No. 164,086, July 19, 1971, Pat. No. 3,875,215. This application Jan. 12, 1976, Ser. No. 648,535

Int. Cl.² A61K *31/44, 31/445*

U.S. Cl. 424—267 **8 Claims**

5. A method for combatting cardiac arrhythmias which comprises administering to an animal a cardiac antiarrhythmic amount of a quaternary ammonium compound corresponding to the formula



wherein Y represents amino, loweralkylamino or diloweralkylamino; R_1 and R_2 taken together represent an aliphatic hydrocarbon moiety of 5 carbon atoms substituted with zero, one or two lower alkyl substituents; R_3 independently is selected from the group consisting of lower alkenyl, phenacyl, mono-, di-, or trihalophenacyl, lower alkynyl, substituted lower alkyl, substituted lower alkenyl and substituted lower alkynyl substituted with a substituent selected from the group consisting of halogen, phenyl, halophenyl, dihalophenyl, trihalophenyl, nitrilo and hydroxy [and carboxyalkyl and keto; R_1, R_2 and R_3 independently taken together represent a quinuclidine, pyridine, picoline or lutidine residue]; X_1 and X_2 both represent halogen; A^- represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable anion; n represents one of the integers 2, 3 or 4; HX represents stochiometric equivalent quantity of a pharmaceutically-acceptable acid; and *m* represents one of the integers zero and one.

4,049,815

TRIAZOLES

John James Alexander Evans, East Brighton, and George Holan, Brighton, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

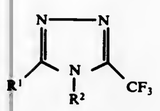
Continuation-in-part of Ser. No. 522,626, Nov. 11, 1974. This application Oct. 6, 1975, Ser. No. 620,185

Claims priority, application Australia, Nov. 30, 1973, 5638/73; United Kingdom, Nov. 11, 1974, 48784/74

Int. Cl.² A61K *31/41*; C07D *249/08*

U.S. Cl. 424—269 **3 Claims**

1. A triazole of the formula I,



I

wherein R^1 is a phenyl group substituted with two or more trihalomethyl groups; and R^2 is H.

4,049,816

ANTIVIRAL 2-AMINO-5-[1-(INDOL-3-YL)ALKYL]-2-THIAZOLIN-4-ONES

Michael Raymond Harnden, Horsham, and Nicholas David Wright, Westcott, near Dorking, both of England, assignors to Beecham Group Limited, England

Filed Mar. 15, 1976, Ser. No. 666,662

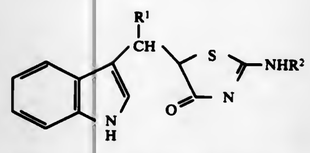
Claims priority, application United Kingdom, Mar. 24, 1975, 12147/75

Int. Cl.² C07D *275/02*

U.S. Cl. 424—270 **24 Claims**

1. A compound of the formula (II):

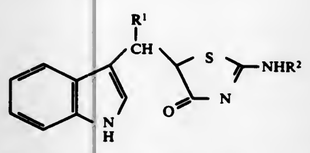
(II)



or a tautomer thereof wherein R^1 is hydrogen or methyl and R^2 is hydrogen, alkyl of 1 to 4 carbon atoms, or benzyl unsubstituted or substituted by one or two halogen atoms, methoxy or nitro groups.

12. A pharmaceutical composition useful for combatting infections caused by an RNA virus in the respiratory system of humans and animals which comprises an anti-virally effective amount of a compound of the formula (II):

(II)



or a tautomer thereof wherein R^1 is hydrogen or methyl and R^2 is hydrogen, alkyl of 1 to 4 carbon atoms, or benzyl unsubstituted or substituted by one or two halogen atoms, methoxy or nitro groups, in combination with a pharmaceutically acceptable carrier.

4,049,817

SYNERGISTIC COMPOSITIONS

Georg Laber, and Eberhard Schutze, both of Vienna, Austria, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 547,546, Feb. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 386,847, Aug. 8, 1973, abandoned. This application Apr. 7, 1976, Ser. No. 674,387

Claims priority, application Switzerland, Aug. 14, 1972, 12008/72

Int. Cl.² A61K *31/425*

U.S. Cl. 424—270 **4 Claims**

1. A pharmaceutical composition which comprises 6-chlorobenzisothiazolinone in free base or pharmaceutically acceptable acid addition salt form and 3-[(5-nitrofurfuryliden-)amino]-2-oxazolidinone in free base or pharmaceutically acceptable acid addition salt form as the active ingredients, the 6-chlorobenzisothiazolinone being present in an amount of from 20 to 80%, and the 3-[(5-nitrofurfuryliden)amino]-2-oxazolidinone in an amount of from 80 to 20% based on the total weight of active ingredients.

4,049,818

3-CHLORO-1,3-OXAZINES OR OXAZOLIDINES AS ANTIBACTERIAL AGENTS

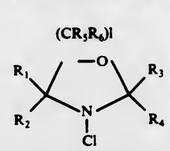
Nicolae S. Bodor, and James J. Kaminski, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Division of Ser. No. 566,747, April 10, 1975, Pat. No. 3,954,985, which is a division of Ser. No. 456,744, April 1, 1974, Pat. No. 3,897,425. This application Feb. 3, 1976, Ser. No. 654,870

Int. Cl.² A01N *9/22*

U.S. Cl. 424—272 **5 Claims**

1. A method for inhibiting bacterial growth which comprises treating said bacterial growth with an antibacterially effective amount of a compound of the formula:



wherein each of R_1 and R_2 which may be the same of different represents an alkyl group of from 1 to 20 carbon atoms; wherein each of R_5 and R6 which may be the same or different, represents a hydrogen atom or alkyl of from 1 to 20 carbon atoms; and wherein each of R_3 and R_4 which may be the same or different represent



wherein Y represents $—(CH_2)_n—W—(CH_2)_m—$ or >CH-Z, wherein W represents a member selected from the group consisting of —O—, $—CH_2—$, $>NCH_3$, $>NHCH_3^+$, $>NC_2H_5$, $>NHC_2H_5^+$, $>N(CH_3)_2^+$, and $>N(C_2H_5)_2^+$, wherein *n* is the same of different from *m* and wherein each of *n* and *m* represent an integer of from 0 to 2 and wherein Z represents a member selected from the group consisting of dimethylamino, diethylamino, trimethylammonium, triethylammonium, dimethylammonium, diethylammonium, $—COOR_7$, $—OOCR_8$ and $—OR_9$, wherein each of R_7 through R_9 respectively, represent a member selected from the group consisting of alkyl of from 1 to 5 carbon atoms and benzyl; and wherein *l* represents an integer of 1 or 2.

4,049,819

METHOD OF COMBATTING MICROORGANISMS EMPLOYING SUBSTITUTED OXAZOLINES

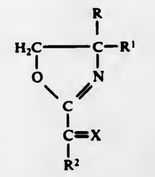
Jerry H. Hunsucker, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Feb. 9, 1976, Ser. No. 656,486

Int. Cl.² A01N *9/22, 9/28*

U.S. Cl. 424—272 **9 Claims**

1. A method of combatting bacteria and fungi by applying in an amount lethal to said bacteria and fungi and to the environment inhabitated by them, an oxazoline represented by the formula



where R and R^1 are hydrogen, methyl, or hydroxymethyl and can be the same or different, R^2 is an alkyl group of from 4 to 16 carbon atoms and X is H_2 or $(—CH_2OH)_2$.

4,049,820

SUBSTITUTED URAZOLE AND THIOURAZOLE COMPOUNDS AS AGRICULTURAL FUNGICIDAL AGENTS

Taichiro Shigematsu; Tetsuya Shibahara; Makoto Nakazawa, all of Yokohama; Masayuki Tomida, Sagamihara, and Toshio Munakata, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

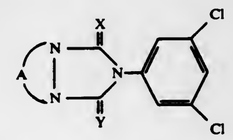
Filed Dec. 8, 1975, Ser. No. 638,761

Claims priority, application Japan, Dec. 13, 1974, 49-143183

Int. Cl.² A01N *9/22*

U.S. Cl. 424—273 P **9 Claims**

1. A method of killing plant pathogenic fungi which comprises applying to said fungi a fungicidally effective amount of a compound represented by the following formula:



wherein each of X and Y represents oxygen or sulfur, and A represents alkylene having 3 carbon atoms which may have branched methyl.

4,049,821

METHOD OF TREATING ALLERGY

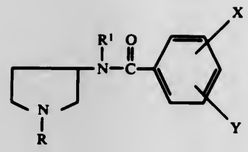
William Henry Funderburk, Jr., Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Filed May 12, 1976, Ser. No. 685,576

Int. Cl.² A61K *31/40*

U.S. Cl. 424—274 **8 Claims**

1. A method for ameliorating and controlling symptoms associated with asthma which comprises internally administering to a living animal body in need thereof an effective amount of an allergy ameliorating benzamide of the formula:



wherein;
R is hydrogen, lower cycloalkyl, phenyllower alkyl or lower alkyl,
R^1 is hydrogen or lower alkyl,
X is hydrogen, nitro, amino, acetamido, diloweralkylamino, hydroxy, lower alkyl or loweralkylsulfonylamino, and
Y is hydrogen, nitro or sulfamoyl.

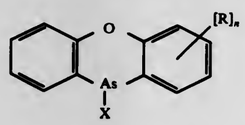
4,049,822

MICROBIOCIDAL COMPOSITIONS COMPRISING A SOLUTION OF A PHENOXARSINE COMPOUND

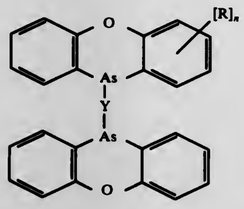
Nuno M. Rei, Peabody, and Ronald C. Wilson, Wenham, both of Mass., assignors to Ventron Corporation, Beverly, Mass.

Filed Aug. 4, 1975, Ser. No. 601,967
Int. Cl.² A01N *9/00*
U.S. Cl. 424—297 **8 Claims**

1. A microbiocidal composition comprising a solution of above about 20 weight percent of a phenoxarsine compound of the formula selected from the group consisting of



and



wherein X is halogen or thiocyanate and Y is oxygen or sulfur, R is lower alkyl or halogen and *n* is 0 to 3 and mixtures of said compounds and a solvent for the phenoxarsine selected from the group consisting of a glycyl phosphite, glycyl phosphonate and mixtures thereof.

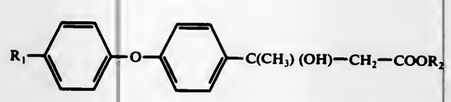
4,049,823

PHENYLBUTANOL DERIVATIVES AND COMPOSITIONS CONTAINING THEM

Erich Schacht; Werner Mehrhof; Albrecht Wild; Joachim Gante, and Hans-Adolf Kurmeier, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Feb. 25, 1975, Ser. No. 552,959
Claims priority, application Germany, Mar. 1, 1974, 2409761; June 14, 1974, 2428686; July 3, 1974, 2431951; July 26, 1974, 2436012
Int. Cl.² C07C *69/76*
U.S. Cl. 424—308 **12 Claims**

1. A compound of the formula



wherein R_1 is F, Cl or Br and R_2 is H or alkyl of 1 to 6 carbon and their physiologically acceptable salts when R_2 is H.

4,049,824

CETYL MYRISTOLEATE

Harry Weldon Diehl, 4424 Oak Hill Road, Rockville, Md. 20853

Filed May 3, 1976, Ser. No. 682,540
Int. Cl.² A61K *31/23*; C11C *3/02*
U.S. Cl. 424—312 **10 Claims**

1. A method of relieving and inhibiting the symptoms of inflammatory rheumatoid arthritis in mammals which comprises the parenteral administration to a mammal of an effective amount of cetyl myristoleate.

10. The compound, cetyl myristoleate, having the structure

$$CH_3(CH_2)_{13}OCO(CH_2)_7CH{=}CH(CH_2)_3CH_3.$$

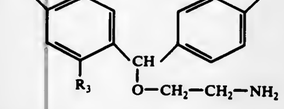
4,049,825

AMINOALKYLETHERS; COMPOSITION AND METHOD OF USE

Johan Gootjes, Heerhugowaard, Netherlands, assignor to Gist-Brocades N.V., Netherlands

Division of Ser. No. 338,621, March 6, 1973, Pat. No. 4,003,932. This application Oct. 20, 1976, Ser. No. 734,358
Claims priority, application United Kingdom, Mar. 7, 1972, 10543/72
Int. Cl.² C07C *9/20, 9/24*
U.S. Cl. 424—316 **7 Claims**

1. Pharmaceutical compositions for treatment of Parkinsonism which comprise as active ingredient at least one diphenylmethoxyethylamine of the general forumla



in which R_1 represents a fluorine, bromine or chlorine atom, R_2 represents a hydrogen or fluorine atom and R_3 represents a hydrogen, fluorine or chlorine atom, with the proviso that R_3 is a hydrogen atom when R_2 is a fluorine atom and R_1 is a fluorine atom when R_3 is a chlorine atom or a non-toxic acid addition salt thereof, in association with a pharmaceutically acceptable carrier in unit dosage form.

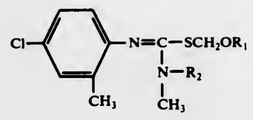
4,049,826

ACARICIDAL AND LEPIDOPTERICIDAL ACTIVE CARBON-IMIDOTHIOATES

George B. Large, Pinole, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 623,844, Oct. 20, 1975, Pat. No. 3,992,447. This application Aug. 6, 1976, Ser. No. 712,288
Int. Cl.² A01N *9/20*
U.S. Cl. 424—326 **12 Claims**

1. A method of killing or substantially injuring lepidoptera and acarids consisting of applying to the habitate thereof an lepidopterically or acaricidally effective amount of the compound having the formula



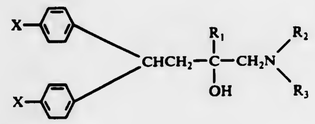
4,049,827

METHOD OF TREATING ARRHYTHMIA WITH DIARYLBUTANOLAMINES

Bryan Barnet Molloy, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 583,819, June 4, 1975, Pat. No. 4,001,328. This application Oct. 12, 1976, Ser. No. 731,156
Int. Cl.² A61K *31/135, 31/535, 31/445, 31/14, 31/40*
U.S. Cl. 424—330 **8 Claims**

1. A method of treating arrhythmia which comprises administering to a subject suffering from an arrhythmia and in need of treated or to a subject suspected of developing an arrhythmia an amount effective for treating the arrhythmia of a compound of the formula



wherein:
X is hydrogen or fluorine;
R_1 is hydrogen or C_1–C_3 alkyl;
R_2 and R_3 independently are hydrogen, C_1–C_6 alkyl, or $-CH_2R_4$, wherein R_4 is C_2–C_5 alkenyl; or R_2 and R_3 taken together with the adjacent nitrogen atom to which they are attached complete a heterocyclic ring selected from pyrrolidine, piperidine, morpholine, or methyl and dimethyl substituted pyrrolidine, piperidine and morpholine; and the non-toxic pharmaceutically acceptable salts thereof.

4,049,828

INSECTICIDAL AND INSECT-REPELLANT METHODS AND COMPOSITIONS

Larry K. Cole, 2709 Judith Drive, Champaign, Ill. 61820

Continuation-in-part of Ser. No. 494,540, Aug. 5, 1974, abandoned. This application July 14, 1975, Ser. No. 595,277
Int. Cl.² A01N *9/24*
U.S. Cl. 424—333 **6 Claims**

1. A method of killing dipterous and lepidopterous insects which comprises applying to said insects or habitat thereof citral vapors at concentrations of about 1 to 20 ppm. in air.

4,049,829

SULPHUR CONTAINING HYDROXY ALIPHATIC COMPOUNDS

Louis Lafon, Paris, France, assignor to Societe anonyme dite: Laboratoire L. Lafon, Maisons-Alfort, France

Filed Sept. 18, 1975, Ser. No. 614,624
Claims priority, application United Kingdom, Sept. 23, 1974, 41381/74
Int. Cl.² A01N *9/00*; C07C *149/18*
U.S. Cl. 424—337 **3 Claims**

1. A therapeutic composition for treatment of hyperlipemia and/or hypocholesterolemia by oral administration comprising a therapeutically effective amount of a compound selected from the group consisting of 2,2,15,15,-tetramethyl-3,14-dithia-1,16-hexadecanediol and 2,15,-dimethyl-3,14 dithia-1,16 hexadecanediol with a physiologically acceptable excipient.

4,049,830

BOVINE TEAT DIP

Peter T. Pugliese, Bernville, Pa., assignor to Milmark Research, Inc., Bernville, Pa.

Continuation-in-part of Ser. No. 523,333, Nov. 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 366,159, June 1, 1973, abandoned. This application Nov. 6, 1975, Ser. No. 629,222
Int. Cl.² A01N *9/24*; A61K *31/045*; A61L *13/00*
U.S. Cl. 424—343 **5 Claims**

1. A bovine teat dip free of inorganic salts and having a pH of between 5.0 and 5.8, a viscosity of from 4 to 10 centipoise at 37° C. and comprising an oil-in-water emulsion of the following ingredients expressed in parts by weight:

polyethoxycetyl ether	0.5%
75 mole polyoxyethylene ether of whole lanolin	4.6%
lauryl (poly-1-oxapropene) oxaethane carboxylic acid	1.0%
propylene glycol	8.0%
2-bromo-2-nitropropan-1,3 diol	0.2%
organic base as necessary to adjust pH to 5.0 to 5.8	
water as necessary to bring total volume to	100%

4,049,831

NOVEL COMPOSITION CONTAINING FATS OR OILS AND METHOD FOR MANUFACTURING SAME

Fumio Ono, and Yasuo Aoyama, both of Kashiwa, Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Japan

Filed Oct. 23, 1974, Ser. No. 517,247
Claims priority, application Japan, Oct. 31, 1973, 48-121619; Feb. 13, 1974, 49-16820
Int. Cl.² A23D *5/00*; A23L *1/04, 1/313*
U.S. Cl. 426—72 **17 Claims**

9. A method for manufacturing a fat- or oil-containing composition, said composition comprising a fat or oil solubilized in an aqueous solution, said method comprising adding with stirring 0.5 to 6.0 parts by weight of a fat or oil to 1 part by weight of an aqueous solution containing 0.8% to 10% by weight in terms of water-soluble nitrogen of an aqueous extract of an animal meat which extract contains as its main constituent water-soluble and thermally noncoagulable peptides, said aqueous solution having a viscosity of 30 to 50,000 centipoises at 25° C., thus solubilizing said fat or oil in said aqueous solution.

4,049,832

HIGH FAT, FORTIFIED, MARSHMALLOW BASED FOOD BAR

James R. Hayward, McHenry; William L. Keyser, East Dundee, and Walter J. Zielinski, Ingleside, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 2, 1976, Ser. No. 710,451
Int. Cl.² A23G *3/00*
U.S. Cl. 426—72 **11 Claims**

1. Marshmallow low in reducing sugars and having therein up to 10 percent by weight emulsified fat, and from 1–20 percent by weight protein of reduced water binding capability; said emulsified fat containing up to 20 percent by weight emulsifier; said protein of reduced water binding capability being selected from the group consisting of heat treated protein, fat coated protein, and combinations thereof; said reducing sugars being below about 5 percent by weight.

4,049,833
PROCESS FOR TREATING PARTIALLY DEFATTED NUTS

Peter Michael Gannis, Stamford, Conn., and Peter Michael Bosco, Hopewell Junction, N.Y., assignors to Standard Brands Incorporated, New York, N.Y.

Filed Oct. 16, 1975, Ser. No. 623,168
Int. Cl.² A23L *1/20*
U.S. Cl. 426—93 9 Claims

1. A process for treating partially defatted nuts comprising contacting the nuts with an aqueous solution containing at least about 2 percent glycerol at a temperature of at least about 150° F for a period of at least about 2 minutes so that at least a portion of said solution is absorbed by the nuts and the nuts are thereby reconstituted, removing the nuts from contact with the solution and roasting the nuts, whereby the resulting nuts have substantially the flavor and texture of roasted nuts which have not been defatted.

4,049,834
HOPS AND METHOD OF MAKING SAME

Günter Bürwald, Seebadstrasse 25, 1 Berlin 28, and Fritz Briem, Obere Hauptstrasse 18, 8301 Au i. d. Hallertau, both of Germany

Filed Apr. 4, 1975, Ser. No. 565,199
Claims priority, application Germany, Apr. 9, 1974, 2417367
Int. Cl.² A23L *1/00*
U.S. Cl. 426—106 14 Claims

1. A hop product pressed to form a shaped body comprising dried hop strobiles comminuted to a grain size of from about 2 - 10 mm and admixed with at least one inert inorganic adsorbent in a solid state, the adsorbent being selected from the group consisting of finely divided silica, silicates and aluminum oxide, the amount of the adsorbent being from about 10 to 30 percent, based on the total weight of hops and adsorbent.

4,049,835
PET FOOD PRESERVATION

Gerhard Julius Haas, Woodcliff Lake, N.J., and Edwin Bernard Herman, Yorktown Heights, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 9, 1976, Ser. No. 665,208
Int. Cl.² A23B *4/14*
U.S. Cl. 426—106 10 Claims

1. In a method for preparing an intermediate-moisture food comprising pasteurized meat and containing a polyhydric alcohol for antimicrobial purposes, the improvement comprising:
- packaging said food in a substantially gas impervious packaging material, and filling the free space in the package with carbon dioxide,
- said food containing a level of said polyhydric alcohol which is ineffective in the absence of the carbon dioxide to prevent microbial growth, but effective to prevent microbial growth when the food is packaged in carbon dioxide.

4,049,836
PIE CRUST, DOUGH AND PACKAGE

George B. Davis, Jr., 7512 Marbury Road, Bethesda, Md. 20034

Continuation-in-part of Ser. No. 498,575, Aug. 19, 1974, abandoned. This application Apr. 16, 1976, Ser. No. 677,713
Int. Cl.² A21D *10/02*
U.S. Cl. 426—112 20 Claims



1. The package combination disclosed comprising a mass of crust dough, two thinly formed sheets of flexible material secured together about their peripheral edge to form a receptacle inclosing said dough mass significantly larger than the dough mass to provide for reshaping by rolling the dough within the receptacle, means forming air passing ports extending into said receptacle for the passage of air into and from the receptacle as the receptacle is extended and the dough therein rolled into pie crust form said air passing ports being sufficiently small
- as to allow the passing of air into and from the receptacle without allowing the viscus dough material extruding excessively from the receptacle through the ports during a normal dough rolling operation and during such time as relatively high pressure are applied to the dough within the receptacle.

4,049,837
CHILL PREVENTION FOR BANANA UNDERPEEL

Hugh T. Freebairn, Houston, Tex., assignor to Catalytic Generators, Inc., Chesapeake, Va.

Filed Dec. 31, 1975, Ser. No. 645,644
Int. Cl.² A23B *7/14*
U.S. Cl. 426—308 30 Claims

1. A method of swelling the cell membranes of the cells surrounding the latex containing vessels in the underpeel of bananas to enable these latex vessels to be more resistant to temperatures within the range of 45° to 55° F, the method comprising,
- treating the exterior peel of a banana finger with an application of an oleaginous material having a viscosity of 10 to 10,000 centistokes,
- maintaining the temperature of the underpeel above 55° F during said application and holding the underpeel for a dwell period of at least 24 hours,
- applying a sufficient amount of said oleaginous material to permit said oleaginous material to penetrate below the exterior peel and into the sites of the latex vessel cell membranes to thereby swell said membranes in order to prevent both a phase change in the cell membranes and an increase in the permeability for the liquid and solutes of the cells surrounding the latex vessels into the latex contained in these vessels.

5. The process of claim 1 wherein the electron-spin resonance in the cell membranes is changed and the cell membrane permeability to phosphate ions is decreased.

4,049,838
MANUFACTURE OF LARGE CHEESE BLOCKS

Grant Edward Krueger, and Richard John Leitner, both of Green Bay, Wis., assignors to Kraft, Inc., Glenview, Ill.

Division of Ser. No. 388,101, Aug. 13, 1973, Pat. No. 3,969,995.
This application June 3, 1976, Ser. No. 692,491
Int. Cl.² A23C *19/02*
U.S. Cl. 426—478 7 Claims

1. A method for manufacturing cheese from curd in particulate form comprising the steps of filling the curd into a container, locating a perforated V-shaped blade having spaced side walls in the curd, opening the curd by means of the blade a maximum distance of two inches, rotating the container about an axis generally in the plane of the blade, applying pressure to the curd while the blade is in the curd, draining the curd through the blade, and removing the blade with minimum disturbance of the curd so as to permit knitting of the curd to provide a cheese block of uniform texture.

4,049,839
PHYSIOCHEMICALLY DESIGNED FAT COMPOSITIONS FROM TALLOW

Francis E. Luddy, Hatboro; James W. Hampson, and Samuel F. Herb, both of Philadelphia, all of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 337,789, March 5, 1973, Pat. No. 3,944,585.
This application Dec. 22, 1975, Ser. No. 642,837
Int. Cl.² A23D *3/00, 5/00*
U.S. Cl. 426—607 5 Claims

1. A high melting crystalline tallow fraction useful for hardening shortenings and margarine stock consisting essentially of trisaturated glycerides with a minor amount of disaturated, monounsaturated glycerides, said fraction having a gas-liquid chromatographic profile indicating a composition having 12%, 31%, 39%, and 18% of glycerides having carbon numbers of 48, 50, 52 and 54, respectively, and a thermal profile indicating softening at about 40° C., commencement of rapid melting at about 50° C. and complete melting at about 57° C.

4,049,840
PROCESS FOR PREPARING AN EXPANDED SOY PRODUCT

Stanley H. Reesman, and Charles R. Eldred, both of Battle Creek, Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 189,735, Oct. 15, 1971, abandoned.
This application Sept. 8, 1975, Ser. No. 611,592
Int. Cl.² A23L *1/20*
U.S. Cl. 426—634 1 Claim

1. A process for preparing an expanded soy product simulating meat in texture and having a reduced soy flavor, which comprises:
- blending a soy mixture comprising soy, from about 1 to about 50% semolina based on the combined weight of soy and semolina, water, and a sulfur compound in an amount sufficient to aid expansion;
- heating and mechanically working the soy mixture under pressure, the heating being sufficient in degree to cook the soy and raise the temperature to at least 250° up to 320° F; and
- extruding the soy mixture to effect expansion of the cooked soy mixture.

4,049,841
SPRAYED CATHODES

Thomas G. Coker, Southgate, and Shyam D. Argade, Woodhaven, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

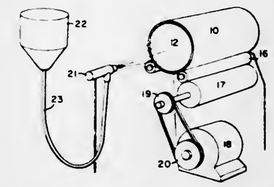
Filed Sept. 8, 1975, Ser. No. 611,030
Int. Cl.² B05D *1/10, 5/12, 7/14*
U.S. Cl. 427—34 9 Claims

1. In a method for manufacturing a chlor-alkali electrolytic cell wherein the cathode is prepared by coating a ferrous metal substrate with a metal, the improvement comprising:
- spray coating the ferrous metal substrate with a powder metal to bond the powder metal to the substrate the powder metal having a lower hydrogen overvoltage than the substrate, the powder metal increasing the surface area of the cathode while maintaining efficient hydrogen bubble release.

4,049,842
PROCESS FOR INTERIOR COATING SMALL MOUTH CONTAINER OPEN AT ONE END

Gene Gerek, and Robert G. Coucher, both of Salt Lake City, Utah, assignors to EPPCO, Salt Lake City, Utah

Division of Ser. No. 486,464, July 8, 1974, Pat. No. 3,947,617.
This application Dec. 29, 1975, Ser. No. 644,926
Int. Cl.² B05D *3/06*
U.S. Cl. 427—34 22 Claims

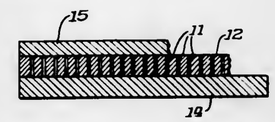


1. A plasma spray process for coating the interior of a thin-walled cylindrical container with a closed end and an open end with a coating having a thickness of less than 1 mil comprising:
- a. introducing finely divided resin particles into the region of a plasma arc flame have a temperature greater than the melting point of said resin;
- b. maintaining the residence time of said resin particles in the vicinity of said flame for a period sufficiently long to soften substantially at least the surface of said particles passing through said region of a plasma generated flame;
- c. rotating said container about its central longitudinal axis at a rotational speed sufficient to create a vortex;
- d. propelling said softened resinous particles into the interior of said container with sufficient velocity to impact said resinous particles with the container interior to cause said particles to adhere and flow upon the interior surface of said container to coat same with a substantially uniform coating which is curable to a continuous film having a thickness less than about one mil.

4,049,843
IMAGE TRANSFER LAYERS FOR INFRARED TRANSFER PROCESSES

Joseph Gaynor, Arcadia, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 330,337, Feb. 7, 1973, Pat. No. 3,970,002, which is a division of Ser. No. 83,397, Oct. 23, 1970, Pat. No. 3,730,091. This application Mar. 13, 1975, Ser. No. 558,084
Int. Cl.² B05D *3/06;* B41M *3/12*
U.S. Cl. 427—43 2 Claims



2. In the process for reproducing radiation absorbing images disposed on the surface of an original by exposing said original to radiant energy sufficient to generate a heat pattern thereon corresponding to radiation absorbing imaged areas and non-imaged areas on the surface of said original, and transferring said heat pattern to a transfer material comprising dye, wax and oil on a transfer sheet disposed in heat transfer relation to said original, the improvemment comprising dispersing a plurality of thermally and electrically conductive particles selected from the group consisting of copper, silver, iron, nickel, cobalt, iron oxide, nickel oxide, copper oxide, manganese dioxide, and magnesium oxide, said particles with one dimension longer than the other dimensions in said transfer material

wherein sufficient particles are disposed in said transfer material to yield a lateral particle frequency in said transfer material of about 10 to 20 particles per millimeter and wherein said transfer material is disposed in a 0.5 mil thick layer between said original and said transfer sheet and the length of said particles dispersed in said transfer material is 0.40 to 0.45 mils, and subjecting said transfer material to an electrical field sufficient to align said longer dimension of said particles contained in said transfer material into positions parallel to said field and transverse to said transfer sheet thereby rendering said transfer material capable of greater thermal conductivity in a direction transverse to said transfer sheet than in a direction lateral to said transfer sheet.

4,049,844

METHOD FOR MAKING A CIRCUIT BOARD AND ARTICLE MADE THEREBY

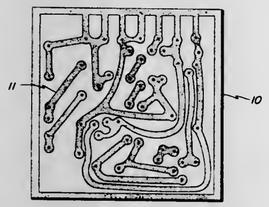
Donald A. Bolon, Scotia; Gary M. Lucas, Schenectady, both of N.Y., and Ralph L. Bartholomew, Painesville, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 509,893, Sept. 27, 1974, Pat. No. 3,988,647. This application Mar. 24, 1976, Ser. No. 670,044

The portion of the term of this patent subsequent to July 6, 1993, has been disclaimed.

Int. Cl.² B05D *5/06*; H01B *1/02*

U.S. Cl. 427—54 **9 Claims**



1. A method for making a circuit board having conductive circuit elements with a specific resistivity of less than 10 ohm-cm patterned on a nonconductive substrate, which comprises,

1. printing a radiation curable ink onto the nonconductive substrate to a desired circuit pattern, and
2. effecting the radiation cure of the radiation curable ink, where said radiation curable ink comprises by volume
   A. from about 10% to 60% of an organic resin binder having a viscosity of from 50 to 10,000 centipoises at 25° C., and
   B. from about 90% to 40% of a particulated electrically conductive metal containing material substantially free of metal containing material having an aspect ratio of diameter to thickness of a value greater than 20.

4,049,845

METHOD FOR PREPARING FILTER-COATED PHOSPHOR PARTICLES

Gerald Scott Lozier, Princeton, and Phyllis Brown Branin, Lawrenceville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,766

Int. Cl.² B05D *5/06, 5/12*

U.S. Cl. 427—68 **12 Claims**

1. A method for coating phosphor particles with discrete filter particles comprising

a. adsorbing in an aqueous medium colloidal particles of a latex onto said phosphor particles,
b. dispersing filter particles in an aqueous medium,
c. combining said phosphor particles and said filter particles in an aqueous medium
d. and coagulating the combined mixture of phosphor particles with adsorbed colloidal particles thereon and filter particles while in an aqueous medium.

4,049,846

PHOTOCHROMIC PLASTIC MATERIALS

Richard J. Hovey, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed June 11, 1976, Ser. No. 694,963

Int. Cl.² G02F *1/01*; G02B *1/10, 1/12*; B05D *5/06*

U.S. Cl. 427—164 **21 Claims**

1. A process for producing a photochromic plastic material characterized by the steps of:

forming a transparent polymeric material from:
- a first component consisting essentially of at least one unsaturated polyester resin produced by esterification of a polybasic, unsaturated organic acid with a polyhydric alcohol, and
- a second component consisting essentially of a polar vinyl monomer;

contacting said material with a solvent to swell a surface layer thereof;

contacting said surface layer with halide ions chosen from the group consisting of chloride, iodide, bromide, and mixtures thereof;

contacting said surface layer with silver ions; and

removing retained solvents from said material to collapse said swelled surface layer.

4,049,847

PRODUCTION OF SELF-ADHESIVE COATINGS ON FLAT SUBSTRATES

Klaus Eisentraeger, Ludwigshafen; Güenther Immel, Weinheim; Matthias Marx, Bad Duerkheim; Hans Reinhard; Herbert Spoor, both of Limburgerhof, and Gerhard Storck, Ruchheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed July 10, 1972, Ser. No. 270,095

Claims priority, application Germany, July 12, 1971, 2134688

Int. Cl.² C09J *7/02*

U.S. Cl. 427—207 B **10 Claims**

1. A process for the production of self-adhesive coatings by applying thin films of self-adhesive polyacrylates to the surface of flat substrates which comprises applying to said surface a mixture of

A. a copolymer of
   a. from 0.3 to 10% w/w of a C_{3-5} mono-olefinically unsaturated mono- or di-carboxylic acid or a vinyl monomer containing at least one hydroxyl group with
   b. up to 99.7% w/w of an alkyl acrylate having C_{6-12} alkyl groups,
   c. from 0 to 60% w/w of mono-olefinically unsaturated C_{4-7} carboxylates and
   d. from 0 to 10% w/w of other olefinically unsaturated monomers;
B. from 0.5 to 8% by weight of the weight of copolymer (A) of melamine/formaldehyde resins, the molar ratio of melamine to formaldehyde in the melamine/formaldehyde resin being from 1:3 to 1:6

and heating the coating to a temperature of at least 50° C.

4,049,848

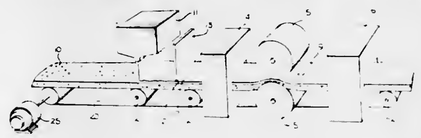
TEXTURED-FOAM COATED URETHANE WALL AND CEILING COVERING AND METHOD OF MAKING THE SAME

Clark W. Goodale, Canoga Park; Charles W. Morgan, Rolling Hills, and Albert L. Rhoton, Cypress, all of Calif., assignors to United Foam Corporation, Compton, Calif.

Continuation-in-part of Ser. No. 532,315, Dec. 13, 1974, abandoned. This application Nov. 19, 1976, Ser. No. 743,169

Int. Cl.² B05D *5/00*; B32B *5/18*

U.S. Cl. 427—244 **42 Claims**



1. A method for producing a composite building material having a continuously textured surface, comprising:

a. providing (i) a foamed emulsion of an uncured and uncross-linked elastomeric resin composition and (ii) a self-supporting resilient urethane foam substrate having an irregular sea sponge cell structure;
b. disposing said foamed elastomeric resin composition onto a surface of said urethane substrate to form a substantially uniform coating of predetermined thickness on the substrate, said thickness being such as to permit the irregular cell structure of the underlying sea sponge substrate to affect the exposed surface of the elastomeric layer in the subsequent step (d) so that after the composite structure is fully processed said textured surface is formed therein;
c. drying said elastomeric resin foam coating until said elastomeric resin foam forms a layer which is only partially cured and partially cross-linked, such that when said partially cured elastomeric layer of the composite structure is crushed, it will deform the cells of the underlying urethane and become interlocked therein to prevent delamination of said elastomeric layer;
d. crushing said composite structure so that said partially cured elastomeric layer is densified and caused to be interlocked into the adjacent cells on said urethane substrate surface which cells have been distorted by the crushing, the resultant partial compression and distortion of the elastomeric foam creating a continuous texture on the exposed surface thereof; and
e. further curing said textured elastomeric layer to hold said textured surface and forming said composite building material.

4,049,849

INHIBITING LEACHING OF FIRE RETARDANT SALTS FROM WOOD WITH CYCLIC SULFONIUM ZWITTERION SOLUTION IMPREGNANT

Frederick L. Brown, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 14, 1976, Ser. No. 676,764

Int. Cl.² B05D *3/12*

U.S. Cl. 427—325 **10 Claims**

1. A process for inhibiting the leaching of a fire retardant salt from a wood substrate comprising:

a. impregnating the wood substrate with either
   i. an aqueous solution comprising between about 5 and about 40 weight percent solids, the solids consisting of the fire retardant salt and a cyclic sulfonium zwitterion at a fire retardant salt:cyclic sulfonium zwitterion weight ratio between about 1:1 and about 20:1; or
   ii. subsequent to impregnating the wood substrate with the fire retardant salt, with an aqueous solution comprising between about 1 and about 40 weight percent of the cyclic sulfonium zwitterion; and
b. curing the resulting cyclic sulfonium zwitterion-impregnated wood substrate.

4,049,850

METHOD OF CURING PLASTIC RAW MATERIALS IMPREGNATED IN A POROUS STUFF SUCH AS WOOD

Heikki Pentti, Kemi, Finland, assignor to Kemi Oy, Kemi, Finland

Filed May 21, 1975, Ser. No. 579,554

Claims priority, application Finland, May 24, 1974, 741596

Int. Cl.² B05D *3/02, 1/18*

U.S. Cl. 427—377 **8 Claims**

1. A method of subjecting a synthetic resin impregnant in a porous cellulosic material to an exothermic curing reaction, comprising the steps of placing the impregnated cellulosic material into a vessel, introducing a medium of high specific heat into the vessel, heating the impregnated material with the medium above the boiling point thereof to initiate the curing reaction, the medium cooling down to at least the phase transition temperature thereof as it delivers heat to the reaction to produce a condensate of the medium, and interrupting the introduction of the medium to the vessel after the reaction has been initiated whereby the condensate on the surface of the impregnated material functions as a coolant effectively binding the reaction heat of the exothermic curing reaction and preventing overheating during heating above the phase transition temperature.

4,049,851

MANUFACTURE OF BONDED TEXTILE SHEET MATERIALS

Norbert Greif; Rolf Fikentscher, both of Ludwigshafen, and Axel Sanner, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

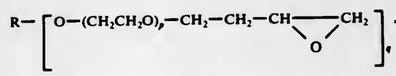
Filed Mar. 12, 1976, Ser. No. 666,461

Claims priority, application Germany, Mar. 21, 1975, 2512515; Jan. 30, 1976, 2603473

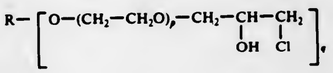
Int. Cl.² B44D *1/09*; C08J *1/44*

U.S. Cl. 427—386 **3 Claims**

1. In a process for the manufacture of bonded textile sheet materials having improved water vapor absorbency by bonding textile sheets with polymeric binders and additionally impregnating the textile sheets with impregnants and drying the impregnated textile sheets at from 40° to 100° C, the improvement wherein the textile sheet is impregnated with from 6 to 40 percent by weight, based on the bonded, impregnated and dried sheet, of an impregnant selected from the group consisting of glycidyl ethers of the general formula (I)



chlorohydrin compounds of the general formula (II)

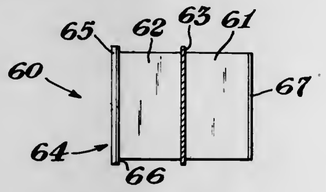


and reaction products of the chlorohydrin compounds (II) with aliphatic amines of 2 to 10 carbon atoms and having from 2 to 4 amino groups, in which general formulae (I) and (II) R is a divalent to hexavalent aliphatic or cycloaliphatic hydrocarbon radical of 2 to 13 carbon atoms, p is an integer from 1 to 30 and q is an integer from 2 to 6, and the impregnants are fixed to the textile sheets by means of compounds containing NH groups.

4,049,852
LAMINATE PREPARATION AND APPLICATION THEREOF

Hubert Stacy Smith, Jr., Essexville, and Robert A. Hay, II, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 2, 1975, Ser. No. 609,468
Int. Cl.² B32B *3/26*
U.S. Cl. 428—55 **9 Claims**



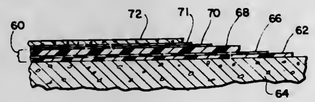
6. A laminate of a plurality of elongate foamed synthetic resinous bodies, the laminate comprising
- a first plurality of elongate generally rectangular foamed resinous bodies,
- a second plurality of elongate generally rectangular synthetic resinous bodies, the first plurality of synthetic resinous bodies being arranged in end-to-end relationship, the second plurality of bodies also being arranged in end-to-end relationship, the first and second plurality being in generally parallel face-to-face arrangement, the first and second plurality of bodies each having a plurality of locations where adjacent elements abut, the abutting locations of the first plurality of bodies and the second plurality of bodies being axially displaced from each other,
- a reinforcement member being disposed between the first and second plurality of bodies, the first and second plurality of bodies, the first and second plurality having having adjacent faces connected,
- a skin member being generally impervious to organic vapors being disposed generally parallel to the reinforcement member and connected to the first plurality at a location remote from the reinforcement member with the further limitation that

the abutting ends of the first plurality and the abutting ends of the second plurality are pressed together with a force sufficient that no visible gap exists between adjacent ends.

4,049,853
TERRAZZO STRUCTURE HAVING A SUB-SURFACE AND AN INTERMEDIATE IMPERMEABLE SHEET

Norman Patrick Tortolo, 20 Ellins Avenue, Toronto, Ontario, M6N 2A3, Canada

Continuation-in-part of Ser. No. 511,010, Oct. 1, 1974, abandoned. This application June 21, 1976, Ser. No. 698,616
Claims priority, application Canada, Oct. 1, 1975, 236850
Int. Cl.² B32B *5/28, 13/12*
U.S. Cl. 428—70 **17 Claims**



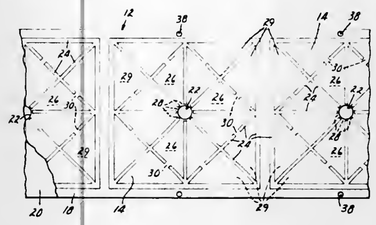
1. In combination, a sub-surface, a sheet of flexible premanufactured liquid impermeable material, an elastomeric adhesive securing said sheet to said sub-surface, a frangible thin facing veneer, and a bonding agent securing said facing veneer to said liquid impermeable sheet, said bonding agent compatible with said sheet material and with said facing veneer whereby said facing veneer is rigidly secured to said liquid impermeable sheet, which facing veneer is applied in the form of a wet slurry mix, said elastomeric adhesive permitting lateral movement of said sub-surface relative to said facing veneer.

10. A method for attaching a frangible thin facing veneer to a planar sub-surface comprising: causing adherence of a premanufactured liquid impermeable sheet to a sub-surface by an adhesive layer and applying said frangible veneer thereover while in a wet slurry state and bonding said frangible layer to said liquid impermeable sheet through a bonding agent compatible with said impermeable sheet and facing veneer whereby said frangible layer is rigidly secured to said liquid impermeable sheet, and wherein the adhesive is selected so that said adhesive layer will allow lateral movement of said sub-surface relative to said frangible thin veneer.

4,049,854
SYSTEM FOR INFLATION AND SEALING OF AIR CUSHIONS

James H. Casey, Roseville; Curtis Lee Larson, St. Paul, and Robert Campbell Brown, Falcon Heights, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 471,580, May 20, 1974, abandoned. This application Mar. 4, 1976, Ser. No. 663,739
Int. Cl.² B65B *31/04*
U.S. Cl. 428—72 **1 Claim**

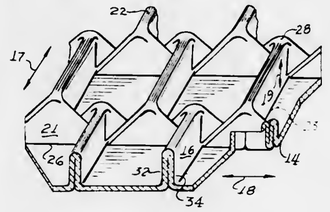


1. A concatenation of uninflated cushions, comprising two elongate, flexible films, each film comprising a heat sealable thermoplastic material forming at least one surface of the film, at least one of said films having a plurality of longitudinally spaced openings, said films being longitudinally aligned and positioned with their thermoplastic surfaces adjacent and with all adjacent portions of their thermoplastic surfaces in face-to-face contact, said films being fused together in discrete areas to define a plurality of cushions, each of said cushions including a continuously fused area extending entirely around each of said openings and fused areas within said continuous fused area defining a plurality of unsealed adjacent surface areas in a pattern providing inflatable primary chambers between the films and disposed around the opening, inflatable inlet passageways communicating between the opening and the primary chambers around the opening, secondary inflatable chambers adjacent said primary chambers, and a crossover passageway for each of said secondary inflatable chambers communicating between the secondary chamber and one of said primary chambers with the opening providing the only inlet to the chambers and passageways so that air directed through the opening into the inlet passageways will simultaneously inflate the primary chambers and via the crossover passageways the secondary chambers, which inflated chambers can then be sealed by heat sealing the inlet passageways in a band around that opening.

4,049,855
BOXCELL CORE AND PANEL

Scott Douglas Cogan, 7275 Demar Road, Cincinnati, Ohio 45243

Filed Mar. 22, 1976, Ser. No. 669,381
Int. Cl.² B32B *3/00*
U.S. Cl. 428—116 **4 Claims**

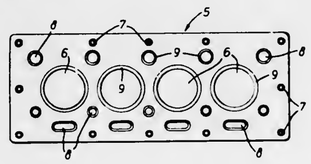


1. A structural monolithic cellular core element consisting of a multiplicity of rectangular cell openings within the body of the material, two sides of all said rectangular cell openings being a plurality of parallel pleats projecting substantially normal to the plane of one side of said material, said pleats being in rows whereas the rows extend in a direction normal to the plane of said pleats and the pleats are uniformly spaced, the depth of said pleats measured in a direction normal to the plane of said material being approximately one-half the distance between adjacent pleats in a single said row of pleats, adjacent said rows of pleats have an off-set of said pleats a distance approximately equal to the said pleat depth, the length of said pleats measured in the direction of the pleat fold being essentially the same for all pleats in a single said row of pleats and the pleats terminate in length at each end into triangular gathering folds thereof directed in planes substantially normal to the planes of said pleats and closing the remaining two sides of said rectangular cell openings, said triangular gathering folds being isosceles in transverse cross section and having an altitude essentially equal to the said pleat depth with the apex angle of said triangular gathering folds bisected by said pleats and said triangular gathering folds have a base length equal to the distance between two adjacent pleats in said row of pleats, the said triangular gathering fold base length being in the plane of said material, the side of said material opposite the projecting said pleats and said triangular gathering folds being a plane and closing one end of said rectangular cell openings.

4,049,856
GASKETS

David John Adams, Great Haywood, England, assignor to TBA Industrial Products Limited, England

Continuation-in-part of Ser. No. 515,410, Oct. 16, 1976, abandoned. This application May 24, 1976, Ser. No. 689,251
Int. Cl.² B32B *1/10*; F02F *1/00*
U.S. Cl. 428—131 **6 Claims**

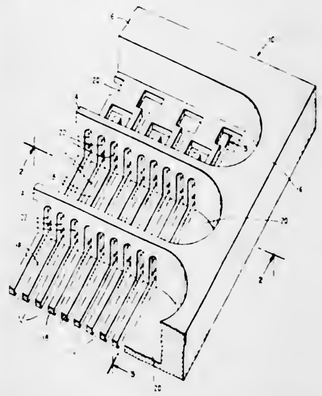


1. A metal-cored gasket comprising, in combination:
- a metal core;
- a facing layer bonded to each side of said core, at least one opening through said core and said facing layer, an eyelet in said opening, said eyelet having flanges seated in said facing layers in facing layer deforming relation, each facing layer consisting essentially of asbestos, rubber and microspheres, said rubber and asbestos being present in relative amounts so as to exhibit a compression set greater than 50% in the absence of said microspheres, said microspheres being present in amount up to 75% by volume and which amount is sufficient locally to modify said facing layer to permit crushing thereof by an associated eyelet flange at a pressure to protect said eyelet from incipient cracks incident to incorporation thereof in the gasket.

4,049,857
DEPOSITION MASK AND METHODS OF MAKING SAME

Robert Hammer, Brookfield Center, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 28, 1976, Ser. No. 709,357
Int. Cl.² B32B *3/10*; B05D *5/00*; B05C *11/16*
U.S. Cl. 428—136 **2 Claims**



1. A vapor deposition mask comprising an integral body of material having a web reinforced by at least one rib,
- the web having a thickness small compared with that of other portions of said mask and adapted to seat against the surface upon which vaporized material is to be deposited through said mask,
- openings extending through said web to define the deposited pattern, at least some of said openings being positioned close to each other so that between each such pair of adjacent openings there is an intervening part of said web having relatively small cross-sectional size and little inherent rigidity,
- each reinforcing rib having a thickness at least three times that of said web and extending across one or more of said openings therein,
- at least some of said openings extending from a point on one side of said rib to a point on the other side of said rib,
- the portion of said rib which bridges each of said openings being recessed so that such opening is effectively extended from said web into said rib to a depth substantially exceeding the web thickness, thus providing a raised bridge portion in said rib above each such opening to afford ample clearance for the passage of vaporized material around said rib and through such opening, said rib giving sufficient support to the tenuous portions of said web which are located between or surrounded by openings in said web to hold such web portions against substantial movements relative to each other and the adjacent parts of the mask while the mask is disengaged from said surface, thereby insuring that said mask is usable repetitively in vapor depositing operations notwithstanding the inherent

weakness that such tenuous web portions would have in the absence of support by said rib.

4,049,858

ARTICLE FOR SOFTENING FABRICS IN AN AUTOMATIC CLOTHES DRYER

Alan P. Murphy, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 12, 1974, Ser. No. 532,276
Int. Cl.² D06M *13/16*
U.S. Cl. 428—136 **10 Claims**

1. A non-staining fabric softening article, especially adapted for use in an automatic clothes dryer, comprising:

a. a fabric conditioning amount of a softener mixture being substantially free of unneutralized fatty acids, said mixture comprising a fabric softener component and a phase-modifying component wherein the presence of said phase-modifying component causes the formation in the dryer of a mesomorphic phase of the softener mixture, wherein:

i. the fabric softener component is selected from the group consisting of sorbitan esters characterized by at least one free hydroxyl group and a melting point of at least about 38° C, and mixtures thereof; and

ii. the phase-modifying component is selected from the group consisting of water-soluble fatty acid soaps, and mixtures thereof with water-soluble C_{10}-C_{20} neutralized alkyl sulfates, the weight ratio of said softener component to said phase-modifying component being in the range of from about 100:1 to about 1:1;

said softener mixture being characterized by a melting point in the range of from about 38° C to about 100° C, said mixture being in releasable combination with;

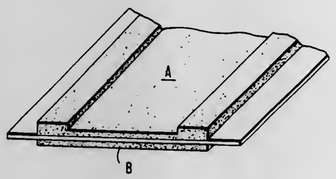
b. means for dispensing the softener mixture when said softening article is tumbled with damp fabrics in the dryer under heat sufficient to melt the mixture.

4,049,859

METALLIZED FILM

Shinsuke Yoshikawa; Tohru Sasaki, and Syuuzi Terasaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1976, Ser. No. 654,820
Claims priority, application Japan, Feb. 3, 1975, 50-13320
Int. Cl.² H01L *41/10*
U.S. Cl. 428—172 **7 Claims**



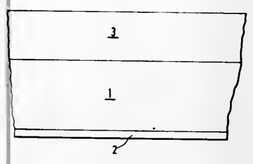
1. In a metallized thermoplastic resin film constituting a transducer and having deposited metal layers on both surfaces thereof, the improvement comprising, at least a portion of said metal layer on one surface of said film having a first thickness between 700–5000A, and at least a portion of said metal layer the other surface of said film, at positions on said other surface opposite to the position of said first thickness portion, having a second thickness between 100–600 A.

4,049,860

PAPER SUPPORT CARRYING ANTI-ADHESIVE LAYER

Ludwig Armbrust, Hassloch, and Jürgen Neubert, Esthal, both of Germany, assignors to Hoffmann & Engelmann, Germany

Filed Nov. 17, 1976, Ser. No. 742,577
Claims priority, application Germany, Nov. 19, 1975, 2551860
Int. Cl.² B32B *3/00*
U.S. Cl. 428—201 **12 Claims**



1. In a paper support for receiving on one side thereof layers of print and/or varnish, in particular for receiving transfer images,

the improvement comprising a water-permeable covering layer on the other side containing polyvinyl alcohol, a polysiloxane, and a polyalkyleneglycol wax.

10. An article comprising a support as claimed in claim 1 bearing at least one transfer image on the surface remote from said covering.

11. An article as claimed in claim 10 wherein each transfer image is adhered to said remote surface by an adhesive and has a protective coating thereon.

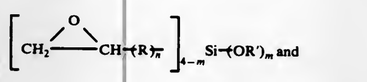
4,049,861

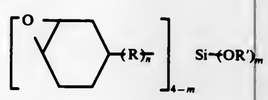
ABRASION RESISTANT COATINGS

Mohammad S. Nozari, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 556,392, March 7, 1975, abandoned. This application Feb. 19, 1976, Ser. No. 659,527
Int. Cl.² B32B *27/38, 27/26*
U.S. Cl. 428—220 **31 Claims**

1. A coated article comprising a substrate and an abrasion resistant coating on the substrate wherein said coating is from 0.1 to 500 microns thick and comprises a polymer comprising at least 15 percent by weight of units from an epoxy-terminated silane represented by the formulae:





wherein

each R is independently a non-hydrolyzable divalent hydrocarbon radical of less than 20 carbon atoms, or a divalent radical of less than 20 carbon atoms the backbone of which is C atoms which may be interrupted by individual atoms from the group of N and O, the O atoms in the form of ether linkages,

m is 1, 2, or 3,

n is 0, or 1, and

R' is an aliphatic hydrocarbon radical of less than 10 carbon atoms, an acyl radical of less than 10 carbon atoms, or a radical of the formula $(CH_2CH_2O)_kZ$ in which *k* is an integer of at least 1, and Z is hydrogen or an aliphatic hydrocarbon radical of less than 10 carbon atoms,

cured in the presence of a catalytically active amount of a highly fluorinated sulfonylic catalyst comprising two highly fluorinated aliphatic sulfonyl groups attached directly to an imide or a methylene or highly fluorinated sulfonic catalyst comprising a highly fluorinated aliphatic sulfonic acid or salt thereof.

4,049,862

FOAMED PIGMENTED EMULSIONS FOR THE BACKCOATING OF LOOSELY STRUCTURED FABRICS

Martin K. Lindemann, Greenville, S.C., assignor to Chas. S. Tanner Co., Greenville, S.C.

Filed Sept. 9, 1976, Ser. No. 720,839
Int. Cl.² B32B *7/00*
U.S. Cl. 428—253 **10 Claims**

1. A foamed pigmented thermosetting aqueous emulsion comprising an aqueous medium having dispersed therein:

1. an aqueous emulsion copolymer of 5% to 40% ethylene, from 1% to 10% of reactive monoethylenic monomer comprising monoethylenic monomer carrying the



group, and the balance of said copolymer consisting essentially of vinyl ester of saturated monocarboxylic acid;

2. mineral filler providing a pigment to binder ratio of at least 0.5:1, said filler having a alkaline character; and

3. surfactant for stabilizing said emulsion; said aqueous emulsion having a viscosity of from 500 to 15,000 centipoises and being foamed to increase the volume thereof to an extent of from 0.5 to 4 times the original volume.

4,049,863

FLUOROPOLYMER PRIMER HAVING IMPROVED SCRATCH RESISTANCE

Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 600,577, July 31, 1975, abandoned. This application June 30, 1976, Ser. No. 701,745
Int. Cl.² B32B *27/00*; C08G *51/24*; C08J *1/48*
U.S. Cl. 428—324 **23 Claims**

1. A coating composition comprising

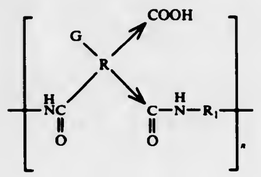
a. about 10%–90%, by weight of the total of (a) and (b) solids, of a particulate polymer of monoethylenically unsaturated hydrocarbon monomers completely substituted with fluorine atoms or a combination of fluorine atoms and chlorine atoms, the polymer having a number average molecular weight of at least 20,000;

b. about 10%–90%, by weight of the total of (a) and (b) solids, of a binder which comprises

1. about 5%–95%, by weight of the total of (1) and (2), of a colloidal silica which air-dries to form a continuous film when laid down by itself,

and

2. about 5%–95%, by weight of the total of (1) and (2), of a salt of a polyamide acid represented by the structure



where

G is a hydrogen or a carboxyl group; → denotes isomerism;

R is a tetravalent organic radical containing at least two carbon atoms, no more than two carbonyl groups of each polyamide acid unit being attached to any carbon atom of said tetravalent radical;

R_1 is a divalent radical containing at least two carbon atoms, the amide groups of adjacent polyamide acid units each being attached to separate atoms of said divalent radical;

and

n is a number large enough to give the polyamide acid an inherent viscosity of at least 0.1, measured as a 0.5% solution in N,N-dimethylacetamide at 30° C,

neutralized with a stoichiometric amount of a tertiary amine;

c. about 10–90%, by weight of (b) (2), of N-methyl pyrrolidone, dimethylformamide, dimethylacetamide, dimethylsulfoxide, cresylic acid, sulfolane or formamide;

d. about 0.2–20%, by weight of the total of (a), (b) (1), (b) (2), (c), and (d), of mica particles, mica particles coated with pigment, or metal flake;

and

e. a liquid carrier.

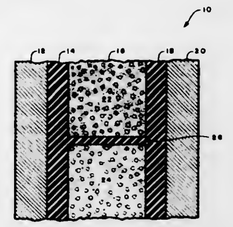
12. An article bearing a primer coat of the composition of claim 1 and a topcoat of a fused fluoropolymer enamel.

4,049,864

PENETRATION RESISTANT BARRIER

William R. Hoover; Keith E. Mead, and Henry K. Street, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 12, 1976, Ser. No. 657,518
Int. Cl.² B32B *9/04, 15/04*
U.S. Cl. 428—332 **3 Claims**



1. A barrier for resisting penetration by cutting torch and hand tools comprising:

an outer plate of mild steel from about 50 mils to about 1 inch thick;

a first layer of silicone rubber from about ¼ inch to about ½ inch thick;

a layer of epoxy resin impregnated ceramic firebrick up to about 1 foot thick;

a second layer of silicone rubber from about ¼ inch to about ½ inch thick, said first and second layers of silicone rubber sandwiching said ceramic firebrick layer between them; and

an inner plate of mild steel from about 50 mils to about 1 inch thick, said inner and outer plates of steel sandwiching between them said first mentioned sandwiched firebrick and silicone rubber layers.

4,049,865

GLASS FIBERS CONTAINING A DUAL POLYESTER RESIN SIZE

John Maughal, Monroeville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 606,272, Aug. 20, 1975, which is a division of Ser. No. 512,646, Oct. 7, 1974, Pat. No. 3,936,285. This application Nov. 11, 1976, Ser. No. 740,982

Int. Cl.[2] C08L *33/04*; D02G *3/00*

U.S. Cl. 428—391 **3 Claims**

1. Glass fibers having thereon the dried residue of a sizing composition comprising:

a water solubilized, condensation, cross-linkable, first unsaturated polyester resin, said polyester resin substantially insoluble in aromatic solvents when crosslinked;

a second unsaturated water dispersible and insoluble polyester resin, said second polyester resin being insoluble in said first polyester resin in a water solution and said second polyester resin preventing the migration of said sizing composition;

a plasticizer;

a first silane coupling agent to promote adhesion between said glass fibers and said resin matrix;

a second silane coupling agent to control the wetting of said glass fibers by said first silane coupling agent;

a thermoplastic polymer being of sufficiently low molecular weight to impart pressure sensitive adhesive characteristics to said sizing composition; and

a major amount of water.

4,049,866

BY-PRODUCT GYPSUM FILLERS FOR MICA-FREE JOINT COMPOUNDS

Marvin K. Lane, Chicago, and Winton C. Anderson, Elk Grove Village, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 359,392, May 11, 1973, Pat. No. 3,975,320. This application Mar. 4, 1976, Ser. No. 663,585

Int. Cl.[2] B32B *5/16*; C04B *11/00, 11/02*

U.S. Cl. 428—402 **4 Claims**



1. A filler for a crack-resistant, drying type joint compound, consisting essentially of calcium sulfate dihydrate synthetically produced from the citric acid process and further processed to have a particle size distribution characterized by

a mean particle size of between about 11 and about 12 microns,

particles having a size smaller than one micron comprising between about 5% and about 6.5% by weight of the filler, and

a packed dry bulk volume no greater than about 93 cc. per 100 grams.

4,049,867

THERMOSETTING RESIN COMPOSITION COMPRISING AN [(2,3-EPOXYPROPOXY)ALKYL]TRIALKYLOXYSILANE

Akihiko Ito; Isao Kaetsu; Hiroshi Okubo; Masamichi Kato, all of Takasaki; Koichiro Hayashi, Suita, and Yuji Maeda, Tokyo, all of Japan, assignors to Japan Atomic Energy Research Institute and Tokyo Optical Company, Ltd., both of Tokyo, Japan

Division of Ser. No. 448,572, March 6, 1974, abandoned. This application Dec. 23, 1975, Ser. No. 643,890

Claims priority, application Japan, Mar. 8, 1973, 48-026594

Int. Cl.[2] B32B *27/38, 27/08*

U.S. Cl. 428—412 **6 Claims**

1. A resin composite comprising a plastic substrate and a cured, abrasion resistant, transparent coating formed from a thermosetting resin composition comprising:

a. at least one [(2,3-epoxypropoxy)alkyl] trialkoxysilane represented by a general formula:

whereby R is an alkylene group containing up to 4 carbon atoms and R' is an alkyl group containing up to 4 carbon atoms, and

b. at least one selected from the group consisting of polymers and copolymers of epoxy-group containing vinyl monomers selected from the group consisting of glycidyl acrylate, 3,4-epoxybutyl methacrylate, 3,4-epoxybutyl acrylate, 4,5-epoxypentyl methacrylate and 4,5-epoxypentyl acrylate, which coating is cured by heating with addition of a ring-opening polymerization catalyst and wherein (b) amounts to 2 to 50% by weight of the total of components (a) and (b).

4,049,868

ABRASION-RESISTANT OPTICAL ELEMENT

Bernard L. Laurin, Ludlow; Don H. Rotenberg, Westboro, both of Mass., and Harry D. Crandon, Woodstock, Conn., assignors to American Optical Corporation, Southbridge, Mass.

Filed Dec. 29, 1975, Ser. No. 644,710

Int. Cl.[2] G02B *1/10, 1/04*; B32B *27/08, 23/08*

U.S. Cl. 428—412 **4 Claims**

1. An optical element with a transparent, abrasion-resistant surface comprising:

a transparent base of a synthetic organic polymeric material;

an adhesion-promoting coating on said transparent base;

an abrasion-resistant surface coating comprising a cured polysilicic acid ester of an alcohol containing from 1 to 12 carbon atoms, said ester having up to four silicic acid ester groups per silicon atom, a hydrolyzed vinyl polymer, a surface active agent and a cross-linking agent selected from the group consisting of formaldehyde, zirconyl nitrate, and mixtures thereof.

4,049,869

METHOD FOR PRESERVING POROUS INORGANIC SUBSTRATES

Charles F. De Long, Washington, D.C., assignor to United States Trading International, Inc., Washington, D.C.

Filed Sept. 19, 1975, Ser. No. 614,924

Int. Cl.[2] B05D *7/24*; B32B *13/12, 3/00*

U.S. Cl. 428—413 **26 Claims**

1. A method for preserving porous inorganic substrates consisting of applying to the porous inorganic substrate a gas and vapor permeable preservative composition consisting of an aqueous solution or dispersion of a carboxylated hydrophilic acrylic copolymer containing monomer units from at least one C_1–C_4 alkyl acrylate or methacrylate and about 5 to about 20% by weight of at least one carboxylic monomer, a cross-linking agent for the carboxylated hydrophilic acrylic copolymer constituting from about 1.0 to about 10% by weight of the aqueous solution or dispersion and from about 0.1 to about 2.0% by weight of said aqueous solution or dispersion of an ultra-violet absorbing agent.

4,049,870

BACKCOATING OF POLYPROPYLENE FABRIC

George Brodmann, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 22, 1975, Ser. No. 643,424

Int. Cl.[2] B05D *3/02*

U.S. Cl. 428—424 **5 Claims**

1. A method of backcoating polypropylene fabric by applying to one surface of the fabric a coating composition comprising polymer and solvent, said polymer being a solid high molecular weight 1,1,1-trichloroethane soluble polymer containing at least 50 weight percent of poly(vinyl chloride/vinylidene chloride) copolymer and said solvent consisting essentially of 1,1,1-trichloroethane; thereafter, affixing the polymer by volatilizing the solvent from the fabric.

4,049,871

MAGNETIC RECORDING MATERIAL

Hiroshi Ogawa; Yasuo Tamai, both of Odawara, and Tutomu Nishina, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 498,671, Aug. 19, 1974, abandoned. This application Apr. 22, 1976, Ser. No. 679,287

Claims priority, application Japan, Aug. 17, 1973, 48-92114

Int. Cl.[2] H01F *10/02*

U.S. Cl. 428—425 **9 Claims**

1. A magnetic material comprising a non-magnetic substrate having a magnetic recording layer thereon which comprises a finely divided ferromagnetic material dispersed in a binder, said binder comprising:

1. a polyurethane resin which comprises a polyester-polyurethane resin;

2. a modified alkyd resin having an acid value of not higher than about 15, consisting of about 20 to 50% by weight polycarboxylic acid, about 10 to 30% by weight polyhydric alcohol, and about 20 to 60% by weight modifiers, said modifiers being natural oils selected from the group consisting of soya oil, linseed oil, tung oil, castor oil, dehydrated castor oil, coconut oil, safflower oil, sesame seed oil, fish oil, walnut oil, oiticica oil or cotton seed oil;

3. and a polyisocyanate compound, said ferromagnetic powder being employed in a weight ratio of 100:10 to 100:200 to said binder; said alkyd resin, said polyurethane resin and said polyisocyanate compound being employed in weight ratios of about 90:10 to 10:90 for said alkyd resin to said polyurethane resin, and about 95:5 to 60:40 for the sum of the weight of said alkyd resin and said polyurethane resin to said polyisocyanate compound.

4,049,872

GLASS FRIT COMPOSITION FOR SEALING WINDOW GLASS

Kenneth Warren Hang, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 12, 1976, Ser. No. 704,325

Int. Cl.[2] C03C *3/22, 3/14*; B32B *17/06*

U.S. Cl. 428—427 **7 Claims**

1. A devitrifiable glass frit consisting essentially by weight on an oxide basis of about 10–20% BaO, 10–11% Li_2O, 2–7% Al_2O_3, and 66–77% B_2O_3.

4,049,873

SURFACE TREATING COMPOSITIONS

Norman Geoffrey Creasey, and Leslie Clark Pike, both of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

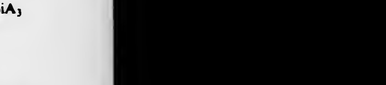
Filed Dec. 24, 1975, Ser. No. 644,199

Claims priority, application United Kingdom, Jan. 28, 1975, 3592/75; July 23, 1975, 30843/75

Int. Cl.[2] B32B *9/04*; C08G *77/04*; C08L *43/04*

U.S. Cl. 428—447 **10 Claims**

1. An organopolysiloxane composition suitable for conferring release properties on substrates comprising 100 parts by weight of a linear diorganopolysiloxane in the form of a curable release composition and from 0.5 to 50 parts by weight based on the linear diorganopolysiloxane of a copolymer consisting essentially of the average general formula:



where A is selected from the group consisting of R, R^1Q, alkenyl and hydroxy groups and hydrogen, Q is oxygen or sulphur, R is selected from the group consisting of (a) alkyl, aryl, alkaryl, aralkyl and cycloalkyl groups, (b) groups $—R^2QR^3$ where R^2 is a divalent organic group having at least 2 carbon atoms and is joined to silicon by a C-Si linkage and R^3 is a monovalent hydrocarbon group and (c) hydrocarbonoxy groups joined to silicon by a C-Si linkage, R^1 is a hydrocarbon or hydrocarbonoxy group, *a* and *d*, which will not normally be the same, are 0 or numbers not greater than 950, *b* is 0 or a number not greater than 999 and *c* is a number from 1 to 1000, $a + b + c + d$ is not less than 20 and not greater than 1000, $(b + c)/(a + b + c + d)$ is not less than 0.05, at least one of the groups R and R^1 being an alkyl group of 8 to 30 carbon atoms, the proportion of said copolymer in the composition being sufficient to provide at least one of said alkyl groups for each 2000 silicon atoms in the composition.

4,049,874

PROCESS FOR PRODUCING AN ARCHITECTURAL PRECAST CONCRETE PANEL

Tsuyoshi Aoyama, Hoya; Yoshimasa Hayashi, Tokyo; Michio Nagano, Urawa, and Hiroshi Nagase, Tokyo, all of Japan, assignors to Fujikura Kasei Co., Ltd., Japan

Continuation-in-part of Ser. No. 592,938, July 3, 1975, abandoned, which is a continuation of Ser. No. 455,504, March 27, 1974, abandoned. This application Jan. 14, 1976, Ser. No. 648,898

Claims priority, application Japan, Aug. 1, 1973, 48-86624

Int. Cl.[2] B32B *13/12*; B28B *1/16*

U.S. Cl. 428—451 **8 Claims**

1. A process for producing a decorative precast concrete panel for an outside wall, which comprises mixing about 100 parts by weight of viscous methyl methacrylate syrup with from about 0.5 to about 15 parts by weight of a radical polymerizable cross-linking monomer having α, β-unsaturated groups to obtain a thermosetting acrylic resin solution, mixing about 100 parts by weight of said resin solution with from about 0.01 to about 1.0 part by weight of a redox type polymerization initiator and from about 300 to about 700 parts by weight of aggregates to form a mixture, molding the said mixture into a shape, then placing a hydraulic cement composition on the surface of the said mixture while the said mixture is in a nonpolymerized state, performing simultaneously the polymerization of said resin and hydration of said hydraulic cement composition, whereby said mixture is formed into molded substances in one body as a concrete panel for outside walls resistant to weathering.

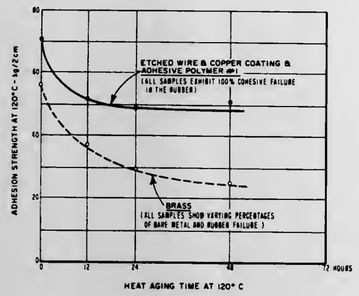
8. A decorative precast concrete panel for an outside wall produced by the process defined in claim 1.

4,049,875

BONDING RUBBER TO FERROUS METAL THROUGH A DEPOSIT OF COPPER AND ADHESIVE AND LAMINATE THEREFROM

Dennis L. Edie, Kobe, Japan, assignor to Honny Chemicals Company, Ltd., Kobe, Japan

Filed Sept. 5, 1975, Ser. No. 610,695
Claims priority, application Japan, Sept. 14, 1974, 49-106501
Int. Cl.[2] B32B *15/06*
U.S. Cl. 428—462 **27 Claims**



1. A laminated article comprising a ferrous metal substrate having a lossely adherent deposit of copper thereon, a layer of adhesive over said copper and rubber bonded through said copper and adhesive to said ferrous metal substrate, said adhesive consisting essentially of an interpolymer containing about 50 to about 99% by weight of a conjugated diene, about 1–45% by weight of a heterocyclic base and 0 to about 40% by weight of at least one additional monomer copolymerized therewith.

13. A process for bonding rubber to a ferrous metal substrate which comprises depositing a loosely adherent layer of copper on said ferrous metal substrate, applying an adhesive thereover, said adhesive consisting essentially of an interpolymer containing about 50 to about 99% by weight of a conjugated diene, about 1–45% by weight of a heterocyclic base and 0 to about 40% by weight of at least one additional monomer copolymerized therewith, thereafter contacting said adhesive with the rubber to be bonded and bonding by heat and pressure.

4,049,876

CEMENTED CARBONITRIDE ALLOYS

Takaharu Yamamoto; Toshio Nomura; Tsuyoshi Asai, and Akio Hara, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 620,853, Oct. 8, 1975, abandoned. This application Nov. 18, 1976, Ser. No. 743,212
Claims priority, application Japan, Oct. 18, 1974, 49-120734; Oct. 18, 1974, 49-120735; Oct. 18, 1974, 49-120736; Oct. 18, 1974, 49-120737; Oct. 18, 1974, 49-120738; Feb. 26, 1975, 50-24357; Feb. 27, 1975, 50-24587
Int. Cl.[2] B22F *3/00*; C22C *29/00*
U.S. Cl. 428—932 **11 Claims**

1. A cemented carbonitride alloy having a hard phase consisting essentially of $[(\text{Group IVa metal})_A(\text{Group Va metal})_B(\text{Group VIa metal})_C]\,(C_XN_Y)_Z$, wherein *A, B, C, X* and *Y* represent mole fractions, *Z* is the mole ratio of the metalloid components to the metal components, and *A, B, C, X, Y* and *Z* satisfy the equations

$$A + B + C = 1,$$

$$X + Y = 1,$$

$$4A + 5B + 6C + 4XZ + 5YZ \geqq 8.6,$$

$$0.05 \leqq Y \leqq 0.50 \text{ and } 0.85 \leqq Z \leqq 1.0,$$

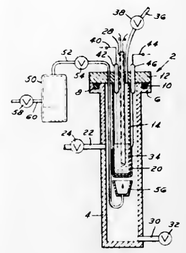
and wherein the hard phase is combined by at least one binder metal selected from the group consisting of iron, cobalt and nickel and there are in the alloy structure WC phase and the hard phase having a B1 crystal structure and containing Ti in a proportion of at least 20 atomic percent to the metallic atoms.

4,049,877

THERMOELECTRIC GENERATOR

Roger B. Saillant, and Neill Weber, both of Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 17, 1975, Ser. No. 614,289
Int. Cl.[2] H01M *6/36*
U.S. Cl. 429—11 **22 Claims**



1. In a thermoelectric generator wherein heat energy is converted to electrical energy and which comprises

1. enclosure means for a first reaction zone;
2. enclosure means for a second reaction zone;
3. a reaction zone separator which
   a. separates and essentially completes enclosure of said first reaction zone and said second reaction zone and
   b. comprises a cationically-conductive, solid electrolyte that is essentially impermeable to elemental alkali metal and compounds thereof and ionically conductive with respect to cations of said alkali metal;
4. alkali metal within said first reaction zone and in fluid communication with said solid electrolyte;
5. an electrode within said second reaction zone in electrical contact with said solid electrolyte and sufficiently porous to permit alkali metal to pass therethrough;
6. conduction means for electron flow between said alkali metal within said first reaction zone and said electrode in said second reaction zone;
7. inlet means for introducing said alkali metal into said first reaction zone; and
8. temperature control means adapted to maintain a temperature in said first reaction zone at least 100° C in excess of the lowest temperature in said second reaction zone,

wherein the improvement comprises employing as said electrode a porous film of a metal which is selected from the group consisting of molybdenum, tungsten, chromium, nickel and iron, said film having been deposited on said reaction zone separator in a thickness of between about 0.5 and about 10 micrometers by chemical vapor deposition.

10. In a process for manufacturing a thermoelectric generator wherein heat energy is converted to electrical energy, which device comprises

1. enclosure means for a first reaction zone;
2. enclosure means for a second reaction zone;
3. a reaction zone separator which
   a. separates and essentially completes enclosure of said first reaction zone and said second reaction zone and
   b. comprises a cationically-conductive, solid electrolyte that is essentially impermeable to elemental alkali metal and compounds thereof and ionically conductive with respect to cations of said alkali metal;

4. alkali metal with said first reaction zone and in fluid communication with said solid electrolyte;
5. an electrode with said second reaction zone in electrical contact with said solid electrolyte and sufficiently porous to permit alkali metal to pass therethrough;
6. conduction means for electron flow between said alkali metal within said first reaction zone and said electrode in said second reaction zone;
7. inlet means for introducing said alkali metal into said first reaction zone; and
8. temperature control means adapted to maintain temperature in said first reaction zone at least 100° C in excess of the lowest temperature in said second reaction zone,

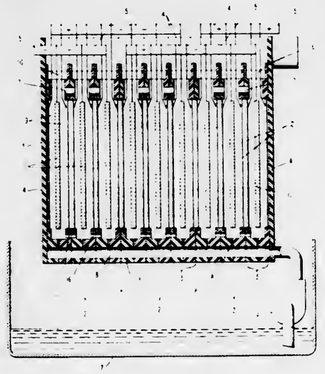
wherein the improvement comprises forming said electrode in electrical contact with said solid electrolyte by depositing a porous film of a metal in a thickness of between about 0.5 and about 10 micrometers by thermally decomposing a vapor phase carbonyl of said metal, said metal being selected from the group consisting of molybdenum, tungsten, chromium, nickel and iron.

4,049,878

ELECTROCHEMICAL BATTERY

Olle Birger Lindstrom, Lorensviksv. 14, 183 63 Taby, Sweden

Filed May 12, 1976, Ser. No. 685,647
Claims priority, application Sweden, May 12, 1975, 7505447
Int. Cl.[2] H01M *2/40*
U.S. Cl. 429—18 **3 Claims**



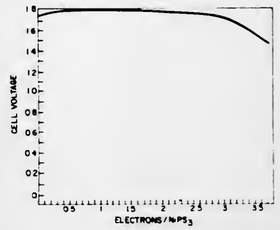
1. An electrochemical battery comprising:
frame means;
at least two modules mounted in said frame means electrically interconnected in series, each module containing at least two cells electrically connected in parallel, each cell comprising:
at least one positive electrode,
a negative electrode, and
an electrolyte space therebetween; and
an electrolyte supply bi-channel connected to each electrolyte space independently of an adjacent space to supply each electrolyte space individually with electrolyte from a source of electrolyte,
the electrolyte spaces of each module being interconnected fluidly in parallel at their lower ends by cross-channels to enable electrolyte to be transferred between said spaces.

4,049,879

INTERCALATED TRANSITION METAL PHOSPHORUS TRISULFIDES

Arthur H. Thompson, New Providence, and M. Stanley Whittingham, Fanwood, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Apr. 19, 1976, Ser. No. 677,889
Int. Cl.[2] H01M *10/00*
U.S. Cl. 429—191 **25 Claims**



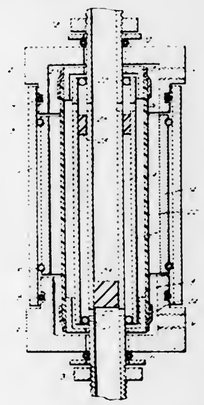
1. An electrochemical cell in the charged state comprising: an anode consisting essentially of an anodeactive material selected from the group consisting of alkali metals, magnesium, calcium, aluminum, and zinc and combinations thereof; a cathode consisting essentially of a transition metal phosphorus trisulfide corresponding to the formula $M(PS_3)_y$ wherein M is at least one transition metal selected from the group consisting of iron and nickel and *y* is a numerical value between about 0.9 and 1.0; and an electrolyte that is inert to the anode and the cathode and allows the passage of ions of the anode-active material to pass from the one electrode to the other.

4,049,880

SELF-GENERATING HALOGEN LIQUIFICATION IN A SECONDARY BATTERY

Thomas G. Hart, Royal Oak, Mich., assignor to Energy Development Associates, Madison Heights, Mich.

Filed June 11, 1976, Ser. No. 695,247
Int. Cl.[2] H01M *10/00*
U.S. Cl. 429—49 **12 Claims**



1. In the method of storing halogen generated during the charging phase of a rechargeable battery for use during the discharging phase thereof, said battery employing a halide containing electrolyte and electrodes for the cation and halogen, the improvement which comprises separating the elec-

trodes by a cation permselective membrane, furnishing halide containing electrolyte to the electrode for the cation and electrode for the halogen in separate but pressure balanced flows, transporting the halogen gas generated during charging to a pressure tight area maintained apart from the electrodes, and allowing the halogen gas to liquify at ambient temperature under the autogenuous pressure developed and without external pressure control.

9. A halide rechargeable battery comprising a first and second electrode compartments separated by a common cation permselective membrane; a first electrode within said first compartment; first liquid electrolyte storage means; first means to circulate liquid electrolyte between said first storage means and first compartment; second electrode within said second compartment; second liquid electrolyte storage means; second means to circulate liquid electrolyte between said second storage means and second compartment; a liquid halogen storage means communicating with said second storage means and located apart from said first and second compartments and first and second storage means, said liquid halogen storage means comprising a pressure tight compartment within which gaseous halogen can liquify at ambient temperature.

4,049,881

SOLID ELECTROLYTE COMPOSITION AND CELL

Bhaskara M. L. Rao, Fanwood, and Bernard G. Silbernagel, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Jan. 18, 1977, Ser. No. 760,341
Int. Cl.² H01M *10/44*
U.S. Cl. 429—50 **25 Claims**

1. A solid electrolyte composition, comprising one or more compounds of the formula:

$$LiI{\cdot}x]Al_2(SO_4)_3{\cdot}nH_2O]$$

wherein x is the number of moles of $Al_2(SO_4)_3{\cdot}nH_2O$ per mole of LiI, and wherein n is the number of moles of H_2O per mole of $Al_2(SO_4)_3$, subject to the proviso that x is a numerical value from about 0.05 to about 5, and n is a numerical value from 0 to about 20.

4,049,882

BATTERY ASSEMBLY

Theodore Robert Beatty, Cleveland, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 11, 1976, Ser. No. 657,204
Int. Cl.² H01M *4/00*
U.S. Cl. 429—94 **8 Claims**



1. In a cylindrical battery assembly, including at least one galvanic cell enclosed within an outer housing having a positive and negative battery terminal and a supply of electrolyte, comprising:

a strip of negative electrode material composed of a conductive metal and electrochemically active material;

a strip of positive electrode material;

a porous separating member for maintaining the positive and negative electrode strips spaced from one another, with the strip of positive and negative electrode material being spirally wound in combination with said porous separating member into a cylindrical form; and

means for electrically coupling said positive and negative strip of electrode material to the corresponding positive and negative terminal of said outer housing, the improvement comprising;

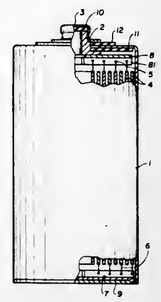
wherein said means for electrically coupling at least said negative strip of electrode material to its corresponding housing terminal comprises at least one conductive element having a multiplicity of projections which penetrate into said electrode for mechanically joining said element to said electrode and for simultaneously establishing electrical contact with said conductive metal in said strip of negative electrode through the mechanical points of contact provided by said projections.

4,049,883

GAS- AND LIQUID-TIGHT STORAGE BATTERY

Gerd Schenk, Iserlohn, and Heinz Haake, Breckerfeld, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed July 21, 1976, Ser. No. 707,284
Claims priority, application Germany, Sept. 24, 1975, 2542459
Int. Cl.² H01M *10/34*
U.S. Cl. 429—94 **5 Claims**



1. A storage battery sealed gas-tightly and liquid tightly comprising a battery casing closed at one end except for an opening in the closed end, an electrode set as an electrode winding disposed in said battery casing with a terminal post as a pole lead of said electrode set extending through said opening, an insulating washer around said pole lead disposed between the interior side of said casing end having the opening and said pole lead to prevent passage of electric current therebetween, an outer sealing washer snugly fitted around said terminal post with the flat surface of said washer resting on the metal wall forming said opening and a terminal post cap placed on said terminal post with said cap pressing against and holding said washer in place as sealing means to make said opening electrolyte-tight and prevent leakage of electrolyte therethrough, a contact disk connected to electrodes of one polarity of said electrode winding with said contact disk attached to said terminal post, and a welded-on bottom disk connected to electrodes of the other polarity of said electrode winding, on the opposite full opening of said battery casing to electrolyte-tightly and gas-tightly seal said opposite end of the battery casing.

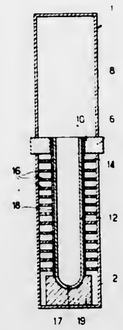
4. A method of producing a storage battery sealed gas-tightly and liquid-tightly which comprises forming a battery casing having a full opening at one end and closed at the opposite end except for an opening in the closed end, inserting through said full opening of said battery casing an electrode set having a hollow terminal post and having an insulating washer around said post, to bring the post through said opening and insulate said post from the metal wall forming the opening, welding a bottom disk to the battery casing at the full opening to provide an electrolyte-tight and gas-tight closure, injecting electrolyte through said hollow terminal post into said battery casing, inserting pressure release means in said hollow terminal post, placing a sealing washer around the outside diameter of the hollow terminal post with the flat surface of said washer resting on said metal wall forming the opening and snugly fitted around the terminal post, and pressing a terminal post cap onto said terminal post to secure said pressure release means and said sealing washer.

4,049,884

SODIUM-SULPHUR ELECTRIC CELL

Gérard Desplanches, Villejust; Yvon Lazennec, St Michel sur Orge, and Alain Wicker, Limours, all of France, assignors to Compagnie Generale d'Electricite S.A., Paris Cedex, France

Filed Apr. 8, 1976, Ser. No. 675,005
Claims priority, application France, Apr. 24, 1975, 75.12853
Int. Cl.² H01M *10/39*
U.S. Cl. 429—104 **12 Claims**



1. Electric cell of the sodium-sulphur type comprising:

a cathode tank containing a cathode reagent which is liquid at operating temperature and is chosen from the group formed by sulphur, phosphorus, selenium and the alkaline salts of those elements;

at least one tube of solid electrolyte closed at its lower end, containing an anode reagent which is liquid at operating temperature, constituted by an alkaline metal and arranged in said cathode tank in order to be immersed in said cathode reagent, the walls of that tube being made of beta alkaline alumina;

a support made of a ceramic insulating material, for holding said electrolyte tube in said cathode tank, the connection between that support and that tube being provided by means of a glass part;

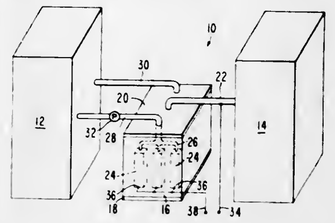
an anode tank containing a supply of said anode reagent and arranged above said cathode tank, so that said electrolyte tube opens at its upper part into that anode tank, said support separating the open ends of said anode tank and of said cathode tank, the said cathode tank being fitted with washers made of graphite felt ensuring the cathode collection of the current generated, that cell being characterized in that on the one hand, the outside face of said electrolyte tube, with the exception of its lower end comprises a porous coating which is electronically insulating and is intended to insulate said washers from said electrolyte tube and that on the other hand, a part made of graphite felt is arranged between said lower end of the electrolyte tube and the bottom of said cathode tank.

4,049,885

CONSTRUCTION FOR SOLID ELECTROLYTE IN SODIUM/SULFUR BATTERY

Stephen Paul Mitoff, Clifton Park, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Oct. 12, 1976, Ser. No. 731,170
Int. Cl.² H01M *6/18*
U.S. Cl. 429—104 **6 Claims**



1. A sodium-sulfur solid electrolyte battery wherein sodium is the negative electrode reactant and sulfur is the positive electrode reactant comprising:

a ceramic block having a plurality of parallel half-cells in spaced-apart planes in a first direction for negative electrode reactant and in a second direction normal to said first direction for positive electrode reactant;

means connected to said negative electrode half-cell for introducing negative electrode reactant into said negative electrode half-cell;

means connected to said positive electrode half-cell for circulating positive electrode reactant through said positive electrode half-cell; and

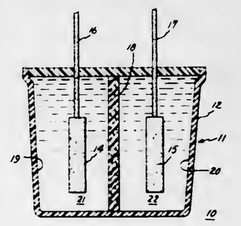
means for collecting current from said positive electrode reactant in said positive electrode half-cell.

4,049,886

RECHARGEABLE AQUEOUS METAL-HALOGEN CELL

Fritz G. Will, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 13, 1976, Ser. No. 750,271
Int. Cl.² H01M *10/24*
U.S. Cl. 429—105 **6 Claims**



1. A rechargeable aqueous metal-halogen cell comprising a casing, a pair of spaced apart porous electrode substrates in the casing, a micro-porous separator between the electrode substrates defining a positive and a negative electrode compartment, an aqueous electrolytic solution containing a zinc salt selected from the class consisting of zinc bromide, zinc iodide and mixtures thereof in both compartments, and an organic halogen complexing additive of nitrobenzene in the electrolytic solution of at least the positive electrode compartment, the additive present in an amount from 1 to 90 weight percent of the electrolytic solution.

4,049,887

ELECTROCHEMICAL CELLS WITH CATHODE-ACTIVE MATERIALS OF LAYERED COMPOUNDS

M. Stanley Whittingham, Fanwood, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed July 20, 1976, Ser. No. 707,091
Int. Cl.² H01M 6/36
U.S. Cl. 429—112 **8 Claims**

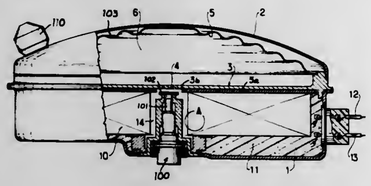
1. An electrochemical cell comprising an anode and cathode; the cathode-active material of said cathode consisting essentially of a layered compound represented by the formula MA_xB_y wherein M is at least one metal selected from the group consisting of iron, vanadium, titanium, chromium and indium, A and B are members selected from the chalcogenides and halides, respectively, and the sum of x and y are equal to about 2, the layered compound belonging to space group V_H^{13}; and, an electrolyte which is inert to the anode and the cathode, the anode and cathode being immersed in the electrolyte.

4,049,888

CENTRALLY-ACTIVATED DEFERRED-ACTION SILVER-ZINC BATTERY

Jacques Flender, Le Raincy, France, assignor to SAFT-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Jan. 27, 1977, Ser. No. 763,098
Claims priority, application France, Oct. 13, 1976, 76.30745
Int. Cl.² H01M 6/38
U.S. Cl. 429—115 **11 Claims**



1. A centrally activated deferred-action battery comprising a stack of couples each constituted by a positive plate and a negative plate and separators each having a central hole forming a central well, means spacing said plates from each other to provide a gap between adjacent facing positive and negative plates for receiving electrolyte, means mechanically separating each couple from the adjacent couple, a metal sheet electrically connecting adjacent couples, said sheet also having a central hole, a first insulating washer with a hole in the center of the washer which is of smaller diameter than the hole in the center of the metal sheet, a second insulating washer cooperating with said first named washer to insulate the inner edge of the said metal sheet, one face of the first washer resting on a said second washer on the adjacent metal sheet and including at least one recess such that the recess together with the said last-named second washer of the adjacent metal sheet forms a channel for conveying electrolyte from the central well to the said gap upon activation of the battery and wherein the recess is so shaped that the channel follows a path which is oblique to the local radial direction of the central hole of said first named washer.

4,049,889

HERMETICALLY SEALED ALKALI METAL BATTERY CONTAINER

Walter K. Heintz, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sept. 1, 1976, Ser. No. 719,881
Int. Cl.² H01M 2/02
U.S. Cl. 429—174 **4 Claims**

1. A hermetically sealed alkali metal battery container comprising:

a ceramic ring having top and bottom surfaces;

an inner casing of a solid alkali ion-conductive material with one open end;

a glass seal sealing said inner casing adjacent its open end to said ceramic ring so that said inner casing extends downwardly from the bottom surface of said ceramic ring;

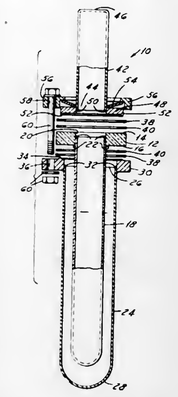
a first outer casing with an open end and a closed end, said outer casing surrounding said inner casing and spaced therefrom;

a first ring encircling and bonded to said open end of said first outer casing, said ring (a) having a raised annular ridge encircling said open end of said first outer casing, (b) having at least a pair of openings for receiving bolts therethrough, and (c) being adjacent said bottom surface of said ceramic ring;

a first pair of thin washers positioned between said raised annular ridge of said first ring and said bottom surface of said ceramic ring, said washer adjacent said first ring having a coefficient of thermal expansion closely matching that of said first ring and said washer adjacent said ceramic ring having a coefficient of thermal expansion closely matching that of said ceramic ring;

a second outer casing with an open end and a closed end;

a second ring encircling and bonded to said open end of said second outer casing, said second ring (a) having a raised



annular ridge encircling said open end of said second outer casing, and (b) being adjacent said top surface of said ceramic ring, whereby said second outer casing is spaced from and extends in an opposite direction to said first outer casing;

a second pair of thin washers positioned between said raised annular ridge of said second ring and said top surface of said ceramic ring, said washer adjacent said second ring having a coefficient of thermal expansion closely matching that of said second ring and said washer adjacent said ceramic having a coefficient of thermal expansion closely matching that of said ceramic ring;

a Belleville spring encircling said second outer casing and engaging an upper surface of said second ring;

a third ring encircling said second outer casing and both (a) engaging an upper edge of said Belleville spring, and (b) having at least a pair of spaced openings aligned with said openings of said first ring for receiving bolts therethrough; and

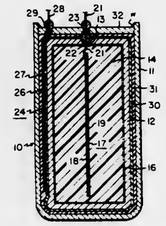
at least a pair of nut and bolt assemblies extending through said openings in said first and said third rings and securely tightened together to draw said annular ridges on said first and said second rings tightly into engagement with said first and said second pair of washers to provide a hermetically sealed alkali metal battery container.

4,049,890

LITHIUM-IODINE CELLS AND METHOD FOR MAKING SAME

Alan A. Schneider, Reisters Town, Md., assignor to Catalyst Research Corporation, Baltimore, Md.

Continuation of Ser. No. 564,755, April 3, 1975, abandoned. This application July 26, 1976, Ser. No. 708,915
Int. Cl.² H01M 6/18
U.S. Cl. 429—181 **4 Claims**



1. A lithium iodine primary cell comprising a lithium anode encasing member, a cathode material positioned within and filling said anode encasing member and consisting essentially of an organic charge transfer complex and iodine; a cathode current collector having a lead portion coated with an insulating material, said insulated portion extending from said collector to a first terminal and being embedded within a portion of the anode encasing member; a lithium iodine electrolyte coextensively positioned between and in contact with the entire inner surface of said anode encasing member and said cathode material; an anode current collector; and first and second terminals, said first terminal being in electrical contact with said cathode lead and said second terminal being in electrical contact with said anode current collector.

4,049,891

COMPOSITIONS FOR FAST ALKALI-METAL-ION TRANSPORT

Henry Y-P Hong, Westford, and John B. Goodenough, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed June 21, 1976, Ser. No. 697,803
Int. Cl.² H01M 12/00; C01B 15/16, 33/32
U.S. Cl. 429—193 **8 Claims**

1. A crystalline compound which promotes fast alkali metal-ion transport in three dimensions having the formula selected from the group consisting of:

$$A_nX_2(ZO_4)_3$$

and

$$A_m(Z'_2O_4)_3$$

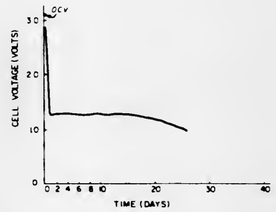
wherein A is potassium, sodium or lithium, Z is a tetrahedrally coordinated cations or mixtures thereof not reducible by molten alkali metal, X is an octahedrally coordinated cation or mixtues thereof not reducible by molten alkali metal, n is a number greater than 1 and less than 4, m is a number from 1 up to 2 and Z' comprises at least two Z cations.

4,049,892

NON-AQUEOUS CELL HAVING AS CATHODE A MIXTURE OF LEAD DIOXIDE AND LEAD MONOXIDE AND/OR LEAD PARTICLES

Marvin Lee Kronenberg, Cleveland Heights, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,362
Int. Cl.² H01M 6/14
U.S. Cl. 429—194 **30 Claims**



1. A lead oxide cell comprising a highly active metal negative electrode, a positive electrode and a non-aqueous electrolyte comprising a salt dissolved in an organic solvent; said positive electrode comprising a substantially uniform mixture of lead dioxide and lead monoxide and said cell having a substantially unipotential discharge voltage.

12. A lead oxide cell comprising a highly active metal negative electrode, a positive electrode and a non-aqueous electrolyte comprising a salt dissolved in an organic solvent; said positive electrode comprising a substantially uniform mixture of lead dioxide and lead particles and said cell having a substantially unipotential discharge voltage.

22. A lead oxide cell comprising a highly active metal negative electrode, a positive electrode and a non-aqueous electrolyte comprising a salt dissolved in an organic solvent; said positive electrode comprising a substantially uniform mixture of lead dioxide, lead monoxide and lead particles; and said cell having a substantially unipotential discharge voltage.

4,049,893

HYDROGENATED WAXY OLEFIN AND PROCESS OF MAKING SAME

Louis E. Kidwell, Jr., Shreveport, La., assignor to Pennzoil Company, Houston, Tex.

Filed Apr. 25, 1975, Ser. No. 571,613
Int. Cl.² C08F 8/04
U.S. Cl. 526—26 **21 Claims**

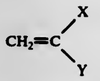
1. A process for the hydrogenation of waxy polyethylene olefins comprising reacting (a) a feed stock consisting of said waxy polyethylene alpha olefins, said alpha olefins having an average molecular weight in the range of 350 to 900, a normal straight chain hydrocarbon content of at least 45% and having at least 22 carbon atoms in at least 95% of the molecules of said alpha olefins with (b) a hydrogen affording gas in an amount sufficient to supply at least a stoichiometrical quantity of hydrogen to said feed stock by contacting said feed stock with said hydrogen-affording gas at pressures ranging from about 200 psig to about 1000 psig at hydrogenation temperatures below about 750° F in the presence of an active hydrogen catalyst.

4,049,894
LATEX MODIFIED PORTLAND CEMENT AND USE THEREOF IN POLYMERIZATION REACTORS

Richard Harold Backderf, Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 25, 1975, Ser. No. 607,628
Int. Cl.² C08F 2/18, 14/06, 14/08
U.S. Cl. 526—62 12 Claims

1. In the aqueous polymerizatin of vinyl halide monomers having the structural formula



where X is chlorine and Y is chlorine or hydrogen, in a polymerization vessel wherein there are areas of excessive polymer build up on the surfaces and fixtures in said vessel exposed to the suspension during said polymerization, the improvement comprising coating said areas of excessive polymer build up prior to the polymerization reaction with a composition comprising portland cement and an aqueous dispersion containing up to about 65 weight percent of a polymer containing about 0.1 to 25 weight percent carbonyl groups and having a Tg° C. of less than 40° C., said polymer present in said composition in an amount less than about 10 weight parts per 100 weight parts of said composition.

4,049,895
REACTOR AND PROCESS FOR VINYL CHLORIDE POLYMERIZATION

Malcolm Peter McOnie, St. Albans, England; Anthony John Philip Tucker, Johannesburg, and Peter Willem van Lienden, Kempton Park, both of South Africa, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 2, 1976, Ser. No. 710,882
Claims priority, application United Kingdom, Aug. 26, 1975, 35207/75; July 12, 1976, 28842/76
Int. Cl.² C08F 2/18, 14/06
U.S. Cl. 526—62 6 Claims

1. A process for the production of a vinyl chloride polymer wherein vinyl chloride is homopolymerised or copolymerised in aqueous dispersion in a reactor having inside at least one polished surface provided by a layer constructed from a Cr/Ni stainless steel of Cr content 13–30 wt % and Ni content 20–35 wt %.

4,049,896
OLEFIN POLYMERIZATION CATALYST

Louis J. Rekers, Wyoming; Stanley J. Katzen, and Jerome H. Krekeler, both of Cincinnati, all of Ohio, assignors to National Petro Chemicals Corporation, New York, N.Y.

Division of Ser. No. 558,504, March 14, 1975, Pat. No. 3,984,351. This application Aug. 20, 1976, Ser. No. 716,038
Int. Cl.² C08F 4/78, 10/00
U.S. Cl. 526—129 3 Claims

1. A process for the polymerization of olefins which comprises contacting said olefins with the catalyst system comprising:

a. a solid inorganic support material having surface hydroxyl groups,
b. a chromium containing compound deposited on said support, said chromium containing compound being capable of reacting with said surface hydroxyl groups, and
c. an aluminum compound deposited on said support, said aluminum compound being capable of reacting with said surface hydroxyl groups,

said supported chromium containing compound and aluminum compound having been heated in a non-reducing atmosphere at a temperature above 300° C. up to the decomposition temperature of the support material and combined with a metallic or non-metallic reducing agent.

4,049,897
RESIDUAL SOLVENT REMOVAL FROM CHLORINATED POLYMERS

Ralph John Gilbert Housley, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 13, 1976, Ser. No. 731,936
Claims priority, application United Kingdom, Nov. 7, 1975, 46207/75
Int. Cl.² C08C 3/02, 19/12; C08F 6/00
U.S. Cl. 528—483 6 Claims

1. A process for at least partly removing residual chlorinated hydrocarbon solvent from a chlorinated polymer obtained by precipitation from the said solvent, which process comprises treatment of the chlorinated polymer with the vapour of an aliphatic halo-hydrocarbon having a boiling point below that of the chlorinated hydrocarbon to be removed, the said treatment being carried out at a temperature of at least 10° C and which is at least 10° C above the boiling point of the halo-hydrocarbon employed in the treatment.

4,049,898
AMPHOTERICIN COMPLEXES CONTAINING OXALIC ACID AND CALCIUM

Julio Metzger, East Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

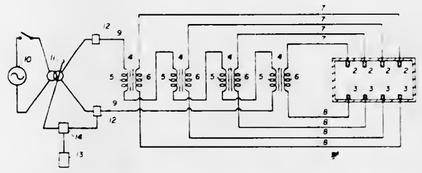
Continuation-in-part of Ser. No. 338,122, March 5, 1973, abandoned, which is a division of Ser. No. 203,037, Nov. 29, 1971, abandoned. This application Mar. 3, 1975, Ser. No. 555,015
Int. Cl.² C07H 17/08
U.S. Cl. 536—17 4 Claims

1. A crystalline amphotericin B complex comprising about 1 mol of amphotericin B, from about 0.5 to about 20 mols of an anion of oxalic acid, and from about 0.2 to about 0.8 mol calcium ion, the complex having a solubility in water at pH 2 of 3.44 g/l, an infrared absorption band at 6.1–6.3 microns, and an E_1^1 U. V. absorption value of 1500 at 405 millimicrons.

4,049,899
APPARATUS FOR UNIFORMLY HEATING MOLTEN GLASS

Hiroshi Shimizu, Moriyama; Jun Nishidai, Kyoto, and Toru Yasuta, Kusatsu, all of Japan, assignors to Nippon Electric Glass Company, Limited, Shiga, Japan

Filed June 14, 1976, Ser. No. 695,644
Claims priority, application Japan, June 17, 1975, 50-72698
Int. Cl.² C03B 5/02
U.S. Cl. 13—6 3 Claims



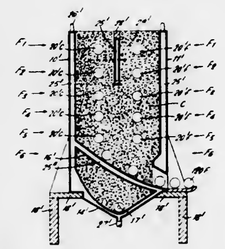
1. An apparatus for uniformly heating a material having an electrical resistance decreasing with an increase in the temperature of the material, which comprises

1. a container for the material,
2. a plurality of pairs of associated electrodes mounted in the container for passing an electric current between the electrodes of each pair and through the material in the container, and
3. a source of the electric current connected to each pair of electrodes, the current source including
   a. a like plurality of transformers each having a primary winding and a secondary winding, and
   b. a source of electric power, the primary windings being connected in series to the electric power source and each of the secondary windings being connected to an associated one of the pairs of electrodes whereby the transformers feed and control the electric current delivered to the pairs of electrodes to equalize the current regardless of electrical resistance variations in the material between the electrodes.

4,049,900
CONTINUOUS GRAPHITIZING FURNACE WITH A VERTICAL DISPLACEMENT OF THE CHARGE

Jean Louis Génevois, Milan, and Rolando Bufarale, Narni Scalo, both of Italy, assignors to Elettrocarbonium S.p.A., Milan, Italy

Filed May 26, 1976, Ser. No. 690,178
Claims priority, application Italy, May 26, 1975, 49789/75
Int. Cl.² H05B 3/60
U.S. Cl. 13—7 10 Claims

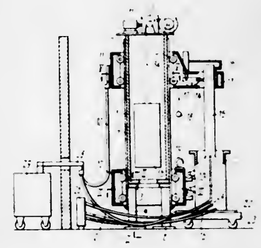


1. Continuous graphitizing furnace for carbon electrodes with vertical charge displacement, wherein the charge is formed by granulated insulating material and the electrodes to be graphitized comprising; an elongated hollow furnace body of a given deepness and defined by two side walls, two end walls and a concave bottom; a base for said body; a sloped grate crossing said hollow furnace body, having its upper part fixed to one wall of said defining walls and its lower part in the opposite wall; an exit opening formed along the entire base of said opposite wall; two head electrodes supported by the upper part of said end walls of the furnace; extracting means arranged in said concave bottom for extracting said granulated insulating material; and electrical connecting bars for electrically connecting the power transformer to said head electrodes.

4,049,901
ELECTROSLAG FURNACE

Andrei Grigorievich Pomeschikov, ulitsa Rimskogo-Korsa-kova, 10, kv. 2; Firs Alexandrovich Buryagin, ulitsa Nemirovicha-Danchenko, 18/1, kv. 39; Lev Seliverstovich Kazantsev, ulitsa Rimskogo-Korsa-kova, 11, kv. 69; Gennady Fedorovich Skvortsov, prospekt Karla Marxa, 25, kv. 26; Jury Anatolievich Naryshkin, ulitsa Bljukhera, 7, kv. 55, all of, Novosibirsk, and Zinaida Ivanovna Gracheva, oblasti, ulitsa Oktyabrskaya, 8, kv. 12, Voskresensk Moskovskoi, all of U.S.S.R.

Filed Feb. 23, 1976, Ser. No. 660,666
Int. Cl.² H05B 3/60
U.S. Cl. 13—9 ES 5 Claims



1. An electroslag furnace comprising: at least one pair of supports mounted on a foundation to provide a plurality of supports; a vertical column mounted on said supports substantially coaxially therewith, at least one pair of supports being spaced from each other on opposite sides of said vertical column to form a space under the same; guides secured to said supports and to said vertical column; a mould mounted on a bottom plate adjacent to said supports; an electrode holder mounted over said mould; an electrode holder carriage movable along said guides for displacing an electrode relative to said mould; a mould carriage movable along said guides along said supports; hoses of a cooling system extending in said space between said at least one pair of supports and below said column and connected to said mould and to said bottom plate; a plurality of current supply cables a number of which extend in said space between said at least one pair of supports and below said column and connected to the bottom plate and the balance of which are connected to said electrode holder carriage.

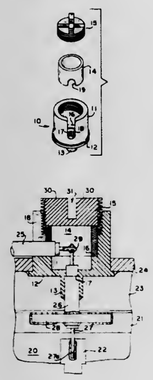
4,049,902
CONNECTOR FOR COAXIAL CABLES

Henry Marinus de Ronde, Lomita, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 24, 1975, Ser. No. 634,471
Int. Cl.² H01R 5/04; H05K 9/00
U.S. Cl. 174—35 C 9 Claims

8. Parts for forming an RF connector for connecting two coaxial cables, each cable having an external diameter of about 0.034 inch comprising

a cylindrical housing and threaded cap, said housing being open at one end and closed at the other by a base having a centered aperture of a diameter just sufficient to receive the inner conductor and insulation of one cable, said open end being internally threaded to receive said threaded cap, and said housing having a concentric extension of said base of an internal diameter just sufficient to receive the outer conductor of said one cable, said housing having an internal annular shoulder on said base and a slot through the side of the housing, said slot being longitudinally disposed and rounded at one end with a radius just half the diameter of the outer conductor of said other cable, said



shoulder being tangent to said rounded end of said slot, whereby said other cable may be inserted into said housing with its outer conductor resting on said shoulder, and a sleeve of outer diameter just small enough to permit it being inserted into said housing, said sleeve having a length less than the distance from said shoulder to the open end of said housing, said sleeve having an open slot at one end, said one end thus being adapted to be inserted into said housing over said other cable, said open slot being rounded with a radius just sufficient to fit over the outer conductor of said other cable, the depth of said slot being not greater than the outside diameter of said outer conductor of said other cable, whereby said other cable is held in place against said shoulder when said cap is screwed in over said sleeve.

4,049,903

CIRCUIT FILM STRIP AND MANUFACTURING METHOD

Robert James Kobler, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 517,124, Oct. 23, 1974, abandoned. This application Apr. 15, 1976, Ser. No. 677,184

Int. Cl.[2] H01B *13/00;* **H05K** *1/04*

U.S. Cl. 174—68.5 **4 Claims**

1. Circuit film strip means comprising:

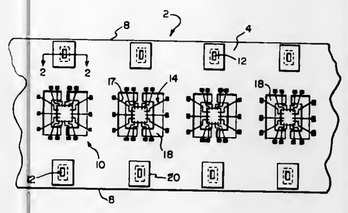
a continuous strip of insulating material, said strip having parallel side edges,

a row of spaced-apart punched holes in said strip extending along each of said side edges,

a layer of metal on one side of said strip in surrounding, and partially covering relationship to, each of said punched holes,

an etched sprocket hole in each of said layers of metal, each of said etched holes being centrally located over its associated punched hole and being smaller than its associated punched hole, and

repetitive spaced apart patterns of etched conductors between said side edges, said etched conductors and said etched sprocket holes having been formed in the same photo etching process by the use of a one mask means for said conductors and said sprocket holes so that each of



said patterns is in registry with at least two adjacent etched sprocket holes with the degree of precision of a photo resist printing and etching process whereby,

upon feeding said strip through a processing apparatus, each of said patterns will be located in said processing apparatus to the degree of precision of the photo resist printing and etching process.

4,049,904

PLASTIC LAMINATED METALLIC FOIL AND METHOD FOR PREPARING THE SAME

Yutaka Hori; Zenzo Honda; Kenji Suzuki; Keiji Nakamoto, and Yoshiharu Yamamoto, all of Toyohashi, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Division of Ser. No. 93,784, Nov. 30, 1970, abandoned. This application Oct. 24, 1972, Ser. No. 300,086

Claims priority, application Japan, Nov. 28, 1969, 44-95974; Jan. 30, 1970, 45-8637; Jan. 30, 1970, 45-8638

Int. Cl.[2] H01B *7/18;* **B32B** *7/02, 15/08*

U.S. Cl. 174—107 **26 Claims**

1. A plastic cable having a covering layer on the outside of its aggregated core and provided with a polyolefin jacket on the outer surface of the covering layer for the aggregated core, said covering layer comprising:

a. a metallic foil-plastic laminated film having adhered thereto a first layer comprising a ionomer of a base copolymer selected from the group consisting of ethylene-unsaturated carboxylic acid copolymers, ethylene-unsaturated carboxylic acid and ethylene-unsaturated carboxylic acid-unsaturated carboxylic acid ester ternary copolymers, on at least one side of a metallic foil and further having adhered a second layer comprising a polymer selected from the group consisting of ethylene-vinyl acetate copolymer or ethylene-unsaturated carboxylic acid ester copolymers, on the outside thereof, with the first layer being positioned between the metallic foil and the second layer.

4,049,905

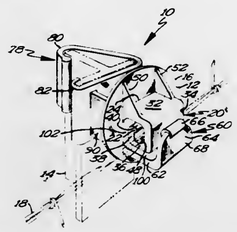
INSULATOR FOR ELECTRIC FENCES

Melvin C. Maranell, St. Bonifacius, Minn., assignor to Sta-Tite Corporation, St. Bonifacius, Minn.

Filed Mar. 29, 1976, Ser. No. 671,336

Int. Cl.[2] H01B *17/16;* **A01K** *3/00*

U.S. Cl. 174—163 F **9 Claims**



1. An insulator mountable on a fence post and capable of supporting and retaining an electrically conductive fence wire and withstanding repeated pushing and pulling on the fence wire by livestock without releasing the wire, comprising:

an insulator body formed of insulative material and including fence post mounting means for mounting said insulator body on the fence post;

said insulator body further including a face and an impact absorbing fence wire retaining hook fixed to and extending outwardly from the junction of said hook and said face and capable of receiving and retaining the fence wire therein, said hook being formed of elastically flexible material so as to be flexibly movable between a rest position adjacent said face and an extended position;

said insulator body further including a reinforcing member fixed to and extending outwardly from said face, said member being closely spaced from and confronting said wire retaining hook when said hook is in rest position and at least partially encompassing said hook;

said wire retaining hook contacting and bearing against said reinforcing member when said hook is in extended position and said hook and said reinforcing member cooperating to resist further movement of said hook toward said reinforcing member as force is applied to said hook by the wire when livestock exert force on the fence wires; and

said wire retaining hook having a generally spiral configuration and extending outwardly, cantileverly from said junction and then returning toward said junction, with the terminal end of said spiral configuration being closely spaced from said junction of said hook with said face.

4,049,906

MESSAGE NETWORK FOR THE TRANSMISSION OF DIGITAL TELEGRAMS WITH AN ADDRESS CONSISTING OF ROUTING WORDS

E. Hafner, Wohlen, and H. Mey, Kehrsatz, both of Switzerland, assignors to Hasler AG, Bern, Switzerland

Filed Apr. 21, 1976, Ser. No. 679,074

Claims priority, application Switzerland, Apr. 25, 1975, 5346/75

Int. Cl.[2] H04L *11/12;* **H04Q** *3/56*

U.S. Cl. 178—2 C **8 Claims**

1. A message network for the transmission of digital telegrams, comprising a plurality of switching stations **(101-109)** for the routing of said telegrams from any of said stations **(101)** on one of a plurality of selectable routes via any successive interconnected stations **(101, 102, 103, 104)**, to any desired station **(104)**, each of said telegrams including an address consisting of a logical stringing together of routing words (p,d,g,b) and said route being determined by the succession of the routing words of the address (*p/d/g/b*), in which in each station **(101-109)** each input line **(14,15,16)** is connected to an input store **(1,2)**, for each output line **(17,18,19)** an output store **(5,6)** is provided and a routing word (*i,a,d*) is assigned, the routing words (*i,a,d*) associated with the output lines **(17,18,19)** of one station **(104)** being different from each other, in each station **(101-109)** the outputs of the input stores **(1,2)** are each connected to one of the inputs of a multiplexer **(4)**, the inputs of the output stores **(5,6)** are connected to the output **(10)** of the multiplexer **(4)** and the output stores **(5,6)** are each connected to a comparator circuit **(7;67;68)** with a fixed value store **(7;68)**



in which the routing word (*i.a.d*) associated with the output line **(17,18,19)** of the output store **(5,6)** is stored, in such a way that upon correspondence of the routing word (*i,a,d*) in one of the fixed value stores **(7; 68)** with the routing word at a specific location of the address of the telegram in the associated output store **(5; 5.2)**, this telegram is transmittable onto the output line **(17,18,19)** thereof.

4,049,907

COMBINATION PHOTOGRAPHING AND PROMPTING SYSTEMS

James William Damon, P.O. Box 282, Bonner Springs, Kans. 66012

Filed Dec. 26, 1972, Ser. No. 318,597

Int. Cl.[2] H04N *5/645*

U.S. Cl. 358—185 **4 Claims**



1. A combination photographing and prompting system for a performer including:

a pan-tilt head thereon,

a motion picture or television camera mounted on said pan-tilt head,

a prompter visual-information — displaying device unit mounted on said camera pan-tilt head combination, the screen of said prompter facing forwardly and disposed above the camera's lens,

an image-reflecting periscope-like, two mirror system secured to said camera pan-tilt head combination, a transparent mirror or reflective transparent sheet of said system being disposed in front of said camera's lens at a substantial angle relative to the longitudinal axis thereof, the reflective surface used of said mirror facing away from

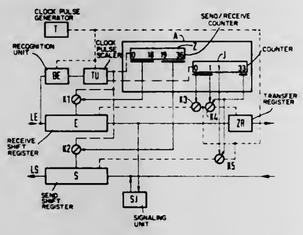
said lens, a second mirror or the like of said system secured to said camera pan-tilt head combination and disposed in front of the screen of said prompter at a substantial angle relative thereto, substantially parallel to the first mirror in substantial spaced relationship thereto, the reflective surface used of said second mirror facing and prompter screen and the first said mirror reflecting information exhibited thereon onto the said first transparent mirror which relfects said information in a direction about parallel to the longitudinal axis of said lens toward a performer's position in front of said camera, whereby said performer may see said information while appearing to be looking toward the direction of the camera lens and hence toward the viewing audience, said camera photographing said performer through said first transparent mirror, a mounting means secured to said mirrors and holding said mirrors disposed in spaced relationship to each other.

4,049,908

METHOD AND APPARATUS FOR DIGITAL DATA TRANSMISSION

Eberhard Knorpp, Gauting, Germany, and Silvian Schaffer, Dat-Yam, Israel, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 2, 1976, Ser. No. 673,344
Claims priority, application Germany, Apr. 14, 1975, 2516192
Int. Cl.² H04L *5/14*
U.S. Cl. 178—58 R **3 Claims**



1. A method of transmitting digital data in a time division multiplex (TDM) telecommunication system between subscriber stations and a concentrator connected to said subscriber stations by means of two-wire lines operating on a four-wire basis, wherein said digital data is coupled through time hybrid circuits at said subscriber stations and through a time hybrid circuit at said concentrator, comprising the steps of:

generating synchronizing pulses in said concentrator and communicating said synchronizing pulses to said concentrator time hybrid circuit,

initiating a send mode in said concentrator time hybrid circuit responsive to a said synchronizing pulse,

transmitting data signals from said concentrator to said subscriber stations,

initiating a send mode in said subscriber station concentrators responsive to reception of said data signals and to a predetermined characteristic of said data signals,

interposing receive pauses between each send mode and the subsequent receive mode in said concentrator time hybrid circuit and said subscriber station time hybrid circuits, each said receive pause having a duration equal to the maximum expected transit time for transmission over a said two-wire line between said concentrator and a said subscriber station, and

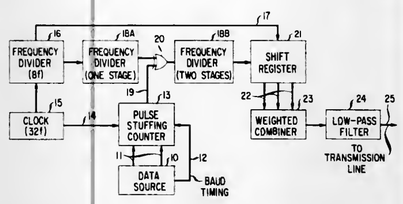
producing send pauses in said subscriber station hybrid circuits and inserting them between receive modes and subsequent send modes, said send pauses ending, at the earliest, with the appearance of said receive pauses in said concentrator time hybrid circuit.

4,049,909

DIGITAL MODULATOR

Richard John Peck, Eatontown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 29, 1975, Ser. No. 626,657
Int. Cl.² H04L *27/24*
U.S. Cl. 178—67 **7 Claims**



1. A modulator for differentially phase-encoded digital data comprising

multistage binary countdown means having an input wave oscillating at an integral multiple of a desired carrier frequency and an output wave at said carrier frequency,

multistage shift-register means driven by said output wave and shifted by said input wave from said countdown means,

weighting means for combining a plurality of successive parallel outputs of said shift register means into quantized line signals at the desired carrier frequency, and

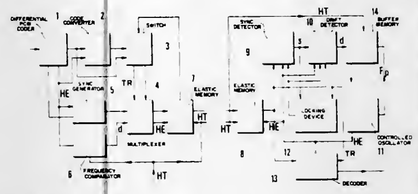
count inserting means responsive to the digital data for inserting extra counts into one or more preselected stages of said countdown means in accordance with a predetermined phase-shift data encoding.

4,049,910

DIGITAL SIGNAL TRANSMISSION SYSTEM

Jean-Claude Jolivet, Saint-Michel-en-Greve, and Francois-Xavier Stouls, Perros Guirec, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Mar. 30, 1976, Ser. No. 671,824
Claims priority, application France, Apr. 18, 1975, 75.12179
Int. Cl.² H04L *7/04*
U.S. Cl. 178—69.1 **2 Claims**



1. A transmission system of the kind for transmitting and receiving digital signals over a transmission line, said system comprising: for transmission, a code converter for coding said signals into variable length words according to their occurrence probabilities, the word rate being determined by an emission clock for establishing an emission frequency, a synchronising word generator operating at a frequency bound to said emission frequency, means for multiplexing words from the code converter and the synchronising word generator forming variable length words, and a first elastic memory connected between said multiplexing means and said transmission line, and for reception, a second elastic memory connected to said transmission line, reading on transmission and writing on reception being carried out at a rate determined by a transmission clock, means for detecting synchronising words at the output of said second elastic memory and a decoder for deriving digital signals from said variable length words from said second elastic memory, said system for transmission further comprising, for transmission, means for supplying to said multiplexing means a signal representative to the drift of said emission frequency with respect to a frequency bound to said transmission frequency, and, for reception, a controlled oscillator supplying a timing signal for reading said reception memory, means for detecting said signal representative of the drift, said means for detecting said signal being controlled by said means for detecting synchronising words;

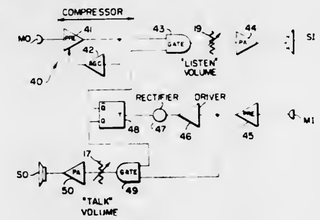
and means for recovering said emission frequency from said drift and said frequency bound to the transmission frequency, said recover means controlling said oscillator.

4,049,911

TALK-THROUGH UNIT WITH VOICE CONTROLLED SWITCHING WITH TURN OFF DELAY VARIABLE FROM 250-500 MILLISECONDS DEPENDING ON VOICE AMPLITUDE

Norman Schlaff, Brooklyn, and Mario Maltese, Williston Park, both of N.Y., assignors to Norcon Electronics Inc., Brooklyn, N.Y.

Filed Jan. 6, 1976, Ser. No. 646,918
Int. Cl.² H04M *9/10*
U.S. Cl. 179—1 H **4 Claims**



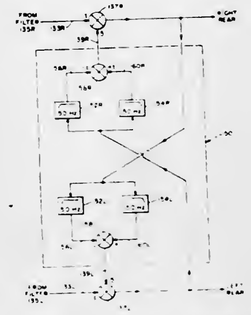
1. A self-contained, talk-through unit comprising a housing adapted for mounting on a partition, a first speaker and a first microphone contained in said housing and facing in a first direction, a second speaker and a second microphone contained in said housing and facing in an opposite direction, said housing including connecting means extending in said opposite direction with said second microphone being mounted at the end thereof at least several inches away from said second speaker, first amplifying means contained in said housing for amplifying a signal at said first microphone and for driving said second speaker, said first amplifying means including level-compression means for reducing variations in the output level of said second speaker in the presence of voice level variations in the vicinity of said first microphone, second amplifying means contained in said housing for amplifying a signal at said second microphone and for driving said first speaker, control means contained in said housing for normally enabling said first amplifying means and disabling said second amplifying means, sensing means contained in said housing responsive to the signal at said second microphone exceeding a pre-set threshold level for disabling said first amplifying means and for enabling said second amplifying means, means for holding said second amplifying means enabled and for holding said first amplifying means disabled for a fraction of a second ranging from 250 to 500 milliseconds even after the signal at said second microphone drops below said pre-set threshold level, said fraction of a second being proportional to the signal level at said second microphone during the operation of said sensing means, and battery means contained in said housing for powering said first and second amplifying means, said control means and said sensing means.

4,049,912

CHANNEL MIXER FOR MULTI-CHANNEL AUDIO SYSTEMS

Peter W. Mitchell, Charlestown, Mass., assignor to Audio Pulse, Inc., Bedford, Mass.

Filed Apr. 26, 1976, Ser. No. 680,474
Int. Cl.² H04R *5/00*
U.S. Cl. 179—1 GQ **11 Claims**



11. A circuit for distributing the information in two input signals into two outputs comprising:

first means responsive to at least a first one of said two input signals for providing a first output representation thereof in which signals in a predetermined range of frequencies are substantially inverted in phase with respect to other frequencies in said first output representation;

second means responsive to at least a second one of said two input signals for providing a second output representation in which signals in a predetermined range of frequencies are substantially inverted in phase with respect to other frequencies in said second output representation;

means for combining said first output representation with said second input signal to provide one of said two outputs;

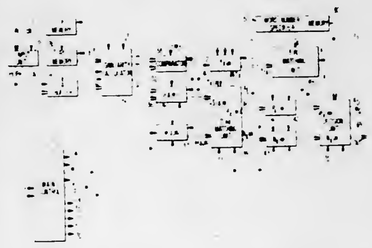
means for combining said second output representation into said first input signal to provide the other of said two outputs.

4,049,913

SYSTEM FOR RECOGNIZING SPEECH CONTINUOUSLY SPOKEN WITH NUMBER OF WORD OR WORDS PRESELECTED

Hiroaki Sakoe, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Nov. 1, 1976, Ser. No. 737,454
Claims priority, application Japan, Oct. 31, 1975, 50-132004; Feb. 20, 1976, 51-18346
Int. Cl.² G10L *1/00*
U.S. Cl. 179—1 SD **6 Claims**



1. In a continuous speech recognition system comprising an

input pattern buffer memory for temporarily memorizing an input pattern A represented by a time sequence of input pattern feature vectors a_i, I in number, as:

$$A = a_1, a_2, \ldots, a_i, \ldots, a_I,$$

said input pattern being representative of a first predetermined number k of continuously spoken words, said first predetermined number being equal at least to unity; a reference pattern memory for memorizing reference patterns B^n representative of a second predetermined number of words n, each reference pattern being represented by a time sequence of referene pattern feature vectors b_j^n, J^n in number, as:

$$B^n = b_1^n, b_2^n, \ldots, b_j^n, \ldots, b_{J^n}^n:$$

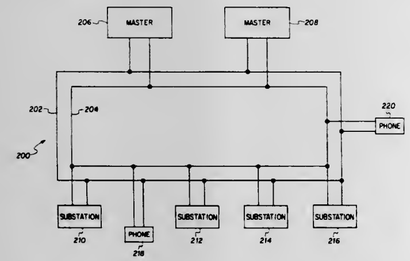
and means responsive to said input and reference pattern feature vectors for recognizing said input pattern to be a concatenation of the reference patterns, k in number; the improvment wherein said means comprises a word number specifier for specifying the number K of words of said input pattern, said word number K being preselected for a predetermined duration to be equal at least to unity with reference to said first predetermined number; and recognition means responsive to said word number K and said input and reference pattern feature vectors for deciding said concatenation.

4,049,914

FREQUENCY DIVISION MULTIPLEX VOICE COMMUNICATION APPARATUS WITH HIERARCHY OF STATIONS

Dean T. Anderson, Marion, and Joseph A. Vanous, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 30, 1976, Ser. No. 719,020
Int. Cl.² H04M 1/70
U.S. Cl. 179—2.5 R **5 Claims**



1. Communication apparatus comprising, in combination:

transmitting means, including output means, for providing at said output means both radio frequency carrier modulated communication signals and audio frequency signals, said transmitting means transmitting communication signals on a plurality of channels and supplying a signaling carrier on at least one of said channels only during periods of transmission of communication signals;

first receiving means for detecting only audio frequency signals;

second receiving means for detecting only carrier modulated signals;

a single communication link means connecting said first and second receiving means to said transmitting means; and

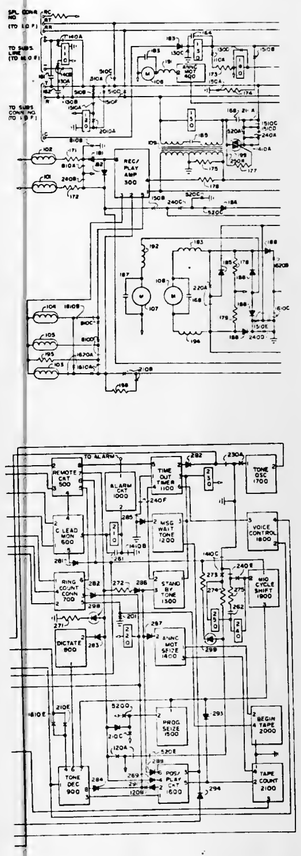
third receiving means, connected to said communication link, for detecting carrier modulated signals and for inhibiting operation thereof only during the time of receipt of said signaling carrier.

4,049,915

REMOTE ACCESS FOR CENTRALLY LOCATED ANSWERING AND RECORDING EQUIPMENT

Dean Wilson Danner, New Berlin, Wis., assignor to GTE Automatic Electric Laboratories Incorporated

Filed June 20, 1975, Ser. No. 589,156
Int. Cl.² H04M 1/64
U.S. Cl. 179—6 C **4 Claims**



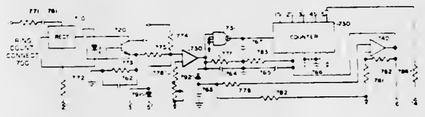
1. Telephone answering and recording apparatus, connected by means of first and second lines to a telephone switching system including signal generating means and serving a plurality of subscriber's subsets, each of said subsets including calling signal generating means, a first one of said subsets including circuit connections directly to said first line, a second one of said subsets connected to said second line through said switching means, and said telephone answering and recording apparatus including: a recording and playback medium connectible to either said first of said second line, adapted for playback of messages to said subscriber's subsets, ringing signal detection means connected to said first line and to said playback medium operable in response to ringing signals received from said switching system; remote access means including an optical isolator including an output circuit; a full wave rectifier connected between said second line and said optical isolator; and a relay including a coil having circuit connections to said optical isolator output and a plurality of circuit contacts connected to said first and to said second lines; said rectifier operated in response to said ringing signal to convert said ringing signal to to a direct current signal and said optical isolator operated in response to said direct current signal to operate said relay to disconnect said first telephone line from said ringing signal detection means and connect said second line to said ringing signal detection means; said ringing signal detection means operated in response to ringing signals received from said switching system over said second line to initially operate said playback medium and connect said medium to said second line whereby an announcement message is transmitted over said second line through said switching system to said second subscriber subset; calling signal detection means connected to said second line in response to operation of said remote access circuit and said ringing signal detection means; and in response to a calling signal generated at said second subset, said calling signal detection means operated to further operate said medium to transmit recorded messages over said second line, through said switching system to said second subscriber subset.

4,049,916

RING DETECTOR CIRCUIT FOR CENTRALLY LOCATED ANSWERING AND RECORDING EQUIPMENT

Dean Wilson Danner, New Berlin, Wis., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 20, 1975, Ser. No. 589,157
Int. Cl.² H04M 1/64
U.S. Cl. 179—6 C **7 Claims**



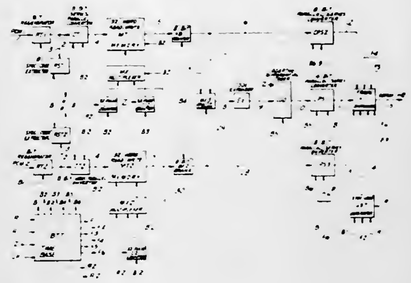
1. Telephone answering and recording apparatus, connected to a telephone switching system serving a plurality of subscribers and including ringing signal generating means, said telephone answering and recording apparatus including a playback medium connectible to said switching system and adapted for playback of announcement messages through said switching system to at least one of said subscribers, and ringing signal detection means connected to said switching system and to said playback medium, said ringing signal detection means comprising: an optical isolator including an input circuit connected to said switching system; counting means including a plurality of outputs, a predetermined one of said outputs connected to said playback medium; and a comparator circuit connected between said optical isolator and said counting means, and including a circuit connection to a source of reference potential; said optical isolator operated to conduct output signals to said comparator circuit in response to receipt of ringing signals generated in said switching system; said comparator circuit operated in response to each output signal from said optical isolator of higher potential than said connected reference potential, to transmit an advance signal to said counting means; said counting means advanced in response to each advance signal received from said comparator to provide an operate signal sequentially at each of said outputs, until an operate signal is transmitted over said predetermined output to said playback medium; said medium operated in response to said received operate signal to play back an announcement message through said switching system to at least one of said subscribers.

4,049,917

PCM TELECOMMUNICATION SYSTEM WITH MERGER OF TWO BIT STREAMS ALONG A COMMON SIGNAL PATH

Maurizio Copperi, and Luciano Nebbia, both of Turin, Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Apr. 23, 1976, Ser. No. 679,787
Claims priority, application Italy, Apr. 23, 1975, 68030/75
Int. Cl.² H04J 3/04
U.S. Cl. 179—15 AP **21 Claims**



5. A system for transmitting two groups of digitized message samples derived from voice signals, arriving simultaneously at a first terminal in the shape of two sets of $2n$-bit code words respectively forming part of recurrent frames in two original bit streams, to a second terminal via a common PCM signal path linking said terminals, comprising:

first transcoding means including an adaptive differential quantizer at said first terminal for converting $2n$-bit code words into substantially equivalent n-bit code words;

first circuit means at said first terminal for feeding the $2n$-bit code words from said original bit streams to said first transcoding means;

first synthesizing means at said first terminal connected to said first transcoding means for interleaving n-bit words derived from the $2n$-bit code words of said original bit streams in frames of a composite bit stream having the same length as the frames of said original bit streams, said first synthesizing means being coupled to said common signal path for transmitting said composite bit stream to said second terminal;

second transcoding means at said second terminal complementary to said first transcoding means for reconverting n-bit words into substantially equivalent $2n$-bit code words;

second circuit means at said second terminal coupled to said common signal path for feeding the n-bit code words of said composite bit stream to said second transcoding means for reconversion into $2n$-bit code words substantially corresponding to the $2n$-bit code words of said original bit streams;

second synthesizing means at said second terminal connected to said second transcoding means for assembling the reconverted $2n$-bit code words into frames forming part of two reconstituted bit streams substantially replicating said original bit streams;

a code expander in said first circuit means upstream of said differential quantizer; and

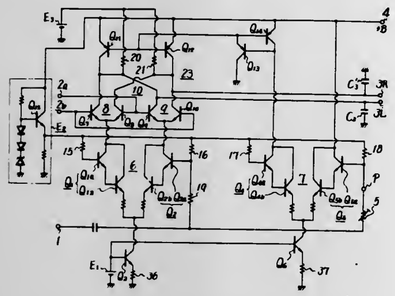
a complementary code compressor inserted between said second transcoding means and said second synthesizing means.

4,049,918

MPX STEREO SIGNAL DEMODULATOR

Misuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 8, 1976, Ser. No. 731,018
Claims priority, application Japan, Oct. 9, 1975, 50-122276; Oct. 10, 1975, 50-122008
Int. Cl.² H04H 5/00
U.S. Cl. 179—15 BT 11 Claims



1. An MPX stereo signal demodulator comprising:
A. a direct voltage source;
B. a first differential amplifier including at least a first pair of transistors and a common emitter impedance connected to a reference voltage point;
C. a second differential amplifier including at least a second pair of transistors with the emitters thereof connected to each other and to the collector of one of the transistors of said first differential amplifier;
D. a third differential amplifier including at least a third pair of transistors with the emitters thereof connected to each other and to the collector of the other transistor of said first differential amplifier;
E. coupling circuit means for coupling the collector of one of the transistors of said second differential amplifier to a first connection point comprising the collector of one of the transistors of said third differential amplifier and coupling the collector of the other transistor of said second differential amplifier to a second connection point comprising the collector of the other transistor of said third differential amplifier, respectively, said connection point comprising a pair of signal output terminals;
F. a fourth differential amplifier including at least a fourth pair of transistors and a common emitter impedance connected to the reference voltage point;
G. current mirror circuit means connected between said direct voltage source and collector circuits of said second, third and fourth differential amplifiers;
H. signal input means for applying a composite stereo signal to said first and fourth differential amplifiers and for applying a subcarrier signal to said second and third differential amplifiers, respectively; and
I. means for varying the composite signal levels applied to said first and fourth differential amplifiers, relatively, so as to adjust separatior. characteristics between the output signals at said signal output terminals.

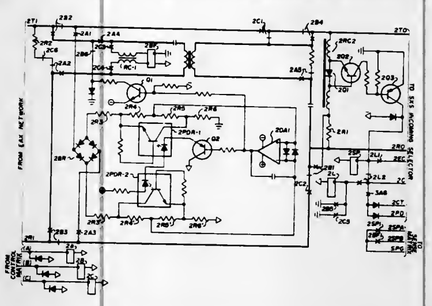
4,049,919

COMMUNICATION SYSTEM TRUNK CIRCUIT

John S. Young, Addison, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 3, 1976, Ser. No. 738,507
Int. Cl.² H04Q 3/18
U.S. Cl. 179—18 FA 6 Claims

1. An electronic sensing circuit for use with a telephone communication circuit of two-wire configuration and including off-hook and on-hook conditions, comprising: a first voltage divider network including a first and a second pair of series connected resistor elements having a mid-point connection between said pairs of series connected resistors and having one circuit end thereof connected to a first wire of said two-wire communication circuit and the other circuit end thereof connected to a voltage supply source, a second voltage divider network including another two pairs of series connected resistor elements having a mid-point connection between said pairs of series connected resistors and having one circuit end thereof connected to a second wire of said two-wire communication circuit and the other circuit end thereof connected to ground potential, and further including a first and a second connection respectively to the junction of each of said resistors of each said pair of resistors of said first voltage divider network to a



first shunting means and a third and fourth connection respectively to the junction of each of said resistors of each said pair of resistors of said second voltage divider network to a second shunting means, said mid-point connections being at the same voltage potential with said communication circuit in said on-hook condition and having a difference of voltage potential there-between with said communication circuit in said off-hook condition, and differential voltage detecting means connected between said mid-point connections for providing a first output signal during said on-hook condition and for detecting said voltage difference occurring with said off-hook condition of said communication circuit to provide a second output signal, and means responsive to said detecting means for operating said shunting means upon the detection of an on-hook condition after an off-hook condition to present a lower impedance to said communication circuit.

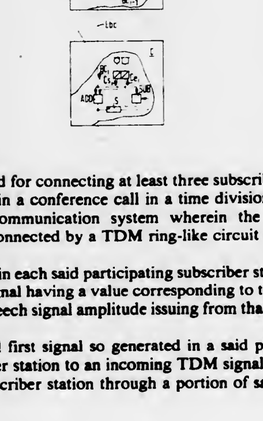
4,049,920

ANALOG SIGNAL SUMMING CONFERENCE CIRCUIT

Dieter John Henry Knollman, Arvada, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 18, 1976, Ser. No. 733,380
Int. Cl.² H04M 3/56
U.S. Cl. 179—18 BC 8 Claims

1. A conference circuit for establishing a simultaneous interchange of information among plural ports, each of which ports contains at least a first terminal for transmitting the analog information signal of a respectively associated conferee and at least a second terminal for receiving the combined analog information signals transmitted from the other ports, a portion of which combined analog information signals is retransmitted through such port to the first terminal thereof, the conference circuit comprising:
means for mixing signals from the first terminal of each of a plurality of the ports to produce a separate signal for the second terminal of each of a plurality of the ports, each port comprising with the mixing means and the other ports a different potentially oscillatory loop circuit, each of the separate signals comprising the algebraic sum of the analog information signals from the first terminal of each of a plurality of the ports in selectable phases and amplitude proportions so as to offset the retransmitted signals



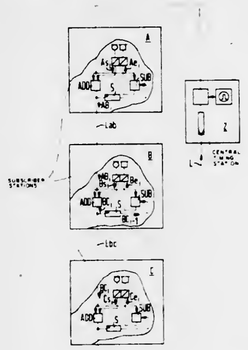
against one another to a sufficient degree to inhibit oscillations in each such loop circuit.

4,049,921

METHOD FOR FORMING A CONFERENCE CONNECTION IN A TIME DIVISION MULTIPLEX TELECOMMUNICATION SWITCHING SYSTEM

Eduard Zwack, Puchheim, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 18, 1975, Ser. No. 614,513
Claims priority, application Germany, Sept. 20, 1974, 2445129
Int. Cl.² H04M 3/56
U.S. Cl. 179—18 BC 3 Claims



1. A method for connecting at least three subscriber stations participating in a conference call in a time division multiplex (TDM) telecommunication system wherein the subscriber stations are connected by a TDM ring-like circuit comprising the steps of:
generating in each said participating subscriber station a first TDM signal having a value corresponding to the instantaneous speech signal amplitude issuing from that subscriber station,
adding said first signal so generated in a said participating subscriber station to an incoming TDM signal coupled to that subscriber station through a portion of said ring circuit cnnected thereto and to another said participating subscriber station to form a composite signal which is the sum of the values of said first signal and said incoming TDM signal, said incoming signal appearing in a time position allocated to the conference call,
transmitting said composite signal from said participating subscriber station wherein it is formed over another portion of said TDM ring circuit to a further subscriber station participating in the conference call,
storing said composite signal in said subscriber station where it is formed for the duration of a signal cycle through said TDM ring circuit,
subtracting a said stored composite signal from said incoming signal to produce a difference signal and
utilizing said difference signal in the said participating subscriber station where it is produced as providing the instantaneous values of the speech signal amplitudes issuing from the others of said participating subscriber stations, thereby providing the signal to be heard in said participating subscriber station.

4,049,922

SWITCHING ARRANGEMENT FOR TELECOMMUNICATION SWITCHING SYSTEMS

Justus König, Munich; Josef Röhrig, Oberhaching, and Friedrich Hilliges, Eichenau, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 22, 1976, Ser. No. 668,955
Claims priority, application Germany, Mar. 21, 1975, 2512551; Dec. 11, 1975, 2555860
Int. Cl.² H04M 3/22
U.S. Cl. 179—18 AB 4 Claims

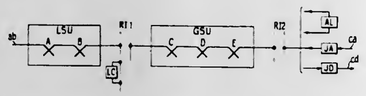


1. In a telecommunication switching system wherein each switching element which is idle is so indicated by an idle potential caused to appear at a test point by a seizing circuit of the switching element and the blocked condition is indicated by the absence of said idle potential, wherein the idle or blocked states of a switching element are determined by test switches in a test and seizing circuit in a preceding switching element that attempts to seize the switching element in question and wherein guarding of a blocked switching element is effected by applying a potential differing from said idle potential to the test and seizing circuit in the preceding switching element, the improvement comprising:
means for preventing seizure attempts on a said seizing circuit in a said switching element in the course of a connection release thereof comprising:
current monitoring means in said seizing circuit for sensing a decrease in the current flowing during the blocked condition of said switching element and
means responsive to an indication of a decrease in current flow from said monitoring means for opening said seizing circuit until said switching element is completely released.

4,049,923
SWITCHING NETWORK EMPLOYING AN IMPROVED INTERCONNECTION

Jean-Pierre André Dartois, Paris, France, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 402,767, Oct. 2, 1973, abandoned. This application Oct. 31, 1975, Ser. No. 627,578
Claims priority, application France, Oct. 27, 1972, 72.38126
Int. Cl.² H04Q *1/16*
U.S. Cl. 179—18 GE **4 Claims**

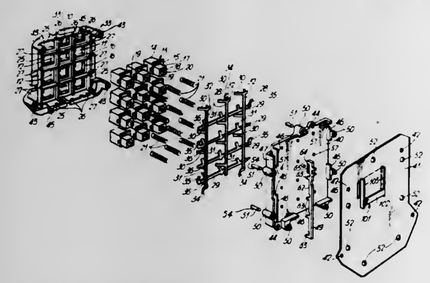


1. A multiple-stage automatic switching network in which each stage of the network comprises a plurality of matrices comprised of intersecting input and output conductors, and in which the network includes a multiple-stage line selection unit at one end of the network and a multiple-stage group selection unit at the other end thereof, an intermediate distributing frame for interconnection of output conductors of the final stage of said line unit and the input conductors of the first stage of said group selection unit, a first plurality of links across said distributing frame, said links being individually disposed between an output conductor of the final stage of said line unit and an input conductor of the first stage of said group selection unit for the processing of calls serially through the stages of said network, a plurality of loop circuits at said frame, each said loop circuit having connection through terminals at said intermediate distributing frame to two input conductors of the first stage of said group selection unit for the return of calls serially transmitted from the output conductors of the final stage of said group selection unit serially doubled back through the stages of said group selection unit, with said links and said loop circuits interspersed on said distributing frame.

4,049,924
PUSHBUTTON DIALS

Pak-Jong Chu, and Jacques Marcel Audette, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 20, 1976, Ser. No. 688,381
Int. Cl.² H04M *1/50*
U.S. Cl. 179—90 R **10 Claims**

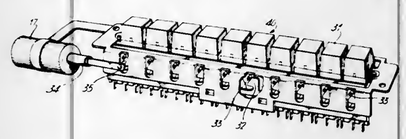


1. A pushbutton dial comprising:
a cover having a plurality of apertures therein, said apertures arranged in columns and rows;
a pushbutton in each aperture, each pushbutton having an upper portion, a base portion and a flange extending peripherally of the pushbutton at the junction of said upper and base portions, said upper portion a sliding fit in said aperture and guided thereby;
a series of longitudinal shafts pivotally supported on the back surface of the cover, a longitudinal shaft related to each column of apertures;
a series of transverse shafts pivotally supported on the back surface of the cover, a transverse shaft related to each row of apertures;
each of said longitudinal and transverse shafts having a plurality of levers positioned to be engaged by said flanges on said pushbuttons, a lever on a longitudinal shaft and a lever on a transverse shaft associated with each flange;
an extension on one end of each longitudinal shaft and each transverse shaft, said extensions alternating at said ends of said shafts;
a back member mounted on and spaced from the back surface of said cover;
spring means positioned between each pushbutton and said back member and biasing said pushbutton away from said back member, said flange limiting movement of said pushbutton away from said back member;
a plurality of bushes in said back member adjacent to the periphery thereof, a bush aligned with each of said extensions on said shafts;
a pin axially slidable in each bush, each pin in engagement at a forward end with one of said extensions on said shafts;
a circuit member mounted on and spaced from the back surface of said back member;
a plurality of pairs of spring contacts mounted on the back surface of said circuit member adjacent the periphery thereof, a pair of contacts associated with each bush and related pin;
said pins extending through holes in said circuit member, a rearward end of each pin in engagement with a contact of one of said pairs of spring contacts.

4,049,925
SOLENOID CIRCUIT FOR PUSHBUTTON RELEASE IN TELEPHONES

Graham Stirling Laing, and Shiro Tom Ito, both of London, Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed Dec. 8, 1975, Ser. No. 638,306
Int. Cl.² H04M *1/08*
U.S. Cl. 179—99 **5 Claims**

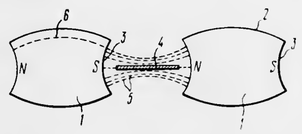


1. A pushbutton release circuit for a pushbutton telephone, comprising:
a plurality of pushbuttons in a key strip and including a common button release latch bar;
a first relay actuated by said pushbuttons;
a hold button;
a pushbutton release solenoid connected to said latch bar for actuation to release any depressed button;
a second relay for actuating said solenoid; and for connection and disconnection of tip and ring lines in said telephone;
a delay circuit for delaying actuation of said second relay until after actuation of said first relay;
means actuated by said hold button to connect said delay circuit into the release circuit;
actuation of said hold button connecting said delay circuit and releasing said first relay, the delay circuit energizing said second relay to actuate said solenoid after release of said first relay.

4,049,926
RIBBON LOUDSPEAKER ACHIEVES FOCUSING AND UNIFORMITY OF THE MAGNETIC FLUX IN THE WORKING GAP

Alexei Fedoseevich Kasatkin, ulitsa Pravdy, 7/9, kv. 42; Jury Vasilievich Smirnov, ulitsa Alabyana, 11, kv. 44, and Ilya Afanasievich Feldman, ulitsa Dubininskaya, 6, korpus 1, kv. 269, all of Moscow, U.S.S.R.

Filed Jan. 5, 1976, Ser. No. 646,546
Claims priority, application U.S.S.R., Jan. 14, 1975, 2090006
Int. Cl.² H04R *9/02*
U.S. Cl. 179—115 V **6 Claims**

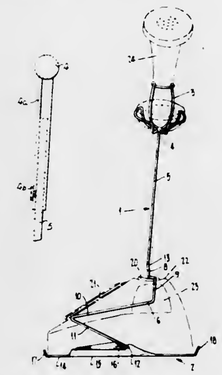


1. A ribbon loudspeaker comprising at least two permanent magnets together making up a magnetic system, said magnets being spaced from each other generally along an axis, each permanent magnet having a pair of generally convex opposing side surfaces spaced from said axis, and having a pair of generally concave opposing pole surfaces spaced from each other along said axis, the facing concave pole surfaces of two adjacent permanent magnets together defining a working gap; and a freely vibrating sound reproducing ribbon positioned in said working gap.

4,049,927
TELEPHONE HAND-SET HOLDING MEANS

Leslie Joseph Sutton, 46 Leonard Street, Frankston, Victoria, Australia (3199)

Filed May 11, 1976, Ser. No. 685,154
Claims priority, application Australia, May 16, 1975, 1633/75
Int. Cl.² H04M *1/12*
U.S. Cl. 179—150 **6 Claims**

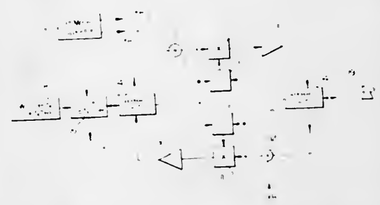


1. A telephone hand-set supporting device for supporting a hand-set, whereby listening and speaking can be effected without requiring the hand-set to be held by the user, said hand-set being usable with a telephone body having a cradle disposed at the upper part of said body for conventionally receiving said hand-set and switch hooks disposed near said cradle which when depressed permit the receipt of ringing signals and when released enable the transmission of outgoing and ingoing conversation signals, said telephone handset supporting device comprising a support member for receiving and supporting the hand-set at a point above the telephone body, and a base member for receiving said telephone body, the support member being pivoted on the base member at a point below said switch hooks, the support member being moveable from a first position to a second position, the support member bearing on the cradle of the telephone body in said first position thereby depressing the switch hooks so that the telephone is in a condition to receive said ringing signals, the support member not bearing on the cradle of the telephone body in said second position thus permitting the switch hooks to release, the telephone thereby being in a condition to enable said transmission of outgoing and incoming conversation signals, the base member being mountable under the base of the telephone body whereby when the support member is in the second position, the hand-set and hand-set supporting device is supported and maintained relative to the base of the telephone body and is of such a length as to be in a position adjacent to the mouth and ear of the telephone user, thereby leaving the user's hands free.

4,049,928
SELF-ADJUSTING VOICE FREQUENCY REPEATER

Israel Levi, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed June 30, 1976, Ser. No. 701,151
Int. Cl.² H04B *3/36*
U.S. Cl. 179—170 R **5 Claims**



1. A self-adjusting voice-frequency repeater for subscriber loops having ohmic resistances between two predetermined values comprising, in combination: means for dividing a control signal proportional to the loop resistance by a temperature-stable d-c reference signal; multiplying means responsive to the output of the dividing means for multiplying said output by an input signal of said repeater; and buffer means responsive to said multiplying means for providing an output signal of said repeater, whereby a temperature generated error of said multiplying means is substantially cancelled by an opposite, temperature generated error of said dividing means.

4,049,929
APPARATUS FOR REDUCING THE SUSCEPTIBILITY OF LINE SIGNAL REPEATERS TO INDUCED CURRENTS

Edward Thomas Ball, Coquitlam, Canada, assignor to GTE Lenkurt Electric (Canada) Ltd., Burnaby, Canada

Filed Dec. 16, 1976, Ser. No. 751,128
Int. Cl.² H04B *3/44*
U.S. Cl. 179—170 J **9 Claims**

1. In a telecommunication system having at least one signal repeater, apparatus for reducing the susceptibility of said repeater to induced currents in said signal line comprising:
an input circuit including first and second input terminals, said input circuit when coupled to said line receiving an input current having a DC and an induced AC component;
an output circuit including third and fourth output terminals, said output circuit when coupled to said repeater supplying load current thereto, said fourth terminal being common with said second terminal;

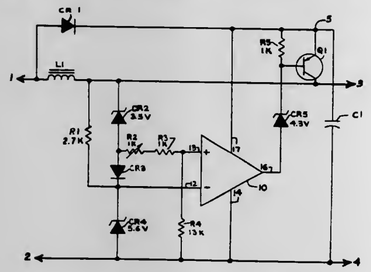
impedance means connected between said first and third terminals, said impedance means for receiving said input current and for supplying said load current and bias current;

a fifth terminal;

energy storage means connected across said fourth and fifth terminals;

rectifying means connected across said first and fifth terminals, said rectifying means being conductive when said DC and AC current components are of the same polarity and said means being nonconductive when said DC and AC current components have opposite polarity, said rectifying means thereby permitting said AC current component to charge said energy storage device when said DC and AC current components have the same polarity;

voltage regulating means connected across said fourth terminal and the junction of said impedance means and said



third terminal, said regulating means responding to said bias current to produce a constant voltage across said third and fourth terminals so long as said bias current exceeds a predetermined minimum, and causing said constant voltage to decrease when said bias current falls below said minimum, said regulating means also providing a control output signal indicative of any decrease in voltage across said regulating means; and

gating means connected across said third and fifth terminals and responsive to said control output signal, said gating means being non-conductive when said DC and AC input current components are of the same polarity and being conductive when said input current components are of opposite polarity, said means thereby controlling the rate of energy discharge from said energy storage means to said output circuit and causing the energy in said energy storage means to supplement said input current when said AC and DC current components are of opposite polarity.

4,049,930

HEARING AID MALFUNCTION DETECTION SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Roger L. Kessinger, Houston, Tex.

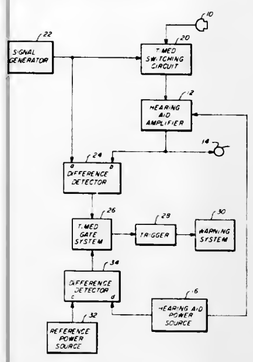
Filed Nov. 8, 1976, Ser. No. 739,914
Int. Cl.² G01R *25/00*
U.S. Cl. 179—175.1 A **28 Claims**

1. A system for detecting malfunctions in hearing aids by periodically applying a test signal at a first point of said hearing aid and comparing the resulting processed signal at a second point of said hearing aid with a reference signal comprising:

a. signal generation means for providing said test signal and said reference signal;

b. timed switching means for periodically applying said test signal at said first point of said hearing aid for a test time interval;

c. first difference detection means for comparing said processed signal with said reference signal to produce a first difference signal whose amplitude is a measure of difference between said processed signal and said reference signal; and



d. warning system means for indicating whenever said amplitude of said first difference signal exceeds a first value.

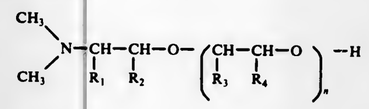
4,049,931

CATALYST SYSTEMS CONTAINING DIMETHYLAMINO ETHER MONO-OLS FOR POLYURETHANE FOAM FORMATION

Michael Ray Sandner, Chappaqua, N.Y., and Robert Donovan Duffy, Summersville, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 29, 1975, Ser. No. 581,745
Int. Cl.² B01J *27/24, 31/12*; C08G *18/18*
U.S. Cl. 260—2.5 AC **50 Claims**

1. A method for producing a cellular urethane polymer which comprises reacting and foaming a reaction mixture containing: (1) an organic polyol reactant comprising a polyether polyol having an average hydroxyl functionality of at least two; (2) an organic polyisocyanate reactant having an average isocyanato functionality of at least two; (3) a blowing agent; and (4) a catalytically effective amount of a catalyst system comprising from about 10 to about 95 weight percent of component (i) and from about 90 to about 5 weight percent of component (ii), said percentages being based on the combined total weight of components (i) and (ii) contained in the reaction mixture, where component (i) is at least one dimethylamino ether mono-ol and component (ii) is at least one other tertiary-amine different from component (i), said dimethylamino ether mono-ol having the formula,



wherein:

R_1 and R_2 each represents hydrogen, methyl or ethyl provided R_1 and R_2 cumulatively have no more than two carbon atoms;

R_3 and R_4 each represents hydrogen, methyl or ethyl provided R_3 and R_4 cumulatively have no more than two carbon atoms; and

n has an average value of at least one and no more than about five.

4,049,932

SAFETY DEVICE FOR A ROTARY STARTER SWITCH FOR AN AUTOMOBILE VEHICLE

Claude Jawdoszyn, Bois-Colombes, France, assignor to Neiman, S.A., Courbevole, France

Filed May 12, 1976, Ser. No. 685,472
Claims priority, application France, June 4, 1975, 75.17375
Int. Cl.² H01H *27/00*
U.S. Cl. 200—44 **7 Claims**



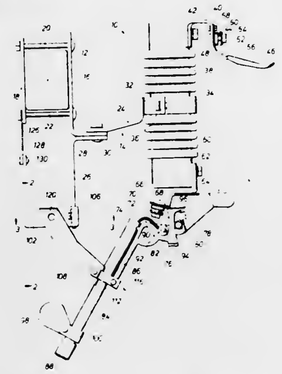
1. A safety device for a rotary starter switch comprising a rotatable part and a fixed part, said rotatable part being movable relative to said fixed part between an operative, starter operating position, and an inoperative, engine stopped, position, cam means on one of said parts and resilient follower means on the other of said parts, said follower means flexing during relative rotation of said parts to cooperate with said cam means, said cam means being effective to cause said follower means to follow a first path relative to said one of said parts as said rotatable part moves from said inoperative to said operative position, and a second path as said rotatable part moves from said operative to said inoperative position, and abutment means on said one part, cooperating with said follower means to preclude movement of said follower means on said second path to said operative position, said follower means comprising a spring blade, an edge region of said blade cooperating with said abutment means, and said blade being fixedly secured to the other of said parts.

4,049,933

ELECTRICAL SHORTING DEVICE

Jack R. Lovett, 1900 Irving, Orange, Tex. 77630

Filed July 18, 1975, Ser. No. 597,305
Int. Cl.² H01H *31/00*
U.S. Cl. 200—48 R **2 Claims**



1. A safety switch for an electrical transmission line and for assuring repairmen that said line is safely de-energized for enabling such repairmen to perform work upon such transmission line, said switch being adapted to be mounted relative to a utility pole for supporting said transmission line, the invention comprising:

a. An insulator for receiving said transmission line;

b. Said transmission line being formed of first and second conductors with said insulator being mounted therebetween;

c. Means mounted at each end of said insulator for electrically connecting said conductors with said insulator;

d. Grounding means mounted adjacent said insulator with the utility pole;

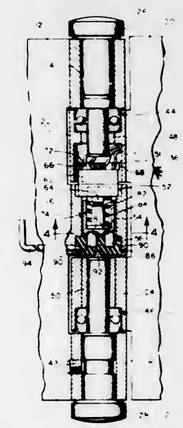
e. A conductor bar pivotally and electrically connected with one of said means for electrically connecting said insulator, said conductor bar being pivotal to a first position which electrically connects said conductors to each other to form said transmission line for conducting of electricity therethrough being pivotal to a second position for contact with said grounding means to completely ground said transmission line to enable workmen to safely repair and work on said transmission lines.

4,049,934

SECURITY HINGE HAVING ADJUSTABLE CAM OPERATOR AND RECIPROCABLE CAM FOLLOWER ACTUATED SWITCH

Robert L. Newlon, Sterling, Ill., assignor to Lawrence Brothers Inc., Sterling, Ill.

Filed July 30, 1976, Ser. No. 710,094
Int. Cl.² H01H *3/16*
U.S. Cl. 200—61.7 **12 Claims**



1. A hinge construction comprising first and second pivotally connected hinge leafs, each said leaf including means adapting same for attachment to a door or a door frame, or the like, each leaf further including at least one knuckle which is disposed adjacent to and is movable relative to the knuckle on the other of said leaves, an electrical circuit component carried by one of said knuckles, actuator means associated with said circuit component, and capable of producing a change in condition thereof, operating means carried by the other of said knuckles, such that upon movement of said hinge leaves relative to each other, said operating means will be moved relative to said circuit component and said actuator means to operate said actuator means and thereby produce a change in the condition of said electrical circuit component, which change in condition may be used as an indication of a change in the relative orientation of said hinge leaves, said actuator means comprising a movable plunger on said component for altering the condition thereof, and piston means non-rotatably mounted

with respect to said circuit component, but being movable axially with respect to said circuit component for engagement and operation of said plunger, said piston means including cam means on the end thereof remote from said circuit component, said operating means carried by the other of said hinge knuckles comprising a member adapted to be fixedly positioned with respect to said other knuckle for movement therewith relative to said circuit component and said piston means; said member including cam means formed thereon engageable with the cam means on piston means to produce axial movement thereof and operation of said plunger, as an incident to movement of said hinge leaves.

6. A hinge construction comprising first and second hinge leafs, each leaf including at least one hinge knuckle which knuckles are juxtaposed in the assembled condition, means for maintaining said hinge leaves in an assembled condition, and an electrical switch carried within one of said knuckles and including a plunger for the operation thereof, operating means carried within the other of said knuckles, and actuator means disposed between said operator means and said switch plunger, which actuator means is operatively and non-rotatably engaged with said switch, while being free to move axially to achieve movement of said plunger, and cam means carried by said operating means and said actuator means capable of producing axial movement of said plunger upon relative movement of said hinge leaves, as would be occasioned upon the opening or closing of a door, said switch, operating means and actuator means being entirely housed within said juxtaposed knuckles and thus being concealed from view when said hinge is in the assembled condition, said actuator means comprising piston means non-rotatably mounted with respect to said switch, but being movable axially with respect to said switch for engagement and operation of said plunger.

4,049,935

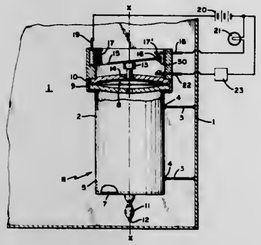
PRESSURE SWITCH WITH DIAPHRAGM

William Paul Gruber, Altadena, Calif., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation of Ser. No. 478,404, June 11, 1974, which is a continuation of Ser. No. 266,880, June 28, 1972. This application May 17, 1976, Ser. No. 686,864

Int. Cl.² H01H *35/34*

U.S. Cl. 200—83 P **8 Claims**



1. In a vehicle having an air cushion device for protection of an occupant in the vehicle, a pressure switch for energizing a signal device upon release of gas stored in a chamber for filling said air cushion device, said pressure switch disposed within a pressure chamber containing a gas having a pressure of P_2, said switch including a pressure vessel, said vessel sealed from gas communication with its surroundings, said vessel containing gas having a pressure of P_1, said pressure established as a result of the sealed vessel environment and the temperature of the environment, said vessel circumscribed by an end wall at one end thereof, side walls and closed at the second end by a flexible, generally convex diaphragm stable only in two positions, said diaphragm mounted in a chamber between apertured support members mounted in said switch and absent any external spring force on said diaphragm, said diaphragm biased in a preset first stable position and subjected to P_2 on one surface thereof and to P_1 on the surface thereof, said diaphragm assuming said first position under its own bias when P_2 does not exceed P_1 by a predetermined amount and snapping to the second stable position when P_2 does exceed P_1 by said amount, and switch means operatively associated with movement of said diaphragm for energizing said signal device when said diaphragm assumes said first position.

7. A pressure switch for energizing a signal device upon release of gas stored in a pressure chamber at a pressure of P_2, said switch including a pressure vessel, said vessel sealed from gas communication with its surroundings, said vessel containing gas having a pressure of P_1, said pressure established as a result of the sealed vessel environment and the temperature of the environment, said vessel circumscribed by an end wall at one end thereof, side walls and closed at the second end by a flexible, generally convex diaphragm stable only in two positions, said diaphragm mounted in a chamber between apertured support members mounted in said switch and absent any external spring force on said diaphragm, said diaphragm biased in a preset first stable position immediately adjacent the vessel and subjected to P_2 on one surface thereof and to P_1 on the other surface thereof, said diaphragm assuming said first position under its own bias and snapping to a second stable position moved away from said position immediately adjacent the vessel upon P_2 lessening a predetermined amount, and switch means operatively associated with movement of said diaphragm for energizing said signal device when said diaphragm assumes said first position.

4,049,936

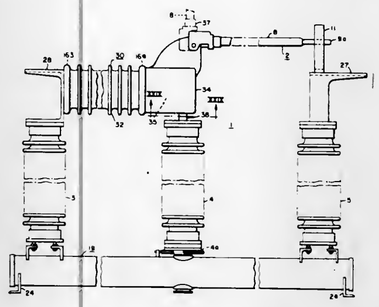
QUICK-ACTING MOVABLE OPERATING-COLUMN TRIPPING DEVICE

Russell E. Frink, Pittsburgh, and Stanislaw A. Milianowicz, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 468,332, May 8, 1974. This application Mar. 18, 1975, Ser. No. 559,465

Int. Cl.² H01H *33/12*

U.S. Cl. 200—146 R **12 Claims**



1. In combination, an electrical device including a circuit-interrupter and a serially-related disconnecting switch having a movable switchblade all at high voltage spaced away from ground potential, said circuit-interrupter having one or more separable contacts, operating means at high voltage for operating both the separable contacts and the switchblade contacts in synchronism, whereby the separable contacts open the electrical circuit passing through the device prior to the subsequent separation of the disconnecting switch contacts, only single rotatable insulating column means for supporting said device up in the air above ground potential, a relatively slow-acting operating mechanism disposed at ground potential, said single rotatable insulating column means rotatively transmitting during opening and closing rotative motions from said relatively slow-acting operating mechanism at ground potential to said high-voltage operating means, said separable contacts remaining open in the fully open-circuit position of the electrical device, the operating mechanism at high voltage functioning to close the disconnecting contacts during the closing operation prior to point of time to the subsequent closing of the separable contacts in the high-voltage circuit interrupter, said sole single rotatable insulating column means including two relatively-movable component parts disposed adjacent the base thereof, biasing means for urging relative motion between said two component parts, means latching said two component parts to remove together as a unit while under bias during rotation of the sole rotatable insulator, and tripping means at ground potential for releasing said latching means to permit the biasing means to effect relative motion of said two relatively-movable parts, whereby face-acting rotation of said single sole insulator column occurs and trip-operation of the circuit-interrupter contacts occurs independently of the relative slow motion of the grounded operating mechanism.

4,049,937

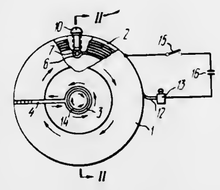
INDUCTOR FOR WORKING METALS BY PRESSURE OF PULSATING MAGNETIC FIELD

Lev Timofeevich Khimenko, poselok Pokotilovka, ulitsa Ulyanovskaya, 35, and Alfred Lvovich Shlyakht, ulitsa Dzerzhinskogo, 32, kv. 15, both of Kharkov, U.S.S.R.

Filed Mar. 8, 1976, Ser. No. 664,495

Int. Cl.² H05B *5/08*

U.S. Cl. 219—7.5 **2 Claims**



1. An inductor, for working metals by using the pressure of a pulsating magnetic field, comprising: a concentrator with a working opening to receive an article to be worked, a radial slot which connects the working opening with the outer surface of the concentrator, annular grooves provided on the outer surface of the concentrator, each annular groove receiving a flat helical section of a winding, and a bore provided in the body of said concentrator next to the annular grooves and parallel to the axis of said working opening; ribs of the concentrator disposed between said annular grooves; an electrically conducting rod tightly inserted in said bore and enveloped by the beginning of each said flat helical section of the winding; screws received in radial threaded holes provided in said ribs of the concentrator, the butt ends of said screws pressing upon said electrically conducting rod; and a collecting bus for parallel interconnection of said flat helical sections of the winding.

4,049,938

MICROWAVE OVEN

Akihiko Ueno, Higashiosaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

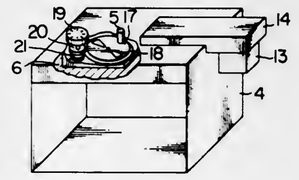
Filed May 11, 1976, Ser. No. 685,135

Claims priority, application Japan, May 17, 1975, 50-58853, Nov. 18, 1975, 50-139042

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 R **11 Claims**

1. A microwave oven comprising a heating cavity in an oven body, a high frequency wave generator for feeding high frequency waves into said heating cavity, radiation detecting means for sequentially detecting radiations from at least two points within said heating cavity, and control means for controlling said high frequency wave generator by signal from said radiation detecting means, said control means controlling



said high frequency wave generator by a signal from that one of said two points which is at relatively higher temperature.

4,049,939

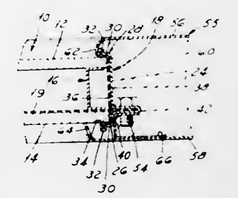
MICROWAVE AND RADIANT WINDOW FOR OVEN DOORS

Joseph W. Katona, Walled Lake, Mich., assignor to Mills Products, Inc., Farmington, Mich.

Filed Apr. 29, 1976, Ser. No. 681,456

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 D **12 Claims**



1. A self-contained window unit adapted to be assembled into an oven door having front and rear panels provided with aligned window openings therein, comprising a pair of glass panes, means for holding said glass panes in spaced parallel relation, said holding means comprising a frame of electrically conducting material extending about the peripheries of said glass panes and having a mounting flange, a microwave shield of electrically-conducting material parallel to said glass panes and having an edge portion held in surface-to-surface electrical contact with said flange, and means for securing said flange to one of said door panels to both mount said window unit and ground said microwave shield.

4,049,940

DEVICES AND METHODS OF USING HF WAVES TO ENERGIZE A COLUMN OF GAS ENCLOSED IN AN INSULATING CASING

Michel Moisan, Montreal, Canada; Philippe Leprince, Gif-sur-Yvette, France; Claude Beaudry, Laval, Canada, and Emile Bloyet, Gif-sur-Yvette, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed Oct. 30, 1975, Ser. No. 627,271

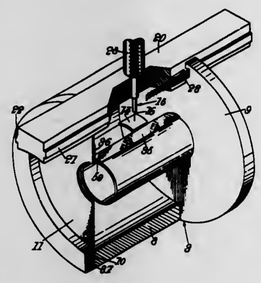
Claims priority, application France, Oct. 31, 1974, 74.36378

Int. Cl.² H05G *9/06*

U.S. Cl. 219—10.55 R **27 Claims**

1. An excitation device for energizing a column of gas enclosed in an insulating casing of elongated form, said device comprising, in combination: generator means for generating a high frequency periodic electrical field having a frequency of at least 100 megahertz and supply means for supplying a signal of said frequency to the said generator means, said generator means comprising a plasma energizing structure adapted to be disposed on a part of the length of the said elongated casing,

and constituting means for applying a said electrical field to the said column of a value such that, in the absence of a magnetic field, a plasma is generated over a certain length comprising



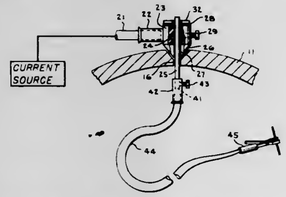
the said part of the length of the elongated casing and an additional length which follows on from said part of the length.

4,049,941

METHOD OF REPAIRING WELDED PIPE SECTIONS

Bennie V. Beatty, Houston, Tex., assignor to Lillie Evelyn Beatty, Houston, Tex.

Filed Apr. 14, 1976, Ser. No. 676,986
Int. Cl.² B23K 9/02
U.S. Cl. 219—61 **4 Claims**



1. A method of repairing welded pipe sections including passing current from outside welded sections of pipe to inside thereof, comprising the steps of:
   a. perforating the weld linking said sections;
   b. enlarging the perforation to a generally conically tapered configuration.
   c. connecting a current source to one end of an electrode;
   d. passing said electrode at least partially through said perforation; and
   e. electrically connecting the other end of said electrode to current utilizing means.

4,049,942

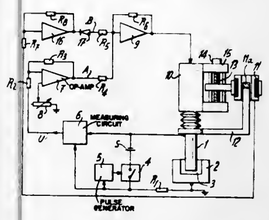
ELECTRIC DISCHARGE MACHINING METHOD AND DEVICE WITH PRESET ELECTRODE FEED

Francois Balleys, Vernier, and Jean Dupraz, Prilly, both of Switzerland, assignors to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed Mar. 19, 1976, Ser. No. 668,750
Claims priority, application Switzerland, Apr. 7, 1975, 4352/75
Int. Cl.² B23P 1/08
U.S. Cl. 219—69 M **7 Claims**

1. A method of machining by applying electrical pulses providing intermittent electrical discharges between an electrode and a workpiece while regulating their relative displacement to maintain a quantity characterizing the sparking conditions at a predetermined value, said method comprising reducing the rate of penetration of the electrode in the workpiece as a function of a quantity representing their relative position in a manner to prevent the electrode from penetrating in the workpiece beyond at least one predetermined final relative position while maintaining the electrical discharges, allowing the electrode and workpiece freedom to move relative to one another as a function of the sparking conditions up to said final relative position and stopping the relative motion of said electrode and workpiece upon reaching said final relative position while maintaining the electrical pulses across said electrode and workpiece.

4. An electrical discharge machining device comprising means for providing intermittent electrical discharges between an electrode and a workpiece, means for providing a first regulating quantity as a function of the difference between a



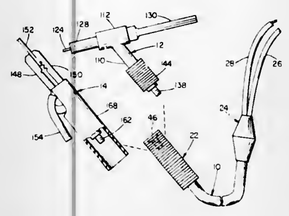
quantity characterizing the sparking conditions and a reference quantity, means for displacing the electrode and workpiece relative to one another as a function of said first regulating quantity, means for measuring the relative position of the electrode and workpiece, means for providing a second regulating quantity as a function of the difference between the measured relative position and at least one reference relative position, means for reducing the speed of relative displacement of the electrode and workpiece as a function of said second regulating quantity until said reference position is reached and means for stopping said relative displacement as soon as said reference position has been reached, while constantly allowing the electrode and workpiece to move relative to one another as a function of said first regulating quantity.

4,049,943

WELDING APPARATUS

Wayne F. Pratt, Plymouth, Mass., assignor to K.A.L. Manufacturing Corporation, Plymouth, Mass.

Filed Oct. 6, 1975, Ser. No. 619,690
Int. Cl.² B23K 9/32
U.S. Cl. 219—74 **7 Claims**



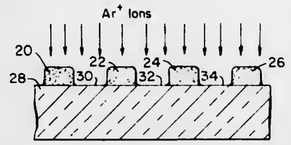
1. Welding apparatus comprising, in combination:
   a cable having a first electrical conductor and a first gas passage, said cable at one end having conductive cable coupling means, said cable coupling means connected to said first conductor and having a valved gas passage, including normally closed valve means, in communication with said first gas passage;
   a first welding torch adapted to hold a first electrode and having a gas outlet adjacent the position of said first electrode in said torch, said first torch having a second electrical conductor therewithin adapted for connection to said first electrode and a torch gas passage therewithin in communication with said gas outlet, and said first torch having conductive first torch coupling means, said first torch coupling means connected to said second conductor and having a torch coupling gas passage in communication with said second gas passage, said first torch coupling means adapted for selective electrically conductive connection to said cable coupling means with said torch coupling gas passage in communication with said valved gas passage, said first torch coupling means including means for opening said valve means with said first torch coupling means and said cable coupling means connected; and
   a second welding torch adapted to hold a second electrode, said torch having a third electrical conductor therewithin adapted for connection to said second electrode, and said second torch having conductive second torch coupling means connected to said third conductor, said second torch coupling means adapted for selective electrically conductive connection to said cable coupling means, said second torch coupling means adapted to maintain said valve means in said normally closed position with said second torch coupling means and said cable coupling means connected.

4,049,944

PROCESS FOR FABRICATING SMALL GEOMETRY SEMICONDUCTIVE DEVICES INCLUDING INTEGRATED COMPONENTS

Hugh L. Garvin, Malibu; Amnon Yariv, and Sasson Somekh, both of Pasadena, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 336,679, Feb. 28, 1973, abandoned.
This application Aug. 20, 1975, Ser. No. 606,373
Int. Cl.² B23K 9/00
U.S. Cl. 219—121 EM **9 Claims**



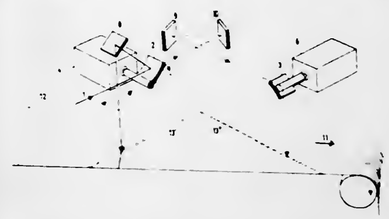
1. A process for controlling the surface geometry of a substrate of ion beam-sensitive material including the steps of:
   a. forming a resist layer on a surface of said substrate of said material;
   b. exposing said resist layer to controlled optical interference patterns, whereby selected regions of said resist layer may be removed thereby leaving a resist mask on the surface of said substrate; and
   c. exposing said substrate and mask thereon to an ion beam for machining and partially etching away exposed regions of said substrate, whereby very fine line widths may be achieved for these etched regions and a very high resolution may be obtained in said process while simultaneously minimizing the temperatures to which said substrate and mask are subjected during said process.

4,049,945

METHOD OF AND APPARATUS FOR CUTTING MATERIAL TO SHAPE FROM A MOVING WEB BY BURNING

Gunter Ehlscheid, Neuwied; Peter Langenbeck, Frickingen, and Kurt Stemmler, Neuwied, all of Germany, assignors to Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG, Neuwied am Rhein, Germany

Division of Ser. No. 513,022, Oct. 8, 1974, Pat. No. 3,965,327.
This application Apr. 6, 1976, Ser. No. 674,247
Claims priority, application Germany, Oct. 10, 1973, 2350933
Int. Cl.² B23K 9/00
U.S. Cl. 219—121 LM **16 Claims**



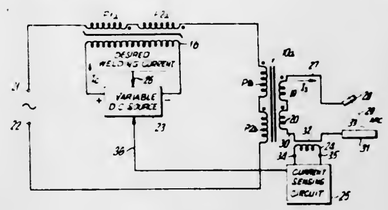
1. Apparatus for cutting a predetermined pattern from a moving web of material, such as paper, cardboard or the like, comprising:
   a. a first pivotable mirror;
   b. a laser beam source which directs a laser beam onto said first pivotable mirror such that said beam is deflected thereby;
   c. a second pivotable mirror located so as to intercept said laser beam after it is deflected by said first pivotable mirror and further deflect said laser beam onto said moving web of material;
   d. means to pivot said first pivotable mirror; and
   e. means to pivot said second pivotable mirror,
   and wherein the pivot axes of said first and second pivotable mirrors are parallel to each other and located in a plane parallel to the plane of said moving web of material.

4,049,946

POWER SUPPLY FOR ELECTRIC ARC WELDING

Jean-Louis Fluckiger, and Pierre Alfred Roulet, both of Sao Paulo, Brazil, assignors to Eutectic Corporation, Flushing, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,537
Int. Cl.² B23K 9/10
U.S. Cl. 219—131 R **1 Claim**



1. A power supply for use in electric arc welding, comprising:
   a transformer having a center tapped primary winding and a secondary winding;
   a pair of conductors for coupling said secondary winding to

an arc welding arrangement comprising an arc welding electrode and a conductive member;

current sensing means coupled to at least one of said conductors for providing a signal dependent upon the current flowing through said arc welding arrangement;

means for coupling the ends of said primary winding remote from said center tap to an alternating current power source;

a saturable reactor having a control winding and an output winding coupled to said primary winding, one end of said control winding being connected to the center tap of said primary winding;

a first thyristor having two main electrodes and a control electrode, one main electrode of said thyristor being coupled to a corresponding end of said primary winding and the other main electrode of said thyristor being coupled to the other end of said control winding;

a second thyristor having two main electrodes and a control electrode, one main electrode of said second thyristor being coupled to the other end of said primary winding and the other main electrode of said second thyristor being coupled to said other end of said control winding;

a phase control circuit for providing firing pulses to the control electrodes of said first and second thyristors in timed relation with the alternations of said power source, and

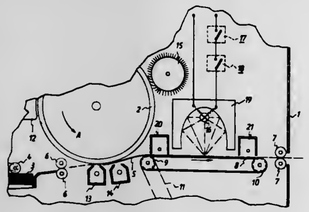
control circuit modifying means coupled to said current sensing means for disabling said phase control circuit to prevent said pulses from being applied to said control electrodes when the current flowing through said arc welding arrangement is less than a predetermined value.

4,049,947

METHOD AND ARRANGEMENT FOR PROTECTING SHEETS FROM CHARRING IN COPYING MACHINES

Friedrich Besteareiner, Grunwald, and Dieter Gigiberger, Unterhaching, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Mar. 10, 1976, Ser. No. 665,383
Claims priority, application Germany, Mar. 15, 1975, 2511423
Int. Cl.² H05B *1/00*; G03G *15/00, 13/00*
U.S. Cl. 219—216 **10 Claims**



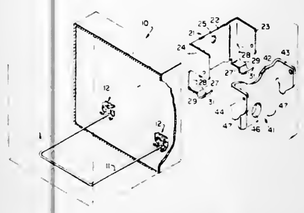
1. In an electro-photographic copier of the type wherein an image is formed on a image-carrying sheet and is thereafter fixed by subjecting the sheet at a fixing station to the influence of heat, a combination comprising heating means at said station for fixing an image on a sheet; means for advancing the sheet through said station at a predetermined speed sufficient to permit said heating means to fix the image on the sheet; and means for preventing charring of the sheet in the event that the latter is advanced through said station at a speed lower than said predetermined speed, said preventing means including a timing switch set at a predetermined time duration sufficient to permit said advancing means to advance the sheet at said predetermined speed through said station, and operative for automatically de-actuating said heating means after said predetermined time duration has elapsed.

4,049,948

OVEN HAVING AN ELECTRIC HEATING ELEMENT WITH A HINGED SUPPORT

Robert V. Gilreath, Cookeville, Tenn., assignor to Still-Man Mfg. Company, Cookeville, Tenn.

Division of Ser. No. 566,739, April 10, 1975, Pat. No. 3,984,003, This application May 14, 1976, Ser. No. 686,277
Int. Cl.² F27D *11/02*
U.S. Cl. 219—404 **3 Claims**



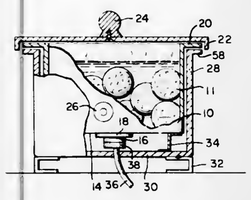
1. In combination with an oven, having an electric heating element, a first bracket attached to an interior wall of the oven; a second bracket supporting said electric heating element, said second bracket being pivotally connected to said first bracket for supporting and moving the heating element between a horizontal position and a tilted elevated position, said first bracket including at least one outwardly extending resilient leg portion, the outer portion of said resilient leg portion including a holding portion; said second bracket including at least one projecting portion in sliding engagement with said resilient leg portion, said projecting portion exerting a force to flex the resilient leg portion with the heating element in a horizontal position, and in moving the heating element to an elevated tilted position, said projecting portion sliding outwardly along said resilient leg portion and into the holding portion to release the flexing force on said resilient leg portion whereby the projecting portion is releasably latched in said holding portion to releasably maintain the heating element in the tilted position.

4,049,949

GOLF BALL WARMER

Ron Fitzsimons, 5557 Fleming Street, Vancouver, B.C.,, Canada

Filed May 1, 1975, Ser. No. 573,418
Int. Cl.² H05B *3/06*
U.S. Cl. 219—521 **4 Claims**



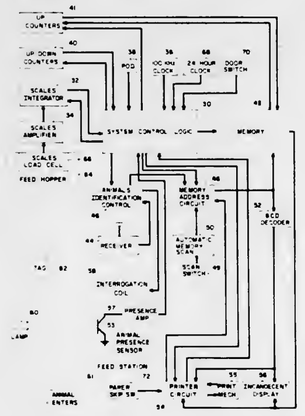
1. A golf ball heater comprising (1) an open ended walled housing having four side wall portions and a bottom wall, said housing adapted to confine a body of water and a plurality of loose golf balls therein, an electric heating means in said housing, an electrical receptacle disposed on said bottom wall, said heating means in electrical communication with said receptacle, said heating means adapted to elevate the temperature of said body of water to about 100°–110° F, illuminating means for providing light to the interior of said housing, said illuminating means including a source of illumination disposed on and integral with one of said side walls, removable cover means for closing said open ended walled housing, said cover means including a transparent portion centrally located in said cover means, whereby the combination of said source of illumination and said transparent portion permits viewing of said golf balls while they are being heated, and (2) a second walled housing adapted to slidably, removably accommodate insertion of said first housing therein, an electrical wire terminating in electrical plug means at each end thereof, one of said plug means adapted to be connected to a source of electrical potential, the other plug means adapted to engage said receptacle whereby a circuit is created and said heating element is actuated, said water heated and in turn said golf balls are heated.

4,049,950

ANIMAL FOOD CONSUMPTION MONITOR

John A. Byrne; Charles K. Rhea, Jr., and Thomas F. Fleming, all of Cookeville, Tenn., assignors to Universal Identification Systems, Inc., Cookeville, Tenn.

Filed Sept. 29, 1975, Ser. No. 617,938
Int. Cl.² G06K *7/08*; A01K *5/02*
U.S. Cl. 235—61.6 R **9 Claims**



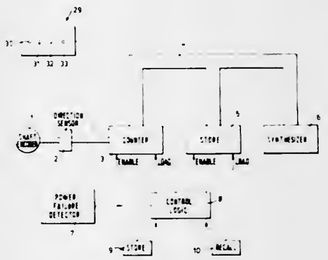
1. Apparatus for determining and registering the amount of food consumed by each of a plurality of animals comprising a feed station, a scale located at the feed station, a feed hopper containing food mounted on the scale, presence sensing means for sensing the arrival and departure of an animal to and from the feed station, scale weight measuring means connected to the scale and responsive to the actuation of said presence sensing means for determining the amount of food in the hopper, identification means responsive to activation of the presence sensing means by the arrival of the animal to determine the identity of the given animal, consumption measuring means responsive to the scale weight measuring means for determining the increment of food consumed by the animal between its arrival and departure, memory means for storing the cumulative totals of food consumed by each animal individually, additive means responsive to said consumption measuring means for determining and storing in the memory means the cumulation of the previous consumption total stored in the memory means plus said increment of food determined by the consumption measuring means, memory address means responsive to the actuation of said presence sensing means upon the departure of said animal from said feed station and responsive to the identity determined by said identification means for connecting the additive means into that portion of said memory means corresponding to the given animal, means responsive to actuation of the additive means and the completion of its function for returning the consumption measuring means and the identification means to their initial states in preparation for the next animal entry, register means connected to said memory means and intermittently operable to recall and register the identity and corresponding amounts of food consumed by each animal individually as stored in the memory means, said identification means including an electromagnetic coil located at the feed station and responsive to the actuation of the presence sensing means by the animal's arrival for providing electromagnetic pulses, identity means on each animal, each identity means including an internal source of power for the identity means, a transmitter tuned to a specific frequency assigned to the given animal, magnetically responsive reed switch means normally open but closable in response to electromagnetic pulses from said electromagnetic coil to power said transmitter in said identity means, a receiver at the feed station for receiving the transmission of said identity means, a frequency sensitive means in said receiver to determine which of the plurality of identity means is transmitting, and identification storage means connected to said receiver for storing in said storage means the identity determined by said frequency sensing means.

4,049,951

DATA RETENTION APPARATUS

Charlton Robert Baty, Dartford, and Alfred John Jarvis, Walderslade, both of England, assignors to Decca Limited, London, England

Filed Nov. 6, 1975, Ser. No. 629,572
Claims priority, application United Kingdom, Nov. 7, 1974, 48156/74
Int. Cl.² G06M *3/14*; H03K *21/34*
U.S. Cl. 235—92 FP **13 Claims**



1. Tuning apparatus including:

a rotatable tuning shaft;

encoding means for providing a first output signal for each unit of rotation through which the shaft rotates;

means for sensing a direction of rotation of the shaft;

directional counter means for providing a tuning output signal, the directional counter means being coupled to the encoding means and the direction of sensing means to count the first output signals, the direction of the count being determined by the direction sensed by the directional sensing means such that the instantaneous count in the directional counter means represents the rotational position of the rotatable tuning shaft;

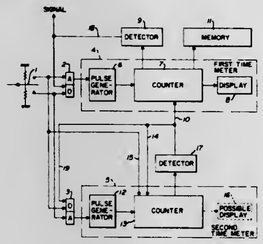
means for comparing the level of the voltage supplied to the directional counter means with a predetermined voltage level; and,

data storing means responsive to the comparing means for storing the output signal of the directional counter means when the voltage level falls below the predetermined level and for loading the stored output signal into the directional counter means when the voltage level subsequently rises above the predetermined level.

4,049,952
INTERMITTENCE-RESPONSIVE WORKING-TIME INDICATOR

Erik Ejnar Forslund, Ekensbergsvagen 85, 171 45 Solna, Sweden

Filed May 3, 1976, Ser. No. 682,862
Claims priority, application Sweden, May 16, 1975, 7505631
Int. Cl.² G06M *3/02*; G07C *3/04*
U.S. Cl. 235—92 T **6 Claims**



1. An intermittence-responsive working-time indicator comprising in combination

I. a first time meter operative as a working-time meter and including

a. means for measuring and indicating the duration of a single period between a start pulse and a subsequent stop pulse supplied to said first meter as well as the total duration of an arbitrary number of insterspaced such periods while neglecting the intervals between them, and

b. means for resetting said first time meter to a zero position at the receipt of a resetting pulse,

II. a second time meter operative as an idling-time meter and including

a. means for measuring the idling-time following immediately after each stop pulse to said first time meter, and

b. means for resetting said second time meter to a zero position at the receipt of a resetting pulse through either one of two separate reset inputs thereof,

III. means for comparing the idling-time measured by said second time meter with a stored value and for supplying a pulse to said resetting means of the first time meter as well as to one of said separate reset inputs of said resetting means of the second time meter at the very moment when the measured idling-time equals said stored value,

IV. means for supplying a resetting pulse to the other one of said separate reset inputs of said resetting means of the second time meter at the receipt of each start pulse to said first time meter, and

V. means for starting the operation of said second time meter whenever a stop pulse is received by said first time meter, and for stopping the operation therof whenever it has become properly reset by a resetting pulse supplied to either one of its reset inputs.

4,049,953
COMPLEX PULSE REPETITION FREQUENCY GENERATOR

Albert B. Evans, Jr., Ventura, Calif., assignor to The United States of America, as represented by the Secretary of the Navy, Washington, D.C.

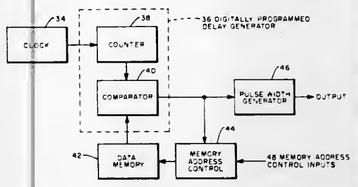
Filed June 24, 1976, Ser. No. 699,820
Int. Cl.² G01S *7/30*; G06F *15/20*
U.S. Cl. 235—150.3 **13 Claims**

1. A complex pulse repetition frequency generator for generating a pulse repetition frequency signal having programmable stagger intervals comprising:

a. clock means for generating a plurality of standard clock frequency signals;

b. memory address control means for generating a plurality of memory address signal sequences, each said memory address signal sequence having a start address and a stop address;

c. data memory means for producing a series of stagger data pulses in response to each said memory address signal sequence; and,

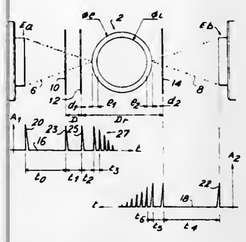


d. digitally programmable delay generating means for producing a pulse repetition frequency signal having stagger intervals generated in response to said series of stagger data pulses and to said clock frequency signals.

4,049,954
DEVICE FOR ACCURATE MEASUREMENT OF THE DIMENSIONS OF AN OBJECT BY ULTRASONIC WAVES

David Da Costa Vieira, Puyricard; Jean-Pierre Dufayet, Aix-en-Provence, and Maurice Lemaire, Manosque, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 19, 1976, Ser. No. 677,888
Claims priority, application France, Apr. 22, 1975, 75.12463; Mar. 9, 1976, 76.06727
Int. Cl.² G01S *9/68*
U.S. Cl. 235—151.32 **10 Claims**

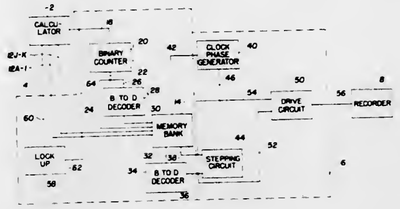


1. A device for the accurate measurement of dimensions of an object by ultrasonic waves, wherein said device comprises at least one ultransonic probe which operates as a transmitter-receiver for ultrasonic pulses, at least two reflecting barriers for said ultrasonic pulses, said barriers being in precisely fixed locations on the path of the ultransonic pulses so as to provide only partial obstruction of said path, means for placing, in a less obstructed portion of said path, an object whose dimensions are to be measured in the direction of propagation of the ultrasonic pulses, means for producing electric signals proportional in value to the time intervals between the reception on each probe of the various echoes corresponding to the reflections of the ultrasonic pulses from said barriers and from said object, and electronic processing means for comparing electric signals proportional to the interval between echoes corresponding to reflections from two of said barriers with electric signals proportional to the interval between echoes corresponding to reflection from different surfaces of said object and for thereby producing electric signals proportional to dimensions of said object.

4,049,955
TEMPORARY MEMORY FOR CALCULATOR-RECORDER SYSTEM

Hal Harris, and Joseph S. Foreman, Jr., both of Dallas, Tex., assignors to Campbell Taggart, Inc., Dallas, Tex.

Filed Mar. 3, 1976, Ser. No. 663,288
Int. Cl.² G06F *3/06*
U.S. Cl. 235—152 **17 Claims**

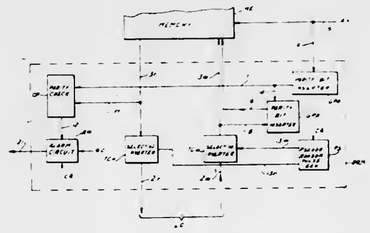


1. In a calculator-recorder system, wherein the output information from the calculator is in decimal form and the recorder receives and records said information, the improvement comprising; information transmission means for transmitting said output information from said calculator to the input of said recorder, including; memory bank means for temporary storing said output information, the memory bank means having nine stages for storing the numerical data portion of the output information from the calculator and two stages for storing the function data portion of the output information from the calculator; binary counter means for converting said output information from said calculator to information in binary form prior to storage in the nine stages of the memory bank; and a pair of binary to decimal decoders, said numerical data information in binary form is converted to information in decimal form after retrieval from said nine stages of said memory bank by a first of said pair of binary to decimal decoders, the function data portion of said output information from said calculator is converted to information in binary form by said binary counter means and said function data in binary form is reconverted to decimal form prior to the storage in two stages of said memory bank by the second of said pair of binary to decimal decoders.

4,049,956
METHOD OF AND MEANS FOR IN-LINE TESTING OF A MEMORY OPERATING IN TIME-DIVISION MODE

Wouter Martinus Dirk Van Veen, San Maurizio Canavese, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Oct. 8, 1976, Ser. No. 730,723
Claims priority, application Italy, Oct. 8, 1975, 69494/75
Int. Cl.² G11C *29/00*; G06F *11/10*
U.S. Cl. 235—153 AC **12 Claims**



1. A method of testing the performance of a multistage memory whose stages are periodically addressed in respective time slots of a recurrent scanning cycle, each time slot being divided into a reading phase and a writing phase, for inscribing an incoming multibit data word in an addressed memory stage during a writing phase and retrieving an inscribed data word from an addressed memory stage during a reading phase of any time slot, comprising the steps of:

generating, during certain scanning cycles selected in a generally stochastic manner, inversion commands for replacing the bits of said incoming words by their complements at a location upstream of said memory prior to inscribing said incoming words in the respective memory stages;

supplementing said incoming data words, between said upstream location and said memory, with party criteria written along with said data words in the respective memory stages;

replicating said inversion commands at a location downstream of said memory for reinverting inverted data words retrieved from said memory stages;

replicating said inversion commands at a location downstream of said memory for reinverting inverted data words retrieved from said memory stages;

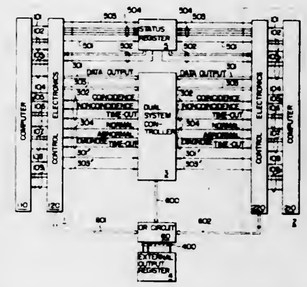
performing a parity check on retrieved data words between said memory and said downstream location; and

generating an alarm signal upon a recurrent negative outcome of said parity check in any bit position in homologous time slots of consecutive scanning cycles.

4,049,957
DUAL COMPUTER SYSTEM

Kazuo Kera; Yutaka Kubo, and Hirokazu Ihara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 512,971, Oct. 7, 1974, abandoned, which is a continuation of Ser. No. 395,012, Sept. 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 264,509, June 20, 1972, abandoned. This application July 18, 1975, Ser. No. 597,174
Claims priority, application Japan, June 23, 1971, 46-44796
Int. Cl.² G06F *11/00*
U.S. Cl. 235—153 AK **6 Claims**



1. A dual computer system comprising a main computer system having means for computing control data to be outputted to an external output register, means for running a diagnose routine stored in an internal memory provided in said main computer system, means for changing over the operation mode of said main computer system from a parallel operation mode to either an independent operation mode or a shut-down mode; a subsidiary computer system having means for computing control data to be outputted to said external output register, means for running a diagnose routine stored in another internal memory provided in said subsidiary computer system, and means for changing over the operation mode of said subsidiary computer system from a parallel operation mode into either an independent operation mode or a shut-down mode; first memory means connected to an output of said main computer system for storing the result of an operation performed by said

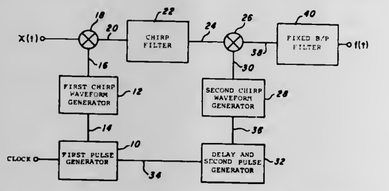
main computer system; second memory means connected to an output of said subsidiary computer system for storing the result of an operation performed by said subsidiary computer system; first comparing means for comparing the content of said first memory means with that of said second memory means and for providing an output signal to initiate the outputting of the content of either of said first and second memory means when coincidence therebetween is detected, and for providing another output signal to initiate the running of the diagnose routine through each of said main and subsidiary computer systems when non-coincidence therebetween is detected; third memory means for storing predetermined information for determining whether or not said main and subsidiary computer systems are functioning correctly by using said predetermined information as a reference for comparison with the respective information stored in said first and second memory means, said information stored in said first and second memory means representing the respective outputs of the main and subsidary computer systems when said computer systems have performed the diagnose routine; second comparing means for comparing the content of said third memory means with the result of checking with the diagnose routine run through said main computer system thereby providing an output signal for immediately placing said main computer system in independent operation when coincidence therebetween is detected, and providing another output signal to instruct shut-down of said main computer system when non-coincidence therebetween is detected; status register means connected to said main and subsidiary computer systems for storing either a first or second output signal from said main computer system for indicating when said main computer system is operating in the independent operation mode or shut-down mode respectively; and third comparing means for comparing the content of said third memory means with the result of checking with the diagnose routine run through said subsidiary computer system thereby providing an output signal to instruct said subsidiary computer system to read the content of said status register means when coincidence therebetween is detected and to place said subsidiary computer system in independent operation only when shut-down of said main computer system is registered in said status register means, and providing another output signal to instruct shut-down of said subsidiary computer system when non-coincidence therebetween is detected.

4,049,958

PROGRAMABLE FILTER USING CHIRP-Z TRANSFORM

Clinton S. Hartmann, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 3, 1975, Ser. No. 554,884
Int. Cl.[2] G06G *7/19*; G06F *15/34*
U.S. Cl. 235—193 **20 Claims**



1. A device for performing transform operations on an input signal, said device comprising:

a first acoustic surface wave generator means for providing a first chirp signal having a substantially linearly varying frequency,

first mixer means having a first input adapted to receive the input signal and a second input connected to said first generator means for multiplying said input signal and said first chirp signal to provide a first product between said input signal and said first chirp signal,

an acoustic surface wave chirp filter connected to the output of said first mixer means and responsive to said first product to provide an impulse response having a substantially linearly varying frequency as a filtered output signal,

a second acoustic surface wave generator means for providing a second chirp signal having a substantially linearly varying frequency,

second mixer means having a first input connected to said chirp filter and a second input connected to said second generator means for multiplying said filtered output signal and said second chirp signal to provide a second product between said filtered output signal and said second chirp signal,

first and second pulse generators respectively operably connected to the inputs of said first and second generator means,

said first and second generator means being responsive to pulses from said first and second pulse generators for producing said first and second chirp signals,

said second pulse generator being connected to the output of said first pulse generator and being provided with delay means for producing a pulse output to said second generator means at a fixed time delay after receiving a pulsed output from said first pulse generator such that said second chirp signal provided by said second generator means lags said first chirp signal provided by said first generator means by a predetermined time delay, and

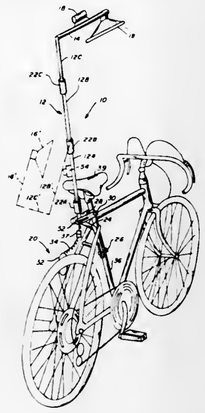
a bandpass filter connected to the output of said second mixer means and responsive to said second product for selecting a desired band of frequencies from said second product.

4,049,959

OVERHEAD BIKE LIGHT

Robert S. Ledterman, 6924 Stella Link, Apartment 34, Houston, Tex. 77025

Filed Sept. 5, 1975, Ser. No. 610,580
Int. Cl.[2] B62J *5/00*; F21V *21/08*
U.S. Cl. 240—7.55 **3 Claims**



1. An overhead lighting apparatus for bicycles, comprising:

a. a vertical tubular standard, and means for removably attaching said standard to the frame of a bicycle behind the seat thereof;

b. said standard having a forwardly projecting portion supporting a lamp fixture adapted to throw light downward onto the head and shoulders of the rider;

c. power means, control means and conductor means passing through the inside of said standard;

d. means for rapidly and simply inserting and removing said standard from said attaching means;

e. a plurality of hinge means spaced along said standard, each of said hinge means comprising
tongue means on one member;
U shaped yoke means on the other member;
hinge pin means; and
tubular collar means slidable along said standard;

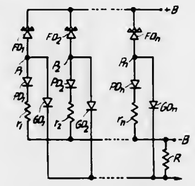
whereby when said collar is positioned at said hinge, said hinge is locked, and when said collar is lifted above said hinge, said members can rotate.

4,049,960

FOCUSING ARRANGEMENT

Hansrichard Schulz, Villingen-Schwenningen, Germany, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 463,690, April 24, 1974, abandoned.
This application Nov. 18, 1975, Ser. No. 633,099
Int. Cl.[2] G01J *1/20*; H01J *39/12*
U.S. Cl. 250—201 **46 Claims**



1. A detecting circuit for detecting the sharpness of an image formed by an image forming optical system, comprising:

A. a plurality of photosensitive members having semiconductor junctions of opposite conductivity, said members being disposed in a coplanar mosaic arrangement, said photosensitive members emitting respective electrical outputs in response to the intensity of illumination of the members by respective portions of the image formed by the image forming optical system;

B. a plurality of resistors having respective constant resistance values, a plurality of coupling means each individually connecting one of said resistances in series with a respective one of said members to form respective series circuits exhibiting signal values at the coupling means, the signal values varying between a minimum extreme signal value and a maximum extreme signal value,

i. each of said circuits being connected in parallel with one another;

C. comparing means electrically coupled to said coupling means for producing an output in response only to the one of the extremes of the signal values, whereby the sharpness of the object image formed by means of the image forming optical system may be detected on the basis of the output from said comparing means.

4,049,961

AUTOMATIC GUIDANCE SYSTEM FOR MOVING OBJECTS

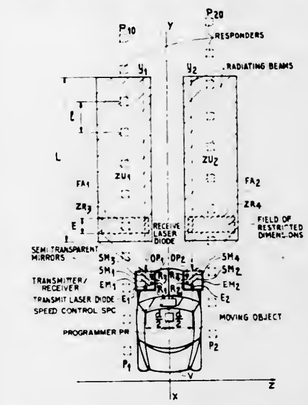
Raymond Marcy, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 30, 1975, Ser. No. 545,749
Claims priority, application France, Feb. 1, 1974, 74.03470
Int. Cl.[2] G05B *1/00*
U.S. Cl. 250—202 **13 Claims**

1. A system for the automatic guidance of a movable object traveling over a supporting surface along a predetermined path, comprising:

transmitting means on said object for directing radiant energy forwardly and sideways toward said surface in the form of at least one pair of beams intersecting said surface in two substantially rectangular zones of illumination with substantially coextensive major dimensions in the direction of motion of said object, said zones being relatively offset transversely to said direction of motion and lying alongside a centerline of said path;

a series of spaced-apart responders disposed in at least one row parallel to said centerline and close to said surface for reflecting radiant energy of substantially equal intensity from both said beams toward said object as long as said



object occupies a normal position athwart said centerline, said zones having a width exceeding that of said row and a length extending over a plurality of responders of said row;

receiving means on said object for separately detecting the reflections of said beams from said responders; and

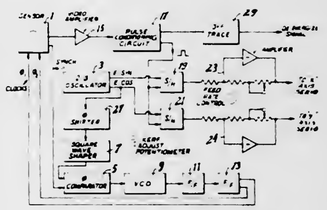
steering-control means on said object connected to said receiving means for correcting deviations from said centerline, said receiving means including comparison means for ascertaining differences indicative of said deviations between the intensities of said reflections.

4,049,962

LINE EDGE FOLLOWER

George Harold Kallen, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 29, 1976, Ser. No. 709,639
Int. Cl.[2] G05B *1/00*
U.S. Cl. 250—202 **3 Claims**



1. A line edge tracer system for use with an X-Y coordinate drive machine to cause said machine to follow the path described by the line edge comprising; a circular photo sensor array capable of scanning a field hving a radius determined by an optical system associated with said photosensor arrays; a phase-lock circuit including said photosensor array and a two-

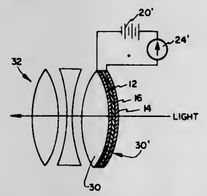
phase oscillator circuit for producing sine and cosine wave forms; a phase comparator circuit connected to said two-phase oscillator circuit, the output of said phase comparator circuit being connected to a voltage controlled oscillator circuit, the output of said voltage controlled oscillator circuit producing clock pulses to sequentially sample the individual photosensitive elements in said photo sensitive array to produce a video output signal and to cause said photo sensor to emit a sync pulse which is fed back to said phase comparator circuit to synchronize the angular position of said veido pulses with the sine and cosine wave forms produced by said two-phase oscillator circuit; video amplifier circuit connected to said photosensor array; a pulse conditioning circuit connected to said video amplifier for receiving the video signal and for changing the wave form of said signal; a sample and hold circuit connected to the two-phase oscillator circuit for receiving said sine and cosine wave forms therefrom and also connected to the pulse conditioning circuit to receive the changed wave form therefrom and also connected to the pulse conditioning circuit to receive the changed wave form therefrom to sample the sine and cosine wave forms by the changed wave forms; and an X and Y axis feed rate control circuit connected to such sample and hold circuits for operating an X servo and a Y servo response to the signal received from such sample and hold circuit whereby the resultant of said X and Y movement being the path described by said line.

4,049,963

PHOTOELECTRIC MEASURING DEVICE

Manfred R. Kuehnle, Lexington, Mass., assignor to Coulter Information Systems, Inc., Bedford, Mass.

Continuation of Ser. No. 397,308, Sept. 14, 1973. This application Aug. 24, 1976, Ser. No. 717,169
Int. Cl.² H01J *39/12*
U.S. Cl. 250—211 R **5 Claims**



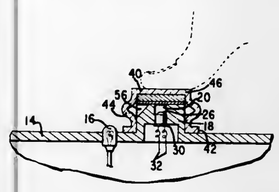
1. A photoelectric measuring device comprising
a substrate of optical material,
a first ohmic layer having a thickness of the order of 50 to 100 A deposited on one surface of said substrate,
a sputter deposited coating on said first ohmic layer and having a thickness of the order of 300 to 3500 A consisting principally of a wholly inorganic, mircrocrystalline, photoconductive material deposited with a vertical orientation to its crystal arrangement relative to the surface upon which deposited, said coating being electrically anisotropic and having high photoelectric gain, a dark resistivity of at least 10^{12} ohm-centimeters and a ratio of dark to light resistivities of at least about 10^4,
a second ohmic layer on said photoconductive coating and having a thickness of the same order as said first ohmic layer deposited upon said photoconductive coating,
said device including substrate, layers and coating having better than 90 percent transmission of radiation at least in the visible spectrum to a degree not materially affecting the integrity of transmission of said radiation through said device and means for detecting current flow between said ohmic layers as a direct quantitative measurement of the radiation passing through, and device.

4,049,964

OPTICAL SWITCHING DEVICE

David G. Wuchinich, New York, and Joseph Tarsia, Valley Stream, both of N.Y., assignors to Cavitron Corporation, New York, N.Y.

Filed Apr. 1, 1976, Ser. No. 672,829
Int. Cl.² G01D *21/04*
U.S. Cl. 250—221 **3 Claims**



1. A contactless, electrical switching device, comprising:
a nipple projecting from the surface on which the switching device is mounted and having a top surface, said nipple having a bore that intersects said top surface to provide an opening therein;
a photo-sensitive element located within said bore and having its photo-sensitive portion (1) facing outwardly from the device mounting surface, and (2) operable in response to light received through said opening,
a resilient, transparent cap that (1) fully encloses said nipple, (2) is retained on said nipple by said cap resiliency and (3) has a cover with a pliable, opaque pressure disc retained in spaced-relation to said top surface by said resilient cap to provide an open space between said top surface and said disc that allows light to impinge on said photo-sensitive portion through said opening, said disc being retained in said cover (a) to prevent light from reaching said photo-sensitive upon the application of sufficient pressure to overcome the resiliency of said cap by blocking said opening and (b) to permit light to reach said photo-sensitive portion upon the removal of pressure on said resilient cap, and
utilization means coupled to said photo-sensitive element for taking advantage of the response of said photo-sensitive portion to the presence and absence of light received through said opening.

4,049,965

MEASUREMENT APPARATUS

Robert Martin Pettigrew, Carluke, Scotland, assignor to National Research Development Corporation, London, England

Filed Mar. 6, 1975, Ser. No. 555,818
Int. Cl.² H01J *3/14*
U.S. Cl. 250—237 G **23 Claims**



1. An apparatus for measuring displacement of a first member relative to a second member in a manner corresponding to motion with one degree of freedom in a given plane, said apparatus comprising:
a substantially planar grating mounted in a fixed position relative to said first member so as to extend substantially parallel to said given plane, said grating having lines which are spatially periodic in the sense of said motion, the spatial periodicity of said grating in said sense being denoted by f_1;

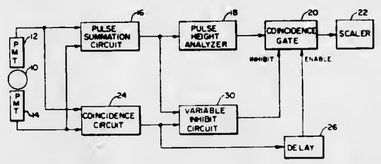
means for illuminating said grating with light, said illuminating means comprising means mounted in a fixed position relative to said second member and defining a substantially planar optical object which extends substantially parallel to said given plane spaced from said grating and is spatially periodic in said sense, said spatial periodicity of said object in said sense being denoted by f_2 and being at least approximately equal to one half f_1 for causing said grating to form a substantially planar image of said object extending substantially parallel to said given plane at a distance from said grating substantially equal to the distance of said object from said grating, said image being spatially periodic in said sense with a periodicity f_3 in said sense substantially equal to the said object periodicity f_2 and moving in said manner relative to said second member when relative movement in said manner occurs between said first and second members; and
photodetector means responsive to light, said photodetector means comprising means mounted in a fixed position relative to said second member and defining a substantially planar light-receiving array which lies at least approximately in the plane of said image and which is spatially periodic in said sense with a periodicity in said sense at least approximately equal to f_3 for producing at least one signal which varies cyclically by virtue of interaction between said image and light-receiving array when said relative movement occurs between said first and second members.

4,049,966

NUCLEAR RADIATION MEASURING METHOD AND APPARATUS HAVING BLANKING TIME INVERSELY RELATED TO COUNT RATE

Samuel H. Luitwieler, Jr., La Mirada, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed July 2, 1976, Ser. No. 702,253
Int. Cl.² G01T *1/20*
U.S. Cl. 250—369 **6 Claims**



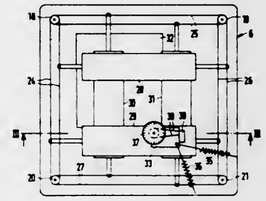
1. A method of inhibiting a measurement of radiation following an overloading radiation surge in a nuclear radiation measuring system which includes apparatus for detecting nuclear radiation and converting same into pulses and for counting the pulses to provide a measure of the nuclear radiation, the method comprising the steps of:
ascertaining the rate at which the pulses are generated;
detecting the occurrence of a radiation surge exceeding a predetermined energy level; and
inhibiting the counting of pulses upon the occurrence of the radiation surge for a time period which varies inversely with the ascertained pulse rate.

4,049,967

X-RAY EXAMINING APPARATUS INCLUDING A TOMOGRAPHIC EXPOSURE INSTALLATION

Helmut Berger; Gunther Holzermer; Harry Kirsch, all of Erlangen, Germany, and Pieter Vijlbrief, Leiden, Netherlands, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 12, 1975, Ser. No. 604,079
Claims priority, application Germany, Aug. 21, 1974, 2440146
Int. Cl.² G01N *21/34*
U.S. Cl. 250—445 T **5 Claims**



1. In an X-ray examining apparatus including a tomographic X-ray exposure installation; positioning drive means for effecting laminagraphic height adjustment; and means for making the presently set laminagraphic height on the tomographic X-ray exposures, the improvement comprising: scale dial means having laminagraphic height gradations thereon being operatively connected to said positioning drive means and associated with X-ray film sheets during exposure of the latter so as to mark the area representative of the currently set laminagraphic height on said film sheets; a position indicator connecting said scale dial means with the positioning drive means, said position indicator comprising an elongated casing with a relatively longitudinally displaceable wire therein, connecting said scale dial means with the positioning drive means for the laminagraphic height adjustment; said laminagraphic height gradations on said scale dial means being reproducible through X-rays; and means for supporting the scale dial means and the area representative of the currently set laminagrahic height in adjacency to film-proximate diaphragm means so as to project into the cone of the focused X-rays; said diaphragm means including at least two diaphragm plates; a base plate adjustably supporting said scale dial means, said base plate including a slide member supported on said diaphragm plates for concurrent longitudinal movement along the intersecting location of said two diaphragm plates; said scale dial means comprising a circular scale plate; means for rotatably supporting said scale plate, said scale plate having the laminagrahic gradations on the circumferential edge zones thereof extending above the edges of said diaphragm means defining the X-ray cone and projecting into said X-ray cone.

4,049,968

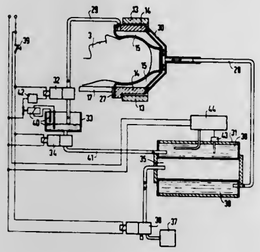
TOMOGRAPHIC X-RAY APPARATUS FOR PRODUCING TOMOGRAPHIC IMAGES

Walter Distler, Erlangen; Roderich Zink, Herzogenaurach, and Gerhard Linke, Erlangen-Frauenaurach, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 4, 1975, Ser. No. 601,706
Claims priority, application Germany, Aug. 5, 1974, 2437710
Int. Cl.² G03B *41/16*
U.S. Cl. 250—445 T **3 Claims**

1. A method of treating a bacterial infection which comprises administering to an animal having said infection an

antibacterially effective quantity of a member selected from the group consisting of gentamicin B, gentamicin B_1, gentamicin X, a non-toxic pharmaceutically acceptable acid addition salt, and a mixture thereof.

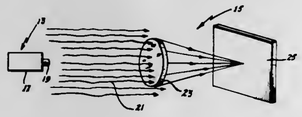


4,049,969

PASSIVE OPTICAL TRANSPONDER

David J. Saloniner, and Buster E. Kelley, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 19, 1970, Ser. No. 24,917
Int. Cl.² F21K *2/00*
U.S. Cl. 250—458 **2 Claims**





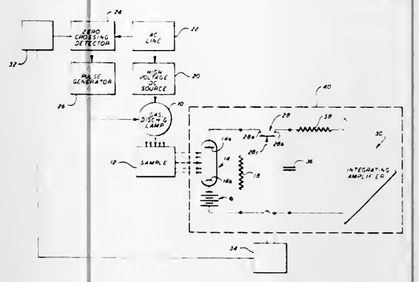
1. In an optical identification and communication system having a combination interrogator and receiver for generating and receiving radiation signals; a passive optical transponder comprising a phosphor device for receiving a converting light from the interrogator, a transponder optic positioned between said phosphor device and said interrogator for collecting and focusing light of a specified wavelength from the interrogator onto the surface of said phosphor, thereby converting the light from the interrogator to a different wavelength and re-transmitting the converted light along the same path back to the receiver in a beam that is re-collimated by said transponder optic, allowing a response light of a different color from the interrogator light to be used to locate and identify friendly forces.

4,049,970

PULSED RADIATION DETECTOR SYSTEM

Michael Alan Ford, Maidenhead, England, assignor to Perkin-Elmer Limited, Beaconsfield, England

Filed Jan. 20, 1976, Ser. No. 650,635
Claims priority, application United Kingdom, Jan. 21, 1975, 02485/75
Int. Cl.² G01N *21/38*
U.S. Cl. 250—461 B **10 Claims**



2. A pulsed radiation detector system comprising, in combination:

a. a source of radiation for irradiating a sample to fluorescence;

b. means, including control means, for intermittently energizing said radiation source to cause fluorescent emissions by said sample of radiation flashes having a duration which is short in comparison to the intervals between flashes;

c. radiation detection means positioned to receive radiation from said sample and generate an output signal in response thereto;

d. means coupling the output signal of said detection means to a signal utilization channel; and

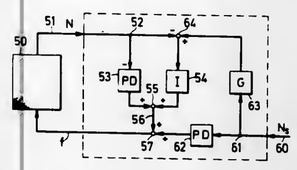
e. switching means associated with said coupling means and operative in timed relation with said control means to interrupt the coupling of said output signal to the utilization channel during periods substantially coinciding with the intervals between flashes.

4,049,971

OUTPUT REGULATOR FOR A THERMAL POWER-PRODUCING PLANT

Dominique le Febve de Vivy, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Jan. 29, 1976, Ser. No. 653,595
Claims priority, application Switzerland, Apr. 17, 1975, 4896/75
Int. Cl.² H02P *9/04*; G05B *11/42*; G06F *15/18*
U.S. Cl. 290—40 R **5 Claims**



1. An output regulator for a thermal power-producing plant comprising

a pair of inputs;

an output for emitting a load control signal;

a first P-member connected to one of said inputs to receive an actual value signal;

an I-member connected to said one input to receive said actual value signal;

a second P-member connected to the other input of said inputs to receive a desired value signal, said second P-member having a smaller transmission factor than said first p-member;

a timing means connected to said other input for receiving and delaying said desired value signal, said timing means being connected to said I-member to emit the delayed desired value signal to said I-member;

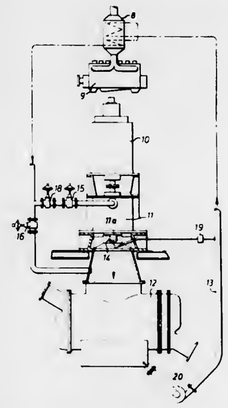
an addition means connected to said first P-member and said I-member to receive superimposed signals therefrom, said second P-member being connected to said addition means to deliver said desired value signal to said addition means for addition to said superimposed signals to produce the load control signal in response thereof, said addition means being connected to said output to deliver the load control signal thereto.

4,049,972

TURBO-ALTERNATOR PLANT

Edmund Porter Crowdy, Newcastle-upon-Tyne, and Hector Fillippus Alexander Drentham-Susman, Barton, both of England, assignors to Hawthorn Leslie (Engineers) Limited, Newcastle-upon-Tyne, England

Filed June 26, 1975, Ser. No. 590,558
Claims priority, application United Kingdom, July 12, 1974, 30962/74
Int. Cl.² F01K *23/10*; F01D *15/10*
U.S. Cl. 290—52 **7 Claims**



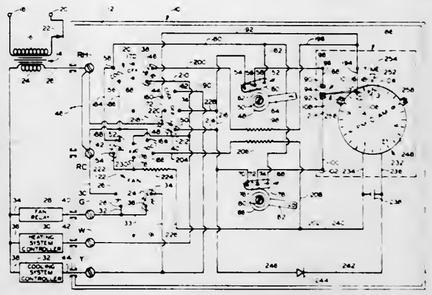
1. In a turbo-alternator plant comprising a prime mover producing hot exhaust gases, a waste heat boiler connected to receive the exhaust gases from the prime mover and thereby generating steam, a turbine receiving the steam to be driven thereby, an alternator, each of said turbine and said alternator having a rotor, the rotors being drivingly connected, and a steam condenser connected to receive steam exhausting from the turbine; the improvement, wherein the turbine rotor and alternator rotor are directly connected together and are disposed with the rotational axis of the said rotors vertical, the alternator being above the turbine and wherein there is a bearing arrangement supporting the said rotors including a bearing supporting the weight of their rotors, said bearing being within the environment of said condenser receiving steam exhausting from the turbine, and there being means governing the rotor composite to a speed appropriate to the desired frequency of the alternator output.

4,049,973

TIMER CONTROLLED SPACE THERMOSTAT WITH BATTERY OPERATED TIMER

Rudolph J. Lambert, Webster Groves, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 26, 1976, Ser. No. 680,142
Int. Cl.² H02J *9/00*
U.S. Cl. 307—66 **8 Claims**



1. In a timer controlled space thermostat for controlling operation of electrically operated space conditioning apparatus, two double-throw temperature responsive switches arranged to move sequentially to a first conductive position in response to a progressing temperature change in one direction and to move sequentially to a second opposite conductive position in response to progressing temperature change in the opposite direction, timer operated switching means including circuit connections for alternately completing an energizing circuit for the operation of space conditioning apparatus through said double-throw switches when in their said first conductive positions, said timer operated switching means including an electrically operated timer movement, a storage battery connected to said timer movement for the energizing thereof, recharging circuit means for said battery completed through said timer operated switching means and one or the other of said double-throw switches when in their said second conductive position, and said double-throw temperature responsive switches having a discrete non-conductive period when moving from their said first to their said second conductive positions during which neither said space conditioning apparatus nor said recharging circuit means are energized.

4,049,974

PRECHARGE ARITHMETIC LOGIC UNIT

Gary W. Boone, and Jerry L. Vandierendonck, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 176,667, Aug. 31, 1971, abandoned. This application Feb. 12, 1974, Ser. No. 441,917
Int. Cl.² H03K *19/08*
U.S. Cl. 307—205 **6 Claims**

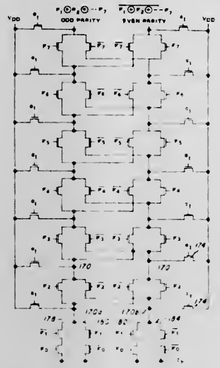
1. A circuit for determining the parity between a plurality of logic signals comprising:

a. first pair of series connected field effect transistors connected between a first node and a first clock voltage source, said transistor having gates for receiving logic signals, and means for applying a first logic signal and the complement of a second logic signal to the gates of the field effect transistors, respectively;

b. a second pair of series connected field effect transistors connected between said first node and said first clock source, said second pair of transistors having gates for receiving logic signals, and means for applying the complement of said first logic signal and said second logic signal to the gates of the second pair, respectively; and

c. means for precharging said first node to a reference nega-

tive voltage simultaneously with applying said first and second signals whereby when said first and second signals



are of opposite logic levels said node is discharged thereby producing at said node a logic 1 level corresponding to uneven parity.

4,049,975

TRANSISTOR CIRCUITS

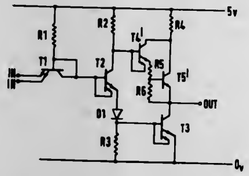
Stephen Francis Colaco, Sale, England, assignor to Ferranti Limited, Hollinwood, England

Filed Dec. 21, 1976, Ser. No. 752,889

Claims priority, application United Kingdom, Dec. 23, 1975, 52680/75

Int. Cl.² H03K *19/08*

U.S. Cl. 307—213 **6 Claims**



1. A transistor-transistor logic circuit arrangement having NPN transistors, and to be energised by a potential supply of at least 4.5 volts, including a multi-emitter input transistor, having an emitter individually connected to each required input for the circuit arrangement, the base is connected via a resistor to a first rail to be maintained at a first, finite positive potential level, the collector is connected to the base to reduce, in the operation of the circuit arrangement, the concentration of stored charge carriers within the transistor, and the collector is also connected to a phase splitter stage connected between the first rail and a second rail to be maintained at a second potential level, less positive than the potential level of the first rail, a diode is provided within the phase splitter stage, and is connected between the input transistor and the second rail to ensure that the input threshold level of the circuit arrangement is above the potential level of the second rail by substantially the maximum obtainable potential difference across two forward biased diodes, one output of the phase splitter stage is connected to the base of an output transistor for the circuit arrangement, the emitter of the output transistor is connected to the second rail, and the other output of the phase splitter stage is connected to a pull-up stage for the output transistor.

4,049,976

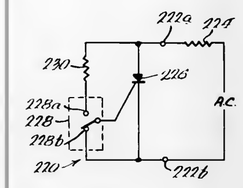
SOLID-STATE VOLTAGE SWITCHING CIRCUIT

Joseph E. Pascente, 71 Regent Drive, Oak Brook, Ill. 60521

Filed May 7, 1976, Ser. No. 684,410

Int. Cl.² H03K *17/72*

U.S. Cl. 307—252 T **17 Claims**



1. In a voltage switching circuit for receiving a voltage across a pair of terminals and having a thyristor for selectively establishing a circuit path therebetween, said thyristor having an anode connected to one of said terminals, a cathode connected to the other of said terminals and a gate, including switch means actuable between two states for directly connecting and short circuiting said gate to said cathode and isolating said gate from said anode in a first state to render said thyristor nonconductive and for connecting said gate to said anode and isolating said gate from said cathode in a second state to render said thyristor conductive, whereby said thyristor requires a decreased gate turn on current to be rendered conductive and when conductive establishes said circuit path, and when nonconductive interrupts said circuit path and has an increased *dv/dt* withstand capability.

4,049,977

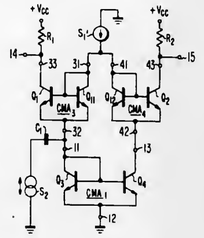
PHASE-SPLITTER

Jonathan Samuel Radovsky, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 8, 1976, Ser. No. 675,258

Int. Cl.² H03K *4/00*

U.S. Cl. 307—262 **7 Claims**



1. The combination of:

a current mirror amplifier having an input terminal, an output terminal, and a common terminal, connected at its common terminal to a point at a reference potential;

first and second loads;

a terminal for an operating voltage;

first and second transistors of the same conductivity type, each having base and emitter and collector electrodes;

a connection of the emitter electrode of said first transistor to the input terminal of said current mirror amplifier;

a connection of the collector electrode of said first transistor through said first load to said terminal for said operating voltage;

a connection of the emitter electrode of said second transistor through said second load to said terminal for said operating voltage;

current generator means coupled to the base electrodes of said first and said second transistors for supplying them quiescent base currents;

bidirectional coupling means between the base electrodes of said first and said second transistors for exchanging their respective base current variations between them; and

means for applying an input signal to the connection of the emitter electrode of said first transistor and the input terminal of said current mirror amplifier.

4,049,978

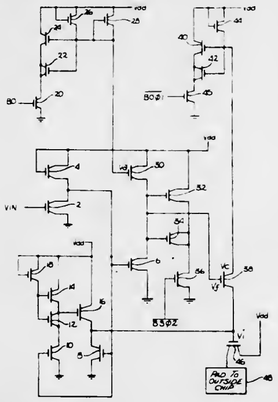
MOS HIGH CURRENT DRIVE CIRCUIT

Luke William Dru, Santa Ana, and Yun Sheng Hwang, Tustin, both of Calif., assignors to Western Digital Corporation, Newport Beach, Calif.

Filed Jan. 26, 1976, Ser. No. 652,398

Int. Cl.² H03K *19/00, 1/00*

U.S. Cl. 307—270 **8 Claims**



1. A high current drive circuit of the type which is controlled by timing signals and powered by a constant source of direct current voltage, comprising:

first and second boot strap inverter circuits, said boot strap inverters being responsive to said timing signals, each having a corresponding output;

a current drive circuit having inputs coupled to said corresponding outputs of said first and second boot strap inverter circuits, said drive circuit arranged and configured such that in response to said timing signals the maximum outputs from said first and second boot strap inverter circuits are coupled to the output of said drive circuit;

wherein said first bootstrap inverter circuit includes first through fifth metal oxide semiconductor devices, each having gate, source and drain electrodes, said drain electrodes of said first, second and third devices and said gate electrode of said third device being coupled to said source of direct current voltage, said source electrodes of said first and fourth devices and said drain electrodes of said fourth and fifth devices being coupled together, said gate electrodes of said first, second, and fourth devices and said source electrode of said second and third devices being coupled together and forming the output of said first bootstrap inverter, and said gate electrode and source electrode of said fifth device being coupled respectively to one of said timing signals and ground.

4,049,979

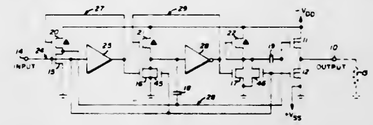
MULTI-BOOTSTRAP DRIVER CIRCUIT

Mark S. D. Shieu, San Jose; Robert B. Johnson, Los Gatos, and Ronald C. Langesen, Sunnyvale, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 24, 1976, Ser. No. 717,428

Int. Cl.² H03K *17/10, 4/58, 17/28, 19/40*

U.S. Cl. 307—270 **8 Claims**



1. A FET output stage driver, said driver employing plural bootstrap means and having the capability of applying a gate electrode drive signal having an amplitude substantially in excess of the supply potential of said output stage, said driver being coupled to the gate electrode of said output stage FET and comprising:

first and second coupling capacitors, each capacitor having two electrodes, one of which is coupled to said output stage gate electrode;

a first tri state FET inverter having an input terminal, an output terminal, and a control terminal, said input terminal being coupled to signal input terminal said output terminal being coupled to said output stage gate electrode;

a FET delay buffer having an input terminal, and output terminal, and a signal delay characteristic such that the signal appearing at said output appears after a first delay interval following an applied input signal, said input terminal being coupled to said signal input terminal, and said output terminal being coupled to said control terminal of said first tri state inverter, whereby said first tri state inverter will respond to an input signal and act as an inverter for the duration of said first delay interval after which said output terminal is rendered floating;

a second tri state FET inverter having an input terminal, an output terminal, and a control terminal, said input terminal being coupled to said output terminal of said delay buffer, and said output terminal being coupled to said second terminal of said first capacitor,

a FET delay inverter having an input terminal, an output terminal, and a signal delay characteristic such that the signal appearing at said output appears after a second delay interval following an applied input signal, said input terminal being coupled to said output terminal of said second tri state inverter and said output terminal being coupled to said control terminal of said second tri state inverter whereby said second tri state inverter will respond to an input signal and act as an inverter for the duration of said second delay interval after which said output terminal is rendered floating; and

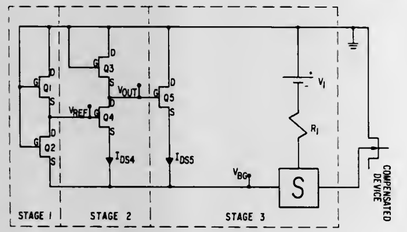
a FET inverter having an input terminal and an output terminal, said input terminal being coupled to said output terminal of said delay inverter and said output terminal being coupled to said second terminal of said second capacitor, whereby said first and said second capacitors along with the gate capacitance of said FET output stage all become discharged to V_{SS} when said first tri state inverter input terminal is at logic one signal state, said plurality of capacitors along with said gate capacitance of said FET output stage all charge to a substantial fraction of V_{DD} during said first delay interval after which said input terminal of said first tri state inverter is switched to logic zero state, second capacitor along with said gate capacitance of said FET output stage both charge to a potential that is a substantial fraction of twice V_{DD} during said second delay interval, and said gate capacitance of said FET output stage charges to substantially in excess of twice V_{DD} after said second delay interval.

4,049,980

IGFET THRESHOLD VOLTAGE COMPENSATOR

David Steven Maitland, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 26, 1976, Ser. No. 680,617
Int. Cl.² H03K *1/02, 3/353*
U.S. Cl. 307—304 **9 Claims**



1. A circuit for compensating for variation in the threshold voltage of IGFETs with a common substrate in an integrated circuit, the circuit comprising:

a reference voltage source with first and second terminals;

a first resistive element serially coupled to

a first IGFET with a gate coupled to the first terminal of said reference voltage source, the serial combination of said first resistive element and said first IGFET being coupled between the second terminal of said reference voltage source and the substrate; and

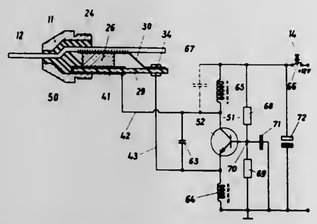
means for applying a bias voltage to the substrate, said means responsive to a voltage at the couple between said first resistive element and said first IGFET for adjusting the bias voltage to maintain the threshold voltage of the IGFETs in the integrated circuit at desired threshold voltage.

4,049,981

PIEZOELECTRICALLY DRIVEN ULTRASONIC TOOL WITH COOLING

Walter Durr, Bissingen, Germany, assignor to Durr-Dental KG, Germany

Continuation of Ser. No. 450,108, March 11, 1974, abandoned, which is a continuation of Ser. No. 288,887, Sept. 13, 1972, abandoned. This application Dec. 15, 1975, Ser. No. 640,778
Int. Cl.² H01L *41/04*
U.S. Cl. 310—317 **17 Claims**



1. A self-contained hand tool for creating and applying ultrasonic vibration for dental use comprising:

A. handle means comprising a tubular casing of slender elongate form to facilitate holding and manipulation of the hand tool by a user, said casing having a forward end and a rearward end,

B. a vibrator unit comprising piezoelectric vibrator means mounted in a forward portion of said casing, a vibratable work-tip disposed forwardly of the forward end of said casing and means coupling said work-tip with said piezoelectric vibrator means for transmitting vibration from said vibrator means to said work-tip,

C. signal generating means disposed in a rearward portion of said casing for generating an alternating electrical signal of ultrasonic frequency, said generating means being spaced from and mechanical vibrationally insulated from said vibrator means in said forward portion of said casing,

D. circuit means wholly within said casing for electrically connecting said signal generating means with said piezoelectric vibrator means, to apply said ultrasonic alternating electric signal to said piezoelectric vibrator means and thereby excite said vibrator means into ultrasonic oscillation and by such oscillation to produce ultrasonic vibration of said work-tip, said circuit means comprising flexible leads from said generating means to said vibrator means to provide electrical connection but mechanical vibrational insulation between said generating means and said vibrator means,

E. electrical conductor means electrically connected with said signal generating means and extending from the rearward end of said casing for supplying low voltage direct current to said signal generating means in said casing, and

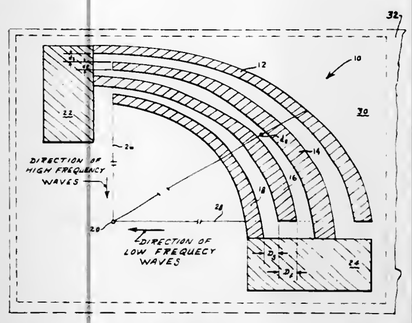
F. fluid supply means comprising flexible fluid conduit means extending from the rearward end of said casing to a fluid supply and fluid passage means extending longitudinally through said casing from said fluid conduit means at the rearward end of said casing to the forward end of said casing to deliver fluid to said work-tip, said fluid passage means comprising a rearward portion in heat transmitting relation with said signal generating means to cool the same, a forward portion in heat transmitting relation with said vibrator means to cool the same and an intermediate portion connecting said rearward portion with said forward portion, said intermediate portion of said passage means being flexible to provide mechanical vibrational insulation between said vibrator means and said signal generating means.

4,049,982

ELLIPTICAL, INTERDIGITAL TRANSDUCER

Paul B. Cohen, East Syracuse, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 18, 1976, Ser. No. 715,759
Int. Cl.² H01L *41/04*
U.S. Cl. 310—366 **7 Claims**



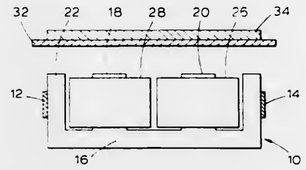
1. An elliptical, interdigital transducer comprising a plurality of concentric, elliptically shaped conductive fingers situated within one quadrant of an ellipse and mounted on a piezoelectric material, said fingers having a width and a spacing along the minor axis of said ellipse substantially equal to each other, said fingers having a width and a spacing along the major axis of said ellipse substantially equal to each other, and said width and spacing of said fingers, respectively, along said major axis being substantially twice the width and spacing of said fingers, respectively, along said minor axis, whereby upon the application of an exitation frequency f_1 to said transducer, a low frequency surface wave of frequency f_1 will propagate along the major axis toward the focus, and upon application of an exitation of frequency f_2, with $f_2 > f_1$, a high frequency surface wave of frequency f_2 will propagate along the minor axis toward the focus, and upon application of exitation frequency f with $f_1 \leqq f \leqq f_2$, a resonance will occur at some point, d_e, on a line through the ellipse and the focus such that $d_e = V/4f$, where V is the characteristic velocity of acoustic waves in said piezoelectric material.

4,049,983

ELECTROMAGNETIC LEVITATION

Alan Attwood, Conwy, Wales, and Eric Roberts Laithwaite, Long Ditton, England, assignors to National Research Development Corporation, London, England

Filed Sept. 16, 1975, Ser. No. 613,858
Claims priority, application United Kingdom, Sept. 24, 1974, 41421/74
Int. Cl.² H02K *41/02*
U.S. Cl. 310—13 **7 Claims**



1. A primary member for a linear induction machine comprising a core of magnetic material and energising windings on said core, said core comprising longitudinally spaced sets of four laterally adjacent co-planar pole faces and means arranged to provide paths for working flux between each pole face and all three other pole faces in the same set, said paths being disposed in transverse planes substantially perpendicular to the plane containing said pole faces, each set of four laterally adjacent pole faces being formed on the ends of four limbs of a respective core portion, the core portion also including a backing part interconnecting the ends of the limbs remote from the pole faces, the energising windings being disposed only on the inner two limbs of each set of four laterally adjacent limbs.

4,049,984

ELECTRIC MOTOR

Hirohisa Ishii, Tokyo, and Masami Shishikura, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 13, 1976, Ser. No. 686,075
Claims priority, application Japan, May 22, 1975, 50-61278
Int. Cl.² H02K *15/00*
U.S. Cl. 310—42 **11 Claims**

1. An electrical motor comprising:

a first cylindrical case having an end wall only at one end thereof with a central bore in said end wall;

a second cylindrical case containing a cylindrical magnet and having an end wall only at one end thereof with a central opening therein, said cylindrical case having an axial length substantially smaller than that of said first cylindrical case and being slidably insertable into said first cylindrical case through the other end of the latter to dispose the end walls of said first and second cases adjacent each other;

a brush base inserted into said first cylindrical case through said other end of the latter so as to bear against the other end edge of said second cylindrical case, said brush base having brush means mounted on the surface thereof facing toward said second cylindrical case, and frequency generating means mounted against the opposite surface of said brush base;

a lid member having a central thrust bearing portion and being shaped to bear axially against said frequency generating means while being engaged with said other end of the first cylindrical case for closing the latter;

means for temporarily holding said lid member in engagement with said other end of the first cylindrical case; and



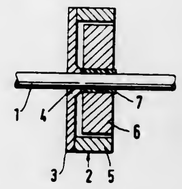
means for rotationally adjusting said second cylindrical case relative to said first cylindrical case from the exterior of the latter while said lid member is temporarily held in engagement with said first cylindrical case so as to adjust the neutral point of said brush means relative to said cylindrical magnet.

4,049,985

DAMPING DEVICE FOR A STEPPER MOTOR

Roland Sudler, Frankfurt am Main, Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed June 14, 1976, Ser. No. 695,460
Claims priority, application Germany, June 18, 1975, 2527046; Aug. 29, 1975, 2538480
Int. Cl.² H02K *37/00*
U.S. Cl. 310—49 R **8 Claims**



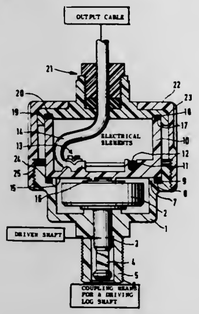
1. In a device for damping the natural oscillations of the permanently magnetized rotor of a stepper motor by means of an inertia mass arranged on the motor shaft, the improvement comprising means for magnetically coupling the rotor and the inertia mass, at least one part of the inertia mass comprising magnetizable material with distinct hysterisis and low coercive force.

4,049,986

ROTATIONAL SPEED TO IMPULSE FREQUENCY CONVERTER

Alois Kreuz, Maintal, Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed Apr. 7, 1976, Ser. No. 674,505
Claims priority, application Germany, Apr. 14, 1975, 2516193
Int. Cl.[2] H02K *11/00*; H01H *9/00*
U.S. Cl. 310—68 B **9 Claims**



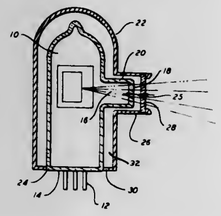
1. A rotational shaft-speed to impulse-frequency converter, such as for converting the speed of a driving underwater shaft of log into a proportional impulse frequency, comprising:
   a. a housing with a shaft orifice with a driven shaft, with means for coupling with an outside driving shaft;
   b. a cup-shaped watertight insert mounted within said housing having a base and a cover with a watertight cable orifice and a cable extending therethrough;
   c. a permanent magnet mounted for rotation on the driven shaft adjacent the said base of said insert;
   d. electrical components, including at least one magnetically actuated switch on the inside of said base of said insert within an effective range of said magnet;
   e. said housing, said insert and said cover comprising mounting means for a watertight mating mounting of their respective peripheries. said housing having an open top; said mounting means comprising: a ring shoulder in said housing; said insert supported by said ring shoulder; and a collar ring engaging the outside of said cover and holding said insert in said housing.

4,049,987

OZONE ABSORBANCE CONTROLLER

Charles Carlyle Helms, Trumbull, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed June 4, 1976, Ser. No. 692,658
Int. Cl.[2] H01J *5/16*; H01K *1/34*
U.S. Cl. 313—112 **8 Claims**



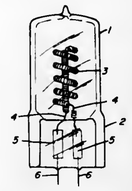
1. An ozone absorbance controller for use with an untraviolet light source comprising a trapped gas filter disposed in an optical emission path of said ultraviolet light source to absorb high energy ultraviolet rays of wave lengths below about 200 nanometers, and to thereby substantially prevent the formation of ozone in said optical emission path subsequent to said filter, said trapped gas filter being vented with a single opening sufficiently large to permit pressure equalization between the gases in the filter and atmosphere yet small enough to prevent gas movement within the gas filter after pressure equalization.

4,049,988

TUNGSTEN HALOGEN LAMP

James P. Keenan, Reading, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Apr. 14, 1976, Ser. No. 676,840
Int. Cl.[2] H01K *1/50*
U.S. Cl. 313—222 **3 Claims**



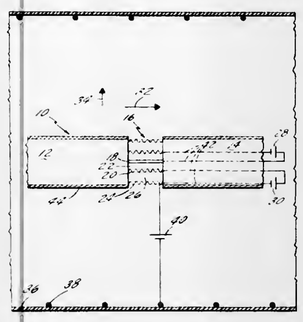
1. In a tungsten halogen lamp of the type where normal lamp operation does not permit attainment of a sufficiently high envelope wall temperature to prevent depositis from forming on the envelope walls, the improvement which comprises providing sufficient helium as a component of the lamp gaseous filling to prevent said deposits from forming, said helium being 20 to 50 volume percent of the total gaseous filling.

4,049,989

ION PRODUCTION MEANS

Robert H. Bullis, and Walter J. Wiegand, Jr., Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 18, 1975, Ser. No. 605,562
Int. Cl.[2] H01J *27/00*
U.S. Cl. 313—230 **12 Claims**



1. Apparatus for providing ions having a specific electrical polarity to a fluid flowing in a conduit along a flow axis wherein the ions migrate across the fluid in a direction essentially perpendicular to the flow axis and the apparatus comprises:
   a main assembly having an outer surface extending along the axis and including,
   an upstream section,
   a downstream section, and
   a center region which separates the upstream and downstream sections;

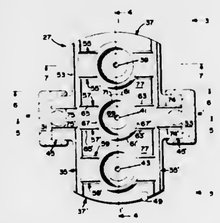
means for producing ions in the center region;
an ion permeable grid which extends in the axial direction across the center region between the upstream and downstream sections, the grid and the ion producing means defining therebetween an ion acceleration region which is bounded axially at the upstream end by the upstream section and at the downstream end by the downstream section; and
means for applying a first electric field across the ion acceleration region between the ion production means and the ion permeable grid.

4,049,990

CRT IN-LINE GUN ELECTRODE HAVING STRENGTHENING RIBS

Floyd K. Collins, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 8, 1976, Ser. No. 731,037
Int. Cl.[2] H01J *29/50, 29/82*
U.S. Cl. 313—417 **6 Claims**



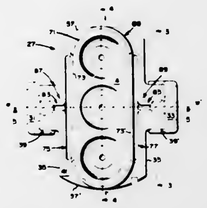
1. An improvement in a plural-electrode in-line multi-beam cathode ray tube electron gun assembly integrated by a plurality of longitudinal insulative support members, said improvement comprising:
   a substantially planar one-piece electrode member having opposed side and end portions and definitive *l-l'* and *w-w'* axes therein, said member having a plurality of spatially positioned and in-line related apertures therethrough such being oriented in a common plane substantially the *l-l'* axis of said member, one of said apertures being located at the *intersection of said l* and *w* axes, said planar member having at least two opposed supporting projections extending from either side thereof in a positional manner for attachment to said assembly support members, each of the side portions of said electrode member having a substantially longitudinal strengthening bend therein, each of the aperture areas in said member having a pair of rib embossments spatially associated therewith, each of said ribs being substantially formed as a yoke configuration having an intermediate arcuate section from which two extremital sections opposedly extend in a substantially common linear relationship, the arcuate sections of said pair of yoke-formed ribs being oriented in spaced circumferential relationship to a respective aperture, the pair of rib embossments spatially associated with said aperture located at the intersection of said *l* and *w* axes have extremital sections thereof co-extending into the respective opposed supporting projections protruding from the sides of said member to provide strengthening thereto.

4,049,991

LONGITUDINAL RIB EMBOSSMENT IN TRI-APERTURED, SUBSTANTIALLY PLANAR ELECTRODE

Floyd K. Collins, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Oct. 8, 1976, Ser. No. 731,038
Int. Cl.[2] H01J *29/50, 29/82*
U.S. Cl. 313—417 **6 Claims**



1. An improvement in a plural electrode in-line multi-beam cathode ray tube electron gun assembly integrated by a plurality of longitudinal insulative support means, said improvement comprising:
   a one-piece electrode member of substantially planar formation having opposed sides and end portions and definitive **1—1'** and *w—w'* axes therein, said member having at least one supporting projection extending from each side thereof to provide positional means for attachment of said member to said assembly supportive means; said member having an alpha planar level from which a plurality of individual longitudinally aligned cup-like shapings are impressed, each of said cups having a formed side wall and a substantially flat bottom with an axial aperture therethrough, the bottoms of said cup being oriented in an omega planar level parallelly spaced from said alpha planar level, said plurality of aligned cups being treated within said member as a longitudinal unitized portion having a continuous turned-perimeter thereabout defining an encompassing rim extending normal to said alpha planar level, the longitudinal sides of said cup-encompassing portion being parallel with said **1—1'** axis, said electrode member having a substantially longitudinal rib embossment formed on either side thereof, with at least one complementary rib projecting outward therefrom in a normal manner to form a rib combination, each of said longitudinal rib embossments being transitionally configurated from the terminal region of the respective longitudinal portion of the turned perimeter of said cup encompassing unit, the complementary rib means of said combination being oriented to extend through each of said supporting projections.

4,049,992

BERYLLIUM-CONTAINING EUROPIUM ACTIVATED PHOSPHATE PHOSPHOR, LUMINESCENT SCREEN AND DISCHARGE LAMP CONTAINING SAME

Judicus Marinus Pieter Jan Versteegen; Willebrordus Hubertus Martinus Maria van de Spijker, and Emiel Petrus Julianus de Meester, all ofEindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 22, 1974, Ser. No. 472,282
Claims priority, application Netherlands, June 1, 1973, 737627
Int. Cl.[2] C09K *11/46*; H01J *1/63*
U.S. Cl. 313—486 **14 Claims**

1. A luminescent screen provided with a luminescent beryllium-containing phosphate, wherein the phosphate is activated by bivalent europium and is defined by the formula $Me_{a-x}Be_b$ $Eu_xP_2O_8$ where $a + b = 3$, $0.01 \leqq x \leqq 0.25$, and b has the

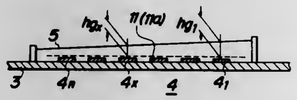
value of 1 or 2 and in which, if $b = 2$, Me represents barium and in which, if $b = 1$, Me represents at least one of the alkaline earth metals selected from the group consisting of barium and strontium.

4,049,993

MULTI-DIGIT FLUORESCENT DISPLAY TUBE WITH INCLINED FILAMENT CATHODE

Takao Kishino, and Yukihiko Utamura, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K. K., Japan

Filed May 25, 1976, Ser. No. 689,902
Claims priority, application Japan, May 31, 1975, 50-64835
Int. Cl.² H01J *19/08, 19/42, 63/06*
U.S. Cl. 313—497 **5 Claims**



1. A multi-digit fluorescent display tube comprising:
a planar insulating substrate;
a plurality of digit fluorescent displays arranged in a row in spaced side-by-side relationship along the longitudinal width of the planar substrate to form a plurality of planar digit fluorescent displays;
each digit fluorescent display comprising a plurality of segment anodes disposed to selectively form one of a plurality of digits and deposited phosphor layers thereon;
at least one filament cathode stretched along the longitudinal width of the planar insulating substrate adjacent to the plurality of digit fluorescent displays but separated therefrom;
the filament cathode being disposed at an acute angle with respect to the planar insulating substrate so that distances between the filament cathode and each of the plurality of digit fluorescent displays are linearly progressively shorter so that the perveance of each of the plurality of digit fluorescent displays is adjusted so as to illuminate each of the plurality of digit fluorescent displays in uniform brightness when the fluorescent display tube is operated by heating the filament cathode with a direct current power source; and
a light transparent evacuated sealed envelope in which the plurality of digit fluorescent displays and the filament cathode are disposed and through which the plurality of digit fluorescent displays may be viewed externally when the fluorescent display tube is in operation.

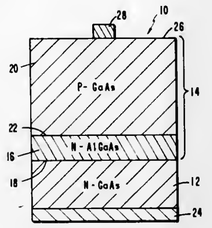
4,049,994

LIGHT EMITTING DIODE HAVING A SHORT TRANSIENT RESPONSE TIME

Ivan Ladany, Stockton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 26, 1976, Ser. No. 652,224
Int. Cl.² H05B *33/16*
U.S. Cl. 313—499 **10 Claims**

1. An electroluminescent device, capable of a transient response time of .2 microseconds or less, comprising:
a body of semiconductor material having a first region of aluminum gallium arsenide of N type conductivity contiguous to a second region of gallium arsenide of P type conductivity, said second region having only silicon as the conductivity modifier, said second region having a heterojunction only with said first region, and said second region being of a thickness, extending from said heterojunction, in the range of about 50 to 200 micrometers;
a substrate in contact with a surface of said first region opposite said heterojunction; and



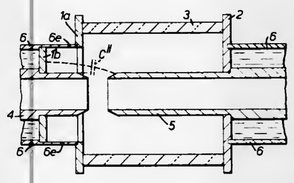
means for electrically contacting said body and said substrate.

4,049,995

RESONANT CAVITY TUBES

Christopher John Edgcombe, Coton, England, assignor to English Electric Valve Co., Ltd., England

Filed May 6, 1976, Ser. No. 683,780
Claims priority, application United Kingdom, May 7, 1975, 19083/75
Int. Cl.² H01J *25/10*
U.S. Cl. 315—5.39 **7 Claims**



1. A klystron type resonant cavity tube comprising two spaced cavity forming walls, a portion of a first drift tube extending through one of said cavity forming walls, a second portion of a drift tube extending through the other of said cavity forming walls, said two drift tube portions extending towards one another along a common axis to end within the cavity of which said walls form part and define a gap therebetween, and at least one of said two cavity forming walls having an inner part through which passes said first drift tube portion and having a radially outer part which is spaced closer along said axis from the end of said second drift tube portion than is said inner part of said one wall, said inner part being spaced axially from said gap by an amount sufficient to mitigate reduction in resonant frequency of the tube caused by the axial dimension of said gap.

4,049,996

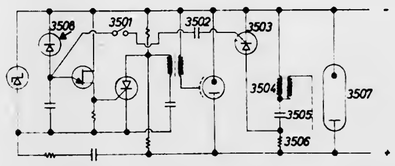
CONTROL OF ELECTRONICALLY GENERATED LIGHT PULSES

Zoltan Vital, Uccle, and Jean Orban, Clabecq, both of Belgium, assignors to Ponder & Best, Inc., Los Angeles, Calif.

Division of Ser. No. 358,974, May 10, 1973, Pat. No. 3,943,406, which is a division of Ser. No. 17,634, March 9, 1970, Pat. No. 3,749,921, which is a continuation-in-part of Ser. No. 799,554, Feb. 13, 1969, abandoned. This application May 23, 1975, Ser. No. 580,519
Claims priority, application Belgium, Mar. 7, 1969, 71104; June 27, 1969, 75962; Sept. 22, 1969, 79321
Int. Cl.² H05B *41/32*
U.S. Cl. 315—151 **2 Claims**

1. A device for controlling the initiation and duration of

light flashes produced by a light flash tube in response to pulses produced by the discharge of a capacitor and including a light sensitive element arranged for receiving light coming from a given direction and operatively connected to said tube for triggering the production of a light flash by said tube in re-



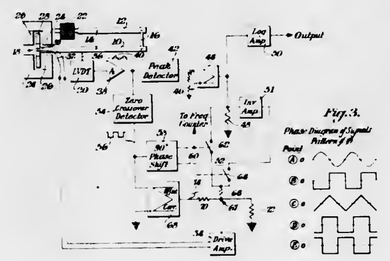
sponse to the application of light to said element wherein the improvement comprises a control circuit connected to said light sensitive element and operatively associated with said tube for controlling the duration of the flash produced by said tube in dependence on the quantity of light received by said light sensitive element after the commencement of such flash.

4,049,997

DRIVE FOR DYNAMIC MECHANICAL SYSTEM

John D. McGhee, Plymouth Meeting, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 27, 1976, Ser. No. 662,270
Int. Cl.² H02K *33/00*
U.S. Cl. 318—128 **7 Claims**



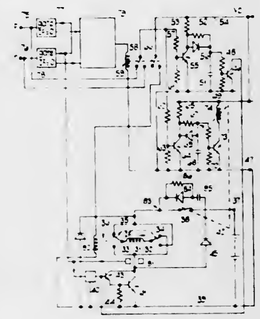
1. In a system for driving a dynamic mechanical system at its resonant frequency, said mechanical system having a displacement transducer for providing an alternating signal corresponding to the instantaneous displacement of said mechanical system, a drive transducer for imparting mechanical motion to said system, and drive means responsive to said displacement signal for actuating said drive transducer to maintain said mechanical system oscillating at said resonant frequency and at a constant amplitude, the improvement wherein:
said drive means includes analog means for developing an analog signal related in amplitude to the power required to maintain said amplitude constant,
switching means responsive the the zero crossover times of said alternating displacement signal for selectively actuating said drive transducer with said analog signal to maintain said resonant frequency,
said switching means includes inverting means for inverting the polarity of said analog signal, and
additional switching means responsive to alternate pairs of successive peaks of said displacement signal and to said inverted analog signal for selectively actuating said drive transducer to drive said mechanical system in both senses.

4,049,998

CONTROL CIRCUIT FOR AN ELECTRICALLY DRIVEN VEHICLE

Trevor Charles Boxer, Birmingham, England, assignor to Joseph Lucas Limited, Birmingham, England

Filed Sept. 18, 1975, Ser. No. 614,674
Int. Cl.² H02P *3/12*
U.S. Cl. 318—258 **4 Claims**



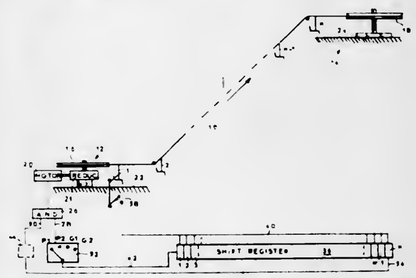
1. A control circuit for an electrically driven vehicle having a battery and a motor with an armature and a separately excited field winding, comprising positive and negative supply lines for connecting the battery to the armature and the field winding, at least one current recirculating diode connected in circuit with the field winding to shunt the field current when the connection between the battery and the field winding is interrupted, a switching mode field current regulator, field current direction control means connected in series with the field winding between the supply lines, switch means connected in the path of the recirculating diode current and means for opening said switch means temporarily when a change of field current direction is required, opening of said switch means causing current flowing in the field winding as a result of collapsing flux therein to be diverted through the vehicle battery so as to increase the rate of decay of said flux above that with the recirculating diode alone thereby allowing rapid reversal of the field current.

4,049,999

SPEED CONTROL SYSTEM FOR A CHAIRLIFT

Bruno Thibaudon, St. Nizier du Moucherotte, France, assignor to Pomagalski S.A., France

Filed July 30, 1976, Ser. No. 710,328
Claims priority, application France, Aug. 14, 1975, 75.25465
Int. Cl.² B61B *10/02;* **H02P** *7/04*
U.S. Cl. 318—305 **5 Claims**



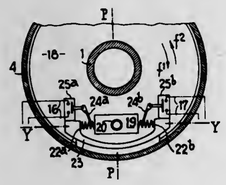
1. A speed control system for a chairlift having seats hung from an endless cable extending between an embarking station and a disembarking station comprising:

a motor for driving said cable
means for changing the speed of the motor
means for detecting the speed at the passage of a seat in the embarking station
a storage device for storing the speed information received from said detecting means and for restoring this speed information at the arrival of said seat in the disembarking station to automatically reproduce at the arrival the speed of the seat at the departure.

4,050,000
MOTOR-DRIVEN CONTROL DEVICE FOR A VALVE-ACTUATING SPINDLE

Jean Georges Sutter, Villers-les-Nancy, France, assignor to Pont-A-Mousson S.A., Nancy, France

Continuation of Ser. No. 470,097, May 15, 1974. This application Apr. 8, 1976, Ser. No. 675,088
Claims priority, application France, June 1, 1973, 73.20072
Int. Cl.² G05D *3/00*
U.S. Cl. 318—468 **10 Claims**

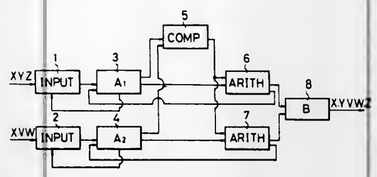


1. In a control device for shifting a closure member of a valve, comprising a case, a spindle rotatably mounted in the case to rotate about an axis for connection to the closure member, an electric motor having a stator and a rotor, means for connecting the rotor to the spindle to rotate the spindle, an electric power supply circuit electrically connected to the motor, means for detecting stoppage of the rotation of the spindle, switching means inserted in said circuit and responsive to the detecting means for opening the supply circuit when the spindle stops rotating, the detecting means comprising a detecting element mounted to be movable with respect to said case transversely of a radial plane containing said axis in a given direction between a first position and a second position, the detecting element being cooperative with the switching means to achieve opening of the supply circuit in said first position and closure of the supply circuit in said second position, and force transmitting means interposed between the spindle and the detecting element for urging the detecting element to said second position while the spindle is being driven in rotation by the motor; the improvement comprising in combintion abutment means fixed relative to said case, elastically yieldable means interposed between said abutment means and said detecting element for elastically biasing the detecting element to said first position, said electric motor being a variable reluctance motor and said means connecting the rotor to the spindle being operative to prevent rotation of the rotor when the spindle is prevented from rotating, said force transmitting means being capable of exerting sufficient force on the detecting element to overcome the action of the elastically yieldable means and shift the detecting element to said second position when the spindle is rotated to actuate the valve in a given direction and capable of allowing the detecting element to return to said first position under the combined actions of the elastically yieldable means and the vibrations of the electric motor when the spindle is prevented from rotating and current is continued to be supplied to the electric motor.

4,050,001
EDIT CIRCUIT FOR A NUMERICAL CONTROL SYSTEM

Hajimu Kishi, and Masashi Takahashi, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 7, 1976, Ser. No. 647,208
Claims priority, application Japan, Jan. 20, 1975, 50-7713
Int. Cl.² G05B *11/32*
U.S. Cl. 318—625 **2 Claims**



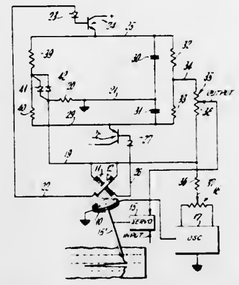
1. An edit circuit for a numerical control system for a plurality of objects being controlled, which objects have one common control axis, characterized in that said circuit comprises a plurality of input means receiving input data corresponding to said objects, respectively, a plurality of A-registers storing the data from the input means, a comparator circuit comparing the data stored in the A-registers, a plurality of arithmetic circuits operating on the data in the A-registers based on the result of comparison at the comparator circuit, and a B-register combining the operated data from the arithmetic circuits into one series of data for storage therein, said input means receiving input data in response to input timing signals from the corresponding A-registers, said input timing signals being generated when each A-register becomes empty, said data delivered to each of said A-registers being compared at said comparator circuit so as to find a datum having the shortest control time t_1 relating to said common control axis among the data being compared at one time, each of said arithmetic circuits dividing the data in the corresponding A-register into partial data to be controlled in the control time t_1 and another partial datum consisting of the remainder thereof based on the outcome from the comparison, said B-register storing those partial data from said arithmetic circuits which have the control time t_1 as one datum, said other partial data being returned to the corresponding A-registers, respectively, said objects being controlled simultaneously by said one datum stored in said B-register.

4,050,002
FEEDBACK SIGNAL GENERATOR FOR A SERVO CONTROL CIRCUIT

Howard N. Fawcett, Briarcliff Manor, N.Y., assignor to Cambridge Instrument Company, Inc., Ossing, N.Y.

Filed Sept. 23, 1975, Ser. No. 615,928
Int. Cl.² G05B *1/06*
U.S. Cl. 318—661 **5 Claims**

1. Means for generating a feedback signal for a servo motor having a rotatable shaft comprising a first coil, second and third coils angularly disposed one relative to the other and inductively coupled with the first coil, means for feeding an AC voltage to the first coil to induce AC voltages in the second and third coils, means coupled to said shaft and at least one coil for effecting relative movement about an axis between the first coil and the second and third coils, and means for combining the voltages of the second and third coils to produce a feedback voltage, said second and third coils each having an annular configuration and are positioned in intersecting relationship and said first coil is of annular configuration and greater in size than the second and third coils to permit rotation thereof about an axis relative to the second and third coils, the axis defined by the intersections of the second and third coils being inclined relative to the axis of rotation and the plane



defined by said first coil is inclined relative to the axis of rotation and the axis of said second and third coils.

4,050,003
MODULAR CORDLESS TOOLS

Peter Russell Owings, Towson, Md.; Jacobus Jan Beckering, Brockville, Canada, and Roderick Francis Bunyea, Cockeysville, Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

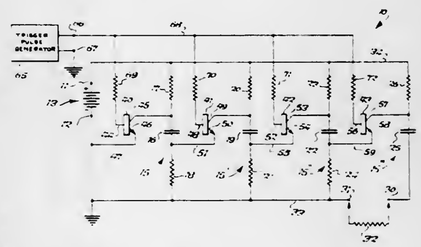
Continuation of Ser. No. 500,131, Aug. 23, 1974, Pat. No. 3,952,239. This application Feb. 18, 1976, Ser. No. 659,035
Int. Cl.² H01R *13/54;* H01M *10/46;* 320 *2-5*
U.S. Cl. 320—2 **4 Claims**

1. A modular, cordless electric tool assembly comprising a power handle module having an enclosing casing, said casing forming a four-sided closed loop about a central opening, one of said sides being configured to provide a hand grip, a plurality of battery cells enclosed within said casing, switch means comprising an electric switch mounted within said casing and a switch operator extending externally of said casing within said closed loop for engagement and manipulation by an operator having his hand in place on said hand grip, a second side of said power handle being provided with a plurality of exposed electrical contacts, means internally of said casing connecting said contacts with said battery cells, a longitudinally extending pilot surface on said second side of said power handle; a tool head module including a housing, output means on said housing, one side of said housing having electrical contact means exposed thereon for interengagement with said electrical contacts on said power handle, a pilot region exposed in said one side of said tool head housing for engaging said pilot surface on said power handle; and complementary male and female interconnection means provided respectively on said second side of said power handle and on said one side of said tool-housing permitting sliding interengagement and disengagement of said power handle and said tool head, said tool head module being stably connected mechanically to said power handle module and electrically connected to said batteries when said power handle and said tool head are engaged.

4,050,004
CARDIAC PACER INCLUDING CONTROLLED VOLTAGE MULTIPLIER

Wilson Greatbatch, Clarence, N.Y., assignor to Wilson Greatbatch Ltd., Clarence, N.Y.

Continuation-in-part of Ser. No. 32,942, April 29, 1970, Pat. No. 3,878,450. This application Jan. 2, 1974, Ser. No. 429,527
Int. Cl.² H02M *7/00*
U.S. Cl. 363—59 **12 Claims**

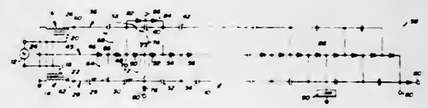


1. A cardiac pacer comprising:
a. a voltage source;
b. a controlled voltage multiplier having an input connected to said voltage source and an output;
c. pulse generating means connected in controlling relation to said voltage multiplier, said pulse generating means including timing means controlling the generation of pulses; and
d. a pair of output terminals connected to the output of said voltage multiplier, at least one of which is adapted to be operatively coupled to a patient's heart.

4,050,005
DUAL PHASE INPUT MULTIPLIER

Brian K. Maginness, Plano, Tex., assignor to Biometrics Instrument Corporation, Garland, Tex.

Filed May 27, 1976, Ser. No. 690,537
Int. Cl.² H02M *7/00*
U.S. Cl. 363—59 **33 Claims**



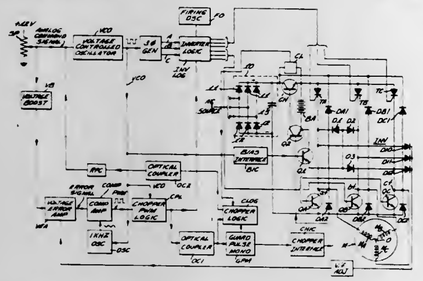
1. A voltage multiplier comprising:
a first AC line;
a second AC line;
a diode line having a plurality of series connected diodes interposed between said first and second AC lines;
a plurality of capacitors interconnected to said lines to define a plurality of multiplier stages;
transformer input means connected to the input of said multiplier stages for receiving AC voltage for driving said plurality of multiplier stages; and
output voltage tapping means extending from one of said AC lines and from at least one point along said diode line and including a rectifier for providing an isolated multiplied DC output voltage.

4,050,006

INVERTER HAVING CONSTANT FREQUENCY CHOPPER SYNCHRONIZED TO MODULATION FREQUENCY

Frederick A. Stich, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 22, 1976, Ser. No. 744,133
Int. Cl.² H02M 7/00
U.S. Cl. 363—98 **10 Claims**



1. A variable frequency, variable voltage power supply comprising, in combination,
- a static inverter adapted to be coupled to a unidirectional electric power source and including a plurality of load current carrying semiconductor switches,
- semiconductor chopper means in one polarity of said source between said source and said semiconductor switches without a filter between said chopper means and said switches,
- means for modulating said semiconductor switches at a selectively variable frequency to establish the output frequency of said inverter,
- means including a carrier constant frequency oscillator for time ratio controlling said chopper means at the carrier frequency of said oscillator, said carrier constant frequency being independent of said inverter output frequency and sufficiently high to permit elimination of a filter between said chopper means and said semiconductor switches, and
- means for synchronizing the switching of said chopper means to said inverter output frequency so that chopping is identical in the positive and negative half cycles of the inverter output waves.

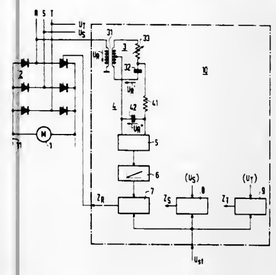
4,050,007

CONTROL UNIT FOR THYRISTORS OF A CYCLOCONVERTER

Hans Gross, Neunkirchen a. Brand, Germany, and Eugenio Berti, Milan, Italy, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 10, 1976, Ser. No. 684,497
Int. Cl.² H02M 7/155
U.S. Cl. 363—87 **2 Claims**

1. A control unit for thyristors of a cycloconverter, the thyristors being adapted to be connected to a three phase network generating three phase voltages, the control unit comprising:
- means for deriving a measuring voltage from a phase voltage, said means for deriving comprising a transformer having a primary winding adapted to be responsive to a phase voltage and a secondary winding having a tap;
- phase-shift means for phase-shifting said measuring voltage, said phase-shift means shifting the phase of said measuring voltage by a first amount which compensates for the phase shift of said measuring voltage relative to said phase voltage by a second amount, said second amount of phase shift being applied to said measuring voltage by passage of said measuring voltage through a smoothing means, said phase-shift means comprising:
- said secondary of said transformer;
- a series connection of a capacitor and potentiometer;



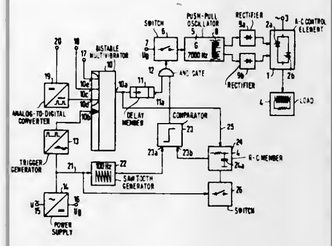
- and smoothing means for smoothing said measuring voltage, said smoothing means being connected between said capacitor and said potentiometer, said smoothing means shifting the phase of said measuring voltage by said second amount.

4,050,008

CONTROL UNIT FOR AN A-C CONTROL ELEMENT WITH FULL-WAVE CONTROL

Helmut Glaser, Forchheim, and Ludwig Schick, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 8, 1976, Ser. No. 674,808
Claims priority, application Germany, Apr. 17, 1975, 2516934
Int. Cl.² G05F 1/44
U.S. Cl. 323—19 **2 Claims**



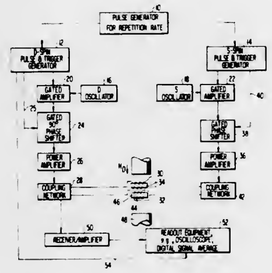
1. A control unit for use with an a-c supply voltage and for use with an a-c control element having full-wave control and including thyristors having firing electrodes, said control unit comprising:
- a push-pull oscillator for generating firing pulses for said thyristors; and
- control means for switching said oscillator on at the beginning of a first half-wave of said a-c supply voltage and for switching said oscillator off at the end of a second half-wave of said supply voltage, said second half-wave being opposite in sign to said first half-wave, said control means including:
- a bistable multivibrator;
- a delay line for delaying the signal generated by said multivibrator;
- a sawtooth generator operating at twice the frequency of said a-c supply voltage;
- an R-C circuit responsive to the output signal of said multivibrator;
- a comparator circuit responsive to the output signals of said sawtooth generator and said R-C circuit;
- and a digital logic means including an AND logic circuit responsive to the output signals of said comparator and said delay line for generating an output signal for switching said oscillator on and off.

4,050,009

SPECTROMETER FOR EXTERNAL DETECTION OF MAGNETIC AND RELATED DOUBLE RESONANCE

Paul L. Sagalyn, and Michael N. Alexander, both of Lexington, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 9, 1976, Ser. No. 647,699
Int. Cl.² G01R 33/08
U.S. Cl. 324—.5 AC **11 Claims**



1. In double resonance spectrometer apparatus including, a probe containing first abundant and second rare spin systems which are adapted to undergo gyromagnetic transitions due to dipolar coupling between abundant and rare spins at respective different gyromagnetic resonance frequencies, means for producing a unidirectional polarizing magnetic field through said probe in a predetermined direction, means for producing resonance transitions in both spin systems at different frequencies comprising first and second means respectively establishing first and second alternating magnetic fields substantially perpendicular to said predetermined direction of the polarizing magnetic field and substantially at the respective gyromagnetic frequency of said first and second spin systems, and means responsive to the resonance of said first spin system for detecting the resonance in said second spin system, the improvement comprising: first material containing said first spin system; and second but separate material containing said second spin system, wherein said first means establishing said first alternating magnetic field influences said first material and said second means establishing said second alternating magnetic field influences said second material and wherein said first and second means comprises coils respectively surrounding said first and second material.

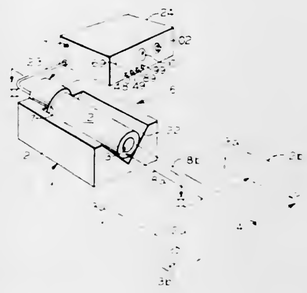
4,050,010

APPARATUS UTILIZING A TEST SURFACE WITH A MAGNETIC FLUX GAP FOR DETECTING DIMENSIONAL DISCONFORMITIES OF MANUFACTURED ELEMENTS

Theophile Isnard, Pont de Claix Isere, France, assignor to Caterpillar France S.A., Isere, France

Filed Feb. 24, 1976, Ser. No. 660,948
Claims priority, application France, Feb. 26, 1975, 75.06015
Int. Cl.² G01R 33/12
U.S. Cl. 324—34 R **8 Claims**

1. Apparatus for determining if at least one dimension of each of a series of ferromagnetic elements differs from a predetermined desired value, comprising:
- an electromagnetic sensing device having a ferromagnetic core forming a magnetic flux path, said core having an exteriorly exposed test surface against which successive ones of said elements may be disposed in a predetermined position relative thereto, said core having a gap in said flux path at said test surface with said gap being located in said test surface to be spanned by disconforming ones of said elements which differ along said dimension from other conforming ones of said elements that conform to said desired value, said gap being further located in said test surface to remain unspanned by said conforming ones of said elements thereby causing said core to exhibit a substantially lower reluctance when a disconforming one of said elements is positioned against said test surface as compared with when a conforming one is positioned thereagainst, said sensing device further having an electrical winding magnetically coupled to said core to establish said magnetic flux therein,
- a power supply for electrically energizing said winding,
- circuit means for detecting a predetermind degree of change of the self-inductance value of said winding whereby said disconforming ones of said elements may be distinguished from said conforming ones thereof, and
- guide means for receiving each of said elements in sequence and for defining said predetermined position of said elements at said test surface of said sensing device.

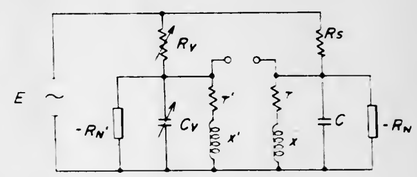


4,050,011

EDDY CURRENT FLAW DETECTOR USING A PAIR OF PARALLEL RESONANT CIRCUITS AND A NEGATIVE RESISTANCE IN PARALLEL WITH EACH CIRCUIT

Toshihiro Mori, Yokohama, and Seigo Ando, Kawasaki, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Japan

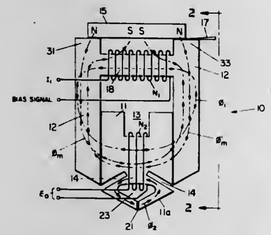
Continuation of Ser. No. 513,083, Oct. 8, 1974, abandoned, which is a continuation of Ser. No. 210,462, Dec. 21, 1971, abandoned. This application Nov. 14, 1975, Ser. No. 632,116
Int. Cl.² G01R 33/12
U.S. Cl. 324—40 **5 Claims**



1. An eddy current flaw detecting apparatus,
- a bridge circuit in which a pair of adjacent arms thereof each include a coil, a condenser and a negative resistance device connected in parallel with each other and forming a resonant circuit,

one terminal of said bridge arms being connected in common to one terminal of an energization source,
a pair of resistance device connected in common at one end to the other terminal of the source,
the other terminal of each resistance device being connected to the other terminal of a respective bridge arm and to a respective output terminal.

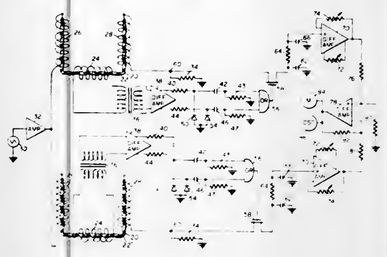
4,050,012
DUAL BIASED STATIC SENSING MAGNETIC TRANSDUCER
James D. Flora, 7067-1/2 Vineland Ave., North Hollywood, Calif. 91605
Filed Apr. 4, 1975, Ser. No. 565,105
Int. Cl.² G01R *33/02*
U.S. Cl. 324—43 R **5 Claims**



1. A magnetic transducer for sensing and indicating the presence of an external magnetic field, the transducer comprising, in combination:
a core formed from magnetic permeable material,
a magnetic flux-conducting ring-shaped field sensor having a gap at one side, connected to the core at a point opposite said gap, said core and field sensor being magnetically isolated from one another, except at the point of contact, by high reluctance slots
first flux inducing means for establishing a unidirectional magnetic flux within the core to bias said core for operation on a minor hysteresis loop of the core material,
second flux inducing means for establishing an alternating magnetic flux within the core, said high reluctance slots diverting the unidirectional and alternating flux away from said gap, and
an output coil wound around the core in which a composite output signal is induced in response to the unidirectional and alternating flux and the magnetic flux of the external magnetic field sensed by said ring sensor.

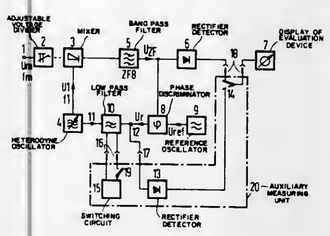
4,050,013
MAGNETIC FIELD PROBE WHICH MEASURES SWITCHING CURRENT OF MAGNETIC ELEMENT AT MOMENT THE ELEMENT SWITCHES AS MEASURE OF EXTERNAL FIELD
Harry L. Maddox, Reynoldsburg, Ohio, assignor to Western Electric Company, Incorporated, New York, N.Y.
Filed Feb. 25, 1976, Ser. No. 661,218
Int. Cl.² G01R *33/02*
U.S. Cl. 324—43 R **12 Claims**

5. Apparatus for testing the strength of a magnetic field comprising:
first conductive coil means;
a magnetic material element having substantially a square hysteresis loop and located within the magnetic influence of the first conductive coil and the magnetic field under test;
second conductive coil means located within the magnetic influence of the magnetic material element;
means for applying an alternating signal to the first conductive coil means, said signal being of sufficient intensity to switch the magnetic material element;
means for sensing a voltage generated in the second conductive coil means at the instant at which the magnetic material element switches magnetic state;



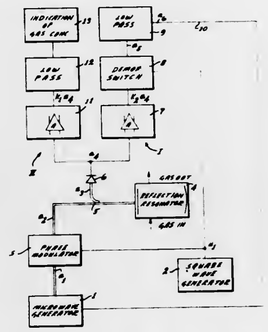
means responsive to the sensing means for sampling the alternating signal applied to the first conductive coil means over a period of time substantially shorter than the cycle time of said alternating signal; and
means for averaging over time a predetermined succession of the sampled portions of the signal applied to the first conductive coil means.

4,050,014
CIRCUIT ARRANGEMENT FOR MEASURING THE PHASE MODULATION DISTURBANCE OF A TEST SIGNAL
Helmuth Fink, Munich, and Günter Wess, Oberalting-Seefeld, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Mar. 10, 1976, Ser. No. 665,500
Claims priority, application Germany, Mar. 14, 1975, 2511323
Int. Cl.² G01R *27/00*
U.S. Cl. 324—57 H **10 Claims**



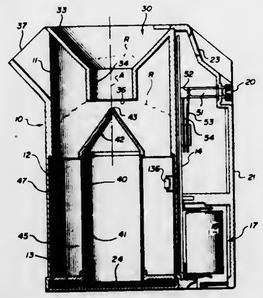
1. A circuit for detecting phase modulation disturbances of a signal, which has passed through a test object, in the carrier-frequency band comprising a carrier-frequency selective heterodyne receiver comprising a mixer receiving the incoming signal after it has passed through said test object, a band pass filter receiving the output of said mixer and passing an I.F. frequency, a voltage tunable heterodyne oscillator supplying an input to said mixer, a reference oscillator, a phase discriminator receiving a portion of said I.F. frequency and the output of said reference oscillator and producing an output voltage which is supplied to said voltage tunable heterodyne oscillator to adjust the frequency of said heterodyne oscillator, a first detector receiving a portion of the I.F. output of said band pass filter, and an evaluation device receiving the output of said first detector.

4,050,015
CONTROL OF MICROWAVE GENERATOR-CAVITY RESONATOR COMBINATIONS FOR GAS ANALYZER
Wolf-Dieter Zollner, Aachen, Germany, assignor to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed July 6, 1976, Ser. No. 702,844
Claims priority, application Germany, July 4, 1975, 2529829
Int. Cl.² G01R *27/04*
U.S. Cl. 324—58.5 C **9 Claims**



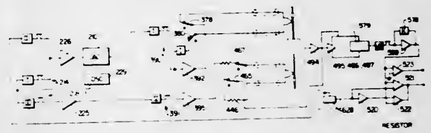
8. In an analyzer as in claim 7, wherein said spectrum generating means includes a phase modulator, the resonator being of the reflector variety.

4,050,016
VOLUMETRIC MOISTURE TESTER
Norman F. Marsh, Auburn, and Warren H. Kelly, Springfield, both of Ill., assignors to Dickey-john Corporation, Auburn, Ill.
Filed Apr. 2, 1976, Ser. No. 673,195
Int. Cl.² G01R *27/26*
U.S. Cl. 324—61 R **6 Claims**



1. A moisture tester for grain and the like comprising a walled test chamber including an inclined pour spout and an inclined conical distributor funnel affixed upon and extending into the chamber of the chamber top, and spaced apart electrodes forming an electrical capacitor at the chamber bottom, the electrodes being located so that the dielectric constant of the capacitor is modified in accordance with the dielectric constant of the test material sample due to moisture therein, an electrical circuit including the capacitor for generating a signal which varies systematically in accordance with the capacitor dielectric constant, the funnel distributor extending into the test chamber interior but spaced apart from the test chamber walls for uniformly distributing the material which comprises the sample introduced into the test chamber and thereby minimizing corresponding variations in the sensed test material dielectric constant the pour spout being defined in part by an inclined wall extending from the chamber at a point above the electrodes and below the funnel in a direction substantially parallel to the distributor funnel to encourage a rapid, uncongested pour-out of test sample material when the test has been completed, and conical means having a tip aligned with the funnel means axis to encourage uniform deflection, flow and packing of test material into the test chamber.

4,050,017
SEQUENCE COMPONENT TESTER
Eldred H. Paufve, Windsor, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.
Filed Mar. 19, 1976, Ser. No. 668,656
Int. Cl.² G01R *15/12*
U.S. Cl. 324—73 AT **27 Claims**



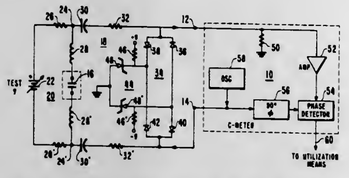
1. An electrical component sequence tester for a plurality of components of nominal values presented in a predetermined sequence comprising:
a pair of contacts for electrically engaging in sequence a component therebetween;
means for forming a two legged bridge using said component between said pair of contacts as a first leg in series with a selected resistance chosen out of a limited plurality of resistors as a second leg;
means for generating a fixed voltage reference signal and a variable voltage test signal, said means for generating a fixed voltage reference signal including a fixed voltage source inputted to a fixed gain amplifier device; and said means for generating a variable voltage test signal including said fixed voltage source inputted to a variable gain amplifier device, said reference signal being the output of said fixed gain amplifier device, and said test signal being the output of said variable gain amplifier device;
means for selectively applying said reference signal and said test signal each to an opposite end on said bridge;
means for feeding back the output signal at the junction between said legs of said bridge to said generating means to electrically balance said bridge, said output signal being zero when the nominal value and the actual value of the component on test are equal, said output signal being finite when the nominal value and the actual value of the component on test are unequal;
means for comparing the output signal at the junction between said legs of said bridge with a predetermined voltage value, said comparison being indicative of the difference between said nominal value and said actual value of the component on test; and
means for controlling said forming means, said generating means, said applying means and said comparing means as a function of the type of test to be performed, the nominal value of the electrical component and an acceptable value of deviation between said nominal value and said actual value.

4,050,018

CAPACITANCE METER BIAS PROTECTION CIRCUIT

Alvin Malcolm Goodman, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,075
Claims priority, application United Kingdom, Sept. 24, 1975, 39152/75
Int. Cl.² G01R *1/36, 27/26*
U.S. Cl. 324—110 **7 Claims**



1. In a circuit for measuring the capacitance between first and second terminals between which an element to be tested is placed and which includes means for producing a test signal at a given frequency to be applied between said terminals, means for producing a direct voltage to be applied between said terminals, and means for measuring the quadrature component of said test signal produced by said element in response to the test signal and direct voltage, a protection circuit comprising, in combination:

third and fourth terminals between which said direct voltage is applied;

a series circuit between said third and fourth terminals comprising inductive means in series with said first and second terminals;

fifth and sixth terminals between which said test signal is applied;

a circuit resonant at said test signal frequency connected between said first and sixth terminals including, in series between said third and fifth terminals a direct voltage blocking capacitance and resistance means, said resonant circuit including also said inductive means, and

semiconductor switching means normally exhibiting a relatively high impedance connected between said fifth and sixth terminals and responsive to a short circuit appearing between said first and second terminals for exhibiting a relatively low impedance to permit discharge of said direct voltage blocking capacitance.

4,050,019

RANGE SWITCHING CIRCUIT FOR SOLID STATE ELECTROMETER

Joseph C. Nirschl, West Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 26, 1976, Ser. No. 708,665
Int. Cl.² G01R *15/08, 1/30*
U.S. Cl. 324—115 **5 Claims**

1. An electrometer which comprises: an operational amplifier having an input connected to the source of the current to be measured, and an output;

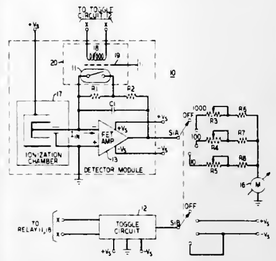
means for applying a feedback signal from the output of said operational amplifier to the input to control the gain thereof, said feedback applying means including at least first and second feedback resistors serially connected in a feedback loop between said output and input;

means connected to the output of said operational amplifier for indicating the amplitude of the output signal therefrom;

means for supplying first and second potentials of opposite polarities;

means for altering the sensitivity of said indicating means thereby to provide a plurality of measurement ranges for said electrometer; and

polarity sensitive switching means activated by the operation of said sensitivity altering means to selectively short out at least one of said first and second resistors to change



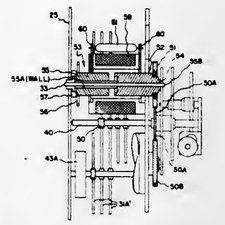
the gain of said operational amplifier, said sensitivity altering means including means for selectively applying said opposite potential polarities to said switching means.

4,050,020

MULTIPLE RATE ELECTRICAL ENERGY METERING SYSTEM AND METHOD

Warren R. Germer, Rochester, and Anseli W. Palmer, Hampton, both of N.H., assignors to General Electric Company, Somersworth, N.H.

Filed Sept. 17, 1976, Ser. No. 724,041
Int. Cl.² G01R *15/08*
U.S. Cl. 324—116 **10 Claims**



1. A multiple rate electrical metering system for registering the total electrical energy consumed by a monitored load and the electrical energy consumed during preselected time intervals including a meter register assembly comprising three sets of rotatably mounted indicating dial pointers, each of said sets of dial pointers being driven by a separate one of three gear trains coupled, respectively, thereto, an input drive gear coupled in continuous meshing engagement with one of said three gear trains and with a first clutch idler gear assembly and a second clutch idler gear assembly, said first clutch idler gear assembly being rotatably mounted in juxtaposition with a first clutch and brake assembly that is mounted for movement relative thereto, a second clutch and brake assembly mounted adjacent said second clutch idler gear assembly for movement relative thereto, said first clutch and brake assembly including a first clutch gear rotatably mounted in continuous meshing engagement with a gear in the second of said three sets of gear trains, said second clutch and brake assembly including a second clutch gear rotatably mounted in continuous meshing engagement with a gear in said third set of gear trains, said first clutch and brake assembly being operable to move from a braked position against a brake member that prevents the gears of said second gear train from rotating to an engaged position that holds it against the first clutch idler gear assembly for rotation therewith, said second clutch and brake assembly being operable to move from a braked position that prevents the gears of said third gear train from rotating to an engaged

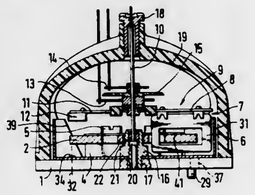
position that holds it against the second clutch idler gear assembly for rotation therewith, and means for selectively operating said first and second clutch and brake assemblies to move them, respectively, into either their braked or engaged positions.

4,050,021

MOVING-COIL MEASURING SYSTEM WITH A LARGE POINTER DEFLECTION

Hans-Georg Flach, Kronberg, and Bernhard Stier, Schwalbach, both of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed July 6, 1976, Ser. No. 702,457
Claims priority, application Germany, July 24, 1975, 2533057
Int. Cl.² G01R *5/08, 1/02*
U.S. Cl. 324—150 **8 Claims**



1. In a moving-coil measuring system with large pointer deflection, comprising:

A. a pole plate,

B. a pole ring including a projection,

C. a permanent magnet arranged between the pole plate and the projection,

D. a first bushing mounted in the pole plate,

E. a second bushing in a support fastened to the pole plate, the first and second bushings being concentric with respect to the pole ring, and

F. a moving coil embracing the pole ring and mounted on a shaft, said shaft rotating in the first and second bushings, the moving coil being adapted to move a pointer,

the improvement comprising:

G. means for fastening the first bushing to the pole ring at a point on the pole ring which is fixed adjacent to the first bushing and which integrally forms a central part of the pole ring.

4,050,022

AM-FM RECEIVER HAVING IMPROVED MODE CONVERSION

Robert J. McFadyen, Syracuse, and William Peil, N. Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

This application Oct. 12, 1976, Ser. No. 731,281
Continuation of Ser. No. 623,653, Oct. 20, 1975.
Int. Cl.² H04B *1/06*
U.S. Cl. 325—315 **20 Claims**

1. In a radio receiver having AM and FM modes, the combination comprising:

A. a d.c. coupled IF amplifier for signals at two intermediate frequencies, subject to amplification control by bias voltage variation and including a plurality of stages having wide band a.c. gain embracing both of said frequencies, each stage including an emitter coupled transistor pair,

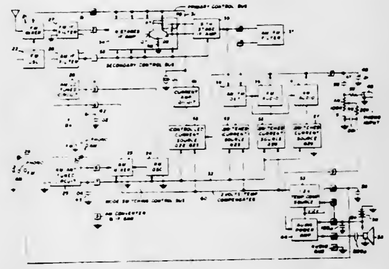
b. means comprising a primary control bus for applying a d.c. collector bias to the individual IF amplifier transistors, said potential being subject to variation in accordance with the mode setting of the radio receiver and/or a signal parameter,

c. a secondary control bus for controlling the input bias level of the individual IF amplifier transistors and for applying a degenerative feedback to balance each transistor pair,

d. means for establishing said secondary control bus at a potential which is a function of the potential of said primary control bus and for applying degenerative d. c. feedback to said secondary control bus, including

1. a collector load resistance connected between said primary control bus and the collector of the final transistor of one IF amplifier stage, and

2. a degenerative feedback resistance having one end connected to said collector and the other end to the base of said final transistor and to said secondary control bus, and



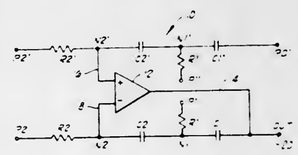
e. capacitance means for bypassing said secondary control bus to ground having a first value in the FM mode, selected in respect to the feedback resistance and the FM gain of said IF amplifier to preclude degenerative feedback at the higher FM IF frequency and to provide a decreased gain and attenuation of noise below said higher IF frequency, and a second value in the AM mode selected in respect to said feedback resistance and the AM gain of said IF amplifier to preclude degenerative feedback at the lower AM IF frequency.

4,050,023

GENERAL PURPOSE POLE-ZERO SINGLE AMPLIFIER ACTIVE FILTER

Albert D. Edgar, 3217 Rock Hollow Road, Oklahoma City, Okla. 73120

Filed Mar. 30, 1976, Ser. No. 672,038
Int. Cl.² H03B *1/00*
U.S. Cl. 328—127 **11 Claims**



1. An active resistance-capacitance filter circuit comprising:

input and ground terminals; an operational amplifier having an output and positive and negative inputs; and

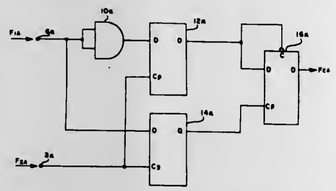
first and second resistance-capacitance networks each connected to the respective positive and negative inputs of the operational amplifier and each consisting of plural series-connected capacitors and interstitially parallel-connected resistors wherein the extremity terminals of each resistor and finally connected capacitor constitute a port, and wherein selected ports are selectively connectable to input and ground terminals and the operational amplifier output to provide a desired linear transfer function at the output of said operational amplifier.

4,050,024

SIDEBAND DETECTOR

Fendall Gregory Winston, IV, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 2, 1975, Ser. No. 618,872
Int. Cl.² H03B 3/04
U.S. Cl. 328—134 **3 Claims**



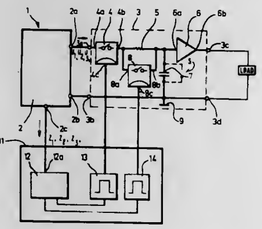
1. A sideband detector, comprising:
delay means responsive to a first signal for delaying said first signal;
first mixer means including first digital sequential logic flip-flop means responsive to the delayed signal and to a second signal for providing a first mixed signal;
second mixer means including second digital sequential logic flip-flop means responsive to both said first and said second signals for providing a second mixed signal; and
digital detector means defining a sequential logic flip-flop responsive to both said first and said second mixed signals for detecting one sideband of the mixed signals.

4,050,025

APPARATUS FOR OBTAINING A MEAN VOLTAGE VALUE

Bernhard Gerber, Langenthal, Switzerland, assignor to Greiner Electronic AG

Filed July 27, 1976, Ser. No. 709,240
Claims priority, application Switzerland, Sept. 1, 1975, 11280/75
Int. Cl.² G06G 7/24
U.S. Cl. 328—143 **3 Claims**



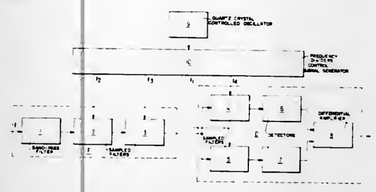
1. Apparatus for obtaining the mean value of a number of measuring voltage values, comprising
a. measuring-transmitting means (2) for producing a series of measurement voltages (U_1, U_2, U_3, . . .) and a series of counting pulses (Z_1, Z_2, Z_3, . . .) corresponding with said measurement voltages, respectively;
b. mean-value producing means (3) having at least one input terminal (3*a*) connected with measuring-transmitting means for receiving said series of measurement voltages, and at least one output terminal (3*c*) adapted for connection with load, said mean-value producing means including a series branch connected between said input and output terminals including, in series,
1. first switch means (4) operable between normally open and closed conditions, respectively; and
2. a resistor-capacitor network including a resistor (5) connected between said first switch means and said output terminal, and a capacitor (7) connected in parallel with the load; and
c. program-control means (11) having an input terminal connected with said measuring-transmitting means for receiving said counting pulses, said program-control means being operable upon the receipt of said counting pulses to close said first switch means for selected periods of time T_i which fulfill the condition $T_i = RCln(i/(i-1))$, where i is the number of the voltage value, R is the resistance value of said resistor when the i-th voltage value is supplied, and C is the capacitance of said capacitor, whereby the output voltage at said output terminal is the average of the series of measurement input voltages.

4,050,026

DEVICE FOR FREQUENCY DISCRIMINATION OF ELECTRICAL SIGNALS

Raffaele Cerra, Via Cilea, 171 - 80100 - Naples, and Michele Scherillo, Via Massimo Stanzione, 18 80100 - Naples, both of Italy

Filed Mar. 29, 1976, Ser. No. 671,373
Claims priority, application Italy, Mar. 28, 1975, 48845/75
Int. Cl.² H03K 9/06
U.S. Cl. 328—167 **5 Claims**



1. A device for filtering and frequency discriminating an electric signal, the device comprising:
a filter section including a band-pass filter, a first sampled resonant filter circuit and a second sampled resonant filter circuit connected in series, each of said first resonant filter circuit and said second resonant filter circuit having respective sampling control input means;
a discriminator including a third sampled resonant filter circuit and a fourth sampled resonant filter circuit coupled in parallel to said second filter circuit and responsive to its output, each of said third resonant filter circuit and said fourth resonant filter circuit having respective sampling control input means, a first detecting means coupled to said third resonant filter circuit and responsive to its output, a second detecting means coupled to said fourth resonant filter circuit and responsive to its output, and an output differentiated amplifier coupled to said third and fourth resonant filter circuits and responsive to outputs therefrom for producing an output signal representative of the frequency of a signal received by said band pass filter; and
means for producing and supplying respective sampling control signals of respective frequencies to each of said sampling control input means, said means for producing and supplying including a single high-stability oscillator feeding sampling control signal generating means.

4,050,027

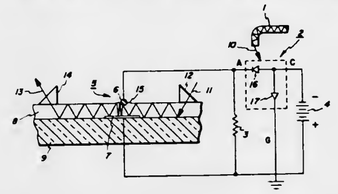
OPTICAL SIGNAL AMPLIFIER

Gustav R. Pfister, Webster, and James C. Maher, Sodus, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 2, 1976, Ser. No. 710,484
Int. Cl.² H03F 3/04
U.S. Cl. 330—5 **1 Claim**

1. An apparatus for amplifying a modulated light signal

propagating through a first optical waveguide, which comprises:
a set of electrodes, the members of said set of electrodes being arranged to contact opposite sides of an elastomeric optical waveguide having unmodulated light of high intensity propagating therethrough such that a light-modulating deformation of said elastomeric optical waveguide occurs whenever a field of sufficient strength is established between said members, said set being electrically connected to a circuit such that said one member of said set of electrodes is electrically connected to the positive terminal of a D.C. power source and the opposing member of said set of electrodes is connected through a photodiode adapted for registering said signal to the negative side of said D.C. power source a resistor being placed



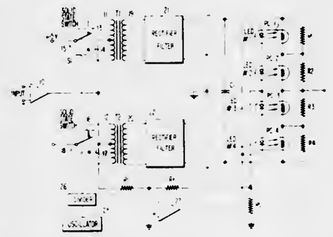
across the circuit between said photodiode and the positive terminal of said D.C. power source, said resistor having a resistance of not more than about 1/10 the dark resistance of the photodiode, and the photodiode having a light resistance of not more than about 1/10 the resistance of the resistor, the frequency response of the apparatus being not greater than $1/2\omega_{max}$ where ω max equals 2π **times the maximum modulation frequency, whereby the resistance of the photodiode when struck by modulated light from the first optical waveguide is sufficiently reduced to result in a field between said electrodes and a corresponding light-modulating deformation of the elastomeric optical waveguide such that the high intensity light output from the elastomeric optical waveguide is modulated corresponding to the modulation of said signal.**

4,050,028

HIGH VOLTAGE AMPLIFIER

Robert E. Vosteen, 1128 Archbald Road, Waterport, N.Y. 14571

Filed Dec. 10, 1976, Ser. No. 749,226
Int. Cl.² H03F 3/38
U.S. Cl. 330—10 **10 Claims**



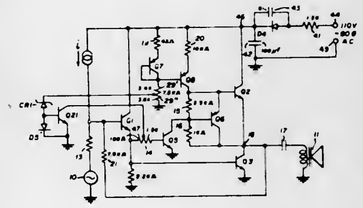
1. A high voltage operational amplifier system comprising:
a first operational amplifier,
first and second inverter means operable in opposite senses of polarity and having their respective inputs connected to the output of the first operational amplifier to convert the DC output voltage of the first operational amplifier to first and second stepped-up differential AC voltages at the same predetermined synchronized frequency,
first and second converter means to convert the first and second AC voltages to corresponding first and second DC voltages,
first and second photoconductor means connected in series across the outputs of the first and second converter means,
a second operational amplifier connected to function as an inverting amplifier having its (−) input connected to the output of the first operational amplifier through resistive means, and its (+) positive input connected to circuit common,
first and second light source means connected to the output of the second operational amplifier, the first light source means being selectively energizable in response to a second operational amplifier output of one polarity and being optically coupled to the first photoconductor means, the second light source means being selectively energizable in response to a second operational amplifier output of the opposite polarity and being optically coupled to the second photoconductor means, the output of the amplifier system being between the series connection of the first and second photoconductor means and circuit common.

4,050,029

ELECTRONIC APPARATUS COMPRISING AN AUDIO AMPLIFIER PROVIDING SHUNT VOLTAGE REGULATION

Robert J. McFadyen, Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed July 2, 1976, Ser. No. 702,287
Int. Cl.² H03F 3/04
U.S. Cl. 330—22 **6 Claims**



1. Electronic apparatus comprising:
A. a source of bias voltage having two output terminals, one common, said source having appreciable internal resistance and requiring voltage regulation,
B. a push-pull audio output stage comprising: a first and a second output transistor of a first conductivity type, each connected in a base input configuration with the collector of said first output transistor being connected to the non-common terminal of said source, the emitter of said first output transistor being coupled to the collector of said second transistor, and the emitter of said second output transistor being returned to said common terminal, said output transistors having sufficient current capacity for shunt regulation of said source, the audio output of said output transistors being taken at their interconnection,
C. a driver stage for said push-pull output stage, comprising:
1. a third transistor of said first conductivity type for driving both output transistors, connected in base input, emitter-follower configuration, the emitter of said third transistor being d.c. coupled to the base of said second output transistor,
2. a phase inverting intermediate driver for coupling the output from the emitter of said third transistor to the base of said first output transistor and comprising a fourth transistor,
a. said fourth transistor being of said first conductivity type and having its base d.c. coupled to the emitter of said third transistor through a first resistance and the emitter common to parallel the input junctions of said

fourth and second transitors to stabilize their current ratio, and

D. output voltage regulating means coupled between said source output terminals comprising:

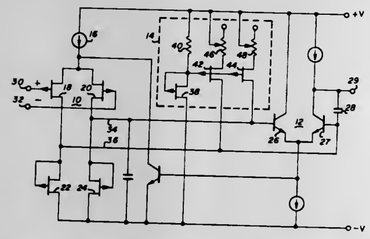
1. a voltage reference for sensing a deviation in bias voltage from a desired value,
2. means for producing an error current in response to said deviation, and
3. means for applying said error current to said first resistance to cause a change in base-emitter voltage in said second output transistor in response to said bias voltage, said change in base-emitter voltage altering said current ratio and changing the idling current of said second output transistor; and by virtue of said interconnection to the emitter of said first output transistor causing a corresponding change in idling current in said first output transistor, said idling current changes in said output transistors being in a sense to provide shunt regulation of said bias voltage.

4,050,030

OFFSET ADJUSTMENT CIRCUIT

Ronald W. Russell, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 549,196, Feb. 12, 1975, abandoned.
This application June 25, 1976, Ser. No. 699,776
Int. Cl.² H03F *3/16, 3/45*
U.S. Cl. 330—23 **5 Claims**



1. In combination with a differential amplifier including an input stage and a second stage connected together by a pair of output lines having an offset error voltage, an offset voltage adjusting circuit, comprising:

a. a current source;

b. first means connected in series with said current source for developing a voltage drop thereacross: and

c. a pair of transistors, each having their biasing circuits connected in parallel with said first means and having their outputs connected to respective ones of said output lines between said input stage and said second stage of said differential amplifier.

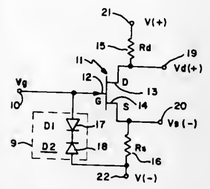
4,050,031

CIRCUIT AND STRUCTURE HAVING HIGH INPUT IMPEDANCE AND DC RETURN

Paul R. Gray, Orinda, and Mark L. Stephens, Campbell, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Mar. 1, 1976, Ser. No. 662,462
Int. Cl.² H03F *3/10, 3/16*
U.S. Cl. 330—24 **13 Claims**

1. A high impedance amplifier circuit comprising, an amplifier for receiving an input signal, said amplifier exhibiting a leakage current conducting in one direction, a leakage current conduction path connected to said amplifier for continuously biasing said amplifier and continuously providing a return for said leakage current irrespective of said input signal polarity and magnitude, said conduction path including first and second diode structures connected in series in opposite conduction directions said structure being operative independent of external fields and biasing means, one of said diode structure having a forward conduction direction opposite to said one direction



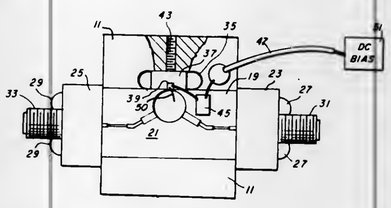
and exhibiting a reverse saturation current greater than the magnitude of said leakage current.

4,050,032

AVALANCHE DIODE AMPLIFIER

Hua Quen Tserng, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 2, 1976, Ser. No. 646,314
Int. Cl.² H03F *3/10*
U.S. Cl. 330—34 **1 Claim**



1. A microwave amplifier comprising:

a. a housing of non-magnetic metallic material having a recess and an opening at the center thereof, and in juxtaposition to each other,

b. a permanent bias magnet disposed in the opening of said housing,

c. a non-magnetic shim covering the top surface of said permanent bias magnet,

d. a ferrite substrate extending across the surface of said metallic housing and said non-magnetic shim,

e. a metallic circulator disposed on said ferrite substrate having an input port, an output port and a third electrical port,

f. a non-magnetic support block disposed in said recess of said housing and located adjacent to said third electrical port of said metallic circulator,

g. a diode mounted on said non-magnetic support block,

h. a bonding wire extending between said diode and said third electrical port of said metallic circulator and connected therebetween,

i. a pair of connector housings attached to said metallic housing, and

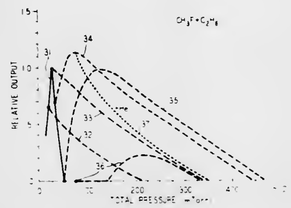
j. means bonding said pair of connector housings to the input and output ports of said metallic circulator.

4,050,033

SUBMILLIMETER WAVE AND FAR INFRARED MOLECULAR LASERS AND POLYATOMIC BUFFER GASES THEREFOR

Tao-Yuan Chang, Lincroft, and Chinlon Lin, Matawan, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 12, 1975, Ser. No. 631,225
Int. Cl.² H01S *3/00*
U.S. Cl. 331—94.5 G **6 Claims**



1. A gas laser comprising

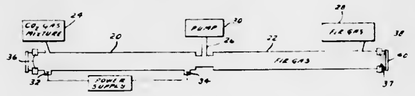
a gaseous medium including as an active constituent a molecular gas having a vibrational-rotational transition and an electric dipole moment, in which gaseous medium the vibrational relaxation time of the active gas is greater than its rotational relaxation time for the vibrational and rotational states involved in the lasing process, means for exciting said vibrational-rotational transition so as to selectively invert the population of a pure rotational transition within said gas, means for stimulating the emission of radiation from said rotational transition and for extracting a portion of said radiation for utilization, characterized in that said gaseous medium includes a hydrocarbon vapor for reducing the vibrational relaxation time of the active gas, whereby the vibrational relaxation time of the active gas is reduced by the transfer of vibrational energy from the active gas to said hydrocarbon vapor, the partial pressure of which hydrocarbon vapor is in an order of magnitude range centered about a unity ratio to the partial pressure of the active gas.

4,050,034

IN CAVITY PUMPING FOR INFRARED LASER

James D. Barry, Fairborn, and Joseph E. Brandelik, Clark County, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 30, 1975, Ser. No. 573,300
Int. Cl.² H01S *3/00*
U.S. Cl. 331—94.5 G **3 Claims**



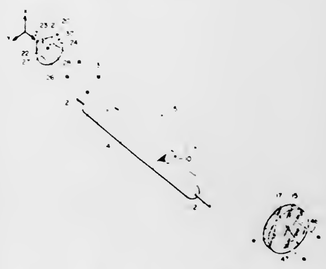
1. A far infrared gas laser, comprising: an optical laser cavity; means for containing lasing gas within said optical laser cavity; said means for containing lasing gas within said optical laser cavity including a first cell in a first portion of said optical laser cavity and a second cell, in another portion of said optical laser cavity, connected to said first cell; said first cell containing far infrared lasing gas molecules; means for providing a flow of CO_2 laser gas through said second cell; means for maintaining a separation of said far infrared gas molecules and said CO_2 gas; means for electrically exciting the CO_2 molecules to provide a population inversion in the CO_2 gas to produce intense circulating CO_2 laser radiation within said optical laser cavity; said CO_2 radiation being absorbed by the far infrared molecules to optically excite the far infrared molecules to produce a population inversion therein to provide a circulating far infrared radiation within said optical cavity; means for extracting far infrared laser energy from said cavity.

4,050,035

SELF-ALIGNED POLARIZED LASER

Ralph F. Wuerker, Palos Verdes Estates, and Lee O. Heflinger, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 13, 1976, Ser. No. 657,794
Int. Cl.² H01S *3/081*
U.S. Cl. 331—94.5 C **3 Claims**



1. A self aligned laser of the type generating linearly polarized light, said laser comprising:

a. a laserable material;

b. means for optically exciting said laserable material;

c. means associated with said laserable material for generating a first laser beam which is linearly polarized in a predetermined direction;

d. a transparent corner reflector having a flat surface and three planes disposed at an angle to each other to form a tetrahedral structure, said structure being disposed in the path of said first laser beam, said first laser beam passing through said flat surface and then impinging on a first one of said planes of said corner reflector away from the apex thereof, said first laser beam being returned substantially parallel thereto to provide a second laser beam, said second laser beam being reflected on a plane adjacent said first plane and then from the third plane, whereupon said second laser beam issues from said flat surface; and

e. reflector means disposed in the path of said first and second laser beams for reflecting said laser beams, for defining an optical cavity and for permitting a portion of at least one of said laser beams to pass, said laserable material and said corner reflector being so aligned and adjusted with respect to each other that said second laser beam when reflected by said reflector means and said corner reflector will return through said laserable material with the same direction of polarization as said first laser beam generated by said laserable material.

4,050,036

OPTICAL SYSTEM FOR LASERS

William A. Chambers, North Tonawanda; Franklin B. Bossler, Williamsville, and Warren F. Brandkamp, Batavia, all of N.Y., assignors to Textron Inc., Providence, R.I.

Filed Feb. 25, 1976, Ser. No. 661,361
Int. Cl.² H01S *3/081*
U.S. Cl. 331—94.5 C **4 Claims**

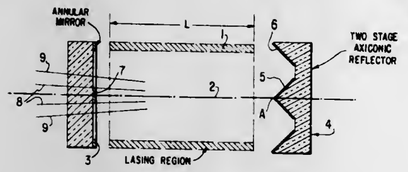
1. An improved laser construction comprising, in combination:

a cylindrical laser combustor for generating a phase coher-

ent optical field in the form of an annular cylinder which defines an axis;

unstable optical resonator means for producing an output beam from said field, which output beam is of low obscuration ratio;

said resonator means comprising an annular reflector centered on said axis and located adjacent one end of said field, said reflector having a reflecting surface facing toward the other end of said field and defining one end of the resonator means; a two stage axiconic reflector located beyond said other end of the field and optically aligned with said annular reflector, said axiconic reflector comprising an inner axiconic element and an outer axi-



conic element concentric therewith and said inner and outer elements both facing in the same direction; and reflecting means located in spaced opposed relationship to said two stage axiconic reflector and in alignment with said inner element to define the other end of said resonator means;

means for coupling some of the energy out of said resonator means;

the axis of said axiconic reflector being disposed at right angles to the axis of said field; and

an annular fold mirror disposed between said axiconic reflector and said reflecting means whereby optically to align said outer element with said annular reflector.

4,050,037

LASER BEAM ALIGNMENT

C. Harry Knowles, Moorestown; John R. Meckley, Mount Laurel, and Charles A. Naylor, Sewell, all of N.J., assignors to Metrologic Instruments, Inc., Bellmawr, N.J.

Filed June 10, 1976, Ser. No. 694,606
Int. Cl.² H01S *3/086*
U.S. Cl. 331—94.5 D **8 Claims**



1. In a laser system having a laser tube rigidly mounted within a hollow, generally cylindrical housing, beam alignment apparatus comprising:

first means, rigidly attached to an end of said housing, having an opening for passage of the laser beam, and a plurality of other openings into said housing;

second means, movable within said housing, having an opening for passage of the laser beam, and threaded openings corresponding respectively to said other openings in said first means;

third means, adapted to receive optical apparatus generally in the path of the laser beam, said third means having threaded openings respectively associated with the threaded openings in said second means; and

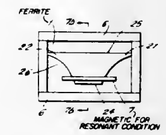
a plurality of screws, each in rigid threaded engagement with respectively corresponding ones of said threaded openings in said second means and in said third means, said screws being smaller than and freely penetrating said other openings in said first means, wherein said second and third means are annular, and with said screws loosened are transversely movable together relatively to said first means and to the laser beam, and with said screws tightened, are adjusted at a fixed position relatively to said first means and to the laser beam.

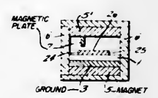
4,050,038

EDGE-GUIDED MODE NON-RECIPROCAL CIRCUIT ELEMENT FOR MICROWAVE ENERGY

Tsutomu Noguchi; Yoshihiko Akaiwa, and Hidehiko Katoh, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Sept. 2, 1975, Ser. No. 609,489
Claims priority, application Japan, Sept. 4, 1974, 49-101665; Sept. 4, 1974, 49-101666; Feb. 3, 1975, 50-15681; Sept. 4, 1974, 49-101667; Jan. 31, 1975, 50-14816
Int. Cl.² H01P *1/36, 1/38*
U.S. Cl. 333—1.1 **11 Claims**





1. A non-reciprocal circuit element for microwave energy comprising:

a ferrimagnetic slab;

a strip-line conductor formed on one main surface of the ferrimagnetic slab and having first and second spaced edge portions of different lengths aligned parallel to the direction in which microwave energy is chiefly propagated; said conductor having a generally trapezoidal shape in which the ends of said conductor taper from said first edge portion to said second edge portion; the ends of said second edge portion defining the end portions of said conductor;

a grounding conductor held in contact with the other main surface of the ferrimagnetic slab and kept at a ground potential;

a first means for applying a DC magnetic field to the ferrimagnetic slab in a direction perpendicular to the plane of said ferrimagnetic slab, wherein a non-reciprocal propagation characteristic is exhibited at opposing edge portions of the strip-line conductor, characterized in that a second means is provided for developing a non-uniform DC magnetic field distribution at least along one edge portion of the strip-line conductor in cooperation with said first means for applying a DC magnetic field to the ferrimagnetic slab;

said second means being comprised of means for supplying a magnetic field to one of said edges of said stripline conductor, the strength of the magnetic field being sufficient to cause said ferrimagnetic slab to bring about a magnetic resonance.

4,050,039

MAGNETIC TRIP ASSEMBLY

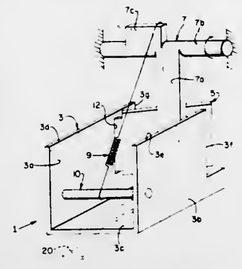
Gerald J. De Angelo, Ballwin, Mo., assignor to Zinsco Electrical Products, St. Louis, Mo.

Filed Jan. 2, 1976, Ser. No. 646,146
Int. Cl.² H01H *75/10, 77/06, 81/04*
U.S. Cl. 335—38 **6 Claims**

1. A magnetic trip assembly for use with a latch mechanism of a device to be controlled by the magnetic trip assembly, said magnetic trip assembly comprising:

a magnetic member having a first portion in a first plane, and a pair of opposed second portions at angles to the first portion and having pole faces in planes transverse to the plane of the first portion, said magnetic member being arranged to receive a load conductor adjacent to the first portion and operative to establish magnetic fields at said pole faces in response to the flow through the load conductor of a current having a value greater than a specified value;

an armature coupled to one of the second portions of the magnetic member and spaced through an air gap from the pole face of the other one of the second portions, said armature being operative to move through said air gap into physical contact with the pole face of the other one of the second portions in response to the establishment at the pole face of magnetic fields resulting from the flow



through the load conductor of a current having a value greater than the specified value;

an actuating and latch member adapted to be confined within a device to be controlled by the magnetic trip assembly and to engage a latch mechanism of said device, said actuating and latch member being coupled with the armature and operative to be moved by the armature in response to the aforesaid movement of the armature and to become disengaged from the latch mechanism of the device to be controlled;

a retaining member connected to the magnetic member; and

biasing means connected to the retaining member and to the actuating and latch member and operative following movement of the actuating and latch member and the armature to return the actuating and latch member and the armature coupled therewith to their positions prior to the aforesaid movement of the armature and the actuating and latch member.

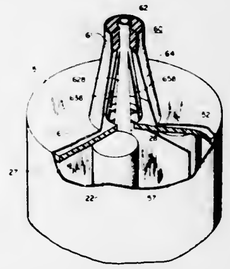
4,050,040

FAST-TUNED MULTIPLEXER-POWER COMBINER

George C. Fincke, West Allenhurst, and George W. Taylor, Brielle, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 12, 1976, Ser. No. 731,158
Int. Cl.² H01P *1/20, 7/04, 5/08, 7/06*
U.S. Cl. 333—73 C **17 Claims**

1. A device for filtering and combining two or more radio-frequency signals in a single coaxial output comprising an outer metallic cylindrical enclosure having a bottom plate and a top plate; at least two radial vanes joined along the central axis of said cylindrical enclosure, and dividing said cylindrical enclosure into at least two sections that comprise the outer conductors of at least two coaxial filter sections; an inner coaxial conductor centrally positioned in each of said coaxial filter sections; the lower end of each of said inner coaxial conductors being connected to said bottom plate of said cylindrical enclosure; an input connection for each of said coaxial filter sections extending through said outer cylindrical enclosure and connected to the upper end of each said inner coaxial conductors; means for tuning each of said coaxial filter sections separately; a strip line extending axially through each of said coaxial filter sections, said strip lines being equidistant from said central axis of said cylindrical enclosure; a coaxial output means having an outer coaxial conductor and an inner coaxial



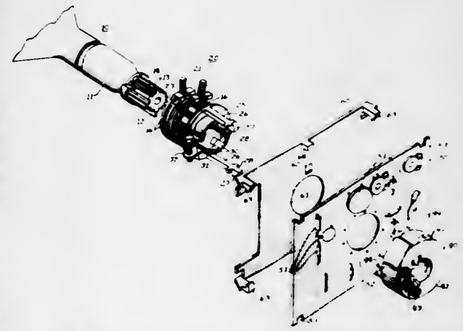
conductor; means for coupling said outer coaxial conductor to said top plate of said cylindrical enclosure; means for coupling the upper end of said strip lines to said inner coaxial conductor of said coaxial output means; and means for applying each of said radio-frequency signals to a corresponding one of said input connections.

4,050,041

STATIC/PURITY DEVICE FOR IN-LINE GUN

Konrad L. Schiecke, Mount Prospect, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 1, 1976, Ser. No. 672,693
Int. Cl.² H01J *29/82*
U.S. Cl. 335—210 **6 Claims**



1. In a color television receiver, a static/purity device for use on the neck of a color picture tube having a cluster of in-line electron guns located in said neck, and having a connecting base at the closed end of said neck making internal connections to said guns and forming a reference surface for the elements of said guns, said receiver including a printed circuit board having a foil side, and an electrical component carrying side, and a socket for making external electrical connections to said guns, mounted in fixed relationship to said board, said socket thereby being engageable with said base in fixed relationship with said reference surface, comprising: magnetic means producing corrective magnetic fields in the vicinity of said elements for compensating free fall beam landing errors in said tube, and a carrier for said magnetic means, having an integral pair of legs for positioning said carrier with respect to said board for assuring correct positioning of said purity device on said tube neck with respect to said reference

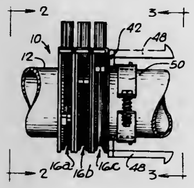
surface for aligning said magnetic means with said gun elements.

4,050,042

STATIC CONVERGENCE DEVICES FOR COLOR TELEVISION PICTURE TUBES

Albert M. Anthony, Bangor, Mich., assignor to Tracor, Inc., Austin, Tex.

Filed Oct. 13, 1976, Ser. No. 732,101
Int. Cl.² H01J *29/68*
U.S. Cl. 335—212 **17 Claims**



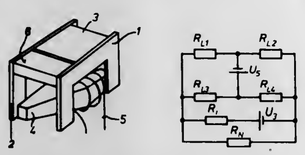
1. A convergence device for television picture tubes,
comprising a mounting sleeve having an axial opening for receiving the neck of a television picture tube,
at least one supporting ring rotatably mounted around said mounting sleeve for rotary adjustment relative thereto,
a pair of magnet rings rotatably mounted around said mounting sleeve and stacked upon said supporting ring,
said magnet rings having respective bevel gears formed in one piece with said magnet rings and facing toward each other,
a rotatable generally radial adjusting shaft having a bevel pinion meshing with and disposed between said bevel gears on said magnet rings,
and a member on said supporting ring supporting said shaft for rotation about a radial axis relative to the axis of the mounting sleeve,
said shaft being rotatable to cause rotation of said magnet rings in opposite directions about the axis of said mounting sleeve,
said supporting ring along with said shaft and said magnet rings being rotatable in common about the axis of said supporting sleeve,
said shaft constituting a handle for the rotary adjustment of the assembly comprising said supporting ring and said magnet rings relative to said mounting sleeve.

4,050,043

ELECTROMAGNETIC SYSTEM

Hans-Werner Reuting, Peine, and Hugo Eggers, Eltze, both of Germany, assignors to Elmeg Elektro-Mechanik GmbH, Peine, Germany

Filed Dec. 26, 1974, Ser. No. 536,436
Claims priority, application Germany, Dec. 29, 1973, 2365190
Int. Cl.² H01F *7/08*
U.S. Cl. 335—237 **14 Claims**



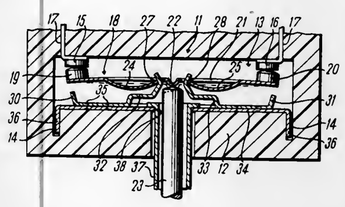
1. In an electromagnet system having a permanent magnet means for energization, further having a magnetically superimposing electromagnetic energization and a magnetizable output, all being included in a magnetic circuit, the improvement for preventing weakening of the permanent magnet means comprising:
a magnet shunt path for the permanent magnet means included in the circuit and connected in parallel thereto and having width dimensions so that the internal magnetic resistance of the shunt and of the permanent magnet means combined is smaller than the sum total of the magnetic resistance of the remainder of the magnetic circuit, the permanent magnet means having a particular demagnetization curve and the shunt having a particular magnetic load characteristics resulting in a point of intersection defined by a flux Bo and a magnetic field strength Ho, said permanent magnet means having a permeability μ so that Bo + μ Ho exceeds 8000 Gauss.

4,050,044

ELECTRICAL SWITCH

Karl Fischer, Oberderdingen, and Robert Kicherer, Knittlingen, both of Germany, assignors to E.G.O. Elektro-Geraete Blanc und Fischer, Germany

Filed Aug. 20, 1974, Ser. No. 498,950
Claims priority, application Germany, Aug. 30, 1973, 2343833; May 10, 1974, 2422684
Int. Cl.² H01H *61/01*
U.S. Cl. 337—137 **33 Claims**



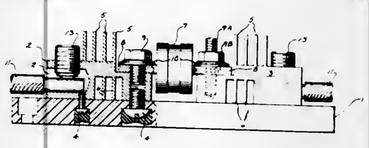
1. An electrical switch comprising a spring being made from resilient flat material and having a resilient base portion intermediate end portions, at least one contact carried on each portion, counter-contacts for engagement with respective contacts, spring tongues carried by said spring, the spring tongues being directed in opposite directions relative to one another, support bearings mounted in a fixed position with respect to said counter-contacts and adapted to support the ends of the spring tongues, the spring tongues being under stress and the ends of the tongues supported by the support bearings being directed towards one another, and an actuating member, moveable with respect to said support bearings, for engaging the resilient base portion of said spring and moving said contacts towards or away from said counter-contacts.

4,050,045

FINNED HEAT SINK FOR FUSE BLOCKS

Roger Henwood Motten, Jr., and Larry Paul LaFreniere, both of Bowling Green, Ohio, assignors to Marathon Electric Manufacturing Corporation, Wausau, Wis.

Filed Sept. 13, 1976, Ser. No. 723,028
Int. Cl.² H01H *85/02*
U.S. Cl. 337—187 **7 Claims**



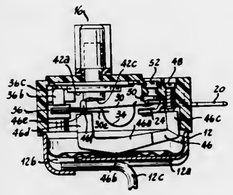
1. A fuse holder of the pressure type construction for use with fuses of varying amp capacity with heat being generated in the fuse holder in service which is required to be dissipated, which comprises a support, a pair of longitudinally spaced pressure connector blocks secured to said support, a generally small size fuse disposed in the space between the connector blocks and having tangs projecting from opposite ends and overlying the connector blocks, means extending through the tangs and into the connector blocks to secure the tangs to the connector blocks, at least one opening at the outer ends of the connector blocks disposed to receive electric wires to complete a circuit through the connectors and fuse, means securing the wires in place against the inside walls of the respective connectors, and at least one fin integrally formed with each connector block and projecting upwardly from each connector block at a location between a respective tang and the respective means securing a wire to a connector block to thereby dissipate heat from the metal area of each connector block between the fuse and the wire connections, said fin being approximately one-sixteenth of an inch in width and of a height to project to a horizontal plane extending vertically outwardly from a horizontal plane extending through the horizontal center line of the fuse and extending completely across the width of the connector block.

4,050,046

THERMOSTATIC SWITCH

Chester K. Wilson, Decatur, Ala., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed May 19, 1976, Ser. No. 687,892
Int. Cl.² H01H *37/40*
U.S. Cl. 337—319 **5 Claims**



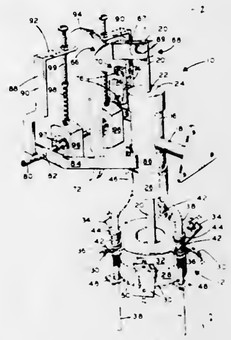
1. In combination in a thermostatic control device:
a molded insulating base;
a pair of spaced apart electrical terminals secured on said base and extending outwardly thereof, one of said terminals having an electric contact mounted thereon within said base,
a one piece flexible metal member comprising a base portion, mounting portions extending perpendicularly of said base portion at opposite ends of the latter and then oppositely of said mounting portions being anchored near the ends thereof with one in electrical contact with the other of said terminals, a generally U-shaped portion having its legs connected to said base portion between said mounting portions and having an electrical contact mounted on its bight to align with said contact on said one of said terminals, an operator portion extending from said base portion partway towards said bight, an extension on said bight aligned with and extending towards the end of said operator portion, and flipper leg portions projecting from said base portion on opposite sides of said operator portion and having ends that hook back towards said base portions,
a spring member formed of flat spring metal and mounted between said operator portion and the hooked ends of said flipper legs so that it assumes generally a C-shape in longitudinal cross section to compressively load said operator portion and tensionally load said flipper legs so that said flexible metal member normally assumes a stable position in which its contact is disengaged from the first mentioned contact,
a thermal power element secured to said base and having a diaphragm which moves toward said operator portion of said flexible member in accordance with increases in pressure in its diaphragm chamber, and
a one piece lever mounted for pivotal movement in said base and having a portion in engagement with said diaphragm and another portion engagable with said operator portion of said flexible member to move the latter and effect snap-action movement of said spring member to effect closure of said electrical contacts upon a given degree of movement by said diaphragm.

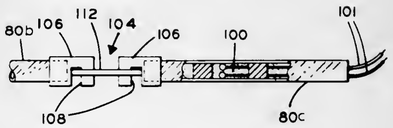
4,050,047

CONDITION-RESPONSIVE SPRING DRIVEN ACTUATOR

Marshall G. Pettit, 1489 Fruitdale Ave., San Jose, Calif. 95128

Filed Nov. 14, 1975, Ser. No. 631,884
The portion of the term of this patent subsequent to June 10, 1992, has been disclaimed.
Int. Cl.² F16K *17/36*
U.S. Cl. 337—408 **8 Claims**





1. A condition-responsive, spring driven actuator comprising:
A. an acutator housing;
B. an actuator shaft concentrically related to said housing and supported for rectilinear reciprocation;
C. a helical compression spring seated within the housing and connected with said shaft for continuously applying a force to said shaft for urging said shaft in axial displacement;
D. means for restraining said shaft against axial displacement including a fulcrum projected from said housing, a lever arm supported for pivotal motion by said fulcrum and having one end attached to said shaft, the other end thereof being depressible relative to said one end for causing said shaft to be displaced against the applied force of said spring, means for supporting said other end of the arm in a depressed configuration comprising a frangible bar for engaging the arm and securing it against pivotal motion, and means for supporting said bar at each of its opposite ends in a fixed relationship with said housing; and

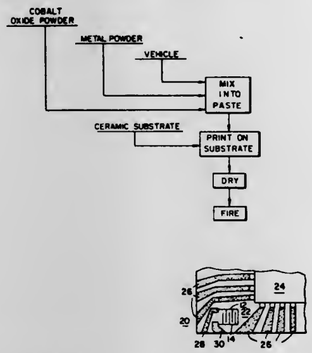
E. means for separating said bar for releasing said lever arm for pivotal motion, whereby the shaft is released for axial displacement.

4,050,048

HUMIDITY SENSOR, MATERIAL THEREFOR AND METHOD

Lawrence E. Frazee, Norfolk, Nebr., assignor to Plessey Incorporated, Melville, N.Y.

Division of Ser. No. 566,350, April 9, 1975, Pat. No. 4,016,308.
This application Dec. 2, 1976, Ser. No. 747,246
Int. Cl.² H01L 7/00
U.S. Cl. 338—35 **10 Claims**



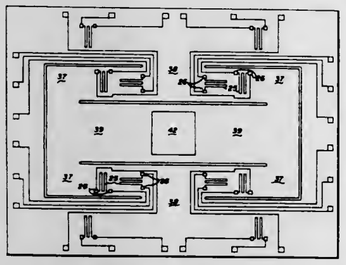
1. A humidity sensor comprising:
a ceramic substrate;
a fired-on pattern of a hygroscopic material in the form of a pair of closely-spaced electrodes;
said material comprising a major proportion of a conductive precious metal and a minor proportion of cobalt oxide; and
means for connecting said electrodes into a circuit.

4,050,049

SOLID STATE FORCE TRANSDUCER, SUPPORT AND METHOD OF MAKING SAME

Albert P. Youmans, Cupertino, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Feb. 9, 1976, Ser. No. 656,636
Int. Cl.² H01L 10/10
U.S. Cl. 338—47 **4 Claims**



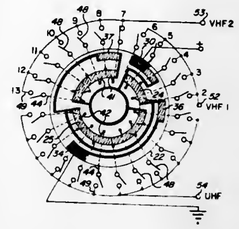
1. In an integral transducer element and support structure, a semiconductor body having top and bottom surfaces, said body having a recess formed therein extending upward within said body from said bottom surface to define internal side walls and a top wall, the top wall of said recess being spaced from said top surface to form a relatively thin transducer membrane portion within said body at least partially surrounded and supported by said internal side wall portions of said body, said transducer membrane having spaced elongate slots formed therethrough extending from said top wall of said recess to said top surface and being positioned intermediate the side walls of said recess extending to said top surface and terminating short of said side walls, said body having a slot formed about the periphery of said membrane portion at the junction of the recess side and top walls extending to said top surface with portions of said body remaining to integrally support the transducer element thereby formed.

4,050,050

ADJUSTABLE POTENTIOMETER ASSEMBLY

Mutsuo Nakanishi, Villa Park, and Hans Schmidt, Schiller Park, both of Ill., assignors to Matsushita Electric Company of America, Franklin Park, Ill.

Filed May 27, 1975, Ser. No. 580,541
Int. Cl.² H01C 10/48
U.S. Cl. 338—190 **21 Claims**



1. An adjustable potentiometer assembly including in combination:
a multiple-segment, resistive element in said potentiometer assembly;
means for applying direct current operating potential across each segment of said resistive element;
adjustable tap means having at least one tap member mounted in said potentiometer assembly for selecting any desired voltage from any of said segments of said resistive element out of the full range of voltages each segment is capable of producing by locating said tap member in contact with the surface of a resistive segment at different points from which the desired voltage is available;
means for adjusting the relative physical positions of said tap member and said resistive element over a predetermined range to obtain voltage adjustments at each of said different points over a second range of voltages which is less than said full range of voltages, the extremes of said second range of voltages at each different point overlying opposite extremes of the second range of voltages at points adjacent to such point; and
means coupled with said tap member for providing an output voltage from said adjustable potentiometer assembly.

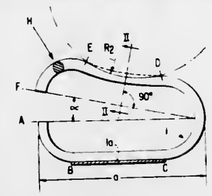
4,050,051

ELECTRIC SLIDER

Ferenc Kädär, and Gyula Galambos, both of Budapest, Hungary, assignors to REMIX Radiotechnikai Vallalat, Budapest, Hungary

Filed Oct. 14, 1975, Ser. No. 622,435
Int. Cl.² H01C 1/12
U.S. Cl. 338—202 **7 Claims**

1. In a slider for contacting an electric conductor to effect current transfer between conductor and slider, the slider having a plurality of uniformly spaced, independently springing, aligned resilient contact elements, the improvement wherein each contact element is of elongated C shape having opposite first and second long sides and opposite first and second short sides, said each contact element having a discontinuity at one of the short sides; each contact element having
a. a base portion constituted essentially by said first long side;
b. a springing portion adjoining said base portion and constituted essentially by said second short side and said second long side; the cross section of said springing portion having a flat configuration along at least one part of said second long side; the length dimension of said flat configuration being oriented substantially perpendicularly to the direction of a springing motion of said second long side towards and away from said first long side;
c. means defining a depression on an outwardly oriented side of said springing portion along said part of flat cross section; said depression having an arcuate course extending in the length dimension of said part of flat cross section;



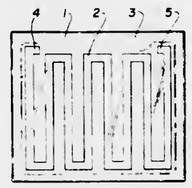
d. a contact portion adjoining said springing portion and constituted by one part of said first short side; said contact portion including a location of contact for engaging the conductor; the cross section of said contact portion being circular at least in the zone of said contact location; and
e. connecting means for electrically and mechanically coupling each contact element to an adjacent contact element at said base portion for immobilizing the contact elements with respect to one another at their base portion.

4,050,052

ELECTRICAL TEMPERATURE MEASURING RESISTOR STRUCTURE, PARTICULARLY FOR RESISTANCE THERMOMETERS

Walter Reichelt, Hanau, and Gunter Sauer, Maintal, both of Germany, assignors to W. C. Heraeus GmbH, Hanau, Germany

Filed June 14, 1976, Ser. No. 695,783
Claims priority, application Germany, June 21, 1975, 2527739
Int. Cl.² H01C 1/012, 3/04
U.S. Cl. 338—308 **17 Claims**



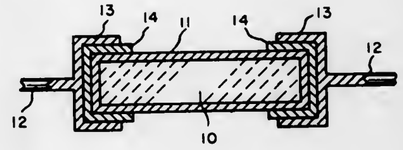
1. Electrical measuring resistor structure for use in resistance thermometers having
a carrier (1) of electrically non-conductive material and a strip of platinum resistance layer (2) applied to the carrier in a predetermined pattern, and comprising the improvement wherein
the carrier comprises a substrate (1) which includes less than 30 parts per million (ppm) Fe, less than 15 ppm Cr, less than 45 ppm Pb and less than 70 ppm Si in a form which can react with the platinum and wherein the sum of said named materials, if more than one is present, does not exceed 20 ppm;
the platinum layer has a thickness of between 0.1 and 10 μm;
and the mean thermal coefficient of expansion of the substrate differs from the coefficient of expansion of the thermal platinum by less than about ± 30%.

4,050,053

RESISTOR END TERMINATIONS

Gaylord L. Francis, Califon, and Amedeo J. Morelli, Randolph, both of N.J., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 22, 1976, Ser. No. 679,167
Int. Cl.² H01C 1/148, 1/142
U.S. Cl. 338—332 **1 Claim**



1. A film-type resistor, comprising
an elongated cylindrical substrate;
a resistive film provided adherently on the cylindrical surface of said substrate;
a termination film, composed solely of aluminum, being adherently provided in at least partially laminated relationship relative to portions of said resistive film on the opposed end portions of said cylindrical substrate; and
means for connecting said termination film to a lead, comprising a cap surrounding said end portions of said substrate and in electrical contact with said termination film.

4,050,054

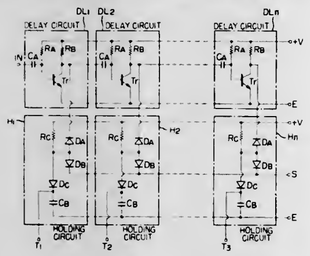
MULTI-CONTACT BRUSH TYPE FISH DETECTING SONAR

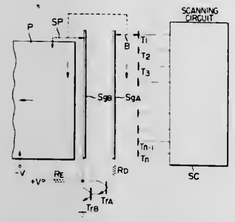
Yasunobu Yagita, Maisaka, Japan, assignor to Keisuke Honda, Japan

Filed June 4, 1975, Ser. No. 583,552
Claims priority, application Japan, June 7, 1974, 49-64807; June 7, 1974, 49-66116; Dec. 2, 1974, 49-139048; Dec. 2, 1974, 49-146518
Int. Cl.² G01S 9/70, 7/60
U.S. Cl. 340—3 F **4 Claims**

1. A multi-contact brush type fish detecting sonar, comprising
a. a plurality of cascaded delay circuits each having an input terminal, a transistor, a differentiating circuit connecting said input terminal to a base of said transistor, and an output terminal connected to a collector of the transistor the output terminal of each delay circuit being connected to the input terminal of the next succeeding delay circuit;
b. a plurality of holding circuits each having two diodes, a signal input terminal of each holding circuit connected to one of said two diodes, means connecting the other of said two diodes to the corresponding output terminal of one of said delay circuits, a holding signal output terminal, a capacitor means for coupling a terminal of said capacitor to the anodes of said two diodes for holding a sonar return signal to be recorded when a delay output pulse from said corresponding delay circuit and the reflected sonar signal applied to said signal input terminal are concurrently applied to said two diodes; and
c. recorder means with a plurality of contacts connected to

the output terminals of said holding circuits, respectively, a slidable brush, and a recording pen slidable over a re-





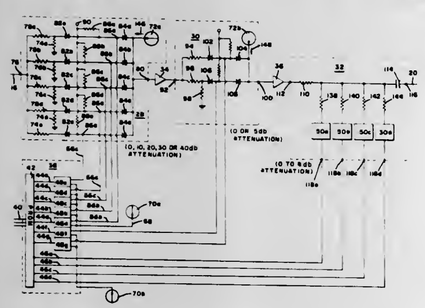
cording sheet in unison with said brush which slides over said contacts.

4,050,055

ATTENUATOR CIRCUIT ULTRASONIC TESTING

Christopher C. DiLeo, Brewster, N.Y., assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed July 26, 1976, Ser. No. 708,556
Int. Cl.² G01S 9/66
U.S. Cl. 340—1 R **13 Claims**



1. A pulse-echo ultrasonic apparatus including an attenuating means disposed in the electrical signal path from a transducer probe to a receiver circuit, said attenuating means comprising in combination;

input terminal means and output terminal means;

a signal attenuating network having a plurality of parallel connected impedance circuits coupled between said input terminal and output terminal means;

each of said impedance circuits comprising attenuating means and a pair of in-opposition connected unidirectional current conductive means;

constant current means coupled to each of said impedance circuits, and

control means which includes further constant current means and switch means coupled to each of said impedance circuits for causing, responsive to the selective operation of said switch means, current flow between said constant current means and said further constant current means through a respective unidirectional current conductive means of a pair of such conductive means,

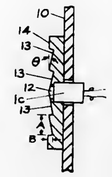
whereby to provide for the passage of an electrical signal from said input terminal means over a selected impedance circuit containing said respective current conductive means to said output terminal means.

4,050,056

ELECTROACOUSTIC TRANSDUCER DESIGN FOR ELIMINATING PHANTOM TARGET ERRORS IN SOUND RANGING SYSTEMS

Frank Massa, Cohasset, Mass., assignor to Fred M. Dollorfano, Jr. and Donald P. Amassa, Trustees of The Stoneleigh Trust, Cohasset, Mass.

Filed Nov. 10, 1975, Ser. No. 630,364
Int. Cl.² G01S 9/66; H04R 1/34
U.S. Cl. 340—1 R **5 Claims**



3. In combination, a directional electroacoustic transducer adaptable for use in a sound-ranging system for the detection of a sound reflecting target and elimination of multiple reflections, means for the detection of said sound reflecting target which includes the reception and recognition of an acoustic signal arriving from the target along an axis which includes the target and the directional transducer, a sound reflecting surface in the vicinity of said electroacoustic transducer, said sound reflecting surface characterized in that the linear dimensions of said sound reflecting surface are larger than the wavelength of said acoustic signal, and further characterized in that the configuration of said sound reflecting surface includes sound reflecting areas oriented in such manner that any line drawn perpendicular to the surface of any of the said sound reflecting areas from any point on the surface of said sound reflecting areas makes an angle with a line drawn parallel to the axis of the transducer from the same point on the surface of said sound reflecting area which is greater than one-half the beam angle of the transducer, the beam angle of the transducer being defined as the angle corresponding to the −3 dB points in the directional response characteristic of the transducer.

4,050,057

DATA SAMPLE RECORDING SYSTEM

William R. Backman, Jr., Portsmouth, and Mark A. Chramiec, Newport, both of R.I., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 2, 1976, Ser. No. 673,229
Int. Cl.² G01S 7/60
U.S. Cl. 340—3 F **7 Claims**

1. A recording system comprising:

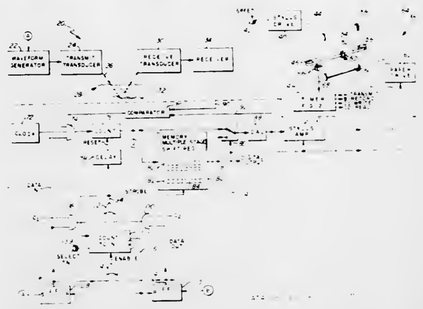
a recorder for recording data of a signal, said recorder having a recording medium and means for printing marks thereupon, there being a predetermined number of resolu-

tion elements across said medium for the printing of said marks;

means synchronized to said printing means for initiating a data sampling interval and a data printing interval;

means coupled to said initiating means for repetitively sampling said signal during said data sampling interval to produce a series of samples, said sampling means including means for selecting one sample of said series of samples during each of a number of subintervals of said data sampling interval, said number of subintervals being equal to said predetermined number;

means for varying the duration of said data sampling interval



while retaining said predetermined number of subintervals; and

means synchronized to said printing means for feeding samples selected by said selecting means to said printing means during said data printing interval.

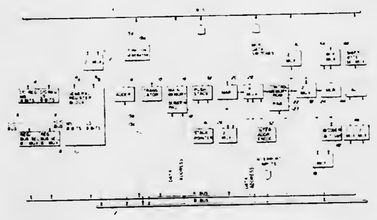
2. A system according to claim **1** wherein said data is the distance of a reflecting surface within a medium propagative of radiant energy, said system further comprising means coupled to said initiating means for transmitting a radiant energy signal toward said reflecting surface at the beginning of said data sampling interval and means coupled to said sampling means for receiving a radiant energy signal reflected by said reflecting surface.

4,050,058

MICROPROCESSOR WITH PARALLEL OPERATION

Richard A. Garlic, Irvine, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 428,651, Dec. 26, 1973. This application Oct. 24, 1975, Ser. No. 625,627
Int. Cl.² G06F 3/00
U.S. Cl. 364—200 **10 Claims**



1. A microprocessor comprising:

a. a control memory for storing control words,

b. a clock for generating a train of clock signals,

c. a first bus,

d. a second bus,

e. means connecting said first bus and said second bus,

f. a plurality of sources of data,

g. a plurality of destinations for storing data,

h. first selecting means for selecting one of said plurality of sources of data,

i. placing means for placing data from said selected source on said first bus,

j. said connecting means comprising transferring means for transferring data from said first bus to said second bus,

k. second selecting means for selecting one of said plurality of destinations for said data,

l. storing means for storing data in said selected destination, and

m. decoder means responsive to one of said control words and to a single one of said clock signals for simultaneously activating:

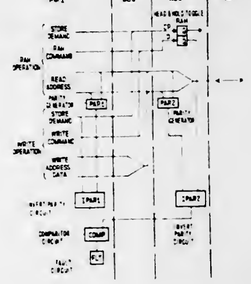
1. said first selecting means thereby selecting one of said plurality of sources of data,
2. said placing means thereby placing data from said selected source on said first bus,
3. said transferring means thereby transferring said data from said first bus to said second bus,
4. said second selecting means thereby selecting one of said destinations for said data, and
5. said storing means thereby storing said data on said second bus in said selected destinations whereby highly parallel operation of said microprocessor is enabled during a single clock cycle by said simultaneous activation of said first and second selecting means, said placing, transferring and storing means by said decoder means.

4,050,059

DATA PROCESSING READ AND HOLD FACILITY

John Lloyd Williams, Cambridge; Roger John Leaman, Maidenhead; Robert Valentine Moberly, Poole; Geoffrey Brian Kenneth Stagg, and Graham John Wisdom, both of Wimborne, all of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Apr. 30, 1976, Ser. No. 682,015
Claims priority, application United Kingdom, May 1, 1975, 18129/75
Int. Cl.² G06F 11/10
U.S. Cl. 364—200 **2 Claims**



1. A data processing system comprising in combination (i) a plurality of processing modules, each of said processing modules having means for initiating read, write, or read-and-hold operations, (ii) a common memory having a plurality of storage modules, (iii) individual highway busses for connecting each processing module to all storage modules for read, write or read-and-hold storage module access operations, (iv) means for generating, in each storage module, a parity indication indicative of the address of the storage location accessed by a processing module which indication is returned by way of the connecting highway bus to the accessing module in response to

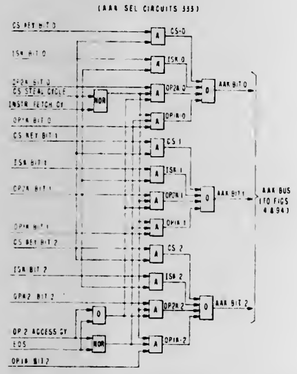
a storage module access operation and means for inverting in each storage module the parity indication returned during a write operation which follows immediately after a read-and-hold operation, (v) means for generating, in each processing module, the expected parity indication and (vi) means for comparing, in each processing module, the expected parity indication with the returned parity indication and for initiating a fault condition if the two parity indications are different.

4,050,060

EQUATE OPERAND ADDRESS SPACE CONTROL SYSTEM

Richard Eugene Birney, and Robert Allen Hood, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,221
Int. Cl.[2] G06F 9/20
U.S. Cl. 364—200 **6 Claims**



1. A system for protecting the contents of main storage of a processor using a plurality of storage protect keys operated by the processor having an equateoperand spaces (EOS) control feature, comprising

storage access request means in the processor for signalling storage access requests sensed in the processor while fetching and executing instructions,

means for generating different storage access type signals for different types of storage accesses signalled by the access request means including an instruction access type signal and at least one operand access type signal,

a plurality of key register sections, each key register section corresponding to an access type gated from the generating means, a key provided in each section being associated with the access type signal connected to the outgate of the respective section,

key selection means for selecting the outgates of the respective key register sections under control of the respective storage access type signals provided by the generating means,

an equate-operand-spaces (EOS) latch which is set and reset by execution of predetermined instructions by the processor,

first means for disabling one key register outgate in response to the setting of the EOS latch, and

second means for enabling another outgate in response to activation of the storage access type signal connected to the one outgate when the EOS latch is set,

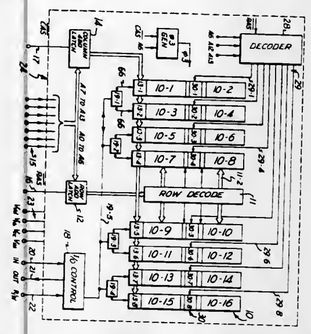
whereby when the EOS latch is set, the another outgate selects the key contained in another key register section instead of the key in the key register section associated with the one outgate; but when the EOS latch is reset, the one outgate being enabled to select the key in the associated key section.

4,050,061

PARTITIONING OF MOS RANDOM ACCESS MEMORY ARRAY

Norihisa Kitagawa, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 3, 1976, Ser. No. 682,685
Int. Cl.[2] G11C 7/06, 8/00
U.S. Cl. 340—173 R **10 Claims**



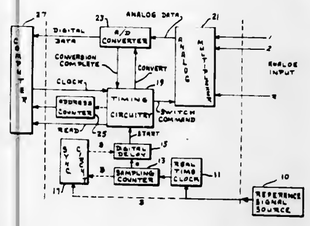
8. A semiconductor memory system comprising a memory array containing a large number of memory cells, means for addressing the memory array by a multi-bit address, first and second decoders for receiving the address and selecting parts of the array for access, the array being partitioned into two groups of pairs of blocks, the first decoder being between the two groups and selecting one of the groups for actuation for refresh and selecting one line in a group, the second decoder being duplicated and located at an end of each group to select a line in each group, and a third decoder for receiving a part of the address and actuating only one pair of blocks for a given address.

4,050,062

SYSTEM FOR DIGITIZING AND INTERFACING ANALOG DATA FOR A DIGITAL COMPUTER

Thomas H. Crocker, Burlington; Barry N. Levitt, Framingham, and Paul J. Suprenant, Chelmsford, all of Mass., assignors to The United States of America as represented bythe Secretary of the Air Force, Washington, D.C.

Filed Aug. 14, 1975, Ser. No. 604,527
Int. Cl.[2] G08C 15/06
U.S. Cl. 340—183 **6 Claims**



1. A system for interfacing a plurality of amplitude modulated signals with a digital computer comprising:

a. an analog multiplexer fed by the plurality of amplitude modulated signals;

b. an analog-to-digital converter fed by the analog multiplexer and read into the computer upon a read command, and with the analog-to-digital converter generating a conversion complete signal;

c. a timing circuit generating an initializing switch command for advancing the analog multiplexer, a convert command to the analog-to-digital converter, and a read command to the computer;

d. an alternating reference signal source having the same frequency as the plurality of amplitude modulated signals;

e. a real time clock connected to and synchronous with the alternating reference signal;

f. a sample counter fed by the real time clock and generating a start pulse to the timing circuit for initializing the multiplexer to input initial data to the analog-to-digital converter; and

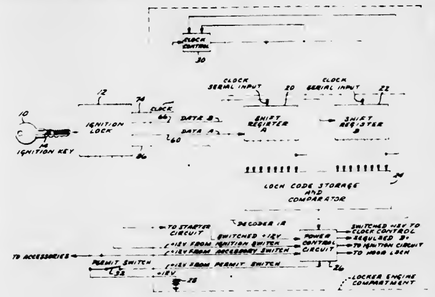
g. an address counter activated by the timing circuit for entering an initial address into the computer and advanced by signals from the timing circuit upon receiving a conversion complete signal from the analog-to-digital converter, and with the address counter generating a stop command upon completion of digital read-in.

4,050,063

KEY ACTUATED ELECTRONIC LOCK FOR AUTO IGNITIONS

George R. Schull, 6778 Eddinghill Drive, Rancho Palos Verdes, Calif. 90274

Filed July 14, 1975, Ser. No. 595,545
Int. Cl.[2] H04Q 3/00
U.S. Cl. 340—274 C **8 Claims**



1. A mechanical-electronic lock system for actuating auto ignitions and the like only upon sequential electronic and mechanical unlocking operations including a matching of a stored electronic lock code with an electronic key code generated as a key is being inserted into a lock cylinder followed by a mechanical turning of the key in the cylinder, the lock system comprising:

control means in a separate compartment and including storage means for storing a predetermined electrical lock code,

comparator means for comparing said electrical lock code with electrical input codes to said control means, and

means responsive only to a match between said lock and input codes for preconditioning an auto ignition and/or auto accessories for operating only in response to a subsequent mechanical turning of a lock cylinder in a mechanical key-actuated auto ignition lock:

a mechanical key-actuated auto ignition lock including a manually turnable lock cylinder for actuating said auto ignition and/or said auto accessories only after a preconditioning thereof by said control means followed by a turning of said lock cylinder, said cylinder having a keyway for receiving a mating ignition key for turning said lock cylinder in response to a turning of said mating ignition key;

a mating ignition key insertable into said keyway for turning said lock cylinder in response to a manual turning of said key and carrying a key code on a side face of said key, said key code matching said lock code;

transducer means in said auto ignition lock for reading said key code and generating an electrical key code indicative of said key code as said key is being inserted into said keyway; and

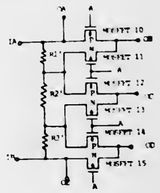
means for applying said electrical key code to said control means as an electrical input code for comparison and matching with said electrical lock code to precondition said auto ignition and/or accessories.

4,050,064

FOUR-LEVEL VOLTAGE SUPPLY FOR LIQUID CRYSTAL DISPLAY

Shitaro Hashimoto, Shiki, and Yuuichi Sato, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 11, 1976, Ser. No. 685,261
Claims priority, application Japan, May 14, 1975, 50-57649
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—324 M **11 Claims**



1. Voltage supply circuitry for supplying to a liquid crystal display first, second and third voltage levels in addition to a reference level, comprising:

first and second input terminals, the first input terminal being connected to the first voltage level and the second input terminal being connected to the reference level;

first, second, third, fourth and fifth output terminals for providing desired voltage levels to the liquid crystal display;

impedance means interposed between the first input terminal and the second input terminal for producing the second and third voltage levels;

connection means for always providing the first and reference levels to the first output terminal and the fifth output terminal respectively; and

switching means for selectively providing the first, second, third and reference voltage levels to the second, third and fourth output terminals.

4,050,065

DUAL SLOPE ANALOG TO DIGITAL CONVERTER WITH DELAY COMPENSATION

Gerald Mosley, Melrose Park, and Ervin T. Raber, Norristown, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed May 22, 1975, Ser. No. 579,762
Int. Cl.[2] H03K 13/20
U.S. Cl. 340—347 NT **5 Claims**

2. An improved precision dual slope analog to digital converter having an input signal sample integration period and a reference integration period comprising

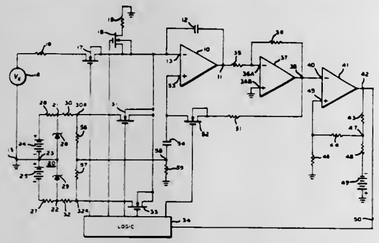
amplifier means including an integrating amplifier for performing said input signal sample integration and said reference integration,

a source of reference voltage,

switching means for applying to said integrating amplifier means during said reference integration period a first signal from said source of reference voltage to produce a

ramp change in the output of said integrating amplifier, and

delay compensation circuit means connected between said source of reference voltage and said amplifier means for applying to said integrating amplifier means throughout



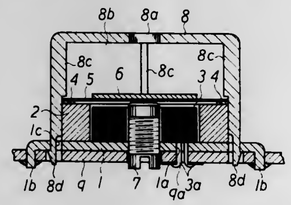
said reference integration period a second signal from said source of reference voltage to produce a step change in the output of said integrating amplifier to compensate for the inherent turn around delay in the response of said amplifier means.

4,050,066

BUZZER

Takeshi Yanagisawa, and Motoyuki Osuga, both of Tokyo, Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Oct. 6, 1976, Ser. No. 730,085
Claims priority, application Japan, Oct. 9, 1975, 50-121998
Int. Cl.² G01K 9/12
U.S. Cl. 340—388 **4 Claims**



1. A buzzer comprising; an annular magnet, a coil disposed at the inside of said magnet, a vibration plate disposed above said magnet, a core inserted into the central opening of said coil with its one end facing said vibration plate, yoke and a case, wherein said magnet, said vibration plate and said yoke are held one another by magnetic attraction of said magnet.

4,050,067

AIRBORNE MICROWAVE PATH MODELING SYSTEM

Ethelbert P. Elmore, Jr., Hernon House 1103, Reston, Va. 22090

Filed Apr. 21, 1976, Ser. No. 679,082
Int. Cl.² G01S 9/00; G01D 9/08
U.S. Cl. 343—5 R **6 Claims**

1. An airborne geophysical measurement and recording system comprising:

radar means for producing a focused radar signal, directing said signal to a terrain area below said aircraft and successively receiving a return signal from said terrain area,

a linear range circuit connected to the output of said radar means for successively producing radar range signals from said return signal indicating the highest obstruction in said terrain area,

an amplitude circuit connected to the output of said radar means for producing an echo magnitude signal which varies as a function of the maximum echo magnitude of said return signal,

temperature means for detecting the atmospheric temperature and producing a temperature signal which varies as a function thereof,

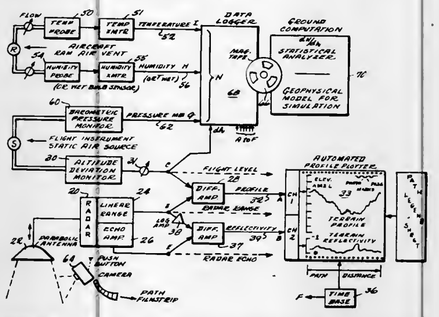
humidity means for detecting atmospheric humidity and producing a humidity signal which varies as a function thereof,

aircraft height means for detecting aircraft altitude and producing an altitude signal,

profile means for producing a profile signal which varies as a function of the difference between said range signal and said altitude signal,

reflectivity means for producing a reflectivity signal which varies as a function of said echo magnitude signal,

pressure means for detecting absolute atmospheric pressure and producing a pressure signal,



means for recording said temperature signal, said humidity signal, said pressure signal, said altitude signal, said profile signal and said reflectivity signal, and

means connected to said pressure means, and wet temperature means for producing from a plurality of data points taken at different altitudes a refractivity gradient dN/dh according to the relation

$N = 77.6\ P/T + 3.73 \times 10^5\ e/T^2$ where N is the radio refractivity in parts per million exceeding unity, h is the altitude at which the data points are taken, P is a data point representing the atmospheric pressure in millibars, T is a data point representing the temperature in degrees Kelvin, e is a data point representing the partial pressure of water vapor in millibars, and dN/dh is the refractivity gradient per kilometer of height in the lower air layer traversed by the microwave beam.

4,050,068

AUGMENTED TRACKING SYSTEM

Robert L. Berg, St. Louis; William J. Murphy, Frontenac, and Dennis E. Simmons, Jr., Bridgeton, all of Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 15, 1976, Ser. No. 667,041
Int. Cl.² G01S 9/02
U.S. Cl. 343—6 R **5 Claims**

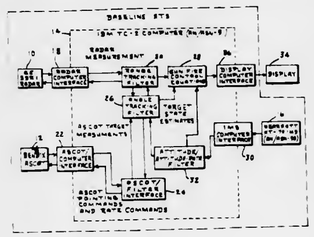
1. An augmented tracking apparatus comprising in combination

a radar sensor to provide range data

an electro-optical sensor to provide angle data

an inertial platform to provide inertial frame of reference data, said inertial platform sensing any change in aircraft attitude from said inertial frame of reference and providing attitude data corresponding to said change, and,

a computing means connected to said radar sensor and said electro-critical sensor to respectively receive said range data and said angle data, said computing means connected to said inertial platform to receive said inertial frame of reference data and said attitude data, said computing means processing said range, angle and attitude data to provide target state data, said computing means providing pointing commands to said electro-optical sensor, said electro-optical sensor responding to said pointing commands to scan a preselected area about the predicted target position said electro-optical sensor being a non-imaging electro-optical sensor.

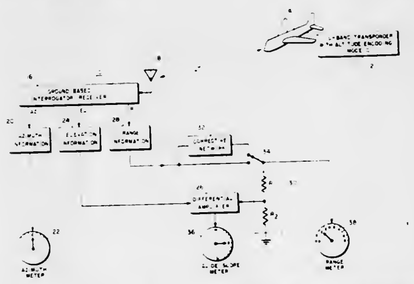


4,050,069

TRANSPONDER BASED LANDING SYSTEM

Henry Schlussler, Lincroft, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 2, 1976, Ser. No. 719,790
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.5 R **10 Claims**



1. A landing approach system for aircraft having a transponder which includes means for automatically transmitting encoded altimeter information when said aircraft transponder is interrogated, said system comprising:

a ground based interrogator/receiver unit for interrogating said aircraft transponder and adapted to receive response signals therefrom including said encoded altimeter information, the electronic center of said land based transponder antenna being aligned with the center line of a prescribed landing runway;

means in circuit with said ground based unit for processing said response signal for respectively determining the azimuth of said aircraft relative to said runway, and the range of said aircraft to the point of touchdown on said runway;

means in circuit with said ground based unit for decoding said encoded altimeter information to produce signals corresponding to the elevation reported from said aircraft;

means responsive to the output of said range determining means for generating signals corresponding to a ground distance and a vertical approach path for said aircraft whereby a glide path for said aircraft is prescribed, said vertical approach path signals being a fixed proportion of said ground distance signals; and

means for comparing said vertical approach path signals with said aircraft elevation reported signals to produce error signals corresponding to the difference therebetween;

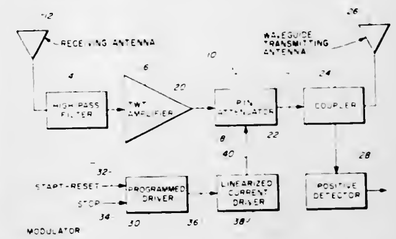
said azimuth, range and error signals comprising the information for guiding said aircraft along said glide path.

4,050,070

PROGRAMMABLE MICROWAVE MODULATOR

Lawrence A. Beno, Camarillo, and Kazumasa Doi, Ventura, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 1, 1976, Ser. No. 691,923
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.8 LC **12 Claims**



1. A programmable microwave modulator comprising:

a. means for providing a radio frequency signal from a receiving antenna;

b. programmable driver means for providing a linear analog signal that is predetermined both as to amplitude pattern and time period;

c. attenuator means responsive to said linear analog signal for attenuating said radio frequency signal; and

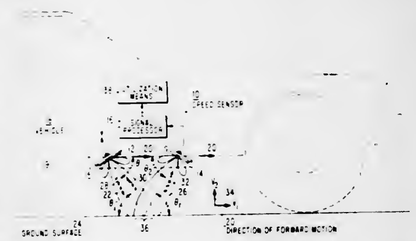
d. linearizing current driver means connected between said programmable driver means and said attenuator means for operating on said linear analog signal such that said radio frequency signal is attenuated by said attenuator means as a linear function of said linear analog signal.

4,050,071

BI-STATIC RADAR SPEED SENSOR

Alvin Seymour Clorfeine, Adelphi, Md., assignor to RCA Corporation, New York, N.Y.

Filed May 17, 1976, Ser. No. 687,142
Int. Cl.² G01S 9/42
U.S. Cl. 343—8 **6 Claims**



1. In an apparatus, cooperating with a vehicle having forward and rearward portions along a longitudinal axis, for sensing the speed of motion of said vehicle with respect to a ground surface in a forward direction substantially parallel to said longitudinal axis and substantially parallel to said ground surface, said apparatus being of the type including first means for transmitting a probe signal to said ground surface, second

means for receiving signals reflected from said ground surface and third means, responsive to signals respectively indicative of said probe signal and said reflected signals for generating a signal indicative of said speed, the improvement wherein:

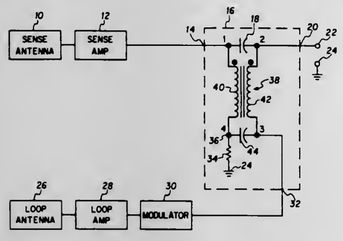
said second means comprises at least first and second antennas each of said antennas receiving a portion of said reflected signals, said first antenna having a radiation pattern disposed facing forwardly in a direction substantially parallel to said longitudinal axis and downwardly towards said ground surface at a first angle with respect to said ground surface, said first antenna radiation pattern covering a portion of said ground surface; and said second antenna having a radiation pattern disposed facing rearwardly in a direction substantially parallel to said longitudinal axis and downwardly towards said ground surface at a second angle with respect to said ground surface and converging with and said first antenna radiation pattern on said ground surface portion.

4,050,072

SIGNAL COMBINING APPARATUS

Orville K. Nyhus, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 26, 1976, Ser. No. 670,769
Int. Cl.² G01S *3/20*
U.S. Cl. 343—121 **11 Claims**



6. The method of combining two out-of-phase signals to produce a resultant signal indicative of an in-phase combination comprising, the steps of:

supplying a first in-phase signal to a first winding of a transformer;

supplying a second quadrature phase signal to a second winding of said transformer;

phase shifting one of said signals so that said first and second signals are the same phase; and

providing a combined output signal indicative of the sum of said first and second signals as phase shifted.

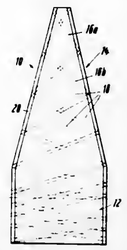
4,050,073

SUPPORT FOR FOAM ABSORBER OF ELECTROMAGNETIC WAVES

Ludwig Weech, Goerrestrasse 54, 6900 Heidelberg, Germany

Filed Jan. 14, 1976, Ser. No. 648,937
Int. Cl.² H01P *1/22*
U.S. Cl. 343—18 A **4 Claims**

1. In a foam-type absorber of electromagnetic waves, a reinforcing framework comprising, in combination, a plurality of elongated outer support elements disposed in spaced relation and oriented to define the longitudinal edges of a pyramid, and a heat-hardenable strand wound in reentrant roving fashion about the support elements to define, between each adjacent pair of the support elements, a lattice-shaped lateral wall having a plurality of substantially diamond-shaped apertures therein, the lattice-shaped wall and the support elements cooperating to define a chamber, and foam-type electromagnetic absorbing means supported within the chamber.

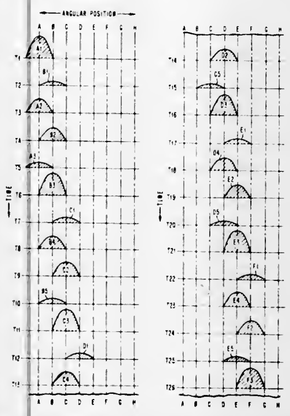


4,050,074

BLENDED STEP SCAN BEAM SIGNAL FROM FIXED BEAM COMPONENTS

Donald J. Toman, Pleasantville, N.Y., assignor to Tull Aviation Corporation, Armonk, N.Y.

Filed July 16, 1976, Ser. No. 706,020
Int. Cl.² G01S *1/16, 1/54*
U.S. Cl. 343—106 R **27 Claims**



1. A method of synthesizing a continuous scanning beam of radio energy from an array of fixed antenna elements having radiation beam ports aimed radially outwardly to different angles in the arc over which the scanning beam is to be scanned, comprising

rapidly switching the radio frequency energy from a transmitter in a repeating sequence of bursts of radio frequency energy to illuminate the different ones of the radiation beam ports at a switching frequency which is substantially greater than the rate of successive interception of the scanning beam to by synthesized with the individual radiation beam port positions,

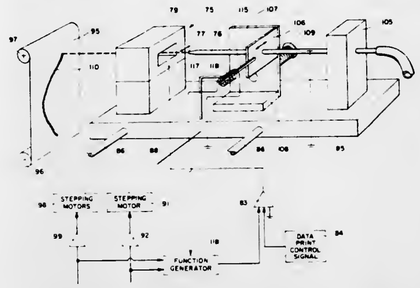
and modulating the energy levels of the individual bursts of radio frequency energy in a predetermined program to provide a composite beam energy profile which is a synthesized directional beam which is moving at a predetermined desired scanning rate.

4,050,075

INK JET METHOD AND APPARATUS

Carl Hellmuth Hertz, Skolbanksvagen 8, S-223 67, and Jan Birger Franz Welinder, c/o Lund Institute of Technology, both of Lund, Sweden

Filed Oct. 7, 1975, Ser. No. 620,358
Claims priority, application Sweden, Oct. 17, 1974, 74130782
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **2 Claims**



1. An ink-jet printer apparatus, comprising in combination

a. receptor means on the surface of which a plot or drawing is formed to comprise at least one line of predetermined width;

b. an ink-jet system comprising in combination

1. nozzle means,

2. ink supply means,

3. droplet forming means including means to force ink from said supply means under pressure through said nozzle means thereby to form a stream of spaced droplets,

4. control electrode means for impressing a charge on selected of said droplets thereby to control the final disposition of said droplets,

5. deflecting plate means defining on electrical field through which said droplets pass, and

6. nozzle vibrating means to vibrate said nozzle both through a predetermined distance in a plane transverse to the plane of said receptor and transverse to the direction of said relative movement and in a direction 90° out of phase with said means to vibrate it transverse to said direction of said relative movement;

c. data print control signal means to transmit signals to said electrode means predeterminative of said final disposition of said droplets whereby the magnitude of said charge on each of said droplets is determined by said signals;

d. traveling carriage means on which said ink jet system is mounted;

e. means to effect relative movement between said carriage means and said receptor, said relative movement being variable with respect to both velocity and direction;

f. data position signal means to control relative movement between said receptor means and said traveling carriage means;

g. means for sensing at least one relative velocity function between said carriage means and said receptor substrate means;

h. means for sensing the movements of vibration of said nozzle;

i. means to generate a function of said vibration movements;

j. means to combine said function of said vibration movements with said at least one relative function thereby to generate a combined relative velocity function; and

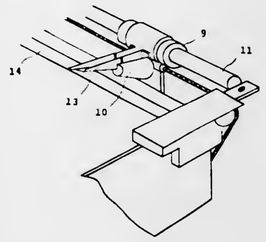
k. means for controlling the signal from said data print control signal means as a function of said relative combined functions.

4,050,076

DEFLECTION MEANS INCLUDING A DEFLECTION ELECTRODE MOUNTED ON A TRAVELLING CARRIAGE IN AN INK JET SYSTEM PRINTER

Rikuo Takano, Musashino; Tamaki Saito, Koganei; Yuji Sumitomo, Nara; Toshio Kobayashi, Osaka; Yoichi Yamamoto, Nara; Fumio Siozaki, and Tokio Maezawa, both of Yamatokoriyama, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Sharp Kabushiki Kaisha, both of Musashino, Japan

Filed Aug. 17, 1976, Ser. No. 715,007
Claims priority, application Japan, Aug. 18, 1975, 50-100370
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **10 Claims**



1. An ink jet system printer of the charge amplitude controlling type which emits charged ink droplets from a printing head toward a record receiving member, said system comprising a stationary body and a carriage, said printing head being carried by a carriage travelling in the lateral direction across the body, means for selectively deflecting said ink droplets by deflection means, and recording desired symbols on said record receiving member with said selectively deflected ink droplets, the deflection means comprising:

a plate shaped slim electrode mounted on the carriage;

a counter electrode mounted on a fixed support means with respect to the body of the ink jet system printer; and

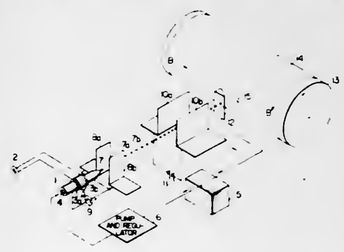
a high-voltage source to establish a high-voltage electric field between the plate shaped slim electrode mounted on the carriage and the counter electrode mounted on the body of the ink jet system printer.

4,050,077

LIQUID DROPLET SUPPLYING SYSTEM

Takahiro Yamada, and Tetsuo Doi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 473,899, May 28, 1974, abandoned.
This application Nov. 6, 1975, Ser. No. 629,566
Claims priority, application Japan, May 30, 1973, 48-59834
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **9 Claims**



1. A liquid droplet supplying system comprising:

a liquid jet nozzle having a predetermined diameter for

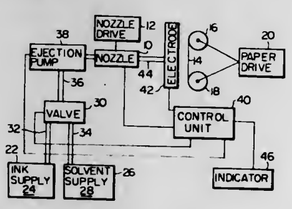
jetting a liquid material with predetermined characteristics under predetermined pressure;
vibration imparting means for mechanically vibrating said nozzle at a predetermined frequency;
electrical means for applying a predetermined electrical signal to the vibration imparting means for controlling said vibration imparting means, the nozzle diameter, pressure and characteristics of the liquid material, the vibrating frequency of the nozzle and the electrical signal applied to the vibration imparting means being cooperable for causing an end portion of a columnar stream of liquid jetted from said nozzle to separate into an alternate series of large liquid droplets and small liquid droplets and to fly said liquid droplets;
a phase signal circuit for receiving a signal from said electrical means and generating a phase signal synchronous with a phase at which small liquid droplets are separated from said columnar stream of liquid;
an information and signal source for producing an information signal voltage in response to the output signal of said first phase signal circuit for imparting to said small liquid droplets electric charges corresponding to the weight of said small liquid droplets and to a desired degree of deflection thereof;
charging means for imparting to said small liquid droplets electric charges corresponding to said information signal voltage;
deflecting means for imparting to said flying liquid droplets a deflection force corresponding to electric charges applied thereto; and
collecting means for collecting as they are flown either the liquid droplets subjected to said degree of deflectin or non-deflected liquid droplets.

4,050,078

AUTOMATIC NOZZLE CLEANING SYSTEM FOR INK EJECTION PRINTER

Takuro Isayama, and Kikuo Kubo, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 5, 1975, Ser. No. 638,136
Claims priority, application Japan, Dec. 9, 1974, 49-141760
Int. Cl.² G01D *18/00*
U.S. Cl. 346—140 R **9 Claims**



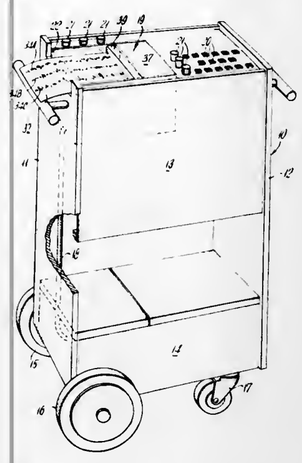
1. Ink ejecting apparatus comprising:
a first electrode;
ejection nozzle means comprising a second electrode and being arranged to eject ink and solvent against the first electrode;
ink supply means for feeding ink to the ejection nozzle means;
solvent supply means for feeding a solvent to the ejection nozzle means;
ink and solvent flow sensor means for sensing a flow parameter of ink and a flow parameter of solvent through the ejection nozzle means, said ink and solvent flow sensor means being connected to the first and second electrodes; and
control means responsive to the ink and solvent flow sensor means and operative to actuate the ink supply means and de-actuate the solvent supply means when the sensed ink flow parameter is above a first predetermined value and to actuate the solvent supply means and de-actuate the ink supply means when the sensed ink flow parameter is below the first predetermined value, and further operative to de-actuate the solvent supply means and re-actuate the ink supply means when the solvent flow parameter exceeds a second predetermined value.

4,050,079

ELECTROCARDIOGRAPHIC APPARATUS WITH RECORDING PEN PROTECTOR

Timothy C. Pegnim, Wilton, Conn.; Larry R. France, Ossining, N.Y.; John G. Sherman, Yonkers, N.Y., and Claude MacQuignon, Lake Peekskill, N.Y., assignors to Cambridge Instrument Company, Inc., Ossining, N.Y.

Filed Sept. 9, 1976, Ser. No. 721,873
Int. Cl.² G01D *15/00, 9/00*; A61B *5/04*
U.S. Cl. 346—145 **8 Claims**



1. In electrocardiographic apparatus including means for amplifying and recording signals from a patient, a housing of insulating material wholly enclosing said amplifying means, recording means including a platen roller for retaining and feeding a recording medium about said roller, at least one pen having means for activating it in response to said signals for recording them on said medium as the latter passes over said platen roller, means for displacing said platen roller from engagement with said pen for replenishment of said medium and an insulating barrier movable to shield said pens from accidental grounding in response to the displacement of said platen roller.

4,050,080

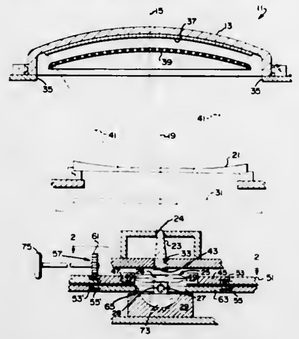
CRT SCREEN EXPOSURE DEVICE UTILIZING IMPROVED LIGHT MEANS

Stanley Leonard Pawlikowski, Seneca Falls, and Carl William Penird, Waterloo, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 2, 1976, Ser. No. 672,968
Int. Cl.² G03C *5/00*
U.S. Cl. 354—1 **3 Claims**

1. An improvement in a cathode ray tube screen exposure device having an axis therethrough wherein an internally positioned optical system is employed to selectively photoexpose a patterned screen structure on a CRT viewing panel having a sensitized coating disposed thereon in spatial relation to a multi-apertured grid oriented thereover, said optical system having an axis and including a defined light output area, related source means of radiant energy and associated reflective means, said improvement relating to said optical system

and particularly to the radiant energy source means incorporated therein comprising:
alpha light means providing a substantially concentrated alpha source of radiant energy in the form of a substantially ellipsoidal incandescence positioned in a plane spatially and proximally related to the plane of said light output area and substantially normal to said optical axis to effect substantially centered orientation of said alpha source of radiant energy on said optical axis, said alpha light means being supported to be arcually movable in a limited and finely adjustable manner about said optical axis;
beta light means providing a substantially concentrated beta source of radiant energy in the form of a second substantially ellipsoidal incandescence positioned in a plane spa-



tially related to and parallel with the plane of said alpha light means to effect substantially centered orientation of said beta source of radiant energy on said optical axis, said beta light means being superjacently positioned on said axis in substantially angularly crossed relationship with said alpha light means and supported to be arcually movable in a limited and finely adjustable manner about said optical axis, said alpha and beta light means being arcually adjusted to provide an optimized conjunctive output of radiant energy substantially along said axis; and
a reflective means associated with said alpha and beta sources of radiant energy, said reflective means having a substantially concave surface fashioned to provide an optimized conjuncture of reflected energy directed toward said light output area.

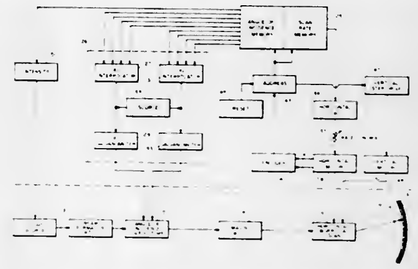
4,050,081

EXPOSURE AREA CONTROL FOR AN OPTICAL SCANNING SYSTEM FOR MANUFACTURING CATHODE RAY TUBES

Thomas W. Schultz, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 23, 1976, Ser. No. 699,046
Int. Cl.² G03B *41/00*
U.S. Cl. 354—1 **13 Claims**

1. In a control system for use with an optical scanning exposure system in manufacturing cathode ray tubes having a faceplate with a layer of photosensitive material thereon, said optical scanning exposure system including a light source with a wavelength spectrum for exposing the photosensitive material, means for scanning the faceplate with a light beam, and means for deflecting the light beam at an angle related to the angle of incidence of an electron beam in a cathode ray tube, and said electrical control system including an angle of incidence and scan rate memory means; a scan rate means for controlling scanning of the light beam, and an angle of incidence control means for controlling the angle of incidence of the light beam, the improvement comprising means for providing a source of signals for combination with a signal from said angle of incidence control means and coupled to said angle of incidence deflector means to cause movement of the effective light beam source in a source plane and provide an increased



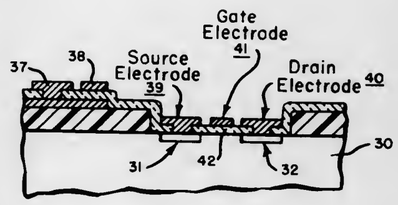
area of partial exposure and a decreased area of full exposure of said faceplate whereby the exposure area size and shape is controlled.

4,050,082

GLASS SWITCHING DEVICE USING AN ION IMPERMEABLE GLASS ACTIVE LAYER

Seymour Merrin, Fairfield, Conn., assignor to Innotech Corporation, Norwalk, Conn.

Continuation of Ser. No. 415,432, Nov. 13, 1973, abandoned, which is a division of Ser. No. 122,302, March 9, 1971, Pat. No. 3,801,878. This application July 15, 1975, Ser. No. 596,147
Int. Cl.² H01L *45/00*
U.S. Cl. 357—2 **13 Claims**



1. A circuit comprising crystalline semiconductor substrate, one or more p-n junctions formed therein, a passivating layer disposed thereupon and including one or more glass switching devices comprising a layer of ionically impermeable glass disposed between a pair of electrodes, said circuit characterized in that said passivating layer is comprised of the same composition of glass as the glass utilized in said switching device.

4,050,083

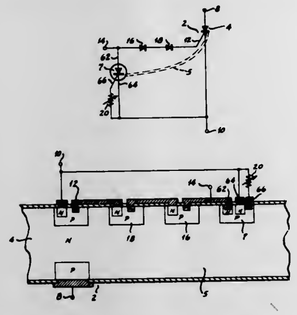
INTEGRATED THERMALLY SENSITIVE POWER SWITCHING SEMICONDUCTOR DEVICE, INCLUDING A THERMALLY SELF-PROTECTED VERSION

Stanley V. Jaskolski, Sussex; Robert W. Lade, Waukesha; Herman P. Schutten, Elm Grove, and Gordon B. Spellman, Mequon, all of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Sept. 22, 1976, Ser. No. 725,626
Int. Cl.² H01L *23/56, 29/66, 29/74, 29/747*
U.S. Cl. 357—28 **30 Claims**

1. A monolithic semiconductor device comprising on a common substrate a plurality of junctions of opposite conductivity type regions, at least one of said junctions being a power switching junction having a current blocking off state and a current passing on state whereby to exhibit a current switching characteristic, at least another of said junctions being a temperature sensitive junction thermally actuatable to intrinsically

switch between high and low resistance states in response to a predetermined temperature of said power switching junction



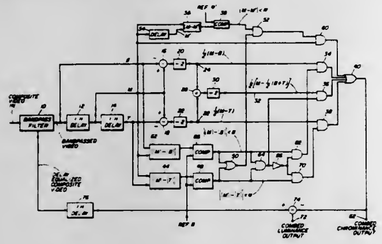
sensed through said substrate, said predetermined temperature being less than the thermal breakover temperature of said power switching junction.

4,050,084

COMB FILTER FOR TELEVISION SIGNALS HAVING ADAPTIVE FEATURES

John P. Rossi, New York, N.Y., assignor to CBS Inc., New York, N.Y.

Filed July 14, 1976, Ser. No. 705,204
Int. Cl.[2] H04N *9/535*
U.S. Cl. 358—31 **7 Claims**



1. An adaptive comb filter system for separating the luminance and chrominance components of an input composite NTSC television information signal, comprising, in combination:

bandpass filter means connected to receive said input composite television signal and operative to pass a band of frequencies including the chrominance components and high frequency luminance components of the signal,

means for separating the bandpassed video signal into a main (M) line component and adjacent top (T) and bottom (B) line components,

an output terminal,

means for deriving from said main line component (M) and said adjacent line components (B) and (T) four possible choices for the chrominance component of said television signal to be coupled to said output terminal, said choices being $\frac{1}{2}[M - \frac{1}{2}(B+T)]$, $\frac{1}{2}(M-B)$, $\frac{1}{2}(M-T)$, or M, and

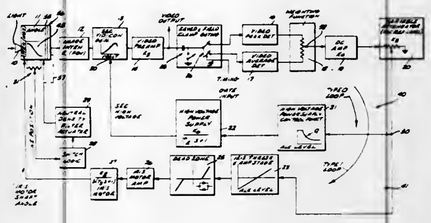
logic means operative in response to luminance or chrominance transitions in the vertical direction in the bandpassed video signal for coupling to said output terminal as the chrominance output the one of said four choices, or no chrominance signal, that most minimizes transient distortions in the television picture reconstructed from said television signal.

4,050,085

AUTOMATIC LIGHT CONTROL SYSTEM

Paul R. Prince; Bernard J. Skehan, both of Manhattan Beach, and Jay M. Hansen, Santa Monica, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed June 4, 1969, Ser. No. 830,589
Int. Cl.[2] H04N *5/38*
U.S. Cl. 358—219 **19 Claims**



1. An electro-optical system comprising:

a. a lens system having an iris diaphragm,

b. a television camera to convert light energy to video output signals,

c. said television camera further comprising a non-linear gain determining element,

d. a first feedback loop responsive to said video output signals to stably control said gain determining element to provide optimum operation below overloading of said camera said first loop including a compensating circuit having a non linearity substantially inverse to said non-linear gain of said non-linear gain determining element,

e. a second feedback loop responsive to said video output signals to adjust said iris diaphragm to admit an amount of light energy for optimum video output signals below overloading of said camera, and,

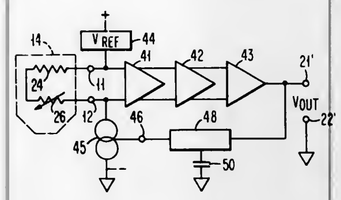
f. a dead zone circuit to inhibit actuation of said second feedback loop from adjusting said iris diaphragm until the energy in said video output signals changes a predetermined increment above or below a level of energy set for said optimum operation below overloading of said camera.

4,050,086

DYNAMIC TRANSDUCER BIASING SIGNAL AMPLIFYING CIRCUITRY

Jerome Danforth Harr, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 6, 1976, Ser. No. 684,053
Int. Cl.[2] G11B *5/02*
U.S. Cl. 360—66 **14 Claims**



1. Dynamic transducer biasing signal amplifying circuitry for translating a signal generated in an electromagnetic transducer having two terminals across which direct biasing current is applied and a unidirectional output voltage having a component of offset voltage and a component of varying output voltage signal is delivered, comprising

a pair of input terminals between which said electromagnetic transducer is connected,

differential translating circuitry having input terminals individually connected to said pair of input terminals and having output terminals at which an output voltage proportional to said varying output voltage signal is delivered,

said translating circuitry being arranged for developing internally thereof an offset voltage substantially equal to said offset voltage of said transducer and

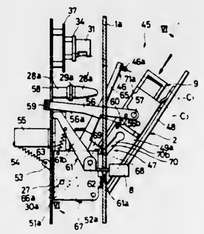
control circuitry having an input circuit connected between one of said output terminals and a point of fixed reference potential and having an output circuit connected to said input terminals for developing a direct voltage proportional to said output voltage for biasing said electromagnetic transducer.

4,050,087

CASSETTE TAPE RECORDING AND/OR REPRODUCING APPARATUS

Yoshio Kishi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 9, 1976, Ser. No. 712,770
Claims priority, application Japan, Aug. 13, 1975, 50-98289
Int. Cl.[2] G11B *23/06*
U.S. Cl. 360—96 **16 Claims**



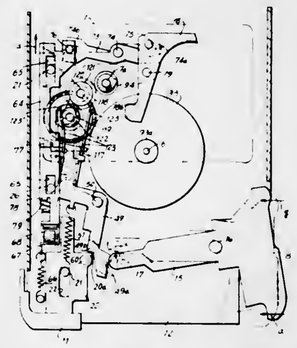
1. A tape recording and/or reproducing apparatus for use with a tape cassette including a housing containing a supply of tape and having spaced parallel walls with an opening therebetween at one side of the housing along which a run of the tape is normally guided, and at least one lid mounted on the housing for movement relative to the latter parallel to the planes of said spaced walls between a closed position where the lid extends along the opening for covering a respective part of said run of the tape and an opened position where the lid is displaced from said opening in the direction away from said one side of the housing to permit the withdrawal of the tape through said opening: said apparatus comprising a chassis; transducer means mounted on said chassic for recording and/or reproducing information signals on a tape engaged therewith; locating means on said chassis engageable with the cassette housing for disposing the latter with said one side thereof facing toward and spaced from said transducer means; tape withdrawing means engageable with said tape run in a cassette housing engaged with said locating means and being operative to withdraw th tape through said opening and into engagement with said transducer means; and a cassette loading device including a cassette holder, means mounting said holder for movement in respect to said chassis between an inoperative position spaced from said locating means for the insertion and removal of a cassette is said holder and an operative position where a cassette in said holder is engaged with said locating means, lid opening means mounted for movement in respect to said holder between an inactive position at which said lid opening means is spaced from said holder in a direction substantially perpendicular to said planes of the walls of a cassette housing in said holder at said inoperative position so as to avoid interference with said insertion and removal of the cassette therein, and an active position at which said lid opening means is engageable with each said lid of a cassette in said holder at said operative position and is displaced relative to said holder in the direction of movement of the respective lid from its closed position to its opened position, and mechanical coupling means connecting said holder and said lid opening means for disposing the latter in said inactive and active positions in response to the movement of said holder to said inoperative and operative positions, respectively.

4,050,088

APPARATUS FOR SELECTING PLAYBACK OR RECORDING MODES IN MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

Hiroshi Okuda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 6, 1975, Ser. No. 629,676
Claims priority, application Japan, Nov. 7, 1974, 49-128385
Int. Cl.[2] G11B *15/02*
U.S. Cl. 360—96 **17 Claims**



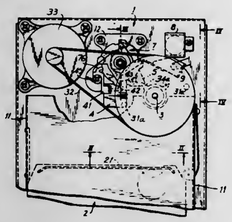
1. A magnetic tape recording and/or reproducing apparatus comprising: a chassis; a head base having magnetic head means thereon for selectively recording and reproducing signals on a tape; means mounting said head base on the chassis for movement relative to the latter between an inactive position, in which said head means is spaced from the tape, and an active position, in which said head means is engageable with the tape; a first mode selecting member selectively manually actuable to a rest position for establishing a stop mode of the apparatus and to an operative position for moving said head base to said active position of the latter; a second mode selecting member manually actuable from a rest position to an operative position; interconnecting means responsive only to actuation of said second mode selecting member to said operative position of the latter for displacing said first mode selecting member from said rest position to said operative position of said first mode selecting member; and mode change-over means for establishing a reproducing mode of the apparatus in response to the actuation of said first mode selecting member to said operative position thereof with said second mode selecting member in said rest position of the latter and for changing-over the apparatus to a recording mode thereof in response to actuation of said second mode selecting member to said operative position of the latter.

4,050,089

APPARATUS FOR SHIFTING THE MAGNETIC TAPE HEAD IN A MULTITRACK TAPE PLAYER

Kenzi Okamoto, Kobe, Japan, assignor to Fujitsu Ten Limited, Kobe, Japan

Filed Oct. 14, 1975, Ser. No. 621,807
Claims priority, application Japan, Oct. 30, 1974, 49-124242
Int. Cl.² G11B *21/08, 5/55*
U.S. Cl. 360—106 **7 Claims**



1. Cartridge type tape player apparatus having a tape deck, a replaceable cartridge accommodating a multitrack magnetic tape, tape driving meanns and a magnetic tape head, said apparatus comprising

head shift means for shifting a magnetic tape head between specific tracks on a multitrack magnetic tape;

a capstan shaft for driving the tape via the tape driving means;

a capstan member affixed to the capstan shaft for rotation with said shaft, said capstan member having a projection extending therefrom;

lever means provided on a vertical axis on the tape deck with freedom of movement in vertical and horizontal directions, said lever means having a guide member selectively engageing the projection of the capstan member, said guide member being positioned so that it crosses the locus of the rotating projection when it is driven in a vertical direction, said lever means having an end portion for guiding an engaging part of the head shift means in a manner whereby it rotates up to the position of the projection on the locus of the rotating projection when said guide member rotatably moves along the vertical axis in cooperation with said projection;

spring means coupled to said lever means and maintaining said lever means in the rest position; and

operating means mounted on he tape deck for transferring the operation in the vertical direction to said lever means in response to the detection of an indication on the tape thereby shifting said lever means from a rest position to an operating position againt the action of said spring means.

4,050,090

HELICAL SCAN MAGNETIC RECORDING DEVICE HAVING A FOLDED MOUNTING PLATE

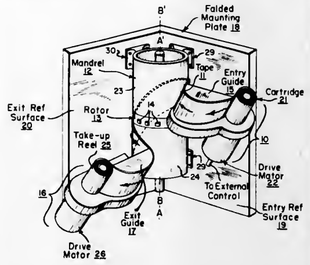
Ernest P. Kollar, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 16, 1975, Ser. No. 613,753
Int. Cl.² G11B *5/52, 5/78, 19/00*
U.S. Cl. 360—130 **7 Claims**

1. In a helical scan magnetic recording device of the type comprising a source of magnetic tape, a mandrel having a cylinder axis for supporting a wrap of said tape about a portion of its periphery; entry guide means for guiding said tape from said tape source onto said mandrel, a rotor for carrying about said cylinder axis at least one magnetic head in scanning adjacency to said tape along a path which is slanted with respect to said tape, a tape sink for receiving tape from said mandrel, exit guide means for guiding said tape off said mandrel and into said tape sink; and mounting means for mounting said mandrel, entry guide means, and exit guide means in operative relationship, the improvement wherein:

said mounting means comprises a folded reference mounting plate having a substantially planar entry reference surface and also having a substantially planar exit reference surface which is non-parallel to said entry reference surface;

said entry guide means is mounted on said entry reference plane of said folded reference mounting plate;



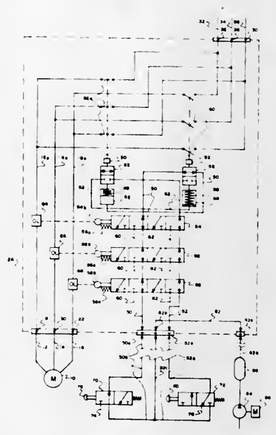
said exit guide means is mounted on said exit reference plane of said folded reference mounting plate at a position for removing tape from a position on said mandrel displaced from the position of entry onto said mandrel displaced from the position of entry onto said mandrel by an angle intermediate 180° and 360°; and said mandrel is mounted on both said entry reference plane of said folded mounting surface and on said exit reference plane.

4,050,091

MANUALLY-CONTROLLED PNEUMATICALLY-ACTUATED ELECTRIC MOTOR STARTER SYSTEM

John H. Goettel, 27279 S. Gribble Road, Canby, Oreg. 97013

Filed Sept. 2, 1976, Ser. No. 719,961
Int. Cl.² H02H *7/085*
U.S. Cl. 361—31 **6 Claims**



1. A manually-controlled, pneumatically actuated electric motor starter and overload protection system comprising:

a. an electric motor;

b. multiple electrical conduits connected to said motor for supplying electrical current thereto;

c. multiple electrical switch means, each interposed in a respective one of said electrical conduits, for selectively permitting or interrupting the flow of said current therethrough;

d. pneumatic actuating means connected to said multiple switch means for moving said multiple switch means in unison to positions permitting the flow of said current through said multiple conduits in response to the exposure of said pneumatic actuating means to a gas charge at a pressure above a predetermined pressure level;

e. biasing means associated with said pneumatic actuating means and said multiple switch means for moving said multiple switch means in unison to positions interrupting the flow of said current through said multiple conduits in response to the reduction of the pressure of said gas charge to below said predetermined pressure level;

f. motor-driven gas compressor means for supplying said gas charge at a pressure above said predetermined pressure level to said pneumatic actuating means;

g. gas conduit means for conveying said gas charge from said compressor means to said pneumatic actuating means;

h. multiple overload sensing means, each interposed in a respective one of said multiple electrical conduits, for sensing the presence of a current flow in any one of said electrical conduits greater than a predetermined current flow;

i. multiple pneumatic overload valve means interposed in series in said gas conduit means between said pneumatic actuating means and said compressor means, each of said pneumatic overload valve means being connected to a respective one of said overload sensing means, for selectively permitting the exposure of said pneumatic actuating means to said gas charge at said pressure above said predetermined pressure level in response to the electrical current flow in each of said electrical conduits, as sensed by said multiple overload sensing means, being below said predetermined current flow, or for selectively reducing the pressure of said gas charge to below said predetermined pressure level in response to the electrical current flow in any one of said electrical conduits, as sensed by any one of said overload sensing means, being greater than said predetermined current flow; and

j. manually-operable pneumatic valve means interposed in said gas conduit means between said pneumatic actuating means and said compressor means and in series with said multiple overload valve means for selectively permitting the exposure of said pneumatic actuating means to said gas charge at said pressure above said predetermined pressure level or reducing the pressure of said gas charge to below said predetermined pressure level, the portion of said gas conduit means between said manually-operable pneumatic valve means and said pneumatic actuating means being electrically nonconductive.

4,050,092

MULTI-CIRCUIT PROTECTOR

Frank L. Simokat, Babylon, N.Y., assignor to TII Corporation, Lindenhurst, N.Y.

Filed Aug. 20, 1976, Ser. No. 716,196
Int. Cl.² H02H *9/06*
U.S. Cl. 361—56 **5 Claims**

1. A multi-circuit overvoltage protector for concurrently protecting both the power and signal circuits of equipment comprising a portable, plug-in unit:

a. configured to be manually inserted in a pre-existing power outlet and having:

b. plug means for making electrical contact with the contacts of said outlet;

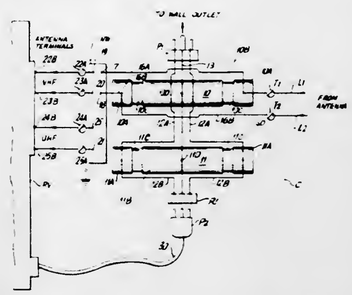
c. receptacle means adapted to receive a power plug connected to said power circuits of said equipment;

d. a power circuit interconnecting said plug means and receptacle means and having a ground line;

e. a first gas filled arrester connected across said power circuit and including a connection to said ground line;

f. signal input connector means for receiving the output of a signal circuit;

g. signal output connector means for supplying said signal circuit of said equipment;



h. a signal coupling circuit interconnecting said signal input and signal output connectors; and

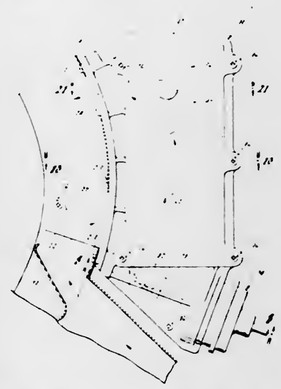
i. a second gas filled arrester connected across said signal coupling circuit and including a connection to said ground line of said power circuit.

4,050,093

HOUSING FOR MOUNTING ELECTRONIC CIRCUIT BOARDS ON AN ENGINE AIR INTAKE STRUCTURE

Frederick William Crall, Farmington, and Lawrence William Tomczak, Sterling Heights, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 587,193, June 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 570,540, April 22, 1975, abandoned. This application Feb. 19, 1976, Ser. No. 659,297
Int. Cl.² H05K *7/20*
U.S. Cl. 361—383 **3 Claims**



1. An assembly adapted for mounting electronic circuitry on a portion of the induction air intake system of an internal combustion engine, said assembly comprising: an electronic circuit board housing defined by two housing elements and containing interiorly thereof a generally rectangular circuit-board-receiving pocket containing an electronic circuit board disposed therein; said housing having a concave, arcuate mounting wall defined jointly by said two housing elements thereof, said concave, arcuate mounting wall being adapted to be disposed against a matching convex portion of a wall of the induction air intake system over one or more openings pro-

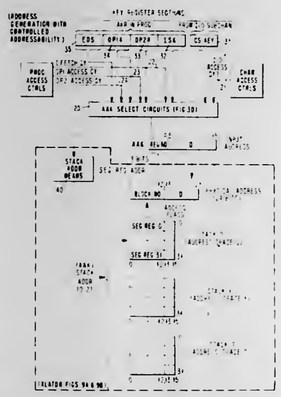
vided therein; said concave, arcuate housing wall including one or more openings for communication with the one or more openings in the wall portion of the induction air intake system; that portion of said concave, arcuate mounting wall which is defined by one of said two housing elements extending arcuately and being generally coextensive with a side of said circuit-board-receiving pocket and being jointed thereto by an intermediate bridging section formed in said one element; means forming an air circulation path through said housing across the circuit board therein so that, in use, when induction air is inducted by the induction air intake system, air circulation is provided via the above one or more openings through the air circulation path in said housing; means on said housing providing for the mounting thereof on the matching convex wall portion of the induction air intake system with said concave, arcuate housing wall disposed thereagainst; and an air scoop via which induction air can enter said housing defined jointly by said two housing elements, said air scoop projecting away from said concave, arcuate mounting wall on the side thereof opposite said circuit-board-receiving pocket.

4,050,094

TRANSLATOR LOOKAHEAD CONTROLS

Donall Garrald Bourke, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,227
Int. Cl.[2] G06F *9/20*
U.S. Cl. 364—200 **6 Claims**



1. Translator lookahead controls for use with a main memory having a plurality of different storage units, the lookahead controls comprising,

a plurality of segmentation registers for translating a part of an inputted logical address into physical block addresses contained in the segmentation registers,

lookahead bistable positions being associated with each segmentation register for storing a lookahead coded signal for identifying a particular one of the storage units which contains a block being addressed by a loaded content of the segmentation register,

means for selecting one of the segmentation registers to be loaded with an inputted physical block address, the lookahead bistable positions associated with each segmentation register being selected when the associated segmentation register is selected,

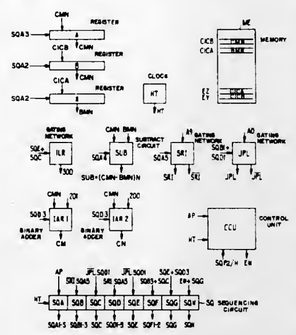
means for generating the lookahead coded signal from the inputted physical block address being loaded into a selected segmentation register, and means for setting the coded signal into the selected lookahead bistable positions.

4,050,095

CALL LOAD SHARING SYSTEM BETWEEN A PLURALITY OF DATA PROCESSING UNITS

Rodney Pettipher, Paris; Lucien Nicolas Leon Vielleveye, Ris-Orangis, and Albert Kruithof, Ville D'Avray, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 367,857, June 7, 1973, abandoned. This application Mar. 1, 1976, Ser. No. 662,670
Int. Cl.[2] G06F *15/16*
U.S. Cl. 364—200 **2 Claims**



1. A call load sharing apparatus for a communications system in which said apparatus processes the completion of calls through the system, said apparatus including a first processor for processing a first plurality of calls through said system and a second processor for processing through said system calls other than said first plurality of calls, said apparatus including a first memory for storing a predetermined first number indicative of the calls which are to be processed through said system, a second memory for storing a lesser number, the lesser number representing the number of said first plurality of calls to be processed by said first processor, scanning means receptive of calls from the system for initiating the processing of calls by said first processor, a first counter responsive to all calls received by the scanning means for producing a first count representing a total of the calls received for processing, a second counter responsive to calls being processed by said first processor for producing a second count, a comparator for comparing the second count against the number stored in said second memory, said second comparator responsive to an equality between said second count and the second number for producing an output signal, and a control unit responsive to the output signal for causing subsequent calls received by said scanning means to be processed by said second processor.

4,050,096

PULSE EXPANDING SYSTEM FOR MICROPROCESSOR SYSTEMS WITH SLOW MEMORY

Thomas H. Bennett, Scottsdale, and Michael F. Wiles, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 519,135, Oct. 30, 1974, abandoned. This application June 7, 1976, Ser. No. 693,465
Int. Cl.[2] G06F *1/04*
U.S. Cl. 364—200 **3 Claims**

1. A microprocessor system comprising:

a clock signal source for producing a clock signal including a sequence of periodic clock pulses;

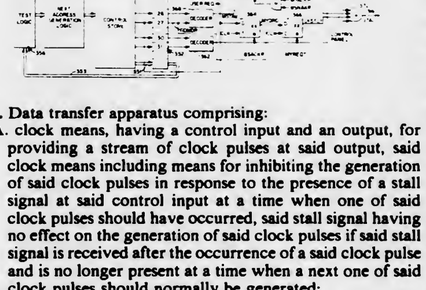
data bus means for transferring data in said microprocessor system;

microprocessor means responsive to said clock signal and coupled to said data bus means for executing program instructions in said microprocessor system;

memory means responsive to said clock signal coupled to said data bus means for storing digital information and for storing said program instructions, said memory means including at least one slow access location having associated therewith a slower access time than other locations of said memory means;

said memory means having an address input for effecting addressing of said slow access location;

said microprocessor means incuding address means coupled to said memory means to effect addressing of said memory means;



said clock signal source including circuit means responsive to said address input for increasing the duration of only one of said pulses of said clock signal by a first predetermined amount of time when said slow access location means is addressed, said first predetermined amount of time being such that the elapsed time between the time at which said location of said memory means is addressed and the time at which the trailing edge of said one of said pulses occurs exceeds by a second predetermined amount of time the minimum access time of said location of said memory means.

4,050,097

SYNCHRONIZATION TECHNIQUE FOR DATA TRANSFERS OVER AN ASYNCHRONOUS COMMON BUS NETWORK COUPLING DATA PROCESSING APPARATUS

Ming T. Miu, Chelmsford; Virendra S. Negi, Pepperell, and Richard A. Lemay, Bolton, all of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Sept. 27, 1976, Ser. No. 727,194
Int. Cl.[2] G06F *1/04*
U.S. Cl. 364—200 **12 Claims**



1. Data transfer apparatus comprising:

A. clock means, having a control input and an output, for providing a stream of clock pulses at said output, said clock means including means for inhibiting the generation of said clock pulses in response to the presence of a stall signal at said control input at a time when one of said clock pulses should have occurred, said stall signal having no effect on the generation of said clock pulses if said stall signal is received after the occurrence of a said clock pulse and is no longer present at a time when a next one of said clock pulses should normally be generated;

B. a plurality of units, including a first unit and a second unit, said clock means included in said first unit;

C. a common electrical bus coupled with each of said units for enabling the transfer of information between said units;

D. means, included in said first unit, for generating a first signal indicating a request for the use of said bus;

E. means for generating a second signal indicating the granting to said first unit of the use of said bus;

F. means, included in said first unit and responsive to said second signal, for transferring information over said bus to said second unit;

G. stall signal generating means, responsive to said first signal and the next occurring one of said clock pulses, for generating a first said stall signal;

H. means for coupling said first said stall signal for receipt by said control input of said clock means;

I. means, included in said second unit and responsive to said information transferred from said first unit, for providing a positive acknowledgement over said bus to said first unit, indicating that said second unit has accepted said information;

J. means, included in said first unit and responsive to said positive acknowledgement, for disabling said stall signal generating means, thereby removing said first said stall signal from said control input; and

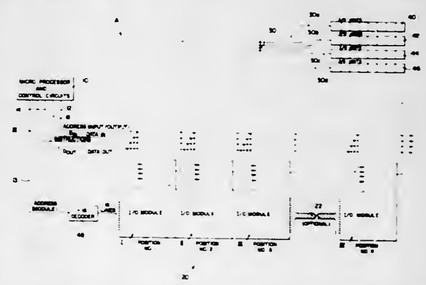
K. means, included in said clock means, for enabling the generation of a said clock pulse in response to the said removal of a said stall signal from said control input.

4,050,098

SELF-ADDRESSING MODULES FOR PROGRAMMABLE CONTROLLER

William H. Seipp, Bettendorf, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,257
Int. Cl.[2] G06F *9/00*
U.S. Cl. 364—900 **6 Claims**



1. In a module for a programmable controller, said module including logic circuits, enabling means for enabling said circuits upon receipt of an externally created module enabling signal, and conductor means on said module for conducting said module enabling signal to said enabling means, the improvement comprising: at least first, second and third input terminals arranged on said module in a preselected pattern having a first position, second position and third position; at least first, second and third output terminals arranged in said preselected pattern; said first input terminal being in said first position and electrically connected to said conductor means; said second input terminal being in said second position and connected to said first output terminal in said first position of said pattern; said third input terminal being in said third position and connected to said second output terminal in said second position of said pattern; said third output terminal being electrically isolated from said input terminals; and means for connecting said first, second and third input terminals to external first, second and third conductors, respectively, and an external decoding means for directing said module enabling signal to said first of said conductors only when said module is to be enabled and said decoding means directing said module enabling signal to said second and third conductors when said first and second output terminals, respectively, are to receive said module enabling signal.

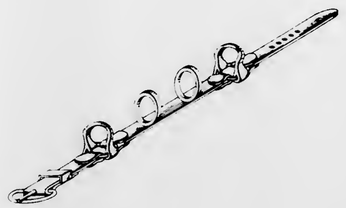
DESIGN PATENTS

GRANTED SEPTEMBER 20, 1977

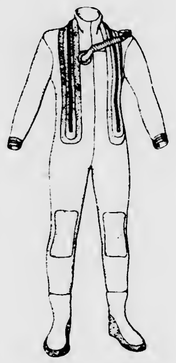
ERRATA

For CLASS	See PATENT NO.
014–059	245,871

245,816
MOTORCYCLIST'S SAFETY BELT
Sam Conti, 140 N. 33rd St., and Salvatore J. Catania, 113 N. 40th St., both of Omaha, Nebr. 68131
Filed Sept. 15, 1975, Ser. No. 613,532
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—380



245,817
DRY SUIT
Charles R. Smalley, Los Angeles, Calif., assignor to Warnaco, Inc.
Filed Sept. 2, 1975, Ser. No. 609,576
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—29



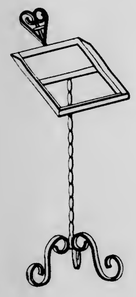
245,818
BELT ATTACHABLE WATERTIGHT CONTAINER
Björn Olof Hjalmar Persson, Bergsgatan 21 B, S-832 00 Froson, Sweden
Filed Apr. 30, 1975, Ser. No. 573,002
Claims priority, application Sweden, Oct. 31, 1974, 741791
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



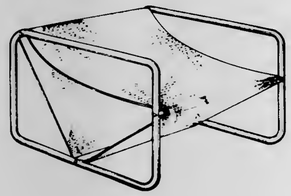
245,819
CHAIR
Robert Tillberg, Viken, Sweden, assignor to Overman AB, Tranas, Sweden
Filed Oct. 30, 1975, Ser. No. 627,133
Claims priority, application Sweden, May 6, 1975, 75974
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—75



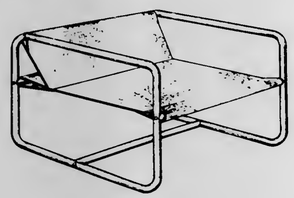
245,820
MISSAL STAND
Joseph W. Matthews, 1700 S. Glendon Drive, Melbourne, Fla. 32901
Filed Oct. 20, 1975, Ser. No. 623,724
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—29



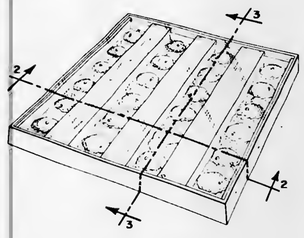
245,821
SEAT OR SIMILAR ARTICLE
Peter D. Piper, and Kent W. Bouldin, both of Dallas, Tex., assignors to Peter Piper Plastics, Inc., Dallas, Tex.
Filed Oct. 22, 1975, Ser. No. 624,649
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



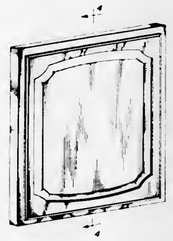
245,822
SEAT OR SIMILAR ARTICLE
Peter D. Piper, and Kent W. Bouldin, both of Dallas, Tex., assignors to Peter Piper Plastics, Inc., Dallas, Tex.
Filed Oct. 22, 1975, Ser. No. 624,651
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



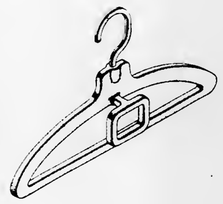
245,823
TABLE TOP
Robert Fields, 229 W. Illinois St., Chicago, Ill. 60610
Filed Mar. 12, 1976, Ser. No. 666,394
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192



245,824
DOOR PANEL
James J. Palka, 1522 E. Peachtree Drive, Arlington Heights, Ill. 60004
Filed May 14, 1976, Ser. No. 686,678
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—193



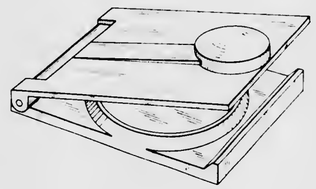
245,825
GARMENT COORDINATING HANGER
Joel F. Lemke, and Mary Lou Lemke, both of 2625 Rainbow Glen Road, Fallbrook, Calif. 92028
Filed Aug. 16, 1976, Ser. No. 714,688
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—256



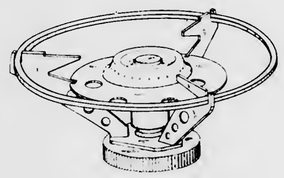
245,826
DINNER PLATE OR SIMILAR ARTICLE
James W. Luce, Syracuse, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Continuation-in-part of Ser. No. 399,998, Sept. 24, 1973, abandoned. This application Sept. 11, 1975, Ser. No. 612,347
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—25



245,827
HAMBURG PATTY PRESS
Reuben F. Korpi, Rte. 2 Box 132, Peterborough, N.H. 03458
Filed Sept. 4, 1975, Ser. No. 610,134
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—43



245,828
GAS BURNER OR SIMILAR ARTICLE
Claude Alain Richard Monnet, Paris, France, assignor to Shell International Petroleum Company Limited, London, England
Filed June 18, 1975, Ser. No. 587,879
Claims priority, application France, Dec. 19, 1974, 74.73454
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—136



245,829
HELICAL SPRING RETRACTING TOOL
Arnold Cowan, 5530 Yarmouth Ave., Apt. 112, Encino, Calif. 91316
Filed May 20, 1976, Ser. No. 688,310
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—16



245,830
BOTTLE-OPENER
François de Gross, Geneva, Switzerland, assignor to François de Gross & Cie., Carouge, Switzerland
Filed Jan. 20, 1976, Ser. No. 650,661
Claims priority, application Switzerland, July 21, 1975, 61365/75
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—18



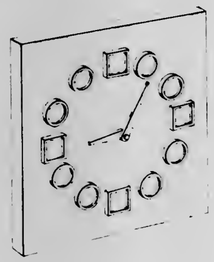
245,831
SCORING KNIFE BLADE
Robert F. West, Simsbury, and Mark Alan Drechsler, Southington, both of Conn., assignors to The Stanley Works, New Britain, Conn.
Filed July 1, 1976, Ser. No. 701,853
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—20



245,832
LOAD HOOK
Lars Fredriksson, Vaxjo, Sweden, assignor to K.A. Bergs Smide AB, Gemla, Sweden
Filed Aug. 1, 1975, Ser. No. 601,312
Claims priority, application Sweden, Jan. 31, 1975, 75214
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367



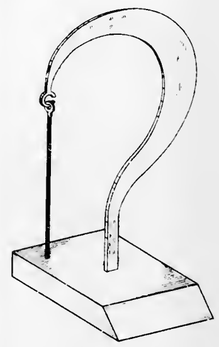
245,833
COMBINED CLOCK FACE AND HANDS THEREFOR
Patricia K. Dystant, 23256 Ithaca St., Oak Park, Mich. 48237
Filed Apr. 11, 1974, Ser. No. 459,944
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125



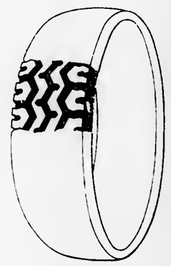
245,834
BRACELET
James T. Wilbert, SRA Box 1568-K, Anchorage, Alaska 99507
Filed Jan. 19, 1976, Ser. No. 650,492
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—7



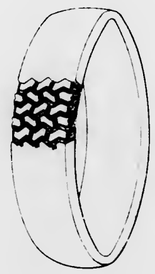
245,835
STATUETTE WITH HANGING STRING
Leon D. Lask; Dorinda J. Lask, both of 1610 Quail Drive, Greensboro, N.C. 27048, and Bobby E. Smith, 1208 Rhue Road, Winston-Salem, N.C. 27107
Filed Jan. 26, 1976, Ser. No. 652,623
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131



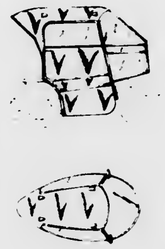
245,836
PNEUMATIC TIRE TREAD AND BUTTRESS
Gernot Arendt, Tribuswinkel, Austria, assignor to Deutsche Semperit Gummiwerk Ges. m.b.H., Munich, Germany
Filed Dec. 15, 1975, Ser. No. 640,942
Claims priority, application Germany, June 20, 1975, 10353
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



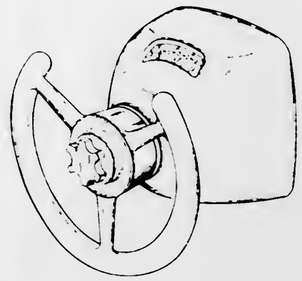
245,837
PNEUMATIC TIRE TREAD AND BUTTRESS
Gernot Arendt, Tribuswinkel, Austria, assignor to Deutsche Semperit Gummiwerk Ges. m.b.H., Munich, Germany
Filed Dec. 15, 1975, Ser. No. 640,878
Claims priority, application Germany, June 20, 1975, 10354
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—151



245,838
MOTORCYCLE CAB
Buck D. Messinger, 6001 SW. 3rd St., Des Moines, Iowa 50315
Filed July 21, 1975, Ser. No. 597,580
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—156



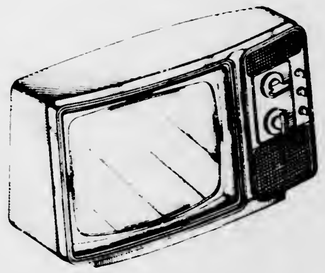
245,839
SHIP'S HELM
William T. Spurgin, Charlottesville, Va., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Oct. 12, 1976, Ser. No. 731,231
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—176



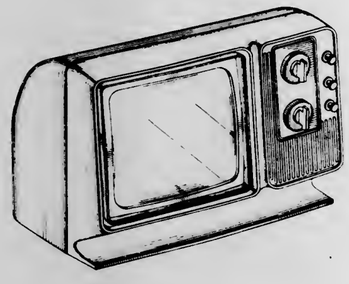
245,840
COMBINED WHEEL AND HUB CAP
Millard Fillmore Harty, Jr., Bloomfield Hills, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Division of Ser. No. 291,304, Sept. 22, 1972, Pat. No. Des. 239,267.
This application Mar. 15, 1976, Ser. No. 666,593
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209



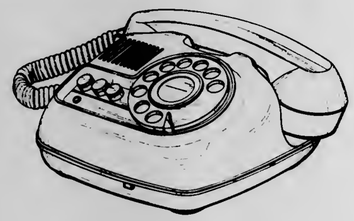
245,841
TELEVISION RECEIVER
Melvin H. Boldt, Glenview, and Richard K. Althaus, Long Grove, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.
Filed Mar. 15, 1976, Ser. No. 666,711
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D14—80



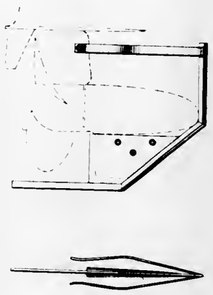
245,842
TELEVISION RECEIVER
Melvin H. Boldt, Glenview, and William M. Casnovsky, Palatine, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.
Filed Feb. 12, 1976, Ser. No. 657,501
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D14—80



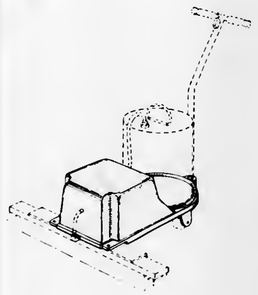
245,843
TELEPHONE
Isamu Hirasawa, Tokyo; Minoru Sasai, Atsugi, and Kunio Ito, Chigasaki, all of Japan, assignors to Kanda Tsushin Kogyo Co., Ltd., Tokyo, Japan
Filed Dec. 7, 1976, Ser. No. 748,394
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—57



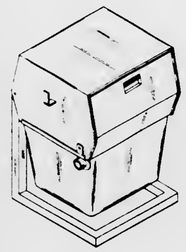
245,844
LOWER UNIT GUARD FOR MARINE OUTBOARD MOTOR AND STERN DRIVE
Daryl J. Donat, Pasco, Wash., assignor to Jack C. Bramlette, Pasco, Wash., a part interest
Filed May 20, 1976, Ser. No. 688,483
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—4



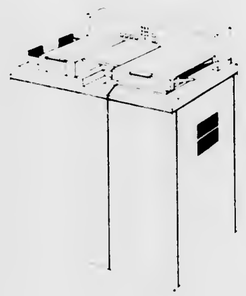
245,845
WAX APPLICATOR HOUSING
Robert C. Deuchar, 209 Bayview Drive, San Carlos, Calif. 94070, and Gene J. Waitzman, 1055 Avondale St., San Jose, Calif. 95129
Filed Dec. 4, 1975, Ser. No. 637,752
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—48



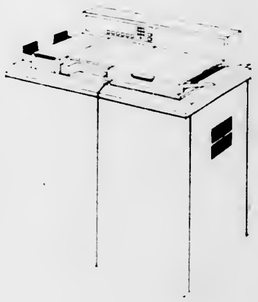
245,846
COIN OPERATED VACUUM OR SIMILAR ARTICLE
Richard W. Livingston, 10100 Raytown Road, Kansas City, Mo. 64134
Filed May 10, 1976, Ser. No. 684,784
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—52



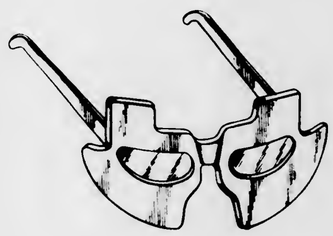
245,847
ELECTROPHOTOGRAPHIC COPIER OR THE LIKE
Ernest Michael Bevilacqua, Wilton; Allen Dana Hawthorne, and Eliot Fette Noyes, both of New Canaan, all of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 3, 1975, Ser. No. 637,484
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—30



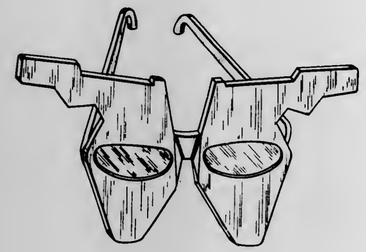
245,848
ELECTROPHOTOGRAPHIC COPIER OR THE LIKE
Ernest Michael Bevilacqua, Wilton; Allen Dana Hawthorne, and Eliot Fette Noyes, both of New Canaan, all of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 3, 1975, Ser. No. 637,486
Term of patent 14 years
Int. Cl. D16—*3*
U.S. Cl. D16—30



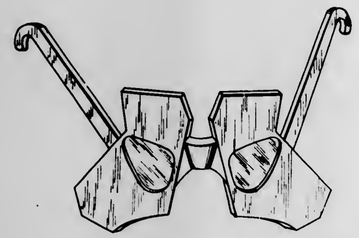
245,849
EYEGLASSES
Lloyd A. Strickland, 2511 Kensington Ave., Richmond, Va. 23220
Filed Aug. 13, 1975, Ser. No. 604,456
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—71



245,850
EYEGLASSES
Lloyd A. Strickland, 2511 Kensington Ave., Richmond, Va. 23220
Filed Aug. 13, 1975, Ser. No. 604,472
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—71



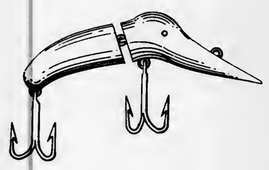
245,851
EYEGLASSES
Lloyd A. Strickland, 2511 Kensington Ave., Richmond, Va. 23220
Filed Aug. 13, 1975, Ser. No. 604,475
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—71



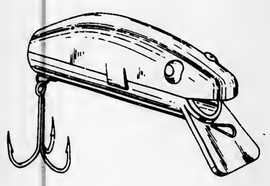
245,852
BALL-POINT PEN
Alain Carre, Paris, France, assignor to Waternab S.A., Paris, France
Filed Oct. 9, 1975, Ser. No. 621,042
Claims priority, application France, Apr. 10, 1975, 75.73777
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—45



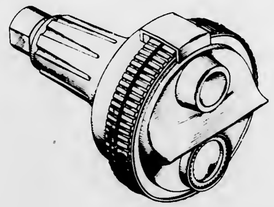
245,853
FISHING LURE
William DeWar, P.O. Box 313, Monte Rio, Calif. 95462
Filed Jan. 4, 1977, Ser. No. 756,731
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



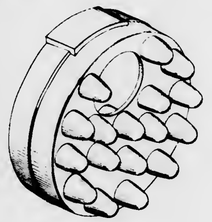
245,854
FISHING LURE
James T. Sullivan, 4436 St. John, Kansas City, Mo. 64123
Filed Feb. 22, 1977, Ser. No. 770,918
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28



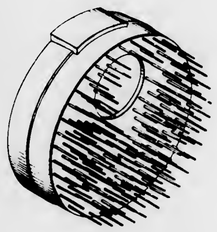
245,855
SHOWERHEAD
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Nov. 15, 1976, Ser. No. 742,207
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



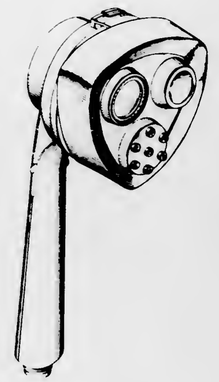
245,856
BODY MASSAGE ATTACHMENT FOR A HANDHELD SHOWERHEAD
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Oct. 18, 1976, Ser. No. 733,076
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



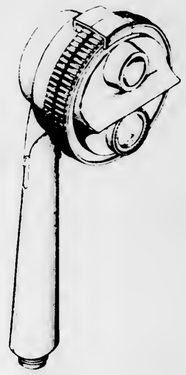
245,857
SCALP MASSAGE ATTACHMENT FOR A HANDHELD SHOWERHEAD
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Oct. 18, 1976, Ser. No. 733,077
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



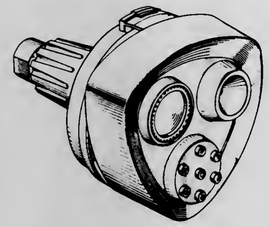
245,858
HANDHELD SHOWERHEAD
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Nov. 15, 1976, Ser. No. 742,205
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



245,859
HANDHELD SHOWERHEAD
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Nov. 15, 1976, Ser. No. 742,206
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



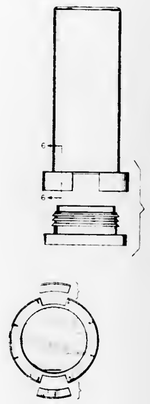
245,860
SHOWERHEAD
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Inc., Chicago, Ill.
Filed Nov. 15, 1976, Ser. No. 742,208
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



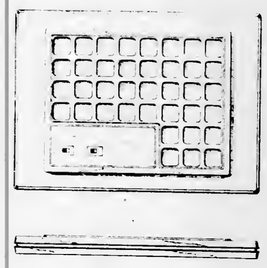
245,861
BABY BATH SEAT
Robert Elder, Altadena, Calif., assignor to Joseph Baker, Glendale, Calif.
Filed July 15, 1976, Ser. No. 705,451
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—52



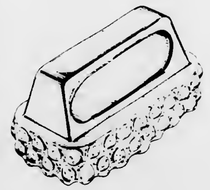
245,862
CONTAINER FOR SOLID VAPORIZER
Andrew C. Bulloch, 13545 Heartside Place, Dallas, Tex. 75234, and Ronald R. Rolen, 2706 Arcady Drive, Garland, Tex. 75041
Filed Feb. 19, 1976, Ser. No. 659,547
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



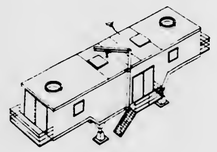
245,863
OPHTHALMIC INSTRUMENT CONTROL BOARD
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 5, 1976, Ser. No. 655,332
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1.1



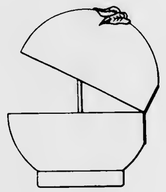
245,864
ROLLING MASSAGE UNIT
Rywka Luba Gelbart, 1745 E. 16th St., Brooklyn, N.Y. 11229
Filed Nov. 28, 1975, Ser. No. 635,573
Term of patent 14 years
Int. Cl. D28—*03*; D24—*99*
U.S. Cl. D24—36



245,865
CRUSHING PLANT
Lars Sture Bostrom, Umea, Sweden, assignor to Aktiebolaget Robacks Mekaniska, Umea, Sweden
Filed Apr. 28, 1976, Ser. No. 681,271
Claims priority, application Sweden, Oct. 30, 1975, 75898
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—3



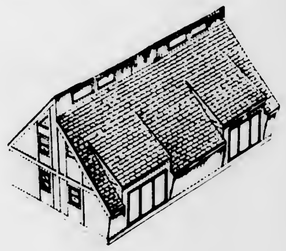
245,866
KIOSK
John Schuldenfrei, 67 Highfield Gardens, London N.W. 11, and Raymond Saadiah Turner, 2 Hartfield Avenue, Elstree, Hertfordshire, both of England
Filed Apr. 16, 1976, Ser. No. 677,733
Claims priority, application United Kingdom, Feb. 24, 1976, 974617/76
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—10



245,867
BUILDING
Eliud W. Holland, 13205 Old Cutler Road, Miami, Fla. 33156
Filed July 19, 1976, Ser. No. 706,288
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—23



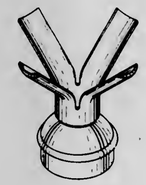
245,868
COMBINED FOLDABLE AND TRANSPORTABLE HOME
Keith O. Burton, P.O. Box 626, White Pigeon, Mich. 49099
Filed Aug. 20, 1975, Ser. No. 606,084
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—30



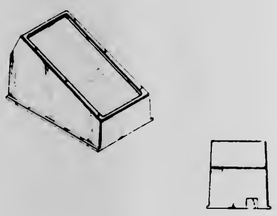
245,869
SHEET PILE
Akemasa Otani, 2 Green Mansion, 7-6-50 Akasaka, Minato, Tokyo, Japan
Filed Aug. 16, 1974, Ser. No. 497,932
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75



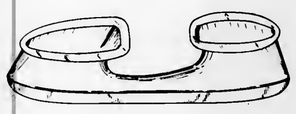
245,870
FENCE POST TOP
Duayne D. Dougherty, 6807 N. 39th Ave., Phoenix, Ariz. 85015
Filed July 29, 1976, Ser. No. 709,594
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—77



245,871
TELEPHONE COMMUNICATIONS MODULE
Maurice I. Smith, Woodinville, Wash., assignor to Tone Commander Systems, Inc.
Filed Aug. 6, 1976, Ser. No. 712,245
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59



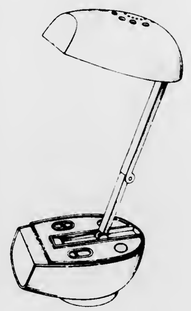
245,872
ICE SKATE
Hugh E. Baikie, 1115 Sherbrooke St. W., Montreal, Quebec, Canada (H3A 1H3), and Peter Willy Schaack, 2380 Laurentien Boulevard, Ville St-Laurent P.Q., Canada
Filed Jan. 19, 1976, Ser. No. 649,926
Claims priority, application Canada, Oct. 17, 1975, 17-10-75-6
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 B



245,873
WALL SCONCE FOR VOTIVE CANDLE HOLDER
William J. O'Shea, 211 Lafayette Road, Nob Hill III, Syracuse, N.Y. 13205
Filed Feb. 9, 1976, Ser. No. 656,323
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



245,874
COMBINATION OF HIGH INTENSITY LAMP AND BUILT-IN SOLID STATE CLOCK
Yiu Chung Lap, Lee Chung Industrial Bldg., 11 Pat Tat Street, San Po Kong, Kowloon, Hong Kong
Filed Mar. 11, 1976, Ser. No. 666,051
Claims priority, application United Kingdom, Nov. 27, 1975, 973407/75; Nov. 27, 1975, 973408/75
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 D



245,875
GUITAR HEAD
Bozo Podunavac, 713 E. Valley Parkway Blvd., Escondido, Calif. 92025
Filed July 14, 1975, Ser. No. 595,865
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



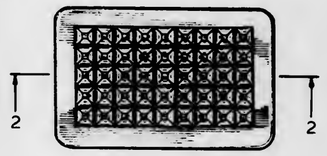
245,876
FLUTIST'S LYRE
George B. Sazama, P.O. Box 316, Mission, S. Dak. 57555
Filed Jan. 7, 1976, Ser. No. 646,962
Term of patent 14 years
Int. Cl. D17—*02*
U.S. Cl. D56—1 C



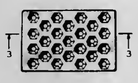
245,877
DECALCOMANIA FOR CULINARY WARE
William C. McBurney, New Castle, Pa., and Thomas J. Strawser, Jr., Corning, N.Y., assignors to Corning Glass Works
Filed Nov. 17, 1975, Ser. No. 632,452
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D59—2 A

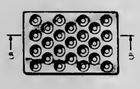


245,878
SOAP BAR
David Jon Morrison, 1402 S. 78th St., Omaha, Nebr. 68127
Filed Mar. 27, 1975, Ser. No. 562,988
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D73—1 A

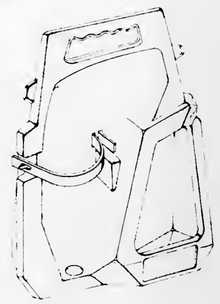


245,879
SOAP BAR
David Jon Morrison, 1402 S. 78th St., Omaha, Nebr. 68127
Filed May 19, 1975, Ser. No. 578,373
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D73—1 A





245,880
COMBINED DISPLAY AND CARRYING CASE FOR A DRILL OR THE LIKE
Donald A. Malcolm, Laureldale, Pa., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Oct. 15, 1974, Ser. No. 514,720
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF SEPTEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. H. Robins Company, Inc.: *See*—
Funderburk, William Henry, Jr., 4,049,821, Cl. 424-274.000.
A/S Ardal og Sunndal Verk: *See*—
Gjosteen, Ole Georg; Terum, Trygve Olavson; and Aarflot, Aksel Ola, 4,049,248, Cl. 266-202.000.
A-T-O Inc.: *See*—
Sullivan, John L.; Knauber, Veronica A.; and Nelson, James E., 4,049,164, Cl. 224-5.00W.
Aarflot, Aksel Ola: *See*—
Gjosteen, Ole Georg; Terum, Trygve Olavson; and Aarflot, Aksel Ola, 4,049,248, Cl. 266-202.000.
AB Akerlund & Rausing: *See*—
Persson, Lennart Gerhard, 4,049,188, Cl. 229-14.0BL.
AB Dellner-Malmco: *See*—
Bergs, Olof Sune, 4,049,129, Cl. 213-4.000.
AB Gotaverken: *See*—
Heyman, Klas, 4,048,937, Cl. 114-72.000.
AB Nynas-Petroleum: *See*—
Bergholm, Carl Arne, 4,049,543, Cl. 208-263.000.
AB Svenska Flaktfabriken: *See*—
Walker, George, 4,048,912, Cl. 98-115.0SB.
AB Telekontroll: *See*—
Andersson, Henry Veine; and Eriksson, Sven Vilhelm, 4,049,302, Cl. 292-201.000.
Abblard, Jean Georges: *See*—
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.
Abbott Laboratories: *See*—
Winn, Martin, 4,049,653, Cl. 544-150.000.
Abe, Noboru: *See*—
Kobashi, Toshiyuki; Ozaki, Masahiko; Ono, Kenichi; and Abe, Noboru, 4,049,605, Cl. 260-29.6AN.
Abe, Yoshinari: *See*—
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.
Abramoska, Alfred A., Jr., to Arthur Products Co. Vent tube with removable tip for filling containers. 4,049,030, Cl. 141-286.000.
Ace Envelope Manufacturing Corporation: *See*—
Ross, Joseph; and Fuchs, Ernest F., 4,049,364, Cl. 417-360.000.
Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED: *See*—
Blanpain, Jacques; and Delehouzee, Leon, 4,048,705, Cl. 29-420.000.
Acker, Ellsworth George; and Winyall, Milton Edward, to W. R. Grace & Co. Method of preparing loosely aggregated 200-500 millimicron silica. 4,049,781, Cl. 423-338.000.
Adachi, Terufumi; and Oda, Tatsuro, to Tokuyama Sekisui Kogyo Kabushiki Kaisha. Process for preparing chlorinated polymer or copolymer of vinyl chloride. 4,049,517, Cl. 204-159.180.
Adams, David John, to TBA Industrial Products Limited. Gaskets. 4,049,856, Cl. 427-131.000.
Addressograph-Multigraph Corporation: *See*—
Nothmann, Gerhard A., 4,048,920, Cl. 101-148.000.
Raschke, Curt R., 4,048,921, Cl. 101-426.000.
Adolph Gottscho, Inc.: *See*—
Navi, Menashe, 4,048,913, Cl. 101-27.000.
Aeschbach, Fritz, to Raskin S.A. Punching tool die. 4,048,890, Cl. 83-146.000.
Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Driole, Jean; Allibert, Colette; Bonnier, Etienne; and Wicker, Alain, 4,049,437, Cl. 75-10.00R.
Moisan, Michel; Leprince, Philippe; Beaudry, Claude; and Bloyet, Emile, 4,049,940, Cl. 219-10.55R.
Rigollot, Georges Alfred, 4,049,299, Cl. 290-52.000.
AGFA-Gevaert, A.G.: *See*—
Bestenreiner, Friedrich; and Giglberger, Dieter, 4,049,947, Cl. 219-216.000.
Boie, Immo; and Lowski, Dieter, 4,049,458, Cl. 96-100.00N.
AGFA-GEVAERT N.V.: *See*—
Van Doorselaer, Marcel Karel; and Bollen, Romain Henri, 4,049,454, Cl. 96-55.000.
Aguirre, Juan E., to Sintetica Americana, Inc. Process for modifying unsaturated polyester systems. 4,049,609, Cl. 260-29.6NR.
Ainslie, Norman George; Hempstead, Robert Douglas; Tan, Swie-In; and Valstyn, Erich Philipp, to International Business Machines Corporation. Low coercivity iron-silicon material, shields, and process. 4,049,522, Cl. 204-192.00M.
Air Products and Chemicals, Inc.: *See*—
Arndt, Edward J., 4,049,472, Cl. 148-16.000.
Dalton, Augustine I., Jr., 4,049,706, Cl. 260-514.00H.
Jepsen, Robert E., 4,048,909, Cl. 92-194.000.
Airco, Inc.: *See*—
Davis, Raymond L., II; and Beck, Robert I., 4,049,473, Cl. 148-16.500.
Akademie der Wissenschaften der D D R: *See*—
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.
Akaiwa, Yoshihiko: *See*—
Noguchi, Tsutomu; Akaiwa, Yoshihiko; and Katoh, Hidehiko, 4,050,038, Cl. 333-1.100.
Akamatsu, Hideo: *See*—
Koitabashi, Takeo; and Akamatsu, Hideo, 4,049,456, Cl. 96-84.00R.
Aktiebolaget Leo: *See*—
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,799, Cl. 424-211.000.
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,800, Cl. 424-211.000.
Akzona Incorporated: *See*—
Eskridge, Brewster B.; Lyon, Boyce M.; and Boasson, Eduard H., 4,049,766, Cl. 264-210.00F.
Oosterwijk, Hendrik Harm Jannes; Wiersum, Ulfert Elle; Magre, Eduard Pieter; and van Dijk, Johannes Hendrinus, 4,049,726, Cl. 260-649.00R.
Penton, Harold Roy, Jr., 4,049,633, Cl. 260-75.00T.
Strade, Henry A., 4,049,805, Cl. 424-243.000.
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Albers, Kenneth H.; and Holliday, Robert E., to Eastman Kodak Company. White non-pigmented hot melt polyolefin adhesives. 4,049,602, Cl. 260-27.00R.
Albers, Kenneth H., to Eastman Kodak Company. Polymeric compositions of styrene and amorphous polyolefins useful in preparing hot melt adhesives. 4,049,752, Cl. 260-878.00R.
Albright, James A., to Velsicol Chemical Corporation. Reactive flame retardants. 4,049,617, Cl. 260-45.80R.
Alcolac Inc.: *See*—
Steckler, Robert; Robinson, Fred; and Farmer, Robert F., III, 4,049,608, Cl. 260-29.6SQ.
Alday, James Marion; and Rowlands, Kenneth Charles, to Remington Arms Company, Inc. Magazine assembly for tournament trap. 4,048,976, Cl. 124-47.000.
Alder, Hanspeter; and Boving, Hans, to Swiss Aluminium Ltd. Protective material made of corundum crystals. 4,049,511, Cl. 204-67.000.
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Alers, George A.; and Thompson, Robert B., to Rockwell International Corporation. Nondestructive detection of stress. 4,048,847, Cl. 73-67.50R.
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Allegheny Ludlum Industries, Inc.: *See*—
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Stich, Frederick A., 4,050,006, Cl. 363-98.000.
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Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,049,619, Cl. 260-45.75B.
Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,049,620, Cl. 260-45.75R.
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Anderson, Howard. Supports. 4,048,752, Cl. 47-47.000.
Anderson, Ralph L., to Anchor Continental, Inc. Moisture-resistant polyurethane-based pressure-sensitive adhesives. 4,049,601, Cl. 260-24.000.
Anderson, Robert F.: *See—*
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Walters, Robert A., 4,049,004, Cl. 128-419.0PG.
ARCO Polymers, Inc.: *See—*
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Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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Asato, Goro, to American Cyanamid Company. Novel 1,2,3,4-tetrahydro-4-oxo-(oxy)-1-naphthylamines and method of preparation thereof. 4,049,717, Cl. 260-575.000.
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Bach, Josef; Kollwig, Horst; Meitzner, Wolfgang; Weintritt, Horst; and Ueberdiek, Ralf, to Hoechst Aktiengesellschaft. Process and device for forming a transfer tail. 4,049,209, Cl. 242-18.0PW.
Bach, Ricardo O.; and Morrison, Robert C., to Lithium Corporation of America. Continuous telomerization process and its liquid products. 4,049,732, Cl. 260-668.00B.
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Bachhuber, Theodore J.; and Bachhuber, Philip C., to Mayville Engineering Company, Inc. Shotgun shell crimper. 4,048,899, Cl. 86-39.000.
Backderf, Richard Harold, to B. F. Goodrich Company, The. Latex modified portland cement and use thereof in polymerization reactors. 4,049,894, Cl. 526-62.000.
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Baker, Don R.; and Walker, Francis H., to Stauffer Chemical Company. N-t-butyl-2-(3,5-dichloro or dimethyl phenoxy)-2-alkoxy amide herbicides. 4,049,424, Cl. 71-118.000.
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Balleys, Francois; and Dupraz, Jean, to Ateliers des Charmilles S.A. Electric discharge machining method and device with preset electrode feed. 4,049,942, Cl. 219-69.00M.
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Beatty, Theodore Robert, to Union Carbide Corporation. Battery assembly. 4,049,882, Cl. 429-94.000.

Beaudry, Claude: *See—*
Moisan, Michel; Leprince, Philippe; Beaudry, Claude; and Bloyet, Emile, 4,049,940, Cl. 219-10.55R.

Bechtel International Corporation: *See—*
Ellers, Fred S.; Hally, Hugh G.; McIlveen, Edward E.; and Doble, William A., 4,048,807, Cl. 61-105.000.

Beck, Robert I.: *See—*
Davis, Raymond L., II; and Beck, Robert I., 4,049,473, Cl. 148-16.500.

Becker, Erich. Diaphragm pump. 4,049,366, Cl. 417-569.000.

Becker, Wolf-Jurgen; Breuer, Wolfram; and Deprez, Jacques, to Bayer Aktiengesellschaft. Electrochemical gas detection. 4,049,503, Cl. 204-1.00T.

Beckering, Jacobus Jan: *See—*
Owings, Peter Russell; Beckering, Jacobus Jan; and Bunyea, Roderick Francis, 4,050,003, Cl. 320-2.000.

Beckman Instruments, Inc.: *See—*
Luitwieler, Samuel H., Jr., 4,049,966, Cl. 250-369.000.

Bednarczyk, Jan: *See—*
Dunikowski, Andrzej; Bednarczyk, Jan; Keska, Jerzy; Pisarkiewicz, Tadeusz; and Zamarski, Andrzej, 4,048,844, Cl. 73-32.00R.

Beeby, Philip J., to Syntex (U.S.A.) Inc. Cephalosporin type antibacterials. 4,049,806, Cl. 424-246.000.

Beecham Group Limited: *See—*
Harnden, Michael Raymond; and Wright, Nicholas David, 4,049,816, Cl. 424-270.000.

Beehive Machinery Inc.: *See—*
McFarland, Archie Rae, 4,049,684, Cl. 260-412.000.

Beemer, Richard B.; and Hennessey, Richard G., to International Harvester Company. Audible lining wear indicator. 4,049,084, Cl. 188-1.00A.

Beggs, Donald, to Midrex Corporation. Method for producing metallic iron pellets. 4,049,440, Cl. 75-35.000.

Beitzel, Stuart Wallace: *See—*
Harter, Joseph William; and Beitzel, Stuart Wallace, 4,049,707, Cl. 250-531.000.

Bell & Howell Company: *See—*
Frystak, Richard, 4,049,257, Cl. 271-114.000.
Gaynor, Joseph, 4,049,843, Cl. 427-43.000.

Bell & Howell Limited: *See—*
Catherall, Reginald, 4,048,846, Cl. 73-67.200.

Bell, John T., to Container Corporation of America. Apparatus for handling and moving articles. 4,049,130, Cl. 214-8.50A.

Bell, Malcolm Charles Evert; and Sridhar, Ramamritham, to International Nickel Company, Inc., The. Process for treatment of lateritic ores. 4,049,444, Cl. 75-82.000.

Bell, Malcolm Charles Evert: *See—*
Sridhar, Ramamrithan; Warner, John Stuart; and Bell, Malcolm Charles Evert, 4,049,438, Cl. 75-21.000.

Bell, Malcolm R., to Sterling Drug Inc. 3-[2-(4-Anisidino)phenyl]-1-phenyl-1-propiophenones and propanols. 4,049,715, Cl. 260-571.000.

Bell, Richard; Sato, Takao; and Lahiri, Chitta Ranjan, to Uniroyal Limited; Uniroyal, Inc.; and Unitta Company Limited. Transmission belts. 4,048,865, Cl. 74-231.00R.

Bell Telephone Laboratories, Incorporated: *See—*
Chang, Tao-Yuan; and Lin, Chinlon, 4,050,033, Cl. 331-94.50G.
French, William George, 4,049,413, Cl. 65-3.00A.
Knollman, Dieter John Henry, 4,049,920, Cl. 179-18.0BC.
Koontz, Donald Eldridge, 4,049,471, Cl. 148-13.000.
Peck, Richard John, 4,049,909, Cl. 178-67.000.

Bell, Theodore F. Index table. 4,049,252, Cl. 269-57.000.

Belles, Wayne Stuart: *See—*
Shen, Kelvin Kei-Wei; and Belles, Wayne Stuart, 4,049,422, Cl. 71-92.000.

Bennett, Howard M.: *See—*
Dent, Joseph B., Jr.; Martin, Walter L., Jr.; and Bennett, Howard M., 4,049,412, Cl. 65-2.000.

Bennett, R. Jackson; and Connors, Daniel F. Air purifying apparatus. 4,049,400, Cl. 55-139.000.

Bennett, Thomas H.; and Wiles, Michael F., to Motorola, Inc. Pulse expanding system for microprocessor systems with slow memory. 4,050,096, Cl. 364-200.000.

Beno, Lawrence A.; and Doi, Kazumasa, to United States of America, Navy. Programmable microwave modulator. 4,050,070, Cl. 343-6.8LC.

Benton, Lawrence M., Jr. Visual display with backlighting. 4,048,739, Cl. 40-106.100.

Berg, Robert L.; Murphy, William J.; and Simmons, Dennis E., Jr., to United States of America, Air Force. Augmented tracking system. 4,050,068, Cl. 343-6.00R.

Bergami, Samuel S., Jr.; and Bergami, Samuel S., Sr. Fireplace heater, circulator, and humidifier system. 4,049,196, Cl. 237-51.000.

Bergami, Samuel S., Sr.: *See—*
Bergami, Samuel S., Jr.; and Bergami, Samuel S., Sr., 4,049,196, Cl. 237-51.000.

Berger, Helmut; Holzermer, Gunther; Kirsch, Harry; and Vijlbrief, Pieter, to Siemens Aktiengesellschaft. X-ray examining apparatus including a tomographic exposure installation. 4,049,967, Cl. 250-445.00T.

Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, to Boehringer Mannheim G.m.b.H. Compositions using cycloalkano-quinolone derivatives and their method of use. 4,049,811, Cl. 424-258.000.

Berger, Rupert: *See—*
Moser, Peter; Eysn, Manfred; Enkner, Bernhard; Berger, Rupert; Wagner, Wolfgang; and Spannlang, Ronald, 4,049,249, Cl. 266-247.000.

Berghoff, Wellington Franklyn, to ISIS Chemicals, Inc. Heat convertible coating compositions. 4,049,607, Cl. 260-29.4UA.

Bergholm, Carl Arne, to AB Nynas-Petroleum. Method for the separation of a mixture of petroleum acids from petroleum distillates containing such a mixture. 4,049,543, Cl. 208-263.000.

Bergs, Olof Sune, to AB Dellner-Malmco. Automatic coupling for streetcars and the like. 4,049,129, Cl. 213-4.000.

Bergwerksverband GmbH: *See—*
Rohde, Wolfgang; and Siebert, Werner, 4,049,141, Cl. 214-152.000.

Berico Industries, Inc.: *See—*
Botkins, Walter Y., 4,048,727, Cl. 34-13.000.

Bernstein, Seymour: *See—*
Conrow, Ransom Brown; Bernstein, Seymour; and Bauman, Norman, 4,049,640, Cl. 260-175.000.

Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, to Boehringer Mannheim G.m.b.H. γ-Glutamyl-4-nitroanilide compounds. 4,049,702, Cl. 260-501.120.

Bertaud, Francois X.: *See—*
Ouska, Ralph C.; and Bertaud, Francois X., 4,049,328, Cl. 308-187.100.

Berti, Eugenio: *See—*
Gross, Hans; and Berti, Eugenio, 4,050,007, Cl. 363-87.000.

Bestenreiner, Friedrich; and Giglberger, Dieter, to AGFA-Gevaert, A.G. Method and arrangement for protecting sheets from charring in copying machines. 4,049,947, Cl. 219-216.000.

Beveridge, John; Davies, Thomas Roderick Harries; Fidler, Fred; and Ring, Maurice Frank, to Metal Box Limited. Container and method of forming same. 4,048,935, Cl. 113-120.00F.

Bhuta, Pravin G.: *See—*
Jacoby, Jerold L.; Tierney, William S.; Wright, James E.; and Bhuta, Pravin G., 4,049,336, Cl. 350-3.500.

Bianchi, Massimo, to Macchine Tessili Circolari MATEC S.p.A. Knitting machine cam. 4,048,817, Cl. 66-57.000.

Bianchi, Sergio; Bornengo, Mario; and Frangioni, Alessandro, to Montedison S.p.A. Process for preparing 0,0-dimethyldithiophosphoric acid and alkaline salts thereof. 4,049,755, Cl. 260-987.000.

Bianchi, Valerio; Latsch, Reinhard; and Schmidt, Peter, to Robert Bosch GmbH. Apparatus for determining the fuel injection quantity in mixture compressing internal combustion engines. 4,048,965, Cl. 123-32.0EA.

Bierbach, Herbert; Dittmar, Heinz; Heinz, Ernst; Hohmann, Klaus; and Rennhack, Rolf, to Metallgesellschaft Aktiengesellschaft. Thermal transformation of metal chlorides to oxides in a fluidized bed. 4,049,788, Cl. 423-592.000.

Billings, Ronald Joseph: *See—*
George, Henry Howard; and Billings, Ronald Joseph, 4,049,356, Cl. 403-173.000.

Bio-Medicus, Inc.: *See—*
Kletschka, Harold D.; and Rafferty, Edson D., 4,049,002, Cl. 128-318.000.

Biometrics Instrument Corporation: *See—*
Maginness, Brian K., 4,050,005, Cl. 363-59.000.

Birney, Richard Eugene; and Hood, Robert Allen, to International Business Machines Corporation. Equate operand address space control system. 4,050,060, Cl. 364-200.000.

Biver, Christian: *See—*
Clerbois, Lucien; Degueldre, Louis; Biver, Christian; Degols, Albert; and Gobillon, Yves, 4,049,532, Cl. 204-290.00F.

Bjordahl, James: *See—*
Burdorf, Donald L.; and Bjordahl, James, 4,049,216, Cl. 242-192.000.

Blachford, John, to H. L. Blachford Limited. Amide waxes. 4,049,680, Cl. 260-404.500.

Black Clawson Fibreclaim, Inc.: *See—*
Marsh, Paul G., 4,049,391, Cl. 44-10.00R.

Black and Decker Manufacturing Company, The: *See—*
Owings, Peter Russell; Beckering, Jacobus Jan; and Bunyea, Roderick Francis, 4,050,003, Cl. 320-2.000.

Blackburne, Robin Michael. Rackets. 4,049,269, Cl. 273-73.00D.

Blackmon, Macy B., to Raymond Lee Organization, Inc., The, a part interest. Key case. 4,048,824, Cl. 70-456.00R.

Blanpain, Jacques; and Delehouzee, Leon, to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED. Method of making soldering wire constituted by a core of powder and a metallic tube enclosing the core. 4,048,705, Cl. 29-420.000.

Bloem, Herman, to U.S. Philips Corporation. Method of joining a metal part having a copper surface and a glass part. 4,049,416, Cl. 65-32.000.

Bloom, Allen; and Bartolini, Robert Alfred, to RCA Corporation. Organic volume phase holographic recording medium. 4,049,459, Cl. 96-115.00R.

Bloom, William M., to Allegheny Ludlum Industries, Inc. Apparatus for supporting and removing a work supporting roll. 4,049,372, Cl. 432-246.000.

Bloyet, Emile: *See—*
Moisan, Michel; Leprince, Philippe; Beaudry, Claude; and Bloyet, Emile, 4,049,940, Cl. 219-10.55R.

Blum, Adolf: *See—*
Schwab, Hermann; and Blum, Adolf, 4,049,377, Cl. 8-169.000.

Blunier, Donald E., to Safety Racing Equipment, Incorporated. Caliper brake with assembly for rotor attachment to hub. 4,049,085, Cl. 188-18.00A.

Board of Trustees Western Washington State College: *See—*
Seal, Michael R., 4,049,309, Cl. 296-1.00S.

Boasson, Eduard H.: *See—*
Eskridge, Brewster B.; Lyon, Boyce M.; and Boasson, Eduard H., 4,049,766, Cl. 264-210.00F.

Bobrovsky, Vasily Mikhailovich: *See—*
Zakharov, Evegny Dmitrievich; Shneider, Gennady Lvovich; Valkov, Viktor Dmitrievich; Kapitonov, Viktor Pavlovich; Miklyaev, Petr Grigorievich; Lebedev, Vladimir Alexandrovich; Kholnova, Vera Ivanovna; Shesterikov, Stanislav Alexeevich; and Bobrovsky, Vasily Mikhailovich, 4,049,474, Cl. 148-32.500.

Bockstiegel, Gerd-Edzard; Neidhardt, Manfred; Rehfeld, Gerhard; and Umlauf, Werner, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of granulated abrasives from fused or sintered refractory inorganic hard substances having a high grain toughness. 4,049,397, Cl. 51-309.00A.

Bodor, Nicolae S.; and Kaminski, James J., to INTERx Research Corporation. 3-Chloro-1,3-oxazines or oxazolidines as antibacterial agents. 4,049,818, Cl. 424-272.000.

Boehnke, Ralf-Dieter; and Gotze, Waldemar, to U.S. Philips Corporation. Method of and device for providing thin layers by cathode sputtering. 4,049,523, Cl. 204-192.00R.

Boehringer Mannheim G.m.b.H.: *See—*
Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, 4,049,811, Cl. 424-258.000.
Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 4,049,702, Cl. 260-501.120.

Boeing Company, The: *See—*
Dean, Roy Delmar; and Weiland, Richard Herschel, 4,049,219, Cl. 244-217.000.
Souslin, Richard Ervin, 4,048,905, Cl. 91-405.000.

Boggs, Jesse K., to Exxon Research & Engineering Co. Amine promoters for hydrohalogenation. 4,049,730, Cl. 260-663.000.

Bohnenstingl, Josef; Laser, Manfred; Lossmann, Gunter; and Gebhard, Helmut, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Apparatus for carrying out chlorinating reactions. 4,049,385, Cl. 23-277.00R.

Bohnert, Jozsef: *See—*
Bole, Karoly; Nagy, Kalman; Aufsatz, Istvan; Bohnert, Jozsef; Branyi, Laszlo; Ilyes, Zoltan; Korbuly, Jozsef; and Nemeth, Janos, 4,048,803, Cl. 61-45.00D.

Boie, Immo; and Lowski, Dieter, to AGFA-Gevaert, A.G. Photographic silver halide material containing 2-equivalent yellow couplers. 4,049,458, Cl. 96-100.00N.

Bokemeyer, Reinhard: *See—*
Stuckmann, Dieter; Babendererde, Siegmund; Jutte, Hans; and Bokemeyer, Reinhard, 4,048,806, Cl. 61-85.000.

Bole, Karoly; Nagy, Kalman; Aufsatz, Istvan; Bohnert, Jozsef; Branyi, Laszlo; Ilyes, Zoltan; Korbuly, Jozsef; and Nemeth, Janos, to Banyaszati Kutato Intezet. Mining shield support apparatus. 4,048,803, Cl. 61-45.00D.

Bollen, Romain Henri: *See—*
Van Doorselaer, Marcel Karel; and Bollen, Romain Henri, 4,049,454, Cl. 96-55.000.

Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., to General Electric Company. Method for making a circuit board and article made thereby. 4,049,844, Cl. 427-54.000.

Bolton, Frank Harold, deceased: *See—*
Morehouse, Donald S., Jr.; and Bolton, Frank Harold, deceased, 4,049,604, Cl. 260-29.6RW.

Bolton, Kathryn M., administratrix: *See—*
Morehouse, Donald S., Jr.; and Bolton, Frank Harold, deceased, 4,049,604, Cl. 260-29.6RW.

Bom, Cornelis Johannes Gerardus: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,049,061, Cl. 172-49.000.

Bonnard, Louis Antoine; and Pierron, Claude Raymond. Machines for cutting cardboard and other articles. 4,048,888, Cl. 83-89.000.

Bonnier, Etienne: *See—*
Driole, Jean; Allibert, Colette; Bonnier, Etienne; and Wicker, Alain, 4,049,437, Cl. 75-10.00R.

Boone, Gary W.; and Vandierendonck, Jerry L., to Texas Instruments Incorporated. Precharge arithmetic logic unit. 4,049,974, Cl. 307-205.000.

Borg-Warner Corporation: *See—*
Leedham, Harry W. T., 4,049,048, Cl. 165-159.000.
Polomski, John; Schulz, Willis Lorenz; and Specht, Victor Joseph, 4,049,094, Cl. 192-3.310.

Bornengo, Mario: *See—*
Bianchi, Sergio; Bornengo, Mario; and Frangioni, Alessandro, 4,049,755, Cl. 260-987.000.

Bosco, Peter Michael: *See—*
Gannis, Peter Michael; and Bosco, Peter Michael, 4,049,833, Cl. 426-93.000.

Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,049,662, Cl. 260-287.00D.

Bossler, Franklin B.: *See—*
Chambers, William A.; Bossler, Franklin B.; and Brandkamp, Warren F., 4,050,036, Cl. 331-94.50C.

Botkins, Walter Y., to Berico Industries, Inc. Recirculating grain dryer. 4,048,727, Cl. 34-13.000.

Bottomley, William K., to Bottomley, William K.; Brightwell, O. J.; and Newell, Thomas J., III. Method for the treatment of Herpes Simplex. 4,049,798, Cl. 424-195.000.

Bottum, Edward W. Solar assisted heat pump system. 4,049,407, Cl. 62-2.000.

Boudreaux, Bettie M. Ironing board cabinet. 4,049,332, Cl. 312-237.000.

Bouju, Michel. Seat belt security release mechanism. 4,049,293, Cl. 280-744.000.

Bourke, Donall Garraid, to International Business Machines Corporation. Translator lookahead controls. 4,050,094, Cl. 364-200.000.

Boving, Hans: *See—*
Alder, Hanspeter; and Boving, Hans, 4,049,511, Cl. 204-67.000.

Bower, Thomas E., to Owens-Illinois, Inc. Tape reel shipping folder. 4,049,120, Cl. 206-396.000.

Bowley, Wallace William, to Ritchie, William Barney, Jr., a part interest. Floating wave barrier. 4,048,802, Cl. 61-5.000.

Boxer, Trevor Charles, to Joseph Lucas Limited. Control circuit for an electrically driven vehicle. 4,049,998, Cl. 318-258.000.

Boyer, Charles: *See—*
Haviland, Herbert, deceased; Haviland, Diane, administratrix; Smith, Arthur; and Boyer, Charles, 4,049,193, Cl. 236-46.00R.

Brammall, Inc.: *See—*
Irwin, George; and Butler, Gary, 4,049,303, Cl. 292-307.00R.

Branan, Floyd: *See—*
Durenec, Peter, 4,049,149, Cl. 220-1.500.

Brand, Herbert: *See—*
Raab, Richard; Spindler, Kurt; Brand, Herbert; and Gast, Leonard, 4,048,832, Cl. 72-255.000.

Brand, Michael J.: *See—*
Burns, Donald A.; Brand, Michael J.; and Saunders, Alexander M., 4,049,381, Cl. 23-230.00R.

Brandelik, Joseph E.: *See—*
Barry, James D.; and Brandelik, Joseph E., 4,050,034, Cl. 331-94.50G.

Brandin, Johan A. I., to Stal Refrigeration AB. Device for establishing and breaking a fluid communication. 4,049,233, Cl. 251-61.100.

Brandkamp, Warren F.: *See—*
Chambers, William A.; Bossler, Franklin B.; and Brandkamp, Warren F., 4,050,036, Cl. 331-94.50C.

Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., to International Paper Company. Viscous dispersion for forming wet-laid, non-woven fabrics. 4,049,491, Cl. 162-101.000.

Branin, Phyllis Brown: *See—*
Lozier, Gerald Scott; and Branin, Phyllis Brown, 4,049,845, Cl. 427-68.000.

Brannan, Raymond: *See—*
King, Mendel; and Brannan, Raymond, 4,049,358, Cl. 404-11.000.

Branyi, Laszlo: *See—*
Bole, Karoly; Nagy, Kalman; Aufsatz, Istvan; Bohnert, Jozsef; Branyi, Laszlo; Ilyes, Zoltan; Korbuly, Jozsef; and Nemeth, Janos, 4,048,803, Cl. 61-45.00D.

Brastad, William A.; and Beall, Nelson J., to General Mills, Inc. Circular package loader. 4,048,786, Cl. 53-159.000.

Braun, Daniel E.: *See—*
Harkness, Joseph R.; and Braun, Daniel E., 4,048,787, Cl. 56-11.300.

Breedis, John F.: *See—*
Watson, W. Gary; and Breedis, John F., 4,049,426, Cl. 75-153.000.

Brener, William: *See—*
Durenec, Peter, 4,049,149, Cl. 220-1.500.

Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., to Texaco Development Corporation. Preparation of N-(aminoalkyl)piperazine. 4,049,657, Cl. 260-268.0SY.

Brenner, Walter. One component shelf stable low shrinkage structural adhesive systems. 4,049,750, Cl. 260-864.000.

Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Game device. 4,049,272, Cl. 273-95.00R.

Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc. Alkoxy and alkylthioalkylureido cephalosporins. 4,049,651, Cl. 544-21.000.

Breuer, Wolfram: *See—*
Becker, Wolf-Jurgen; Breuer, Wolfram; and Deprez, Jacques, 4,049,503, Cl. 204-1.00T.

Bridgestone Tire Company Limited: *See—*
Kawakami, Hiroshi; Nagaoka, Isao; and Tsukagawa, Yukio, 4,049,170, Cl. 226-74.000.

Briem, Fritz: *See—*
Barwald, Gunter; and Briem, Fritz, 4,049,834, Cl. 426-106.000.

Briggs & Stratton Corporation: *See—*
Harkness, Joseph R.; and Braun, Daniel E., 4,048,787, Cl. 56-11.300.
Kamlukin, Igor; and Harkness, Joseph R., 4,048,788, Cl. 56-11.300.

Bright, John Harvey, to American Cyanamid Company. Process for preparing bis(hydroxymethyl) methylphosphine oxide. 4,049,719, Cl. 260-606.50P.

Brightwell, O. J.: *See—*
Bottomley, William K., 4,049,798, Cl. 424-195.000.

Briles, Franklin S. Riveting method expanding a work counterbore. 4,048,708, Cl. 29-509.000.

Briles, Paul R.: *See—*
Salter, Larry, 4,048,898, Cl. 85-77.000.

Brilovich, Gregorio; and Masserant, Irvin F., to Memorex Corporation. Magnetic coating composition. 4,049,566, Cl. 252-62.540.

Bristol-Myers Company: *See—*
Cotty, Val F.; Sterbenz, Francis J.; and Melman, Kenneth J., 4,049,803, Cl. 424-233.000.

British Gas Corporation: *See—*
Nicklin, Thomas; and Hughes, Dorothy, 4,049,776, Cl. 423-226.000.

Broadbent, David J., to S. C. Johnson & Son, Inc. Roach bait composition. 4,049,460, Cl. 106-15.00R.

Brodmaan, George, to PPG Industries, Inc. Backcoating of polypropylene fabric. 4,049,870, Cl. 428-424.000.

Broeils, John: *See—*
Silverman, Stanley; and Broeils, John, 4,048,916, Cl. 101-40.000.

Brois, Stanley J.: *See—*
Ryer, Jack; Zielinski, James; Miller, Harold N.; and Brois, Stanley J., 4,049,564, Cl. 252-51.50A.

Brookes, Cyril James, to Reed Building Products, Pty. Limited. Covering piece for a water closet assembly. 4,048,676, Cl. 4-1.000.

Brookes, Malcolm J.; Sheridan, James A.; and Spranger, Douglas M. Ladder caddy. 4,049,283, Cl. 280-47.13R.

Brosch, Eric Joseph: *See—*
Woidke, Richard Paul; Wester, Thomas Joseph; and Brosch, Eric Joseph, 4,048,861, Cl. 74-56.000.

Brothers, Magdalena M., executrix: *See—*
Brothers, Richard V., deceased; and Brothers, Magdalena M., executrix, 4,049,008, Cl. 132-33.00B.

Brothers, Richard V., deceased; and by Brothers, Magdalena M., executrix. Hair-curling device. 4,049,008, Cl. 132-33.00B.

Brouwer, Frans, to Sloan, Albert E. Spray dispenser. 4,049,197, Cl. 239-218.500.

Brown, Cicero C., deceased (by Brown, Joe R., executor), to Brown Oil Tools, Inc. Check valve assembly. 4,049,015, Cl. 137-496.000.

Brown, Frederick L., to Dow Chemical Company, The. Inhibiting leaching of fire retardant salts from wood with cyclic sulfonium zwitterion solution impregnant. 4,049,849, Cl. 427-325.000.

Brown, Harold E. Porta-crane. 4,049,238, Cl. 254-139.100.

Brown, Howard R.: *See—*
Hurlburt, Joseph C.; Brown, Howard R.; and Buck, Ernest E., 4,048,862, Cl. 74-57.000.

Brown, Joe R., to Brown Oil Tools, Inc. Gravel pack method, retrievable well packer and gravel pack apparatus. 4,049,055, Cl. 166-278.000.

Brown, Joe R., executor: *See—*
Brown, Cicero C., deceased, 4,049,015, Cl. 137-496.000.

Brown Oil Tools, Inc.: *See—*
Brown, Cicero C., deceased, 4,049,015, Cl. 137-496.000.
Brown, Joe R., 4,049,055, Cl. 166-278.000.

Brown, Robert Campbell: *See—*
Casey, James H.; Larson, Curtis Lee; and Brown, Robert Campbell, 4,049,854, Cl. 428-72.000.

Brown & Williamson Tobacco Corporation: *See—*
Grimm, Wolfgang H., 4,049,117, Cl. 206-270.000.

Browne, Joseph N. Clamp means and support for skis, in combination. 4,048,700, Cl. 280-11.37K.

Bruck, Gernot Klaus, to DIHACO Diamanten Handels Compagnie Est. Process and apparatus for detecting inclusions. 4,049,350, Cl. 356-30.000.

Brunty, Fred. Multi-purpoae labor-saver wheeled tool. 4,048,735, Cl. 37-130.000.

Brush, John D., Jr.; and Burgess, George M., to John D. Brush & Co., Inc. Safe. 4,048,926, Cl. 109-65.000.

Buchel, Karl Heinz: *See—*
Timmler, Heimut; Draber, Wilfried; Buchel, Karl Heinz; and Lurssen, Klaus, 4,049,418, Cl. 71-76.000.

Bucholtz, Glen E.; and Finegold, Hyman B., to Globe Tool and Engineering Company, The. Chuck spindle positioning mechanism for armature winding machine. 4,049,208, Cl. 242-7.05B.

Buck, Ernest E.: *See—*
Hurlburt, Joseph C.; Brown, Howard R.; and Buck, Ernest E., 4,048,862, Cl. 74-57.000.

Buell, Erik F. Brake discs. 4,049,090, Cl. 188-251.00M.

Bufarale, Rolando: *See—*
Genevois, Jean Louis; and Bufarale, Rolando, 4,049,900, Cl. 13-7.000.

Buiatti, Marina, to SELENIA-Industrie Elettroniche Associate S.p.A. Processes for manufacturing semiconductor devices. 4,048,712, Cl. 29-571.000.

Buljovcic, Stephan, to Rene Cosson S.A. Self-fragmentable bullet. 4,048,922, Cl. 102-92.700.

Bullis, Robert H.; and Wiegand, Walter J., Jr., to United Technologies Corporation. Ion production means. 4,049,989, Cl. 313-230.000.

Bulova Watch Company, Inc.: *See—*
Risi, Rene, 4,048,795, Cl. 58-4.00R.

Bulten, Eric J.: *See—*
Verbeek, Francois; Bulten, Eric J.; and van den Hurk, Jan W. G., 4,049,689, Cl. 260-429.700.

Bundy, Gordon L., to Upjohn Company, The. PG-type, 1,9-lactones. 4,049,648, Cl. 542-426.000.

Bunge, Wilhelm; Last, Wolf-Dieter; Saitner, Rudolf; and Wolf, Karlheinz, to Bayer Aktiengesellschaft. Pigment preparations. 4,049,610, Cl. 260-31.20N.

Bunker Ramo Corporation: *See—*
Nijman, John Peter, 4,048,710, Cl. 29-566.400.
Riches, Arthur John, 4,048,874, Cl. 81-57.310.

Bunting, Keith Brian, to Simon Container Machinery Limited. Waste collection systems. 4,049,321, Cl. 302-41.000.

Bunyea, Roderick Francis: *See—*
Owings, Peter Russell; Beckering, Jacobus Jan; and Bunyea, Roderick Francis, 4,050,003, Cl. 320-2.000.

Burdorf, Donald L.; and Bjordahl, James, to BASF Aktiengesellschaft. Method and apparatus for generating constant tape tension in a tape transport apparatus. 4,049,216, Cl. 242-192.000.

Burgess, George M.: *See—*
Brush, John D., Jr.; and Burgess, George M., 4,048,926, Cl. 109-65.000.

Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., to Dow Chemical Company, The. 2-Chloro-3-((4-(2,2-dichloro-1,1-difluoroethoxy)phenyl)sulfonyl)propanenitrile. 4,049,693, Cl. 260-465.00F.

Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., to Dow Chemical Company, The. 3-(4-(((Trichloroethenyl)thio)phenyl)sulfonyl)-2-propenenitrile. 4,049,694, Cl. 260-465.00G.

Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., to Dow Chemical Company, The. 3-((3-Trifluoromethyl)phenyl)sulfonyl)-2-propenenitrile. 4,049,695, Cl. 260-465.00G.

Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., to Dow Chemical Company, The. 3-((4-(2,2-Dichloro-1,1-difluoroethoxy)-phenyl)sulfonyl)-2-propenenitrile. 4,049,696, Cl. 260-465.00F.

Burks, Howard L., to Perino B. Wingfield, a part interest. Vending machine with tiered turn table construction. 4,049,154, Cl. 221-76.000.

Burns, Donald A.; Brand, Michael J.; and Saunders, Alexander M., to Technicon Instruments Corporation. Apparatus and method of fluid sample analysis. 4,049,381, Cl. 23-230.00R.

Burris Industries, Inc.: *See—*
Grachten, Erich, 4,049,368, Cl. 425-502.000.

Burrous, Merwyn L., to Chevron Research Company. Jet engine oils containing extreme pressure additive. 4,049,563, Cl. 252-49.900.

Burton, C. Shepherd; Harker, Alan B.; and Ho, William W., to Rockwell International Corporation. Method of detecting gaseous contaminants. 4,049,383, Cl. 23-232.00E.

Burton, Claudia J., to Special Metals Corporation. Refining nickel base superalloys. 4,049,470, Cl. 148-3.000.

Buryagin, Firs Alexandrovich: *See—*
Pomeschikov, Andrei Grigorievich; Buryagin, Firs Alexandrovich; Kazantsev, Lev Seliverstovich; Skvortsov, Gennady Fedorovich; Naryshkin, Jury Anatolievich; and Gracheva, Zinaida Ivanovna, 4,049,901, Cl. 13-9.0ES.

Buss, David R., to Upjohn Company, The. Process for the production of purified camphorsulfonic acid salts. 4,049,703, Cl. 260-503.000.

Bussard, Charles B., to Monarch Marking Systems, Inc. Tag attaching apparatus. 4,049,177, Cl. 227-67.000.

Butler, Gary: *See—*
Irwin, George; and Butler, Gary, 4,049,303, Cl. 292-307.00R.

Butler, Gordon C.: *See—*
Simpson, George R.; Gundlach, Robert W.; and Butler, Gordon C., 4,049,344, Cl. 355-10.000.

Byers, James Otto, Jr., to Tomco, Inc. Pressure compensating fluid control valve. 4,049,232, Cl. 251-30.000.

Byrne, John A.; Rhea, Charles K., Jr.; and Fleming, Thomas F., to Universal Identification Systems, Inc. Animal food consumption monitor. 4,049,950, Cl. 235-61.60R.

C. van der Lely N. V.: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,049,061, Cl. 172-49.000.

Cagle, William A. Adjustable open end wrench. 4,048,876, Cl. 81-165.000.

Calato, Joseph D.; and Calato, Joseph S. Drum beater. 4,048,896, Cl. 84-422.00R.

Calato, Joseph S.: *See—*
Calato, Joseph D.; and Calato, Joseph S., 4,048,896, Cl. 84-422.00R.

Calderon, Nissim: *See—*
Scott, Kenneth W.; and Calderon, Nissim, 4,049,616, Cl. 260-42.320.

Camber International (England) Limited: *See—*
Scarffe, Michael, 4,048,816, Cl. 66-50.00R.

Cambridge Instrument Company, Inc.: *See—*
Fawcett, Howard N., 4,050,002, Cl. 318-661.000.
Pegnim, Timothy C.; France, Larry R.; Sherman, John G.; and MacQuignon, Claude, 4,050,079, Cl. 346-145.000.

Campbell Taggart, Inc.: *See—*
Harris, Hal; and Foreman, Joseph S., Jr., 4,049,955, Cl. 235-152.000.

Canada Square Management Limited: *See—*
Moog, Gerhard W.; and Cooper, Kenneth R., 4,049,045, Cl. 165-12.000.

Cancilla, Philip S. Hydraulic jack having rotating pump handle. 4,048,800, Cl. 60-477.000.

Canon Kabushiki Kaisha: *See—*
Schulz, Hansrichard, 4,049,960, Cl. 250-201.000.

Capper, Ronald. Combination hand truck and garden cart. 4,049,284, Cl. 280-47.180.

Caputi, Alfred A. Holder for shoe polish containers. 4,049,306, Cl. 294-34.000.

Card & Co. Inc.: *See—*
Card, Roy T., 4,048,930, Cl. 112-79.00A.

Card, Roy T., to Card & Co. Inc. Method and apparatus for forming J-tuft pile. 4,048,930, Cl. 112-79.00A.

Carlsson, Ernest R., Jr.; Delach, Henry; and Hinz, Henry, to Ideal Toy Corporation. Bubble free die agitator. 4,049,277, Cl. 273-145.00C.

Caron, John L.: *See—*
Kavanagh, George; and Caron, John L., 4,049,068, Cl. 177-25.000.

Carpenter, Erwin D. Ditch digging apparatus. 4,048,734, Cl. 37-98.000.

Carpenter Technology Corporation: *See—*
Myers, Lewis P., 4,049,430, Cl. 75-124.000.

Carroll, Frank E., to Carroll Research, Inc. Building deck structure. 4,048,777, Cl. 52-309.120.

Carroll Research, Inc.: *See—*
Carroll, Frank E., 4,048,777, Cl. 52-309.120.

Carson, Eunice. Pour spout construction. 4,049,157, Cl. 222-81.000.

Cartner, Jack O. Mower attachment for tractors. 4,048,789, Cl. 56-11.900.

Carvalho, Rocky: *See—*
Horvath, Peter J., 4,049,545, Cl. 210-28.000.

Casady, Fern: *See—*
Stevens, Henry H., 4,048,873, Cl. 81-3.00R.

Cassaire Limited: *See—*
Simmons, Robert Sidney, 4,048,809, Cl. 62-89.000.

Casey, James H.; Larson, Curtis Lee; and Brown, Robert Campbell, to Minnesota Mining and Manufacturing Company. System for inflation and sealing of air cushions. 4,049,854, Cl. 428-72.000.

Cassano, James R.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,049,255, Cl. 271-3.000.

Castleman, Howard H.; and Stewart, Henry G., to Package Products Company, Inc. Laminated composite sheet packaging material. 4,048,736, Cl. 40-2.00R.

Castonguay, Roger A.: *See—*
Wenckus, Joseph F.; Menashi, Wilson P.; and Castonguay, Roger A., 4,049,384, Cl. 23-273.0SP.

Catalyst Research Corporation: *See—*
Schneider, Alan A., 4,049,890, Cl. 429-181.000.

Catalytic Generators, Inc.: *See—*
Freebairn, Hugh T., 4,049,837, Cl. 426-308.000.

Caterpillar France S.A.: *See—*
Isnard, Theophile, 4,050,010, Cl. 324-34.00R.

Caterpillar Tractor Co.: *See—*
Engel, William K., 4,048,907, Cl. 91-492.000.
Golan, Kenneth F.; and Winzeler, James E., 4,048,799, Cl. 60-413.000.
Goloff, Alexander; and Keske, Frank E., 4,049,327, Cl. 308-161.000.
Oldenburg, Dorrance; and Fischer, Robert L., 4,049,032, Cl. 144-2.00Z.
Stedman, Robert N., 4,049,071, Cl. 180-24.050.
Stedman, Robert N., 4,049,079, Cl. 182-2.000.
Stedman, Robert N., 4,049,139, Cl. 214-138.00R.

Catherall, Reginald, to Bell & Howell Limited. Pressure responsive apparatus. 4,048,846, Cl. 73-67.200.

Catuma Pty. Limited: *See—*
Lapinski, Richard, 4,048,743, Cl. 43-17.500.

Caudill, Freddie R.: *See—*
DeRegnaucourt, Robert A.; Hall, John C.; and Caudill, Freddie R., 4,049,320, Cl. 301-13.0SM.

Cavitron Corporation: *See—*
Wuchinich, David G.; and Tarsia, Joseph, 4,049,964, Cl. 250-221.000.

Cayton, Robert J.: *See—*
Hyman, David L.; Cayton, Robert J.; and Rosenquist, Kurt E., 4,049,038, Cl. 160-166.00A.

CBS Inc.: *See—*
Rossi, John P., 4,050,084, Cl. 358-31.000.

Celanese Polymer Specialties Company: *See—*
Masters, John Edward, 4,049,744, Cl. 260-837.00R.

Centre d'Etudes Experimentales et Cliniques de Physio Biologie de Pharmacologie et d'Eutonologie: *See—*
Laborit, Henri, 4,049,795, Cl. 424-180.000.

Cermak, Eduard. Electro-pneumatic emergency brake control system for a vehicle train. 4,049,324, Cl. 303-7.000.

Cerra, Raffaele; and Scherillo, Michele. Device for frequency discrimination of electrical signals. 4,050,026, Cl. 328-167.000.

Chabardes, Pierre; Julia, Marc; and Menet, Albert, to Rhone-Poulenc, S.A. Sulphones. 4,049,718, Cl. 260-590.00C.

Chacour, Selim A., to Allis-Chalmers Corporation. Runner seals for hydraulic turbines. 4,049,361, Cl. 415-170.00A.

Chalabian, Jack S., to K-Jack Engineering Company, Inc. Vending machine mechanism housing and armor protection therefor. 4,049,106, Cl. 194-1.00B.

Chambers, William A.; Bossler, Franklin B.; and Brandkamp, Warren F., to Textron Inc. Optical system for lasers. 4,050,036, Cl. 331-94.50C.

Champion International Corporation: *See—*
Cottrell, Edward D., 4,048,761, Cl. 51-138.000.
Frazier, Robert Doyal, 4,049,023, Cl. 139-339.000.
Lare, Donald W., 4,049,492, Cl. 162-146.000.
Lare, Donald W., 4,049,493, Cl. 162-157.00R.

Chandler, Leon, to Cortland Line Company. Fly fishing line. 4,048,744, Cl. 43-17.500.

Chang, Charles: *See—*
Wen, Lian-Tong, 4,049,218, Cl. 244-23.00C.

Chang, Tao-Yuan; and Lin, Chinlon, to Bell Telephone Laboratories, Incorporated. Submillimeter wave and far infrared molecular lasers and polyatomic buffer gases therefor. 4,050,033, Cl. 331-94.50G.

Chardon Laboratories, Inc.: *See—*
Hood, Charles B., 4,049,156, Cl. 222-54.000.

Chas. S. Tanner Co.: *See—*
Lindemann, Martin K., 4,049,862, Cl. 428-253.000.

Chasen, Lee Richard; and Einhorn, Ruediger, to Coats & Clark, Inc. Mounting bracket having hinged base. 4,049,225, Cl. 248-219.400.

Chattem Drug & Chemical Company: *See—*
Bailey, Wesley T., 4,049,748, Cl. 260-861.000.

Chatterji, Arun K. Photoconductors for electrostatic imaging systems. 4,049,505, Cl. 204-38.00R.

Chemetron Corporation: *See—*
George, Henry Howard; and Billings, Ronald Joseph, 4,049,356, Cl. 403-173.000.

Chen, Nai Y.: *See—*
Reagan, William J.; and Chen, Nai Y., 4,049,578, Cl. 252-455.00R.

Chen, Nai Yuen; and Reagan, William Joseph, to Mobil Oil Corporation. Use of elemental oxygen to inhibit election of antimony from an antimony-ZSM-5 catalyst. 4,049,735, Cl. 260-668.00R.

Chen, Tiyung. Space-saving folding bed. 4,048,683, Cl. 5-180.000.

Chenevard, Alexis, to SAPAL Societe Anonyme des Plieuses Automatiques. Method and apparatus for placing objects into boxes. 4,048,780, Cl. 53-26.000.

Chesnick, John C. Arm guard for archers. 4,048,674, Cl. 2-16.000.

Chevallier, George Edward: *See—*
Todd, John Arnold; and Chevallier, George Edward, 4,049,159, Cl. 222-144.500.

Chevron Research Company: *See—*
Burrous, Merwyn L., 4,049,563, Cl. 252-49.900.
Edwards, Leroy H., 4,049,421, Cl. 71-90.000.
Gibson, Kirk R.; Hughes, Thomas R.; and Jacobson, Robert L., 4,049,542, Cl. 208-213.000.
Hodgson, Clive, 4,049,778, Cl. 423-265.000.
Hotten, Bruce W., 4,049,561, Cl. 252-46.700.
Hotten, Bruce W., 4,049,562, Cl. 252-46.700.
Mages, Philip S., 4,049,679, Cl. 260-402.500.
Shrum, Sidney J., 4,048,945, Cl. 114-294.000.

Chiang, John S., to FMC Corporation. Process of preparing peroxymonosulfate. 4,049,786, Cl. 423-513.000.

Chichkov, Jury Viktorovich: *See—*
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.

Chieger, George, to Fruehauf Corporation. Aluminum platform trailer. 4,049,285, Cl. 280-106.00T.

Childress, David L.; Hayes, William V.; and Poppe, Richard L., to Dow Chemical Company, The. Catalyst for making acrolein. 4,049,577, Cl. 252-443.000.

Chillino, Joseph. Inflatable cover for a swimming pool. 4,048,678, Cl. 4-172.120.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt: *See—*
Schawartz, Jozsef; Hornyak, Maria; Majorszki, Eva; David, Agoston; and Horvath, Gabor, 4,049,639, Cl. 260-140.000.

Chiodo, Daniel J.; and Alvarez, Charles S. Rotation-preventing lock assembly. 4,048,741, Cl. 42-1.0LP.

Chiyoda Chemical Engineering & Construction Co. Ltd.: *See—*
Nakagawa, Tetsuo; Matsuda, Nobuo; Mitani, Kazumitsu; and Tanemoto, Toshiharu, 4,049,541, Cl. 208-127.000.
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.

Chr. Hausler AG: *See—*
Elsener, Fritz, 4,048,830, Cl. 72-175.000.

Chramiec, Mark A.: *See—*
Backman, William R., Jr.; and Chramiec, Mark A., 4,050,057, Cl. 340-3.00F.

Chrenko, Richard M.: *See—*
Hanneman, Rodney E.; Chrenko, Richard M.; and Kittle, Donald B., 4,049,186, Cl. 228-225.000.

Christon, Robert H. Turntable support structure for radius mills and the like. 4,048,759, Cl. 51-97.00R.

Chrysler Corporation: *See—*
Crall, Frederick William; and Tomczak, Lawrence William, 4,050,093, Cl. 361-383.000.
Hurst, John W., 4,049,102, Cl. 192-93.00R.
Kissel, William Ronald, 4,048,964, Cl. 123-32.0ED.

Chu, Nori Y. C.; and Piusz, Peter G., to American Optical Corporation. Silver halide activated photochromic plastics. 4,049,567, Cl. 252-300.000.

Chu, Pak-Jong; and Audette, Jacques Marcel, to Northern Telecom Limited. Pushbutton dials. 4,049,924, Cl. 179-90.00R.

Chu, Simon L.; and Golda, Eugene, to Polychrome Corporation. Method of producing lithographic printing plates. 4,049,504, Cl. 204-38.00A.

Chubb, Raymond L.; Haven, Lawrence F.; and Hisey, Robert W., to Gardner-Denver Company. Multi function drill drive system. 4,049,064, Cl. 173-147.000.

Chubb, Wayne L., to Faircraft Engineering, Inc. Attache case and the like. 4,049,091, Cl. 190-18.00R.

Church, John Allen; Feinstein, Paul, Jr.; Hunt, Ronald Eugene; McDaniels, Louis Marion; and Munch, Paul Francis, to International Business Machines Corporation. Document alignment assembly. 4,049,256, Cl. 271-9.000.

Churillo, Charles J.: *See—*
Lock, William E.; and Churillo, Charles J., 4,048,900, Cl. 86-48.000.

Ciba-Geigy AG: *See—*
Hindermann, Peter; and Meindl, Hubert, 4,049,656, Cl. 260-256.50R.
Seiler, Herbert; and Dusay, Paul, 4,049,661, Cl. 260-256.40N.

Ciba-Geigy Corporation: *See—*
Elsener, Anton; Gehrt, Hans Harald; Medinger, Bernhard; and Wiese, Volkhard, 4,049,615, Cl. 260-39.00P.
Holt, Brian; and Randell, Donald Richard, 4,049,647, Cl. 542-426.000.
Jaeggi, Knut A.; Schroter, Herbert; and Ostermayer, Franz, 4,049,797, Cl. 424-180.000.
Kray, Raymond J., 4,049,711, Cl. 260-551.00C.

Spivack, John D., 4,049,654, Cl. 544-221.000.
Spivack, John D., 4,049,713, Cl. 260-559.00R.
Cincinnati Milacron Inc.: *See—*
Cox, Joseph Henry, 4,048,879, Cl. 82-28.00R.
Clark, Donald W.: *See—*
Jaco, Charles M., Jr.; Menear, Wallace C.; and Clark, Donald W., 4,049,441, Cl. 75-35.000.
Claudius Peters AG: *See—*
Stamer, Walter; and Eichinger, Frithjof, 4,049,247, Cl. 266-182.000.
Cleary, James W., to Phillips Petroleum Company. Production of tetramethylene terephthalate polymers using 225° to 248° C. polycondensation temperature. 4,049,635, Cl. 260-75.00R.
Clerbois, Lucien; Degueldre, Louis; Biver, Christian; Degols, Albert; and Gobillon, Yves, to Solvay & Cie. Electrodes for electrochemical processes. 4,049,532, Cl. 204-290.00F.
Clingan, Andrew J. Minnow dipper with automatic partitioning access door. 4,048,742, Cl. 43-4.000.
Clorfeine, Alvin Seymour, to RCA Corporation. Bi-static radar speed sensor. 4,050,071, Cl. 343-8.000.
Coats & Clark, Inc.: *See—*
Chasen, Lee Richard; and Einhorn, Ruediger, 4,049,225, Cl. 248-219.400.
Cocozza, Eugene P., to Wehran Engineering Corporation. Chemical fixation of desulfurization residues. 4,049,462, Cl. 106-85.000.
Coffey, D. A. Combined dust pan and broom holder. 4,048,692, Cl. 15-257.200.
Cogan, Scott Douglas. Boxcell core and panel. 4,049,855, Cl. 428-116.000.
Cohen, David J. Heating and cooling system consumption meter. 4,049,044, Cl. 165-11.000.
Cohen, Louis, to Delco Chemical Company, Inc. Prolonged acting appetite suppressant and anti-obesity compositions containing amphetamine adipate, dextroamphetamine adipate, amphetamine sulfate and dextroamphetamine sulfate as the active agents. 4,049,791, Cl. 424-20.000.
Cohen, Paul B., to United States of America, Air Force. Elliptical, interdigital transducer. 4,049,982, Cl. 310-366.000.
Coker, Thomas G.; and Argade, Shyam D., to BASF Wyandotte Corporation. Sprayed cathodes. 4,049,841, Cl. 427-34.000.
Colaco, Stephen Francis, to Ferranti Limited. Transistor circuits. 4,049,975, Cl. 307-213.000.
Cole, Larry K. Insecticidal and insect-repellant methods and compositions. 4,049,828, Cl. 424-333.000.
Cole, Leon J.; and Tolan, John R., to Milliken Research Corporation. Tension equalizer. 4,049,168, Cl. 226-40.000.
Coles, Donald K. Electronic musical instrument. 4,048,893, Cl. 84-1.010.
Colgate-Palmolive Company: *See—*
Douglass, Miriam Lois, 4,049,665, Cl. 260-294.80J.
Rasmussen, Hjorth, 4,049,558, Cl. 252-8.900.
Wixon, Harold Eugene, 4,049,557, Cl. 252-8.800.
Collet, Paul, to Rhone-Poulenc Industries. Compositions based on polyamines with ether groups. 4,049,716, Cl. 260-573.000.
Collier, Everett J., to Procter & Gamble Company, The. Builder system and detergent product. 4,049,586, Cl. 252-532.000.
Collins, Floyd K., to GTE Sylvania Incorporated. CRT in-line gun electrode having strengthening ribs. 4,049,990, Cl. 313-417.000.
Collins, Floyd K., to GTE Sylvania Incorporated. Longitudinal rib embossment in tri-apertured, substantially planar electrode. 4,049,991, Cl. 313-417.000.
Columbia Chemical Corporation: *See—*
Rosenberg, William E., 4,049,510, Cl. 204-55.00R.
Columbia Ribbon & Carbon Mfg. Co., Inc.: *See—*
Peterson, Glenn E.; Emerson, Robert T.; and Schoenlein, William J., 4,048,952, Cl. 118-6.000.
Combustion Engineering, Inc.: *See—*
Prible, Glen Virgil, 4,049,371, Cl. 432-234.000.
Combustion Research Corporation: *See—*
Johnson, Arthur C. W., 4,049,404, Cl. 55-387.000.
Cominco Ltd.: *See—*
Swinkels, Godefridus Maria; Furber, Robert Arthur; Milner, Edward Francis Godfrey; Genik-Sas-Berezowsky, Roman Michael; and Kirby, Charles Ray, 4,049,770, Cl. 423-37.000.
Commer S.r.l.: *See—*
Verbeek, Francois; Bulten, Eric J.; and van den Hurk, Jan W. G., 4,049,689, Cl. 260-429.700.
Commissariat a l'Energie Atomique: *See—*
Da Costa Vieira, David; Dufayet, Jean-Pierre; and Lemaire, Maurice, 4,049,954, Cl. 235-151.320.
Hatterer, Andre; Oberlin, Claude; and Strobel, Pierre, 4,049,443, Cl. 75-66.000.
Commonwealth Scientific and Industrial Research Organization: *See—*
Evans, John James Alexander; and Holan, George, 4,049,815, Cl. 424-269.000.
Compagnie Francaise des Petroles: *See—*
Corgnet, Jean Louis, 4,048,944, Cl. 114-293.000.
Compagnie Generale d'Electricite S.A.: *See—*
Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, 4,049,884, Cl. 429-104.000.
Condes Corporation: *See—*
Martin, Thomas R., 4,048,915, Cl. 101-35.000.
Connors, Daniel F.: *See—*
Bennett, R. Jackson; and Connors, Daniel F., 4,049,400, Cl. 55-139.000.
Conrad, Donald W. Quick shut-off direct reading liquid level indicator. 4,048,856, Cl. 73-324.000.
Conrow, Ransom Brown; Bernstein, Seymour; and Bauman, Norman, to American Cyanamid Company. Substituted bisnaphthylazo diphenyl ureido complement inhibitors. 4,049,640, Cl. 260-175.000.
Container Corporation of America: *See—*
Bell, John T., 4,049,130, Cl. 214-8.50A.
Conval-Penn, Inc.: *See—*
Deem, Howard H., 4,048,709, Cl. 29-527.600.
Convertini, Ursula; Dimigen, Heinz; and Luthje, Holger, to U.S. Philips Corporation. Cathode sputtering method for the manufacture of etched structures. 4,049,521, Cl. 204-192.00E.
Cooper, David J.; Gebhardt, George W.; Valenta, Joseph R.; and Wdzieczkowski, Francis E., to SmithKline Corporation. Automatic fraction collector. 4,049,031, Cl. 141-284.000.
Cooper, David J.; Waitz, Jay Allan; Counelis, Mae; and Weinstein, Jay, to Schering Corporation. Amino glycoside antibiotics having antibacterial activity. 4,049,796, Cl. 424-180.000.
Cooper, Kenneth R.: *See—*
Moog, Gerhard W.; and Cooper, Kenneth R., 4,049,045, Cl. 165-12.000.
Cope, Kenneth, to Neff Folding Box Company. Bottle and glass carrier. 4,049,116, Cl. 206-176.000.
Cope, William M.: *See—*
Lillard, Richard E.; and Cope, William M., 4,049,092, Cl. 191-40.000.
Copperi, Maurizio; and Nebbia, Luciano, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. PCM telecommunication system with merger of two bit streams along a common signal path. 4,049,917, Cl. 179-15.0AP.
Coppolani, Joseph; and Vandernotte, Leon, to Societe Franco-Europeenne de Material pour l'Industrie Alimentaire "F.E.M.I.A" France. Sorting machine for elongated articles. 4,049,124, Cl. 209-98.000.
Cordes, Claus: *See—*
Doerfel, Helmut; and Cordes, Claus, 4,049,638, Cl. 260-78.00L.
Corgnet, Jean Louis, to Compagnie Francaise des Petroles. Interconnection of a floating structure and a submerged anchor station. 4,048,944, Cl. 114-293.000.
Cormier, Yves. Photocopying apparatus. 4,049,348, Cl. 355-50.000.
Corn, John E., Jr.; and Klopfer, Howard J., to General Electric Company. Purification of crude 9,9-bis-(4-hydroxyphenyl)-fluorene. 4,049,721, Cl. 260-619.00A.
Corning Glass Works: *See—*
Lepp, Cyrus A.; Mason, Robert D.; and Ramsey, William S., 4,049,499, Cl. 195-100.000.
Smith, Roy E., 4,049,414, Cl. 65-4.00B.
Zine, Anthony R., Jr., 4,049,692, Cl. 260-448.20B.
Cortland Line Company: *See—*
Chandler, Leon, 4,048,744, Cl. 43-17.500.
Cottell, Eric Charles. Combustion method comprising burning an intimate emulsion of fuel and water. 4,048,963, Cl. 123-25.00R.
Cotton, Charles C.; and Jencks, Guy S. D., to United States of America, Navy. Helicopter towline recovery buoy system. 4,048,942, Cl. 114-253.000.
Cottrell, Edward D., to Champion International Corporation. Paper stick pointing apparatus. 4,048,761, Cl. 51-138.000.
Cotty, Val F.; Sterbenz, Francis J.; and Melman, Kenneth J., to Bristol-Myers Company. Augmentation of blood levels of aspirin. 4,049,803, Cl. 424-233.000.
Coucher, Robert G.: *See—*
Gerek, Gene; and Coucher, Robert G., 4,049,842, Cl. 427-34.000.
Coulter Information Systems, Inc.: *See—*
Kuehnle, Manfred R., 4,049,963, Cl. 250-211.00R.
Counelis, Mae: *See—*
Cooper, David J.; Waitz, Jay Allan; Counelis, Mae; and Weinstein, Jay, 4,049,796, Cl. 424-180.000.
Coutant, Ralph W., to Litton Systems, Inc. Keeper for idler rolls. 4,048,707, Cl. 29-509.000.
Cox, Joseph Henry, to Cincinnati Milacron Inc. Stock sensing device. 4,048,879, Cl. 82-28.00R.
CPC International Inc.: *See—*
Walon, Raoul Guillaume Phillipe, 4,049,466, Cl. 127-29.000.
Crall, Frederick William; and Tomczak, Lawrence William, to Chrysler Corporation. Housing for mounting electronic circuit boards on an engine air intake structure. 4,050,093, Cl. 361-383.000.
Crandon, Harry D.: *See—*
Laurin, Bernard L.; Rotenberg, Don H.; and Crandon, Harry D., 4,049,868, Cl. 428-412.000.
Creasey, Norman Geoffrey; and Pike, Leslie Clark, to Imperial Chemical Industries Limited. Surface treating compositions. 4,049,873, Cl. 428-447.000.
Criger, Glenn L.: *See—*
Rodeu, William A.; and Criger, Glenn L., 4,049,183, Cl. 228-50.000.
Crocker, Thomas H.; Levitt, Barry N.; and Suprenant, Paul J., to United States of America, Air Force. System for digitizing and interfacing analog data for a digital computer. 4,050,062, Cl. 340-183.000.
Crouch, Ivan Percy, to USM Corporation. Control mechanism for edge folding machines. 4,048,688, Cl. 12-55.100.
Crowdy, Edmund Porter; and Drentham-Susman, Hector Fillippus Alexander, to Hawthorn Leslie (Engineers) Limited. Turbo-alternator plant. 4,049,972, Cl. 290-52.000.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Copperi, Maurizio; and Nebbia, Luciano, 4,049,917, Cl. 179-15.0AP.
Van Veen, Wouter Martinus Dirk, 4,049,956, Cl. 235-153.0AC.
Cueman, Glenn F., to Zimmer U.S.A., Inc. Therapeutic stocking and method. 4,048,818, Cl. 66-172.00E.

Cunningham, Jere P., Jr. User-actuated simulated motorcycle ride. 4,049,262, Cl. 272-1.00R.
Cunningham, Sinclair Upton: *See—*
Firth, Donald; and Cunningham, Sinclair Upton, 4,048,906, Cl. 91-491.000.
Cutler-Hammer, Inc.: *See—*
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,050,083, Cl. 357-28.000.
Wilson, Chester K., 4,050,046, Cl. 337-319.000.
Da Costa Vieira, David; Dufayet, Jean-Pierre; and Lemaire, Maurice, to Commissariat a l'Energie Atomique. Device for accurate measurement of the dimensions of an object by ultrasonic waves. 4,049,954, Cl. 235-151.320.
Dainippon Screen Seizo Kabushiki-Kaisha: *See—*
Tanabe, Osamu; Nishizawa, Hisao; and Hata, Kazuo, 4,049,345, Cl. 355-41.000.
Dalton, Augustine I., Jr., to Air Products and Chemicals, Inc. Selective oxidation of chrysanthemyl alcohol. 4,049,706, Cl. 260-514.00H.
D'Amico, John J., to Monsanto Company. Use of benzothiazoline compounds as plant growth regulants. 4,049,419, Cl. 71-76.000.
Damon, James William. Combination photographing and prompting systems. 4,049,907, Cl. 358-185.000.
Danforth Agri-Resources: *See—*
Barnidge, Thomas O.; and Hasty, Russell D., 4,048,960, Cl. 119-28.000.
Danguillier, Wilhelm: *See—*
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,049,394, Cl. 48-62.00R.
Gernhardt, Paul; Grams, Wolfgang; Pohl, Siegfried; and Danguillier, Wilhelm, 4,049,570, Cl. 252-373.000.
Danheisser, Hans, to Immco Industries, Inc. Convertible carton. 4,049,114, Cl. 206-44.00B.
Daniels, Peter John Lovell: *See—*
Weinstein, Marvin Joseph; Daniels, Peter John Lovell; Wagman, Gerald Howard; and Testa, Raymond Thomas, 4,049,498, Cl. 195-96.000.
Danner, Dean Wilson, to GTE Automatic Electric Laboratories Incorporated. Remote access for centrally located answering and recording equipment. 4,049,915, Cl. 179-6.00C.
Danner, Dean Wilson, to GTE Automatic Electric Laboratories Incorporated. Ring detector circuit for centrally located answering and recording equipment. 4,049,916, Cl. 179-6.00C.
Dantzer, Peter H.; and Tatay, Charles L., to Intercontinental Plastics Mfg. Co. Closure lid assembly for protective housings. 4,048,766, Cl. 52-19.000.
Dart Industries Inc.: *See—*
Scardiglia, Frank; and Kiss, Kornel Dezso, 4,049,751, Cl. 260-876.00R.
Dartois, Jean-Pierre Andre, to International Standard Electric Corporation. Switching network employing an improved interconnection. 4,049,923, Cl. 179-18.0GE.
Dashevsky, Zinovy Moiseevich: *See—*
Kolomoets, Nikolai Vasilievich; Dashevsky, Zinovy Moiseevich; Granovsky, Vladimir Isaakovich; Shmidt, Igor Aronovich; and Gelfgat, David Mendelevich, 4,049,469, Cl. 136-225.000.
Dastrup, John Burke; and Green, Paul Oscar. Coil re-bar straightener and cutter. 4,048,825, Cl. 72-12.000.
David, Agoston: *See—*
Schawartz, Jozsef; Hornyak, Maria; Majorszki, Eva; David, Agoston; and Horvath, Gabor, 4,049,639, Cl. 260-140.000.
Davies, Thomas Roderick Harries: *See—*
Beveridge, John; Davies, Thomas Roderick Harries; Fidler, Fred; and Ring, Maurice Frank, 4,048,935, Cl. 113-120.00F.
Davis, Charles J.: *See—*
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,049,491, Cl. 162-101.000.
Davis, George B., Jr. Pie crust, dough and package. 4,049,836, Cl. 426-112.000.
Davis, Raymond L., II; and Beck, Robert I., to Airco, Inc. Methods for carburizing steel parts. 4,049,473, Cl. 148-16.500.
Davis, William P., to L G Industries, Incorporated. Torque control devices of the viscous shear type and components therefor. 4,049,100, Cl. 192-58.00C.
Davy Powergas GmbH: *See—*
Furkert, Herbert, 4,049,646, Cl. 260-239.30A.
Daymond Limited: *See—*
Reid, Robert, 4,049,082, Cl. 200-217.000.
Dayton-Walther Corporation: *See—*
DeRegnaucourt, Robert A.; Hall, John C.; and Caudill, Freddie R., 4,049,320, Cl. 301-13.0SM.
Dean, Roy Delmar; and Weiland, Richard Herschel, to Boeing Company, The. Variable pivot trailing edge flap. 4,049,219, Cl. 244-217.000.
De Angelo, Gerald J., to Zinsco Electrical Products. Magnetic trip assembly. 4,050,039, Cl. 335-38.000.
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, to Philagro. Phosphite compounds as fungicidal agents. 4,049,801, Cl. 424-217.000.
Decca Limited: *See—*
Baty, Charlton Robert; and Jarvis, Alfred John, 4,049,951, Cl. 235-92.0FP.
Decker, Karl. Fifth wheel attachment. 4,049,146, Cl. 214-620.000.
Deckrow, Rodger E. Composite automotive vehicle, components thereof, and a method of constructing and using the same. 4,049,289, Cl. 280-423.00R.
DeCrane, Charles E.: *See—*
Harris, Thomas C.; and DeCrane, Charles E., 4,049,028, Cl. 141-10.000.
Deem, Howard H., to Conval-Penn, Inc. Method of casting. 4,048,709, Cl. 29-527.600.
Deflandre, Rene. Balancing and compensating arrangement. 4,048,902, Cl. 90-11.00F.
Degols, Albert: *See—*
Clerbois, Lucien; Degueldre, Louis; Biver, Christian; Degols, Albert; and Gobillon, Yves, 4,049,532, Cl. 204-290.00F.
Degueldre, Louis: *See—*
Clerbois, Lucien; Degueldre, Louis; Biver, Christian; Degols, Albert; and Gobillon, Yves, 4,049,532, Cl. 204-290.00F.
Delach, Henry: *See—*
Carlsson, Ernest R., Jr.; Delach, Henry; and Hinz, Henry, 4,049,277, Cl. 273-145.00C.
Delalande S.A.: *See—*
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,658, Cl. 260-268.0PC.
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,660, Cl. 260-268.0PC.
Delco Chemical Company, Inc.: *See—*
Cohen, Louis, 4,049,791, Cl. 424-20.000.
Delehouzee, Leon: *See—*
Blanpain, Jacques; and Delehouzee, Leon, 4,048,705, Cl. 29-420.000.
Del Fabro, Remigio. Bending apparatus having a shaped mandrel used in automatic bending machines for metal wire and bar stock. 4,049,026, Cl. 140-105.000.
De Long, Charles F., to United States Trading International, Inc. Method for preserving porous inorganic substrates. 4,049,869, Cl. 428-413.000.
de Meester, Emiel Petrus Juliaan: *See—*
Verstegen, Judicus Marinus Pieter Jan; van de Spijker, Willebrordus Hubertus Martinus Maria; and de Meester, Emiel Petrus Juliaan, 4,049,992, Cl. 313-486.000.
Demidov, Alek Platonovich: *See—*
Golyanov, Vyacheslav Mikhailovich; and Demidov, Alek Platonovich, 4,049,533, Cl. 204-298.000.
Denisovich, Vasily Alexeevich: *See—*
Zaplatin, Veniamin Petrovich; Svitelsky, Vasily Petrovich; Galov, Lev Ivanovich; Djukareva, Alla Konstantinovna; Sklyar, Rozalia Grigorievna; Denisovich, Vasily Alexeevich; Shirokov, Dmitry Alexeevich; and Shevchenko, Vladimir Alexandrovich, 4,049,490, Cl. 162-37.000.
Dennis, James T. Automatic record changer. 4,049,278, Cl. 274-10.00R.
Dent, Joseph B., Jr.; Martin, Walter L., Jr.; and Bennett, Howard M., to PPG Industries, Inc. Method and apparatus for forming glass fibers. 4,049,412, Cl. 65-2.000.
Dent, Joseph B., Jr., to PPG Industries, Inc. Apparatus for forming glass fibers. 4,049,415, Cl. 65-11.00W.
Dent, Joseph B., Jr.: *See—*
Long, David M.; and Dent, Joseph B., Jr., 4,049,411, Cl. 65-2.000.
Deprez, Jacques: *See—*
Becker, Wolf-Jurgen; Breuer, Wolfram; and Deprez, Jacques, 4,049,503, Cl. 204-1.00T.
DeRegnaucourt, Robert A.; Hall, John C.; and Caudill, Freddie R., to Dayton-Walther Corporation. Vehicle wheels, spacers and dual rims. 4,049,320, Cl. 301-13.0SM.
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, to Hoffman-La Roche Inc. Tricyclic benzodiazepines. 4,049,666, Cl. 260-294.80R.
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, to Hoffmann-La Roche Inc. Tricyclic benzodiazepines. 4,049,667, Cl. 260-294.80R.
Derks, Harry G., to Fleetwood Furniture Company. Electrical teaching system. 4,048,729, Cl. 35-8.00A.
de Ronde, Henry Marinus, to Hughes Aircraft Company. Connector for coaxial cables. 4,049,902, Cl. 174-35.00C.
deRosset, Armand J.: *See—*
Neuzil, Richard W.; and deRosset, Armand J., 4,049,688, Cl. 260-428.000.
Desoutter Brothers Limited: *See—*
Webb, George Henry, 4,049,104, Cl. 192-150.000.
Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, to Compagnie Generale d'Electricite S.A. Sodium-sulphur electric cell. 4,049,884, Cl. 429-104.000.
Detectronic Limited: *See—*
Smith, Peter David; and Smith, Keith Hindle, 4,048,853, Cl. 73-194.00A.
Dettmann, Heinrich: *See—*
Lechner, Manfred; Schirm, Volker; and Dettmann, Heinrich, 4,048,826, Cl. 72-21.000.
Diamond Shamrock Corporation: *See—*
Szur, Alex J., 4,049,668, Cl. 260-295.00R.
Dickerson, Richard C. Mobile demineralizer. 4,049,548, Cl. 210-96.00R.
Dickey-john Corporation: *See—*
Marsh, Norman F.; and Kelly, Warren H., 4,050,016, Cl. 324-61.00R.
Didier Engineering GmbH: *See—*
Divivier, Rudolf; and Uckert, Gotthard, 4,049,777, Cl. 423-239.000.
DIEHL: *See—*
Raab, Richard; Spindler, Kurt; Brand, Herbert; and Gast, Leonard, 4,048,832, Cl. 72-255.000.
Diehl, Harry Weldon. Cetyl myristoleate. 4,049,824, Cl. 424-312.000.

Dielman, Harold J., to Sanymetal Products Co., Inc., The. Anchor assembly for pilasters. 4,048,775, Cl. 52-239.000.

Dietrich, Alfred T.; and Galbreath, Gerald W., to Overhead Door Corporation. Bulkhead door. 4,049,311, Cl. 296-24.00R.

Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, to Akademie der Wissenschaften der D D R. Processes for the separation of potassium salts of perfluoroalkanoic acids from aqueous solutions thereof. 4,049,681, Cl. 260-408.000.

Dietrich, William John, to DMI, Inc. Multi-unit adjustable plow system. 4,049,063, Cl. 172-283.000.

Diggens, Albert A.: *See*—
Ross, James W., Jr.; and Diggens, Albert A., 4,049,382, Cl. 23-230.00R.

DIHACO Diamanten Handels Compagnie Est.: *See*—
Bruck, Gernot Klaus, 4,049,350, Cl. 356-30.000.

DiLeo, Christopher C., to Krautkramer-Branson, Incorporated. Attenuator circuit ultrasonic testing. 4,050,055, Cl. 340-1.00R.

Dimigen, Heinz: *See*—
Convertini, Ursula; Dimigen, Heinz; and Luthje, Holger, 4,049,521, Cl. 204-192.00E.

Dimitrov, Dimiter Tanev: *See*—
Nikolov, Ivan Dimov; Kortenski, Hristo Georgiev; Dimitrov, Dimiter Tanev; and Antonov, Asparuh Mihaylov, 4,049,041, Cl. 164-120.000.

Disston, Horace C., Jr., to Van Wood Manufacturing Co., Inc. Tailstock powering device. 4,048,881, Cl. 82-31.000.

Distler, Walter; Zink, Roderich; and Linke, Gerhard, to Siemens Aktiengesellschaft. Tomographic X-ray apparatus for producing tomographic images. 4,049,968, Cl. 250-445.00T.

Dittmar, Heinz: *See*—
Bierbach, Herbert; Dittmar, Heinz; Heinz, Ernst; Hohmann, Klaus; and Rennhack, Rolf, 4,049,788, Cl. 423-592.000.

Dively, Charles R., to Ingersoll-Rand Company. Cutter mounting extension apparatus. 4,049,067, Cl. 175-406.000.

Divivier, Rudolf; and Uckert, Gotthard, to Didier Engineering GmbH. Method of waste gas treatment. 4,049,777, Cl. 423-239.000.

Dixico Inc.: *See*—
Hubert, Warren N., 4,048,933, Cl. 113-1.00B.

Djukareva, Alla Konstantinovna: *See*—
Zaplatin, Veniamin Petrovich; Svitelsky, Vasily Petrovich; Galov, Lev Ivanovich; Djukareva, Alla Konstantinovna; Sklyar, Rozalia Grigorievna; Denisovich, Vasily Alexeevich; Shirokov, Dmitry Alexeevich; and Shevchenko, Vladimir Alexandrovich, 4,049,490, Cl. 162-37.000.

DMI, Inc.: *See*—
Dietrich, William John, 4,049,063, Cl. 172-283.000.

Doble, William A.: *See*—
Ellers, Fred S.; Hally, Hugh G.; McIlveen, Edward E.; and Doble, William A., 4,048,807, Cl. 61-105.000.

Dobritz, Gunter, to Dragerwerk Aktiengesellschaft. Humidity exchanger in an apparatus for respiration and anasthesia. 4,048,993, Cl. 128-212.000.

Dr. C. Otto & Comp. G.m.b.H.: *See*—
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,049,394, Cl. 48-62.00R.
Gernhardt, Paul; Grams, Wolfgang; Pohl, Siegfried; and Danguillier, Wilhelm, 4,049,570, Cl. 252-373.000.

Doerfel, Helmut; and Cordes, Claus, to BASF Aktiengesellschaft. Manufacture of polylactams with initial pressures above vapor pressures of starting materials. 4,049,638, Cl. 260-78.00L.

Doi, Kazumasa: *See*—
Beno, Lawrence A.; and Doi, Kazumasa, 4,050,070, Cl. 343-6.8LC.

Doi, Tetsuo: *See*—
Yamada, Takahiro; and Doi, Tetsuo, 4,050,077, Cl. 346-75.000.

Dolgen, Igor E., to Perkin-Elmer Corporation, The. Movable ladle in a pressurized conduct for transporting specimens to a combustion chamber. 4,049,134, Cl. 214-29.000.

Dominey, Alan Michael, to Exxon Research & Engineering Co. Detergent additives. 4,049,560, Cl. 252-33.300.

Dominguez, Richard J. G., to Shell Oil Company. Block copolymer compositions. 4,049,595, Cl. 260-5.000.

Donachie, Stephen James, to International Nickel Company, Inc., The. Ferritic alloys of low flow stress for P/M forgings. 4,049,429, Cl. 75-246.000.

Dorentruper Sand- und Thonwerke GmbH: *See*—
Florian, Rudolf, 4,049,759, Cl. 264-30.000.

Dost, Nicolaas: *See*—
Middelhoek, Servaas; Santing, Gerhardus; and Dost, Nicolaas, 4,049,425, Cl. 75-135.000.

Douglas, Walter M., to UOP Inc. Catalyst and method of manufacture and use thereof. 4,049,572, Cl. 252-431.00N.

Douglass, Miriam Lois, to Colgate-Palmolive Company. Unsymmetrical disulfides as antimicrobial agents. 4,049,665, Cl. 260-294.80J.

Dow Chemical Company, The: *See*—
Brown, Frederick L., 4,049,849, Cl. 427-325.000.
Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., 4,049,693, Cl. 260-465.00F.
Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., 4,049,694, Cl. 260-465.00G.
Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., 4,049,695, Cl. 260-465.00G.
Burk, George A.; Goralski, Christian T.; and Mixan, Craig E., 4,049,696, Cl. 260-465.00F.
Childress, David L.; Hayes, William V.; and Poppe, Richard L., 4,049,577, Cl. 252-443.000.
Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., 4,049,736, Cl. 260-669.0QZ.
Morehouse, Donald S., Jr.; and Bolton, Frank Harold, deceased, 4,049,604, Cl. 260-29.6RW.
Smith, Hubert Stacy, Jr.; and Hay, Robert A., II, 4,049,852, Cl. 428-55.000.
Strycker, Stanley J., 4,049,814, Cl. 424-267.000.

Downing, James H.; and Bear, Harold F., to Bear Industries, Inc. Reversible and variable speed drive means for conveyors and beaters on a forage wagon. 4,049,145, Cl. 214-519.000.

Draber, Wilfried: *See*—
Timmler, Helmut; Draber, Wilfried; Buchel, Karl Heinz; and Lurssen, Klaus, 4,049,418, Cl. 71-76.000.

Dragerwerk Aktiengesellschaft: *See*—
Dobritz, Gunter, 4,048,993, Cl. 128-212.000.

Drehman, Lewis E.; and Farha, Floyd, Jr., to Phillips Petroleum Company. Selective oxidation of acetylenes. 4,049,743, Cl. 260-681.50R.

Drentham-Susman, Hector Fillippus Alexander: *See*—
Crowdy, Edmund Porter; and Drentham-Susman, Hector Fillippus Alexander, 4,049,972, Cl. 290-52.000.

Dresser Europe S.A.: *See*—
Fruin, Harry James, 4,049,318, Cl. 299-81.000.

Dresser Industries, Inc.: *See*—
Englert, Robert Dixon; and Armstrong, Kenneth Ronald, 4,049,758, Cl. 261-62.000.
Henry, Ralph Eugene, 4,049,016, Cl. 137-498.000.
Nystrom, Walter Albert, 4,048,878, Cl. 81-409.000.
Todd, John Arnold; and Chevallier, George Edward, 4,049,159, Cl. 222-144.500.

Driole, Jean; Allibert, Colette; Bonnier, Etienne; and Wicker, Alain, to Agence Nationale de Valorisation de la Recherche (ANVAR). Process of separation, particularly of a solid phase, from a matrix in liquid phase. 4,049,437, Cl. 75-10.00R.

Dru, Luke William; and Hwang, Yun Sheng, to Western Digital Corporation. MOS high current drive circuit. 4,049,978, Cl. 307-270.000.

Ducret, Jacques Joseph: *See*—
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.

Dudouyt, Jean-Paul. Sail vehicles. 4,049,287, Cl. 280-213.000.

Duenser, William F., to Signode Corporation. Sealless strap end alignment and connection means. 4,048,697, Cl. 24-20.0EE.

Dufayet, Jean-Pierre: *See*—
Da Costa Vieira, David; Dufayet, Jean-Pierre; and Lemaire, Maurice, 4,049,954, Cl. 235-151.320.

Duffy, Robert Donovan: *See*—
Sandner, Michael Ray; and Duffy, Robert Donovan, 4,049,931, Cl. 260-2.5AC.

Dugois, Jean-Pierre: *See*—
Morel, Paul; and Dugois, Jean-Pierre, 4,049,528, Cl. 204-243.00M.

Dulson, John E.: *See*—
Freeman, George M.; Dulson, John E.; and Morris, Monica F., 4,049,514, Cl. 204-119.000.

Dunbar, Glenn G. Scale testing vehicle. 4,048,843, Cl. 73-1.00B.

Dunikowski, Andrzej; Bednarczyk, Jan; Keska, Jerzy; Pisarkiewicz, Tadeusz; and Zamarski, Andrzej. Electric system of meter for measurements of density of mixtures conveyed in a pipeline. 4,048,844, Cl. 73-32.00R.

Dunphy, Gerald Francis: *See*—
Newman, Donald John; and Dunphy, Gerald Francis, 4,048,694, Cl. 16-52.000.

Du Pont de Nemours, E. I., and Company: *See*—
Lauder, Alan, 4,049,583, Cl. 252-466.0PT.
McGhee, John D., 4,049,997, Cl. 318-128.000.
Otto, Kenneth Wayne; and Hatten, Jimmy L., 4,049,729, Cl. 260-654.00H.
Schwing, Gregory Wayne, 4,049,705, Cl. 260-512.00C.
Tocker, Stanley, 4,049,710, Cl. 260-544.00C.
Vassiliou, Eustathios, 4,049,863, Cl. 428-324.000.

Dupraz, Jean: *See*—
Balleys, Francois; and Dupraz, Jean, 4,049,942, Cl. 219-69.00M.

Durant, Graham John; Ganellin, Charon Robin; and White, George Raymond, to Smith Kline & French Laboratories Limited. Process for preparing N-cyanoguanidines. 4,049,671, Cl. 548-342.000.

Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. 4-Methyl-5-imidazolylmethylthioethylamine and -S-methylisothiourea. 4,049,672, Cl. 548-342.000.

Durbin, Charles R.; and Schoenbachler, Bernard W., to General Electric Company. Apparatus for forming serpentine heat exchangers. 4,048,834, Cl. 72-294.000.

Durenec, Peter, to Brener, William; Ball, Edward; and Branan, Floyd, a part interest to each. Freight container universal corner. 4,049,149, Cl. 220-1.500.

Durr-Dental KG: *See*—
Durr, Walter, 4,049,981, Cl. 310-317.000.

Durr, Walter, to Durr-Dental KG. Piezoelectrically driven ultrasonic tool with cooling. 4,049,981, Cl. 310-317.000.

Dussy, Paul: *See*—
Seiler, Herbert; and Dussy, Paul, 4,049,661, Cl. 260-256.40N.

Duthweiler, Frederick C., to Union Oil Company of California. Ice islands and method for forming same. 4,048,808, Cl. 61-103.000.

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Seiler, Claus-Dieter; and Vahlensieck, Hans-Joachim, 4,049,690, Cl. 260-448.20E.

Dzus Fastener Co., Inc.: *See*—
Schenk, Peter, 4,049,301, Cl. 292-113.000.

E-C Apparatus Corporation: *See*—
Posner, Israel, 4,049,534, Cl. 204-299.00R.

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Fischer, Karl; and Kicherer, Robert, 4,050,044, Cl. 337-137.000.

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Lundberg, George A., 4,049,313, Cl. 292-307.00R.

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Breuer, Hermann; and Treuner, Uwe D., 4,049,651, Cl. 544-21.000.
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Gilkey, Russell; Hilbert, Samuel D.; and Wicker, Thomas H., Jr., 4,049,621, Cl. 260-40.000.
Hawkins, Gary Fred; and Gass, Robert Lee, 4,049,698, Cl. 560-127.000.
Weaver, Max A.; Straley, James M.; and Moore, William H., 4,049,643, Cl. 260-207.100.

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Walters, Thomas, Jr., 4,049,240, Cl. 259-3.000.

Eddy, Robert A.; Gustafson, Norman F.; and Erwin, Stephen J., to Wyman-Gordon Company. Forming and heat treating process. 4,048,836, Cl. 72-364.000.

Edgar, Albert D. General purpose pole-zero single amplifier active filter. 4,050,023, Cl. 328-127.000.

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Stamer, Walter; and Eichinger, Frithjof, 4,049,247, Cl. 266-182.000.

Eigenmann, Ludwig. Reflex reflecting system for road surface marking. 4,049,337, Cl. 350-105.000.

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Chasen, Lee Richard; and Einhorn, Ruediger, 4,049,225, Cl. 248-219.400.

Eisenhardt, Fred W.; and Tonsfeldt, Wayne S., to Alloway Manufacturing, Inc. Sugar beet harvester. 4,049,058, Cl. 171-58.000.

Eisentraeger, Klaus; Immel, Guenther; Marx, Matthias; Reinhard, Hans; Spoor, Herbert; and Storck, Gerhard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of self-adhesive coatings on flat substrates. 4,049,847, Cl. 427-207.00B.

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Elbert, Raymond John; and Farrier, Ernest Gilbert, to Union Carbide Corporation. Metal porous abradable seal. 4,049,428, Cl. 75-208.00R.

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Reesman, Stanley H.; and Eldred, Charles R., 4,049,840, Cl. 426-634.000.

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Mitoff, Stephen Paul, 4,049,885, Cl. 429-104.000.

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Genevois, Jean Louis; and Bufarale, Rolando, 4,049,900, Cl. 13-7.000.

Eli Lilly and Company: *See*—
Molloy, Bryan Barnet, 4,049,827, Cl. 424-330.000.

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Korner, Anneliese F.; Piziali, Robert L.; and Ellsworth, Orval T., 4,048,684, Cl. 5-370.000.

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Elmer, Otto C., to General Tire & Rubber Company, The. Adhesion of glass fibers to rubber. 4,049,603, Cl. 260-28.50R.

Elmore, Ethelbert P., Jr. Airborne microwave path modeling system. 4,050,067, Cl. 343-5.00R.

Elsasser, Konrad. Sliding closure arrangement. 4,049,153, Cl. 220-345.000.

Elsener, Anton; Gehrt, Hans Harald; Medinger, Bernhard; and Wiese, Volkhard, to Ciba-Geigy Corporation. Process for the distortion-free coloration of polyolefins with organic pigments. 4,049,615, Cl. 260-39.00P.

Elsener, Fritz, to Chr. Hausler AG. Four-roller sheet bending machines. 4,048,830, Cl. 72-175.000.

Elsnau, Walter Hugh, to Procter & Gamble Company, The. Antiperspirant stick. 4,049,792, Cl. 424-66.000.

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Lambert, Rudolph J., 4,049,973, Cl. 307-66.000.

Emerson, Robert T.: *See*—
Peterson, Glenn E.; Emerson, Robert T.; and Schoenlein, William J., 4,048,952, Cl. 118-6.000.

Emhart Industries, Inc.: *See*—
Raudat, John L.; and Johnson, Lloyd D., 4,048,783, Cl. 53-61.000.

Emmett, John Colin: *See*—
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,049,672, Cl. 548-342.000.

Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, to Sankyo Company Limited. Physiologically active substances and fermentative process for producing the same. 4,049,495, Cl. 195-36.00R.

Endo, Takaya: *See*—
Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Kato, Katsunori, 4,049,455, Cl. 96-76.00R.

Energy Development Associates: *See*—
Hart, Thomas G., 4,049,880, Cl. 429-49.000.

Engel, William K., to Caterpillar Tractor Co. Radial piston pump or motor with unrestricted inlet means. 4,048,907, Cl. 91-492.000.

Engler, Gunter: *See*—
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Englert, Robert Dixon; and Armstrong, Kenneth Ronald, to Dresser Industries, Inc. Fuel introduction device for internal combustion engine. 4,049,758, Cl. 261-62.000.

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Edgcombe, Christopher John, 4,049,995, Cl. 315-5.390.

English, Robert William, to Mastermix Engineering Company Limited, The. Horizontal, detachable, ball mill. 4,049,205, Cl. 241-67.000.

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Moser, Peter; Eysn, Manfred; Enkner, Bernhard; Berger, Rupert; Wagner, Wolfgang; and Spannlang, Ronald, 4,049,249, Cl. 266-247.000.

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Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Enomoto, Masahisa, 4,049,530, Cl. 204-273.000.

EPPCO: *See*—
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Meyers, Norman W., 4,049,513, Cl. 204-290.00F.

Erdmann, Hans; and Miller, Franz-Friedrich, to BASF Aktiengesellschaft. Complex basic zirconium salts and aluminum salts. 4,049,379, Cl. 8-94.260.

Erickson, Henry; and Mooi, John, to Atlantic Richfield Company. Method for producing a supported catalyst. 4,049,582, Cl. 252-466.0PT.

Eriksson, Sven Vilhelm: *See*—
Andersson, Henry Veine; and Eriksson, Sven Vilhelm, 4,049,302, Cl. 292-201.000.

Erwin, Stephen J.: *See*—
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Escher Wyss Limited: *See*—
Marchioro, Ignazio, 4,048,701, Cl. 29-116.0AD.

Eskridge, Brewster B.; Lyon, Boyce M.; and Boasson, Eduard H., to Akzona Incorporated. Process for improving crystallinity in nylon 6. 4,049,766, Cl. 264-210.00F.

Essilor International Cie Generale d'Optique: *See*—
Godot, Jean Marie, 4,049,254, Cl. 269-156.000.

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Giger, Urs, 4,048,835, Cl. 72-334.000.
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Metzger, Carl; Eue, Ludwig; and Hack, Helmuth, 4,049,670, Cl. 260-306.80D.
Eutectic Corporation: *See*—
Fluckiger, Jean-Louis; and Roulet, Pierre Alfred, 4,049,946, Cl. 219-131.00R.
Evans, Albert B., Jr., to United States of America, Navy. Complex pulse repetition frequency generator. 4,049,953, Cl. 235-150.300.
Evans, John James Alexander; and Holan, George, to Commonwealth Scientific and Industrial Research Organization. Triazoles. 4,049,815, Cl. 424-269.000.
Evans Products Company: *See*—
Wolak, Norbert S.; and Wolak, Thomas J., 4,048,755, Cl. 49-130.000.
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Gerwick, Ben G., Jr., 4,048,943, Cl. 114-256.000.
Howell, James D., 4,049,239, Cl. 254-172.000.
Mifsud, Joseph F., 4,049,077, Cl. 181-114.000.
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Bogga, Jesse K., 4,049,730, Cl. 260-663.000.
Dominey, Alan Michael, 4,049,560, Cl. 252-33.300.
Horowitz, Harold S.; and Longo, John M., 4,049,790, Cl. 423-599.000.
Plumlee, Karl W.; and Vernon, Lonnie W., 4,049,536, Cl. 208-10.000.
Plumlee, Karl W.; and Vernon, Lonnie W., 4,049,537, Cl. 208-10.000.
Rao, Bhaskara M. L.; and Silbernagel, Bernard G., 4,049,881, Cl. 429-50.000.
Ryer, Jack; Zielinski, James; Miller, Harold N.; and Brois, Stanley J., 4,049,564, Cl. 252-51.50A.
Thompson, Arthur H.; and Whittingham, M. Stanley, 4,049,879, Cl. 429-191.000.
Whittingham, M. Stanley, 4,049,887, Cl. 429-112.000.
Eyan, Manfred: *See*—
Moser, Peter; Eyan, Manfred; Enkner, Bernhard; Berger, Rupert; Wagner, Wolfgang; and Spannlang, Ronald, 4,049,249, Cl. 266-247.000.
F. B. J. Engineering Services Pty. Limited: *See*—
Urquhart, William James, 4,048,908, Cl. 92-159.000.
Urquhart, William James, 4,048,975, Cl. 123-193.00P.
F. W. Luling KG, Firma: *See*—
Luling, Adalbert, 4,048,822, Cl. 70-93.000.
Fabian, Wolfgang; Klein, Konrad; and Sevenich, Theodor, to Hoesch Werke Aktiengesellschaft. Two-roller driving device. 4,048,831, Cl. 72-251.000.
Faircraft Engineering, Inc.: *See*—
Chubb, Wayne L., 4,049,091, Cl. 190-18.00R.
Falcy, Bernard Charles Albert; and Vaudant, Adrien, to Societe Anonyme des Hauts Fourneaux de la Chiers. Sealed cables for attachment to submarine anchorages. 4,048,794, Cl. 57-149.000.
Falk, Henry Joseph; and Tocci, Gerald Charles, to Union Carbide Corporation. Detachable container refrigeration system. 4,048,813, Cl. 62-297.000.
Falkenstein, Georg; Stein, Dieter; Haaf, Franz; Heinz, Gerhard; and Schoen, Ernst, to BASF Aktiengesellschaft. Manufacture of polyurethane compositions. 4,049,590, Cl. 260-2.5BE.
Farahar, Robert M., to ARC Concrete Limited. Concrete pipes. 4,049,022, Cl. 138-176.000.
Farha, Floyd, Jr.: *See*—
Drehman, Lewis E.; and Farha, Floyd, Jr., 4,049,743, Cl. 260-681.50R.
Farmer, Robert F., III: *See*—
Steckler, Robert; Robinson, Fred; and Farmer, Robert F., III, 4,049,608, Cl. 260-29.6SQ.
Farr, Glyn Phillip Reginald, to Girling Limited. Vehicle braking systems. 4,049,322, Cl. 303-6.00C.
Farrier, Ernest Gilbert: *See*—
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Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., to Delalande S.A. N'-substituted derivatives of 4'-(N-piperazinylmethyl) spiro dibenzocycloheptadi- (or tri-) ene-5, 2'-dioxolane (1',3') their method of preparation and their application in therapeutics. 4,049,658, Cl. 260-268.0PC.
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., to Delalande S.A. N-substituted derivatives of 4 (N-piperazinylmethyl) spiro dibenzocycloheptadi- (or tri-) ene-5, 2-dioxolane (1,3) their method of preparation and their application in therapeutics. 4,049,660, Cl. 260-268.0PC.
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Foti, Sam J., 4,049,298, Cl. 285-177.000.
Fedorov, Oleg Georgievich: *See*—
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukosnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.
Fegley, Charles R.; Winings, Richard H.; and Yeich, Clifford R., Jr., to Western Electric Company, Inc. Methods of and apparatus for sorting articles in accordance with their resistivity and thickness. 4,049,123, Cl. 209-74.00M.
Feiler, Robert J. Sport practice apparatus. 4,049,266, Cl. 273-29.00A.
Feinstein, Paul, Jr.: *See*—
Church, John Allen; Feinstein, Paul, Jr.; Hunt, Ronald Eugene; McDaniels, Louis Marion; and Munch, Paul Francis, 4,049,256, Cl. 271-9.000.
Feldman, Ilya Afanasievich: *See*—
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Feller, Herman H.: *See*—
Shanahan, Francis V.; and Feller, Herman H., 4,048,747, Cl. 43-114.000.
Ferich, Joseph. Bathroom partitions. 4,048,767, Cl. 52-35.000.
Ferranti Limited: *See*—
Colaco, Stephen Francis, 4,049,975, Cl. 307-213.000.
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Fex, Hans: *See*—
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Fincke, George C.; and Taylor, George W., to United States of America, Army. Fast-tuned multiplexer-power combiner. 4,050,040, Cl. 333-73.00C.
Finegold, Hyman B.: *See*—
Bucholtz, Glen E.; and Finegold, Hyman B., 4,049,208, Cl. 242-7.05B.
Fink, Helmuth; and Wess, Guenter, to Siemens Aktiengesellschaft. Circuit arrangement for measuring the phase modulation disturbance of a test signal. 4,050,014, Cl. 324-57.00H.
Finley, George C. Elastomeric stripper having metal head and stripping plates. 4,048,889, Cl. 83-138.000.
Finn, Donald J. Currency bill billfold file. 4,049,035, Cl. 150-38.000.
Firth, Donald; and Cunningham, Sinclair Upton, to National Research Development Corporation. Low-stress cam-driven piston machines. 4,048,906, Cl. 91-491.000.
Fischer, Karl; and Kicherer, Robert, to E.G.O. Elektro-Geraete Blanc und Fischer. Electrical switch. 4,050,044, Cl. 337-137.000.
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Herzl, Peter J., 4,048,854, Cl. 73-194.0VS.
Fischer, Robert L.: *See*—
Oldenburg, Dorrance; and Fischer, Robert L., 4,049,032, Cl. 144-2.00Z.
Fisher, Charles B.: *See*—
Fisher, Sidney T.; and Fisher, Charles B., 4,049,053, Cl. 166-249.000.
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Gates, Peter Stuart, 4,049,420, Cl. 71-88.000.
Harper, Douglas Charles; Robinson, Norman; and Janikowski, Stanislaw Maria, 4,049,774, Cl. 260-851.000.
Fitzgerald, William Maurice Bard. Fuel injector. 4,048,970, Cl. 123-139.0AJ.
Fitzsimons, Ron. Golf ball warmer. 4,049,949, Cl. 219-521.000.
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Fleenor, Warren O. Prime mover and box car combination for handling cargo. 4,049,136, Cl. 214-38.00R.
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Derks, Harry G., 4,048,729, Cl. 35-8.00A.
Fleig, Helmut; Hagen, Helmut; Naarmann, Herbert; and Penzien, Klaus, to BASF Aktiengesellschaft. Self-extinguishing thermoplastic molding compositions. 4,049,622, Cl. 260-2.5HB.
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Byrne, John A.; Rhea, Charles K., Jr.; and Fleming, Thomas F., 4,049,950, Cl. 235-61.60R.
Flender, Jacques, to SAFT-Societe des Accumulateurs Fixes et de Traction. Centrally-activated deferred-action silver-zinc battery. 4,049,888, Cl. 429-115.000.
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Flora, James D. Dual biased static sensing magnetic transducer. 4,050,012, Cl. 324-43.00R.

Florian, John, to Mobil Oil Corporation. Thermoformed hot drink cup. 4,049,187, Cl. 229-1.50B.
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Fluckiger, Jean-Louis; and Roulet, Pierre Alfred, to Eutectic Corporation. Power supply for electric arc welding. 4,049,946, Cl. 219-131.00R.
FMC Corporation: *See*—
Chiang, John S., 4,049,786, Cl. 423-513.000.
Follert, Hans Gunter, to Gewerkschaft Eisenhutte Westfalia. Tunnel driving apparatus. 4,049,317, Cl. 299-33.000.
Fonti, Richard A. Target board sail game. 4,049,271, Cl. 273-95.00R.
Ford, Michael Alan, to Perkin-Elmer Limited. Pulsed radiation detector system. 4,049,970, Cl. 250-461.00B.
Ford Motor Company: *See*—
Gale, Ronald J.; and Rowbotham, Edwin M., 4,049,037, Cl. 152-427.000.
Heintz, Walter K., 4,049,889, Cl. 429-174.000.
Saillant, Roger B.; and Weber, Neill, 4,049,877, Cl. 429-11.000.
Foreman, Joseph S., Jr.: *See*—
Harris, Hal; and Foreman, Joseph S., Jr., 4,049,955, Cl. 235-152.000.
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Lucas, Roger; and Auberger, Jacques, 4,048,828, Cl. 72-83.000.
Forrest, Charles Phelps. Football place-kicking device. 4,049,267, Cl. 273-55.00B.
Forslund, Erik Torsten, to Ostbergs Fabriks AB. Device for use in removal of stumps. 4,048,733, Cl. 37-2.00R.
Forsslund, Erik Ejnar. Intermittence-responsive working-time indicator. 4,049,952, Cl. 235-92.00T.
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Fortson, Charles B., to United States of America, Navy. Gas mixing device. 4,049,402, Cl. 55-208.000.
Foti, Sam J., to Federal Metal Hose Corporation, The. Compression coupling. 4,049,298, Cl. 285-177.000.
Fountain, Claude Lloyd, to Lockheed Aircraft Corporation. Relief of inter-compartment differential pressure in aircraft. 4,049,221, Cl. 244-118.00R.
Fox, Charles L., Jr., to Research Corporation. Zinc sulfadiazine and its use in the treatment of burns. 4,049,802, Cl. 424-229.000.
Fox Grinders, Inc.: *See*—
Bair, James G., Jr., 4,048,762, Cl. 51-206.500.
France, Larry R.: *See*—
Pegnim, Timothy C.; France, Larry R.; Sherman, John G.; and MacQuignon, Claude, 4,050,079, Cl. 346-145.000.
Francis, Gaylord L.; and Morelli, Amedeo J., to North American Philips Corporation. Resistor end terminations. 4,050,053, Cl. 338-332.000.
Francis, George W., Jr., to Saginaw Products Corporation. Latch assembly for containerized baggage trailer. 4,049,286, Cl. 280-179.00R.
Franek, Jozef Tadeusz; and Porucznik, Paul, to Metal Box Limited. Feeder for feeding sheets having a recessed profile end edge. 4,049,261, Cl. 271-269.000.
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Bianchi, Sergio; Bornengo, Mario; and Frangioni, Alessandro, 4,049,755, Cl. 260-987.000.
Frazee, Lawrence E., to Plessey Incorporated. Humidity sensor, material therefor and method. 4,050,048, Cl. 338-35.000.
Frazier, Robert Doyal, to Champion International Corporation. Stop motion for narrow width needle looms. 4,049,023, Cl. 139-339.000.
Frechette, Kenneth R., to Xerox Corporation. Print wheel mounting assembly. 4,049,110, Cl. 197-53.000.
Fred M. Dollorfano, Jr. and Donald P. Amassa, Trustees of The Stoneleigh Trust: *See*—
Massa, Frank, 4,050,056, Cl. 340-1.00R.
Frederiksen, Ronald A.: *See*—
Muzyczko, Thaddeus M.; Frederiksen, Ronald A.; and York, David L., 4,049,746, Cl. 260-851.000.
Fredholm, Bo: *See*—
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,799, Cl. 424-211.000.
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,800, Cl. 424-211.000.
Freebairn, Hugh T., to Catalytic Generators, Inc. Chill prevention for banana underpeel. 4,049,837, Cl. 426-308.000.
Freed, Meier E.; and Potoski, John R., to American Home Products Corporation. Benzobicycloalkane amines. 4,049,701, Cl. 560-130.000.
Freeman, George M.; Dulson, John E.; and Morris, Monica F., to Texasgulf Canada Ltd. Zinc hydrometallurgical process. 4,049,514, Cl. 204-119.000.
Freissmuth, Alfred; Heinl, Walter; Knahl, Herbert; and Pfluger, Erich, to Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft. Composition for desulfurizing iron melts. 4,049,442, Cl. 75-55.000.
French, William George, to Bell Telephone Laboratories, Incorporated. Method for making optical fibers with variations in core diameter. 4,049,413, Cl. 65-3.00A.
Frink, Russell E.; and Milianowicz, Stanislaw A., to Westinghouse Electric Corporation. Quick-acting movable operating-column tripping device. 4,049,936, Cl. 200-146.00R.
Fritz, Edward A.: *See*—
Storm, Donald P.; Sammarco, Peter; Fritz, Edward A.; and Mackert, Robert J., 4,049,207, Cl. 241-101.700.
Froberg, Robert W., to Pfizer Inc. Apparatus for vapor depositing pyrolytic carbon on porous sheets of carbon material. 4,048,953, Cl. 118-49.000.
Fromm, Ellsworth H.; and Murray, Norman R., to Phillips Petroleum Company. Variable dome valves and combustors provided with said valves. 4,049,021, Cl. 137-625.310.
Fruehauf Corporation: *See*—
Chieger, George, 4,049,285, Cl. 280-106.00T.
Fruin, Harry James, to Dresser Europe S.A. Mining machine with cam-operated water jet pump. 4,049,318, Cl. 299-81.000.
Fryer, Rodney Ian: *See*—
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,049,666, Cl. 260-294.80R.
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,049,667, Cl. 260-294.80R.
Frystak, Richard, to Bell & Howell Company. Document feeder apparatus. 4,049,257, Cl. 271-114.000.
Fuchs, Ernest F.: *See*—
Ross, Joseph; and Fuchs, Ernest F., 4,049,364, Cl. 417-360.000.
Fuel Computer Corporation: *See*—
Haviland, Herbert, deceased; Haviland, Diane, administratrix; Smith, Arthur; and Boyer, Charles, 4,049,193, Cl. 236-46.00R.
Fuji Photo Film Co., Ltd.: *See*—
Honjo, Satoru; and Takimoto, Masaaki, 4,049,448, Cl. 96-1.50R.
Ogawa, Hiroshi; Tamai, Yasuo; and Nishina, Tutomu, 4,049,871, Cl. 428-425.000.
Fuji Xerox Co., Ltd.: *See*—
Nakaguchi, Michiharu; and Nagashima, Toshio, 4,048,958, Cl. 118-658.000.
Fujii, Shouji: *See*—
Sato, Hiroshi; Okumura, Munehiro; Itani, Fujio; Fujii, Shouji; Kakuda, Tsutomu; and Nakatui, Hiroshi, 4,049,593, Cl. 260-2.50E.
Fujikura Kasei Co., Ltd.: *See*—
Aoyama, Tsuyoshi; Hayashi, Yoshimasa; Nagano, Michio; and Nagase, Hiroshi, 4,049,874, Cl. 428-451.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,049,664, Cl. 260-294.80C.
Fujita, Nobuo: *See*—
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.
Fujita, Rokuro: *See*—
Ko, Keiun; Takashina, Naomitsu; Shiokawa, Shigeru; and Fujita, Rokuro, 4,049,634, Cl. 260-75.0UA.
Fujita, Tadao: *See*—
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Fujita, Tadao, 4,049,507, Cl. 204-39.000.
Fujitsu Ten Limited: *See*—
Okamoto, Kenzi, 4,050,089, Cl. 360-106.000.
Fukushima, Yoshikiyo; and Watanabe, Shigeru, to Nippon Concrete Industries Co. Ltd.; and Nikkai Giken Co., Ltd. Concrete pile. 4,048,805, Cl. 61-56.000.
Fullenkamp, Anthony L.; and Russell, Herman F., to Hobart Corporation. Meat cleaning machine. 4,048,689, Cl. 15-3.170.
Fuller, Willard A., to Hooker Chemicals & Plastics Corporation. Production of chlorine dioxide with product slurry metathesis. 4,049,784, Cl. 423-478.000.
Fuller, Willard A., to Hooker Chemicals & Plastics Corporation. Production of chlorine dioxide with product slurry metathesis. 4,049,785, Cl. 423-478.000.
Funderburk, William Henry, Jr., to A. H. Robins Company, Inc. Method of treating allergy. 4,049,821, Cl. 424-274.000.
Furber, Robert Arthur: *See*—
Swinkels, Godefridus Maria; Furber, Robert Arthur; Milner, Edward Francis Godfrey; Genik-Sas-Berezowsky, Roman Michael; and Kirby, Charles Ray, 4,049,770, Cl. 423-37.000.
Furkert, Herbert, to Davy Powergas GmbH. Process for the manufacture of lactams. 4,049,646, Cl. 260-239.30A.
Furman, Anthony H., to General Electric Company. Method for extrusion of coal containing body. 4,049,390, Cl. 44-10.00R.
Furman, Anthony H., to General Electric Company. Method for extrusion of coal containing body. 4,049,392, Cl. 44-10.00R.
Futaba Denshi Kogyo K. K.: *See*—
Kishino, Takao; and Utamura, Yukihiko, 4,049,993, Cl. 313-497.000.
Futamura, Kazumasa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas purifier. 4,049,387, Cl. 23-277.00C.
Futatsuki, Sachio: *See*—
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.
Fyock, Norman G. Variable speed power transmission for small vehicles and the like. 4,048,871, Cl. 74-687.000.
Gail, William A. Trailable houseboat. 4,048,685, Cl. 9-1.200.
Gaines, George L., Jr.: *See*—
Lavallee, Francois A.; Le Grand, Donald G.; and Gaines, George L., Jr., 4,049,649, Cl. 542-400.000.
Galambos, Gyula: *See*—
Kadar, Ferenc; and Galambos, Gyula, 4,050,051, Cl. 338-202.000.
Galbreath, Gerald W.: *See*—
Dietrich, Alfred T.; and Galbreath, Gerald W., 4,049,311, Cl. 296-24.00R.
Gale, Ronald J.; and Rowbotham, Edwin M., to Ford Motor Company. Inflation valve for tubeless tire. 4,049,037, Cl. 152-427.000.

Galov, Lev Ivanovich: *See*—
Zaplatin, Veniamin Petrovich; Svitelsky, Vasily Petrovich; Galov, Lev Ivanovich; Djukareva, Alla Konstantinovna; Sklyar, Rozalia Grigorievna; Denisovich, Vasily Alexeevich; Shirokov, Dmitry Alexeevich; and Shevchenko, Vladimir Alexandrovich, 4,049,490, Cl. 162-37.000.

Ganellin, Charon Robin: *See*—
Durant, Graham John; Ganellin, Charon Robin; and White, George Raymond, 4,049,671, Cl. 548-342.000.
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,049,672, Cl. 548-342.000.

Gangelhoff, Fred R. Scissors sharpener. 4,048,760, Cl. 51-116.000.

Gannis, Peter Michael; and Bosco, Peter Michael, to Standard Brands Incorporated. Process for treating partially defatted nuts. 4,049,833, Cl. 426-93.000.

Gante, Joachim: *See*—
Schacht, Erich; Mehrhof, Werner; Wild, Albrecht; Gante, Joachim; and Kurmeier, Hans-Adolf, 4,049,823, Cl. 424-308.000.

Gardner-Denver Company: *See*—
Chubb, Raymond L.; Haven, Lawrence F.; and Hisey, Robert W., 4,049,064, Cl. 173-147.000.

Garlic, Richard A., to Xerox Corporation. Microprocessor with parallel operation. 4,050,058, Cl. 364-200.000.

Garlock Inc.: *See*—
Bainard, Dean R., 4,049,281, Cl. 277-1.000.

Garnett, David Morris. Ball bearings. 4,048,702, Cl. 29-148.40A.

Garnett, Wayne A. Toilet seat. 4,048,679, Cl. 4-237.000.

Garrett Corporation, The: *See*—
Parker, Kenneth O., 4,049,051, Cl. 165-166.000.

Garvey, Eugene N., to Woodward Mfg. & Sales Co., Inc. Electrically powered hand truck with stacker attachment. 4,049,083, Cl. 187-9.00R.

Garvin, Hugh L.; Yariv, Amnon; and Somekh, Sasson, to Hughes Aircraft Company. Process for fabricating small geometry semiconductive devices including integrated components. 4,049,944, Cl. 219-121.0EM.

Garwood, William E.; Jacob, Solomon M.; Kuo, James C.; and Wise, John J., to Mobil Oil Corporation. Conversion of coal to high octane gasoline. 4,049,734, Cl. 260-668.00R.

Gass, Robert Lee: *See*—
Hawkins, Gary Fred; and Gass, Robert Lee, 4,049,698, Cl. 560-127.000.

Gast, Leonard: *See*—
Raab, Richard; Spindler, Kurt; Brand, Herbert; and Gast, Leonard, 4,048,832, Cl. 72-255.000.

Gates, Peter Stuart, to Fisons Limited. Certain sulfonic acid esters of certain 2,3-dihydro-2-hydrocarbonoxy-benzofuran-5-ols and their use as herbicides and plant growth controllers. 4,049,420, Cl. 71-88.000.

Gaul, Michael F. Modular crypt system. 4,048,772, Cl. 52-136.000.

Gaulliard, Jean-Michel: *See*—
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.

Gaynor, Joseph, to Bell & Howell Company. Image transfer layers for infrared transfer processes. 4,049,843, Cl. 427-43.000.

Gea Luftkuhlergesellschaft Happel GmbH & Co. KG: *See*—
Baumann, Jan; and Petter, Franz, 4,049,363, Cl. 416-157.00B.

Gebert, Meril D. Circuit breaker. 4,049,073, Cl. 180-103.00A.

Gebhard, Helmut: *See*—
Bohnenstingl, Josef; Laser, Manfred; Lossmann, Gunter; and Gebhard, Helmut, 4,049,385, Cl. 23-277.00R.

Gebhardt, George W.: *See*—
Cooper, David J.; Gebhardt, George W.; Valenta, Joseph R.; and Wdzieczkowski, Francis E., 4,049,031, Cl. 141-284.000.

Gebhardt, Paul A. Windshield covers. 4,049,036, Cl. 150-52.00K.

Gehrt, Hans Harald: *See*—
Eisener, Anton; Gehrt, Hans Harald; Medinger, Bernhard; and Wiese, Volkhard, 4,049,615, Cl. 260-39.00P.

Gejyo, Tetsuo: *See*—
Manabe, Toshikatsu; Ohta, Masao; Kudo, Tetsuichi; Mochizuki, Shouji; and Gejyo, Tetsuo, 4,049,789, Cl. 423-593.000.

Gelfand, Samuel, to Hooker Chemicals & Plastics Corporation. Polyhaloindene compounds. 4,049,727, Cl. 260-650.00R.

Gelfgat, David Mendelevich: *See*—
Kolomoets, Nikolai Vasilievich; Dashevsky, Zinovy Moiseevich; Granovsky, Vladimir Isaakovich; Shmidt, Igor Aronovich; and Gelfgat, David Mendelevich, 4,049,469, Cl. 136-225.000.

Gellato, Michel; Seris, Jean-Louis; and Suberloco, Jeannine, to Societe Nationale Elf Aquitaine. Photochemical process for the production of halogeno-alkanes. 4,049,516, Cl. 204-158.0HA.

Gemar, George D.: *See*—
Rossmiller, Lawrence E.; and Gemar, George D., 4,049,062, Cl. 172-126.000.

General Corrugated Machinery Co., Inc.: *See*—
Szymborski, Andrew M., 4,049,260, Cl. 271-151.000.
Ventz, George A., 4,049,259, Cl. 271-151.000.
Zeblisky, Joseph A., 4,049,258, Cl. 271-151.000.

General Dynamics Corporation: *See*—
Roden, William A.; and Criger, Glenn L., 4,049,183, Cl. 228-50.000.

General Electric Company: *See*—
Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., 4,049,844, Cl. 427-54.000.
Corn, John E., Jr.; and Klopfer, Howard J., 4,049,721, Cl. 260-619.00A.
Durbin, Charles R.; and Schoenbachler, Bernard W., 4,048,834, Cl. 72-294.000.
Furman, Anthony H., 4,049,390, Cl. 44-10.00R.
Furman, Anthony H., 4,049,392, Cl. 44-10.00R.
Germer, Warren R.; and Palmer, Ansell W., 4,050,020, Cl. 324-116.000.
Hanneman, Rodney E.; Chrenko, Richard M.; and Kittle, Donald B., 4,049,186, Cl. 228-225.000.
Jehlicka, Roger F., 4,048,716, Cl. 29-628.000.
Kazin, Stephen B., 4,049,074, Cl. 181-286.000.
Lavallee, Francois A.; Le Grand, Donald G.; and Gaines, George L., Jr., 4,049,649, Cl. 542-400.000.
McFadyen, Robert J.; and Peil, William, 4,050,022, Cl. 325-315.000.
McFadyen, Robert J., 4,050,029, Cl. 330-22.000.
Smith, Carlyle F., Jr., 4,049,347, Cl. 355-133.000.
White, Dwain M., 4,049,613, Cl. 260-37.00N.
Will, Fritz G., 4,049,886, Cl. 429-105.000.

General Foods Corporation: *See*—
Haas, Gerhard Julius; and Herman, Edwin Bernard, 4,049,835, Cl. 426-106.000.
Reesman, Stanley H.; and Eldred, Charles R., 4,049,840, Cl. 426-634.000.

General Mills Chemicals, Inc.: *See*—
Peerman, Dwight E.; Swan, Dale G.; and Kanten, H. Gordon, 4,049,594, Cl. 260-18.00N.

General Mills, Inc.: *See*—
Brastad, William A.; and Beall, Nelson J., 4,048,786, Cl. 53-159.000.

General Motors Corporation: *See*—
Vukovich, William J.; and Stevenson, Paul D., 4,049,093, Cl. 192-3.300.

General Tire & Rubber Company, The: *See*—
Elmer, Otto C., 4,049,603, Cl. 260-28.50R.
Henley, Virgil E., 4,049,486, Cl. 156-405.00R.

Genevois, Jean Louis; and Bufarale, Rolando, to Elettrocarbonium S.p.A. Continuous graphitizing furnace with a vertical displacement of the charge. 4,049,900, Cl. 13-7.000.

Genik-Sas-Berezowsky, Roman Michael: *See*—
Swinkels, Godefridus Maria; Furber, Robert Arthur; Milner, Edward Francis Godfrey; Genik-Sas-Berezowsky, Roman Michael; and Kirby, Charles Ray, 4,049,770, Cl. 423-37.000.

Genth, Hermann: *See*—
Paulus, Wilfried; Scheinpflug, Hans; and Genth, Hermann, 4,049,807, Cl. 424-246.000.

Gentran Inc.: *See*—
Sarasohn, Neil L., 4,048,948, Cl. 116-114.0PV.

George, Henry Howard; and Billings, Ronald Joseph, to Chemetron Corporation. Double-sigmoid connector. 4,049,356, Cl. 403-173.000.

Georgopulos, Thomas, to GTE Automatic Electric Laboratories Incorporated. Mounting arrangement for electrical components and electrical component cases adapted to be used therewith. 4,049,227, Cl. 248-309.00R.

Geratewerk Lahr GmbH: *See*—
Kleis, Gustav, 4,049,279, Cl. 274-15.00R.

Gerber, Bernhard, to Greiner Electronic AG. Apparatus for obtaining a mean voltage value. 4,050,025, Cl. 328-143.000.

Gerber Garment Technology, Inc.: *See*—
Pearl, David R., 4,048,891, Cl. 83-528.000.

Gerek, Gene; and Coucher, Robert G., to EPPCO. Process for interior coating small mouth container open at one end. 4,049,842, Cl. 427-34.000.

Germer, Warren R.; and Palmer, Ansell W., to General Electric Company. Multiple rate electrical energy metering system and method. 4,050,020, Cl. 324-116.000.

Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, to Dr. C. Otto & Comp. G.m.b.H. Control system for a coal gasification plant. 4,049,394, Cl. 48-62.00R.

Gernhardt, Paul; Grams, Wolfgang; Pohl, Siegfried; and Danguillier, Wilhelm, to Dr. C. Otto & Comp. G.m.b.H. Method and apparatus for removing vapors and aerosols from gases produced in a gasification plant. 4,049,570, Cl. 252-373.000.

Gerritsen, Dirk J.; and Kuipers, Marcus, to N. V. Tramposafe. Diving board. 4,049,263, Cl. 272-66.000.

Gerwick, Ben G., Jr., to Exxon Production Research Company. Arctic caisson. 4,048,943, Cl. 114-256.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Elsner, Burckhardt; Plevak, Lubomir; Lagodka, Gunter; and Rosenberg, Harry, 4,048,804, Cl. 61-45.00D.
Follert, Hans Gunter, 4,049,317, Cl. 299-33.000.
Golla, Franz, 4,049,529, Cl. 204-246.000.
Stuckmann, Dieter; Babendererde, Siegmund; Jutte, Hans; and Bokemeyer, Reinhard, 4,048,806, Cl. 61-85.000.
Tyslauk, Willy, 4,049,112, Cl. 198-834.000.
Weirich, Walter; and Kussel, Willy, 4,048,866, Cl. 74-242.1FP.

Ghiselin, Robert Earle: *See*—
Louw, Johan August; and Ghiselin, Robert Earle, 4,049,182, Cl. 228-2.000.

Ghisoni, Emilio. Recoil-operated automatic pistol. 4,048,901, Cl. 89-132.000.

Ghosh, Hitendra N.; Joshi, Madhukar L.; and Yeh, Tsu-Haing, to International Business Machines Corporation. Utilization of an arsenic diffused emitter in the fabrication of a high performance semiconductor device. 4,049,478, Cl. 148-187.000.

Gibson, Kirk R.; Hughes, Thomas R.; and Jacobson, Robert L., to Chevron Research Company. Reduction of sulfur from hydrocarbon feed stock containing olefinic component. 4,049,542, Cl. 208-213.000.

Gibu, Yoshitaka: *See*—
Koenuma, Masao; and Gibu, Yoshitaka, 4,048,725, Cl. 33-81.000.

Giessner, Frank, to NCR Corporation. Actuator for a matrix print head. 4,049,108, Cl. 197-1.00R.

Giger, Urs, to Eta A.G. Ebauches-Fabrik. Method of punching a small hole in a precision mechanics workpiece. 4,048,835, Cl. 72-334.000.

Giglberger, Dieter: *See*—
Bestenreiner, Friedrich; and Giglberger, Dieter, 4,049,947, Cl. 219-216.000.

Gilbert, Ray, to Glass Containers Corporation. Canning jar lid test device and method. 4,048,845, Cl. 73-45.500.

Gilding, Denis K., to Tribotech. Method for coating bonding tools and product. 4,049,506, Cl. 204-38.00R.

Gilkey, Russell; Hilbert, Samuel D.; and Wicker, Thomas H., Jr., to Eastman Kodak Company. Textile fiber. 4,049,621, Cl. 260-40.000.

Gillain, Arthur Jules, to Ateliers Belges Reunis. Apparatus for extracting components of solids by means of a liquid. 4,049,386, Cl. 23-269.000.

Gillette Company, The: *See*—
Nigro, Louis V., 4,048,998, Cl. 128-263.000.

Gillingwater, Abel R. Wire bending fixture. 4,049,025, Cl. 140-102.500.

Gillis, Richard W.: *See*—
Myerson, Elliot Lee; and Gillis, Richard W., 4,048,894, Cl. 84-318.000.

Gilreath, Robert V., to Still-Man Mfg. Company. Oven having an electric heating element with a hinged support. 4,049,948, Cl. 219-404.000.

Giraud, Francois Louis, to Savec. Return loop for transport vehicles. 4,048,923, Cl. 104-21.000.

Girling Limited: *See*—
Farr, Glyn Phillip Reginald, 4,049,322, Cl. 303-6.00C.
Heinz, Kurt Erich; and Klassen, Horst Willi, 4,049,087, Cl. 188-73.500.
Hess, Wolfgang, 4,049,323, Cl. 303-6.00C.
Rath, Heinrich Bernhard, 4,049,086, Cl. 188-73.300.

Gist-Brocades N.V.: *See*—
Gootjes, Johan, 4,049,825, Cl. 424-316.000.

Gjosteen, Ole Georg; Terum, Trygve Olavson; and Aarflot, Aksel Ola, to A/S Ardal og Sunndal Verk. Dynamic vacuum treatment. 4,049,248, Cl. 266-202.000.

GKN Transmissions Limited: *See*—
Webb, Oswald, 4,048,872, Cl. 74-711.000.

Glaser, Helmut; and Schick, Ludwig, to Siemens Aktiengesellschaft. Control unit for an a-c control element with full-wave control. 4,050,008, Cl. 323-19.000.

Glass Containers Corporation: *See*—
Gilbert, Ray, 4,048,845, Cl. 73-45.500.

Glassmeyer, John J., to Pullman Incorporated. Container handling arrangement with chassis adapter frame. 4,049,135, Cl. 214-38.0CC.

Glaverbel-Mecaniver: *See*—
Plumat, Emile; Baudin, Pol; Posset, Robert; and Autequitte, Jean-Marie, 4,048,978, Cl. 126-200.000.

Glazer, Patti. Collapsible doll house. 4,048,748, Cl. 46-12.000.

Globe Tool and Engineering Company, The: *See*—
Bucholtz, Glen E.; and Finegold, Hyman B., 4,049,208, Cl. 242-7.05B.

Glory Kogyo Kabushiki Kaisha: *See*—
Nakai, Shiro; and Nishikawa, Yoshio, 4,049,011, Cl. 133-1.00A.

Glover, Donald Francis: *See*—
Tice, Vernon Lawton; and Glover, Donald Francis, 4,049,194, Cl. 237-1.00A.

Glyco-Metall-Werke Daelen & Loos GmbH: *See*—
Lehnhart, Dieter, 4,048,703, Cl. 29-149.5DP.

Go, Santos W., to Owens-Illinois, Inc. Isophthalic acid/p,p-sulfonyldibenzoic acid/ethylene glycol/neopentyl glycol polyester compositions and containers made therefrom. 4,049,631, Cl. 260-75.00S.

Gobillon, Yves: *See*—
Clerbois, Lucien; Degueldre, Louis; Biver, Christian; Degols, Albert; and Gobillon, Yves, 4,049,532, Cl. 204-290.00F.

Gocho, Makio; Ota, Masanori; and Kuraishi, Tatsuo, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for measuring surface flatness of material. 4,048,849, Cl. 73-105.000.

Godfrey, Charles S., to Physics International Company. Oil and gas well stimulation. 4,049,056, Cl. 166-299.000.

Godot, Jean Marie, to Essilor International Cie Generale d'Optique. Supporting and positioning plate assembly for spectacle frames. 4,049,254, Cl. 269-156.000.

Goettel, John H. Manually-controlled pneumatically-actuated electric motor starter system. 4,050,091, Cl. 361-31.000.

Goettl, Adam D. Pan structure. 4,049,150, Cl. 220-62.000.

Goetz, Robert H. Heart massage apparatus. 4,048,990, Cl. 128-64.000.

Golan, Kenneth F.; and Winzeler, James E., to Caterpillar Tractor Co. Winch control. 4,048,799, Cl. 60-413.000.

Golda, Eugene: *See*—
Chu, Simon L.; and Golda, Eugene, 4,049,504, Cl. 204-38.00A.

Goldhaft, Morris. Case and closure cap for instant miniature fishing rod and reel. 4,049,165, Cl. 224-5.00E.

Goldsmith, Jesse M.; and O'Nan, Alex, Jr., to American Air Filter Company, Inc. Filter material charging apparatus for filter assembly for radioactive contaminants. 4,049,405, Cl. 55-479.000.

Golla, Franz, to Gewerkschaft Eisenhutte Westfalia. Apparatus with crust piercing and gas feeding means for use with electrolytic furnaces. 4,049,529, Cl. 204-246.000.

Goloff, Alexander; and Keske, Frank E., to Caterpillar Tractor Co. Thrust bearing. 4,049,327, Cl. 308-161.000.

Golyanov, Vyacheslav Mikhailovich; and Demidov, Alek Platonovich. Device for producing coatings by means of ion sputtering. 4,049,533, Cl. 204-298.000.

Gomez-Alecha, Laurentino, to Alacoop S. Coop. Bar stock feeding device. 4,049,173, Cl. 226-196.000.

Good, Wayne W., to Harter Corporation. Device for lockably securing appurtenances to a decorative wall. 4,048,768, Cl. 52-36.000.

Goodale, Clark W.; Morgan, Charles W.; and Rhoton, Albert L., to United Foam Corporation. Textured-foam coated urethane wall and ceiling covering and method of making the same. 4,049,848, Cl. 427-244.000.

Goodenough, John B.: *See*—
Hong, Henry Y-P; and Goodenough, John B., 4,049,891, Cl. 429-193.000.

Goodman, Alvin Malcolm, to RCA Corporation. Capacitance meter bias protection circuit. 4,050,018, Cl. 324-110.000.

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Scott, Kenneth W.; and Calderon, Nissim, 4,049,616, Cl. 260-42.320.

Googin, John M.; Schmitt, Charles R.; Schreyer, James M.; and Whitehead, Harlan D., to United States of America, Energy Research and Development Administration. Solar radiation absorbing material. 4,048,980, Cl. 126-270.000.

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Goto, Tatsuo: *See*—
Kato, Kanji; Goto, Tatsuo; and Inoyama, Tadao, 4,048,687, Cl. 10-155.00R.

Gotze, Waldemar: *See*—
Boehnke, Ralf-Dieter; and Gotze, Waldemar, 4,049,523, Cl. 204-192.00R.

Gould Inc.: *See*—
Lee, Timothy Charles Philip; and Millns, William, 4,049,588, Cl. 260-2.300.

Graat, Johannes W., to Smit Nijmegen B.V. Process and apparatus for producing an inert gas. 4,049,569, Cl. 252-372.000.

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Pomeschikov, Andrei Grigorievich; Buryagin, Firs Alexandrovich; Kazantsev, Lev Seliverstovich; Skvortsov, Gennady Fedorovich; Naryshkin, Jury Anatolievich; and Gracheva, Zinaida Ivanovna, 4,049,901, Cl. 13-9.0ES.

Grachten, Erich, to Burris Industries, Inc. Apparatus for manufacturing furniture. 4,049,368, Cl. 425-502.000.

Grams, Wiktor: *See*—
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Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,049,394, Cl. 48-62.00R.
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Granovsky, Vladimir Isaakovich: *See*—
Kolomoets, Nikolai Vasilievich; Dashevsky, Zinovy Moiseevich; Granovsky, Vladimir Isaakovich; Shmidt, Igor Aronovich; and Gelfgat, David Mendelevich, 4,049,469, Cl. 136-225.000.

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Patterson, W. W., III; and Grapes, Eugene F., 4,048,938, Cl. 114-75.000.

Gray, Paul R.; and Stephens, Mark L., to Signetics Corporation. Circuit and structure having high input impedance and DC return. 4,050,031, Cl. 330-24.000.

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Stearley, Robert J., 4,049,191, Cl. 229-62.500.

Greatbatch, Wilson, to Wilson Greatbatch Ltd. Cardiac pacer including controlled voltage multiplier. 4,050,004, Cl. 363-59.000.

Green Cross Corporation, The: *See*—
Okamoto, Hiroyuki; Tsuda, Yoshio; and Yokoyama, Kazumasa, 4,049,683, Cl. 260-410.700.

Green, Paul Oscar: *See*—
Dastrup, John Burke; and Green, Paul Oscar, 4,048,825, Cl. 72-12.000.

Greenwald, Richard B., to Polaroid Corporation. 4-Hydroxypyrazole developing agents. 4,049,450, Cl. 96-29.00R.

Greif, Norbert; Fikentscher, Rolf; and Sanner, Axel, to BASF Aktiengesellschaft. Manufacture of bonded textile sheet materials. 4,049,851, Cl. 427-386.000.

Greiner Electronic AG: *See*—
Gerber, Bernhard, 4,050,025, Cl. 328-143.000.

Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., to Merck & Co., Inc. Composition for secondary and tertiary oil recovery. 4,049,559, Cl. 252-8.55D.

Grier, Nathaniel: *See*—
Witzel, Bruce E.; Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,049,417, Cl. 71-67.000.

Griffin, Donald C., to Plain Brown Wrapper, Inc. Jacket construction. 4,048,675, Cl. 2-93.000.

Grigat, Ernst: *See—*
Sundermann, Rudolf; Putter, Rolf; and Grigat, Ernst, 4,049,630, Cl. 260-47.00R.

Grill, Carl E.; and Levi, Phillip M., Jr. Tool for removing staples. 4,049,236, Cl. 254-28.000.

Grimm, Harald: *See—*
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.

Grimm, Wolfgang H., to Brown & Williamson Tobacco Corporation. Package having a slide actuated closure member. 4,049,117, Cl. 206-270.000.

Grinberg, Ijun Iosifovich; Zhukov, Evgeny Kuzmich; and Koshkin, Lev Nikolaevich. Method and apparatus for assembling aerosol valve. 4,049,389, Cl. 29-157.10R.

Groebke, Wolfgang; and Korte, Klaus, to Sandoz Ltd. Phenyl-azo-naphthyl dyes having a 2-acyloxy, alkoxy or hydroxy-1-arylethyl-amino group in the 4-position of the naphthalene ring. 4,049,642, Cl. 260-196.000.

Grof, Helmut Theodor; Schumann, Jochen; Wamser, Anton; Schumann, Rainer; and Thomas, Werner Friedrich, to Leybold-Heraeus GmbH & Co. Kg. Method and apparatus for the production of solid forging blocks with manipulator pins. 4,049,039, Cl. 164-52.000.

Gross, Hans; and Berti, Eugenio, to Siemens Aktiengesellschaft. Control unit for thyristors of a cycloconverter. 4,050,007, Cl. 363-87.000.

Gross, Udo: *See—*
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.

Grow Chemical Corporation: *See—*
Lott, Joseph C., 4,049,599, Cl. 260-22.00M.

Grozdanov, Petko Kostadinov: *See—*
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Petrov, Peter Dimitrov; and Punchev, Simeon Georgiev, 4,049,172, Cl. 226-90.000.

Gruber, William Paul, to Allied Chemical Corporation. Pressure switch with diaphragm. 4,049,935, Cl. 200-83.00P.

Gruber, Wolfgang: *See—*
Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 4,049,702, Cl. 260-501.120.

GTE Automatic Electric Laboratories Incorporated: *See—*
Danner, Dean Wilson, 4,049,915, Cl. 179-6.00C.
Danner, Dean Wilson, 4,049,916, Cl. 179-6.00C.
Georgopulos, Thomas, 4,049,227, Cl. 248-309.00R.
Young, John S., 4,049,919, Cl. 179-18.0FA.

GTE Laboratories Incorporated: *See—*
Auborn, James J.; and Trickett, Elizabeth Ann, 4,049,024, Cl. 140-71.500.
Maringer, Robert E., 4,049,042, Cl. 164-278.000.

GTE Lenkurt Electric (Canada) Ltd.: *See—*
Ball, Edward Thomas, 4,049,929, Cl. 179-170.00J.

GTE Sylvania Incorporated: *See—*
Collins, Floyd K., 4,049,990, Cl. 313-417.000.
Collins, Floyd K., 4,049,991, Cl. 313-417.000.
Keenan, James P., 4,049,988, Cl. 313-222.000.
Pawlikowski, Stanley Leonard; and Penird, Carl William, 4,050,080, Cl. 354-1.000.
Quatrini, L. Rita; and MacInnis, Martin B., 4,049,771, Cl. 423-49.000.
Schultz, Thomas W., 4,050,081, Cl. 354-1.000.
Shaffer, John W., 4,049,369, Cl. 431-95.00R.

Gueant, Auguste; and Mercier, Serge, to Produits Chimiques Ugine Kuhlmann. Method for preparing primary alcohols having alkyls branched at the second carbon. 4,049,725, Cl. 260-638.00B.

Guerra, Ricardo. Non-precious dental alloy. 4,049,427, Cl. 75-171.000.

Guildford, Allen John: *See—*
McLoughlin, Bernard Joseph; and Guildford, Allen John, 4,049,808, Cl. 424-248.400.

Guissard, Jean, to Saint-Gobain Industries. Cutting of glass. 4,049,167, Cl. 225-2.000.

Gulf & Western Industries, Inc.: *See—*
Seipp, William H., 4,050,098, Cl. 364-900.000.

Gundlach, Robert W.: *See—*
Simpson, George R.; Gundlach, Robert W.; and Butler, Gordon C., 4,049,344, Cl. 355-10.000.

Gunson, Brennand, to Russell (Shears) Limited. Scissors. 4,048,721, Cl. 30-254.000.

Gustafson, Norman F.: *See—*
Eddy, Robert A.; Gustafson, Norman F.; and Erwin, Stephen J., 4,048,836, Cl. 72-364.000.

Gutmann, Karl, Jr., to Karl Gutmann KG. Work desk construction. 4,049,331, Cl. 312-203.000.

H. K. Porter Company, Inc.: *See—*
Lillard, Richard E.; and Cope, William M., 4,049,092, Cl. 191-40.000.

H. L. Blachford Limited: *See—*
Blachford, John, 4,049,680, Cl. 260-404.500.

H. Moldow A/S: *See—*
Udengaard, Poul Werner; Mosevang, Orla; Thomsen, Finn Erling; and Eklund, Erik Paul, 4,049,403, Cl. 55-378.000.

H. Sass-E International Inc.: *See—*
Sasse, Howard A., 4,048,985, Cl. 128-2.00S.

Haaf, Franz: *See—*
Falkenstein, Georg; Stein, Dieter; Haaf, Franz; Heinz, Gerhard; and Schoen, Ernst, 4,049,590, Cl. 260-2.5BE.

Haag, Werner O.: *See—*
Yan, Tsoung Y.; Huang, Tracy J.; and Haag, Werner O., 4,049,539, Cl. 208-65.000.

Haake, Heinz: *See—*
Schenk, Gerd; and Haake, Heinz, 4,049,883, Cl. 429-94.000.

Haas, Gerhard Julius; and Herman, Edwin Bernard, to General Foods Corporation. Pet food preservation. 4,049,835, Cl. 426-106.000.

Hack, Helmuth: *See—*
Metzger, Carl; Eue, Ludwig; and Hack, Helmuth, 4,049,670, Cl. 260-306.80D.

Haeger, Bruce Edwin; Krueger, James Elwood; Lowery, James Alfred; and Ritter, Lawrence, to American Cyanamid Company. Solution of a oxazepine for oral or parenteral administration. 4,049,809, Cl. 424-250.000.

Hafner, E.; and Mey, H., to Hasler AG. Message network for the transmission of digital telegrams with an address consisting of routing words. 4,049,906, Cl. 178-2.00C.

Hafner, Leo, to Treibacher Chemische Werke Aktiengesellschaft. Method for producing a pure cerium oxide. 4,049,463, Cl. 106-288.00B.

HAG Aktiengesellschaft: *See—*
Rothe, Rudolf; and Kohler, Johann, 4,049,409, Cl. 62-9.000.

Hagel, William C.; Smidt, Frederick A.; and Korenko, Michael K., to United States of America, Energy Research and Development Administration. High strength ferritic alloy. 4,049,431, Cl. 75-126.00C.

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Hagen, Helmut: *See—*
Fleig, Helmut; Hagen, Helmut; Naarmann, Herbert; and Penzien, Klaus, 4,049,622, Cl. 260-2.5HB.

Haid, Erich: *See—*
Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 4,049,702, Cl. 260-501.120.

Hajos, Zoltan George, to Hoffman-La Roche Inc. Stereospecific total steroidal synthesis via substituted C/D-trans indanones. 4,049,677, Cl. 260-340.9AS.

Hakluyt, John Philip Dabbs; and Tilston, John Ronald, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Combustion apparatus. 4,048,797, Cl. 60-39.72R.

Hall, John C.: *See—*
DeRegnaucourt, Robert A.; Hall, John C.; and Caudill, Freddie R., 4,049,320, Cl. 301-13.0SM.

Hall, Richard H.: *See—*
Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., 4,049,736, Cl. 260-669.0QZ.

Haller, Freidrich A., to TRW Inc. Wire insertion apparatus. 4,048,711, Cl. 29-566.300.

Hally, Hugh G.: *See—*
Ellers, Fred S.; Hally, Hugh G.; McIlveen, Edward E.; and Doble, William A., 4,048,807, Cl. 61-105.000.

Halverson, Lance K., to Rolf Sporting Goods, Inc. Weight equalized foldable bat rack. 4,049,126, Cl. 211-104.000.

Hamada, Masa: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,049,497, Cl. 195-80.00R.

Hamer, Martin; and Batzer, Othmer F., to International Minerals & Chemical Corporation. Use of chelating agents for enhancing the settling of slimes. 4,049,547, Cl. 210-54.000.

Hamilton, Joel A. Controlled film advance apparatus. 4,048,782, Cl. 53-51.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Sliding coupling device for a lanyard or the like. 4,049,357, Cl. 403-209.000.

Hamisch, Paul H., Sr., to Monarch Marking Systems, Inc. Tag attaching apparatus. 4,049,174, Cl. 227-67.000.

Hamisch, Paul H., Sr., to Monarch Marking Systems, Inc. Tag attaching apparatus. 4,049,175, Cl. 227-67.000.

Hamlin, Thomas J.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,049,255, Cl. 271-3.000.

Hammer, Robert, to International Business Machines Corporation. Deposition mask and methods of making same. 4,049,857, Cl. 428-136.000.

Hamprecht, Gerhard; and Kersten, Siegfried, to BASF Aktiengesellschaft. Vinyl-substituted sulfamic acid halides. 4,049,709, Cl. 260-543.00R.

Hampson, James W.: *See—*
Luddy, Francis E.; Hampson, James W.; and Herb, Samuel F., 4,049,839, Cl. 426-607.000.

Hang, Kenneth Warren, to RCA Corporation. Glass frit composition for sealing window glass. 4,049,872, Cl. 428-427.000.

Hank, Dietrich; Lipfert, Gerhard; and Niesgoda, Tassilo, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Automatic regulation of the position of the lateral edge of a travelling web. 4,049,213, Cl. 242-57.100.

Hanneman, Rodney E.; Chrenko, Richard M.; and Kittle, Donald B., to General Electric Company. Process for reducing stress corrosion in a weld by applying an overlay weld. 4,049,186, Cl. 228-225.000.

Hansel, William B., to Suntech, Inc. Valve system for a vapor receiving system on a dispensing nozzle. 4,049,029, Cl. 141-206.000.

Hansen, Jay M.: *See—*
Prince, Paul R.; Skehan, Bernard J.; and Hansen, Jay M., 4,050,085, Cl. 358-219.000.

Hara, Akio: *See—*
Yamamoto, Takaharu; Nomura, Toshio; Asai, Tsuyoshi; and Hara, Akio, 4,049,876, Cl. 428-932.000.

Harada, Masanori; Katou, Shinzo; and Hayashi, Nobuyuki, to Nissan Motor Company. Vacuum advance control system. 4,048,966, Cl. 123-117.00A.

Harimoto, Takeshi; and Nishiyama, Keisuke, to Mitsui Mining & Smelting Co., Ltd. Electrodeposited metal plate peeling-off machine. 4,049,527, Cl. 204-198.000.

Harker, Alan B.: *See—*
Burton, C. Shepherd; Harker, Alan B.; and Ho, William W., 4,049,383, Cl. 23-232.00E.

Harkness, Joseph R.; and Braun, Daniel E., to Briggs & Stratton Corporation. Combination clutch and brake for rotary power mower. 4,048,787, Cl. 56-11.300.

Harkness, Joseph R.: *See—*
Kamlukin, Igor; and Harkness, Joseph R., 4,048,788, Cl. 56-11.300.

Harnden, Michael Raymond; and Wright, Nicholas David, to Beecham Group Limited. Antiviral 2-amino-5-[1-(indol-3-yl)alkyl]-2-thiazolin-4-ones. 4,049,816, Cl. 424-270.000.

Harper, Douglas Charles; Robinson, Norman; and Janikowski, Stanislaw Maria, to Fisons Limited. Process for reducing formation of gypsum scale durng the washing of calcium sulphate hemihydrate crystals. 4,049,774, Cl. 423-167.000.

Harper, Norman James; and Veitch, George Bryan Austin, to Allen & Hanburys Limited. Ethylene diamine derivatives. 4,049,663, Cl. 260-293.860.

Harr, Jerome Danforth, to International Business Machines Corporation. Dynamic transducer biasing signal amplifying circuitry. 4,050,086, Cl. 360-66.000.

Harris, Hal; and Foreman, Joseph S., Jr., to Campbell Taggart, Inc. Temporary memory for calculator-recorder system. 4,049,955, Cl. 235-152.000.

Harris, Thomas C.; and DeCrane, Charles E., to Olinkraft, Inc. Transition section for a bag filling device and method. 4,049,028, Cl. 141-10.000.

Harrison, Brian: *See—*
Rakowicz, Jan Antoni; and Harrison, Brian, 4,048,950, Cl. 118-6.000.

Harrison, David V.: *See—*
Estebanez, Joseph; Harrison, David V.; Jones, Clifford P.; and Wilson, Henry G. E., 4,048,956, Cl. 118-306.000.

Harrison, George W., to Team, Inc. Leak repair clamp. 4,049,296, Cl. 285-15.000.

Harsco Corporation: *See—*
Martino, Paul D.; and Barbre, Norris H., 4,049,762, Cl. 264-94.000.

Hart, Thomas G., to Energy Development Associates. Self-generating halogen liquification in a secondary battery. 4,049,880, Cl. 429-49.000.

Harter Corporation: *See—*
Good, Wayne W., 4,048,768, Cl. 52-36.000.

Harter, Joseph William; and Beitzel, Stuart Wallace, to O-3 Company. Apparatus for fluid treatment by corona discharge. 4,049,707, Cl. 250-531.000.

Hartmann & Braun Aktiengesellschaft: *See—*
Zollner, Wolf-Dieter, 4,050,015, Cl. 324-58.50C.

Hartmann, Clinton S., to Texas Instruments Incorporated. Programable filter using chirp-Z transform. 4,049,958, Cl. 235-193.000.

Hartung, Richard S., to Hedstrom Co. Wheel construction. 4,049,319, Cl. 301-1.000.

Harvey, Louis A. Horizontal shelf and vertical panel bracket. 4,049,226, Cl. 248-248.000.

Hase, Yoshihiko: *See—*
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,049,538, Cl. 208-50.000.

Hashimoto, Shitaro; and Sato, Yuuichi, to Sharp Kabushiki Kaisha. Four-level voltage supply for liquid crystal display. 4,050,064, Cl. 340-324.00M.

Hasler AG: *See—*
Hafner, E.; and Mey, H., 4,049,906, Cl. 178-2.00C.

Hasty, Russell D.: *See—*
Barnidge, Thomas O.; and Hasty, Russell D., 4,048,960, Cl. 119-28.000.

Hata, Kazuo: *See—*
Tanabe, Osamu; Nishizawa, Hisao; and Hata, Kazuo, 4,049,345, Cl. 355-41.000.

Hatakka, Vesa; and Sarvela, Jussi, to Oy Innovation Services Co. Trailer-type vehicle for lifting, transporting, and depositing loads. 4,049,143, Cl. 214-390.000.

Hatswell, John Sidney: *See—*
Sloboda, Mieczyslaw Herman; and Hatswell, John Sidney, 4,049,434, Cl. 75-134.00C.

Hatten, Jimmy L.: *See—*
Otto, Kenneth Wayne; and Hatten, Jimmy L., 4,049,729, Cl. 260-654.00H.

Hatterer, Andre; Oberlin, Claude; and Strobel, Pierre, to Commissariat a l'Energie Atomique. Method of fabrication of an alloy containing an alkali metal and/or an alkaline-earth metal. 4,049,443, Cl. 75-66.000.

Hattori, Torao; and Maezono, Masakazu, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for preventing faulty operation in transmission of motorcars. 4,049,101, Cl. 192-87.190.

Hause, Jonathan E., to Xerox Corporation. Stitching head bypass apparatus. 4,049,180, Cl. 227-78.000.

Haven, Lawrence F.: *See—*
Chubb, Raymond L.; Haven, Lawrence F.; and Hisey, Robert W., 4,049,064, Cl. 173-147.000.

Haviland, Diane, administratrix: *See—*
Haviland, Herbert, deceased; Haviland, Diane, administratrix; Smith, Arthur; and Boyer, Charles, 4,049,193, Cl. 236-46.00R.

Haviland, Herbert, deceased; by Haviland, Diane, administratrix; Smith, Arthur; and Boyer, Charles, to Fuel Computer Corporation. Systems and apparatus for control of fueled heat generators. 4,049,193, Cl. 236-46.00R.

Hawkins, Gary Fred; and Gass, Robert Lee, to Eastman Kodak Company. Process for producing methylene malonic esters. 4,049,698, Cl. 560-127.000.

Hawthorn Leslie (Engineers) Limited: *See—*
Crowdy, Edmund Porter; and Drentham-Susman, Hector Fillippus Alexander, 4,049,972, Cl. 290-52.000.

Hay, Robert A., II: *See—*
Smith, Hubert Stacy, Jr.; and Hay, Robert A., II, 4,049,852, Cl. 428-55.000.

Hayashi, Hideki: *See—*
Tanaka, Seiichi; Watari, Kazuhiro; and Hayashi, Hideki, 4,049,723, Cl. 260-621.00A.

Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, to Maruzen Petrochemical Co. Ltd. Process for producing high-crystalline petroleum coke. 4,049,538, Cl. 208-50.000.

Hayashi, Koichiro: *See—*
Ito, Akihiko; Shimizu, Akira; and Hayashi, Koichiro, 4,049,518, Cl. 204-159.210.
Ito, Akihiko; Kaetsu, Isao; Okubo, Hiroshi; Kato, Masamichi; Hayashi, Koichiro; and Maeda, Yuji, 4,049,867, Cl. 428-412.000.

Hayashi, Nobuyuki: *See—*
Harada, Masanori; Katou, Shinzo; and Hayashi, Nobuyuki, 4,048,966, Cl. 123-117.00A.

Hayashi, Yoshimasa: *See—*
Aoyama, Tsuyoshi; Hayashi, Yoshimasa; Nagano, Michio; and Nagase, Hiroshi, 4,049,874, Cl. 428-451.000.

Hayes, William V.: *See—*
Childress, David L.; Hayes, William V.; and Poppe, Richard L., 4,049,577, Cl. 252-443.000.

Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., to Quaker Oats Company, The. High fat, fortified, marshmallow based food bar. 4,049,832, Cl. 426-72.000.

Hazemag Dr. E. Andreas Kg: *See—*
Konig, Rolf; Nordemann, Bernhard; and Motek, Herbert, 4,049,206, Cl. 241-73.000.

Hearon, Guy Head, to Dymat Photomatrix Corporation. Microfiche cartridge and transport apparatus. 4,049,342, Cl. 353-27.00R.

Heberlein Maschinenfabrik AG: *See—*
Ritter, Helmut, 4,048,864, Cl. 74-230.17F.

Heckert, David Clinton, to Procter & Gamble Company, The. Detergent compositions containing internal vicinal disulfates. 4,049,585, Cl. 252-531.000.

Hedgewick, Peter: *See—*
Suhr, Donald C.; and Hedgewick, Peter, 4,049,148, Cl. 215-214.000.

Hedrich, Wilhelm, to Wilhelm Hedrich Vakuumanlagen, Firma. Apparatus for the high-speed mixing and degasification of viscous materials especially synthetic resin. 4,049,244, Cl. 259-185.000.

Hedstrom Co.: *See—*
Hartung, Richard S., 4,049,319, Cl. 301-1.000.

Heflinger, Lee O.: *See—*
Wuerker, Ralph F.; and Heflinger, Lee O., 4,050,035, Cl. 331-94.50C.

Heinen, Richard; and Rieger, Georg, to Dyckerhoff & Widmann Aktiengesellschaft. Apparatus for screwing a threaded nut onto a steel rod. 4,048,875, Cl. 81-125.000.

Heinl, Walter: *See—*
Freissmuth, Alfred; Heinl, Walter; Knahl, Herbert; and Pfluger, Erich, 4,049,442, Cl. 75-55.000.

Heintz, Walter K., to Ford Motor Company. Hermetically sealed alkali metal battery container. 4,049,889, Cl. 429-174.000.

Heinz, Ernst: *See—*
Bierbach, Herbert; Dittmar, Heinz; Heinz, Ernst; Hohmann, Klaus; and Rennhack, Rolf, 4,049,788, Cl. 423-592.000.

Heinz, Gerhard: *See—*
Falkenstein, Georg; Stein, Dieter; Haaf, Franz; Heinz, Gerhard; and Schoen, Ernst, 4,049,590, Cl. 260-2.5BE.

Heinz, Kurt Erich; and Klassen, Horst Willi, to Girling Limited. Friction pad assemblies for sliding caliper disc brakes. 4,049,087, Cl. 188-73.500.

Helms, Charles Carlyle, to Perkin-Elmer Corporation, The. Ozone absorbance controller. 4,049,987, Cl. 313-112.000.

Hemphill, J. Barry, to United States Steel Corporation. Method for the homogeneous distribution of alloys in molten steel using oil and water mixtures. 4,049,433, Cl. 75-129.000.

Hempstead, Robert Douglas: *See—*
Ainslie, Norman George; Hempstead, Robert Douglas; Tan, Swie-In; and Valstyn, Erich Philipp, 4,049,522, Cl. 204-192.00M.

Henley, Virgil E., to General Tire & Rubber Company, The. Rubber strip guide apparatus. 4,049,486, Cl. 156-405.00R.

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Ito, Tadashi; Wakahara, Katuhiro; and Tatsuoka, Masao, to Sharp Kabushiki Kaisha. Combination of air conditioner and ventilating unit provided with total heat exchanger assembly. 4,048,811, Cl. 62-263.000.
Ito, Yuzuru, to Kabushiki Kaisha Daini Seikosha. Solid electrolyte cell. 4,049,468, Cl. 429-193.000.
Itoh, Takuji; Nishikawa, Eiichiroh; Miura, Tadashi; and Yamahata, Takashi, to Toa Nenryo Kogyo Kabushiki Kaisha. Method for preparing hydrocarbon conversion catalyst using acid amide solutions to impregnate a tin component. 4,049,581, Cl. 252-466.0PT.
Iversen, Bjorn, to Simon Container Machinery Limited. Corrugating machinery. 4,049,485, Cl. 156-351.000.
Izon Corporation: *See*—
Yevick, George J., 4,049,756, Cl. 264-1.000.
J. I. Case Company: *See*—
Johnson, Donald L., 4,048,869, Cl. 74-471.00R.
Jablonski, Werner: *See*—
Mallek, Heinz; Jablonski, Werner; and Augustin, Friedhelm, 4,048,927, Cl. 110-8.00R.
Jacknow, Burton B.: *See*—
Azar, Jack C.; Hoffend, Thomas A.; and Jacknow, Burton B., 4,049,447, Cl. 96-1.0SD.
Jaco, Charles M., Jr.; Menear, Wallace C.; and Clark, Donald W., to Midrex Corporation. Method of extending the life of a catalyst in a process of producing metallic iron pellets. 4,049,441, Cl. 75-35.000.
Jacob, Solomon M.: *See*—
Garwood, William E.; Jacob, Solomon M.; Kuo, James C.; and Wise, John J., 4,049,734, Cl. 260-668.00R.
Jacobson, John D. Chair having independent seat and back. 4,049,315, Cl. 297-447.000.
Jacobson, Robert L.: *See*—
Gibson, Kirk R.; Hughes, Thomas R.; and Jacobson, Robert L., 4,049,542, Cl. 208-213.000.
Jacoby, Jerold L.; Tierney, William S.; Wright, James E.; and Bhuta, Pravin G., to TRW Inc. Pulsed holographic system having independent universal beam adjustment. 4,049,336, Cl. 350-3.500.
Jaeggi, Knut A.; Schroter, Herbert; and Ostermayer, Franz, to Ciba-Geigy Corporation. Composition and method for treatment of heart and circulatory ailments. 4,049,797, Cl. 424-180.000.
Jager, Horst, to Bayer Aktiengesellschaft. 2-Amino-1-sulfonaphthalene containing acylaminomethyl substituent. 4,049,704, Cl. 260-507.00R.
James, Barrie Sydney: *See*—
Such, Tony Eugene; Wyszynski, Apoloniusz; and James, Barrie Sydney, 4,049,509, Cl. 204-49.000.
Janikowski, Stanislaw Maria: *See*—
Harper, Douglas Charles; Robinson, Norman; and Janikowski, Stanislaw Maria, 4,049,774, Cl. 423-167.000.
Janssen, Jos M., to JMJ Werkzeugmaschinen GmbH fuer Feinbearbeitung. Method for surface-, plane-parallel-, and plain lapping. 4,048,763, Cl. 51-281.0SF.
Japan Atomic Energy Research Institute: *See*—
Ito, Akihiko; Shimizu, Akira; and Hayashi, Koichiro, 4,049,518, Cl. 204-159.210.
Ito, Akihiko; Kaetsu, Isao; Okubo, Hiroshi; Kato, Masamichi; Hayashi, Koichiro; and Maeda, Yuji, 4,049,867, Cl. 428-412.000.
Japan Exlan Company Limited: *See*—
Kobashi, Toshiyuki; Ozaki, Masahiko; Ono, Kenichi; and Abe, Noboru, 4,049,605, Cl. 260-29.6AN.
Jarvis, Alfred John: *See*—
Baty, Charlton Robert; and Jarvis, Alfred John, 4,049,951, Cl. 235-92.0FP.
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., to Cutler-Hammer, Inc. Integrated thermally sensitive power switching semiconductor device, including a thermally self-protected version. 4,050,083, Cl. 357-28.000.
Jawdoszyn, Claude, to Neiman, S.A. Safety device for a rotary starter switch for an automobile vehicle. 4,049,932, Cl. 200-44.000.
Jaworski, Eugene: *See*—
Breslow, Jeffrey D.; and Jaworski, Eugene, 4,049,272, Cl. 273-95.00R.
Jeffrey, William B., to Westinghouse Air Brake Company. Control system for automatic railway car coupler. 4,049,128, Cl. 213-1.600.
Jehlicka, Roger F., to General Electric Company. Method of making electrical connections. 4,048,716, Cl. 29-628.000.
Jencks, Guy S. D.: *See*—
Cotton, Charles C.; and Jencks, Guy S. D., 4,048,942, Cl. 114-253.000.
Jenkins, Jimmie M. Flute breaker. 4,048,977, Cl. 125-23.00R.
Jenkins, William A., to Monarch Marking Systems, Inc. Tag attaching apparatus. 4,049,176, Cl. 227-67.000.
Jenkins, William A., to Monarch Marking Systems, Inc. Tag attaching apparatus. 4,049,179, Cl. 227-67.000.
Jensen, Reed J.: *See*—
Robinson, C. Paul; Rockwood, Stephen D.; Jensen, Reed J.; Lyman, John L.; and Aldridge, Jack P., III, 4,049,515, Cl. 204-157.10R.
Jepsen, Robert E., to Air Products and Chemicals, Inc. Piston ring. 4,048,909, Cl. 92-194.000.
Jevons, Cecil F. Motorcycle team racing game. 4,049,274, Cl. 273-134.0CA.
Jin, Jung Il; and Kraft, Paul, to Stauffer Chemical Company. Cross-linked vinyl halide polymers as flame retardant additives for thermoplastics. 4,049,747, Cl. 260-859.0PV.
JMJ Werkzeugmaschinen GmbH fuer Feinbearbeitung: *See*—
Janssen, Jos M., 4,048,763, Cl. 51-281.0SF.
Johansen, Poul Egon, to Portion Packaging Limited. Process for the production of a product filled container. 4,048,781, Cl. 53-30.00R.
John D. Brush & Co., Inc.: *See*—
Brush, John D., Jr.; and Burgess, George M., 4,048,926, Cl. 109-65.000.
John Pierce Co., Inc., The: *See*—
Pierce, John H., 4,049,210, Cl. 242-18.00R.
Johns-Manville Corporation: *See*—
Woidke, Richard Paul; Wester, Thomas Joseph; and Brosch, Eric Joseph, 4,048,861, Cl. 74-56.000.
Johnson, Arthur C. W., to Combustion Research Corporation. Ventilation system with thermal energy recovery. 4,049,404, Cl. 55-387.000.
Johnson, Donald L., to J. I. Case Company. Shifting mechanism for control elements. 4,048,869, Cl. 74-471.00R.
Johnson, Eloise: *See*—
Stevens, Henry H., 4,048,873, Cl. 81-3.00R.
Johnson, Gary L.; and Zoya, Walter J., to Sperry Rand Corporation. Power transmission. 4,049,014, Cl. 137-315.000.
Johnson & Johnson: *See*—
Tritsch, Ludwig, 4,049,001, Cl. 128-287.000.
Johnson, Lloyd D.: *See*—
Raudat, John L.; and Johnson, Lloyd D., 4,048,783, Cl. 53-61.000.
Johnson, Martin Robert, to Ridley, Spriggs and Johnson Limited. Knitted garments. 4,048,819, Cl. 66-177.000.
Johnson, Matthey & Co., Limited: *See*—
Priest, John Garrick; and Tooth, Robert Barry, 4,049,484, Cl. 156-285.000.
Sloboda, Mieczyslaw Herman; and Hatswell, John Sidney, 4,049,434, Cl. 75-134.00C.
Johnson, Robert B.: *See*—
Shieu, Mark S. D.; Johnson, Robert B.; and Laugesen, Ronald C., 4,049,979, Cl. 307-270.000.
Johnson, Tony: *See*—
Stevens, Henry H., 4,048,873, Cl. 81-3.00R.
Jolivet, Jean-Claude; and Stouls, Francois-Xavier, to Societe Anonyme de Telecommunications. Digital signal transmission system. 4,049,910, Cl. 178-69.100.
Jones, Allen, Jr. Free-flooding chamber structuremountable on the underside of a watercraft. 4,048,939, Cl. 114-125.000.
Jones, Clifford P.: *See*—
Estebanez, Joseph; Harrison, David V.; Jones, Clifford P.; and Wilson, Henry G. E., 4,048,956, Cl. 118-306.000.
Jones, Evan, to Henry Valve Company. Adjustable relief valve. 4,049,017, Cl. 137-540.000.
Joseph Lucas Limited: *See*—
Boxer, Trevor Charles, 4,049,998, Cl. 318-258.000.
Joshi, Madhukar L.: *See*—
Ghosh, Hitendra N.; Joshi, Madhukar L.; and Yeh, Tsu-Hsing, 4,049,478, Cl. 148-187.000.

Jovan, Inc.: *See*—
Mitchell, Bernard A.; and Shipp, Barry E., 4,049,010, Cl. 132-88.500.
Joyce, James E.; and Zeller, Judy A. Merchandise container. 4,049,113, Cl. 206-44.00R.
Juilfs, Donald R.: *See*—
Juilfs, Otto H.; and Juilfs, Donald R., 4,048,695, Cl. 16-65.000.
Juilfs, Otto H.; and Juilfs, Donald R. Door check and closure device. 4,048,695, Cl. 16-65.000.
Julia, Marc: *See*—
Chabardes, Pierre; Julia, Marc; and Menet, Albert, 4,049,718, Cl. 260-590.00C.
Julian, Kenneth A.: *See*—
Julian, Victor J.; and Julian, Kenneth A., 4,049,335, Cl. 339-224.000.
Julian, Victor J.; and Julian, Kenneth A. Sealed battery threaded stud termination. 4,049,335, Cl. 339-224.000.
Jurd, Leonard, to United States of America, Agriculture. Polybutyl-2-cinnamylphenols as insect anti-procreants. 4,049,722, Cl. 260-619.00R.
Jutte, Hans: *See*—
Stuckmann, Dieter; Babendererde, Siegmund; Jutte, Hans; and Bokemeyer, Reinhard, 4,048,806, Cl. 61-85.000.
K.A.L. Manufacturing Corporation: *See*—
Pratt, Wayne F., 4,049,943, Cl. 219-74.000.
K-Jack Engineering Company, Inc.: *See*—
Chalabian, Jack S., 4,049,106, Cl. 194-1.00B.
Kabushiki Kaisha Daini Seikosha: *See*—
Ito, Yuzuru, 4,049,468, Cl. 429-193.000.
Kabushiki Kaisha Seikosha: *See*—
Yanagisawa, Takeshi; and Osuga, Motoyuki, 4,050,066, Cl. 340-388.000.
Kabushiki Kaisha Takuma: *See*—
Sakakibara, Kaichi; and Sumida, Hiroyuki, 4,048,852, Cl. 73-193.00R.
Kadar, Ferenc; and Galambos, Gyula, to REMIX Radiotechnikai Vallalat. Electric slider. 4,050,051, Cl. 338-202.000.
Kaeding, Warren W., to Mobil Oil Corporation. Zeolite catalyst containing oxide of boron or magnesium. 4,049,573, Cl. 252-432.000.
Kaetsu, Isao: *See*—
Ito, Akihiko; Kaetsu, Isao; Okubo, Hiroshi; Kato, Masamichi; Hayashi, Koichiro; and Maeda, Yuji, 4,049,867, Cl. 428-412.000.
Kaiser, Joachim: *See*—
Kunstmann, Rudolf; and Kaiser, Joachim, 4,049,655, Cl. 424-248.500.
Kajima Corporation: *See*—
Sato, Kuniaki, 4,048,776, Cl. 52-297.000.
Kajiwara, Masatoshi: *See*—
Honda, Fumio; Taki, Tsuneo; and Kajiwara, Masatoshi, 4,049,118, Cl. 206-330.000.
Kajlich, Anton J. Turbulence inhibitors. 4,048,677, Cl. 4-172.000.
Kakuda, Tsutomu: *See*—
Sato, Hiroshi; Okumura, Munehiro; Itani, Fujio; Fujii, Shouji; Kakuda, Tsutomu; and Nakatui, Hiroshi, 4,049,593, Cl. 260-2.50E.
Kallen, George Harold, to Union Carbide Corporation. Line edge follower. 4,049,962, Cl. 250-202.000.
Kametaki, Shigemasa. Automatic nailing machine. 4,049,181, Cl. 227-113.000.
Kaminski, James J.: *See*—
Bodor, Nicolae S.; and Kaminski, James J., 4,049,818, Cl. 424-272.000.
Kamlukin, Igor; and Harkness, Joseph R., to Briggs & Stratton Corporation. Rotary power mower with improved clutch and brake mechanism. 4,048,788, Cl. 56-11.300.
Kamm, Lawrence J. Manufacturing machine. 4,049,500, Cl. 198-345.000.
Kammann, Wilfried; and Keller, Manfred, to Werner Kammann Maschinenfabrik. Apparatus for screen printing images on objects. 4,048,914, Cl. 101-35.000.
Kammel, Gernot; and Wiedenmann, Rudolf, to Siemens Aktiengesellschaft. Process for the production of shaped bodies from polyolefins. 4,049,757, Cl. 264-22.000.
Kamyr Incorporated: *See*—
Kindersley, Peter G., 4,049,105, Cl. 193-31.00R.
Kaneko, Norio: *See*—
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.
Kanner, Bernard; and Prokai, Bela, to Union Carbide Corporation. Sulfolanyl-bearing organosilicone polymers. 4,049,674, Cl. 260-332.100.
Kanner, Bernard; and Prokai, Bela, to Union Carbide Corporation. Sulfolanyloxy alkyl-polyalkyl-siloxanes. 4,049,675, Cl. 260-332.100.
Kanten, H. Gordon: *See*—
Peerman, Dwight E.; Swan, Dale G.; and Kanten, H. Gordon, 4,049,598, Cl. 260-18.00N.
Kanzaka, Yoshihiro, to Yoshida Kogyo Kabushiki Kaisha. Slider for slide fastener. 4,048,699, Cl. 24-205.14R.
Kapitonov, Viktor Pavlovich: *See*—
Zakharov, Evegny Dmitrievich; Shneider, Gennady Lvovich; Valkov, Viktor Dmitrievich; Kapitonov, Viktor Pavlovich; Miklyaev, Petr Grigorievich; Lebedev, Vladimir Alexandrovich; Kholnova, Vera Ivanovna; Shesterikov, Stanislav Alexeevich; and Bobrovsky, Vasily Mikhailovich, 4,049,474, Cl. 148-32.500.
Karl Gutmann KG.: *See*—
Gutmann, Karl, Jr., 4,049,331, Cl. 312-203.000.
Kasatkin, Alexei Fedoseevich; Smirnov, Jury Vasilievich; and Feldman, Ilya Afanasievich. Ribbon loudspeaker achieves focusing and uniformity of the magnetic flux in the working gap. 4,049,926, Cl. 179-115.00V.
Kasyan, Vladimir Khrisanfovich: *See*—
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.
Kato, Kanji; Goto, Tatsuo; and Inoyama, Tadao, to Hitachi, Ltd. Automatic assembly apparatus for bolts and nuts. 4,048,687, Cl. 10-155.00R.
Kato, Katsunori: *See*—
Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Kato, Katsunori, 4,049,455, Cl. 96-76.00R.
Kato, Masamichi: *See*—
Ito, Akihiko; Kaetsu, Isao; Okubo, Hiroshi; Kato, Masamichi; Hayashi, Koichiro; and Maeda, Yuji, 4,049,867, Cl. 428-412.000.
Katoh, Hidehiko: *See*—
Noguchi, Tsutomu; Akaiwa, Yoshihiko; and Katoh, Hidehiko, 4,050,038, Cl. 333-1.100.
Katona, Joseph W., to Mills Products, Inc. Microwave and radiant window for oven doors. 4,049,939, Cl. 219-10.55D.
Katou, Shinzo: *See*—
Harada, Masanori; Katou, Shinzo; and Hayashi, Nobuyuki, 4,048,966, Cl. 123-117.00A.
Kattis, Theodore. Flake ice maker. 4,048,815, Cl. 62-354.000.
Katzen, Stanley J.: *See*—
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,049,896, Cl. 526-129.000.
Kaun, Thomas D.: *See*—
Vissers, Donald R.; Nelson, Paul A.; Kaun, Thomas D.; and Tomczuk, Zygmunt, 4,048,715, Cl. 29-623.500.
Kavanagh, George; and Caron, John L., to Hi-Speed Checkweigher Co., Inc. Price labeling system with floating zero reference. 4,049,068, Cl. 177-25.000.
Kawabata, Minoru; and Takahashi, Kenji, to Toyoda-Koki Kabushiki-Kaisha. Servo valve device in power steering apparatus. 4,048,904, Cl. 91-375.00A.
Kawakami, Hiroshi; Nagaoka, Isao; and Tsukagawa, Yukio, to Bridgestone Tire Company Limited. Device for pulling up and paying out an oil boom. 4,049,170, Cl. 226-74.000.
Kawakami, Koichi; and Osaki, Tatsuo, to Yoshida Kogyo Kabushiki Kaisha. Apparatus for assembling sliders to slide fastener chain. 4,049,155, Cl. 221-192.000.
Kawazu, Takashi. Pipe coupling. 4,049,355, Cl. 403-172.000.
Kayaba Kogyo Kabushiki Kaisha: *See*—
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.
Kazantsev, Lev Seliverstovich: *See*—
Pomeschikov, Andrei Grigorievich; Buryagin, Firs Alexandrovich; Kazantsev, Lev Seliverstovich; Skvortsov, Gennady Fedorovich; Naryshkin, Jury Anatolievich; and Gracheva, Zinaida Ivanovna, 4,049,901, Cl. 13-9.0ES.
Kazin, Stephen B., to General Electric Company. Sound-attenuating inlet duct. 4,049,074, Cl. 181-286.000.
Keen, John William, to Marston Excelsior Limited. Liquid heat exchange system with separately compartmented make-up tanks. 4,049,047, Cl. 165-107.000.
Keenan, James P., to GTE Sylvania Incorporated. Tungsten halogen lamp. 4,049,988, Cl. 313-222.000.
Keisuke Honda: *See*—
Yagita, Yasunobu, 4,050,054, Cl. 340-3.00F.
Keller, Manfred: *See*—
Kammann, Wilfried; and Keller, Manfred, 4,048,914, Cl. 101-35.000.
Kelley, Buster E.: *See*—
Salonimer, David J.; and Kelley, Buster E., 4,049,969, Cl. 250-458.000.
Kellogg, William L.: *See*—
McCall, Adrian W.; and Kellogg, William L., 4,049,270, Cl. 273-95.00A.
Kelly, Warren H.: *See*—
Marsh, Norman F.; and Kelly, Warren H., 4,050,016, Cl. 324-61.00R.
Kemi Oy: *See*—
Pentti, Heikki, 4,049,850, Cl. 427-377.000.
Kemlite Corporation: *See*—
Morse, Donald B.; and Pribish, Bernard A., 4,048,887, Cl. 83-79.000.
Kendall Company, The: *See*—
Patel, Harish A., 4,049,408, Cl. 62-4.000.
Kent, Anthony John, to Matrix Engineering Limited. Forming apparatus. 4,048,841, Cl. 72-450.000.
Kera, Kazuo; Kubo, Yutaka; and Ihara, Hirokazu, to Hitachi, Ltd. Dual computer system. 4,049,957, Cl. 235-153.0AK.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Bohnenstingl, Josef; Laser, Manfred; Lossmann, Gunter; and Gebhard, Helmut, 4,049,385, Cl. 23-277.00R.

Mallek, Heinz; Jablonski, Werner; and Augustin, Friedhelm, 4,048,927, Cl. 110-8.00R.

Kerr, Ralph O.; and Barone, Bruno J., to Petro-Tex Chemical Corporation. Catalyst and process for preparing maleic anhydride from C_4 hydrocarbons. 4,049,574, Cl. 252-437.000.

Kersten, Siegfried: *See*—
Hamprecht, Gerhard; and Kersten, Siegfried, 4,049,709, Cl. 260-543.00R.

Keska, Jerzy: *See*—
Dunikowski, Andrzej; Bednarczyk, Jan; Keska, Jerzy; Pisarkiewicz, Tadeusz; and Zamarski, Andrzej, 4,048,844, Cl. 73-32.00R.

Keske, Frank E.: *See*—
Goloff, Alexander; and Keske, Frank E., 4,049,327, Cl. 308-161.000.

Kessinger, Roger L.: *See*—
United States of America, National Aeronautics and Space Administration; and Kessinger, Roger L., 4,049,930, Cl. 179-175.10A.

Keuver, Paul H. Ellipsograph. 4,048,724, Cl. 33-31.000.

Keyser, William L.: *See*—
Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., 4,049,832, Cl. 426-72.000.

KHD Industrieanlagen Ag: *See*—
Schmidt, Horst, 4,049,202, Cl. 241-30.000.

Kheifets, Robert Georgievich: *See*—
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.

Khimenko, Lev Timofeevich; and Shlyakht, Alfred Lvovich. Inductor for working metals by pressure of pulsating magnetic field. 4,049,937, Cl. 219-7.500.

Kholnova, Vera Ivanovna: *See*—
Zakharov, Evegny Dmitrievich; Shneider, Gennady Lvovich; Valkov, Viktor Dmitrievich; Kapitonov, Viktor Pavlovich; Miklyaev, Petr Grigorievich; Lebedev, Vladimir Alexandrovich; Kholnova, Vera Ivanovna; Shesterikov, Stanislav Alexeevich; and Bobrovsky, Vasily Mikhailovich, 4,049,474, Cl. 148-32.500.

Kicherer, Robert: *See*—
Fischer, Karl; and Kicherer, Robert, 4,050,044, Cl. 337-137.000.

Kidwell, Louis E., Jr., to Pennzoil Company. Hydrogenated waxy olefin and process of making same. 4,049,893, Cl. 526-26.000.

Kieserling & Albrecht: *See*—
Lorenz, Horst, 4,048,833, Cl. 72-290.000.

Kikkoman Shoyu Co., Ltd.: *See*—
Ono, Fumio; and Aoyama, Yasuo, 4,049,831, Cl. 426-72.000.

Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Kato, Katsunori, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic material. 4,049,455, Cl. 96-76.00R.

Kikuchi, Yukio: *See*—
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.

Kikumoto, Ryoji: *See*—
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,049,645, Cl. 260-239.00B.

Kimberly-Clark Corporation: *See*—
Sigl, Wayne C.; and Lassen, Frederick O., 4,049,764, Cl. 264-178.00F.

Kindersley, Peter G., to Kamyr Incorporated. Diverter valve. 4,049,105, Cl. 193-31.00R.

King, Mendel; and Brannan, Raymond. Visible markers for road surfaces. 4,049,358, Cl. 404-11.000.

King-Seeley Thermos Co.: *See*—
Kohl, Vance L., 4,049,161, Cl. 222-233.000.

Kirby, Charles Ray: *See*—
Swinkels, Godefridus Maria; Furber, Robert Arthur; Milner, Edward Francis Godfrey; Genik-Sas-Berezowsky, Roman Michael; and Kirby, Charles Ray, 4,049,770, Cl. 423-37.000.

Kirknes, Bjorn: *See*—
Ramberg, Kjell Oystein; and Kirknes, Bjorn, 4,048,850, Cl. 73-133.00R.

Kirsch, Harry: *See*—
Berger, Helmut; Holzermer, Gunther; Kirsch, Harry; and Vijlbrief, Pieter, 4,049,967, Cl. 250-445.00T.

Kishi, Hajimu; and Takahashi, Masashi, to Oki Electric Industry Co., Ltd. Edit circuit for a numerical control system. 4,050,001, Cl. 318-625.000.

Kishi, Yoshio, to Sony Corporation. Cassette tape recording and/or reproducing apparatus. 4,050,087, Cl. 360-96.000.

Kishida, Katsuhiro: *See*—
Togawa, Kimmochi; Takao, Hiroshi; Matoba, Kazuo; and Kishida, Katsuhiro, 4,049,524, Cl. 204-195.00S.

Kishino, Takao; and Utamura, Yukihiko, to Futaba Denshi Kogyo K. K. Multi-digit fluorescent display tube with inclined filament cathode. 4,049,993, Cl. 313-497.000.

Kiss, Kornel Dezso: *See*—
Scardiglia, Frank; and Kiss, Kornel Dezso, 4,049,751, Cl. 260-876.00R.

Kissel, William Ronald, to Chrysler Corporation. Fuel metering apparatus and method. 4,048,964, Cl. 123-32.0ED.

Kita, Yasuo; and Kou, Makoto, to Shimadzu Seisakusho Ltd. Hydraulic motor with a mechanical brake device. 4,049,098, Cl. 192-8.00R.

Kitagawa, Norihisa, to Texas Instruments Incorporated. Partitioning of MOS random access memory array. 4,050,061, Cl. 340-173.00R.

Kittle, Donald B.: *See*—
Hanneman, Rodney E.; Chrenko, Richard M.; and Kittle, Donald B., 4,049,186, Cl. 228-225.000.

Kjolberg, Sven Arne: *See*—
Mejdell, Glor Thorvald; and Kjolberg, Sven Arne, 4,049,773, Cl. 423-127.000.

Klaiber, Erich Manfred: *See*—
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,049,682, Cl. 260-410.000.

Klassen, Horst Willi: *See*—
Heinz, Kurt Erich; and Klassen, Horst Willi, 4,049,087, Cl. 188-73.500.

Klein, Imrich: *See*—
Tadmor, Zehev; and Klein, Imrich, 4,049,245, Cl. 259-191.000.

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Fabian, Wolfgang; Klein, Konrad; and Sevenich, Theodor, 4,048,831, Cl. 72-251.000.

Kleis, Gustav, to Geratewerk Lahr GmbH. Control devices for pick-up arms of record players. 4,049,279, Cl. 274-15.00R.

Kletschka, Harold D.; and Rafferty, Edson D., to Bio-Medicus, Inc. Fluid conveying surgical instrument. 4,049,002, Cl. 128-318.000.

Klocke, Donald J.: *See*—
Dwyer, Francis G.; and Klocke, Donald J., 4,049,737, Cl. 260-671.00P.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Hulsebusch, Karl-Heinz, 4,048,870, Cl. 74-473.00R.
Weigel, Horst; and Spitz, Anton, deceased, 4,049,445, Cl. 75-82.000.

Klockner-Werke AG: *See*—
Nagels, Gunther, 4,049,502, Cl. 203-10.000.

Kloften & Kloften A/S: *See*—
Ege, Sigmund, 4,048,686, Cl. 9-8.00R.

Klopfer, Howard J.: *See*—
Corn, John E., Jr.; and Klopfer, Howard J., 4,049,721, Cl. 260-619.00A.

Knabel, Korst. Apparatus for producing an instantaneous pressure on a workpiece. 4,048,840, Cl. 72-437.000.

Knahl, Herbert: *See*—
Freissmuth, Alfred; Heinl, Walter; Knahl, Herbert; and Pfluger, Erich, 4,049,442, Cl. 75-55.000.

Knauber, Veronica A.: *See*—
Sullivan, John L.; Knauber, Veronica A.; and Nelson, James E., 4,049,164, Cl. 224-5.00W.

Knollman, Dieter John Henry, to Bell Telephone Laboratories, Incorporated. Analog signal summing conference circuit. 4,049,920, Cl. 179-18.0BC.

Knorpp, Eberhard; and Schaffer, Silvian, to Siemens Aktiengesellschaft. Method and apparatus for digital data transmission. 4,049,908, Cl. 178-58.00R.

Knowles, C. Harry; Meckley, John R.; and Naylor, Charles A., to Metrologic Instruments, Inc. Laser beam alignment. 4,050,037, Cl. 331-94.50D.

Ko, Keiun; Takashina, Naomitsu; Shiokawa, Shigeru; and Fujita, Rokuro, to Mitsubishi Gas Chemical Company, Inc. In-air curable resin compositions. 4,049,634, Cl. 260-75.0UA.

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Kobayashi, Nobuyuki: *See*—
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,049,538, Cl. 208-50.000.

Kobayashi, Toshio: *See*—
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.

Kobel, Erich, to Merck Patent Gesellschaft mit beschrankter Haftung. Two-chamber mixing syringe. 4,048,999, Cl. 128-272.100.

Kobler, Robert James, to AMP Incorporated. Circuit film strip and manufacturing method. 4,049,903, Cl. 174-68.500.

Koch, Terry David, to Inno-Cept Corporation. Insertion of compressible sheets in concrete. 4,049,359, Cl. 404-89.000.

Koenuma, Masao; and Gibu, Yoshitaka, to Asahi Seimitsu Kabu Shiki Kaisha. Feed index device in universal parallel ruler or the like. 4,048,725, Cl. 33-81.000.

Kohl, Vance L., to King-Seeley Thermos Co. Ice making and vending machine. 4,049,161, Cl. 222-233.000.

Kohler, Johann: *See*—
Rothe, Rudolf; and Kohler, Johann, 4,049,409, Cl. 62-9.000.

Koitabashi, Takeo; and Akamatsu, Hideo, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide color photographic material. 4,049,456, Cl. 96-84.00R.

Kolb, Gustav: *See*—
Bardenheuer, Friedrich; and Kolb, Gustav, 4,048,857, Cl. 73-354.000.

Kolenik, Steve A.: *See*—
Walters, Robert A.; and Kolenik, Steve A., 4,049,003, Cl. 128-419.0PG.

Kollar, Ernest P., to International Business Machines Corporation. Helical scan magnetic recording device having a folded mounting plate. 4,050,090, Cl. 360-130.000.

Kollonitsch, Janos; and Marburg, Stephen, to Merck & Co., Inc. Fluorodesulfurization of alkyl mercaptans or alkyl dithianes. 4,049,708, Cl. 260-534.00C.

Kollwig, Horst: *See*—
Bach, Josef; Kollwig, Horst; Meitzner, Wolfgang; Weintritt, Horst; and Ueberdiek, Ralf, 4,049,209, Cl. 242-18.0PW.

Kolomoets, Nikolai Vasilievich; Dashevsky, Zinovy Moiseevich; Granovsky, Vladimir Isaakovich; Shmidt, Igor Aronovich; and Gelfgat, David Mendelevich. Film thermoelement. 4,049,469, Cl. 136-225.000.

Kolosov, Ivan Alexandrovich. Automatic device for maintaining the level of a stack of plates. 4,049,329, Cl. 312-71.000.

Kondo, Shinichi: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,049,497, Cl. 195-80.00R.

Konig, Fritz, to Losenhausen Maschinenbau AG. Method of determining standard sound levels. 4,048,860, Cl. 73-556.000.

Konig, Justus; Rohrig, Josef; and Hilliges, Friedrich, to Siemens Aktiengesellschaft. Switching arrangement for telecommunication switching systems. 4,049,922, Cl. 179-18.0AB.

Konig, Rolf; Nordemann, Bernhard; and Motek, Herbert, to Hazemag Dr. E. Andreas Kg. Comminuting machine for trash. 4,049,206, Cl. 241-73.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Kato, Katsunori, 4,049,455, Cl. 96-76.00R.
Koitabashi, Takeo; and Akamatsu, Hideo, 4,049,456, Cl. 96-84.00R.

Kontak Manufacturing Company Limited: *See*—
Singleton, Anthony, 4,049,235, Cl. 251-297.000.

Koontz, Donald Eldridge, to Bell Telephone Laboratories, Incorporated. Technique for stabilizing contact resistance of gold plated electrical contacts. 4,049,471, Cl. 148-13.000.

Koopman, Richard. Fishing reel drive mechanism. 4,049,217, Cl. 242-213.000.

Koppers Company, Inc.: *See*—
Lindgren, Carl G., 4,049,501, Cl. 202-239.000.

Korbuly, Jozsef: *See*—
Bole, Karoly; Nagy, Kalman; Aufsatz, Istvan; Bohnert, Jozsef; Branyi, Laszlo; Ilyes, Zoltan; Korbuly, Jozsef; and Nemeth, Janos, 4,048,803, Cl. 61-45.00D.

Korenko, Michael K.: *See*—
Hagel, William C.; Smidt, Frederick A.; and Korenko, Michael K., 4,049,431, Cl. 75-126.00C.
Hagel, William C.; Smidt, Frederick A.; and Korenko, Michael K., 4,049,432, Cl. 75-128.00F.

Korfund Dynamics Corporation: *See*—
Baratoff, Paul, 4,048,842, Cl. 72-455.000.

Korner, Anneliese F.; Piziali, Robert L.; and Ellsworth, Orval T., to Leland Stanford Junior University, The Board of Trustees of. Infant waterbed. 4,048,684, Cl. 5-370.000.

Korte, Klaus: *See*—
Groebke, Wolfgang; and Korte, Klaus, 4,049,642, Cl. 260-196.000.

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Nikolov, Ivan Dimov; Kortenski, Hristo Georgiev; Dimitrov, Dimiter Tanev; and Antonov, Asparuh Mihaylov, 4,049,041, Cl. 164-120.000.

Koshkin, Lev Nikolaevich: *See*—
Grinberg, Ijun Iosifovich; Zhukov, Evgeny Kuzmich; and Koshkin, Lev Nikolaevich, 4,049,389, Cl. 29-157.10R.

Kou, Makoto: *See*—
Kita, Yasuo; and Kou, Makoto, 4,049,098, Cl. 192-8.00R.

Kovach, Stephen M.; and Wilson, George D., to Ashland Oil, Inc. Platinum-palladium catalyst for selective hydrogenation of aromatics and olefins in hydrocarbon fractions. 4,049,576, Cl. 252-441.000.

Kovacsovics, Erzsebet: *See*—
Schawartz, Jozsef; Hornyak, Maria; Majorszki, Eva; David, Agoston; and Horvath, Gabor, 4,049,639, Cl. 260-140.000.

Kracklauer, John J., to Syntex (U.S.A.) Inc. Polyvinyl chloride composition containing ferrocene smoke suppressant additives. 4,049,618, Cl. 260-45.75P.

Kraft, Inc.: *See*—
Krueger, Grant Edward; and Leitner, Richard John, 4,049,838, Cl. 426-478.000.

Kraft, Paul: *See*—
Jin, Jung Il; and Kraft, Paul, 4,049,747, Cl. 260-859.0PV.

Kramer, Hyman. Blending and kneading apparatus. 4,049,243, Cl. 259-122.000.

Kraus, Wayne P.; and Hutson, Thomas, Jr., to Phillips Petroleum Company. Hydrofluorination process. 4,049,728, Cl. 260-653.600.

Krautkramer-Branson, Incorporated: *See*—
DiLeo, Christopher C., 4,050,055, Cl. 340-1.00R.

Kray, Raymond J., to Ciba-Geigy Corporation. N-cyanosulfonamides. 4,049,711, Cl. 260-551.00C.

Krebs, Daniel Fritz; and Miranda, Hector, to Union Carbide Corporation. Blood washing method using a saline wash solution of varying concentration for use with blood washing apparatus. 4,049,192, Cl. 233-14.00R.

Krekeler, Jerome H.: *See*—
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,049,896, Cl. 526-129.000.

Kremer, Charles J.: *See*—
Russell, Donald H.; and Kremer, Charles J., 4,049,007, Cl. 132-7.000.

Kreuz, Alois, to VDO Adolf Schindling AG. Rotational speed to impulse frequency converter. 4,049,986, Cl. 310-68.00B.

Krings, Josef. Sheeting-plate for trench sheeting. 4,048,778, Cl. 52-615.000.

Kronenberg, Marvin Lee, to Union Carbide Corporation. Non-aqueous cell having as cathode a mixture of lead dioxide and lead monoxide and/or lead particles. 4,049,892, Cl. 429-194.000.

Krueger, Grant Edward; and Leitner, Richard John, to Kraft, Inc. Manufacture of large cheese blocks. 4,049,838, Cl. 426-478.000.

Krueger, James Elwood: *See*—
Haeger, Bruce Edwin; Krueger, James Elwood; Lowery, James Alfred; and Ritter, Lawrence, 4,049,809, Cl. 424-250.000.

Kruithof, Albert: *See*—
Pettipher, Rodney; Viellevoye, Lucien Nicolas Leon; and Kruithof, Albert, 4,050,095, Cl. 364-200.000.

Krumbein, Fritz, to Robert Bosch GmbH. Film wind-up arrangement for motion-picture cameras. 4,049,340, Cl. 352-166.000.

Kubo, Kikuo: *See*—
Isayama, Takuro; and Kubo, Kikuo, 4,050,078, Cl. 346-140.00R.

Kubo, Yutaka: *See*—
Kera, Kazuo; Kubo, Yutaka; and Ihara, Hirokazu, 4,049,957, Cl. 235-153.0AK.

Kubus, James Michael; Seese, Ray Bruce; and Watson, Bela Lee, to Union Carbide Corporation. System for metering abrasive materials. 4,048,757, Cl. 51-436.000.

Kudo, Tetsuichi: *See*—
Manabe, Toshikatsu; Ohta, Masao; Kudo, Tetsuichi; Mochizuki, Shouji; and Gejyo, Tetsuo, 4,049,789, Cl. 423-593.000.

Kuehnle, Manfred R., to Coulter Information Systems, Inc. Photoelectric measuring device. 4,049,963, Cl. 250-211.00R.

Kuipers, Marcus: *See*—
Gerritsen, Dirk J.; and Kuipers, Marcus, 4,049,263, Cl. 272-66.000.

Kunstmann, Rudolf; and Kaiser, Joachim, to Hoechst Aktiengesellschaft. 1,4-Dihydro-2H-isoquinoline derivatives. 4,049,655, Cl. 424-248.500.

Kunz, Bernard P. Apparatus for producing honeycomb paneling. 4,049,487, Cl. 156-436.000.

Kuo, James C.; Prater, Charles D.; and Wise, John J., to Mobil Oil Corporation. Method for upgrading Fischer-Tropsch synthesis products. 4,049,741, Cl. 260-676.00R.

Kuo, James C.: *See*—
Garwood, William E.; Jacob, Solomon M.; Kuo, James C.; and Wise, John J., 4,049,734, Cl. 260-668.00R.

Kuraishi, Tatsuo: *See*—
Gocho, Makio; Ota, Masanori; and Kuraishi, Tatsuo, 4,048,849, Cl. 73-105.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Yoshikawa, Shinsuke; Sasaki, Tohru; and Terasaki, Syuuzi, 4,049,859, Cl. 428-172.000.

Kurmeier, Hans-Adolf: *See*—
Schacht, Erich; Mehrhof, Werner; Wild, Albrecht; Gante, Joachim; and Kurmeier, Hans-Adolf, 4,049,823, Cl. 424-308.000.

Kuroda, Masao: *See*—
Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, 4,049,495, Cl. 195-36.00R.

Kussel, Willy: *See*—
Weirich, Walter; and Kussel, Willy, 4,048,866, Cl. 74-242.1FP.

Kutschke, C. T., to Nipak, Inc. Method and apparatus for forming a joint in a confined space between two abutting ends of conduit liners. 4,049,480, Cl. 156-94.000.

Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, to Takeda Chemical Industries, Ltd. Benzodiazepine carboxamides and pharmaceutical compositions with central nervous system activity. 4,049,812, Cl. 424-263.000.

L G Industries, Incorporated: *See*—
Davis, William P., 4,049,100, Cl. 192-58.00C.

Laber, Georg; and Schutze, Eberhard, to Sandoz Ltd. Synergistic compositions. 4,049,817, Cl. 424-270.000.

Laborit, Henri, to Centre d'Etudes Experimentales et Cliniques de Physio Biologie de Pharmacologie et d'Eutonologie. Treatment of hemorrhagic shock. 4,049,795, Cl. 424-180.000.

Lacrex Brevetti S.A.: *See*—
Pasbrig, Max, 4,049,115, Cl. 206-.840.

Lacroix, Guy-Bernard: *See*—
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillou, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.

Ladany, Ivan, to RCA Corporation. Light emitting diode having a short transient response time. 4,049,994, Cl. 313-499.000.

Ladd Research Industries, Inc.: *See*—
Porter, John H., 4,049,242, Cl. 259-72.000.

Lade, Robert W.: *See*—
Jaakolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,050,083, Cl. 357-28.000.

Lafon, Louis, to Societe anonyme dite: Laboratoire L. Lafon. Sulphur containing hydroxy aliphatic compounds. 4,049,829, Cl. 424-337.000.

LaFreniere, Larry Paul: *See*—
Motten, Roger Henwood, Jr.; and LaFreniere, Larry Paul, 4,050,045, Cl. 337-187.000.

Lagodka, Gunter: *See*—
Elsner, Burckhardt; Plevak, Lubomir; Lagodka, Gunter; and Rosenberg, Harry, 4,048,804, Cl. 61-45.00D.

Lahiri, Chitta Ranjan: *See*—
Bell, Richard; Sato, Takao; and Lahiri, Chitta Ranjan, 4,048,865, Cl. 74-231.00R.

Laing, Graham Stirling; and Ito, Shiro Tom, to Northern Electric Company Limited. Solenoid circuit for pushbutton release in telephones. 4,049,925, Cl. 179-99.000.

Laithwaite, Eric Roberts: *See*—
Attwood, Alan; and Laithwaite, Eric Roberts, 4,049,983, Cl. 310-13.000.
Lam, Bing Lun; Lewis, Joseph James; Webb, Robert Lee; and Wellman, George Robert, to SmithKline Corporation. Process for preparing 5-(alkoxy- and aminoethyl thio)methylthiazole compounds. 4,049,669, Cl. 260-306.80R.
Lambert, Rudolph J., to Emerson Electric Co. Timer controlled space thermostat with battery operated timer. 4,049,973, Cl. 307-66.000.
Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., to Dow Chemical Company, The. Dehydration of α-methylbenzyl alcohols to form monovinylidene aromatic monomers. 4,049,736, Cl. 260-669.0QZ.
Landis, Phillip S.: *See*—
Nnadi, John C.; and Landis, Phillip S., 4,049,565, Cl. 252-51.50A.
Lane, Marvin K.; and Anderson, Winton C., to United States Gypsum Company. By-product gypsum fillers for mica-free joint compounds. 4,049,866, Cl. 428-402.000.
Langenbeck, Peter: *See*—
Ehlscheid, Gunter; Langenbeck, Peter; and Stemmler, Kurt, 4,049,945, Cl. 219-121.0LM.
Lapinski, Richard, to Catuma Pty. Limited. Hand caster. 4,048,743, Cl. 43-17.500.
Laporte Industries Limited: *See*—
Neumann, Barbara Susan, 4,049,780, Cl. 423-331.000.
Lardon, Marcel; and Pulker, Hans, to Balzers Patent und Beteiligungs AG. Method and apparatus for determining the rate of flow of particles in a vacuum deposition device. 4,049,352, Cl. 356-73.000.
Lare, Donald W., to Champion International Corporation. Self-bonding synthetic wood pulp and paper-like films thereof and method for production of same. 4,049,492, Cl. 162-146.000.
Lare, Donald W., to Champion International Corporation. Self-bonding synthetic wood pulp and paper-like films thereof and method for production of same. 4,049,493, Cl. 162-157.00R.
Large, George B., to Stauffer Chemical Company. Acaricidal and lepidoptericidal active carbon-imidothioates. 4,049,826, Cl. 424-326.000.
Larkins, John S., Jr. Suction power-driven air turbine. 4,048,798, Cl. 60-407.000.
Larson, Curtis Lee: *See*—
Casey, James H.; Larson, Curtis Lee; and Brown, Robert Campbell, 4,049,854, Cl. 428-72.000.
Laser, Manfred: *See*—
Bohnenstingl, Josef; Laser, Manfred; Lossmann, Gunter; and Gebhard, Helmut, 4,049,385, Cl. 23-277.00R.
Lassen, Frederick O.: *See*—
Sigl, Wayne C.; and Lassen, Frederick O., 4,049,764, Cl. 264-178.00F.
Last, Wolf-Dieter: *See*—
Bunge, Wilhelm; Last, Wolf-Dieter; Saitner, Rudolf; and Wolf, Karlheinz, 4,049,610, Cl. 260-31.20N.
Latsch, Reinhard: *See*—
Bianchi, Valerio; Latsch, Reinhard; and Schmidt, Peter, 4,048,965, Cl. 123-32.0EA.
Lauder, Alan, to Du Pont de Nemours, E. I., and Company. Metal oxide catalytic compositions having perovskite crystal structures and containing metals of the platinum group. 4,049,583, Cl. 252-466.0PT.
Laugesen, Ronald C.: *See*—
Shieu, Mark S. D.; Johnson, Robert B.; and Laugesen, Ronald C., 4,049,979, Cl. 307-270.000.
Laurent, Henry; Annen, Klaus; Wiechert, Rudolf; and Hofmeister, Helmut, to Schering Aktiengesellschaft. Novel pregnanoic acid derivatives. 4,049,804, Cl. 424-242.000.
Laurin, Bernard L.; Rotenberg, Don H.; and Crandon, Harry D., to American Optical Corporation. Abrasion-resistant optical element. 4,049,868, Cl. 428-412.000.
Laux, Leon E. Window box planter with tool-free quick set-up and hanging adjustment. 4,048,754, Cl. 47-68.000.
Lavallee, Francois A.; Le Grand, Donald G.; and Gaines, George L., Jr., to General Electric Company. Pyridine-containing indicator dye. 4,049,649, Cl. 542-400.000.
LaVasseur, Jon D. Fuel-saving fireplace screen unit. 4,048,979, Cl. 126-202.000.
Laven, Merrill L. Above-ground pool walls, panels therefor, and panel-manufacturing methods. 4,048,773, Cl. 52-169.700.
Law, Harold Bell, to RCA Corporation. Method for forming a color television picture tube screen. 4,049,451, Cl. 96-36.100.
Lawrence Brothers Inc.: *See*—
Newlon, Robert L., 4,049,934, Cl. 200-61.700.
Lawrence, James R., to Raymond Lee Organization, Inc., a part interest. Air relief mechanism. 4,048,756, Cl. 49-171.000.
Lawrence Peska Associates, Inc.: *See*—
Matherne, Charley F., 4,049,555, Cl. 210-409.000.
Lazennec, Yvon: *See*—
Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, 4,049,884, Cl. 429-104.000.
Leaman, Roger John: *See*—
Williams, John Lloyd; Leaman, Roger John; Moberly, Robert Valentine; Stagg, Geoffrey Brian Kenneth; and Wisdom, Graham John, 4,050,059, Cl. 364-200.000.
Leavens, Dwight E.: *See*—
Smith, Gary W.; Leavens, Dwight E.; and Sims, Louis Ray, 4,049,685, Cl. 260-412.500.
Lebedev, Vladimir Alexandrovich: *See*—
Zakharov, Evegny Dmitrievich; Shneider, Gennady Lvovich; Valkov, Viktor Dmitrievich; Kapitonov, Viktor Pavlovich; Miklyaev, Petr Grigorievich; Lebedev, Vladimir Alexandrovich; Kholnova, Vera Ivanovna; Shesterikov, Stanislav Alexeevich; and Bobrovsky, Vasily Mikhailovich, 4,049,474, Cl. 148-32.500.
Lechner, Manfred; Schirm, Volker; and Dettmann, Heinrich, to Messerschmitt-Bolkow-Blohm. Device for manufacturing rotationally symmetrical constructional parts. 4,048,826, Cl. 72-21.000.
Lecrone, Dale S. Band-type roll slicing machine. 4,048,883, Cl. 83-4.000.
Lecrone, Dale S. Adjustable roll slicing system. 4,049,171, Cl. 225-94.000.
Ledan, Antoine. Movie viewing eyeglasses. 4,049,339, Cl. 351-45.000.
Ledterman, Robert S. Overhead bike light. 4,049,959, Cl. 240-7.550.
Lee, Timothy Charles Philip; and Millns, William, to Gould Inc. Treatment of vulcanized rubber. 4,049,588, Cl. 260-2.300.
Leedham, Harry W. T., to Borg-Warner Corporation. Finned tube bundle heat exchanger. 4,049,048, Cl. 165-159.000.
Leedom, Marvin Allan, to RCA Corporation. Pickup cartridge. 4,049,280, Cl. 274-37.000.
Leeds & Northrup Company: *See*—
Mosley, Gerald; and Raber, Ervin T., 4,050,065, Cl. 340-347.0NT.
le Febve de Vivy, Dominique, to Sulzer Brothers Ltd. Output regulator for a thermal power-producing plant. 4,049,971, Cl. 290-40.00R.
LeFebvre, Albert W. Apparatus for sighting a projectile firing weapon. 4,048,726, Cl. 33-180.00R.
Legnos, Peter John. Seagoing composite barge-tug vessel. 4,048,941, Cl. 114-248.000.
Le Grand, Donald G.: *See*—
Lavallee, Francois A.; Le Grand, Donald G.; and Gaines, George L., Jr., 4,049,649, Cl. 542-400.000.
Lehnhart, Dieter, to Glyco-Metall-Werke Daelen & Loos GmbH. Collar sleeves and process and tool for the manufacture thereof. 4,048,703, Cl. 29-149.5DP.
Leigh Products, Inc.: *See*—
Imhoff, William B., 4,049,304, Cl. 292-333.000.
Leitner, Richard John: *See*—
Krueger, Grant Edward; and Leitner, Richard John, 4,049,838, Cl. 426-478.000.
Leland Stanford Junior University, The Board of Trustees of: *See*—
Korner, Anneliese F.; Piziali, Robert L.; and Ellsworth, Orval T., 4,048,684, Cl. 5-370.000.
Lemaire, Maurice: *See*—
Da Costa Vieira, David; Dufayet, Jean-Pierre; and Lemaire, Maurice, 4,049,954, Cl. 235-151.320.
Lemay, Richard A.: *See*—
Miu, Ming T.; Negi, Virendra S.; and Lemay, Richard A., 4,050,097, Cl. 364-200.000.
Lemper, Anthony L.: *See*—
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Le Pape, Alain Yves, to Produits Chimiques Ugine Kuhlmann. Dyed copolyesters and method of making. 4,049,376, Cl. 8-162.00R.
Lepp, Cyrus A.; Mason, Robert D.; and Ramsey, William S., to Corning Glass Works. Microbial medium having fluorescent growth indicator. 4,049,499, Cl. 195-100.000.
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Moisan, Michel; Leprince, Philippe; Beaudry, Claude; and Bloyet, Emile, 4,049,940, Cl. 219-10.55R.
Lever Brothers Company: *See*—
Rek, Johannes Henricus Maria, 4,049,687, Cl. 260-428.000.
Ringers, Hendrik Johan; and Segers, Jacobus Cornelis, 4,049,686, Cl. 260-424.000.
Rubin, Fred Kurt, 4,049,467, Cl. 134-2.000.
Levi, Israel, to Northern Telecom Limited. Self-adjusting voice frequency repeater. 4,049,928, Cl. 179-170.00R.
Levi, Phillip M., Jr.: *See*—
Grill, Carl E.; and Levi, Phillip M., Jr., 4,049,236, Cl. 254-28.000.
Levitt, Barry N.: *See*—
Crocker, Thomas H.; Levitt, Barry N.; and Suprenant, Paul J., 4,050,062, Cl. 340-183.000.
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Leybold-Heraeus GmbH & Co. Kg: *See*—
Grof, Helmut Theodor; Schumann, Jochen; Wamser, Anton; Schumann, Rainer; and Thomas, Werner Friedrich, 4,049,039, Cl. 164-52.000.
Ligon, Thomas R., to Hewlett-Packard Company. Method for fabricating a self-aligned metal oxide field effect transistor. 4,049,477, Cl. 148-187.000.
Lillard, Richard E.; and Cope, William M., to H. K. Porter Company, Inc. Current conductor system. 4,049,092, Cl. 191-40.000.
Lin, Chinlon: *See*—
Chang, Tao-Yuan; and Lin, Chinlon, 4,050,033, Cl. 331-94.50G.
Lindemann, Hans-Joachim; and Wiest, Peter P. Insufflator. 4,048,992, Cl. 128-184.000.
Lindemann, Martin K., to Chas. S. Tanner Co. Foamed pigmented emulsions for the backcoating of loosely structured fabrics. 4,049,862, Cl. 428-253.000.
Lindgren, Carl G., to Koppers Company, Inc. Device for spotting within tolerance apparatus associated with the coke oven chambers of a battery. 4,049,501, Cl. 202-239.000.
Lindstrom, Olle Birger. Electrochemical battery. 4,049,878, Cl. 429-18.000.
Link, Helmut, to Index-Werke KG Hahn & Tessky. System for supplying hydraulic fluid to aggregates on spindles or the like. 4,048,880, Cl. 82-29.00R.

Linke, Gerhard: *See*—
Distler, Walter; Zink, Roderich; and Linke, Gerhard, 4,049,968, Cl. 250-445.00T.
Lipfert, Gerhard: *See*—
Hank, Dietrich; Lipfert, Gerhard; and Niesgoda, Tassilo, 4,049,213, Cl. 242-57.100.
Lipp, Xaver. Apparatus for forming a large diameter pipe. 4,048,827, Cl. 72-50.000.
Lithium Corporation of America: *See*—
Bach, Ricardo O.; and Morrison, Robert C., 4,049,732, Cl. 260-668.00B.
Little, Richard Frederick: *See*—
Scheitlin, George Edward; and Little, Richard Frederick, 4,049,388, Cl. 23-288.0FB.
Litton Systems, Inc.: *See*—
Coutant, Ralph W., 4,048,707, Cl. 29-509.000.
Lo, Liu Ying P. Self-inflating liquid container for keeping I.V. fluid or blood plasma. 4,048,994, Cl. 128-214.00F.
Lo, Vincent; Vos, Kenneth D.; and Suchla, Germane M., to S. C. Johnson & Son, Inc. Pressurized container-dispensers and filling method. 4,049,158, Cl. 222-95.000.
Lobeck, Walter G.: *See*—
Wu, Yao Hua; and Lobeck, Walter G., 4,049,714, Cl. 260-564.00R.
Lock, William E. Interrupted intermittent motion device. 4,048,868, Cl. 74-436.000.
Lock, William E.; and Churillo, Charles J. Extraction assembly. 4,048,900, Cl. 86-48.000.
Lockheed Aircraft Corporation: *See*—
Fountain, Claude Lloyd, 4,049,221, Cl. 244-118.00R.
Loder, Harry A.; and Mathna, Charles A., to Minnesota Mining and Manufacturing Company. Pressure sensitive hot-melt adhesive system. 4,049,483, Cl. 156-230.000.
Long, David M.; and Dent, Joseph B., Jr., to PPG Industries, Inc. Forming level air conditioning system. 4,049,411, Cl. 65-2.000.
Longo, John M.: *See*—
Horowitz, Harold S.; and Longo, John M., 4,049,790, Cl. 423-599.000.
Lorenz, Horst, to Kieserling & Albrecht. Gripping arrangement. 4,048,833, Cl. 72-290.000.
Lorge, Michel; and Houba, Roger, to Solvay & Cie. Process for the manufacture of oriented hollow articles made of thermoplastic material. 4,049,761, Cl. 264-89.000.
Losenhausen Maschinenbau AG: *See*—
Konig, Fritz, 4,048,860, Cl. 73-556.000.
Lossmann, Gunter: *See*—
Bohnenstingl, Josef; Laser, Manfred; Lossmann, Gunter; and Gebhard, Helmut, 4,049,385, Cl. 23-277.00R.
Lotosh, Valery Efimovich; and Steblyak, Vladimir Demyanovich. Method for obtaining a lump product. 4,049,435, Cl. 75-3.000.
Lott, Joseph C., to Grow Chemical Corporation. High solids polyesters capable of dissolving in an organic solvent. 4,049,599, Cl. 260-22.00M.
Louverdrape, Inc.: *See*—
Hyman, David L.; Cayton, Robert J.; and Rosenquist, Kurt E., 4,049,038, Cl. 160-166.00A.
Louw, Johan August; and Ghiselin, Robert Earle, to Textron Inc. Inertia welding indexing system. 4,049,182, Cl. 228-2.000.
Lovett, Jack R. Electrical shorting device. 4,049,933, Cl. 200-48.00R.
Lowery, James Alfred: *See*—
Haeger, Bruce Edwin; Krueger, James Elwood; Lowery, James Alfred; and Ritter, Lawrence, 4,049,809, Cl. 424-250.000.
Lowski, Dieter: *See*—
Boie, Immo; and Lowski, Dieter, 4,049,458, Cl. 96-100.00N.
Lozach, Guy, to Societe Chimique des Charbonnages. Method of manufacture of foamed thermo-plastic extruded shapes. 4,049,760, Cl. 264-51.000.
Lozier, Gerald Scott; and Branin, Phyllis Brown, to RCA Corporation. Method for preparing filter-coated phosphor particles. 4,049,845, Cl. 427-68.000.
Lucas, Gary M.: *See*—
Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., 4,049,844, Cl. 427-54.000.
Lucas Industries Limited: *See*—
Roberts, Thomas Ernest Edwin, 4,048,903, Cl. 91-6.500.
Lucas, Roger; and Auberger, Jacques, to Forgeal, Societe pour le Forgeage et l'Estampage des Alliages Legers. Process for manufacturing monobloc wheels by die stamping and rotary extrusion. 4,048,828, Cl. 72-83.000.
Luchko, Viktor Nikolaevich: *See*—
Axelrod, Iosif Maxovich; Alengoz, Anton Savvich; Luchko, Viktor Nikolaevich; Mukhin, Valentin Alexandrovich; Nikolenko, Ignat Leontievich; and Potapenko, Igor Alexandrovich, 4,048,693, Cl. 15-310.000.
Luddy, Francis E.; Hampson, James W.; and Herb, Samuel F., to United States of America, Agriculture. Physiochemically designed fat compositions from tallow. 4,049,839, Cl. 426-607.000.
Ludvigson, Birger. Method of eliminating and uneven stress distribution in an elongated reinforced member. 4,048,706, Cl. 29-452.000.
Luitwieler, Samuel H., Jr., to Beckman Instruments, Inc. Nuclear radiation measuring method and apparatus having blanking time inversely related to count rate. 4,049,966, Cl. 250-369.000.
Luling, Adalbert, to F. W. Luling KG, Firma. Locks for doors and the like. 4,048,822, Cl. 70-93.000.
Lundberg, George A., to E. J. Brooks Company. Locking receptacle for electric meter box or the like. 4,049,313, Cl. 292-307.00R.
Lunkwitz, Klaus: *See*—
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.
Lurssen, Klaus: *See*—
Timmler, Helmut; Draber, Wilfried; Buchel, Karl Heinz; and Lurssen, Klaus, 4,049,418, Cl. 71-76.000.
Luthje, Holger: *See*—
Convertini, Ursula; Dimigen, Heinz; and Luthje, Holger, 4,049,521, Cl. 204-192.00E.
Luthra, Vinod K., to Mobil Oil Corporation. Method for extending thermoplastic foams having smooth external skins. 4,049,768, Cl. 264-45.500.
Lutz, Michael. Mold for manufacturing an integrally molded ball and socket type hinge. 4,049,231, Cl. 249-64.000.
Lyakhovetsky, Lev Semenovich: *See*—
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.
Lyman, John L.: *See*—
Robinson, C. Paul; Rockwood, Stephen D.; Jensen, Reed J.; Lyman, John L.; and Aldridge, Jack P., III, 4,049,515, Cl. 204-157.10R.
Lynch, Richard F., to N L Industries, Inc. Squeeze casting apparatus and method. 4,049,040, Cl. 164-120.000.
Lyon, Boyce M.: *See*—
Eskridge, Brewster B.; Lyon, Boyce M.; and Boasson, Eduard H., 4,049,766, Cl. 264-210.00F.
Maaghul, John, to PPG Industries, Inc. Glass fibers containing a dual polyester resin size. 4,049,865, Cl. 428-391.000.
MacArthur, Glen. Mechanical separation of substances. 4,049,201, Cl. 241-5.000.
Macchine Tessili Circolari MATEC S.p.A.: *See*—
Bianchi, Massimo, 4,048,817, Cl. 66-57.000.
MacInnis, Martin B.: *See*—
Quatrini, L. Rita; and MacInnis, Martin B., 4,049,771, Cl. 423-49.000.
Mackert, Robert J.: *See*—
Storm, Donald P.; Sammarco, Peter; Fritz, Edward A.; and Mackert, Robert J., 4,049,207, Cl. 241-101.700.
Mackie, Thomas Barnet, to Thomas Salter Limited. Question and answer game. 4,049,265, Cl. 273-1.00R.
MacQuignon, Claude: *See*—
Pegnim, Timothy C.; France, Larry R.; Sherman, John G.; and MacQuignon, Claude, 4,050,079, Cl. 346-145.000.
Maddox, Harry L., to Western Electric Company, Incorporated. Magnetic field probe which measures switching current of magnetic element at moment the element switches as measure of external field. 4,050,013, Cl. 324-43.00R.
Maeda, Yuji: *See*—
Ito, Akihiko; Kaetsu, Isao; Okubo, Hiroshi; Kato, Masamichi; Hayashi, Koichiro; and Maeda, Yuji, 4,049,867, Cl. 428-412.000.
Maeno, Shizuo: *See*—
Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,049,664, Cl. 260-294.80C.
Maezawa, Tokio: *See*—
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.
Maezono, Masakazu: *See*—
Hattori, Torao; and Maezono, Masakazu, 4,049,101, Cl. 192-87.190.
Magee, Philip S., to Chevron Research Company. Insecticidal O,S-dihydrocarbyl-N-haloacylphosphoroamidothioates and S,S-dihydrocarbyl-N-haloacylphosphoroamidodithioates. 4,049,679, Cl. 260-402.500.
Maginness, Brian K., to Biometrics Instrument Corporation. Dual phase input multiplier. 4,050,005, Cl. 363-59.000.
Magnusson, Alan B.; and White, Howard S., to Armstrong Cork Company. Chain extending polyurethanes with a large excess of water. 4,049,632, Cl. 260-75.0NE.
Magre, Eduard Pieter: *See*—
Oosterwijk, Hendrik Harm Jannes; Wiersum, Ulfert Elle; Magre, Eduard Pieter; and van Dijk, Johannes Hendrinus, 4,049,726, Cl. 260-649.00R.
Maher, James C.: *See*—
Pfister, Gustav R.; and Maher, James C., 4,050,027, Cl. 330-5.000.
Maitland, David Steven, to Hewlett-Packard Company. IGFET threshold voltage compensator. 4,049,980, Cl. 307-304.000.
Majewska, Janina; Grams, Wiktor; Rybicki, Zbigniew; and Banasiak, Jozef, to Instytut Wlokien Chemicznych. Method for purifying waste air from sulphuric gases, particularly in the production of viscose fibres. 4,049,775, Cl. 423-224.000.
Majorszki, Eva: *See*—
Schawartz, Jozsef; Hornyak, Maria; Majorszki, Eva; David, Agoston; and Horvath, Gabor, 4,049,639, Cl. 260-140.000.
Makap Limited: *See*—
Treanor, Eugene Joseph, 4,049,152, Cl. 220-209.000.
Maki, Tatuya: *See*—
Tujimoto, Hiroaki; Maki, Tatuya; Suganuma, Sadao; and Sano, Taketora, 4,049,556, Cl. 252-3.000.
Mallek, Heinz; Jablonski, Werner; and Augustin, Friedhelm, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Plant for burning waste. 4,048,927, Cl. 110-8.00R.

Malmedie & Co. Maschinenfabrik: *See*—
Faymonville, Ernst, 4,048,838, Cl. 72-405.000.
Maltese, Mario: *See*—
Schlaff, Norman; and Maltese, Mario, 4,049,911, Cl. 179-1.00H.
Mameniskis, Walter A.: *See*—
Sheng, Ming N.; and Mameniskis, Walter A., 4,049,724, Cl. 260-635.00H.
Manabe, Toshikatsu; Ohta, Masao; Kudo, Tetsuichi; Mochizuki, Shouji; and Gejyo, Tetsuo, to Hitachi, Ltd.; and Babcock-Hitachi K.K. Process for preparation of mixed oxide powders. 4,049,789, Cl. 423-593.000.
Mandel, George I. Toe clamp. 4,049,253, Cl. 269-137.000.
Manning, Harold E., to Petro-Tex Chemical Corporation. Dehydrogenation catalyst. 4,049,579, Cl. 252-455.00R.
Manufacturers Brush Company, The: *See*—
Samuelson, Ivar J., 4,048,765, Cl. 51-328.000.
Mao, Chung-Ling; and O'Shea, Francis X., to Uniroyal, Inc. Thermally stable polyurethane elastomer useful in molding flexible automobile exterior body parts. 4,049,636, Cl. 260-77.5CR.
Maranell, Melvin C., to Sta-Tite Corporation. Insulator for electric fences. 4,049,905, Cl. 174-163.00F.
Marans, Nelson Samuel; and Pollack, Alan Ricky, to W. R. Grace & Co. Biodegradable hydrophilic foams and method. 4,049,592, Cl. 260-2.5AD.
Marathon Electric Manufacturing Corporation: *See*—
Motten, Roger Henwood, Jr.; and LaFreniere, Larry Paul, 4,050,045, Cl. 337-187.000.
Marburg, Stephen: *See*—
Kollonitsch, Janos; and Marburg, Stephen, 4,049,708, Cl. 260-534.00C.
Marchand, Florian. Apparatus for trimming the nails. 4,049,009, Cl. 132-76.400.
Marchioro, Ignazio, to Escher Wyss Limited. Deflection compensating roll. 4,048,701, Cl. 29-116.0AD.
Marcy, Raymond, to Thomson-CSF. Automatic guidance system for moving objects. 4,049,961, Cl. 250-202.000.
Maringer, Robert E., to GTE Laboratories Incorporated. Apparatus for continuous casting. 4,049,042, Cl. 164-278.000.
Marsh, Dana G., to Xerox Corporation. Method for forming an electrophotographic member. 4,049,449, Cl. 96-1.50R.
Marsh, Norman F.; and Kelly, Warren H., to Dickey-john Corporation. Volumetric moisture tester. 4,050,016, Cl. 324-61.00R.
Marsh, Paul G., to Black Clawson Fibreclaim, Inc. Process for refuse dispoal and heat recovery therefrom. 4,049,391, Cl. 44-10.00R.
Marston Excelsior Limited: *See*—
Keen, John William, 4,049,047, Cl. 165-107.000.
Martan, Michael, to UOP Inc. Synthesis of diphenylmethane using phosphoric-sulfuric acid catalyst. 4,049,733, Cl. 260-668.00C.
Martin, Donald E., to Rexnord Inc. Synthetic flanged carrier roller. 4,049,308, Cl. 295-8.000.
Martin, Johannes Josef. Apparatus for discharging cinders from an incinerator. 4,048,928, Cl. 110-165.00R.
Martin, Thomas R., to Condes Corporation. Method and apparatus for denesting cartons. 4,048,915, Cl. 101-35.000.
Martin, Walter L., Jr.: *See*—
Dent, Joseph B., Jr.; Martin, Walter L., Jr.; and Bennett, Howard M., 4,049,412, Cl. 65-2.000.
Martino, Paul D.; and Barbre, Norris H., to Harsco Corporation. Method of forming a pipe coupling. 4,049,762, Cl. 264-94.000.
Maruzen Petrochemical Co. Ltd.: *See*—
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,049,538, Cl. 208-50.000.
Marvin Glass & Associates: *See*—
Breslow, Jeffrey D.; and Jaworski, Eugene, 4,049,272, Cl. 273-95.00R.
Marx, Alvin J. Brace apparatus. 4,048,991, Cl. 128-165.000.
Marx, Matthias: *See*—
Eisentraeger, Klaus; Immel, Guenther; Marx, Matthias; Reinhard, Hans; Spoor, Herbert; and Storck, Gerhard, 4,049,847, Cl. 427-207.00B.
Masae, Watanabe, to Yamaha Hatsudoki Kabushiki Kaisha. Shock absorbing strut assembly. 4,049,251, Cl. 267-64.00R.
Maschinenfabrik Augsburg-Nurnberg AG: *See*—
Seifert, Hans; Will, Kurt; and Zapf, Horst, 4,048,974, Cl. 123-191.00M.
Maschio, Joseph, to Master Machine & Manufacturing Co. Shrimp sheller. 4,048,696, Cl. 17-69.000.
Mason, Robert D.: *See*—
Lepp, Cyrus A.; Mason, Robert D.; and Ramsey, William S., 4,049,499, Cl. 195-100.000.
Massa, Frank, to Fred M. Dollorfano, Jr. and Donald P. Amassa, Trustees of The Stoneleigh Trust. Electroacoustic transducer design for eliminating phantom target errors in sound ranging systems. 4,050,056, Cl. 340-1.00R.
Massachusetts Institute of Technology: *See*—
Hong, Henry Y-P; and Goodenough, John B., 4,049,891, Cl. 429-193.000.
Masserant, Irvin F.: *See*—
Brilovich, Gregorio; and Masserant, Irvin F., 4,049,566, Cl. 252-62.540.
Master Machine & Manufacturing Co.: *See*—
Maschio, Joseph, 4,048,696, Cl. 17-69.000.
Mastermix Engineering Company Limited, The: *See*—
English, Robert William, 4,049,205, Cl. 241-67.000.
Masters, John Edward, to Celanese Polymer Specialties Company. Process for making powder coatings. 4,049,744, Cl. 260-837.00R.
Matherne, Charley F., to Lawrence Peska Associates, Inc. Reusable filter apparatus. 4,049,555, Cl. 210-409.000.
Mathna, Charles A.: *See*—
Loder, Harry A.; and Mathna, Charles A., 4,049,483, Cl. 156-230.000.
Matoba, Kazuo: *See*—
Togawa, Kinmochi; Takao, Hiroshi; Matoba, Kazuo; and Kishida, Katsuhiro, 4,049,524, Cl. 204-195.00S.
Matrix Engineering Limited: *See*—
Kent, Anthony John, 4,048,841, Cl. 72-450.000.
Matsuda, Hiyoshi: *See*—
Mineo, Masatoshi; Oka, Ken-ichiro; Nakagawa, Kiyoshi; Matsuda, Hiyoshi; Ohno, Shigeo; and Takagi, Yasuo, 4,049,763, Cl. 264-176.00F.
Matsuda, Nobuo: *See*—
Nakagawa, Tetsuo; Matsuda, Nobuo; Mitani, Kazumitsu; and Tanemoto, Toshiharu, 4,049,541, Cl. 208-127.000.
Matsuo, Masaaki: *See*—
Umio, Sumisori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,049,664, Cl. 260-294.80C.
Matsushita Electric Company of America: *See*—
Nakanishi, Mutsuo; and Schmidt, Hans, 4,050,050, Cl. 338-190.000.
Schmidt, Hans, 4,048,949, Cl. 116-124.300.
Matsushita Electric Industrial Co., Ltd.: *See*—
Ueno, Akihiko, 4,049,938, Cl. 219-10.55R.
Mattson, Arne, to Paul Anderson Industrier AB. Apparatus for obtaining substantially equal steplength of each jack in a group of pressure fluid operated climbing jacks. 4,049,237, Cl. 254-106.000.
Maurer, James I., to Oxy Metal Industries Corporation. Extended-life electrode. 4,049,526, Cl. 204-195.00M.
Maurer, John H., to United States of America, Air Force. Duct pressure actuated nozzle. 4,049,198, Cl. 239-265.390.
MAXPETERS Gesellschaft fur Verfahrenstechnik mbH: *See*—
Stamer, Walter; and Eichinger, Frithjof, 4,049,247, Cl. 266-182.000.
Maxwell, Earl G. Nestable non-corrosive container for pressurized beverages and processes for manufacture and handling thereof. 4,049,122, Cl. 206-519.000.
May, Randall L. Adjustable pitch drum. 4,048,895, Cl. 84-411.00A.
Mayo, Henry C. Anchor with independent pairs of flukes. 4,048,946, Cl. 114-307.000.
Mayville Engineering Company, Inc.: *See*—
Bachhuber, Theodore J.; and Bachhuber, Philip C., 4,048,899, Cl. 86-39.000.
McCall, Adrian W.; and Kellogg, William L. Tethered ball and shaft game device. 4,049,270, Cl. 273-95.00A.
McClocklin, Samuel B., to Owatonna Tool Company. Rotary valve. 4,049,019, Cl. 137-625.210.
McDaniels, Louis Marion: *See*—
Church, John Allen; Feinstein, Paul, Jr.; Hunt, Ronald Eugene; McDaniels, Louis Marion; and Munch, Paul Francis, 4,049,256, Cl. 271-9.000.
McDermott, Clifton Eugene. Dual identification card and identification card holder. 4,048,737, Cl. 40-2.200.
McDonald, Walter; Seitel, Norbert F.; and Ayres, John E. Operator-actuated elevating device. 4,049,081, Cl. 182-148.000.
McEntire, Edward E.; and Speranza, George P., to Texaco Development Corporation. Foams and elastomers prepared in the presence of high tertiary amine content polyurethane catalysts. 4,049,591, Cl. 260-2.5AC.
McFadyen, Robert J.; and Peil, William, to General Electric Company. AM-FM receiver having improved mode conversion. 4,050,022, Cl. 325-315.000.
McFadyen, Robert J., to General Electric Company. Electronic apparatus comprising an audio amplifier providing shunt voltage regulation. 4,050,029, Cl. 330-22.000.
McFarland, Archie Rae, to Beehive Machinery Inc. Process for the separation of fat from animal skins. 4,049,684, Cl. 260-412.000.
McGaffin, Andrew W. Multi-use furniture. 4,049,314, Cl. 297-130.000.
McGhee, John D., to Du Pont de Nemours, E. I., and Company. Drive for dynamic mechanical system. 4,049,997, Cl. 318-128.000.
McHenry, Edward R. Display sign and replaceable message. 4,048,738, Cl. 40-16.000.
McIlveen, Edward E.: *See*—
Ellers, Fred S.; Hally, Hugh G.; McIlveen, Edward E.; and Doble, William A., 4,048,807, Cl. 61-105.000.
McKee Bros. Limited: *See*—
McKee, Russell C., 4,049,204, Cl. 241-55.000.
McKee, Russell C., to McKee Bros. Limited. Fan for forage harvesting system. 4,049,204, Cl. 241-55.000.
McKenzie, Alexander J., III. Building structure. 4,048,770, Cl. 52-81.000.
McKenzie, Edwin Charles, to Babcock & Wilcox, Limited. Coal slurry drying apparatus. 4,049,203, Cl. 241-52.000.
McLoughlin, Bernard Joseph; and Guildford, Allen John, to Imperial Chemical Industries Limited. 2-Phenyl ethyl morpholine compounds. 4,049,808, Cl. 424-248.400.
McOnie, Malcolm Peter; Tucker, Anthony John Philip; and van Lienden, Peter Willem, to Imperial Chemical Industries Limited. Reactor and process for vinyl chloride polymerization. 4,049,895, Cl. 526-62.000.
Mead Corporation, The: *See*—
Wood, Prentice J., 4,049,189, Cl. 229-48.00R.
Mead Johnson & Company: *See*—
Wu, Yao Hua; and Lobeck, Walter G., 4,049,714, Cl. 260-564.00R.

Mead, Keith E.: *See*—
Hoover, William R.; Mead, Keith E.; and Street, Henry K., 4,049,864, Cl. 428-332.000.
Meckley, John R.: *See*—
Knowles, C. Harry; Meckley, John R.; and Naylor, Charles A., 4,050,037, Cl. 331-94.50D.
Medinger, Bernhard: *See*—
Elsener, Anton; Gehrt, Hans Harald; Medinger, Bernhard; and Wiese, Volkhard, 4,049,615, Cl. 260-39.00P.
Medlin, William K. Clamp apparatus. 4,049,166, Cl. 224-42.10G.
Meguro, Kanji: *See*—
Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, 4,049,812, Cl. 424-263.000.
Mehrhof, Werner: *See*—
Schacht, Erich; Mehrhof, Werner; Wild, Albrecht; Gante, Joachim; and Kurmeier, Hans-Adolf, 4,049,823, Cl. 424-308.000.
Meiller, Francois, to Rhone-Progil. Aromatic amino silanes and their polymers. 4,049,691, Cl. 260-448.20N.
Meindl, Hubert: *See*—
Hindermann, Peter; and Meindl, Hubert, 4,049,656, Cl. 260-256.50R.
Meitzner, Wolfgang: *See*—
Bach, Josef; Kollwig, Horst; Meitzner, Wolfgang; Weintritt, Horst; and Ueberdiek, Ralf, 4,049,209, Cl. 242-18.0PW.
Mejdell, Glor Thorvald; and Kjolberg, Sven Arne, to Norsk Hydro A.S. Process for precipitation of aluminum hydroxide from aluminate solution. 4,049,773, Cl. 423-127.000.
Melman, Kenneth J.: *See*—
Cotty, Val F.; Sterbenz, Francis J.; and Melman, Kenneth J., 4,049,803, Cl. 424-233.000.
Memorex Corporation: *See*—
Brilovich, Gregorio; and Masserant, Irvin F., 4,049,566, Cl. 252-62.540.
Menashi, Wilson P.: *See*—
Wenckus, Joseph F.; Menashi, Wilson P.; and Castonguay, Roger A., 4,049,384, Cl. 23-273.0SP.
Menear, Wallace C.: *See*—
Jaco, Charles M., Jr.; Menear, Wallace C.; and Clark, Donald W., 4,049,441, Cl. 75-35.000.
Menet, Albert: *See*—
Chabardes, Pierre; Julia, Marc; and Menet, Albert, 4,049,718, Cl. 260-590.00C.
Mercier, Serge: *See*—
Gueant, Auguste; and Mercier, Serge, 4,049,725, Cl. 260-638.00B.
Merck & Co., Inc.: *See*—
Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,049,559, Cl. 252-8.55D.
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Sasaki, Yutaka; Morii, Akimitsu; Nakamura, Yoshimi; Moriya, Kiyoshi; and Utsumi, Hiroshi, 4,049,575, Cl. 252-439.000.
Nakanishi, Mutsuo; and Schmidt, Hans, to Matsushita Electric Company of America. Adjustable potentiometer assembly. 4,050,050, Cl. 338-190.000.
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Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,049,538, Cl. 208-50.000.
Nakatui, Hiroshi: *See—*
Sato, Hiroshi; Okumura, Munehiro; Itani, Fujio; Fujii, Shouji; Kakuda, Tsutomu; and Nakatui, Hiroshi, 4,049,593, Cl. 260-2.50E.
Nakayama, Hiroo: *See—*
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.
Nakazawa, Makoto: *See—*
Shigematsu, Taichiro; Shibahara, Tetsuya; Nakazawa, Makoto; Tomida, Masayuki; and Munakata, Toshio, 4,049,820, Cl. 424-273.00P.
Nalco Chemical Company: *See—*
Hunter, Wood E.; and Sieder, Theodore P., 4,049,606, Cl. 260-29.4UA.
Naryshkin, Jury Anatolievich: *See—*
Pomeschikov, Andrei Grigorievich; Buryagin, Firs Alexandrovich; Kazantsev, Lev Seliverstovich; Skvortsov, Gennady Fedorovich; Naryshkin, Jury Anatolievich; and Gracheva, Zinaida Ivanovna, 4,049,901, Cl. 13-9.0ES.
Nason, George F., III; and Winter, Walter W., to Systex, Inc. Training system for telephone switchboard operators using computer central processing unit. 4,048,728, Cl. 35-8.00A.
National Blank Book Company, Inc.: *See—*
Wilson, Robert B., 4,049,119, Cl. 206-387.000.
National Distillers and Chemical Corporation: *See—*
Stiles, Claude J.; and Tomo, Daniel, 4,049,147, Cl. 215-12.00R.
National Petro Chemicals Corporation: *See—*
Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., 4,049,896, Cl. 526-129.000.
National Research Development Corporation: *See—*
Attwood, Alan; and Laithwaite, Eric Roberts, 4,049,983, Cl. 310-13.000.
Firth, Donald; and Cunningham, Sinclair Upton, 4,048,906, Cl. 91-491.000.
Hiles, Maurice Arthur Frederick, 4,049,396, Cl. 51-295.000.
Pettigrew, Robert Martin, 4,049,965, Cl. 250-237.00G.
National Semiconductor Corporation: *See—*
Russell, Ronald W., 4,050,030, Cl. 330-23.000.
Shieu, Mark S. D.; Johnson, Robert B.; and Laugesen, Ronald C., 4,049,979, Cl. 307-270.000.
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Navi, Menashe, to Adolph Gottscho, Inc. Apparatus for repetitive imprinting at uniform increments on a continuously moving web. 4,048,913, Cl. 101-27.000.
Naylor, Charles A.: *See—*
Knowles, C. Harry; Meckley, John R.; and Naylor, Charles A., 4,050,037, Cl. 331-94.50D.
NCR Corporation: *See—*
Giessner, Frank, 4,049,108, Cl. 197-1.00R.
Nebbia, Luciano: *See—*
Copperi, Maurizio; and Nebbia, Luciano, 4,049,917, Cl. 179-15.0AP.
Neff Folding Box Company: *See—*
Cope, Kenneth, 4,049,116, Cl. 206-176.000.
Negi, Virendra S.: *See—*
Miu, Ming T.; Negi, Virendra S.; and Lemay, Richard A., 4,050,097, Cl. 364-200.000.
Neidhardt, Manfred: *See—*
Bockstiegel, Gerd-Edzard; Neidhardt, Manfred; Rehfeld, Gerhard; and Umlauf, Werner, 4,049,397, Cl. 51-309.00A.
Neiman, S.A.: *See—*
Jawdoszyn, Claude, 4,049,932, Cl. 200-44.000.
Nekut, Edith Mayaud, to RCA Corporation. Reverse-printing method for producing cathode-ray-tube-screen structure. 4,049,452, Cl. 96-36.100.
Nelson, James E.: *See—*
Sullivan, John L.; Knauber, Veronica A.; and Nelson, James E., 4,049,164, Cl. 224-5.00W.
Nelson, Paul A.: *See—*
Vissers, Donald R.; Nelson, Paul A.; Kaun, Thomas D.; and Tomczuk, Zygmunt, 4,048,715, Cl. 29-623.500.
Nemechek, Alfred Emmerich: *See—*
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Petrov, Peter Dimitrov; and Punchev, Simeon Georgiev, 4,049,172, Cl. 226-90.000.
Nemeth, Janos: *See—*
Bole, Karoly; Nagy, Kalman; Aufsatz, Istvan; Bohnert, Jozsef; Branyi, Laszlo; Ilyes, Zoltan; Korbuly, Jozsef; and Nemeth, Janos, 4,048,803, Cl. 61-45.00D.

Neubert, Jurgen: *See—*
Armbrust, Ludwig; and Neubert, Jurgen, 4,049,860, Cl. 428-201.000.

Neumann, Barbara Susan, to Laporte Industries Limited. Production of magnesium silicates. 4,049,780, Cl. 423-331.000.

Neuzil, Richard W.; and deRoeset, Armand J., to UOP Inc. Process for separating esters of fatty acids by selective adsorption. 4,049,688, Cl. 260-428.000.

Neveux, Rene Elie, to Societe Anonyme Francaise du Ferodo. Vacuum control valve. 4,049,020, Cl. 137-625.110.

Newell, Thomas J., III: *See—*
Bottomley, William K., 4,049,798, Cl. 424-195.000.

Newlon, Robert L., to Lawrence Brothers Inc. Security hinge having adjustable cam operator and reciprocable cam follower actuated switch. 4,049,934, Cl. 200-61.700.

Newman, Donald John; and Dunphy, Gerald Francis, to Ogden Industries Pty. Limited. Hydraulic door closer with adjustable time delay dampener. 4,048,694, Cl. 16-52.000.

Neyret, Guy, to Societe Anonyme dite: Etablissements Genoud & Cie. Cigarette lighter with presale tamper protection. 4,049,370, Cl. 431-144.000.

Nicklin, Thomas; and Hughes, Dorothy, to British Gas Corporation. Method of removing hydrogen sulfide from gases and liquids. 4,049,776, Cl. 423-226.000.

Niesgoda, Tassilo: *See—*
Hank, Dietrich; Lipfert, Gerhard; and Niesgoda, Tassilo, 4,049,213, Cl. 242-57.100.

Nieuwenhoven, Hendricus Jacobus Cornelis: *See—*
van der Lely, Cornelis; and Nieuwenhoven, Hendricus Jacobus Cornelis, 4,048,769, Cl. 52-79.700.

Nightingale, Douglas John, to Rolls-Royce (1971) Limited. Nozzles for gas turbine engines. 4,049,199, Cl. 239-265.390.

Nigro, Louis V., to Gillette Company, The. Tampon inserter. 4,048,998, Cl. 128-263.000.

Nihon Koki Kabushi Kaisha: *See—*
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.

Nijman, John Peter, to Bunker Ramo Corporation. Conductor terminating apparatus. 4,048,710, Cl. 29-566.400.

Nikkai Giken Co., Ltd.: *See—*
Fukushima, Yoshikiyo; and Watanabe, Shigeru, 4,048,805, Cl. 61-56.000.

Nikolenko, Ignat Leontievich: *See—*
Axelrod, Iosif Maxovich; Alengoz, Anton Savvich; Luchko, Viktor Nikolaevich; Mukhin, Valentin Alexandrovich; Nikolenko, Ignat Leontievich; and Potapenko, Igor Alexandrovich, 4,048,693, Cl. 15-310.000.

Nikolov, Ivan Dimov; Kortenski, Hristo Georgiev; Dimitrov, Dimiter Tanev; and Antonov, Asparuh Mihaylov, to Institute po Metalosnanie i Technologia na Metalite pri Ban. Method of and apparatus for fluid die stamping. 4,049,041, Cl. 164-120.000.

Nipak, Inc.: *See—*
Kutschke, C. T., 4,049,480, Cl. 156-94.000.

Nippert Company, The: *See—*
Nippert, Russell A., 4,049,185, Cl. 228-155.000.

Nippert, Russell A., to Nippert Company, The. Method of forming double extruded mount. 4,049,185, Cl. 228-155.000.

Nippon Chemical Industrial Co., Ltd.: *See—*
Tujimoto, Hiroaki; Maki, Tatuya; Suganuma, Sadao; and Sano, Taketora, 4,049,556, Cl. 252-3.000.

Nippon Concrete Industries Co. Ltd.: *See—*
Fukushima, Yoshikiyo; and Watanabe, Shigeru, 4,048,805, Cl. 61-56.000.

Nippon Electric Company, Ltd.: *See—*
Noguchi, Tsutomu; Akaiwa, Yoshihiko; and Katoh, Hidehiko, 4,050,038, Cl. 333-1.100.
Sakoe, Hiroaki, 4,049,913, Cl. 179-1.0SD.

Nippon Electric Glass Company, Limited: *See—*
Shimizu, Hiroshi; Nishidai, Jun; and Yasuta, Toru, 4,049,899, Cl. 13-6.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Gocho, Makio; Ota, Masanori; and Kuraishi, Tatsuo, 4,048,849, Cl. 73-105.000.
Mori, Toshihiro; and Ando, Seigo, 4,050,011, Cl. 324-40.000.
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.

Nippon Steel Corporation: *See—*
Nakamura, Kunio; and Takahashi, Mitsuo, 4,049,439, Cl. 75-24.000.

Nippon Telegraph and Telephone Public Corporation: *See—*
Takano, Riku; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.

Nippon Zeon Co., Ltd.: *See—*
Yamazaki, Masahiro, 4,049,765, Cl. 264-261.000.

Nirschl, Joseph C., to United States of America, Army. Range switching circuit for solid state electrometer. 4,050,019, Cl. 324-115.000.

Nishidai, Jun: *See—*
Shimizu, Hiroshi; Nishidai, Jun; and Yasuta, Toru, 4,049,899, Cl. 13-6.000.

Nishikawa, Eiichiroh: *See—*
Itoh, Takuji; Nishikawa, Eiichiroh; Miura, Tadashi; and Yamahata, Takashi, 4,049,581, Cl. 252-466.0PT.

Nishikawa, Yoshio: *See—*
Nakai, Shiro; and Nishikawa, Yoshio, 4,049,011, Cl. 133-1.00A.

Nishimura Seisakusho Co., Ltd.: *See—*
Yamaguchi, Toshiaki; and Shoji, Jinichi, 4,049,212, Cl. 242-56.900.
Yamaguchi, Toshiaki; and Shoji, Jinichi, 4,049,214, Cl. 242-75.510.

Nishina, Tutomu: *See—*
Ogawa, Hiroshi; Tamai, Yasuo; and Nishina, Tutomu, 4,049,871, Cl. 428-425.000.

Nishiyama, Keisuke: *See—*
Harimoto, Takeshi; and Nishiyama, Keisuke, 4,049,527, Cl. 204-198.000.

Nishizawa, Hisao: *See—*
Tanabe, Osamu; Nishizawa, Hisao; and Hata, Kazuo, 4,049,345, Cl. 355-41.000.

Nissan Motor Company: *See—*
Harada, Masanori; Katou, Shinzo; and Hayashi, Nobuyuki, 4,048,966, Cl. 123-117.00A.

Nissan Motor Company, Limited: *See—*
Aoyama, Syuniti, 4,048,968, Cl. 123-119.00A.
Togawa, Kimmochi; Takao, Hiroshi; Matoba, Kazuo; and Kishida, Katsuhiro, 4,049,524, Cl. 204-195.00S.

Nissen, Axel; Fliege, Werner; and Voges, Dieter, to BASF Aktiengesellschaft. Manufacture of a catalyst composition containing zinc and nickel or cobalt. 4,049,571, Cl. 252-430.000.

Nitto Chemical Industry Co., Ltd.: *See—*
Sasaki, Yutaka; Morii, Akimitsu; Nakamura, Yoshimi; Moriya, Kiyoshi; and Utsumi, Hiroshi, 4,049,575, Cl. 252-439.000.

Nitto Electric Industrial Co., Ltd.: *See—*
Hori, Yutaka; Honda, Zenzo; Suzuki, Kenji; Nakamoto, Keiji; and Yamamoto, Yoshiharu, 4,049,904, Cl. 174-107.000.

Nnadi, John C.; and Landis, Phillip S., to Mobil Oil Corporation. Substituted maleimide lubricant additives and lubricant compositions made therewith. 4,049,565, Cl. 252-51.50A.

Noguchi, Tsutomu; Akaiwa, Yoshihiko; and Katoh, Hidehiko, to Nippon Electric Company, Ltd. Edge-guided mode non-reciprocal circuit element for microwave energy. 4,050,038, Cl. 333-1.100.

Nomura, Toshio: *See—*
Yamamoto, Takaharu; Nomura, Toshio; Asai, Tsuyoshi; and Hara, Akio, 4,049,876, Cl. 428-932.000.

Norcon Electronics Inc.: *See—*
Schlaff, Norman; and Maltese, Mario, 4,049,911, Cl. 179-1.00H.

Nordemann, Bernhard: *See—*
Konig, Rolf; Nordemann, Bernhard; and Motek, Herbert, 4,049,206, Cl. 241-73.000.

Norman, Donald O.: *See—*
Shriver, Joe E.; and Norman, Donald O., 4,048,792, Cl. 56-98.000.

Norsk Hydro A.S.: *See—*
Mejdell, Glor Thorvald; and Kjolberg, Sven Arne, 4,049,773, Cl. 423-127.000.

North American Philips Corporation: *See—*
Francis, Gaylord L.; and Morelli, Amedeo J., 4,050,053, Cl. 338-332.000.

Northern Electric Company Limited: *See—*
Laing, Graham Stirling; and Ito, Shiro Tom, 4,049,925, Cl. 179-99.000.

Northern Telecom Limited: *See—*
Chu, Pak-Jong; and Audette, Jacques Marcel, 4,049,924, Cl. 179-90.00R.
Levi, Israel, 4,049,928, Cl. 179-170.00R.

Nothmann, Gerhard A., to Addressograph-Multigraph Corporation. Moisture system control apparatus. 4,048,920, Cl. 101-148.000.

Novar Electronics Corporation: *See—*
Ott, James H., 4,048,986, Cl. 128-2.00R.

Nozari, Mohammad S., to Minnesota Mining and Manufacturing Company. Abrasion resistant coatings. 4,049,861, Cl. 428-220.000.

Nunan, Denis M. Combination removable release ski binding. 4,049,291, Cl. 280-614.000.

Nyhus, Orville K., to Rockwell International Corporation. Signal combining apparatus. 4,050,072, Cl. 343-121.000.

Nystrom, Walter Albert, to Dresser Industries, Inc. Slip-type pliers tool. 4,048,878, Cl. 81-409.000.

O-3 Company: *See—*
Harter, Joseph William; and Beitzel, Stuart Wallace, 4,049,707, Cl. 250-531.000.

Oberlin, Claude: *See—*
Hatteter, Andre; Oberlin, Claude; and Strobel, Pierre, 4,049,443, Cl. 75-66.000.

Obidniak, Louis. Water filtration module. 4,049,550, Cl. 210-152.000.

Ochi, Kazushi: *See—*
Seko, Maomi; Miyake, Tetsuya; Inada, Kohji; Ochi, Kazushi; and Sakamoto, Tomio, 4,049,769, Cl. 423-7.000.

Oda, Tatsuro: *See—*
Adachi, Terufumi; and Oda, Tatsuro, 4,049,517, Cl. 204-159.180.

Oden, Laurance L.; Sanker, Philip E.; and Russell, James H., to United States of America, Interior. Method for producing supported Raney nickel catalyst. 4,049,580, Cl. 252-466.00J.

Odermann, Charles R.; Peterson, Wesley R.; Herr, John A.; and Porter, Oswald M., to Singer Company, The. Bight stop mechanism for sewing machines. 4,048,932, Cl. 112-158.00E.

Ogawa, Hiroshi; Tamai, Yasuo; and Nishina, Tutomu, to Fuji Photo Film Co., Ltd. Magnetic recording material. 4,049,871, Cl. 428-425.000.

Ogden Industries Pty. Limited: *See—*
Newman, Donald John; and Dunphy, Gerald Francis, 4,048,694, Cl. 16-52.000.

Ogisu, Kenji: *See—*
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Fujita, Tadao, 4,049,507, Cl. 204-39.000.

Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Enomoto, Masahisa, 4,049,530, Cl. 204-273.000.

Ohkubo, Kazuo: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,049,645, Cl. 260-239.00B.

Ohno, Shigeo: *See—*
Mineo, Masatoshi; Oka, Ken-ichiro; Nakagawa, Kiyoshi; Matsuda, Hiyoshi; Ohno, Shigeo; and Takagi, Yasuo, 4,049,763, Cl. 264-176.00F.

Ohsawa, Misuo, to Sony Corporation. MPX stereo signal demodulator. 4,049,918, Cl. 179-15.0BT.

Ohta, Masao: *See—*
Manabe, Toshikatsu; Ohta, Masao; Kudo, Tetsuichi; Mochizuki, Shouji; and Gejyo, Tetsuo, 4,049,789, Cl. 423-593.000.

Oka, Ken-ichiro: *See—*
Mineo, Masatoshi; Oka, Ken-ichiro; Nakagawa, Kiyoshi; Matsuda, Hiyoshi; Ohno, Shigeo; and Takagi, Yasuo, 4,049,763, Cl. 264-176.00F.

Okamoto, Hiroyuki; Tsuda, Yoshio; and Yokoyama, Kazumasa, to Green Cross Corporation, The. Method of preparing labelled vegetable oil. 4,049,683, Cl. 260-410.700.

Okamoto, Kenzi, to Fujitsu Ten Limited. Apparatus for shifting the magnetic tape head in a multitrack tape player. 4,050,089, Cl. 360-106.000.

Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, to Mitsubishi Chemical Industries Limited; and Okamoto, Shosuke. N^2-naphthalenesulfonyl-L-arginine derivatives, and the pharmaceutically acceptable acid addition salts thereof. 4,049,645, Cl. 260-239.00B.

Oki Electric Industry Co., Ltd.: *See—*
Kishi, Hajimu; and Takahashi, Masashi, 4,050,001, Cl. 318-625.000.

Okita, Koichi; and Sakane, Isamu, to Sumitomo Electric Industries, Ltd. Porous films of polytetrafluoroethylene and process for producing said films. 4,049,589, Cl. 260-2.50M.

Okonite Company, The: *See—*
Ellers, Fred S.; Hally, Hugh G.; McIlveen, Edward E.; and Doble, William A., 4,048,807, Cl. 61-105.000.

Okubo, Hiroshi: *See—*
Ito, Akihiko; Kaetsu, Isao; Okubo, Hiroshi; Kato, Masamichi; Hayashi, Koichiro; and Maeda, Yuji, 4,049,867, Cl. 428-412.000.

Okuda, Hiroshi, to Sony Corporation. Apparatus for selecting playback or recording modes in magnetic recording and/or reproducing apparatus. 4,050,088, Cl. 360-96.000.

Okumura, Munehiro: *See—*
Sato, Hiroshi; Okumura, Munehiro; Itani, Fujio; Fujii, Shouji; Kakuda, Tsutomu; and Nakatui, Hiroshi, 4,049,593, Cl. 260-2.50E.

Oldenburg, Dorrance; and Fischer, Robert L., to Caterpillar Tractor Co. Chain delimber assembly for tree harvester. 4,049,032, Cl. 144-2.00Z.

Olin Corporation: *See—*
Watson, W. Gary; and Breedis, John F., 4,049,426, Cl. 75-153.000.

Olinkraft, Inc.: *See—*
Harris, Thomas C.; and DeCrane, Charles E., 4,049,028, Cl. 141-10.000.

Olivier, Daniel E.: *See—*
Valenziano, Frank P.; and Olivier, Daniel E., 4,048,779, Cl. 52-726.000.

O'Nan, Alex, Jr.: *See—*
Goldsmith, Jesse M.; and O'Nan, Alex, Jr., 4,049,405, Cl. 55-479.000.

O'Neill, James L., to Merkert Enterprises, Inc. Mailing and storage box. 4,049,190, Cl. 206-611.000.

Ono, Fumio; and Aoyama, Yasuo, to Kikkoman Shoyu Co., Ltd. Novel composition containing fats or oils and method for manufacturing same. 4,049,831, Cl. 426-72.000.

Ono, Kenichi: *See—*
Kobashi, Toshiyuki; Ozaki, Masahiko; Ono, Kenichi; and Abe, Noboru, 4,049,605, Cl. 260-29.6AN.

Oosterwijk, Hendrik Harm Jannes; Wiersum, Ulfert Elle; Magre, Eduard Pieter; and van Dijk, Johannes Hendrinus, to Akzona Incorporated. Fire retardant compounds. 4,049,726, Cl. 260-649.00R.

Orban, Jean: *See—*
Vital, Zoltan; and Orban, Jean, 4,049,996, Cl. 315-151.000.

Ordonez, Marino Paneda. Lifting mechanisms for truck bodies. 4,049,316, Cl. 298-22.00B.

Oregon Patent Development Company: *See—*
Arff, John H., 4,049,552, Cl. 210-192.000.

Orelup, Richard B., to Morton-Norwich Products, Inc. Colored petroleum-derived product. 4,049,393, Cl. 44-59.000.

Orion Research Incorporated: *See—*
Ross, James W., Jr.; and Diggens, Albert A., 4,049,382, Cl. 23-230.00R.

O'Rourke, James L. Toothbrush with dentifrice attachment. 4,049,354, Cl. 401-134.000.

Osaki, Tatsuo: *See—*
Kawakami, Koichi; and Osaki, Tatsuo, 4,049,155, Cl. 221-192.000.

O'Shea, Francis X.: *See—*
Mao, Chung-Ling; and O'Shea, Francis X., 4,049,636, Cl. 260-77.5CR.

Ostbergs Fabriks AB: *See—*
Forslund, Erik Torsten, 4,048,733, Cl. 37-2.00R.

Ostermayer, Franz: *See—*
Jaeggi, Knut A.; Schroter, Herbert; and Ostermayer, Franz, 4,049,797, Cl. 424-180.000.

Osterreichisch-Amerkianische Magnesit Aktiengesellschaft: *See—*
Mortl, Gunther Lorenz; Werthmann, Eckhart; and Zoglmeyr, Gunther, 4,049,461, Cl. 106-56.000.

Ostrenko, Viktor Yakovlevich: *See—*
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich. 4,049,184, Cl. 228-131.000.

Osuga, Motoyuki: *See—*
Yanagisawa, Takeshi; and Osuga, Motoyuki, 4,050,066, Cl. 340-388.000.

Ota, Masanori: *See—*
Gocho, Makio; Ota, Masanori; and Kuraishi, Tatsuo, 4,048,849, Cl. 73-105.000.

Otis Engineering Corporation: *See—*
Arendt, Henry P., 4,049,052, Cl. 166-183.000.

Ott, James H., to Novar Electronics Corporation. Individual identification and diagnosis using wave polarization. 4,048,986, Cl. 128-2.00R.

Otto, Kenneth Wayne; and Hatten, Jimmy L., to Du Pont de Nemours, E. I., and Company. Chlorination of butadiene. 4,049,729, Cl. 260-654.00H.

Otzen, Karl G., to Safety-Kleen Corporation. Safety device for open receptacle. 4,049,551, Cl. 210-163.000.

Ouska, Ralph C.; and Bertaud, Francois X., to Stephens-Adamson, Inc. Subassembly cartridge for sealing and adjusting bearing assemblies. 4,049,328, Cl. 308-187.100.

Overhead Door Corporation: *See—*
Dietrich, Alfred T.; and Galbreath, Gerald W., 4,049,311, Cl. 296-24.00R.

Owatonna Tool Company: *See—*
McClocklin, Samuel B., 4,049,019, Cl. 137-625.210.

Owens-Illinois, Inc.: *See—*
Bower, Thomas E., 4,049,120, Cl. 206-396.000.
Go, Santos W., 4,049,631, Cl. 260-75.00S.
Moid, Donald F.; and Rice, Ronald G., 4,049,049, Cl. 165-165.000.
Moid, Donald F.; and Rice, Ronald G., 4,049,050, Cl. 165-165.000.
Pei, Yu Kun, 4,048,982, Cl. 126-271.000.
Pei, Yu Kun, 4,048,983, Cl. 126-271.000.

Owings, Peter Russell; Beckering, Jacobus Jan; and Bunyea, Roderick Francis, to Black and Decker Manufacturing Company, The. Modular cordless tools. 4,050,003, Cl. 320-2.000.

Oxy Metal Industries Corporation: *See—*
Maurer, James I., 4,049,526, Cl. 204-195.00M.

Oy Innovation Services Co.: *See—*
Hatakka, Vesa; and Sarvela, Jussi, 4,049,143, Cl. 214-390.000.

Oy Tampella AB: *See—*
Romantschuk, Hakan Wilhelm; and Vuojolainen, Tuomo Juhani, 4,049,787, Cl. 423-563.000.

Ozaki, Masahiko: *See—*
Kobashi, Toshiyuki; Ozaki, Masahiko; Ono, Kenichi; and Abe, Noboru, 4,049,605, Cl. 260-29.6AN.

Package Products Company, Inc.: *See—*
Castleman, Howard H.; and Stewart, Henry G., 4,048,736, Cl. 40-2.00R.

Pagliaro, Vincent A.; and Walters, Richard G., to Printing Developments, Inc. Composite developer-etch composition for chromium-plated lithographic printing plates. 4,049,453, Cl. 96-36.300.

Paitson, John Lloyd; and Anderson, Clifford E., to Western Geophysical Co. of America. Marine acoustic pulse train signal generator. 4,049,078, Cl. 181-120.000.

Palmer, Ansell W.: *See—*
Germer, Warren R.; and Palmer, Ansell W., 4,050,020, Cl. 324-116.000.

Parker, Kenneth O., to Garrett Corporation, The. Heat exchanger with variable thermal response core. 4,049,051, Cl. 165-166.000.

Pasbrig, Max, to Lacrex Brevetti S.A. Coin holder. 4,049,115, Cl. 206-.840.

Pascente, Joseph E. Solid-state voltage switching circuit. 4,049,976, Cl. 307-252.00T.

Patel, Harish A., to Kendall Company, The. Disposable cold pack for blood specimen. 4,049,408, Cl. 62-4.000.

Patel, Kanti D., to Mortell Company. Weldable corrosion resistant primer material. 4,049,600, Cl. 260-22.0EP.

Patterson, W. W., III; and Grapes, Eugene F. Container lash systems. 4,048,938, Cl. 114-75.000.

Pattison, Victor A.: *See—*
Pawlak, Joseph A.; Lemper, Anthony L.; and Pattison, Victor A., 4,049,629, Cl. 260-47.00C.

Paufve, Eldred H., to Universal Instruments Corporation. Sequence component tester. 4,050,017, Cl. 324-73.0AT.

Paul Anderson Industrier AB: *See—*
Mattson, Arne, 4,049,237, Cl. 254-106.000.

Paulus, Wilfried; Scheinpflug, Hans; and Genth, Hermann, to Bayer Aktiengesellschaft. 2-Amino-1,3-thiazines their use and preparation. 4,049,807, Cl. 424-246.000.

Pawlak, Joseph A.; Lemper, Anthony L.; and Pattison, Victor A., to Hooker Chemicals & Plastics Corporation. Solution polycondensation method. 4,049,629, Cl. 260-47.00C.

Pawlikowski, Stanley Leonard; and Penird, Carl William, to GTE Sylvania Incorporated. CRT screen exposure device utilizing improved light means. 4,050,080, Cl. 354-1.000.

Pearl, David R., to Gerber Garment Technology, Inc. Cutter mechanism for cutting sheet material. 4,048,891, Cl. 83-528.000.

Pechmeze, Jacques Pierre Edmond, to Produits Chimiques Ugine Kuhlmann. Process for dyeing synthetic fibers formed from aromatic polyesters and new monoazo dyestuffs useful for such dyeing. 4,049,375, Cl. 8-41.00C.

Peck, Gregory George Alexander, to Identicar Corporation of America. Stenciling apparatus and identification system. 4,048,918, Cl. 101-114.000.

Peck, Richard John, to Bell Telephone Laboratories, Incorporated. Digital modulator. 4,049,909, Cl. 178-67.000.

Peerman, Dwight E.; Swan, Dale G.; and Kanten, H. Gordon, to General Mills Chemicals, Inc. Amino-poly(amidazoline-amide). 4,049,598, Cl. 260-18.00N.

Pegnim, Timothy C.; France, Larry R.; Sherman, John G.; and MacQuignon, Claude, to Cambridge Instrument Company, Inc. Electrocardiographic apparatus with recording pen protector. 4,050,079, Cl. 346-145.000.

Pei, Yu Kun, to Owens-Illinois, Inc. Bulb-type solar energy collector. 4,048,982, Cl. 126-271.000.

Pei, Yu Kun, to Owens-Illinois, Inc. Solar energy collector apparatus. 4,048,983, Cl. 126-271.000.

Peil, William: *See*—
McFadyen, Robert J.; and Peil, William, 4,050,022, Cl. 325-315.000.

Peisner, Israel Daniel, to Whitehead & Kales Company. Hook. 4,049,229, Cl. 248-503.000.

Pemberton, Robert E. Friction drive. 4,048,863, Cl. 74-229.000.

Penird, Carl William: *See*—
Pawlikowski, Stanley Leonard; and Penird, Carl William, 4,050,080, Cl. 354-1.000.

Pennsylvania Engineering Corporation: *See*—
Ziegler, Joseph, 4,049,246, Cl. 266-158.000.

Pennwalt Corporation: *See*—
Sandler, Stanley R., 4,049,612, Cl. 260-31.80R.

Pennzoil Company: *See*—
Kidwell, Louis E., Jr., 4,049,893, Cl. 526-26.000.

Penton, Harold Roy, Jr., to Akzona Incorporated. Method for improving disperse dyeability of polyesters and product thereof. 4,049,633, Cl. 260-75.00T.

Pentti, Heikki, to Kemi Oy. Method of curing plastic raw materials impregnated in a porous stuff such as wood. 4,049,850, Cl. 427-377.000.

Penzien, Klaus: *See*—
Fleig, Helmut; Hagen, Helmut; Naarmann, Herbert; and Penzien, Klaus, 4,049,622, Cl. 260-2.5HB.

Perego, Giuseppe, to Perego-Pines S.p.A. Baby carriage foldable in width and shortenable in height so as to be easily carried on a person's arm like an umbrella. 4,049,292, Cl. 280-642.000.

Perego-Pines S.p.A.: *See*—
Perego, Giuseppe, 4,049,292, Cl. 280-642.000.

Perino B. Wingfield: *See*—
Burks, Howard L., 4,049,154, Cl. 221-76.000.

Perkin-Elmer Corporation, The: *See*—
Dolgen, Igor E., 4,049,134, Cl. 214-29.000.
Helms, Charles Carlyle, 4,049,987, Cl. 313-112.000.

Perkin-Elmer Limited: *See*—
Ford, Michael Alan, 4,049,970, Cl. 250-461.00B.

Perklev, Torsten: *See*—
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,799, Cl. 424-211.000.
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,800, Cl. 424-211.000.

Perrey, Hermann; Schulze, Jurgen; Rosenkranz, Hans Jurgen; Rudolph, Hans; and Hornle, Reinhold, to Bayer Aktiengesellschaft. Dyestuff preparations. 4,049,378, Cl. 8-87.000.

Persson, Lennart Gerhard, to AB Akerlund & Rausing. Package. 4,049,188, Cl. 229-14.0BL.

Peterpaul, Joseph, to Thomas & Betts Corporation. Die means having workpiece releasing means. 4,048,839, Cl. 72-412.000.

Peters, Arnold: *See*—
Skrypek, John P.; and Peters, Arnold, 4,048,917, Cl. 101-40.000.

Petersen, Ross K. Air supply apparatus. 4,048,911, Cl. 98-39.000.

Peterson, David C., to Upjohn Company, The. 9-Deoxy-PGD-type, 1,15-lactones. 4,049,678, Cl. 260-343.410.

Peterson, Glenn E.; Emerson, Robert T.; and Schoenlein, William J., to Columbia Ribbon & Carbon Mfg. Co., Inc. Direct ribbon inking by gravure. 4,048,952, Cl. 118-6.000.

Peterson, Paul F., to United States of America, Air Force. Ejector rack for nuclear stores. 4,049,222, Cl. 244-137.00R.

Peterson, Wesley R.: *See*—
Odermann, Charles R.; Peterson, Wesley R.; Herr, John A.; and Porter, Oswald M., 4,048,932, Cl. 112-158.00E.

Petro-Tex Chemical Corporation: *See*—
Kerr, Ralph O.; and Barone, Bruno J., 4,049,574, Cl. 252-437.000.
Manning, Harold E., 4,049,579, Cl. 252-455.00R.

Petrolite Corporation: *See*—
Wagner, Oliver, 4,049,520, Cl. 204-186.000.
Winslow, Joseph D., Jr., 4,049,535, Cl. 204-305.000.

Petrov, Peter Dimitrov: *See*—
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Petrov, Peter Dimitrov; and Punchev, Simeon Georgiev, 4,049,172, Cl. 226-90.000.

Petter, Franz: *See*—
Baumann, Jan; and Petter, Franz, 4,049,363, Cl. 416-157.00B.

Pettigrew, Robert Martin, to National Research Development Corporation. Measurement apparatus. 4,049,965, Cl. 250-237.00G.

Pettipher, Rodney; Viellevoye, Lucien Nicolas Leon; and Kruithof, Albert, to International Standard Electric Corporation. Call load sharing system between a plurality of data processing units. 4,050,095, Cl. 364-200.000.

Pettit, Marshall G. Condition-responsive spring driven actuator. 4,050,047, Cl. 337-408.000.

Pfister, Gustav R.; and Maher, James C., to Xerox Corporation. Optical signal amplifier. 4,050,027, Cl. 330-5.000.

Pfizer Inc.: *See*—
Froberg, Robert W., 4,048,953, Cl. 118-49.000.

Pfluger, Erich: *See*—
Freissmuth, Alfred; Heinl, Walter; Knahl, Herbert; and Pfluger, Erich, 4,049,442, Cl. 75-55.000.

Philagro: *See*—
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.

Phillips Petroleum Company: *See*—
Cleary, James W., 4,049,635, Cl. 260-75.00R.
Drehman, Lewis E.; and Farha, Floyd, Jr., 4,049,743, Cl. 260-681.50R.
Fromm, Ellsworth H.; and Murray, Norman R., 4,049,021, Cl. 137-625.310.
Kraus, Wayne P.; and Hutson, Thomas, Jr., 4,049,728, Cl. 260-653.600.
Moczygemba, George A., 4,049,753, Cl. 260-880.00B.
Wier, Donald R., 4,049,054, Cl. 166-273.000.

Physics International Company: *See*—
Godfrey, Charles S., 4,049,056, Cl. 166-299.000.

Pictorial Machinery Limited: *See*—
Austin, Cecil Alfred, 4,049,346, Cl. 355-45.000.

Pielemeier, John William, to Whirlpool Corporation. Ramped scrubbing vanes for auger agitator. 4,048,820, Cl. 68-133.000.

Pierce, John H., to John Pierce Co., Inc., The. Strand winding apparatus. 4,049,210, Cl. 242-18.00R.

Pierrel, Michel: *See*—
Fort, Pierre Henri Marie; and Pierrel, Michel, 4,049,043, Cl. 164-295.000.

Pierron, Claude Raymond: *See*—
Bonnard, Louis Antoine; and Pierron, Claude Raymond, 4,048,888, Cl. 83-89.000.

Piers, Eugene. Couplings for metal tubes. 4,049,295, Cl. 285-9.00M.

Piette, Leonard A., to Unipas, Inc. Apparatus for assembling an encapsulated wet motor circulator. 4,048,717, Cl. 29-732.000.

Pike, Leslie Clark: *See*—
Creasey, Norman Geoffrey; and Pike, Leslie Clark, 4,049,873, Cl. 428-447.000.

Pillon, Daniel Jean: *See*—
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.

Pipe Line Development Co., The: *See*—
Spisak, John A., 4,049,234, Cl. 251-149.900.

Pisarkiewicz, Tadeusz: *See*—
Dunikowski, Andrzej; Bednarczyk, Jan; Keska, Jerzy; Pisarkiewicz, Tadeusz; and Zamarski, Andrzej, 4,048,844, Cl. 73-32.00R.

Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, to International Flavors & Fragrances Inc. Processes for preparing enol esters. 4,049,682, Cl. 260-410.000.

Piusz, Peter G.: *See*—
Chu, Nori Y. C.; and Piusz, Peter G., 4,049,567, Cl. 252-300.000.

Piziali, Robert L.: *See*—
Korner, Anneliese F.; Piziali, Robert L.; and Ellsworth, Orval T., 4,048,684, Cl. 5-370.000.

Plain Brown Wrapper, Inc.: *See*—
Griffin, Donald C., 4,048,675, Cl. 2-93.000.

Plaza, Mario G.; and Trezise, Richard D., to Xerox Corporation. Print member carriage assembly. 4,049,109, Cl. 197-53.000.

Plessey Handel und Investments A.G.: *See*—
Williams, John Lloyd; Leaman, Roger John; Moberly, Robert Valentine; Stagg, Geoffrey Brian Kenneth; and Wisdom, Graham John, 4,050,059, Cl. 364-200.000.

Plessey Incorporated: *See*—
Frazee, Lawrence E., 4,050,048, Cl. 338-35.000.

Plevak, Lubomir: *See*—
Elsner, Burckhardt; Plevak, Lubomir; Lagodka, Gunter; and Rosenberg, Harry, 4,048,804, Cl. 61-45.00D.

Plumat, Emile; Baudin, Pol; Posset, Robert; and Autequitte, Jean-Marie, to Glaverbel-Mecaniver. Heat insulating screen. 4,048,978, Cl. 126-200.000.

Plumlee, Karl W.; and Vernon, Lonnie W., to Exxon Research & Engineering Co. Coal liquefaction process. 4,049,536, Cl. 208-10.000.

Plumlee, Karl W.; and Vernon, Lonnie W., to Exxon Research & Engineering Co. Coal liquefaction process. 4,049,537, Cl. 208-10.000.

Pohl, Siegfried: *See*—
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,049,394, Cl. 48-62.00R.
Gernhardt, Paul; Grams, Wolfgang; Pohl, Siegfried; and Danguillier, Wilhelm, 4,049,570, Cl. 252-373.000.

Pohlke, Rolf, to Merck Patent Gesellschaft mit beschrankter Haftung. Process for the preparation of 4-oxo-hexahydro-pyrazinoisoquinoline derivatives. 4,049,659, Cl. 260-268.0TR.

Polaroid Corporation: *See*—
Greenwald, Richard B., 4,049,450, Cl. 96-29.00R.

Politycki, Alfred; and Hieber, Konrad, to Siemens Aktiengesellschaft. Coating device for small electrically conductive components. 4,048,954, Cl. 118-49.100.

Pollack, Alan Ricky: *See*—
Marans, Nelson Samuel; and Pollack, Alan Ricky, 4,049,592, Cl. 260-2.5AD.

Polomski, John; Schulz, Willis Lorenz; and Specht, Victor Joseph, to Borg-Warner Corporation. Centrifugal and torque responsive lock up clutch for couplings. 4,049,094, Cl. 192-3.310.

Polychrome Corporation: *See*—
Chu, Simon L.; and Golda, Eugene, 4,049,504, Cl. 204-38.00A.

Pomagalski S.A.: *See*—
Thibaudon, Bruno, 4,049,999, Cl. 318-305.000.

Pomeschikov, Andrei Grigorievich; Buryagin, Firs Alexandrovich; Kazantsev, Lev Seliverstovich; Skvortsov, Gennady Fedorovich; Naryshkin, Jury Anatolievich; and Gracheva, Zinaida Ivanovna. Electroslag furnace. 4,049,901, Cl. 13-9.0ES.

Ponder & Best, Inc.: *See*—
Vital, Zoltan; and Orban, Jean, 4,049,996, Cl. 315-151.000.

Pont-A-Mousson S.A.: *See*—
Fort, Pierre Henri Marie; and Pierrel, Michel, 4,049,043, Cl. 164-295.000.
Sutter, Jean Georges, 4,050,000, Cl. 318-468.000.

Pool, Robert B. Lacross stick and preformed netting therefor. 4,049,273, Cl. 273-96.00D.

Poppe, Richard L.: *See*—
Childress, David L.; Hayes, William V.; and Poppe, Richard L., 4,049,577, Cl. 252-443.000.

Porter, John H., to Ladd Research Industries, Inc. Mixer for products contained in sealed envelopes. 4,049,242, Cl. 259-72.000.

Porter, Oswald M.: *See*—
Odermann, Charles R.; Peterson, Wesley R.; Herr, John A.; and Porter, Oswald M., 4,048,932, Cl. 112-158.00E.

Portier, Jean Louis, to Soletanche. Axial and annular magneto-elastic dynamometers. 4,048,851, Cl. 73-141.00A.

Portion Packaging Limited: *See*—
Johansen, Poul Egon, 4,048,781, Cl. 53-30.00R.

Porucznik, Paul: *See*—
Franek, Jozef Tadeusz; and Porucznik, Paul, 4,049,261, Cl. 271-269.000.

Posner, Israel, to E-C Apparatus Corporation. Electrophorectic apparatus for elution from preparative gels. 4,049,534, Cl. 204-299.00R.

Posset, Robert: *See*—
Plumat, Emile; Baudin, Pol; Posset, Robert; and Autequitte, Jean-Marie, 4,048,978, Cl. 126-200.000.

Potapenko, Igor Alexandrovich: *See*—
Axelrod, Iosif Maxovich; Alengoz, Anton Savvich; Luchko, Viktor Nikolaevich; Mukhin, Valentin Alexandrovich; Nikolenko, Ignat Leontievich; and Potapenko, Igor Alexandrovich, 4,048,693, Cl. 15-310.000.

Potoski, John R.: *See*—
Freed, Meier E.; and Potoski, John R., 4,049,701, Cl. 560-130.000.

Potts, Walter C. Extractor device. 4,049,307, Cl. 294-99.00R.

Powell, B. J.: *See*—
Savage, Donald D., 4,049,072, Cl. 180-64.00M.

PPG Industries, Inc.: *See*—
Brodmann, George, 4,049,870, Cl. 428-424.000.
Dent, Joseph B., Jr.; Martin, Walter L., Jr.; and Bennett, Howard M., 4,049,412, Cl. 65-2.000.
Dent, Joseph B., Jr., 4,049,415, Cl. 65-11.00W.
Long, David M.; and Dent, Joseph B., Jr., 4,049,411, Cl. 65-2.000.
Maaghul, John, 4,049,865, Cl. 428-391.000.
Motsinger, Donald L., 4,049,597, Cl. 260-18.0EP.
Schimmel, Karl F.; and Wismer, Marco, 4,049,637, Cl. 260-78.0TF.
Traister, Andrew; and Troup, Glenn, 4,049,596, Cl. 260-18.0EP.

Prater, Charles D.: *See*—
Kuo, James C.; Prater, Charles D.; and Wise, John J., 4,049,741, Cl. 260-676.00R.

Pratt, Albert R., to Raytheon Company. Knob with lock release means. 4,049,097, Cl. 192-8.00R.

Pratt, Wayne F., to K.A.L. Manufacturing Corporation. Welding apparatus. 4,049,943, Cl. 219-74.000.

Preobrazhensky, Alexandr Yakovlevich: *See*—
Vereschagin, Leonid Fedorovich; Yakovlev, Evgeny Nikolaevich; Varfolomeeva, Tatyana Dmitrievna; Preobrazhensky, Alexandr Yakovlevich; Slesarev, Vladislav Nikolaevich; Stepanov, Vasily Alexandrovich; and Shterenberg, Ljudmila Efimovna, 4,049,783, Cl. 423-446.000.

Prescher, Dietrich: *See*—
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.

Pressmaster Ltd.: *See*—
Undin, Hans, 4,048,877, Cl. 81-313.000.

Presto Lock Company, Division of Walter Kidde & Company, Inc.: *See*—
Bako, Lazlo; and Wingert, Rudolf, 4,048,821, Cl. 70-25.000.

Pribish, Bernard A.: *See*—
Morse, Donald B.; and Pribish, Bernard A., 4,048,887, Cl. 83-79.000.

Prible, Glen Virgil, to Combustion Engineering, Inc. Pipe insulation. 4,049,371, Cl. 432-234.000.

Price, Ellie Edward, Jr. Laterally engagable and releasable nut assembly. 4,048,897, Cl. 85-33.000.

Priefert Mfg. Co.: *See*—
Priefert, William D., 4,048,961, Cl. 119-96.000.

Priefert, William D., to Priefert Mfg. Co. Squeeze bar structure for a cattle chute. 4,048,961, Cl. 119-96.000.

Priest, John Garrick; and Tooth, Robert Barry, to Johnson, Matthey & Co., Limited. Vacuum transfer head and method of use. 4,049,484, Cl. 156-285.000.

Prince, Paul R.; Skehan, Bernard J.; and Hansen, Jay M., to Hughes Aircraft Company. Automatic light control system. 4,050,085, Cl. 358-219.000.

Printing Developments, Inc.: *See*—
Pagliaro, Vincent A.; and Walters, Richard G., 4,049,453, Cl. 96-36.300.

Pristelski, Stanley. Water tank heated by smoke from a furnace. 4,048,962, Cl. 122-20.00B.

Pritchett, Donald H. Fuel injection system. 4,048,971, Cl. 123-139.00R.

Procter & Gamble Company, The: *See*—
Collier, Everett J., 4,049,586, Cl. 252-532.000.
Elsnau, Walter Hugh, 4,049,792, Cl. 424-66.000.
Heckert, David Clinton, 4,049,585, Cl. 252-531.000.
Murphy, Alan P., 4,049,858, Cl. 428-136.000.

Produits Chimiques Ugine Kuhlmann: *See*—
Gueant, Auguste; and Mercier, Serge, 4,049,725, Cl. 260-638.00B.
Le Pape, Alain Yves, 4,049,376, Cl. 8-162.00R.
Pechmeze, Jacques Pierre Edmond, 4,049,375, Cl. 8-41.00C.
Schirmann, Jean-Pierre; and Weiss, Francis, 4,049,712, Cl. 260-554.000.
Weiss, Jean; and Zalmanski, Alain, 4,049,628, Cl. 260-47.0UA.

Prohoroff, Jack P.: *See*—
Hernandez, Armando C.; and Prohoroff, Jack P., 4,049,005, Cl. 131-187.000.

Prokai, Bela: *See*—
Kanner, Bernard; and Prokai, Bela, 4,049,674, Cl. 260-332.100.
Kanner, Bernard; and Prokai, Bela, 4,049,675, Cl. 260-332.100.

Prolizenz AG: *See*—
Schmidt, Walter, 4,049,250, Cl. 266-275.000.

Pugliese, Peter T., to Milmark Research, Inc. Bovine teat dip. 4,049,830, Cl. 424-343.000.

Pulker, Hans: *See*—
Lardon, Marcel; and Pulker, Hans, 4,049,352, Cl. 356-73.000.

Pullman Incorporated: *See*—
Glassmeyer, John J., 4,049,135, Cl. 214-38.0CC.

Punchev, Simeon Georgiev: *See*—
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Petrov, Peter Dimitrov; and Punchev, Simeon Georgiev, 4,049,172, Cl. 226-90.000.

Putter, Rolf: *See*—
Sundermann, Rudolf; Putter, Rolf; and Grigat, Ernst, 4,049,630, Cl. 260-47.00R.

Quack, Hans, to Sulzer Brothers Ltd. Refrigerating plant using helium as a refrigerant. 4,048,814, Cl. 62-335.000.

Quaker Oats Company, The: *See*—
Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., 4,049,832, Cl. 426-72.000.

Quast, Kenneth J.: *See*—
Rice, John F.; Yundt, Albert P.; and Quast, Kenneth J., 4,049,457, Cl. 96-88.000.

Quatrini, L. Rita; and MacInnis, Martin B., to GTE Sylvania Incorporated. Extraction process for recovery of rhenium. 4,049,771, Cl. 423-49.000.

Raab, Richard; Spindler, Kurt; Brand, Herbert; and Gast, Leonard, to DIEHL. Separating device for removing the press skin from a combined extrusion disc. 4,048,832, Cl. 72-255.000.

Raber, Ervin T.: *See*—
Mosley, Gerald; and Raber, Ervin T., 4,050,065, Cl. 340-347.0NT.

Radovsky, Jonathan Samuel, to RCA Corporation. Phase-splitter. 4,049,977, Cl. 307-262.000.

Rafferty, Edson D.: *See*—
Kletschka, Harold D.; and Rafferty, Edson D., 4,049,002, Cl. 128-318.000.

Raghavachari, Srinivas T.; and Striebel, Robert L., II, to MPL, Inc. Syringe with actinic radiation protection. 4,048,997, Cl. 128-215.000.

Rakowicz, Jan Antoni; and Harrison, Brian, to Molins Limited. Devices for applying adhesives to a moving web. 4,048,950, Cl. 118-6.000.

Ralston, Philip G., Jr., to Baxter Travenol Laboratories, Inc. Molded collapsible solution container. 4,049,033, Cl. 105-.500.

Ramberg, Kjell Oystein; and Kirknes, Bjorn, to Simrad A.S. Mechanism for gauging the catch within a trawl net. 4,048,850, Cl. 73-133.00R.

Ramsey, William S.: *See*—
Lepp, Cyrus A.; Mason, Robert D.; and Ramsey, William S., 4,049,499, Cl. 195-100.000.

Randell, Donald Richard: *See*—
Holt, Brian; and Randell, Donald Richard, 4,049,647, Cl. 542-426.000.

Rao, Bhaskara M. L.; and Silbernagel, Bernard G., to Exxon Research & Engineering Co. Solid electrolyte composition and cell. 4,049,881, Cl. 429-50.000.

Raschke, Curt R., to Addressograph-Multigraph Corporation. Electrostatic printing/duplicating method using polarization forces. 4,048,921, Cl. 101-426.000.

Raskin S.A.: *See*—
Aeschbach, Fritz, 4,048,890, Cl. 83-146.000.

Rasmussen, Hjorth, to Colgate-Palmolive Co. Free flowing phosphate ester compositions for post addition to detergents. 4,049,558, Cl. 252-8.900.

Rath, Heinrich Bernhard, to Girling Limited. Vehicle disc brakes. 4,049,086, Cl. 188-73.300.

Raudat, John L.; and Johnson, Lloyd D., to Emhart Industries, Inc. Case loader with invert grid and pushdown feature. 4,048,783, Cl. 53-61.000.

Ray, Lynn L. Racket string clamp. 4,049,268, Cl. 273-73.00A.

Raychem Corporation: *See—*
Schweiso, Robert J., 4,049,151, Cl. 220-201.000.
Siden, Dennis C., 4,049,334, Cl. 339-97.00R.

Raymond Lee Organization, Inc., The: *See—*
Blackmon, Macy B., 4,048,824, Cl. 70-456.00R.
Lawrence, James R., 4,048,756, Cl. 49-171.000.

Raynaud, Guy M.: *See—*
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,658, Cl. 260-268.0PC.
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,660, Cl. 260-268.0PC.

Raytheon Company: *See—*
Backman, William R., Jr.; and Chramiec, Mark A., 4,050,057, Cl. 340-3.00F.
Pratt, Albert R., 4,049,097, Cl. 192-8.00R.

RCA Corporation: *See—*
Bloom, Allen; and Bartolini, Robert Alfred, 4,049,459, Cl. 96-115.00R.
Clorfeine, Alvin Seymour, 4,050,071, Cl. 343-8.000.
Goodman, Alvin Malcolm, 4,050,018, Cl. 324-110.000.
Hang, Kenneth Warren, 4,049,872, Cl. 428-427.000.
Ladany, Ivan, 4,049,994, Cl. 313-499.000.
Law, Harold Bell, 4,049,451, Cl. 96-36.100.
Leedom, Marvin Allan, 4,049,280, Cl. 274-37.000.
Lozier, Gerald Scott; and Branin, Phyllis Brown, 4,049,845, Cl. 427-68.000.
Nekut, Edith Mayaud, 4,049,452, Cl. 96-36.100.
Radovsky, Jonathan Samuel, 4,049,977, Cl. 307-262.000.

Reagan, William J.; and Chen, Nai Y., to Mobil Oil Corporation. Hydrocarbon conversion catalyst. 4,049,578, Cl. 252-455.00R.

Reagan, William Joseph: *See—*
Chen, Nai Yuen; and Reagan, William Joseph, 4,049,735, Cl. 260-668.00R.

Reed Building Products, Pty. Limited: *See—*
Brookes, Cyril James, 4,048,676, Cl. 4-1.000.

Reesman, Stanley H.; and Eldred, Charles R., to General Foods Corporation. Process for preparing an expanded soy product. 4,049,840, Cl. 426-634.000.

Refratechnik GmbH: *See—*
Tutsek, Alexander; and Bartha, Peter, 4,049,464, Cl. 106-288.00B.

Regenbogen, Eberhard, to Richard Wolf GmbH. Shutter for a rectoscope. 4,048,988, Cl. 128-4.000.

Rehfeld, Gerhard: *See—*
Bockstiegel, Gerd-Edzard; Neidhardt, Manfred; Rehfeld, Gerhard; and Umlauf, Werner, 4,049,397, Cl. 51-309.00A.

Rei, Nuno M.; and Wilson, Ronald C., to Ventron Corporation. Microbiocidal compositions comprising a solution of a phenoxarsine compound. 4,049,822, Cl. 424-297.000.

Reica Kogyo Kabushiki Kaisha: *See—*
Taniguchi, Toru, 4,049,241, Cl. 259-4.0AC.

Reichelt, Walter; and Sauer, Gunter, to W. C. Heraeus GmbH. Electrical temperature measuring resistor structure, particularly for resistance thermometers. 4,050,052, Cl. 338-308.000.

Reid, Robert, to Daymond Limited. Structural member for a structural frame. 4,049,082, Cl. 182-217.000.

Reinecke, Erich, to WABCO Westinghouse GmbH. Safety circuit arrangement for wheel anti-skid brake control system. 4,049,325, Cl. 303-92.000.

Reinhard, Hans: *See—*
Eisentraeger, Klaus; Immel, Guenther; Marx, Matthias; Reinhard, Hans; Spoor, Herbert; and Storck, Gerhard, 4,049,847, Cl. 427-207.00B.

Rejto, Thomas. Simultaneous transfer printing and embossing or surface texturing method. 4,049,374, Cl. 8-2.50A.

Rek, Johannes Henricus Maria, to Lever Brothers Company. Process for the separation of triglycerides in an aqueous system. 4,049,687, Cl. 260-428.000.

Rekers, Louis J.; Katzen, Stanley J.; and Krekeler, Jerome H., to National Petro Chemicals Corporation. Olefin polymerization catalyst. 4,049,896, Cl. 526-129.000.

Remington Arms Company, Inc.: *See—*
Alday, James Marion; and Rowlands, Kenneth Charles, 4,048,976, Cl. 124-47.000.

REMIX Radiotechnikai Vallalat: *See—*
Kadar, Ferenc; and Galambos, Gyula, 4,050,051, Cl. 338-202.000.

Rene Cosson S.A.: *See—*
Buljovcic, Stephan, 4,048,922, Cl. 102-92.700.

Reneau, Bobby J. Pipe coupling apparatus. 4,049,297, Cl. 285-24.000.

Rennhack, Rolf: *See—*
Bierbach, Herbert; Dittmar, Heinz; Heinz, Ernst; Hohmann, Klaus; and Rennhack, Rolf, 4,049,788, Cl. 423-592.000.

Research Corporation: *See—*
Fox, Charles L., Jr., 4,049,802, Cl. 424-229.000.

Restaino, Alfred Joseph, to ICI United States Inc. Stabilized polymerizable compositions. 4,049,731, Cl. 260-666.500.

Reuting, Hans-Werner; and Eggers, Hugo, to Elmeg Elektro-Mechanik GmbH. Electromagnetic system. 4,050,043, Cl. 335-237.000.

Rexnord Inc.: *See—*
Martin, Donald E., 4,049,308, Cl. 295-8.000.

Reynolds Metals Company: *See—*
Wallace, Joseph W., 4,048,934, Cl. 113-120.00H.

Reznikov, Efim Abramovich: *See—*
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.

RFD Systems Engineering Limited: *See—*
Edwards, Michael John, 4,048,730, Cl. 35-25.000.

Rhea, Charles K., Jr.: *See—*
Byrne, John A.; Rhea, Charles K., Jr.; and Fleming, Thomas F., 4,049,950, Cl. 235-61.60R.

Rhomberg, Alfred: *See—*
Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, 4,049,811, Cl. 424-258.000.

Rhone-Poulenc Industries: *See—*
Collet, Paul, 4,049,716, Cl. 260-573.000.

Rhone-Poulenc, S.A.: *See—*
Chabardes, Pierre; Julia, Marc; and Menet, Albert, 4,049,718, Cl. 260-590.00C.

Rhone-Progil: *See—*
Meiller, Francois, 4,049,691, Cl. 260-448.20N.

Rhoton, Albert L.: *See—*
Goodale, Clark W.; Morgan, Charles W.; and Rhoton, Albert L., 4,049,848, Cl. 427-244.000.

Rice, John F.; Yundt, Albert P.; and Quast, Kenneth J., to Bard Laboratories, Inc. Photosensitive composition of polynitrate ester, aromatic amines and organic esters. 4,049,457, Cl. 96-88.000.

Rice, Ronald G.: *See—*
Mold, Donald F.; and Rice, Ronald G., 4,049,049, Cl. 165-165.000.
Mold, Donald F.; and Rice, Ronald G., 4,049,050, Cl. 165-165.000.

Richard Wolf GmbH: *See—*
Regenbogen, Eberhard, 4,048,988, Cl. 128-4.000.

Richardson Company, The: *See—*
Muzyczko, Thaddeus M.; Frederiksen, Ronald A.; and York, David L., 4,049,746, Cl. 260-851.000.

Riches, Arthur John, to Bunker Ramo Corporation. Hand tool. 4,048,874, Cl. 81-57.310.

Richey, Vernon T. Apparatus for reducing annular back pressure near the drill bit. 4,049,066, Cl. 175-323.000.

Ricoh Company, Ltd.: *See—*
Isayama, Takuro; and Kubo, Kikuo, 4,050,078, Cl. 346-140.00R.
Tagawa, Kazuaki, 4,048,957, Cl. 118-653.000.

Ridley, Spriggs and Johnson Limited: *See—*
Johnson, Martin Robert, 4,048,819, Cl. 66-177.000.

Rieger, Georg: *See—*
Heinen, Richard; and Rieger, Georg, 4,048,875, Cl. 81-125.000.

Rieter Machine Works, Ltd.: *See—*
Spescha, Gelli, 4,049,211, Cl. 242-45.000.

Rigollot, Georges Alfred, to Agence Nationale de Valorisation de la Recherche (ANVAR). Anti-polluting power plant using compressors and gas turbines. 4,049,299, Cl. 290-52.000.

Rineer, Arthur E. Wind-driven rotor assembly. 4,049,362, Cl. 416-119.000.

Ring, Maurice Frank: *See—*
Beveridge, John; Davies, Thomas Roderick Harries; Fidler, Fred; and Ring, Maurice Frank, 4,048,935, Cl. 113-120.00F.

Ring, Michael: *See—*
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,049,491, Cl. 162-101.000.

Ringers, Hendrik Johan; and Segers, Jacobus Cornelis, to Lever Brothers Company. Degumming process for triglyceride oils. 4,049,686, Cl. 260-424.000.

Risi, Rene, to Bulova Watch Company, Inc. Timepiece calendar mechanism. 4,048,795, Cl. 58-4.00R.

Ritchie, William Barney, Jr.: *See—*
Bowley, Wallace William, 4,048,802, Cl. 61-5.000.

Ritter, Helmut, to Heberlein Maschinenfabrik AG. Drive with continuously adjustable speed variation. 4,048,864, Cl. 74-230.17F.

Ritter, Lawrence: *See—*
Haeger, Bruce Edwin; Krueger, James Elwood; Lowery, James Alfred; and Ritter, Lawrence, 4,049,809, Cl. 424-250.000.

Rivers, Richard D., to American Air Filter Company, Inc. Fluid filter housing and assembly. 4,049,406, Cl. 55-484.000.

Robert Bosch GmbH: *See—*
Bianchi, Valerio; Latsch, Reinhard; and Schmidt, Peter, 4,048,965, Cl. 123-32.0EA.
Krumbein, Fritz, 4,049,340, Cl. 352-166.000.
Stumpp, Gerhard, 4,048,967, Cl. 123-119.00A.
Worz, Paul, 4,048,972, Cl. 123-148.00D.

Roberts, David B., Jr.; and Wells, Joseph L. Hydroponic garden structure. 4,048,753, Cl. 47-59.000.

Roberts, Thomas Ernest Edwin, to Lucas Industries Limited. Rotary hydraulic machine having a valve responsive to rotor bore pressure and stator port pressure. 4,048,903, Cl. 91-6.500.

Robinson, C. Paul; Rockwood, Stephen D.; Jensen, Reed J.; Lyman, John L.; and Aldridge, Jack P., III, to United States of America, Energy Research and Development Administration. Laser isotope separation by multiple photon absorption. 4,049,515, Cl. 204-157.10R.

Robinson, Fred: *See—*
Steckler, Robert; Robinson, Fred; and Farmer, Robert F., III, 4,049,608, Cl. 260-29.6SQ.

Robinson, Norman: *See—*
Harper, Douglas Charles; Robinson, Norman; and Janikowski, Stanislaw Maria, 4,049,774, Cl. 423-167.000.

Rochester Button Company, The: *See—*
Hodgins, Howard A., 4,048,931, Cl. 112-121.270.

Rochestie, Barnett B., to Royal Engineering Company. Carpet sample display apparatus. 4,049,125, Cl. 211-47.000.

Rock, Steven L., to Rohm and Haas Company. Decolorization of effluents from pulp mills. 4,049,546, Cl. 210-30.00R.

Rockwell International Corporation: *See—*
Alers, George A.; and Thompson, Robert B., 4,048,847, Cl. 73-67.50R.
Anderson, Dean T.; and Vanous, Joseph A., 4,049,914, Cl. 179-2.50R.
Babcock, Gary D., 4,048,859, Cl. 73-516.00R.
Burton, C. Shepherd; Harker, Alan B.; and Ho, William W., 4,049,383, Cl. 23-232.00E.
Molina, Orlando G., 4,049,568, Cl. 252-301.190.
Nyhus, Orville K., 4,050,072, Cl. 343-121.000.

Rockwood, Stephen D.: *See—*
Robinson, C. Paul; Rockwood, Stephen D.; Jensen, Reed J.; Lyman, John L.; and Aldridge, Jack P., III, 4,049,515, Cl. 204-157.10R.

Roden, William A.; and Criger, Glenn L., to General Dynamics Corporation. Welding back-up tape. 4,049,183, Cl. 228-50.000.

Rodgers, Leonard John, to Rolls-Royce Limited. Ejector sleeves for aircraft mounted gas turbine engines. 4,049,220, Cl. 244-53.00R.

Rogers, Walter Clark, Jr., to Royal Development Company, Inc. Sofa bed and linkage mechanism. 4,048,680, Cl. 5-37.00R.

Rohde, Wolfgang; and Siebert, Werner, to Bergwerksverband GmbH. Method of charging a plurality of coking ovens. 4,049,141, Cl. 214-152.000.

Rohm and Haas Company: *See—*
Rock, Steven L., 4,049,546, Cl. 210-30.00R.

Rohrig, Josef: *See—*
Konig, Justus; Rohrig, Josef; and Hilliges, Friedrich, 4,049,922, Cl. 179-18.0AB.

Rolf Sporting Goods, Inc.: *See—*
Halverson, Lance K., 4,049,126, Cl. 211-104.000.

Rolls-Royce Limited: *See—*
Rodgers, Leonard John, 4,049.220, Cl. 244-53.00R.

Rolls-Royce (1971) Limited: *See—*
Nightingale, Douglas John, 4,049,199, Cl. 239-265.390.
Smith, Stanley, 4,049,401, Cl. 55-184.000.
Snell, Leonard Stanley, 4,049,360, Cl. 415-149.00R.

Roman, Steven A., to Shell Oil Company. Esters of nitro(tetrahydro-2H-1,3-thiazin-2-ylidene)acetic acid. 4,049,652, Cl. 544-54.000.

Romantschuk, Hakan Wilhelm; and Vuojolainen, Tuomo Juhani, to Oy Tampella AB. Process for separating sulphur in the form of hydrogen sulphide from clarified green liquor obtained from the combustion of waste liquor. 4,049,787, Cl. 423-563.000.

Rondeau, Benjamin G.: *See—*
Spencer, Clark V.; and Rondeau, Benjamin G., 4,048,837, Cl. 72-387.000.

Roose, Gerald L. Bale carrying and unrolling device. 4,049,140, Cl. 214-147.00G.

Ropp, Richard C., to Allied Chemical Corporation. Crystalline salt monomers for stable phosphate glasses. 4,049,779, Cl. 423-309.000.

Rose, Harold T.: *See—*
Schrader, William L.; and Rose, Harold T., 4,049,131, Cl. 214-14.000.

Rosenberg, Harry: *See—*
Elsner, Burckhardt; Plevak, Lubomir; Lagodka, Gunter; and Rosenberg, Harry, 4,048,804, Cl. 61-45.00D.

Rosenberg, William E., to Columbia Chemical Corporation. Baths and additives for the electrodeposition of bright zinc. 4,049,510, Cl. 204-55.00R.

Rosenkranz, Hans Jurgen: *See—*
Perrey, Hermann; Schulze, Jurgen; Rosenkranz, Hans Jurgen; Rudolph, Hans; and Hornle, Reinhold, 4,049,378, Cl. 8-87.000.
Schuster, Karl Ernst; Rosenkranz, Hans Jurgen; and Rudolph, Hans, 4,049,745, Cl. 260-837.00R.

Rosenquist, Kurt E.: *See—*
Hyman, David L.; Cayton, Robert J.; and Rosenquist, Kurt E., 4,049,038, Cl. 160-166.00A.

Ross, James W., Jr.; and Diggens, Albert A., to Orion Research Incorporated. Total residual chlorine. 4,049,382, Cl. 23-230.00R.

Ross, Joseph; and Fuchs, Ernest F., to Ace Envelope Manufacturing Corporation. Removable impeller assembly for printing press centrifugal pump. 4,049,364, Cl. 417-360.000.

Rossi, John P., to CBS Inc. Comb filter for television signals having adaptive features. 4,050,084, Cl. 358-31.000.

Rossmiller, Lawrence E.; and Gemar, George D. Swing mount pivotally supporting width gauge from vehicle. 4,049,062, Cl. 172-126.000.

Rote, Everett Arthur, to Xerox Corporation. Pin crimping apparatus and product therefrom. 4,048,718, Cl. 29-739.000.

Rotenberg, Don H.: *See—*
Laurin, Bernard L.; Rotenberg, Don H.; and Crandon, Harry D., 4,049,868, Cl. 428-412.000.

Rothe. Rudolf; and Kohler, Johann, to HAG Aktiengesellschaft. Method for transferring a highly compressed gas from a reactor to a storage tank with condensation of the gas. 4,049,409, Cl. 62-9.000.

Roulet, Pierre Alfred: *See—*
Fluckiger, Jean-Louis; and Roulet, Pierre Alfred, 4,049,946, Cl. 219-131.00R.

Rowbotham, Edwin M.: *See—*
Gale, Ronald J.; and Rowbotham, Edwin M., 4,049,037, Cl. 152-427.000.

Rowlands, Kenneth Charles: *See—*
Alday, James Marion; and Rowlands, Kenneth Charles, 4,048,976, Cl. 124-47.000.

Royal Development Company, Inc.: *See—*
Rogers, Walter Clark, Jr., 4,048,680, Cl. 5-37.00R.

Royal Engineering Company: *See—*
Rochestie, Barnett B., 4,049,125, Cl. 211-47.000.

Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich. Method of manufacturing polymetallic pipes. 4,049,184, Cl. 228-131.000.

Rubin, Fred Kurt, to Lever Brothers Company. Method and compositions for removal of hard surface manganese ion-derived discolorations. 4,049,467, Cl. 134-2.000.

Rudbeck, Per-Olof Bertil, to Saab-Scania, Scania Division. Storage arrangement for vehicles. 4,049,312, Cl. 296-28.00A.

Rudolph, Hans: *See—*
Perrey, Hermann; Schulze, Jurgen; Rosenkranz, Hans Jurgen; Rudolph, Hans; and Hornle, Reinhold, 4,049,378, Cl. 8-87.000.
Schuster, Karl Ernst; Rosenkranz, Hans Jurgen; and Rudolph, Hans, 4,049,745, Cl. 260-837.00R.

Rudy, Erwin: *See—*
Yih, Stephen Wei Hong; Worcester, Samuel Austin, Jr.; and Rudy, Erwin, 4,049,380, Cl. 428-539.500.

Rugenstein, Robert W. Solar heated building structure. 4,049,195, Cl. 237-1.00A.

Rumm, Arnold. Flexible squeeze dispenser for liquid sealant. 4,049,160, Cl. 222-215.000.

Rundle, Frederick Stanley, to Shepard Niles Crane & Hoist Corporation. Electromagnetic brake assembly. 4,049,089, Cl. 188-171.000.

Russell, Donald H.; and Kremer, Charles J., to Atlantic Richfield Company. Permanent waving of human hair by means of crosslinking urethane and/or hydroxamate derived from reactive acrylic resins and adipodinitrile carbonate. 4,049,007, Cl. 132-7.000.

Russell, Herman F.: *See—*
Fullenkamp, Anthony L.; and Russell, Herman F., 4,048,689, Cl. 15-3.170.

Russell, James H.: *See—*
Oden, Laurance L.; Sanker, Philip E.; and Russell, James H., 4,049,580, Cl. 252-466.00J.

Russell, Ronald W., to National Semiconductor Corporation. Offset adjustment circuit. 4,050,030, Cl. 330-23.000.

Russell (Shears) Limited: *See—*
Gunson, Brennand, 4,048,721, Cl. 30-254.000.

Rybicki, Zbigniew: *See—*
Grams, Wiktor; Rybicki, Zbigniew; and Banasiak, Jozef, 4,049,775, Cl. 423-224.000.

Ryer, Jack; Zielinski, James; Miller, Harold N.; and Brois, Stanley J., to Exxon Research & Engineering Co. Oxazoline derivatives as additives useful in oleaginous compositions. 4,049,564, Cl. 252-51.50A.

Ryusho Sangyo Kabushiki: *See—*
Sakakibara, Kaichi; and Sumida, Hiroyuki, 4,048,852, Cl. 73-193.00R.

S. C. Johnson & Son, Inc.: *See—*
Broadbent, David J., 4,049,460, Cl. 106-15.00R.
Lo, Vincent; Vos, Kenneth D.; and Suchla, Germane M., 4,049,158, Cl. 222-95.000.

Saab-Scania, Scania Division: *See—*
Rudbeck, Per-Olof Bertil, 4,049,312, Cl. 296-28.00A.

Saari, Oliver Edward, to Illinois Tool Works Inc. Mechanical device converting rotary input to linear compression or stretching output with a high mechanical advantage. 4,048,867, Cl. 74-424.80B.

Safety-Kleen Corporation: *See—*
Otzen, Karl G., 4,049,551, Cl. 210-163.000.

Safety Racing Equipment, Incorporated: *See—*
Blunier, Donald E., 4,049,085, Cl. 188-18.00A.

SAFT-Societe des Accumulateurs Fixes et de Traction: *See—*
Flender, Jacques, 4,049,888, Cl. 429-115.000.

Sagalyn, Paul L.; and Alexander, Michael N., to United States of America, Army. Spectrometer for external detection of magnetic and related double resonance. 4,050,009, Cl. 324-.5AC.

Saginaw Products Corporation: *See—*
Francis, George W., Jr., 4,049,286, Cl. 280-179.00R.

Saillant, Roger B.; and Weber, Neill, to Ford Motor Company. Thermoelectric generator. 4,049,877, Cl. 429-11.000.

Saint-Gobain Industries: *See—*
Guissard, Jean, 4,049,167, Cl. 225-2.000.

Saitner, Rudolf: *See—*
Bunge, Wilhelm; Last, Wolf-Dieter; Saitner, Rudolf; and Wolf, Karlheinz, 4,049,610, Cl. 260-31.20N.

Saito, Kenji: *See—*
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.

Saito, Shinroku: *See—*
Tominaga, Hiroshi; Yasunami, Kazuo; Saito, Shinroku; Takamatsu, Masanobu; and Sawaoka, Akira, 4,049,367, Cl. 425-77.000.

Saito, Tamaki: *See—*
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.

Sakakibara, Kaichi; and Sumida, Hiroyuki, to Kabushiki Kaisha Takuma; and Ryusho Sangyo Kabushiki. Integrating calorimeter. 4,048,852, Cl. 73-193.00R.

Sakamoto, Tomio: *See—*
Seko, Maomi; Miyake, Tetsuya; Inada, Kohji; Ochi, Kazushi; and Sakamoto, Tomio, 4,049,769, Cl. 423-7.000.

Sakane, Isamu: *See—*
Okita, Koichi; and Sakane, Isamu, 4,049,589, Cl. 260-2.50M.

Sakoe, Hiroaki, to Nippon Electric Company, Ltd. System for recognizing speech continuously spoken with number of word or words preselected. 4,049,913, Cl. 179-1.0SD.

Salen & Wicander Terminalsystem AB: *See—*
Strombeck, Per, 4,049,132, Cl. 214-14.000.

Salomon, Georges Pierre Joseph. Ski-binding. 4,049,290, Cl. 280-613.000.

Salonimer, David J.; and Kelley, Buster E., to United States of America, Air Force. Passive optical transponder. 4,049,969, Cl. 250-458.000.

Salter, Larry, to Briles, Paul R., a part interest. Fastener for multi metal stack-ups. 4,048,898, Cl. 85-77.000.

Sammarco, Peter: *See—*
Storm, Donald P.; Sammarco, Peter; Fritz, Edward A.; and Mackert, Robert J., 4,049,207, Cl. 241-101.700.

Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Petrov, Peter Dimitrov; and Punchev, Simeon Georgiev, to Institute po Zavaryavane. Planetary wire-feeding mechanism for electric arc-welding applications. 4,049,172, Cl. 226-90.000.

Samuelson, Ivar J., to Manufacturers Brush Company, The. Non-cellular polyurethane wheel in a process for finishing a metal workpiece. 4,048,765, Cl. 51-328.000.

Sanda, Shoogo; and Nakamura, Norihiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine provided with precombustion chamber. 4,048,973, Cl. 123-191.0SP.

Sander, Nils Borje Lennart: *See—*
Stjarne, Anders Olov Gunnar; and Sander, Nils Borje Lennart, 4,049,088, Cl. 188-107.000.

Sandler, Stanley R., to Pennwalt Corporation. Metal phosphinates as smoke retardants for polyvinyl halides. 4,049,612, Cl. 260-31.80R.

Sandner, Michael Ray; and Duffy, Robert Donovan, to Union Carbide Corporation. Catalyst systems containing dimethylamino ether mono-ols for polyurethane foam formation. 4,049,931, Cl. 260-2.5AC.

Sandoz, Inc.: *See—*
Nadelson, Jeffrey, 4,049,813, Cl. 424-263.000.

Sandoz Ltd.: *See—*
Groebke, Wolfgang; and Korte, Klaus, 4,049,642, Cl. 260-196.000.
Laber, Georg; and Schutze, Eberhard, 4,049,817, Cl. 424-270.000.
Studer, Martin, 4,049,641, Cl. 260-191.000.

Sanker, Philip E.: *See—*
Oden, Laurance L.; Sanker, Philip E.; and Russell, James H., 4,049,580, Cl. 252-466.00J.

Sankyo Company Limited: *See—*
Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, 4,049,495, Cl. 195-36.00R.

Sanner, Axel: *See—*
Greif, Norbert; Fikentscher, Rolf; and Sanner, Axel, 4,049,851, Cl. 427-386.000.

Sano, Taketora: *See—*
Tujimoto, Hiroaki; Maki, Tatuya; Suganuma, Sadao; and Sano, Taketora, 4,049,556, Cl. 252-3.000.

Santing, Gerhardus: *See—*
Middelhoek, Servaas; Santing, Gerhardus; and Dost, Nicolaas, 4,049,425, Cl. 75-135.000.

Sanymetal Products Co., Inc., The: *See—*
Dielman, Harold J., 4,048,775, Cl. 52-239.000.

SAPAL Societe Anonyme des Plieuses Automatiques: *See—*
Chenevard, Alexis, 4,048,780, Cl. 53-26.000.

Sarasohn, Neil L., to Gentran Inc. Pressure gauge. 4,048,948, Cl. 116-114.0PV.

Sarvela, Jussi: *See—*
Hatakka, Vesa; and Sarvela, Jussi, 4,049,143, Cl. 214-390.000.

Sasaki, Takehiko, to Sharp Kabushiki Kaisha. Touch sensitive electrodes formed on the frame of an electronic wristwatch. 4,048,796, Cl. 58-23.00R.

Sasaki, Tohru: *See—*
Yoshikawa, Shinsuke; Sasaki, Tohru; and Terasaki, Syuuzi, 4,049,859, Cl. 428-172.000.

Sasaki, Yutaka; Morii, Akimitsu; Nakamura, Yoshimi; Moriya, Kiyoshi; and Utsumi, Hiroshi, to Nitto Chemical Industry Co., Ltd. Process of producing antimony-containing oxide catalysts. 4,049,575, Cl. 252-439.000.

Sasse, Howard A., to H. Sass-E International Inc. Exercise device. 4,048,985, Cl. 128-2.00S.

Sato, Hiroshi; Okumura, Munehiro; Itani, Fujio; Fujii, Shouji; Kakuda, Tsutomu; and Nakatui, Hiroshi, to Mitsubishi Rayon Co., Ltd. Inorganic substance composition and process for producing same. 4,049,593, Cl. 260-2.50E.

Sato, Kazunori: *See—*
Takada, Shunsuke; and Sato, Kazunori, 4,049,772, Cl. 423-54.000.

Sato, Kuniaki, to Kajima Corporation. Steel column base member. 4,048,776, Cl. 52-297.000.

Sato, Takao: *See—*
Bell, Richard; Sato, Takao; and Lahiri, Chitta Ranjan, 4,048,865, Cl. 74-231.00R.

Sato, Yoshinari: *See—*
Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,049,664, Cl. 260-294.80C.

Sato, Yuuichi: *See—*
Hashimoto, Shitaro; and Sato, Yuuichi, 4,050,064, Cl. 340-324.00M.

Satoh, Ryosuke: *See—*
Kikuchi, Shoji; Satoh, Ryosuke; Endo, Takaya; and Kato, Katsunori, 4,049,455, Cl. 96-76.00R.

Sauer, Gunter: *See—*
Reichelt, Walter; and Sauer, Gunter, 4,050,052, Cl. 338-308.000.

Sauer, Winfriede: *See—*
Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, 4,049,811, Cl. 424-258.000.

Saunders, Alexander M.: *See—*
Burns, Donald A.; Brand, Michael J.; and Saunders, Alexander M., 4,049,381, Cl. 23-230.00R.

Saunders, Proxy G.; and Moorman, Lorine. Hair-weaving device. 4,049,006, Cl. 132-5.000.

Savage, Donald D., to Powell, B. J. Modular vehicle subassembly. 4,049,072, Cl. 180-64.00M.

Savec: *See—*
Giraud, Francois Louis, 4,048,923, Cl. 104-21.000.

Sawaoka, Akira: *See—*
Tominaga, Hiroshi; Yasunami, Kazuo; Saito, Shinroku; Takamatsu, Masanobu; and Sawaoka, Akira, 4,049,367, Cl. 425-77.000.

Scardiglia, Frank; and Kiss, Kornel Dezso, to Dart Industries Inc. Extraction resistant polyolefin stabilizers. 4,049,751, Cl. 260-876.00R.

Scarffe, Michael, to Camber International (England) Limited. Needle selection mechanism. 4,048,816, Cl. 66-50.00R.

Schacht, Erich; Mehrhof, Werner; Wild, Albrecht; Gante, Joachim; and Kurmeier, Hans-Adolf, to Merck Patent Gesellschaft mit beschrankter Haftung. Phenylbutanol derivatives and compositions containing them. 4,049,823, Cl. 424-308.000.

Schaefer, E. Lowell. Tissue pulsator operating with a tapping action, and method. 4,048,989, Cl. 128-55.000.

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Knorpp, Eberhard; and Schaffer, Silvian, 4,049,908, Cl. 178-58.00R.

Schawartz, Jozsef; Hornyak, Maria; Majorszki, Eva; David, Agoston; and Horvath, Gabor, to Kovacsovics, Erzsebet; and Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. 5-Amido imido triazene triazoles and pyrazoles with photographic and antimycotic utility. 4,049,639, Cl. 260-140.000.

Scheinberg, Israel Herbert. Preparation of ferrous hemoglobin and enzymatic digestion products thereof active for absorption of carbon monoxide. 4,049,673, Cl. 260-314.000.

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Paulus, Wilfried; Scheinpflug, Hans; and Genth, Hermann, 4,049,807, Cl. 424-246.000.

Scheitlin, George Edward; and Little, Richard Frederick, to Arvin Industries, Inc. Center air manifold for catalytic converter. 4,049,388, Cl. 23-288.0FB.

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Schenk, Peter, to Dzus Fastener Co., Inc. Toggle latch. 4,049,301, Cl. 292-113.000.

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Cerra, Raffaele; and Scherillo, Michele, 4,050,026, Cl. 328-167.000.

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Laurent, Henry; Annen, Klaus; Wiechert, Rudolf; and Hofmeister, Helmut, 4,049,804, Cl. 424-242.000.

Schering Corporation: *See—*
Cooper, David J.; Waitz, Jay Allan; Counelis, Mae; and Weinstein, Jay, 4,049,796, Cl. 424-180.000.
Weinstein, Marvin Joseph; Daniels, Peter John Lovell; Wagman, Gerald Howard; and Testa, Raymond Thomas, 4,049,498, Cl. 195-96.000.

Schick, Ludwig: *See—*
Glaser, Helmut; and Schick, Ludwig, 4,050,008, Cl. 323-19.000.

Schiecke, Konrad L., to Zenith Radio Corporation. Static/purity device for in-line gun. 4,050,041, Cl. 335-210.000.

Schilling, Curtis Louis, Jr., to Union Carbide Corporation. Sulfolanyloxyalkyl cyclic polysiloxanes. 4,049,676, Cl. 260-332.100.

Schimke, Lloyd J. Liquid dispensing apparatus. 4,049,144, Cl. 222-448.000.

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Schirm, Volker: *See—*
Lechner, Manfred; Schirm, Volker; and Dettmann, Heinrich, 4,048,826, Cl. 72-21.000.

Schirmann, Jean-Pierre; and Weiss, Francis, to Produits Chimiques Ugine Kuhlmann. Method for manufacturing hydrazodicarbonamide. 4,049,712, Cl. 260-554.000.

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Schlapp, Wilhelm. Storage facility. 4,049,330, Cl. 312-186.000.

Schlussler, Henry, to United States of America, Army. Transponder based landing system. 4,050,069, Cl. 343-6.50R.

Schmidt, Hans, to Matsushita Electric Company of America. Planetary turret indicator. 4,048,949, Cl. 116-124.300.

Schmidt, Hans: *See—*
Nakanishi, Mutsuo; and Schmidt, Hans, 4,050,050, Cl. 338-190.000.

Schmidt, Horst, to KHD Industrieanlagen Ag. Impact hammer mill. 4,049,202, Cl. 241-30.000.

Schmidt, Peter: *See—*
Bianchi, Valerio; Latsch, Reinhard; and Schmidt, Peter, 4,048,965, Cl. 123-32.0EA.

Schmidt, Walter, to Prolizenz AG. Crucible. 4,049,250, Cl. 266-275.000.

Schmitt, Charles R.: *See—*
Googin, John M.; Schmitt, Charles R.; Schreyer, James M.; and Whitehead, Harlan D., 4,048,980, Cl. 126-270.000.

Schmitz, H. Gunter, to Supfina Maschinenfabrik Hentzen KG. Method for micro-finish machining of compound, circular arc-shaped profiled surfaces in annular workpieces. 4,048,764, Cl. 51-291.000.

Schneider, Alan A., to Catalyst Research Corporation. Lithium-iodine cells and method for making same. 4,049,890, Cl. 429-181.000.

Schneider, Daniel J. Fluid driven power producing apparatus. 4,049,300, Cl. 290-54.000.

Schoen, Ernst: *See—*
Falkenstein, Georg; Stein, Dieter; Haaf, Franz; Heinz, Gerhard; and Schoen, Ernst, 4,049,590, Cl. 260-2.5BE.

Schoenbachler, Bernard W.; *See—*
Durbin, Charles R.; and Schoenbachler, Bernard W., 4,048,834, Cl. 72-294.000.

Schoenlein, William J.: *See—*
Peterson, Glenn E.; Emerson, Robert T.; and Schoenlein, William J., 4,048,952, Cl. 118-6.000.

Scholz, Adolf: *See—*
Weis, Martin; and Scholz, Adolf, 4,048,758, Cl. 51-416.000.

Schopen, Joseph L.: *See—*
Mittleman, Herbert; and Schopen, Joseph L., 4,048,996, Cl. 128-214.00R.

Schrader, William L.; and Rose, Harold T., to United States of America, Army. Freight container unloading system. 4,049,131, Cl. 214-14.000.

Schreyer, James M.: *See—*
Googin, John M.; Schmitt, Charles R.; Schreyer, James M.; and Whitehead, Harlan D., 4,048,980, Cl. 126-270.000.

Schroter, Herbert: *See—*
Jaeggi, Knut A.; Schroter, Herbert; and Ostermayer, Franz, 4,049,797, Cl. 424-180.000.

Schubert, Eckart: *See—*
Weitz, Hans-Martin; Wagner, Ulrich; Volkamer, Klaus; Schubert, Eckart; and Bandermann, Friedhelm, 4,049,742, Cl. 260-681.50R.

Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See—*
Husges, Gerd, 4,049,215, Cl. 242-125.100.

Schull, George R. Key actuated electronic lock for auto ignitions. 4,050,063, Cl. 340-274.00C.

Schultz, Thomas W., to GTE Sylvania Incorporated. Exposure area control for an optical scanning system for manufacturing cathode ray tubes. 4,050,081, Cl. 354-1.000.

Schulz, Hansrichard, to Canon Kabushiki Kaisha. Focusing arrangement. 4,049,960, Cl. 250-201.000.

Schulz, Willis Lorenz: *See—*
Polomski, John; Schulz, Willis Lorenz; and Specht, Victor Joseph, 4,049,094, Cl. 192-3.310.

Schulze, Jurgen: *See—*
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.
Perrey, Hermann; Schulze, Jurgen; Rosenkranz, Hans Jurgen; Rudolph, Hans; and Hornle, Reinhold, 4,049,378, Cl. 8-87.000.

Schumann, Jochen: *See—*
Grof, Helmut Theodor; Schumann, Jochen; Wamser, Anton; Schumann, Rainer; and Thomas, Werner Friedrich, 4,049,039, Cl. 164-52.000.

Schumann, Rainer: *See—*
Grof, Helmut Theodor; Schumann, Jochen; Wamser, Anton; Schumann, Rainer; and Thomas, Werner Friedrich, 4,049,039, Cl. 164-52.000.

Schurmann, Barbara Wilhelmine Spitz nee, legal representative: *See—*
Weigel, Horst; and Spitz, Anton, deceased, 4,049,445, Cl. 75-82.000.

Schuster, Karl Ernst; Rosenkranz, Hans Jurgen; and Rudolph, Hans, to Bayer Aktiengesellschaft. Highly reactive sulphur-containing coating agents hardening under UV-light. 4,049,745, Cl. 260-837.00R.

Schutten, Herman P.: *See—*
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,050,083, Cl. 357-28.000.

Schutze, Eberhard: *See—*
Laber, Georg; and Schutze, Eberhard, 4,049,817, Cl. 424-270.000.

Schwab, Hermann; and Blum, Adolf, to BASF Aktiengesellschaft. Dyeing and printing of cellulosic fibers or mixtures of cellulosic fibers with synthetic fibers. 4,049,377, Cl. 8-169.000.

Schweiso, Robert J., to Raychem Corporation. Metal expansion plug. 4,049,151, Cl. 220-201.000.

Schwing, Gregory Wayne, to Du Pont de Nemours, E. I., and Company. 2-Alkyl-1-naphthol-4-sulfonic acids. 4,049,705, Cl. 260-512.00C.

Scientific Process & Research, Inc.: *See—*
Tadmor, Zehev; and Klein, Imrich, 4,049,245, Cl. 259-191.000.

Scott, Kenneth W.; and Calderon, Nissim, to Goodyear Tire & Rubber Company, The. Preparation of graft, block and crosslinked unsaturated polymers and copolymers by olefin metathesis. 4,049,616, Cl. 260-42.320.

Seal, Michael R., to Board of Trustees Western Washington State College. Automotive vehicle. 4,049,309, Cl. 296-1.00S.

Seese, Ray Bruce: *See—*
Kubus, James Michael; Seese, Ray Bruce; and Watson, Bela Lee, 4,048,757, Cl. 51-436.000.

Segers, Jacobus Cornelis: *See—*
Ringers, Hendrik Johan; and Segers, Jacobus Cornelis, 4,049,686, Cl. 260-424.000.

Seifert, Hans; Will, Kurt; and Zapf, Horst, to Maschinenfabrik Augsburg-Nurnberg AG. Externally ignited four cycle gas engine. 4,048,974, Cl. 123-191.00M.

Seiger, Harvey N., to Yardney Electric Corporation. Active material for pressed nickel electrodes. 4,049,027, Cl. 141-1.100.

Seiler, Claus-Dieter; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Method of preparing β-chloroethyltrichlorosilane. 4,049,690, Cl. 260-448.20E.

Seiler, Herbert; and Dussy, Paul, to Ciba-Geigy AG. Water-insoluble anthraquinone dyestuffs containing a halodiazinyl group which are soluble in aprotic solvents. 4,049,661, Cl. 260-256.40N.

Seipp, William H., to Gulf & Western Industries, Inc. Self-addressing modules for programmable controller. 4,050,098, Cl. 364-900.000.

Seitel, Norbert F.: *See—*
McDonald, Walter; Seitel, Norbert F.; and Ayres, John E., 4,049,081, Cl. 182-148.000.

Sejournet, Jerome. Liquid level gauge particularly for motorcycle. 4,048,855, Cl. 73-299.000.

Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See—*
Ikeda, Toshiki; Yamai, Fumito; and Ishida, Tomohiko, 4,049,594, Cl. 260-2.50B.

Seko, Maomi; Miyake, Tetsuya; Inada, Kohji; Ochi, Kazushi; and Sakamoto, Tomio, to Asahi Kasei Kogyo Kabushiki Kaisha. Separation of uranium isotopes by accelerated isotope exchange reactions. 4,049,769, Cl. 423-7.000.

SELENIA-Industrie Elettroniche Associate S.p.A.: *See—*
Buiatti, Marina, 4,048,712, Cl. 29-571.000.

Seris, Jean-Louis: *See—*
Gellato, Michel; Seris, Jean-Louis; and Suberloco, Jeannine, 4,049,516, Cl. 204-158.0HA.

Sessler, John A. Automatic transmission. 4,049,103, Cl. 192-105.0CD.

Sevenich, Theodor: *See—*
Fabian, Wolfgang; Klein, Konrad; and Sevenich, Theodor, 4,048,831, Cl. 72-251.000.

Shaffer, John W., to GTE Sylvania Incorporated. Photoflash lamp and multilamp unit with electrostatic protection. 4,049,369, Cl. 431-95.00R.

Shanahan, Francis V.; and Feller, Herman H., to Stick-M-All, Inc. Baseboard trap for crawling insects. 4,048,747, Cl. 43-114.000.

Sharp Kabushiki Kaisha: *See—*
Hashimoto, Shitaro; and Sato, Yuuichi, 4,050,064, Cl. 340-324.00M.
Ito, Tadashi; Wakahara, Katuhiro; and Tatsuoka, Masao, 4,048,811, Cl. 62-263.000.
Sasaki, Takehiko, 4,048,796, Cl. 58-23.00R.
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.

Shell Internationale Research Maatschappij B.V.: *See—*
Estebanez, Joseph; Harrison, David V.; Jones, Clifford P.; and Wilson, Henry G. E., 4,048,956, Cl. 118-306.000.
Staudinger, Gernot, 4,049,133, Cl. 214-17.00B.

Shell Oil Company: *See—*
Ayers, Ray R., 4,049,554, Cl. 210-242.00S.
Dominguez, Richard J. G., 4,049,595, Cl. 260-5.000.
Middelhoek, Servaas; Santing, Gerhardus; and Dost, Nicolaas, 4,049,425, Cl. 75-135.000.
Roman, Steven A., 4,049,652, Cl. 544-54.000.

Shen, Kelvin Kei-Wei; and Belles, Wayne Stuart, to United States Borax & Chemical Corporation. Herbicidal morpholinobenzimidazoles. 4,049,422, Cl. 71-92.000.

Sheng, Ming N.; and Mameniskis, Walter A., to Atlantic Richfield Company. Osmium catalyzed organic hydroperoxide hydroxylation of olefinic compounds. 4,049,724, Cl. 260-635.00H.

Shenk, William. Sewage system. 4,049,013, Cl. 137-263.000.

Shepard Niles Crane & Hoist Corporation: *See—*
Rundle, Frederick Stanley, 4,049,089, Cl. 188-171.000.

Sheridan, James A.: *See—*
Brookes, Malcolm J.; Sheridan, James A.; and Spranger, Douglas M., 4,049,283, Cl. 280-47.13R.

Sherman, John G.: *See—*
Pegnim, Timothy C.; France, Larry R.; Sherman, John G.; and MacQuignon, Claude, 4,050,079, Cl. 346-145.000.

Sherritt Gordon Mines Limited: *See—*
Swinkels, Godefridus Maria; Furber, Robert Arthur; Milner, Edward Francis Godfrey; Genik-Sas-Berezowsky, Roman Michael; and Kirby, Charles Ray, 4,049,770, Cl. 423-37.000.

Shesterikov, Stanislav Alexeevich: *See—*
Zakharov, Evegny Dmitrievich; Shneider, Gennady Lvovich; Valkov, Viktor Dmitrievich; Kapitonov, Viktor Pavlovich; Miklyaev, Petr Grigorievich; Lebedev, Vladimir Alexandrovich; Kholnova, Vera Ivanovna; Shesterikov, Stanislav Alexeevich; and Bobrovsky, Vasily Mikhailovich, 4,049,474, Cl. 148-32.500.

Shevchenko, Vladimir Alexandrovich: *See—*
Zaplatin, Veniamin Petrovich; Svitelsky, Vasily Petrovich; Galov, Lev Ivanovich; Djukareva, Alla Konstantinovna; Sklyar, Rozalia Grigorievna; Denisovich, Vasily Alexeevich; Shirokov, Dmitry Alexeevich; and Shevchenko, Vladimir Alexandrovich, 4,049,490, Cl. 162-37.000.

Shibahara, Tetsuya: *See—*
Shigematsu, Taichiro; Shibahara, Tetsuya; Nakazawa, Makoto; Tomida, Masayuki; and Munakata, Toshio, 4,049,820, Cl. 424-273.00P.

Shieu, Mark S. D.; Johnson, Robert B.; and Laugesen, Ronald C., to National Semiconductor Corporation. Multi-bootstrap driver circuit. 4,049,979, Cl. 307-270.000.

Shigematsu, Taichiro; Shibahara, Tetsuya; Nakazawa, Makoto; Tomida, Masayuki; and Munakata, Toshio, to Mitsubishi Chemical

Industries Limited. Substituted urazole and thiourazole compounds as agricultural fungicidal agents. 4,049,820, Cl. 424-273.00P.

Shimadzu Seisakusho Ltd.: *See—*
Kita, Yasuo; and Kou, Makoto, 4,049,098, Cl. 192-8.00R.

Shimizu, Akira: *See—*
Ito, Akihiko; Shimizu, Akira; and Hayashi, Koichiro, 4,049,518, Cl. 204-159.210.

Shimizu, Hiroshi; Nishidai, Jun; and Yasuta, Toru, to Nippon Electric Glass Company, Limited. Apparatus for uniformly heating molten glass. 4,049,899, Cl. 13-6.000.

Shiokawa, Shigeru: *See—*
Ko, Keiun; Takashina, Naomitsu; Shiokawa, Shigeru; and Fujita, Rokuro, 4,049,634, Cl. 260-75.0UA.

Shipp, Barry E.: *See—*
Mitchell, Bernard A.; and Shipp, Barry E., 4,049,010, Cl. 132-88.500.

Shirokov, Dmitry Alexeevich: *See—*
Zaplatin, Veniamin Petrovich; Svitelsky, Vasily Petrovich; Galov, Lev Ivanovich; Djukareva, Alla Konstantinovna; Sklyar, Rozalia Grigorievna; Denisovich, Vasily Alexeevich; Shirokov, Dmitry Alexeevich; and Shevchenko, Vladimir Alexandrovich, 4,049,490, Cl. 162-37.000.

Shishikura, Masami: *See—*
Ishii, Hirohisa; and Shishikura, Masami, 4,049,984, Cl. 310-42.000.

Shlyakht, Alfred Lvovich: *See—*
Khimenko, Lev Timofeevich; and Shlyakht, Alfred Lvovich, 4,049,937, Cl. 219-7.500.

Shmidt, Igor Aronovich: *See—*
Kolomoets, Nikolai Vasilievich; Dashevsky, Zinovy Moiseevich; Granovsky, Vladimir Isaakovich; Shmidt, Igor Aronovich; and Gelfgat, David Mendelevich, 4,049,469, Cl. 136-225.000.

Shneider, Gennady Lvovich: *See—*
Zakharov, Evegny Dmitrievich; Shneider, Gennady Lvovich; Valkov, Viktor Dmitrievich; Kapitonov, Viktor Pavlovich; Miklyaev, Petr Grigorievich; Lebedev, Vladimir Alexandrovich; Kholnova, Vera Ivanovna; Shesterikov, Stanislav Alexeevich; and Bobrovsky, Vasily Mikhailovich, 4,049,474, Cl. 148-32.500.

Shohji, Yoshihiko: *See—*
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.

Shoji, Jinichi: *See—*
Yamaguchi, Toshiaki; and Shoji, Jinichi, 4,049,212, Cl. 242-56.900.
Yamaguchi, Toshiaki; and Shoji, Jinichi, 4,049,214, Cl. 242-75.510.

Shriver, Joe E.; and Norman, Donald O., to Sperry Rand Corporation. Row crop means for a harvesting unit. 4,048,792, Cl. 56-98.000.

Shrum, Sidney J., to Chevron Research Company. Removable anchor having retrievable ballast. 4,048,945, Cl. 114-294.000.

Shterenberg, Ljudmila Efimovna: *See—*
Vereschagin, Leonid Fedorovich; Yakovlev, Evgeny Nikolaevich; Varfolomeeva, Tatyana Dmitrievna; Preobrazhensky, Alexandr Yakovlevich; Slesarev, Vladislav Nikolaevich; Stepanov, Vasily Alexandrovich; and Shterenberg, Ljudmila Efimovna, 4,049,783, Cl. 423-446.000.

Shuster, Edward J.: *See—*
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,049,682, Cl. 260-410.000.

Sicard, Charles Andre. Rotary device driven by a moving fluid. 4,048,947, Cl. 115-3.000.

Siden, Dennis C., to Raychem Corporation. Wire preparation and termination means and method. 4,049,334, Cl. 339-97.00R.

Siebert, Werner: *See—*
Rohde, Wolfgang; and Siebert, Werner, 4,049,141, Cl. 214-152.000.

Sieder, Theodore P.: *See—*
Hunter, Wood E.; and Sieder, Theodore P., 4,049,606, Cl. 260-29.4UA.

Siemens Aktiengesellschaft: *See—*
Berger, Helmut; Holzermer, Gunther; Kirsch, Harry; and Vijlbrief, Pieter, 4,049,967, Cl. 250-445.00T.
Distler, Walter; Zink, Roderich; and Linke, Gerhard, 4,049,968, Cl. 250-445.00T.
Fink, Helmuth; and Wess, Guenter, 4,050,014, Cl. 324-57.00H.
Glaser, Helmut; and Schick, Ludwig, 4,050,008, Cl. 323-19.000.
Gross, Hans; and Berti, Eugenio, 4,050,007, Cl. 363-87.000.
Kammel, Gernot; and Wiedenmann, Rudolf, 4,049,757, Cl. 264-22.000.
Knorpp, Eberhard; and Schaffer, Silvian, 4,049,908, Cl. 178-58.00R.
Konig, Justus; Rohrig, Josef; and Hilliges, Friedrich, 4,049,922, Cl. 179-18.0AB.
Politycki, Alfred; and Hieber, Konrad, 4,048,954, Cl. 118-49.100.
Zeuch, Klaus, 4,049,373, Cl. 432-265.000.
Zwack, Eduard, 4,049,921, Cl. 179-18.0BC.

Sigl, Wayne C.; and Lassen, Frederick O., to Kimberly-Clark Corporation. Method of forming highly absorbent filaments and webs having improved softness, wicking, and solvent drying characteristics. 4,049,764, Cl. 264-178.00F.

Signetics Corporation: *See—*
Gray, Paul R.; and Stephens, Mark L., 4,050,031, Cl. 330-24.000.
Youmans, Albert P., 4,050,049, Cl. 338-47.000.

Signode Corporation: *See—*
Duenser, William F., 4,048,697, Cl. 24-20.0EE.

Siker, Stephen J. Method of installing decals on vertically ribbed trailer bodies. 4,049,479, Cl. 156-71.000.

Silbernagel, Bernard G.: *See—*
Rao, Bhaskara M. L.; and Silbernagel, Bernard G., 4,049,881, Cl. 429-50.000.

Silverman, Stanley; and Broeils, John, to Sun Chemical Corporation. Curing section for continuous motion decorator. 4,048,916, Cl. 101-40.000.

Simmons, Dennis E., Jr.: *See—*
Berg, Robert L.; Murphy, William J.; and Simmons, Dennis E., Jr., 4,050,068, Cl. 343-6.00R.

Simmons, Robert Sidney, to Casaire Limited. Air conditioning. 4,048,809, Cl. 62-89.000.

Simokat, Frank L., to TII Corporation. Multi-circuit protector. 4,050,092, Cl. 361-56.000.

Simon Container Machinery Limited: *See—*
Bunting, Keith Brian, 4,049,321, Cl. 302-41.000.
Iversen, Bjorn, 4,049,485, Cl. 156-351.000.

Simpson, George R.; Gundlach, Robert W.; and Butler, Gordon C., to Xerox Corporation. Electrostatic imaging system. 4,049,344, Cl. 355-10.000.

Simrad A.S.: *See—*
Ramberg, Kjell Oystein; and Kirknes, Bjorn, 4,048,850, Cl. 73-133.00R.

Sims, Louis Ray: *See—*
Smith, Gary W.; Leavens, Dwight E.; and Sims, Louis Ray, 4,049,685, Cl. 260-412.500.

Singer Company, The: *See—*
Odermann, Charles R.; Peterson, Wesley R.; Herr, John A.; and Porter, Oswald M., 4,048,932, Cl. 112-158.00E.

Singleton, Anthony, to Kontak Manufacturing Company Limited. Detents for locking movable elements. 4,049,235, Cl. 251-297.000.

Sinkula, Anthony A., to Upjohn Company, The. Ibuprofen p-hydroxybenzaldehyde semicarbazone ester. 4,049,699, Cl. 560-105.000.

Sinkula, Anthony A., to Upjohn Company, The. Ibuprofen p-hydroxyphenylurea ester. 4,049,700, Cl. 560-105.000.

Sintetica Americana, Inc.: *See—*
Aguirre, Juan E., 4,049,609, Cl. 260-29.6NR.

Siozaki, Fumio: *See—*
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.

Skehan, Bernard J.: *See—*
Prince, Paul R.; Skehan, Bernard J.; and Hansen, Jay M., 4,050,085, Cl. 358-219.000.

Skelton, Carl W. Board game apparatus. 4,049,275, Cl. 273-134.0AE.

Skewis, William A. Adjustable truck side mirror system adjunct. 4,049,228, Cl. 248-480.000.

SKF Industrial Trading and Development Company B.V.: *See—*
van de Kooi, Johannes Maria, 4,049,012, Cl. 137-3.000.

Skibowski, Hubert. Shut-off and regulator device for controllable mechanisms intended for installation in pipelines. 4,049,018, Cl. 137-561.00R.

Sklyar, Rozalia Grigorievna: *See—*
Zaplatin, Veniamin Petrovich; Svitelsky, Vasily Petrovich; Galov, Lev Ivanovich; Djukareva, Alla Konstantinovna; Sklyar, Rozalia Grigorievna; Denisovich, Vasily Alexeevich; Shirokov, Dmitry Alexeevich; and Shevchenko, Vladimir Alexandrovich, 4,049,490, Cl. 162-37.000.

Skrypek, John P.; and Peters, Arnold, to Sun Chemical Corporation. Continuous motion printing apparatus. 4,048,917, Cl. 101-40.000.

Skvortsov, Gennady Fedorovich: *See—*
Pomeschikov, Andrei Grigorievich; Buryagin, Firs Alexandrovich; Kazantsev, Lev Seliverstovich; Skvortsov, Gennady Fedorovich; Naryshkin, Jury Anatolievich; and Gracheva, Zinaida Ivanovna, 4,049,901, Cl. 13-9.0ES.

Slesarev, Vladislav Nikolaevich: *See—*
Vereschagin, Leonid Fedorovich; Yakovlev, Evgeny Nikolaevich; Varfolomeeva, Tatyana Dmitrievna; Preobrazhensky, Alexandr Yakovlevich; Slesarev, Vladislav Nikolaevich; Stepanov, Vasily Alexandrovich; and Shterenberg, Ljudmila Efimovna, 4,049,783, Cl. 423-446.000.

Sloan, Albert E.: *See—*
Brouwer, Frans, 4,049,197, Cl. 239-218.500.

Sloan, Walter John. Carbonate reduction. 4,049,519, Cl. 204-180.00P.

Sloboda, Mieczyslaw Herman; and Hatswell, John Sidney, to Johnson, Matthey & Co., Limited. Brazing alloy. 4,049,434, Cl. 75-134.00C.

Slocum, Robert E., to Texas Instruments Incorporated. Light polarizing material method and apparatus. 4,049,338, Cl. 350-152.000.

Smidt, Frederick A.: *See—*
Hagel, William C.; Smidt, Frederick A.; and Korenko, Michael K., 4,049,431, Cl. 75-126.00C.
Hagel, William C.; Smidt, Frederick A.; and Korenko, Michael K., 4,049,432, Cl. 75-128.00F.

Smirnov, Jury Vasilievich: *See—*
Kasatkin, Alexei Fedoseevich; Smirnov, Jury Vasilievich; and Feldman, Ilya Afanasievich, 4,049,926, Cl. 179-115.00V.

Smit Nijmegen B.V.: *See—*
Graat, Johannes W., 4,049,569, Cl. 252-372.000.

Smith, Arthur: *See—*
Haviland, Herbert, deceased; Haviland, Diane, administratrix; Smith, Arthur; and Boyer, Charles, 4,049,193, Cl. 236-46.00R.

Smith, Carlyle F., Jr., to General Electric Company. Scratch-resistant mask for photolithographic processing. 4,049,347, Cl. 355-133.000.

Smith, Gary W.; Leavens, Dwight E.; and Sims, Louis Ray, to Sylvachem Corporation. Process for cleansing spent clay. 4,049,685, Cl. 260-412.500.

Smith, Hubert Stacy, Jr.; and Hay, Robert A., II, to Dow Chemical Company, The. Laminate preparation and application thereof. 4,049,852, Cl. 428-55.000.

Smith, Keith Hindle: *See—*
Smith, Peter David; and Smith, Keith Hindle, 4,048,853, Cl. 73-194.00A.

Smith Kline & French Laboratories Limited: *See—*
Durant, Graham John; Ganellin, Charon Robin; and White, George Raymond, 4,049,671, Cl. 548-342.000.
Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,049,672, Cl. 548-342.000.

Smith, Pattie. Bed pan. 4,048,682, Cl. 5-91.000.

Smith, Peter David; and Smith, Keith Hindle, to Detectronic Limited. Method and apparatus for monitoring the flow of liquid and the like. 4,048,853, Cl. 73-194.00A.

Smith, Richard E.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,049,255, Cl. 271-3.000.

Smith, Roy E., to Corning Glass Works. Method and apparatus for splicing optical fibers. 4,049,414, Cl. 65-4.00B.

Smith, Stanley, to Rolls-Royce (1971) Limited. Apparatus for separating suspensions of liquids in gas. 4,049,401, Cl. 55-184.000.

Smith, William L. Trolling attachment for outboard engine. 4,048,940, Cl. 114-145.00A.

SmithKline Corporation: *See—*
Cooper, David J.; Gebhardt, George W.; Valenta, Joseph R.; and Wdzieczkowski, Francis E., 4,049,031, Cl. 141-284.000.
Lam, Bing Lun; Lewis, Joseph James; Webb, Robert Lee; and Wellman, George Robert, 4,049,669, Cl. 260-306.80R.

Snell, Leonard Stanley, to Rolls-Royce (1971) Limited. Variable stator vane actuating mechanism. 4,049,360, Cl. 415-149.00R.

Sobol, Jacob M. Nebulizer. 4,049,200, Cl. 239-338.000.

Societe Anonyme de Telecommunications: *See—*
Jolivet, Jean-Claude; and Stouls, Francois-Xavier, 4,049,910, Cl. 178-69.100.

Societe Anonyme des Hauts Fourneaux de la Chiers: *See—*
Falcy, Bernard Charles Albert; and Vaudant, Adrien, 4,048,794, Cl. 57-149.000.

Societe Anonyme dite: Etablissements Genoud & Cie: *See—*
Neyret, Guy, 4,049,370, Cl. 431-144.000.

Societe anonyme dite: Laboratoire L. Lafon: *See—*
Lafon, Louis, 4,049,829, Cl. 424-337.000.

Societe Anonyme Francaise du Ferodo: *See—*
Neveux, Rene Elie, 4,049,020, Cl. 137-625.110.

Societe Chimique des Charbonnages: *See—*
Lozach, Guy, 4,049,760, Cl. 264-51.000.

Societe d'Applications Generales d'Electricite et de Mecanique SAGEM: *See—*
Murat, Roger, 4,049,107, Cl. 197-1.00R.

Societe Franco-Europeenne de Material pour l'Industrie Alimentaire "F.E.M.I.A" France: *See—*
Coppolani, Joseph; and Vandernotte, Leon, 4,049,124, Cl. 209-98.000.

Societe Nationale Elf Aquitaine: *See—*
Gellato, Michel; Seris, Jean-Louis; and Suberloco, Jeannine, 4,049,516, Cl. 204-158.0HA.

Soletanche: *See—*
Portier, Jean Louis, 4,048,851, Cl. 73-141.00A.

Solvay & Cie.: *See—*
Clerbois, Lucien; Degueldre, Louis; Biver, Christian; Degols, Albert; and Gobillon, Yves, 4,049,532, Cl. 204-290.00F.
Lorge, Michel; and Houba, Roger, 4,049,761, Cl. 264-89.000.

Somekh, Sasson: *See—*
Garvin, Hugh L.; Yariv, Amnon; and Somekh, Sasson, 4,049,944, Cl. 219-121.0EM.

Sony Corporation: *See—*
Ishii, Hirohisa; and Shishikura, Masami, 4,049,984, Cl. 310-42.000.
Kishi, Yoshio, 4,050,087, Cl. 360-96.000.
Ohsawa, Misuo, 4,049,918, Cl. 179-15.0BT.
Okuda, Hiroshi, 4,050,088, Cl. 360-96.000.
Tamura, Michio, 4,048,951, Cl. 118-6.000.
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Fujita, Tadao, 4,049,507, Cl. 204-39.000.
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Enomoto, Masahisa, 4,049,530, Cl. 204-273.000.

Souslin, Richard Ervin, to Boeing Company, The. Variable orifice hydraulic snubber. 4,048,905, Cl. 91-405.000.

Soyland, Ingebret. Excavator having lifting legs and cooperating boom mounted bucket for "walking". 4,049,070, Cl. 180-8.00C.

Soyland, Ingebret. Excavator having adjustable wheels. 4,049,138, Cl. 214-132.000.

Spangler, Glen C. Trash sack support. 4,048,691, Cl. 15-257.100.

Spannlang, Ronald: *See—*
Moser, Peter; Eysn, Manfred; Enkner, Bernhard; Berger, Rupert; Wagner, Wolfgang; and Spannlang, Ronald, 4,049,249, Cl. 266-247.000.

Sparks, Virgil H., Sr. Oil well pump with plunger pull down and desanding assembly. 4,049,365, Cl. 417-554.000.

Specht, Victor Joseph: *See—*
Polomski, John; Schulz, Willis Lorenz; and Specht, Victor Joseph, 4,049,094, Cl. 192-3.310.

Special Metals Corporation: *See—*
Burton, Claudia J., 4,049,470, Cl. 148-3.000.

SpectraMetrics, Incorporated: *See—*
Missio, Danilo V., 4,049,353, Cl. 356-85.000.

Spellman, Gordon B.: *See—*
Jaskolski, Stanley V.; Lade, Robert W.; Schutten, Herman P.; and Spellman, Gordon B., 4,050,083, Cl. 357-28.000.

Spencer, Clark V.; and Rondeau, Benjamin G. Choker straightener. 4,048,837, Cl. 72-387.000.

Speranza, George P.: *See—*
McEntire, Edward E.; and Speranza, George P., 4,049,591, Cl. 260-2.5AC.

Sperry Rand Corporation: *See—*
Hurlburt, Joseph C.; Brown, Howard R.; and Buck, Ernest E., 4,048,862, Cl. 74-57.000.
Johnson, Gary L.; and Zoya, Walter J., 4,049,014, Cl. 137-315.000.
Shriver, Joe E.; and Norman, Donald O., 4,048,792, Cl. 56-98.000.

Spescha, Gelli, to Rieter Machine Works, Ltd. Winding apparatus for textile threads. 4,049,211, Cl. 242-45.000.

Spindler, Kurt: *See—*
Raab, Richard; Spindler, Kurt; Brand, Herbert; and Gast, Leonard, 4,048,832, Cl. 72-255.000.

Spisak, John A., to Pipe Line Development Co., The. Safety cock. 4,049,234, Cl. 251-149.900.

Spitz, Anton, deceased: *See—*
Weigel, Horst; and Spitz, Anton, deceased, 4,049,445, Cl. 75-82.000.

Spivack, John D., to Ciba-Geigy Corporation. 2,3,5-Trialkylsubstituted hydroxybenzyl isocyanurates. 4,049,654, Cl. 544-221.000.

Spivack, John D., to Ciba-Geigy Corporation. Esters and amides of trisubstituted hydroxyphenylalkanoic acids. 4,049,713, Cl. 260-559.00R.

Spoor, Herbert: *See—*
Eisentraeger, Klaus; Immel, Guenther; Marx, Matthias; Reinhard, Hans; Spoor, Herbert; and Storck, Gerhard, 4,049,847, Cl. 427-207.00B.

Spranger, Douglas M.: *See—*
Brookes, Malcolm J.; Sheridan, James A.; and Spranger, Douglas M., 4,049,283. Cl. 280-47.13R.

Sridhar, Ramamritham: *See—*
Bell, Malcolm Charles Evert; and Sridhar, Ramamritham, 4,049,444, Cl. 75-82.000.

Sridhar, Ramamrithan; Warner, John Stuart; and Bell, Malcolm Charles Evert, to International Nickel Company, Inc., The. Non-ferrous metal recovery from deep sea nodules. 4,049,438, Cl. 75-21.000.

Sta-Tite Corporation: *See—*
Maranell, Melvin C., 4,049,905, Cl. 174-163.00F.

Stach, Kurt: *See—*
Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, 4,049,811, Cl. 424-258.000.

Stagg, Geoffrey Brian Kenneth: *See—*
Williams, John Lloyd; Leaman, Roger John; Moberly, Robert Valentine; Stagg, Geoffrey Brian Kenneth; and Wisdom, Graham John, 4,050,059, Cl. 364-200.000.

Stahler, Fritz: *See—*
Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 4,049,702, Cl. 260-501.120.

Stal Refrigeration AB: *See—*
Brandin, Johan A. I., 4,049,233, Cl. 251-61.100.

Stamer, Walter; and Eichinger, Frithjof, to Claudius Peters AG; and MAXPETERS Gesellschaft fur Verfahrenstechnik mbH. Equipment for the continuous pneumatic introduction of coal dust. 4,049,247, Cl. 266-182.000.

Standard Brands Incorporated: *See—*
Gannis, Peter Michael; and Bosco, Peter Michael, 4,049,833, Cl. 426-93.000.

Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., to Xerox Corporation. Apparatus for feeding documents to and from a copier. 4,049,255, Cl. 271-3.000.

Staudinger, Gernot, to Shell Internationale Research Maatschappij B.V. Process and apparatus for the supply of a dry, free-flowing coal powder to a high-pressure coal gasification reactor. 4,049,133, Cl. 214-17.00B.

Stauffer Chemical Company: *See—*
Baker, Don R.; and Walker, Francis H., 4,049,423, Cl. 71-118.000.
Baker, Don R.; and Walker, Francis H., 4,049,424, Cl. 71-118.000.
Jin, Jung Il; and Kraft, Paul, 4,049,747, Cl. 260-859.0PV.
Large, George B., 4,049,826, Cl. 424-326.000.
Weil, Edward D., 4,049,754, Cl. 260-952.000.

Stearley, Robert J., to Great Plains Bag Corporation. Block bottom valve bag. 4,049,191, Cl. 229-62.500.

Stebbins, George B.; and Stebbins, James F. Water polishing means for removing oil and other flotsam from water. 4,049,553, Cl. 210-195.00R.

Stebbins, James F.: *See—*
Stebbins, George B.; and Stebbins, James F., 4,049,553, Cl. 210-195.00R.

Steblyak, Vladimir Demyanovich: *See—*
Lotosh, Valery Efimovich; and Steblyak, Vladimir Demyanovich, 4,049,435, Cl. 75-3.000.

Steckler, Robert; Robinson, Fred; and Farmer, Robert F., III, to Alcolac Inc. Functional monomers and copolymers thereof. 4,049,608, Cl. 260-29.6SQ.

Stedman, Robert N., to Caterpillar Tractor Co. Modular dual wheel suspension and drive arrangement for trucks. 4,049,071, Cl. 180-24.050.

Stedman, Robert N., to Caterpillar Tractor Co. Tractor mounted apparatus for performing aerial work tasks. 4,049,079, Cl. 182-2.000.

Stedman, Robert N., to Caterpillar Tractor Co. Backhoe with multi-movement capabilities. 4,049,139, Cl. 214-138.00R.

Steele, James E. Mobile corral. 4,048,959, Cl. 119-20.000.

Stein, Dieter: *See—*
Falkenstein, Georg; Stein, Dieter; Haaf, Franz; Heinz, Gerhard; and Schoen, Ernst, 4,049,590, Cl. 260-2.5BE.

Stemmler, Kurt: *See—*
Ehlscheid, Gunter; Langenbeck, Peter; and Stemmler, Kurt, 4,049,945, Cl. 219-121.0LM.

Stepanov, Vasily Alexandrovich: *See—*
Vereachagin, Leonid Fedorovich; Yakovlev, Evgeny Nikolaevich; Varfolomeeva, Tatyana Dmitrievna; Preobrazhensky, Alexandr Yakovlevich; Slesarev, Vladislav Nikolaevich; Stepanov, Vasily Alexandrovich; and Shterenberg, Ljudmila Efimovna, 4,049,783, Cl. 423-446.000.

Stephens-Adamson, Inc.: *See—*
Ouska, Ralph C.; and Bertaud, Francois X., 4,049,328, Cl. 308-187.100.

Stephens, Mark L.: *See—*
Gray, Paul R.; and Stephens, Mark L., 4,050,031, Cl. 330-24.000.

Sterbenz, Francis J.: *See—*
Cotty, Val F.; Sterbenz, Francis J.; and Melman, Kenneth J., 4,049,803, Cl. 424-233.000.

Sterling Drug Inc.: *See—*
Bell, Malcolm R., 4,049,715, Cl. 260-571.000.

Sternbach, Leo Henryk: *See—*
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,049,666, Cl. 260-294.80R.
Derieg, Michael Edward; Earley, James Valentine; Fryer, Rodney Ian; and Sternbach, Leo Henryk, 4,049,667, Cl. 260-294.80R.

Stevens, Dale: *See—*
Stevens, Henry H., 4,048,873, Cl. 81-3.00R.

Stevens, Doyle: *See—*
Stevens, Henry H., 4,048,873, Cl. 81-3.00R.

Stevens, Henry H., to Johnson, Tony; Johnson, Eloise; Stevens, Dale; Stevens, Doyle; Stevens, Tom; and Casady, Fern. Door security lock opening tool and method of using same. 4,048,873, Cl. 81-3.00R.

Stevens, Tom: *See—*
Stevens, Henry H., 4,048,873, Cl. 81-3.00R.

Stevenson, Paul D.: *See—*
Vukovich, William J.; and Stevenson, Paul D., 4,049,093, Cl. 192-3.300.

Stewart, Henry G.: *See—*
Castleman, Howard H.; and Stewart, Henry G., 4,048,736, Cl. 40-2.00R.

Stich, Frederick A., to Allis-Chalmers Corporation. Inverter having constant frequency chopper synchronized to modulation frequency. 4,050,006, Cl. 363-98.000.

Stick-M-All, Inc.: *See—*
Shanahan, Francis V.; and Feller, Herman H., 4,048,747, Cl. 43-114.000.

Stickl, Helmut. Preparations for local treatment of acne vulgaris. 4,049,793, Cl. 424-115.000.

Stier, Bernhard: *See—*
Flach, Hans-Georg; and Stier, Bernhard, 4,050,021, Cl. 324-150.000.

Stiles, Claude J.; and Tomo, Daniel, to National Distillers and Chemical Corporation. Plastic skin envelopes for glass bottles and the like. 4,049,147, Cl. 215-12.00R.

Still-Man Mfg. Company: *See—*
Gilreath, Robert V., 4,049,948, Cl. 219-404.000.

Stix, Nathan, to United States Shoe Corporation, The. Shoe and method of making the same. 4,048,732, Cl. 36-34.00B.

Stjarne, Anders Olov Gunnar; and Sander, Nils Borje Lennart, to Svenska Aktiebolaget Bromsregulator. Parking brake arrangement for a rail vehicle brake. 4,049,088, Cl. 188-107.000.

Stock, Gunter: *See—*
Wener, Kurt; Stock, Gunter; Herrig, Klaus; and Wagner, Heinz, 4,049,224, Cl. 245-6.000.

Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,049,662, Cl. 260-287.00D.

Stolz, Gerhard. Clothes-hanging clip. 4,049,163, Cl. 223-96.000.

Stonner, Hans-Martin: *See—*
Wohler, Fritz; Stonner, Hans-Martin; and Wiesner, Paul, 4,049,782, Cl. 423-352.000.

Storck, Gerhard: *See—*
Eisentraeger, Klaus; Immel, Guenther; Marx, Matthias; Reinhard, Hans; Spoor, Herbert; and Storck, Gerhard, 4,049,847, Cl. 427-207.00B.

Stork, Gilbert J.: *See—*
Untch, Karl G.; and Stork, Gilbert J., 4,049,697, Cl. 560-118.000.

Storm, Anders Georg, to Swedish Rail System AB SRS. Vehicle for and method of operation on both road and railroad track. 4,048,925, Cl. 105-215.00C.

Storm, Donald P.; Sammarco, Peter; Fritz, Edward A.; and Mackert, Robert J., to International Harvester Company. Forage harvester drive. 4,049,207, Cl. 241-101.700.

Stouls, Francois-Xavier: *See—*
Jolivet, Jean-Claude; and Stouls, Francois-Xavier, 4,049,910, Cl. 178-69.100.

Strade, Henry A., to Akzona Incorporated. Steroidal erythropoietic agents and therapeutic compositions and methods. 4,049,805, Cl. 424-243.000.

Straka, Daniel Charles, to ARCO Polymers, Inc. Latex frothing agent used in making an elastomeric latex foam. 4,049,587, Cl. 260-2.50L.

Straley, James M.: *See—*
Weaver, Max A.; Straley, James M.; and Moore, William H., 4,049,643, Cl. 260-207.100.

Straub, Otto-Christian, to Bayer Aktiengesellschaft. Treatment of infections in animals. 4,049,794, Cl. 424-167.000.

Strausburg, Larry D., to Monarch Marking Systems, Inc. Tag attacher. 4,049,178, Cl. 227-67.000.

Street, Henry K.: *See—*
Hoover, William R.; Mead, Keith E.; and Street, Henry K., 4,049,864, Cl. 428-332.000.

Strelitz, Robert A.: *See—*
Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,049,559, Cl. 252-8.55D.
Witzel, Bruce E.; Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,049,417, Cl. 71-67.000.

Striebel, Robert L., II: *See—*
Raghavachari, Srinivas T.; and Striebel, Robert L., II, 4,048,997, Cl. 128-215.000.

Strobel, Pierre: *See—*
Hatterer, Andre; Oberlin, Claude; and Strobel, Pierre, 4,049,443, Cl. 75-66.000.

Stroiwas, Edward: *See—*
Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., 4,049,736, Cl. 260-669.0QZ.

Stromback, Per, to Salen & Wicander Terminalsystem AB. Crane adapted to the handling of uniform cargo units. 4,049,132, Cl. 214-14.000.

Strycker, Stanley J., to Dow Chemical Company, The. Substituted phenoxyalkyl quaternary ammonium compounds as antiarrhythemic agents. 4,049,814, Cl. 424-267.000.

Stuckmann, Dieter; Babendererde, Siegmund; Jutte, Hans; and Bokemeyer, Reinhard, to Gewerkschaft Eisenhutte Westfalia; and Hochtief A.G. Apparatus for, and a method of, driving tunnels. 4,048,806, Cl. 61-85.000.

Studer, Martin, to Sandoz Ltd. Optionally substituted sulfophenyl-azo-naphthylene-azo-para-alkoxyphenyl dyes. 4,049,641, Cl. 260-191.000.

Stumpf, Irvin L.: *See—*
Meyer, Gustave, 4,049,137, Cl. 214-82.000.

Stumpp, Gerhard, to Robert Bosch GmbH. System for detoxicating exhaust gases. 4,048,967, Cl. 123-119.00A.

Suberloco, Jeannine: *See—*
Gellato, Michel; Seris, Jean-Louis; and Suberloco, Jeannine, 4,049,516, Cl. 204-158.0HA.

Such, Tony Eugene; Wyszynski, Apoloniusz; and James, Barrie Sydney, to W. Canning & Company Limited. Plating. 4,049,509, Cl. 204-49.000.

Suchla, Germane M.: *See—*
Lo, Vincent; Vos, Kenneth D.; and Suchla, Germane M., 4,049,158, Cl. 222-95.000.

Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft: *See—*
Freissmuth, Alfred; Heinl, Walter; Knahl, Herbert; and Pfluger, Erich, 4,049,442, Cl. 75-55.000.

Sudler, Roland, to VDO Adolf Schindling AG. Damping device for a stepper motor. 4,049,985, Cl. 310-49.00R.

Suga, Shigeru. Contact means for a weather resistance and solar radiation tester. 4,049,351, Cl. 356-72.000.

Suganuma, Sadao: *See—*
Tujimoto, Hiroaki; Maki, Tatuya; Suganuma, Sadao; and Sano, Taketora, 4,049,556, Cl. 252-3.000.

Suhr, Donald C.; and Hedgewick, Peter, to International Tools (1973) Ltd. Child resistant closure assembly. 4,049,148, Cl. 215-214.000.

Sukonnik, Izrail Moishevich: *See—*
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.

Sullivan, John L.; Knauber, Veronica A.; and Nelson, James E., to A-T-O Inc. Back frame. 4,049,164, Cl. 224-5.00W.

Sulzer Brothers Ltd.: *See—*
le Febve de Vivy, Dominique, 4,049,971, Cl. 290-40.00R.
Quack, Hans, 4,048,814, Cl. 62-335.000.

Sumida, Hiroyuki: *See—*
Sakakibara, Kaichi; and Sumida, Hiroyuki, 4,048,852, Cl. 73-193.00R.

Sumitomo Chemical Company, Limited: *See—*
Hosaka, Hirokazu; Tanimoto, Kenji; and Yamachika, Hiroshi, 4,049,720, Cl. 260-610.00B.
Inoue, Yasuhiko; and Uyeo, Keizo, 4,049,740, Cl. 260-671.00R.

Sumitomo Electric Industries, Ltd.: *See—*
Okita, Koichi; and Sakane, Isamu, 4,049,589, Cl. 260-2.50M.
Yamamoto, Takaharu; Nomura, Toshio; Asai, Tsuyoshi; and Hara, Akio, 4,049,876, Cl. 428-932.000.

Sumitomo, Yuji: *See—*
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.

Sun Chemical Corporation: *See—*
Silverman, Stanley; and Broeils, John, 4,048,916, Cl. 101-40.000.
Skrypek, John P.; and Peters, Arnold, 4,048,917, Cl. 101-40.000.

Sundermann, Rudolf; Putter, Rolf; and Grigat, Ernst, to Bayer Aktiengesellschaft. Process for preparation of s-triazine prepolymers. 4,049,630, Cl. 260-47.00R.

Suntech, Inc.: *See—*
Hansel, William B., 4,049,029, Cl. 141-206.000.

Supfina Maschinenfabrik Hentzen KG: *See—*
Schmitz, H. Gunter, 4,048,764, Cl. 51-291.000.

Suprenant, Paul J.: *See—*
Crocker, Thomas H.; Levitt, Barry N.; and Suprenant, Paul J., 4,050,062, Cl. 340-183.000.

Sutter, Jean Georges, to Pont-A-Mousson S.A. Motor-driven control device for a valve-actuating spindle. 4,050,000, Cl. 318-468.000.

Sutton, Leslie Joseph. Telephone hand-set holding means. 4,049,927, Cl. 179-150.000.

Suzuki, Kenji: *See—*
Hori, Yutaka; Honda, Zenzo; Suzuki, Kenji; Nakamoto, Keiji; and Yamamoto, Yoshiharu, 4,049,904, Cl. 174-107.000.

Suzuki, Yoshio. Escape device for a multi-storey building. 4,049,080, Cl. 182-48.000.

Svenska Aktiebolaget Bromsregulator: *See—*
Stjarne, Anders Olov Gunnar; and Sander, Nils Borje Lennart, 4,049,088, Cl. 188-107.000.

Svitelsky, Vasily Petrovich: *See—*
Zaplatin, Veniamin Petrovich; Svitelsky, Vasily Petrovich; Galov, Lev Ivanovich; Djukareva, Alla Konstantinovna; Sklyar, Rozalia Grigorievna; Denisovich, Vasily Alexeevich; Shirokov, Dmitry Alexeevich; and Shevchenko, Vladimir Alexandrovich, 4,049,490, Cl. 162-37.000.

Swan, Dale G.: *See—*
Peerman, Dwight E.; Swan, Dale G.; and Kanten, H. Gordon, 4,049,598, Cl. 260-18.00N.

Swedish Rail System AB SRS: *See—*
Storm, Anders Georg, 4,048,925, Cl. 105-215.00C.

Swenson, Roy S.: *See—*
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,049,491, Cl. 162-101.000.

Swinkels, Godefridus Maria; Furber, Robert Arthur; Milner, Edward Francis Godfrey; Genik-Sas-Berezowsky, Roman Michael; and Kirby, Charles Ray, to Sherritt Gordon Mines Limited; and Cominco Ltd. Recovery of copper and zinc as sulfides from copper-iron sulfides. 4,049,770, Cl. 423-37.000.

Swiss Aluminium Ltd.: *See—*
Alder, Hanspeter; and Boving, Hans, 4,049,511, Cl. 204-67.000.

Sylvachem Corporation: *See—*
Smith, Gary W.; Leavens, Dwight E.; and Sims, Louis Ray, 4,049,685, Cl. 260-412.500.

Syntex (U.S.A.) Inc.: *See—*
Beeby, Philip J., 4,049,806, Cl. 424-246.000.
Kracklauer, John J., 4,049,618, Cl. 260-45.75P.
Untch, Karl G.; and Stork, Gilbert J., 4,049,697, Cl. 560-118.000.

Systex, Inc.: *See—*
Nason, George F., III; and Winter, Walter W., 4,048,728, Cl. 35-8.00A.

Szova, Janos. Combination lock. 4,048,823, Cl. 70-306.000.

Szur, Alex J., to Diamond Shamrock Corporation. Cationic fluorochemical surfactants. 4,049,668, Cl. 260-295.00R.

Szymborski, Andrew M., to General Corrugated Machinery Co., Inc. Apparatus for feeding sheets. 4,049,260, Cl. 271-151.000.

Tadmor, Zehev; and Klein, Imrich, to Scientific Process & Research, Inc. Apparatus and method for preparing a plasticated material. 4,049,245, Cl. 259-191.000.

Tagawa, Kazuaki, to Ricoh Company, Ltd. Magnetic brush developing apparatus for electrophotography. 4,048,957, Cl. 118-653.000.

Takada, Shunsuke; and Sato, Kazunori, to Tokico, Ltd. Process for the recovery of chromic acid solution from waste water containing chromate ions. 4,049,772, Cl. 423-54.000.

Takagi, Yasuo: *See—*
Mineo, Masatoshi; Oka, Ken-ichiro; Nakagawa, Kiyoshi; Matsuda, Hiyoshi; Ohno, Shigeo; and Takagi, Yasuo, 4,049,763, Cl. 264-176.00F.

Takahashi, Kenji: *See—*
Kawabata, Minoru; and Takahashi, Kenji, 4,048,904, Cl. 91-375.00A.

Takahashi, Masashi: *See—*
Kishi, Hajimu; and Takahashi, Masashi, 4,050,001, Cl. 318-625.000.

Takahashi, Mitsuo: *See—*
Nakamura, Kunio; and Takahashi, Mitsuo, 4,049,439, Cl. 75-24.000.

Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Semipermanently lockable slider. 4,048,698, Cl. 24-205.14R.

Takamatsu, Masanobu: *See—*
Tominaga, Hiroshi; Yasunami, Kazuo; Saito, Shinroku; Takamatsu, Masanobu; and Sawaoka, Akira, 4,049,367, Cl. 425-77.000.

Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, to Nippon Telegraph and Telephone Public Corporation; and Sharp Kabushiki Kaisha. Deflection means including a deflection electrode mounted on a travelling carriage in an ink jet system printer. 4,050,076, Cl. 346-75.000.

Takao, Hiroshi: *See—*
Togawa, Kimmochi; Takao, Hiroshi; Matoba, Kazuo; and Kishida, Katsuhiro, 4,049,524, Cl. 204-195.00S.

Takashina, Naomitsu: *See—*
Ko, Keiun; Takashina, Naomitsu; Shiokawa, Shigeru; and Fujita, Rokuro, 4,049,634, Cl. 260-75.0UA.

Takeda Chemical Industries, Ltd.: *See—*
Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, 4,049,812, Cl. 424-263.000.

Takeuchi, Tomio: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,049,497, Cl. 195-80.00R.

Taki, Tsuneo: *See—*
Honda, Fumio; Taki, Tsuneo; and Kajiwara, Masatoshi, 4,049,118, Cl. 206-330.000.

Takimoto, Masaaki: *See—*
Honjo, Satoru; and Takimoto, Masaaki, 4,049,448, Cl. 96-1.50R.

Tamai, Yasuo: *See—*
Ogawa, Hiroshi; Tamai, Yasuo; and Nishina, Tutomu, 4,049,871, Cl. 428-425.000.

Tamamura, Ryozo; and Yamanaka, Masami, to Yamato Scale Company, Limited. Device for weighing running vehicle. 4,049,069, Cl. 177-134.000.

Tamao, Yoshikuni: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,049,645, Cl. 260-239.00B.

Tamura, Chihiro: *See—*
Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, 4,049,495, Cl. 195-36.00R.

Tamura, Michio, to Sony Corporation. Apparatus for applying a glass frit to a seal edge of a funnel portion of a picture tube. 4,048,951, Cl. 118-6.000.

Tan, Swie-In: *See—*
Ainslie, Norman George; Hempstead, Robert Douglas; Tan, Swie-In; and Valstyn, Erich Philipp, 4,049,522, Cl. 204-192.00M.

Tanabe, Osamu; Nishizawa, Hisao; and Hata, Kazuo, to Dainippon Screen Seizo Kabushiki-Kaisha. Apparatus for exposing a photosensitive beltlike material. 4,049,345, Cl. 355-41.000.

Tanaka, Eiji: *See—*
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Fujita, Tadao, 4,049,507, Cl. 204-39.000.
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Enomoto, Masahisa, 4,049,530, Cl. 204-273.000.

Tanaka, Seiichi; Watari, Kazuhiro; and Hayashi, Hideki, to Mitsui Petrochemical Industries, Ltd. Method for separation and recovering hydroquinone. 4,049,723, Cl. 260-621.00A.

Tanaka, Tsunemitsu: *See—*
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.

Tanemoto, Toshiharu: *See—*
Nakagawa, Tetsuo; Matsuda, Nobuo; Mitani, Kazumitsu; and Tanemoto, Toshiharu, 4,049,541, Cl. 208-127.000.
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.

Taniguchi, Toru, to Reica Kogyo Kabushiki Kaisha. Motionless mixing device. 4,049,241, Cl. 259-4.0AC.

Tanimoto, Kenji: *See—*
Hosaka, Hirokazu; Tanimoto, Kenji; and Yamachika, Hiroshi, 4,049,720, Cl. 260-610.00B.

Taninaka, Takato: *See—*
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.

Tarsia, Joseph: *See—*
Wuchinich, David G.; and Tarsia, Joseph, 4,049,964, Cl. 250-221.000.

Tatay, Charles L.: *See—*
Dantzer, Peter H.; and Tatay, Charles L., 4,048,766, Cl. 52-19.000.

Tatsuoka, Masao: *See—*
Ito, Tadashi; Wakahara, Katuhiro; and Tatsuoka, Masao, 4,048,811, Cl. 62-263.000.

Taylor, George W.: *See—*
Fincke, George C.; and Taylor, George W., 4,050,040, Cl. 333-73.00C.

TBA Industrial Products Limited: *See—*
Adams, David John, 4,049,856, Cl. 427-131.000.

Team, Inc.: *See—*
Harrison, George W., 4,049,296, Cl. 285-15.000.

Technic, Inc.: *See—*
Morrissey, Ronald J., 4,049,508, Cl. 204-43.00S.

Technicon Instruments Corporation: *See—*
Burns, Donald A.; Brand, Michael J.; and Saunders, Alexander M., 4,049,381, Cl. 23-230.00R.

Tektronix, Inc.: *See—*
Winston, Fendall Gregory, IV, 4,050,024, Cl. 328-134.000.

Teledyne Industries, Inc.: *See—*
Yih, Stephen Wei Hong; Worcester, Samuel Austin, Jr.; and Rudy, Erwin, 4,049,380, Cl. 428-539.500.

Teller, Aaron Joseph, to Teller Environmental Systems, Inc. Treatment of flue gases. 4,049,399, Cl. 55-73.000.

Teller Environmental Systems, Inc.: *See—*
Teller, Aaron Joseph, 4,049,399, Cl. 55-73.000.

Terahara, Akira: *See—*
Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, 4,049,495, Cl. 195-36.00R.

Terasaki, Syuuzi: *See—*
Yoshikawa, Shinsuke; Sasaki, Tohru; and Terasaki, Syuuzi, 4,049,859, Cl. 428-172.000.

Terum, Trygve Olavson: *See—*
Gjosteen, Ole Georg; Terum, Trygve Olavson; and Aarflot, Aksel Ola, 4,049,248, Cl. 266-202.000.

Testa, Raymond Thomas: *See—*
Weinstein, Marvin Joseph; Daniels, Peter John Lovell; Wagman, Gerald Howard; and Testa, Raymond Thomas, 4,049,498, Cl. 195-96.000.

Texaco Development Corporation: *See—*
Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., 4,049,657, Cl. 260-268.0SY.
McEntire, Edward E.; and Speranza, George P., 4,049,591, Cl. 260-2.5AC.
Texas Instruments Incorporated: *See—*
Anderson, Roger Norman, 4,048,955, Cl. 118-49.500.
Boone, Gary W.; and Vandierendonck, Jerry L., 4,049,974, Cl. 307-205.000.
Hartmann, Clinton S., 4,049,958, Cl. 235-193.000.
Kitagawa, Norihisa, 4,050,061, Cl. 340-173.00R.
Slocum, Robert E., 4,049,338, Cl. 350-152.000.
Tserng, Hua Quen, 4,050,032, Cl. 330-34.000.
Texasgulf Canada Ltd.: *See—*
Freeman, George M.; Dulson, John E.; and Morris, Monica F., 4,049,514, Cl. 204-119.000.
Textron Inc.: *See—*
Chambers, William A.; Bossler, Franklin B.; and Brandkamp, Warren F., 4,050,036, Cl. 331-94.50C.
Louw, Johan August; and Ghiselin, Robert Earle, 4,049,182, Cl. 228-2.000.
Tezuka, Tohru: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,049,645, Cl. 260-239.00B.
Thibaudon, Bruno, to Pomagalski S.A. Speed control system for a chairlift. 4,049,999, Cl. 318-305.000.
Thiolliere, Jean Pierre: *See—*
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.
Thistlethwaite, Mark K., to Vicon Supply Company, The. Door framing fixture and method. 4,048,771, Cl. 52-127.000.
Thizy, Andre: *See—*
Debourge, Jean-Claude; Gaulliard, Jean-Michel; Thiolliere, Jean Pierre; Abblard, Jean Georges; Lacroix, Guy-Bernard; Pillon, Daniel Jean; Ducret, Jacques Joseph; and Thizy, Andre, 4,049,801, Cl. 424-217.000.
Thomas & Betts Corporation: *See—*
Peterpaul, Joseph, 4,048,839, Cl. 72-412.000.
Thomas, Hector. Gasket winding machine. 4,048,829, Cl. 72-148.000.
Thomas, Janine M.: *See—*
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,658, Cl. 260-268.0PC.
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,660, Cl. 260-268.0PC.
Thomas Salter Limited: *See—*
Mackie, Thomas Barnet, 4,049,265, Cl. 273-1.00R.
Thomas, Werner Friedrich: *See—*
Grof, Helmut Theodor; Schumann, Jochen; Wamser, Anton; Schumann, Rainer; and Thomas, Werner Friedrich, 4,049,039, Cl. 164-52.000.
Thomason, Harry E. Solar-energy conserving. 4,048,812, Cl. 62-264.000.
Thompson, Arthur H.; and Whittingham, M. Stanley, to Exxon Research & Engineering Co. Intercalated transition metal phosphorus trisulfides. 4,049,879, Cl. 429-191.000.
Thompson, Mary Kay. Carton opener. 4,048,719, Cl. 30-2.000.
Thompson, Robert B.: *See—*
Alers, George A.; and Thompson, Robert B., 4,048,847, Cl. 73-67.50R.
Thomsen, Finn Erling: *See—*
Udengaard, Poul Werner; Mosevang, Orla; Thomsen, Finn Erling; and Eklund, Erik Paul, 4,049,403, Cl. 55-378.000.
Thomson-CSF: *See—*
Marcy, Raymond, 4,049,961, Cl. 250-202.000.
Thorpe, Donald H., to Hooker Chemicals & Plastics Corporation. Pigmentable low-profile polyester molding compositions. 4,049,749, Cl. 260-862.000.
Thorup, Palle. Dental explorer. 4,048,723, Cl. 32-40.00R.
Tice, Vernon Lawton; and Glover, Donald Francis. Fireplace/forced air furnace heat generation and distribution system. 4,049,194, Cl. 237-1.00A.
Tierney, William S.: *See—*
Jacoby, Jerold L.; Tierney, William S.; Wright, James E.; and Bhuta, Pravin G., 4,049,336, Cl. 350-3.500.
TII Corporation: *See—*
Simokat, Frank L., 4,050,092, Cl. 361-56.000.
Tijburg, Rudolf Paulus, to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 4,049,488, Cl. 156-655.000.
Tilston, John Ronald: *See—*
Hakluytt, John Philip Dabbs; and Tilston, John Ronald, 4,048,797, Cl. 60-39.72R.
Timmler, Helmut; Draber, Wilfried; Buchel, Karl Heinz; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Method of regulating plant growth. 4,049,418, Cl. 71-76.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
Itoh, Takuji; Nishikawa, Eiichiroh; Miura, Tadashi; and Yamahata, Takashi, 4,049,581, Cl. 252-466.0PT.
Toby, Max Edward. Loader for sliced comestible product. 4,048,784, Cl. 53-77.000.
Tocci, Gerald Charles: *See—*
Falk, Henry Joseph; and Tocci, Gerald Charles, 4,048,813, Cl. 62-297.000.
Tocker, Stanley, to Du Pont de Nemours, E. I., and Company. Novel carbamimidoyl chlorides and their use in the synthesis of herbicidal triaziniediones. 4,049,710, Cl. 260-544.00C.
Todd, John Arnold; and Chevallier, George Edward, to Dresser Industries, Inc. Hand drive for blending-type gasoline dispenser. 4,049,159, Cl. 222-144.500.
Togawa, Kimmochi; Takao, Hiroshi; Matoba, Kazuo; and Kishida, Katsuhiro, to Nissan Motor Company, Limited. Oxygen sensor with noncatalytic electrode. 4,049,524, Cl. 204-195.00S.
Tokico, Ltd.: *See—*
Takada, Shunsuke; and Sato, Kazunori, 4,049,772, Cl. 423-54.000.
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Fujita, Tadao, to Sony Corporation. Electrodepositing method. 4,049,507, Cl. 204-39.000.
Tokumoto, Shin-Ichi; Tanaka, Eiji; Ogisu, Kenji; and Enomoto, Masahisa, to Sony Corporation. Electrolyzer. 4,049,530, Cl. 204-273.000.
Tokuyama Sekisui Kogyo Kabushiki Kaisha: *See—*
Adachi, Terufumi; and Oda, Tatsuro, 4,049,517, Cl. 204-159.180.
Tokyo Optical Company, Ltd.: *See—*
Ito, Akihiko; Kaetsu, Isao; Okubo, Hiroshi; Kato, Masamichi; Hayashi, Koichiro; and Maeda, Yuji, 4,049,867, Cl. 428-412.000.
Tokyu Sharyo Seizo Kabushiki Kaisha: *See—*
Tominaga, Hiroshi; Yasunami, Kazuo; Saito, Shinroku; Takamatsu, Masanobu; and Sawaoka, Akira, 4,049,367, Cl. 425-77.000.
Tolan, John R.: *See—*
Cole, Leon J.; and Tolan, John R., 4,049,168, Cl. 226-40.000.
Tolle, Albert E., Jr. Cathode structure for electrolytic apparatus employing impellers. 4,049,512, Cl. 204-212.000.
Toman, Donald J., to Tull Aviation Corporation. Blended step scan beam signal from fixed beam components. 4,050,074, Cl. 343-106.00R.
Tomco, Inc.: *See—*
Byers, James Otto, Jr., 4,049,232, Cl. 251-30.000.
Tomczak, Lawrence William: *See—*
Crall, Frederick William; and Tomczak, Lawrence William, 4,050,093, Cl. 361-383.000.
Tomczuk, Zygmunt: *See—*
Vissers, Donald R.; Nelson, Paul A.; Kaun, Thomas D.; and Tomczuk, Zygmunt, 4,048,715, Cl. 29-623.500.
Tomei, L. David, to United States of America, Agriculture. Vaccine production process. 4,049,494, Cl. 195-1.100.
Tomida, Massyuki: *See—*
Shigematsu, Taichiro; Shibahara, Tetsuya; Nakazawa, Makoto; Tomida, Masayuki; and Munakata, Toshio, 4,049,820, Cl. 424-273.00P.
Tominaga, Hiroshi; Yasunami, Kazuo; Saito, Shinroku; Takamatsu, Masanobu; and Sawaoka, Akira, to Tokyu Sharyo Seizo Kabushiki Kaisha. Apparatus for generating shock waves by means of a supersonic projectile. 4,049,367, Cl. 425-77.000.
Tomo, Daniel: *See—*
Stiles, Claude J.; and Tomo, Daniel, 4,049,147, Cl. 215-12.00R.
Tonomura, Shinji: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tonomura, Shinji; Tamao, Yoshikuni; Tezuka, Tohru; and Hijikata, Akiko, 4,049,645, Cl. 260-239.00B.
Tonsfeldt, Wayne S.: *See—*
Eisenhardt, Fred W.; and Tonsfeldt, Wayne S., 4,049,058, Cl. 171-58.000.
Tooth, Robert Barry: *See—*
Priest, John Garrick; and Tooth, Robert Barry, 4,049,484, Cl. 156-285.000.
Toray Industries, Inc.: *See—*
Mineo, Masatoshi; Oka, Ken-ichiro; Nakagawa, Kiyoshi; Matsuda, Hiyoshi; Ohno, Shigeo; and Takagi, Yasuo, 4,049,763, Cl. 264-176.00F.
Toriumi, Shiro; and Yamagishi, Seiichi, to Minolta Camera Kabushiki Kaisha. Film carrier for microfilm reader. 4,049,341, Cl. 353-23.000.
Tornabene, Michael G. Process and device for harnessing wave energy. 4,048,801, Cl. 60-502.000.
Tortolo, Norman Patrick. Terrazzo structure having a sub-surface and an intermediate impermeable sheet. 4,049,853, Cl. 428-70.000.
Toyoda-Koki Kabushiki-Kaisha: *See—*
Kawabata, Minoru; and Takahashi, Kenji, 4,048,904, Cl. 91-375.00A.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Futamura, Kazumasa, 4,049,387, Cl. 23-277.00C.
Sanda, Shoogo; and Nakamura, Norihiko, 4,048.973, Cl. 123-191.0SP.
Tracor, Inc.: *See—*
Anthony, Albert M., 4,050,042, Cl. 335-212.000.
Traister, Andrew; and Troup, Glenn, to PPG Industries, Inc. Corrosion resistant aqueous and solvent-based primer compositions containing synergistic blends of zinc borate and barium metaborate pigments. 4,049,596, Cl. 260-18.0EP.
Treanor, Eugene Joseph, to Makap Limited. Closure caps for vessels. 4,049,152, Cl. 220-209.000.
Treen, J. Paul. Reversible sickle-bar type lawn mower and trimmer. 4,048,791, Cl. 56-17.600.
Treibacher Chemische Werke Aktiengesellschaft: *See—*
Hafner, Leo, 4,049,463, Cl. 106-288.00B.
Treuner, Uwe D.: *See—*
Breuer, Hermann; and Treuner, Uwe D., 4,049,651, Cl. 544-21.000.
Trezise, Richard D.: *See—*
Plaza, Mario G.; and Trezise, Richard D., 4,049,109, Cl. 197-53.000.
Tribotech: *See—*
Gilding, Denis K., 4,049,506, Cl. 204-38.00R.

Trickett, Elizabeth Ann: *See—*
Auborn, James J.; and Trickett, Elizabeth Ann, 4,049,024, Cl. 140-71.500.
Tritsch, Ludwig, to Johnson & Johnson. Diaper with resealable tape closure. 4,049,001, Cl. 128-287.000.
Troup, Glenn: *See—*
Traister, Andrew; and Troup, Glenn, 4,049,596, Cl. 260-18.0EP.
Trudeau, Albert R. Method for rebuilding pinsetter pulley assemblies. 4,048,704, Cl. 29-401.00R.
TRW Inc.: *See—*
Haller, Freidrich A., 4,048,711, Cl. 29-566.300.
Jacoby, Jerold L.; Tierney, William S.; Wright, James E.; and Bhuta, Pravin G., 4,049,336, Cl. 350-3.500.
Wuerker, Ralph F.; and Heflinger, Lee O., 4,050,035, Cl. 331-94.50C.
Tserng, Hua Quen, to Texas Instruments Incorporated. Avalanche diode amplifier. 4,050,032, Cl. 330-34.000.
Tsuda, Yoshio: *See—*
Okamoto, Hiroyuki; Tsuda, Yoshio; and Yokoyama, Kazumasa, 4,049,683, Cl. 260-410.700.
Tsujita, Yoshio: *See—*
Endo, Akira; Kuroda, Masao; Terahara, Akira; Tsujita, Yoshio; and Tamura, Chihiro, 4,049,495, Cl. 195-36.00R.
Tsukagawa, Yukio: *See—*
Kawakami, Hiroshi; Nagaoka, Isao; and Tsukagawa, Yukio, 4,049,170, Cl. 226-74.000.
Tucker, Anthony John Philip: *See—*
McOnie, Malcolm Peter; Tucker, Anthony John Philip; and van Lienden, Peter Willem, 4,049,895, Cl. 526-62.000.
Tujimoto, Hiroaki; Maki, Tatuya; Suganuma, Sadao; and Sano, Taketora, to Nippon Chemical Industrial Co., Ltd.; and Yamato Shokaki Co., Ltd. Foam fire extinguishing agent. 4,049,556, Cl. 252-3.000.
Tull Aviation Corporation: *See—*
Toman, Donald J., 4,050,074, Cl. 343-106.00R.
Turin, Michel J.: *See—*
Fauran, Claude P.; Raynaud, Guy M.; Turin, Michel J.; and Thomas, Janine M., 4,049,658, Cl. 260-268.0PC.
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Turner, Henry Neil. Method and device for separating particles. 4,049,544, Cl. 209-45.000.
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Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, to Nippon Kokan Kabushiki Kaisha; Kayaba Kogyo Kabushiki Kaisha; and Nihon Koki Kabushi Kaisha. Apparatus and method for selectively supporting, conveying and mounting a propeller and rudder. 4,048,936, Cl. 114-65.00R.
Uckert, Gotthard: *See—*
Divivier, Rudolf; and Uckert, Gotthard, 4,049,777, Cl. 423-239.000.
Udengaard, Poul Werner; Mosevang, Orla; Thomsen, Finn Erling; and Eklund, Erik Paul, to H. Moldow A/S. Device for suspension of air filter bags. 4,049,403, Cl. 55-378.000.
Ueberdiek, Ralf: *See—*
Bach, Josef; Kollwig, Horst; Meitzner, Wolfgang; Weintritt, Horst; and Ueberdiek, Ralf, 4,049,209, Cl. 242-18.0PW.
Ueda, Ikuo: *See—*
Umio, Suminori; Maeno, Shizuo; Ueda, Ikuo; Sato, Yoshinari; and Matsuo, Masaaki, 4,049,664, Cl. 260-294.80C.
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, to Chiyoda Chemical Engineering & Construction Co. Ltd.; and Mitsubishi Petrochemical Company Limited. Process for the thermal cracking of heavy oils with a fluidized particulate heat carrier. 4,049,540, Cl. 208-127.000.
Ueno, Akihiko, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 4,049,938, Cl. 219-10.55R.
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Production of antibiotics neothramycin A and neothramycin B. 4,049,497, Cl. 195-80.00R.
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Bockstiegel, Gerd-Edzard; Neidhardt, Manfred; Rehfeld, Gerhard; and Umlauf, Werner, 4,049,397, Cl. 51-309.00A.
Undin, Hans, to Pressmaster Ltd. Device, particularly of the pliers or scissors type. 4,048,877, Cl. 81-313.000.
Union Carbide Corporation: *See—*
Beatty, Theodore Robert, 4,049,882, Cl. 429-94.000.
Elbert, Raymond John; and Farrier, Ernest Gilbert, 4,049,428, Cl. 75-208.00R.
Falk, Henry Joseph; and Tocci, Gerald Charles, 4,048,813, Cl. 62-297.000.
Kallen, George Harold, 4,049,962, Cl. 250-202.000.
Kanner, Bernard; and Prokai, Bela, 4,049,674, Cl. 260-332.100.
Kanner, Bernard; and Prokai, Bela, 4,049,675, Cl. 260-332.100.
Krebs, Daniel Fritz; and Miranda, Hector, 4,049,192, Cl. 233-14.00R.
Kronenberg, Marvin Lee, 4,049,892, Cl. 429-194.000.
Kubus, James Michael; Seese, Ray Bruce; and Watson, Bela Lee, 4,048,757, Cl. 51-436.000.
Sandner, Michael Ray; and Duffy, Robert Donovan, 4,049,931, Cl. 260-2.5AC.
Schilling, Curtis Louis, Jr., 4,049,676, Cl. 260-332.100.
Union Oil Company of California: *See—*
Duthweiler, Frederick C., 4,048,808, Cl. 61-103.000.
Unipas, Inc.: *See—*
Piette, Leonard A., 4,048,717, Cl. 29-732.000.
Uniroyal, Inc.: *See—*
Bell, Richard; Sato, Takao; and Lahiri, Chitta Ranjan, 4,048,865, Cl. 74-231.00R.
Mao, Chung-Ling; and O'Shea, Francis X., 4,049,636, Cl. 260-77.5CR.
Uniroyal Limited: *See—*
Bell, Richard; Sato, Takao; and Lahiri, Chitta Ranjan, 4,048,865, Cl. 74-231.00R.
United Foam Corporation: *See—*
Goodale, Clark W.; Morgan, Charles W.; and Rhoton, Albert L., 4,049,848, Cl. 427-244.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Hakluytt, John Philip Dabbs; and Tilston, John Ronald, 4,048,797, Cl. 60-39.72R.
United States Borax & Chemical Corporation: *See—*
Shen, Kelvin Kei-Wei; and Belles, Wayne Stuart, 4,049,422, Cl. 71-92.000.
United States Gypsum Company: *See—*
Lane, Marvin K.; and Anderson, Winton C., 4,049,866, Cl. 428-402.000.
United States of America
Agriculture: *See—*
Jurd, Leonard, 4,049,722, Cl. 260-619.00R.
Luddy, Francis E.; Hampson, James W.; and Herb, Samuel F., 4,049,839, Cl. 426-607.000.
Tomei, L. David, 4,049,494, Cl. 195-1.100.
Air Force: *See—*
Barry, James D.; and Brandelik, Joseph E., 4,050,034, Cl. 331-94.50G.
Berg, Robert L.; Murphy, William J.; and Simmons, Dennis E., Jr., 4,050,068, Cl. 343-6.00R.
Cohen, Paul B., 4,049,982, Cl. 310-366.000.
Crocker, Thomas H.; Levitt, Barry N.; and Suprenant, Paul J., 4,050,062, Cl. 340-183.000.
Maurer, John H., 4,049,198, Cl. 239-265.390.
Peterson, Paul F., 4,049,222, Cl. 244-137.00R.
Salonimer, David J.; and Kelley, Buster E., 4,049,969, Cl. 250-458.000.
Army: *See—*
Fincke, George C.; and Taylor, George W., 4,050,040, Cl. 333-73.00C.
Nirschl, Joseph C., 4,050,019, Cl. 324-115.000.
Sagalyn, Paul L.; and Alexander, Michael N., 4,050,009, Cl. 324-.5AC.
Schlussler, Henry, 4,050,069, Cl. 343-6.50R.
Schrader, William L.; and Rose, Harold T., 4,049,131, Cl. 214-14.000.
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Googin, John M.; Schmitt, Charles R.; Schreyer, James M.; and Whitehead, Harlan D., 4,048,980, Cl. 126-270.000.
Hagel, William C.; Smidt, Frederick A.; and Korenko, Michael K., 4,049,431, Cl. 75-126.00C.
Hagel, William C.; Smidt, Frederick A., and Korenko, Michael K., 4,049,432, Cl. 75-128.00F.
Hoover, William R.; Mead, Keith E.; and Street, Henry K., 4,049,864, Cl. 428-332.000.
Robinson, C. Paul; Rockwood, Stephen D.; Jensen, Reed J.; Lyman, John L.; and Aldridge, Jack P., III, 4,049,515, Cl. 204-157.10R.
Vissers, Donald R.; Nelson, Paul A.; Kaun, Thomas D.; and Tomczuk, Zygmunt, 4,048,715, Cl. 29-623.500.
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Oden, Laurance L.; Sanker, Philip E.; and Russell, James H., 4,049,580, Cl. 252-466.00J.
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Kessinger, Roger L. Hearing aid malfunction detection system. 4,049,930, Cl. 179-175.10A.
Navy: *See—*
Beno, Lawrence A.; and Doi, Kazumasa, 4,050,070, Cl. 343-6.8LC.
Cotton, Charles C.; and Jencks, Guy S. D., 4,048,942, Cl. 114-253.000.
Evans, Albert B., Jr., 4,049,953, Cl. 235-150.300.
Fortson, Charles B., 4,049,402, Cl. 55-208.000.
Watson, William S., 4,049,223, Cl. 244-180.000.
U.S. Philips Corporation: *See—*
Bloem, Herman, 4,049,416, Cl. 65-32.000.
Boehnke, Ralf-Dieter; and Gotze, Waldemar, 4,049,523, Cl. 204-192.00R.
Convertini, Ursula; Dimigen, Heinz; and Luthje, Holger, 4,049,521, Cl. 204-192.00E.
Tijburg, Rudolf Paulus, 4,049,488, Cl. 156-655.000.

Verstegen, Judicus Marinus Pieter Jan; van de Spijker, Willebrordus Hubertus Martinus Maria; and de Meester, Emiel Petrus Juliaan, 4,049,992, Cl. 313-486.000.

United States Shoe Corporation, The: *See*—
Stix, Nathan, 4,048,732, Cl. 36-34.00B.

United States Steel Corporation: *See*—
Hemphill, J. Barry, 4,049,433, Cl. 75-129.000.

United States Trading International, Inc.: *See*—
De Long, Charles F., 4,049,869, Cl. 428-413.000.

United Technologies Corporation: *See*—
Bullis, Robert H.; and Wiegand, Walter J., Jr., 4,049,989, Cl. 313-230.000.

Unitta Company Limited: *See*—
Bell, Richard; Sato, Takao; and Lahiri, Chitta Ranjan, 4,048,865, Cl. 74-231.00R.

Universal Identification Systems, Inc.: *See*—
Byrne, John A.; Rhea, Charles K., Jr.; and Fleming, Thomas F., 4,049,950, Cl. 235-61.60R.

Universal Instruments Corporation: *See*—
Paufve, Eldred H., 4,050,017, Cl. 324-73.0AT.

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Untilov, Viktor Jurievich: *See*—
Rozengart, Jury Iosifovich; Ostrenko, Viktor Yakovlevich; Reznikov, Efim Abramovich; Sukonnik, Izrail Moishevich; Fedorov, Oleg Georgievich; Kheifets, Robert Georgievich; Untilov, Viktor Jurievich; Chichkov, Jury Viktorovich; Kasyan, Vladimir Khrisanfovich; and Lyakhovetsky, Lev Semenovich, 4,049,184, Cl. 228-131.000.

UOP Inc.: *See*—
Douglas, Walter M., 4,049,572, Cl. 252-431.00N.
Martan, Michael, 4,049,733, Cl. 260-668.00C.
Neuzil, Richard W.; and deRosset, Armand J., 4,049,688, Cl. 260-428.000.
Zabransky, Robert F.; and Anderson, Robert F., 4,049,739, Cl. 260-671.00R.

Upjohn Company, The: *See*—
Bundy, Gordon L., 4,049,648, Cl. 542-426.000.
Buss, David R., 4,049,703, Cl. 260-503.000.
Peterson, David C., 4,049,678, Cl. 260-343.410.
Sinkula, Anthony A., 4,049,699, Cl. 560-105.000.
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Urquhart, William James, to F. B. J. Engineering Services Pty. Limited. Pistons. 4,048,908, Cl. 92-159.000.

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USM Corporation: *See*—
Crouch, Ivan Percy, 4,048,688, Cl. 12-55.100.

Utamura, Yukihiko: *See*—
Kishino, Takao; and Utamura, Yukihiko, 4,049,993, Cl. 313-497.000.

Utsumi, Hiroshi: *See*—
Sasaki, Yutaka; Morii, Akimitsu; Nakamura, Yoshimi; Moriya, Kiyoshi; and Utsumi, Hiroshi, 4,049,575, Cl. 252-439.000.

Uyeo, Keizo: *See*—
Inoue, Yasuhiko; and Uyeo, Keizo, 4,049,740, Cl. 260-671.00R.

Vahlensieck, Hans-Joachim: *See*—
Seiler, Claus-Dieter; and Vahlensieck, Hans-Joachim, 4,049,690, Cl. 260-448.20E.

Vaidya, Deepak V. Rotational molding process for forming a closed hollow toroidal article. 4,049,767, Cl. 264-257.000.

Valenta, Joseph R.: *See*—
Cooper, David J.; Gebhardt, George W.; Valenta, Joseph R.; and Wdzieczkowski, Francis E., 4,049,031, Cl. 141-284.000.

Valenziano, Frank P.; and Olivier, Daniel E., to Interpace Corporation. Turnbuckle connector useable in a method for replacing an existing utility pole without disturbing hardware mounted thereon. 4,048,779, Cl. 52-726.000.

Valkov, Viktor Dmitrievich: *See*—
Zakharov, Evegny Dmitrievich; Shneider, Gennady Lvovich; Valkov, Viktor Dmitrievich; Kapitonov, Viktor Pavlovich; Miklyaev, Petr Grigorievich; Lebedev, Vladimir Alexandrovich; Kholnova, Vera Ivanovna; Shesterikov, Stanislav Alexeevich; and Bobrovsky, Vasily Mikhailovich, 4,049,474, Cl. 148-32.500.

Valstyn, Erich Philipp: *See*—
Ainslie, Norman George; Hempstead, Robert Douglas; Tan, Swie-In; and Valstyn, Erich Philipp, 4,049,522, Cl. 204-192.00M.

Van Wood Manufacturing Co., Inc.: *See*—
Disston, Horace C., Jr., 4,048,881, Cl. 82-31.000.

van de Kooi, Johannes Maria, to SKF Industrial Trading and Development Company B.V. Method and device for measuring and keeping constant the water content in a salt bath. 4,049,012, Cl. 137-3.000.

van den Hurk, Jan W. G.: *See*—
Verbeek, Francois; Bulten, Eric J.; and van den Hurk, Jan W. G., 4,049,689, Cl. 260-429.700.

van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, to C. van der Lely N. V. Rotary harrows. 4,049,061, Cl. 172-49.000.

van der Lely, Ary: *See*—
van der Lely, Cornelis; and van der Lely, Ary, 4,048,793, Cl. 56-370.000.

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van der Lely, Cornelis; and van der Lely, Ary. Raking machine. 4,048,793, Cl. 56-370.000.

Vandernotte, Leon: *See*—
Coppolani, Joseph; and Vandernotte, Leon, 4,049,124, Cl. 209-98.000.

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Boone, Gary W.; and Vandierendonck, Jerry L., 4,049,974, Cl. 307-205.000.

van Dijk, Johannes Hendrinus: *See*—
Oosterwijk, Hendrik Harm Jannes; Wiersum, Ulfert Elle; Magre, Eduard Pieter; and van Dijk, Johannes Hendrinus, 4,049,726, Cl. 260-649.00R.

Van Doorselaer, Marcel Karel; and Bollen, Romain Henri, to AGFA-GEVAERT N.V. Color radiography. 4,049,454, Cl. 96-55.000.

van Lienden, Peter Willem: *See*—
McOnie, Malcolm Peter; Tucker, Anthony John Philip; and van Lienden, Peter Willem, 4,049,895, Cl. 526-62.000.

Vanous, Joseph A.: *See*—
Anderson, Dean T.; and Vanous, Joseph A., 4,049,914, Cl. 179-2.50R.

Van Veen, Wouter Martinus Dirk, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Method of and means for in-line testing of a memory operating in time-division mode. 4,049,956, Cl. 235-153.0AC.

Varfolomeeva, Tatyana Dmitrievna: *See*—
Vereschagin, Leonid Fedorovich; Yakovlev, Evgeny Nikolaevich; Varfolomeeva, Tatyana Dmitrievna; Preobrazhensky, Alexandr Yakovlevich; Slesarev, Vladislav Nikolaevich; Stepanov, Vasily Alexandrovich; and Shterenberg, Ljudmila Efimovna, 4,049,783, Cl. 423-446.000.

Varta Batterie Aktiengesellschaft: *See*—
Schenk, Gerd; and Haake, Heinz, 4,049,883, Cl. 429-94.000.

Vaseen, Vesper A. Separating oxygen from the air by means of dissolving air in a nonmagnetic, inert liquid and then paramagnetically collecting the oxygen from the liquid. 4,049,398, Cl. 55-3.000.

Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Fluoropolymer primer having improved scratch resistance. 4,049,863, Cl. 428-324.000.

Vater, Wulf: *See*—
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; and Stoepel, Kurt, 4,049,662, Cl. 260-287.00D.

Vaudant, Adrien: *See*—
Falcy, Bernard Charles Albert; and Vaudant, Adrien, 4,048,794, Cl. 57-149.000.

Vcelka, John Leonard; and Winchell, David A., to Baxter Travenol Laboratories, Inc. Attaching means and method for attaching flexible tubing to a plastic container. 4,049,034, Cl. 150-8.000.

VDO Adolf Schindling AG: *See*—
Flach, Hans-Georg; and Stier, Bernhard, 4,050,021, Cl. 324-150.000.
Kreuz, Alois, 4,049,986, Cl. 310-68.00B.
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VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen: *See*—
Hank, Dietrich; Lipfert, Gerhard; and Niesgoda, Tassilo, 4,049,213, Cl. 242-57.100.

Vegeby, Anders. Method of producing pulp and burning waste liquor obtained thereby. 4,049,489, Cl. 162-30.00R.

Veige, Sten: *See*—
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,799, Cl. 424-211.000.
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,049,800, Cl. 424-211.000.

Veitch, George Bryan Austin: *See*—
Harper, Norman James; and Veitch, George Bryan Austin, 4,049,663, Cl. 260-293.860.

Velsicol Chemical Corporation: *See*—
Albright, James A., 4,049,617, Cl. 260-45.80R.
Anderson, Arnold L., 4,049,619, Cl. 260-45.75B.
Anderson, Arnold L., 4,049,620, Cl. 260-45.75R.
Anderson, Arnold L., 4,049,623, Cl. 260-45.95G.
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Ventron Corporation: *See*—
Rei, Nuno M.; and Wilson, Ronald C., 4,049,822, Cl. 424-297.000.

Ventz, George A., to General Corrugated Machinery Co., Inc. Method of and apparatus for feeding sheets. 4,049,259, Cl. 271-151.000.

Verbeek, Francois; Bulten, Eric J.; and van den Hurk, Jan W. G., to Commer S.r.l. Method for the preparation of alkyl tin halides. 4,049,689, Cl. 260-429.700.

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Moser, Peter; Eysn, Manfred; Enkner, Bernhard; Berger, Rupert; Wagner, Wolfgang; and Spannlang, Ronald, 4,049,249, Cl. 266-247.000.

Vereschagin, Leonid Fedorovich; Yakovlev, Evgeny Nikolaevich; Varfolomeeva, Tatyana Dmitrievna; Preobrazhensky, Alexandr Yakovlevich; Slesarev, Vladislav Nikolaevich; Stepanov, Vasily Alexandrovich; and Shterenberg, Ljudmila Efimovna. Method of producing polycrystalline diamonds. 4,049,783, Cl. 423-446.000.

Vernon, Lonnie W.: *See*—
Plumlee, Karl W.; and Vernon, Lonnie W., 4,049,536, Cl. 208-10.000.
Plumlee, Karl W.; and Vernon, Lonnie W., 4,049,537, Cl. 208-10.000.

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Vicon Supply Company, The: *See*—
Thistlethwaite, Mark K., 4,048,771, Cl. 52-127.000.

Viellevoye, Lucien Nicolas Leon: *See*—
Pettipher, Rodney; Viellevoye, Lucien Nicolas Leon; and Kruithof, Albert, 4,050,095, Cl. 364-200.000.

Vijlbrief, Pieter: *See*—
Berger, Helmut; Holzermer, Gunther; Kirsch, Harry; and Vijlbrief, Pieter, 4,049,967, Cl. 250-445.00T.

Vinals, Joaquin: *See*—
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,049,682, Cl. 260-410.000.

Vissers, Donald R.; Nelson, Paul A.; Kaun, Thomas D.; and Tomczuk, Zygmunt, to United States of America, Energy Research and Development Administration. Method of preparing porous, active material for use in electrodes of secondary electrochemical cells. 4,048,715, Cl. 29-623.500.

Vital, Zoltan; and Orban, Jean, to Ponder & Best, Inc. Control of electronically generated light pulses. 4,049,996, Cl. 315-151.000.

Vock, Manfred Hugo: *See*—
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,049,682, Cl. 260-410.000.

Voges, Dieter: *See*—
Nissen, Axel; Fliege, Werner; and Voges, Dieter, 4,049,571, Cl. 252-430.000.

Volkamer, Klaus: *See*—
Weitz, Hans-Martin; Wagner, Ulrich; Volkamer, Klaus; Schubert, Eckart; and Bandermann, Friedhelm, 4,049,742, Cl. 260-681.50R.

Vomel, Wolfgang: *See*—
Berger, Herbert; Rhomberg, Alfred; Stach, Kurt; Vomel, Wolfgang; and Sauer, Winfriede, 4,049,811, Cl. 424-258.000.

von Scheele, Gert H., to Hoganas AB. Boron alloyed iron powder for filler metals. 4,049,436, Cl. 75-.50R.

Vos, Kenneth D.: *See*—
Lo, Vincent; Vos, Kenneth D.; and Suchla, Germane M., 4,049,158, Cl. 222-95.000.

Vosteen, Robert E. High voltage amplifier. 4,050,028, Cl. 330-10.000.

Vukovich, William J.; and Stevenson, Paul D., to General Motors Corporation. Torque converter and lock-up clutch with a flow divider valve. 4,049,093, Cl. 192-3.300.

Vuojolainen, Tuomo Juhani: *See*—
Romantschuk, Hakan Wilhelm; and Vuojolainen, Tuomo Juhani, 4,049,787, Cl. 423-563.000.

W. C. Heraeus GmbH: *See*—
Reichelt, Walter; and Sauer, Gunter, 4,050,052, Cl. 338-308.000.

W. Canning & Company Limited: *See*—
Such, Tony Eugene; Wyszynski, Apoloniusz; and James, Barrie Sydney, 4,049,509, Cl. 204-49.000.

W. R. Grace & Co.: *See*—
Acker, Ellsworth George; and Winyall, Milton Edward, 4,049,781, Cl. 423-338.000.
Marans, Nelson Samuel; and Pollack, Alan Ricky, 4,049,592, Cl. 260-2.5AD.

WABCO Westinghouse GmbH: *See*—
Reinecke, Erich, 4,049,325, Cl. 303-92.000.

Wagman, Gerald Howard: *See*—
Weinstein, Marvin Joseph; Daniels, Peter John Lovell; Wagman, Gerald Howard; and Testa, Raymond Thomas, 4,049,498, Cl. 195-96.000.

Wagner, Heinz: *See*—
Wener, Kurt; Stock, Gunter; Herrig, Klaus; and Wagner, Heinz, 4,049,224, Cl. 245-6.000.

Wagner, Oliver, to Petrolite Corporation. Color improvement process for organic liquid. 4,049,520, Cl. 204-186.000.

Wagner, Ulrich: *See*—
Weitz, Hans-Martin; Wagner, Ulrich; Volkamer, Klaus; Schubert, Eckart; and Bandermann, Friedhelm, 4,049,742, Cl. 260-681.50R.

Wagner, Wolfgang: *See*—
Moser, Peter; Eysn, Manfred; Enkner, Bernhard; Berger, Rupert; Wagner, Wolfgang; and Spannlang, Ronald, 4,049,249, Cl. 266-247.000.

Wahlefeld, August Wilhelm: *See*—.
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Waitz, Jay Allan: *See*—
Cooper, David J.; Waitz, Jay Allan; Counelis, Mae; and Weinstein, Jay, 4,049,796, Cl. 424-180.000.

Wakahara, Katuhiro: *See*—
Ito, Tadashi; Wakahara, Katuhiro; and Tatsuoka, Masao, 4,048,811, Cl. 62-263.000.

Walker, Francis H.: *See*—
Baker, Don R.; and Walker, Francis H., 4,049,423, Cl. 71-118.000.
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Walker, George, to AB Svenska Flaktfabriken. Color spray booth and method of ventilating the same. 4,048,912, Cl. 98-115.0SB.

Wallace, Dewey K. Magnetic radio mounting bracket. 4,049,333, Cl. 339-12.00R.

Wallace, Joseph W., to Reynolds Metals Company. Method of bottom embossing. 4,048,934, Cl. 113-120.00H.

Wallbraun, Astrid: *See*—
Dietrich, Peter; Engler, Gunter; Ferse, Armin; Grimm, Harald; Gross, Udo; Lunkwitz, Klaus; Prescher, Dietrich; Schulze, Jurgen; and Wallbraun, Astrid, 4,049,681, Cl. 260-408.000.

Walon, Raoul Guillaume Phillipe, to CPC International Inc. Levulose containing sweetening compositions. 4,049,466, Cl. 127-29.000.

Walter, Hans-Philipp. Drilling apparatus. 4,049,065, Cl. 175-52.000.

Walters, Richard G.: *See*—
Pagliaro, Vincent A.; and Walters, Richard G., 4,049,453, Cl. 96-36.300.

Walters, Robert A.; and Kolenik, Steve A., to ARCO Medical Products Company. Digital cardiac pacer. 4,049,003, Cl. 128-419.0PG.

Walters, Robert A., to ARCO Medical Products Company. Implantable digital cardiac pacer having externally selectible operating parameters and "one shot" digital pulse generator for use therein. 4,049,004, Cl. 128-419.0PG.

Walters, Thomas, Jr., to Ecolaire Incorporated. Continuous mixer and unloader. 4,049,240, Cl. 259-3.000.

Wamser, Anton: *See*—
Grof, Helmut Theodor; Schumann, Jochen; Wamser, Anton; Schumann, Rainer; and Thomas, Werner Friedrich, 4,049,039, Cl. 164-52.000.

Wang, Yung-Heng: *See*—
Wen, Lian-Tong, 4,049,218, Cl. 244-23.00C.

Warner, John Stuart: *See*—
Sridhar, Ramamrithan; Warner, John Stuart; and Bell, Malcolm Charles Evert, 4,049,438, Cl. 75-21.000.

Watanabe, Shigeru: *See*—
Fukushima, Yoshikiyo; and Watanabe, Shigeru, 4,048,805, Cl. 61-56.000.

Watari, Kazuhiro: *See*—
Tanaka, Seiichi; Watari, Kazuhiro; and Hayashi, Hideki, 4,049,723, Cl. 260-621.00A.

Watkins, Richard F. Post turret tool holder for engine lathes. 4,048,882, Cl. 82-36.00A.

Watson, Bela Lee: *See*—
Kubus, James Michael; Seese, Ray Bruce; and Watson, Bela Lee, 4,048,757, Cl. 51-436.000.

Watson, W. Gary; and Breedis, John F., to Olin Corporation. Copper-base alloys containing chromium, niobium and zirconium. 4,049,426, Cl. 75-153.000.

Watson, William S., to United States of America, Navy. Constant altitude auto pilot circuit. 4,049,223, Cl. 244-180.000.

Wdzieczkowski, Francis E.: *See*—
Cooper, David J.; Gebhardt, George W.; Valenta, Joseph R.; and Wdzieczkowski, Francis E., 4,049,031, Cl. 141-284.000.

Weaver, Max A.; Straley, James M.; and Moore, William H., to Eastman Kodak Company. Phenylazo compounds from cyclohexylaminoacylanilides. 4,049,643, Cl. 260-207.100.

Webb, George Henry, to Desoutter Brothers Limited. Power operated torque tool. 4,049,104, Cl. 192-150.000.

Webb, James W. Method and apparatus for forming flanges. 4,049,482, Cl. 156-172.000.

Webb, Oswald, to GKN Transmissions Limited. Control couplings. 4,048,872, Cl. 74-711.000.

Webb, Robert Lee: *See*—
Lam, Bing Lun; Lewis, Joseph James; Webb, Robert Lee; and Wellman, George Robert, 4,049,669, Cl. 260-306.80R.

Weber, Neill: *See*—
Saillant, Roger B.; and Weber, Neill, 4,049,877, Cl. 429-11.000.

Wehran Engineering Corporation: *See*—
Cocozza, Eugene P., 4,049,462, Cl. 106-85.000.

Wehrmeister, Herbert Louis, to IMC Chemical Group, Inc. Coccidiostats. 4,049,810, Cl. 424-258.000.

Weibling, Robert L. Combined garden cultivator and lawn edger. 4,049,059, Cl. 172-15.000.

Weigel, Horst; and Spitz, Anton, deceased (by Schurmann, Barbara Wilhelmine Spitz nee, legal representative), to Klockner-Humboldt-Deutz Aktiengesellschaft. Method for thermal treatment of nickel ore. 4,049,445, Cl. 75-82.000.

Weil, Edward D., to Stauffer Chemical Company. Tribromoneopentyl phosphorus reactive flame retardants. 4,049,754, Cl. 260-952.000.

Weiland, Richard Herschel: *See*—
Dean, Roy Delmar; and Weiland, Richard Herschel, 4,049,219, Cl. 244-217.000.

Weimann, Gunter: *See*—
Bernt, Erich; Gruber, Wolfgang; Haid, Erich; Stahler, Fritz; Wahlefeld, August Wilhelm; and Weimann, Gunter, 4,049,702, Cl. 260-501.120.

Weinstein, Jay: *See*—
Cooper, David J.; Waitz, Jay Allan; Counelis, Mae; and Weinstein, Jay, 4,049,796, Cl. 424-180.000.

Weinstein, Marvin Joseph; Daniels, Peter John Lovell; Wagman, Gerald Howard; and Testa, Raymond Thomas, to Schering Corporation. Methods for the preparation of semi-synthetic aminocyclitol aminoglycoside antibiotics. 4,049,498, Cl. 195-96.000.

Weintritt, Horst: *See*—
Bach, Josef; Kollwig, Horst; Meitzner, Wolfgang; Weintritt, Horst; and Ueberdiek, Ralf, 4,049,209, Cl. 242-18.0PW.

Weir, Robert. Plenum cover for roof mounted vehicle air conditioner. 4,048,910, Cl. 98-2.160.

Weirich, Walter; and Kussel, Willy, to Gewerkschaft Eisenhutte Westfalia. Apparatus for use in controlling the tension of a chain or chains of mining equipment. 4,048,866, Cl. 74-242.1FP.

Weis, Martin; and Scholz, Adolf, to Badische Maschinenfabrik GmbH. Sand-blasting machine for castings. 4,048,758, Cl. 51-416.000.

Weiss, Francis: *See*—
Schirmann, Jean-Pierre; and Weiss, Francis, 4,049,712, Cl. 260-554.000.

Weiss, Jean; and Zalmanski, Alain, to Produits Chimiques Ugine Kuhlmann. Polyesters and process for their preparation. 4,049,628, Cl. 260-47.0UA.

Weissel, Oskar, to Bayer Aktiengesellschaft. Supported ruthenium catalyst and process for preparing it. 4,049,584, Cl. 252-470.000.

Weitz, Hans-Martin; Wagner, Ulrich; Volkamer, Klaus; Schubert, Eckart; and Bandermann, Friedhelm, to BASF Aktiengesellschaft. Recovery of 1,3-butadiene from a C_4-hydrocarbon mixture. 4,049,742, Cl. 260-681.50R.

Welinder, Jan Birger Franz: *See*—
Hertz, Carl Hellmuth; and Welinder, Jan Birger Franz, 4,050,075, Cl. 346-75.000.

Wellman, George Robert: *See*—
Lam, Bing Lun; Lewis, Joseph James; Webb, Robert Lee; and Wellman, George Robert, 4,049,669, Cl. 260-306.80R.

Wells, Joseph L.: *See*—
Roberts, David B., Jr.; and Wells, Joseph L., 4,048,753, Cl. 47-59.000.

Wen, Lian-Tong, to Wang, Yung-Heng; and Chang, Charles, part interest to each. Vertical take off and landing aircraft. 4,049,218, Cl. 244-23.00C.

Wenckus, Joseph F.; Menashi, Wilson P.; and Castonguay, Roger A., to Arthur D. Little, Inc. Cold crucible system. 4,049,384, Cl. 23-273.0SP.

Wener, Kurt; Stock, Gunter; Herrig, Klaus; and Wagner, Heinz, to ARBED, Acieries Reunies de Burbach-Eich-Dudelange. Chain-link fencing package and method of making same. 4,049,224, Cl. 245-6.000.

Wennerstrom, Arthur J. Device for measuring rotor tip clearance in operating turbomachinery. 4,049,349, Cl. 356-4.000.

Wennerstrom, Arthur J. Device for measuring tip deflection of rotating blades. 4,049,644, Cl. 250-233.000.

Werner Kammann Maschinenfabrik: *See*—
Kammann, Wilfried; and Keller, Manfred, 4,048,914, Cl. 101-35.000.

Werthmann, Eckhart: *See*—
Mortl, Gunther Lorenz; Werthmann, Eckhart; and Zoglmeyr, Gunther, 4,049,461, Cl. 106-56.000.

Wesch, Ludwig. Support for foam absorber of electromagnetic waves. 4,050,073, Cl. 343-18.00A.

Wess, Guenter: *See*—
Fink, Helmuth; and Wess, Guenter, 4,050,014, Cl. 324-57.00H.

Wester, Thomas Joseph: *See*—
Woidke, Richard Paul; Wester, Thomas Joseph; and Brosch, Eric Joseph, 4,048,861, Cl. 74-56.000.

Western Digital Corporation: *See*—
Dru, Luke William; and Hwang, Yun Sheng, 4,049,978, Cl. 307-270.000.

Western Electric Company, Inc.: *See*—
Fegley, Charles R.; Winings, Richard H.; and Yeich, Clifford R., Jr., 4,049,123, Cl. 209-74.00M.
Maddox, Harry L., 4,050,013, Cl. 324-43.00R.

Western Geophysical Co. of America: *See*—
Paitson, John Lloyd; and Anderson, Clifford E., 4,049,078, Cl. 181-120.000.

Westinghouse Air Brake Company: *See*—
Jeffrey, William B., 4,049,128, Cl. 213-1.600.

Westinghouse Electric Corporation: *See*—
Frink, Russell E.; and Milianowicz, Stanislaw A., 4,049,936, Cl. 200-146.00R.

Wheeler, Charles J. Chain saw guide apparatus. 4,048,720, Cl. 30-166.00A.

Whirlpool Corporation: *See*—
Pielemeier, John William, 4,048,820, Cl. 68-133.000.

White, Dwain M., to General Electric Company. Polyetherimide composites 4,049,613, Cl. 260-37.00N.

White, George Raymond: *See*—
Durant, Graham John; Ganellin, Charon Robin; and White, George Raymond, 4,049,671, Cl. 548-342.000.

White, Howard S.: *See*—
Magnusson, Alan B.; and White, Howard S., 4,049,632, Cl. 260-75.0NE.

White, Leonard Alan, to Baxter Travenol Laboratories, Inc. Moisture detection system for a sterile package. 4,049,121, Cl. 206-439.000.

White, Ralph L., Jr., to Morton-Norwich Products, Inc. 1-[[[5-(Substituted phenyl)-2-oxazolyl]methylene]amino]-2,4-imidazolidinediones. 4,049,650, Cl. 542-400.000.

Whitehead, Harlan D.: *See*—
Googin, John M.; Schmitt, Charles R.; Schreyer, James M.; and Whitehead, Harlan D., 4,048,980, Cl. 126-270.000.

Whitehead & Kales Company: *See*—
Peisner, Israel Daniel, 4,049,229, Cl. 248-503.000.

Whittingham, M. Stanley, to Exxon Research & Engineering Co. Electrochemical cells with cathode-active materials of layered compounds. 4,049,887, Cl. 429-112.000.

Whittingham, M. Stanley: *See*—
Thompson, Arthur H.; and Whittingham, M. Stanley, 4,049,879, Cl. 429-191.000.

Wibben, Warren G. Roofing system. 4,048,924, Cl. 104-245.000.

Wicker, Alain: *See*—
Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, 4,049,884, Cl. 429-104.000.
Driole, Jean; Allibert, Colette; Bonnier, Etienne; and Wicker, Alain, 4,049,437, Cl. 75-10.00R.

Wicker, Thomas H., Jr.: *See*—
Gilkey, Russell; Hilbert, Samuel D.; and Wicker, Thomas H., Jr., 4,049,621, Cl. 260-40.000.

Wickman Machine Tool Sales Limited: *See*—
Yearsley, Norman, 4,049,282, Cl. 279-50.000.

Widman, D. Edward. Fuel vaporizer apparatus. 4,048,969, Cl. 123-133.000.

Wiechert, Rudolf: *See*—
Laurent, Henry; Annen, Klaus; Wiechert, Rudolf; and Hofmeister, Helmut, 4,049,804, Cl. 424-242.000.

Wiedenmann, Rudolf: *See*—
Kammel, Gernot; and Wiedenmann, Rudolf, 4,049,757, Cl. 264-22.000.

Wiegand, Walter J., Jr.: *See*—
Bullis, Robert H.; and Wiegand, Walter J., Jr., 4,049,989, Cl. 313-230.000.

Wier, Donald R., to Phillips Petroleum Company. Stable mixtures of polymers and surfactants for surfactant flooding. 4,049,054, Cl. 166-273.000.

Wiersum, Ulfert Elle: *See*—
Oosterwijk, Hendrik Harm Jannes; Wiersum, Ulfert Elle; Magre, Eduard Pieter; and van Dijk, Johannes Hendrinus, 4,049,726, Cl. 260-649.00R.

Wiese, Volkhard: *See*—
Elsener, Anton; Gehrt, Hans Harald; Medinger, Bernhard; and Wiese, Volkhard, 4,049,615, Cl. 260-39.00P.

Wiesner, Paul: *See*—
Wohler, Fritz; Stonner, Hans-Martin; and Wiesner, Paul, 4,049,782, Cl. 423-352.000.

Wiest, Peter P.: *See*—
Lindemann, Hans-Joachim; and Wiest, Peter P., 4,048,992, Cl. 128-184.000.

Wild, Albrecht: *See*—
Schacht, Erich; Mehrhof, Werner; Wild, Albrecht; Gante, Joachim; and Kurmeier, Hans-Adolf, 4,049,823, Cl. 424-308.000.

Wiles, Michael F.: *See*—
Bennett, Thomas H.; and Wiles, Michael F., 4,050,096, Cl. 364-200.000.

Wilhelm Hedrich Vakuumanlagen, Firma: *See*—
Hedrich, Wilhelm, 4,049,244, Cl. 259-185.000.

Will, Fritz G., to General Electric Company. Rechargeable aqueous metal-halogen cell. 4,049,886, Cl. 429-105.000.

Will, Kurt: *See*—
Seifert, Hans; Will, Kurt; and Zapf, Horst, 4,048,974, Cl. 123-191.00M.

Williams, John Lloyd; Leaman, Roger John; Moberly, Robert Valentine; Stagg, Geoffrey Brian Kenneth; and Wisdom, Graham John, to Plessey Handel und Investments A.G. Data processing read and hold facility. 4,050,059, Cl. 364-200.000.

Williams, Robert W. Suction retraction instrument. 4,049,000, Cl. 128-276.000.

Wilson, Chester K., to Cutler-Hammer, Inc. Thermostatic switch. 4,050,046, Cl. 337-319.000.

Wilson, Clive Westgarth: *See*—
Metcalfe, Kenneth A.; Wilson, Clive Westgarth; and Field, Denton, 4,049,446, Cl. 96-1.0LY.

Wilson, George D.: *See*—
Kovach, Stephen M.; and Wilson, George D., 4,049,576, Cl. 252-441.000.

Wilson Greatbatch Ltd.: *See*—
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Wilson, Henry G. E.: *See*—
Estebanez, Joseph; Harrison, David V.; Jones, Clifford P.; and Wilson, Henry G. E., 4,048,956, Cl. 118-306.000.

Wilson, Robert B., to National Blank Book Company, Inc. Tape cassette filing unit. 4,049,119, Cl. 206-387.000.

Wilson, Ronald C.: *See*—
Rei, Nuno M.; and Wilson, Ronald C., 4,049,822, Cl. 424-297.000.

Winchell, David A.: *See*—
Vcelka, John Leonard; and Winchell, David A., 4,049,034, Cl. 150-8.000.

Wingert, Rudolf: *See*—
Bako, Lazlo; and Wingert, Rudolf, 4,048,821, Cl. 70-25.000.

Winings, Richard H.: *See*—
Fegley, Charles R.; Winings, Richard H.; and Yeich, Clifford R., Jr., 4,049,123, Cl. 209-74.00M.

Winkler & Dunnebier Maschinenfabrik und Eisengiesserei KG: *See*—
Ehlscheid, Gunter; Langenbeck, Peter; and Stemmler, Kurt, 4,049,945, Cl. 219-121.0LM.

Winn, James Buchanan, Jr., to Archilithic Company, The. Fiber shear system. 4,048,884, Cl. 83-24.000.

Winn, Martin, to Abbott Laboratories. Heterocyclic esters of alkylphenyl benzopyrans. 4,049,653, Cl. 544-150.000.

Winslow, Joseph D., Jr., to Petrolite Corporation. Electrical treater with a.c-d.c. electrical fields. 4,049,535, Cl. 204-305.000.

Winston, Fendall Gregory, IV, to Tektronix, Inc. Sideband detector. 4,050,024, Cl. 328-134.000.

Winter, Walter W.: *See*—
Nason, George F., III; and Winter, Walter W., 4,048,728, Cl. 35-8.00A.

Winyall, Milton Edward: *See*—
Acker, Ellsworth George; and Winyall, Milton Edward, 4,049,781, Cl. 423-338.000.

Winzeler, James E.: *See*—
Golan, Kenneth F.; and Winzeler, James E., 4,048,799, Cl. 60-413.000.

Wisdom, Graham John: *See*—
Williams, John Lloyd; Leaman, Roger John; Moberly, Robert Valentine; Stagg, Geoffrey Brian Kenneth; and Wisdom, Graham John, 4,050,059, Cl. 364-200.000.

Wise, John J.: *See*—
Garwood, William E.; Jacob, Solomon M.; Kuo, James C.; and Wise, John J., 4,049,734, Cl. 260-668.00R.
Kuo, James C.; Prater, Charles D.; and Wise, John J., 4,049,741, Cl. 260-676.00R.

Wisner, Marco: *See*—
Schimmel, Karl F.; and Wismer, Marco, 4,049,637, Cl. 260-78.0TF.

Witzel, Bruce E.; Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., to Merck & Co., Inc. Alicyclic alkylene polyamine microorganism and algae growth inhibitors. 4,049,417, Cl. 71-67.000.

Wixon, Harold Eugene, to Colgate-Palmolive Company. Fabric conditioning compositions. 4,049,557, Cl. 252-8.800.

Wohler, Fritz; Stonner, Hans-Martin; and Wiesner, Paul, to Metallgesellschaft Aktiengesellschaft. Process for producing pure concentrated ammonia. 4,049,782, Cl. 423-352.000.

Woidke, Richard Paul; Wester, Thomas Joseph; and Brosch, Eric Joseph, to Johns-Manville Corporation. Device for oscillating a rotating body along its rotational axis. 4,048,861, Cl. 74-56.000.

Wolak, Norbert S.; and Wolak, Thomas J., to Evans Products Company. Full length door arrangement for railway house car. 4,048,755, Cl. 49-130.000.

Wolak, Thomas J.: *See*—
Wolak, Norbert S.; and Wolak, Thomas J., 4,048,755, Cl. 49-130.000.

Wolf, Karlheinz: *See*—
Bunge, Wilhelm; Last, Wolf-Dieter; Saitner, Rudolf; and Wolf, Karlheinz, 4,049,610, Cl. 260-31.20N.

Wolfe, Gilbert H. Game call with two-diaphragm sounder. 4,048,750, Cl. 46-180.000.

Wolfson, Alan. Twin-brushes rotary toothbrush. 4,048,690, Cl. 15-22.00R.

Wood, Prentice J., to Mead Corporation, The. Panel interlocking means and method. 4,049,189, Cl. 229-48.00R.

Woods, Kenneth D. Water fountain control wiper unit for offset printing machines. 4,048,919, Cl. 101-148.000.

Woodward Mfg. & Sales Co., Inc.: *See*—
Garvey, Eugene N., 4,049,083, Cl. 187-9.00R.

Worcester, Samuel Austin, Jr.: *See*—
Yih, Stephen Wei Hong; Worcester, Samuel Austin, Jr.; and Rudy, Erwin, 4,049,380, Cl. 428-539.500.

Worthington, Mark N. Solar heating/cooling system. 4,049,046, Cl. 165-18.000.

Worz, Paul, to Robert Bosch GmbH. Ignition coil for internal combustion engines. 4,048,972, Cl. 123-148.00D.

Wright, Edward James, to Baker Perkins Holdings Limited. Apparatus for depositing fibrous material into containers. 4,048,785, Cl. 53-122.000.

Wright, James E.: *See*—
Jacoby, Jerold L.; Tierney, William S.; Wright, James E.; and Bhuta, Pravin G., 4,049,336, Cl. 350-3.500.

Wright, Nicholas David: *See*—
Harnden, Michael Raymond; and Wright, Nicholas David, 4,049,816, Cl. 424-270.000.

Wu, Yao Hua; and Lobeck, Walter G., to Mead Johnson & Company. N-phenyl amidines. 4,049,714, Cl. 260-564.00R.

Wuchinich, David G.; and Tarsia, Joseph, to Cavitron Corporation. Optical switching device. 4,049,964, Cl. 250-221.000.

Wuerker, Ralph F.; and Heflinger, Lee O., to TRW Inc. Self-aligned polarized laser. 4,050,035, Cl. 331-94.50C.

Wyman-Gordon Company: *See*—
Eddy, Robert A.; Gustafson, Norman F.; and Erwin, Stephen J., 4,048,836, Cl. 72-364.000.

Wyszynski, Apoloniusz: *See*—
Such, Tony Eugene; Wyszynski, Apoloniusz; and James, Barrie Sydney, 4,049,509, Cl. 204-49.000.

Xenex Corporation: *See*—
Zettler, John Francis, 4,048,886. Cl. 83-58.000.

Xerox Corporation: *See*—
Azar, Jack C.; Hoffend, Thomas A.; and Jacknow, Burton B., 4,049,447, Cl. 96-1.0SD.
Frechette, Kenneth R., 4,049,110, Cl. 197-53.000.
Garlic, Richard A., 4,050,058, Cl. 364-200.000.
Hause, Jonathan E., 4,049,180, Cl. 227-78.000.
Hermanson, Herman A., 4,049,343, Cl. 355-3.00P.
Marsh, Dana G., 4,049,449, Cl. 96-1.50R.
Pfister, Gustav R.; and Maher, James C., 4,050,027, Cl. 330-5.000.
Plaza, Mario G.; and Trezise, Richard D., 4,049,109, Cl. 197-53.000.
Rote, Everett Arthur, 4,048,718, Cl. 29-739.000.
Simpson, George R.; Gundlach, Robert W.; and Butler, Gordon C., 4,049,344, Cl. 355-10.000.
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,049,255, Cl. 271-3.000.

Yagita, Yasunobu, to Keisuke Honda. Multi-contact brush type fish detecting sonar. 4,050,054, Cl. 340-3.00F.

Yakovlev, Evgeny Nikolaevich: *See*—
Vereschagin, Leonid Fedorovich; Yakovlev, Evgeny Nikolaevich; Varfolomeeva, Tatyana Dmitrievna; Preobrazhensky, Alexandr Yakovlevich; Slesarev, Vladislav Nikolaevich; Stepanov, Vasily Alexandrovich; and Shterenberg, Ljudmila Efimovna, 4,049,783, Cl. 423-446.000.

Yamachika, Hiroshi: *See*—
Hosaka, Hirokazu; Tanimoto, Kenji; and Yamachika, Hiroshi, 4,049,720, Cl. 260-610.00B.

Yamada, Kentaro: *See*—
Uchizono, Kazuhiro; Yamada, Kentaro; Saito, Kenji; Taninaka, Takato; Abe, Yoshinari; Ishii, Masayoshi; Nakayama, Hiroo; and Futatsuki, Sachio, 4,048,936, Cl. 114-65.00R.

Yamada, Takahiro; and Doi, Tetsuo, to Hitachi, Ltd. Liquid droplet supplying system. 4,050,077, Cl. 346-75.000.

Yamagishi, Seiichi: *See*—
Toriumi, Shiro; and Yamagishi, Seiichi, 4,049,341, Cl. 353-23.000.

Yamaguchi, Toshiaki; and Shoji, Jinichi, to Nishimura Seisakusho Co., Ltd. Apparatus for independently rewinding slit strips in a web slitting and rewinding machine. 4,049,212, Cl. 242-56.900.

Yamaguchi, Toshiaki; and Shoji, Jinichi, to Nishimura Seisakusho Co., Ltd. Method and apparatus for driving rewinding shafts for slit strips. 4,049,214, Cl. 242-75.510.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Masae, Watanabe, 4,049,251, Cl. 267-64.00R.

Yamahata, Takashi: *See*—
Itoh, Takuji; Nishikawa, Eiichiroh; Miura, Tadashi; and Yamahata, Takashi, 4,049,581, Cl. 252-466.0PT.

Yamai, Fumito: *See*—
Ikeda, Toshiki; Yamai, Fumito; and Ishida, Tomohiko, 4,049,594, Cl. 260-2.50B.

Yamamoto, Minoru: *See*—
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,049,538, Cl. 208-50.000.

Yamamoto, Takaharu; Nomura, Toshio; Asai, Tsuyoshi; and Hara, Akio, to Sumitomo Electric Industries, Ltd. Cemented carbonitride alloys. 4,049,876, Cl. 428-932.000.

Yamamoto, Yoichi: *See*—
Takano, Rikuo; Saito, Tamaki; Sumitomo, Yuji; Kobayashi, Toshio; Yamamoto, Yoichi; Siozaki, Fumio; and Maezawa, Tokio, 4,050,076, Cl. 346-75.000.

Yamamoto, Yoshiharu: *See*—
Hori, Yutaka; Honda, Zenzo; Suzuki, Kenji; Nakamoto, Keiji; and Yamamoto, Yoshiharu, 4,049,904, Cl. 174-107.000.

Yamamoto, Yukio, to Yoshida Kogyo Kabushiki Kaisha. Exterior window unit having adapter sill member. 4,048,774, Cl. 52-202.000.

Yamanaka, Masami: *See*—
Tamamura, Ryozo; and Yamanaka, Masami, 4,049,069, Cl. 177-134.000.

Yamashita, Daizo. Belt saw guiding device for a belt saw machine. 4,048,892, Cl. 83-799.000.

Yamato Scale Company, Limited: *See*—
Tamamura, Ryozo; and Yamanaka, Masami, 4,049,069, Cl. 177-134.000.

Yamato Shokaki Co., Ltd.: *See*—
Tujimoto, Hiroaki; Maki, Tatuya; Suganuma, Sadao; and Sano, Taketora, 4,049,556, Cl. 252-3.000.

Yamazaki, Masahiro, to Nippon Zeon Co., Ltd. Method for setting end portion of bundle of thread-like bodies. 4,049,765, Cl. 264-261.000.

Yan, Tsoung Y.; Huang, Tracy J.; and Haag, Werner O., to Mobil Oil Corporation. Two-stage process for upgrading naphtha. 4,049,539, Cl. 208-65.000.

Yanagisawa, Takeshi; and Osuga, Motoyuki, to Kabushiki Kaisha Seikosha. Buzzer. 4,050,066, Cl. 340-388.000.

Yardney Electric Corporation: *See*—
Seiger, Harvey N., 4,049,027, Cl. 141-1.100.

Yariv, Amnon: *See*—
Garvin, Hugh L.; Yariv, Amnon; and Somekh, Sasson, 4,049,944, Cl. 219-121.0EM.

Yasunami, Kazuo: *See*—
Tominaga, Hiroshi; Yasunami, Kazuo; Saito, Shinroku; Takamatsu, Masanobu; and Sawaoka, Akira, 4,049,367, Cl. 425-77.000.

Yasuta, Toru: *See*—
Shimizu, Hiroshi; Nishidai, Jun; and Yasuta, Toru, 4,049,899, Cl. 13-6.000.

Yats, Larry D.: *See*—
Lamson, Junior J.; Hall, Richard H.; Stroiwas, Edward; and Yats, Larry D., 4,049,736, Cl. 260-669.0QZ.

Yeakey, Ernest L.: *See*—
Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., 4,049,657, Cl. 260-268.0SY.

Yearsley, Norman, to Wickman Machine Tool Sales Limited. Collet actuating mechanisms. 4,049,282, Cl. 279-50.000.

Yeh, Tsu-Hsing: *See*—
Ghosh, Hitendra N.; Joshi, Madhukar L.; and Yeh, Tsu-Hsing, 4,049,478, Cl. 148-187.000.

Yeich, Clifford R., Jr.: *See*—
Fegley, Charles R.; Winings, Richard H.; and Yeich, Clifford R., Jr., 4,049,123, Cl. 209-74.00M.

Yevick, George J., to Izon Corporation. Method of making microfiche laminate having apertures with doublet lenses. 4,049,756, Cl. 264-1.000.

Yih, Stephen Wei Hong; Worcester, Samuel Austin, Jr.; and Rudy,

Erwin, to Teledyne Industries, Inc. Cemented carbides containing hexagonal molybdenum. 4,049,380, Cl. 428-539.500.
Yoder, Perry E. Recreational vehicle with expansible section. 4,049,310, Cl. 296-26.000.
Yokoyama, Kazumasa: *See—*
Okamoto, Hiroyuki; Tsuda, Yoshio; and Yokoyama, Kazumasa, 4,049,683, Cl. 260-410.700.
York, David L.: *See—*
Muzyczko, Thaddeus M.; Frederiksen, Ronald A.; and York, David L., 4,049,746, Cl. 260-851.000.
Yoshida Kogyo Kabushiki Kaisha: *See—*
Kanzaka, Yoshihiro, 4,048,699, Cl. 24-205.14R.
Kawakami, Koichi; and Osaki, Tatsuo, 4,049,155, Cl. 221-192.000.
Takamatsu, Ikuo, 4,048,698, Cl. 24-205.14R.
Yamamoto, Yukio, 4,048,774, Cl. 52-202.000.
Yoshikawa, Shinsuke; Sasaki, Tohru; and Terasaki, Syuuzi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Metallized film. 4,049,859, Cl. 428-172.000.
Yoshioka, Shigeo: *See—*
Ueda, Tetsuo; Yoshioka, Shigeo; Shohji, Yoshihiko; Tanaka, Tsunemitsu; Kikuchi, Yukio; Fujita, Nobuo; Kaneko, Norio; and Tanemoto, Toshiharu, 4,049,540, Cl. 208-127.000.
Youmans, Albert P., to Signetics Corporation. Solid state force transducer, support and method of making same. 4,050,049, Cl. 338-47.000.
Young, David A., to Hoover Ball and Bearing Company. Trailer hitch. 4,049,288, Cl. 280-406.00A.
Young, John S., to GTE Automatic Electric Laboratories Incorporated. Communication system trunk circuit. 4,049,919, Cl. 179-18.0FA.
Young, Lewis B., to Mobil Oil Corporation. Selective production of para-xylene. 4,049,738, Cl. 260-671.00M.
Yule, Lance S. Metering valve. 4,049,162, Cl. 222-476.000.
Yundt, Albert P.: *See—*
Rice, John F.; Yundt, Albert P.; and Quast, Kenneth J., 4,049,457, Cl. 96-88.000.
Zabransky, Robert F.; and Anderson, Robert F., to UOP Inc. Simulated moving bed alkylation process. 4,049,739, Cl. 260-671.00R.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Hamada, Masa; Kondo, Shinichi; Ishizuka, Masaaki; and Naganawa, Hiroshi, 4,049,497, Cl. 195-80.00R.
Zakharov, Evegny Dmitrievich; Shneider, Gennady Lvovich; Valkov, Viktor Dmitrievich; Kapitonov, Viktor Pavlovich; Miklyaev, Petr Grigorievich; Lebedev, Vladimir Alexandrovich; Kholnova, Vera Ivanovna; Shesterikov, Stanislav Alexeevich; and Bobrovsky, Vasily Mikhailovich. Aluminum-based alloy. 4,049,474, Cl. 148-32.500.
Zalmanski, Alain: *See—*
Weiss, Jean; and Zalmanski, Alain, 4,049,628, Cl. 260-47.0UA.
Zamarski, Andrzej: *See—*
Dunikowski, Andrzej; Bednarczyk, Jan; Keska, Jerzy; Pisarkiewicz, Tadeusz; and Zamarski, Andrzej, 4,048,844, Cl. 73-32.00R.
Zapf, Horst: *See—*
Seifert, Hans; Will, Kurt; and Zapf, Horst, 4,048,974, Cl. 123-191.00M.
Zaplatin, Veniamin Petrovich; Svitelsky, Vasily Petrovich; Galov, Lev Ivanovich; Djukareva, Alla Konstantinovna; Sklyar, Rozalia Grigorievna; Denisovich, Vasily Alexeevich; Shirokov, Dmitry Alexeevich; and Shevchenko, Vladimir Alexandrovich. Electrodialysis of bleaching effluent. 4,049,490, Cl. 162-37.000.
Zeblisky, Joseph A., to General Corrugated Machinery Co., Inc. Method of and apparatus for feeding sheets. 4,049,258, Cl. 271-151.000.
Zeigler, Joseph Spence. Motorcycle safety hub. 4,049,099, Cl. 192-46.000.
Zeilon, Sten Olof. Refrigerating process and apparatus therefor. 4,048,810, Cl. 62-101.000.
Zeller, Judy A.: *See—*
Joyce, James E.; and Zeller, Judy A., 4,049,113, Cl. 206-44.00R.
Zenith Radio Corporation: *See—*
Schiecke, Konrad L., 4,050,041, Cl. 335-210.000.
Zetterlund, Ture R.; and Amberg, Arthur A., to International Harvester Company. Cab door latch mechanism. 4,049,305, Cl. 292-336.300.
Zettler, John Francis, to Xenex Corporation. Brake monitor with self-checking. 4,048,886, Cl. 83-58.000.
Zeuch, Klaus, to Siemens Aktiengesellschaft. Apparatus for producing compact polycrystalline InP and GaP ingots. 4,049,373, Cl. 432-265.000.
Zhukov, Evgeny Kuzmich: *See—*
Grinberg, Ijun Iosifovich; Zhukov, Evgeny Kuzmich; and Koshkin, Lev Nikolaevich, 4,049,389, Cl. 29-157.10R.
Ziegler, Joseph, to Pennsylvania Engineering Corporation. Bumper guard for steel converting apparatus enclosure. 4,049,246, Cl. 266-158.000.
Zielinski, James: *See—*
Ryer, Jack; Zielinski, James; Miller, Harold N.; and Brois, Stanley J., 4,049,564, Cl. 252-51.50A.
Zielinski, Walter J.: *See—*
Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., 4,049,832, Cl. 426-72.000.
Zimmer U.S.A., Inc.: *See—*
Cueman, Glenn F., 4,048,818, Cl. 66-172.00E.
Zine, Anthony R., Jr., to Corning Glass Works. Stabilized blood separating composition. 4,049,692, Cl. 260-448.20B.
Zink, Roderich: *See—*
Distler, Walter; Zink, Roderich; and Linke, Gerhard, 4,049,968, Cl. 250-445.00T.
Zinsco Electrical Products: *See—*
De Angelo, Gerald J., 4,050,039, Cl. 335-38.000.
Zitting, Carl Edward; and Zitting, George Fredrick. Marionette bird. 4,048,749, Cl. 46-126.000.
Zitting, George Fredrick: *See—*
Zitting, Carl Edward; and Zitting, George Fredrick, 4,048,749, Cl. 46-126.000.
Zitzelberger, Donald J.; and Zitzelberger, Dorothy A. Post card folio. 4,048,740, Cl. 40-158.00R.
Zitzelberger, Dorothy A.: *See—*
Zitzelberger, Donald J.; and Zitzelberger, Dorothy A., 4,048,740, Cl. 40-158.00R.
Zobel, Don W., to Motorola, Inc. Fail safe circuit for an anti-skid control apparatus. 4,049,326, Cl. 303-92.000.
Zoglmeyr, Gunther: *See—*
Mortl, Gunther Lorenz; Werthmann, Eckhart; and Zoglmeyr, Gunther, 4,049,461, Cl. 106-56.000.
Zollner, Wolf-Dieter, to Hartmann & Braun Aktiengesellschaft. Control of microwave generator-cavity resonator combinations for gas analyzer. 4,050,015, Cl. 324-58.50C.
Zoya, Walter J.: *See—*
Johnson, Gary L.; and Zoya, Walter J., 4,049,014, Cl. 137-315.000.
Zumbahlen, Vincent J. Combined apparatus for tilling and planting. 4,048,929, Cl. 111-85.000.
Zwack, Eduard, to Siemens Aktiengesellschaft. Method for forming a conference connection in a time division multiplex telecommunication switching system. 4,049,921, Cl. 179-18.0BC.
Zweegers, Petrus Wilhelmus. Agricultural implements. 4,048,790, Cl. 56-13.600.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF SEPTEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Blevens, Bertram G., to Huffman Manufacturing Company, The. Braking system. Re. 29,404, Cl. 188-24.000.
C. Weinberger & Co., Ltd.: *See—*
Yoshino, Toshio, Re. 29,410, Cl. 427-390.00R.
Caterpillar Tractor Co.: *See—*
Shotwell, Daniel Bronson, Re. 29,402, Cl. 16-116.00R.
Chemotronics International, Inc.: *See—*
Geen, Henry C.; and Rice, Edwin E., Re. 29,408, Cl. 148-9.00R.
Geen, Henry C.; and Rice, Edwin E., to Chemotronics International, Inc. Process for treating articles of manufacture to eliminate superfluous projections. Re. 29,408, Cl. 148-9.00R.
Gunzel, Rudolph M., Jr.; James, Donald R.; and Radecki, Tony, to Meiko, Incorporated. Spray apparatus. Re. 29,405, Cl. 239-318.000.
Huffman Manufacturing Company, The: *See—*
Blevens, Bertram G., Re. 29,404, Cl. 188-24.000.
James, Donald R.: *See—*
Gunzel, Rudolph M., Jr.; James, Donald R.; and Radecki, Tony, Re. 29,405, Cl. 239-318.000.
Kabushiki Kaisha Suwa Seikosha: *See—*
Yamazaki, Satoshi, Re. 29,403, Cl. 58-23.00D.
Meiko, Incorporated: *See—*
Gunzel, Rudolph M., Jr.; James, Donald R.; and Radecki, Tony, Re. 29,405, Cl. 239-318.000.
Mesur-Matic Electronics Corporation: *See—*
Newell, Harold R., Re. 29,411, Cl. 310-49.00R.
Minolta Camera Kabushiki Kaisha: *See—*
Ogawa, Masaya, Re. 29,407, Cl. 355-51.000.
Newell, Harold R., to Mesur-Matic Electronics Corporation. Harmonic drive for digital step motor. Re. 29,411, Cl. 310-49.00R.
Ogawa, Masaya, to Minolta Camera Kabushiki Kaisha. Surface exposure device for copying apparatus. Re. 29,407, Cl. 355-51.000.
Radecki, Tony: *See—*
Gunzel, Rudolph M., Jr.; James, Donald R.; and Radecki, Tony, Re. 29,405, Cl. 239-318.000.
Rice, Edwin E.: *See—*
Geen, Henry C.; and Rice, Edwin E., Re. 29,408, Cl. 148-9.00R.
Shotwell, Daniel Bronson, to Caterpillar Tractor Co. Vibration isolating grip for pneumatic hand tools. Re. 29,402, Cl. 16-116.00R.
Ventron Corporation: *See—*
Yeager, Charles C., Re. 29,409, Cl. 424-78.000.
Walker-Arnott, David Athelton, to Xerox Corporation. Document original handling system. Re. 29,406, Cl. 355-12.000.
Xerox Corporation: *See—*
Walker-Arnott, David Athelton, Re. 29,406, Cl. 355-12.000.
Yamazaki, Satoshi, to Kabushiki Kaisha Suwa Seikosha. Quartz crystal wrist watch. Re. 29,403, Cl. 58-23.00D.
Yeager, Charles C., to Ventron Corporation. Phenoxarsine compounds incorporated into resins with phenols. Re. 29,409, Cl. 424-78.000.
Yoshino, Toshio, to C. Weinberger & Co., Ltd. Process for manufacturing of deodorizing air filters. Re. 29,410, Cl. 427-390.00R.

LIST OF PLANT PATENTEES

Zaiger, Chris Floyd. Nectarine tree. 4,106, 9-20-77, Cl. 41.000.
Zaiger, Chris Floyd. Nectarine tree. 4,107, 9-20-77, Cl. 41.000.
Zaiger, Chris Floyd. Peach tree. 4,108, 9-20-77, Cl. 41.000.
Zaiger, Chris Floyd. Peach tree. 4,109, 9-20-77, Cl. 43.000.
Zaiger, Chris Floyd. Nectarine tree. 4,110, 9-20-77, Cl. 41.000.

LIST OF DESIGN PATENTEES

Aktiebolaget Robacks Mekaniska: *See—*
Bostrom, Lars Sture, 245,865, Cl. D25-3.000.
Althans, Richard K.: *See—*
Boldt, Melvin H.; and Althans, Richard K., 245,841, Cl. D14-80.000.
American Optical Corporation: *See—*
Armbruster, John T., 245,863, Cl. D24-1.100.
Arendt, Gernot, to Deutsche Semperit Gummiwerk Ges. m.b.H. Pneumatic tire tread and buttress. 245,836, 9-20-77, Cl. D12-143.000.
Arendt, Gernot, to Deutsche Semperit Gummiwerk Ges. m.b.H. Pneumatic tire tread and buttress. 245,837, 9-20-77, Cl. D12-151.000.
Armbruster, John T., to American Optical Corporation. Ophthalmic instrument control board. 245,863, 9-20-77, Cl. D24-1.100.
Associated Mills, Inc.: *See—*
Grube, Clifford E., 245,855, Cl. D23-35.000.
Grube, Clifford E., 245,856, Cl. D23-35.000.
Grube, Clifford E., 245,857, Cl. D23-35.000.
Grube, Clifford E., 245,858, Cl. D23-35.000.
Grube, Clifford E., 245,859, Cl. D23-35.000.
Grube, Clifford E., 245,860, Cl. D23-35.000.
Baikie, Hugh E.; and Schaack, Peter Willy. Ice Skate. 245,872, 9-20-77, Cl. D34-14.003.
Baker, Joseph: *See—*
Elder, Robert, 245,861, Cl. D23-52.000.
Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, to International Business Machines Corporation. Electrophotographic machine. 245,847, 9-20-77, Cl. D16-30.000.
Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, to International Business Machines Corporation. Electrophotographic copier or the like. 245,848, 9-20-77, Cl. D16-30.000.
Boldt, Melvin H.; and Althans, Richard K., to Zenith Radio Corporation. Television receiver. 245,841, 9-20-77, Cl. D14-80.000.
Boldt, Melvin H.; and Casnovsky, William M., to Zenith Radio Corporation. Television receiver. 245,842, 9-20-77, Cl. D14-80.000.
Bostrom, Lars Sture, to Aktiebolaget Robacks Mekaniska. Crushing plant. 245,865, 9-20-77, Cl. D25-3.000.
Bouldin, Kent W.: *See—*
Piper, Peter D.; and Bouldin, Kent W., 245,821, Cl. D6-69.000.
Piper, Peter D.; and Bouldin, Kent W., 245,822, Cl. D6-69.000.
Bramlette, Jack C.: *See—*
Donat, Daryl J., 245,844, Cl. D15-4.000.
Bulloch, Andrew C.; and Rolen, Ronald R. Container for solid vaporizer. 245,862, 9-20-77, Cl. D23-150.000.
Burton, Keith O. Combined foldable and transportable home. 245,868, 9-20-77, Cl. D25-30.000.
Carre, Alain, to Waternab S.A. Ball-point pen. 245,852, 9-20-77, Cl. D19-45.000.
Casnovsky, William M.: *See—*
Boldt, Melvin H.; and Casnovsky, William M., 245,842, Cl. D14-80.000.
Catania, Salvatore J.: *See—*
Conti, Sam; and Catania, Salvatore J., 245,816, Cl. D2-380.000.
Conti, Sam; and Catania, Salvatore J. Motorcyclist's safety belt. 245,816, 9-20-77, Cl. D2-380.000.
Corning Glass Works: *See—*
McBurney, William C.; and Strawser, Thomas J., Jr., 245,877, Cl. D59-2.00A.
Cowan, Arnold. Helical spring retracting tool. 245,829, 9-20-77, Cl. D8-16.000.
de Gross, Francois, to Francois de Gross & Cie. Bottle-opener. 245,830, 9-20-77, Cl. D8-18.000.
Deuchar, Robert C.; and Waitzman, Gene J. Wax applicator housing. 245,845, 9-20-77, Cl. D15-48.000.
Deutsche Semperit Gummiwerk Ges. m.b.H.: *See—*
Arendt, Gernot, 245,836, Cl. D12-143.000.
Arendt, Gernot, 245,837, Cl. D12-151.000.
DeWar, William. Fishing lure. 245,853, 9-20-77, Cl. D22-27.000.
Donat, Daryl J., to Bramlette, Jack C., a part interest. Lower unit guard

for marine outboard motor and stern drive. 245,844, 9-20-77, Cl. D15-4.000.
Dougherty, Duayne D. Fence post top. 245,870, 9-20-77, Cl. D25-77.000.
Drechsler, Mark Alan: *See—*
West, Robert F.; and Drechsler, Mark Alan, 245,831, Cl. D8-20.000.
Dystant, Patricia K. Combined clock face and hands therefor. 245,833, 9-20-77, Cl. D10-125.000.
Elder, Robert, to Baker, Joseph. Baby bath seat. 245,861, 9-20-77, Cl. D23-52.000.
Fields, Robert. Table top. 245,823, 9-20-77, Cl. D6-192.000.
Francois de Gross & Cie.: *See—*
de Gross, Francois, 245,830, Cl. D8-18.000.
Fredriksson, Lars, to K.A. Bergs Smide AB. Load hook. 245,832, 9-20-77, Cl. D8-367.000.
Gelbart, Rywka Luba. Rolling massage unit. 245,864, 9-20-77, Cl. D24-36.000.
Grube, Clifford E., to Associated Mills, Inc. Showerhead. 245,855, 9-20-77, Cl. D23-35.000.
Grube, Clifford E., to Associated Mills, Inc. Body massage attachment for a handheld showerhead. 245,856, 9-20-77, Cl. D23-35.000.
Grube, Clifford E., to Associated Mills, Inc. Scalp massage attachment for a handheld showerhead. 245,857, 9-20-77, Cl. D23-35.000.
Grube, Clifford E., to Associated Mills, Inc. Handheld showerhead. 245,858, 9-20-77, Cl. D23-35.000.
Grube, Clifford E., to Associated Mills, Inc. Handheld showerhead. 245,859, 9-20-77, Cl. D23-35.000.
Grube, Clifford E., to Associated Mills, Inc. Showerhead. 245,860, 9-20-77, Cl. D23-35.000.
Harty, Millard Fillmore, Jr., to Motor Wheel Corporation. Combined wheel and hub cap. 245,840, 9-20-77, Cl. D12-209.000.
Hawthorne, Allen Dana: *See—*
Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, 245,847, Cl. D16-30.000.
Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, 245,848, Cl. D16-30.000.
Hirasawa, Isamu; Sasai, Minoru; and Ito, Kunio, to Kanda Tsushin Kogyo Co., Ltd. Telephone. 245,843, 9-20-77, Cl. D14-57.000.
Holland, Eliud W. Building. 245,867, 9-20-77, Cl. D25-23.000.
International Business Machines Corporation: *See—*
Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, 245,847, Cl. D16-30.000.
Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, 245,848, Cl. D16-30.000.
Ito, Kunio: *See—*
Hirasawa, Isamu; Sasai, Minoru; and Ito, Kunio, 245,843, Cl. D14-57.000.
K.A. Bergs Smide AB: *See—*
Fredriksson, Lars, 245,832, Cl. D8-367.000.
Kanda Tsushin Kogyo Co., Ltd.: *See—*
Hirasawa, Isamu; Sasai, Minoru; and Ito, Kunio, 245,843, Cl. D14-57.000.
Korpi, Reuben F. Hamburg patty press. 245,827, 9-20-77, Cl. D7-43.000.
Lap, Yiu Chung. Combination of high intensity lamp and built-in solid state clock. 245,874, 9-20-77, Cl. D48-20.00D.
Lemke, Joel F.; and Lemke, Mary Lou. Garment coordinating hanger. 245,825, 9-20-77, Cl. D6-256.000.
Lemke, Mary Lou: *See—*
Lemke, Joel F.; and Lemke, Mary Lou, 245,825, Cl. D6-256.000.
Livingston, Richard W. Coin operated vacuum. 245,846, 9-20-77, Cl. D15-52.000.
Luce, James W., to Syracuse China Corporation. Dinner plate or similar article. 245,826, 9-20-77, Cl. D7-25.000.
Lusk, Dorinda J.: *See—*
Lusk, Leon D.; Lusk, Dorinda J.; and Smith, Bobby E., 245,835, Cl. D11-131.000.
Lusk, Leon D.; Lusk, Dorinda J.; and Smith, Bobby E. Statuette with hanging string. 245,835, 9-20-77, Cl. D11-131.000.
Malcolm, Donald A., to W. R. Grace & Co. Combined display and carrying case for a drill or the like. 245,880, 9-20-77, Cl. D87-1.00R.
Matthews, Joseph W. Missal stand. 245,820, 9-20-77, Cl. D6-29.000.
McBurney, William C.; and Strawser, Thomas J., Jr., to Corning Glass Works. Decalcomania for culinary ware. 245,877, 9-20-77, Cl. D59-2.00A.
Messinger, Buck D. Motorcycle cab. 245,838, 9-20-77, Cl. D12-156.000.
Monnet, Claude Alain Richard, to Shell International Petroleum Company Limited. Gas burner or similar article. 245,828, 9-20-77, Cl. D7-136.000.
Morrison, David Jon. Soap bar. 245,878, 9-20-77, Cl. D73-1.00A.
Morrison, David Jon. Soap bar. 245,879, 9-20-77, Cl. D73-1.00A.
Motor Wheel Corporation: *See—*
Harty, Millard Fillmore, Jr., 245,840, Cl. D12-209.000.
Noyes, Eliot Fette: *See—*
Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, 245,847, Cl. D16-30.000.
Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, 245,848, Cl. D16-30.000.
O'Shea, William J. Wall sconce for votive candle holder. 245,873, 9-20-77, Cl. D48-2.000.
Otani, Akemasa. Sheet pile. 245,869, 9-20-77, Cl. D25-75.000.
Overman AB: *See—*
Tillberg, Robert, 245,819, Cl. D6-75.000.
Palka, James J. Door panel. 245,824, 9-20-77, Cl. D6-193.000.
Persson, Bjorn Olof Hjalmar. Belt attachable watertight container. 245,818, 9-20-77, Cl. D2-400.000.
Peter Piper Plastics, Inc.: *See—*
Piper, Peter D.; and Bouldin, Kent W., 245,821, Cl. D6-69.000.
Piper, Peter D.; and Bouldin, Kent W., 245,822, Cl. D6-69.000.
Piper, Peter D.; and Bouldin, Kent W., to Peter Piper Plastics, Inc. Seat or similar article. 245,821, 9-20-77, Cl. D6-69.000.
Piper, Peter D.; and Bouldin, Kent W., to Peter Piper Plastics, Inc. Seat or similar article. 245,822, 9-20-77, Cl. D6-69.000.
Podunavac, Bozo. Guitar head. 245,875, 9-20-77, Cl. D56-1.00A.
Rolen, Ronald R.: *See—*
Bulloch, Andrew C.; and Rolen, Ronald R., 245,862, Cl. D23-150.000.
Sasai, Minoru: *See—*
Hirasawa, Isamu; Sasai, Minoru; and Ito, Kunio, 245,843, Cl. D14-57.000.
Sazama, George B. Flutist's lyre. 245,876, 9-20-77, Cl. D56-1.00C.
Schaack, Peter Willy: *See—*
Baikie, Hugh E.; and Schaack, Peter Willy, 245,872, Cl. D34-14.00B.
Schuldenfrei, John; and Turner, Raymond Saadiah. Kiosk. 245,866, 9-20-77, Cl. D25-10.000.
Shell International Petroleum Company Limited: *See—*
Monnet, Claude Alain Richard, 245,828, Cl. D7-136.000.
Smalley, Charles R., to Warnaco, Inc. Dry suit. 245,817, 9-20-77, Cl. D2-29.000.
Smith, Bobby E.: *See—*
Lusk, Leon D.; Lusk, Dorinda J.; and Smith, Bobby E., 245,835, Cl. D11-131.000.
Smith, Maurice I., to Tone Commander Systems, Inc. Telephone communications module. 245,871, 9-20-77, Cl. D14-59.000.
Sperry Rand Corporation: *See—*
Spurgin, William T., 245,839, Cl. D12-176.000.
Spurgin, William T., to Sperry Rand Corporation. Ship's helm. 245,839, 9-20-77, Cl. D12-176.000.
Stanley Works, The: *See—*
West, Robert F.; and Drechsler, Mark Alan, 245,831, Cl. D8-20.000.
Strawser, Thomas J., Jr.: *See—*
McBurney, William C.; and Strawser, Thomas J., Jr., 245,877, Cl. D59-2.00A.
Strickland, Lloyd A. Eyeglasses. 245,849, 9-20-77, Cl. D16-71.000.
Strickland, Lloyd A. Eyeglasses. 245,850, 9-20-77, Cl. D16-71.000.
Strickland, Lloyd A. Eyeglasses. 245,851, 9-20-77, Cl. D16-71.000.
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Luce, James W., 245,826, Cl. D7-25.000.
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Tone Commander Systems, Inc.: *See—*
Smith, Maurice I., 245,871, Cl. D14-59.000.
Turner, Raymond Saadiah: *See—*
Schuldenfrei, John; and Turner, Raymond Saadiah, 245,866, Cl. D25-10.000.
W. R. Grace & Co.: *See—*
Malcolm, Donald A., 245,880, Cl. D87-1.00R.
Waitzman, Gene J.: *See—*
Deuchar, Robert C.; and Waitzman, Gene J., 245,845, Cl. D15-48.000.
Warnaco, Inc.: *See—*
Smalley, Charles R., 245,817, Cl. D2-29.000.
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Carre, Alain, 245,852, Cl. D19-45.000.
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CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 20, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
16 4,048,674
93 4,048,675

CLASS 4
1 4,048,676
172 4,048,677
172.12 4,048,678
237 4,048,679

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81 R 4,048,681
91 4,048,682
180 4,048,683
370 4,048,684

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2.5 A 4,049,374
41 C 4,049,375
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94.26 4,049,379
162 R 4,049,376
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155 R 4,048,687

CLASS 12
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6 4,049,899
7 4,049,900
9 ES 4,049,901

CLASS 15
3.17 4,048,689
22 R 4,048,690
257.1 4,048,691
257.2 4,048,692
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232 E 4,049,383
269 4,049,386
273 SP 4,049,384
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CLASS 29
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149.5 DP 4,048,703
157.1 R 4,049,389
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509 4,048,707
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527.6 4,048,709
566.3 4,048,711
566.4 4,048,710
571 4,048,712
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603 4,048,714
623.5 4,048,715
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136 4,048,772
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202 4,048,774
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297 4,048,776
309.12 4,048,777
615 4,048,778
726 4,048,779

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30 R 4,048,781
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61 4,048,783
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208 4,049,402
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364 4,048,836
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455 4,048,842

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67.5 R 4,048,847
88.5 R 4,048,848
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193 R 4,048,852
194 A 4,048,853
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134 C 4,049,434
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799 4,048,892

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2 Z 4,049,032

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151 4,049,481
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351 4,049,485
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165 4,049,049
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299 4,049,056
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49 4,049,061
126 4,049,062
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153 AK 4,049,957
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125.1 4,049,215
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137 R 4,049,222
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	4,048,882		4,049,722		4,049,833		4,049,006		4,049,025		4,049,890
	4,048,894		4,049,748		4,049,857		4,049,010		4,049,091		4,050,003
	4,048,898		4,049,758		4,049,987		4,049,017		4,049,303		4,050,071
	4,048,919		4,049,778		4,049,989		4,049,032		4,049,310	25 :	Re.29,409
	4,048,940		4,049,826		4,050,079		4,049,033		4,049,388		4,048,836
	4,048,943		4,049,843		4,050,082		4,049,034		4,049,714		4,048,886
	4,048,948		4,049,848	06 :	4,050,085		4,049,036		4,049,721		4,048,998
	4,048,989		4,049,902	10 :	4,049,519		4,049,044		4,049,810		4,049,024
	4,049,005		4,049,935		4,049,583		4,049,063		4,049,819		4,049,097
	4,049,008		4,049,944		4,049,705		4,049,071		4,049,827		4,049,099
	4,049,038		4,049,953		4,049,710		4,049,079		4,049,962		4,049,119
	4,049,051		4,049,966		4,049,731		4,049,084	19 :	4,048,745		4,049,190
	4,049,056		4,049,978		4,049,863		4,049,121		4,048,873		4,049,271
	4,049,073		4,049,979	11 :	4,048,812		4,049,130		4,048,961		4,049,353
	4,049,075		4,050,012		4,049,869		4,049,139		4,049,140		4,049,382
	4,049,076		4,050,030	12 :	4,048,728		4,049,147		4,049,191		4,049,384
	4,049,106		4,050,031		4,048,741		4,049,157		4,049,914		4,049,399
	4,049,109		4,050,035		4,048,753		4,049,169		4,050,072		4,049,450
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September 27, 1977 Volume 962 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Sets of Addenda to the Classification Definitions

The definitions of the classes listed below were modified by addenda as part of Classification Orders 500 to 581, issued between January 1, 1976 and March 31, 1977. The availability of these Classification Orders has been announced in the Official Gazette from time to time. However, these notices do not identify the definitions being modified by addenda. Classification definitions furnished to the public have and will continue to include the addenda from issued Classification Orders.

All of these addenda have been consolidated into three sets of "Addenda to the Classification Definitions." Future addenda sets will be prepared and announced quarterly.

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331	II; III
332	II; III
333	II; III
334	II; III
335	II; III
336	I; II; III
337	III
339	II; III
340	I; II; III
343	I; II; III
346	II; III
350	II; III
351	II
352	II; III
353	II
354	II; III
355	II; III
356	I; II; III
357	III
358	II; III
360	II; III
361	III
402	II
403	II; III
408	I
415	II
416	II; III
417	II
423	II
424	II
425	I; II; III
426	II
427	I; II; III
428	I; II
429	II
431	I; II; III
432	I; II
520+	II
530+	II

Aug. 19, 1977.

ALFRED C. MARMOR,
Administrator for Documentation.

Certificate of Mailing Procedures

On November 1, 1976, the Patent and Trademark Office instituted the Certificate of Mailing Procedure by promulgating 37 CFR 1.8 in an attempt to reduce the number of problems resulting from late receipt of responses due to mail delays. This notice was published in the OFFICIAL GAZETTE on October 26, 1976 (951 O.G. 1342 and TM 210). Guidelines relative to this procedure were published in the OFFICIAL GAZETTE on November 16, 1976 (952 O.G. 918 and TM 174).

Although the new procedure has gained wide acceptance, it has not been entirely without problems. One major problem involves the correlation of the certification with the appropriate papers when presented on a separate sheet. In order to curtail this problem and other minor ones, the guidelines published on November 16, 1976, are superseded by the following guidelines. They are applicable to responses in both patent and trademark matters, as permitted by 37 CFR 1.8.

Guidelines

A) The certification requires a signature. Specifically, if the certification appears on a paper that requires a signature, two signatures are required, one for the paper and one for the certification. Although not specifically required by 37 CFR 1.8, it is preferred that the certificate be signed by the applicant, assignee, or registered practitioner.

B) When possible, the certification should appear on a portion of the paper being submitted. However, if there is insufficient space to make the certification on the same paper, such as in the case of the patent issue fee transmittal form PTO–85, the certification should be on a separate sheet securely attached to the paper.

C) When the certification is presented on a separate sheet, that sheet must (1) be signed and (2) fully identify and be securely attached to the paper it accompanies. The required identification should include the serial number and filing date of the application as well as the type of paper being filed, e.g., response to rejection or refusal, Notice of Appeal, etc. An unsigned certification will not be considered acceptable.

Moreover, without the proper identifying data, a certification presented on a separate sheet will not be considered acceptable if there is any question or doubt concerning the connection between the sheet and the paper filed.

If the sheet should become detached from the paper and thereafter not associated with the appropriate file, evidence that this sheet was received in the Office can be supported by submitting a copy of a post card receipt specifically identifying this sheet and the paper and by submitting a copy of the sheet as originally mailed. Attention is directed to the notice of November 21, 1968 published in the OFFICIAL GAZETTE (857 O.G. 667) relative to the use of post cards as receipts.

D) In situations wherein the correspondence includes papers for more than one application (e.g., a single envelope containing separate papers responding to Office actions in different applications) or papers for various parts of the Office (e.g., a patent issue fee transmittal form PTO–85 and an assignment), each paper must have its own certification as a part thereof or attached thereto.

E) In situations wherein the correspondence includes several papers directed to the same application (e.g., a proposed response under 37 CFR 1.116 and a Notice of Appeal), each paper should have its own certification as a part thereof or attached thereto.

Use of Stamped Certification

Some practitioners are placing the certification language on the first page of a paper with an inked stamp. Such a practice is encouraged because the certification is not only readily visible but also forms an integral part of the paper. An example of a preferred stamp is:

> I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ----------.
> (Date of Deposit)
> ----------
> Name of applicant, assignee, or Registered Representative
> ----------
> Signature
> ----------
> Date of Signature

Interpretations

The phrase "prior to expiration of the set period" in 37 CFR 1.8(a) includes the last day of the set period, which last day may be the "next succeeding secular or business day" as set out in 35 U.S.C. 21. Also, the filing of a 37 CFR 3.54 form to effect a filing under 37 CFR 1.60 is considered the filing of an application is, therefore, excluded from the Certificate of Mailing procedure.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patent and Trademarks.*

New Procedures for Recordation of Interviews

This notice establishes within the Patent and Trademark Office additional general procedures for the recordation of interviews. Proposed procedures were published in the OFFICIAL GAZETTE of June 28, 1977 (959 O.G. 36) for comment from interested members of the public by August 10, 1977. Fifteen written comments were received the majority of which were favorable to the proposed procedures. Careful consideration has been given to the comments and the procedures are being adopted with a few changes.

Under present practice it is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability as set forth in Section 713.04 of the Manual of Patent Examining Procedure (MPEP). This practice is continued and further amplified as set forth below.

Recent surveys have indicated that the substance of many interviews has not been made of record or the text thereof is incomplete as to substantive matters. In some cases, the substance of an interview may be presented as arguments in a subsequent response filed by the applicant but without any indication that they had been presented at the interview. In order to help insure a better record of examiner-applicant interviews in application files, the following new procedures are adopted to become effective for interviews conducted on and after January 1, 1978. Appropriate changes will be made in the Manual of Patent Examining Procedure (MPEP).

Examiners will complete a two-sheet carbon interleaf Interview Summary Form for each interview held where a matter of substance has been discussed by checking the appropriate boxes and filling in the blanks in neat handwritten form. Discussions regarding only procedural matters, directed solely to restriction requirements (for which interview recordation is otherwise provided for in Section 812.01 of the MPEP), or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below.

The Interview Summary Form shall be given an appropriate paper number, placed in the file, and listed on the "Contents" list on the file wrapper. The docket and serial register cards will not be updated to reflect this interview. In a personal interview, the duplicate copy of the Form will be removed and given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephonic interview, the copy will be mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner before an allowance is not likely or if other circumstances dictate, the Form will be mailed promptly after the telephonic interview rather than with the next official communication. The original of the completed Form will be made of record and placed in the right hand flap of the file.

The Form provides for recordation of the following information:

- — Serial Number of the application
- — Name of applicant
- — Name of examiner
- — Date of interview
- — Type of interview (personal or telephonic)
- — Name of participant(s) (applicant, attorney or agent, etc.)
- — An indication whether or not an exhibit was shown or a demonstration conducted
- — An identification of the claims discussed
- — An identification of the specific prior art discussed
- — An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). (Agreements as to allowability are tentative and do not restrict further action by the examiner to the contrary.)
- — The signature of the examiner who conducted the interview
- — Names of other Patent and Trademark Office personnel present.

The Form also contains a statement reminding the applicant of his responsibility to record the substance of the interview.

It is desirable that the examiner orally remind the applicant of his obligation to record the substance of the interview in each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner will check a box at the bottom of the Form informing the applicant that he need not supplement the Form by submitting a separate record of the substance of the interview.

It should be noted, however, that the Interview Summary Form will not be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview:

The complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner. The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he feels were or might be persuasive to the examiner,
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete or accurate, the examiner will take appropriate action as set forth in MPEP Section 713.04. If the record is complete and accurate, the examiner should place the indication "Interview record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

C. MARSHALL DANN,
Aug. 30, 1977. *Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,055,988, B. B. Bauer, MAGNETIC PHONOGRAPH PICKUP; **3,077,521,** Ahrens, Kuhn and Richter, STEREOPHONIC MOVING MAGNET PHONOGRAPH PICKUP; **3,077,522,** Gunter, Jr. and Anderson, STEREOPHONIC PICKUP CARTRIDGE, **filed** May 6, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1609, *Shure Brothers, Inc.* v. *Korvettes, Inc.*

3,077,521. (See 3,055,988.)

3,077,522. (See 3,055,988.)

3,214,510, R. W. Harmon, CORONA REDUCTION IN CONDUCTOR CLAMPS FOR HIGH VOLTAGE TRANSMISSION LINES, **filed** May 11, 1977, D.C., N.D. Ill. (Chicago) Doc. 77o1681, *Bunker Ramo Corp.* v. *Western Electric Company, Inc.*

3,442,692, C. J. Gaiser, METHOD OF CONDITIONING FABRICS; **3,944,694,** A. R. McQueary, ARTICLE FOR CONDITIONING FABRICS IN A CLOTHES DRYER, **filed** May 16, 1977, D.C., N.D. Ohio (Toledo) Doc. C77–229, *The Procter & Gamble Company* v. *Hunt Chemicals, Inc.*

3,487,221, L. M. Frank, LIGHT ACTIVATED TRIGGER FOR PHOTOGRAPHIC FLASH SYSTEM, **filed** May 24, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c1928, *The Lase Co.* v. *Lawrence L. Goldberg, doing business as Lenmar Enterprises.* Defendant has infringed said patent, motion for entry of judgment order on consent is granted, Nov. 23, 1976.

3,537,091, G. E. Schenkgenberg, SEED MONITORING SYSTEM; **3,723,989,** G. H. Fathauer, ELECTRONIC PLANTER MONITOR; **3,928,751,** same, SEED POPULATION MONITOR; **3,974,377,** D. E. Steffen, SOLID STATE SEED SENSOR; **4,009,799,** same, MONITOR FOR SEED PLANTING APPARATUS, **filed** May 11, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1680, *Dickey-John Corporation* v. *Richway Sales et al.*

3,568,924, L. H. Chenault, SNOW MELTING SYSTEM, **filed** June 9, 1976, D.C., E.D. Wis. (Milwaukee), Doc. 76–401, *Hume Snow Melting Systems, Inc. and Lawrence H. Chenault* v. *Grunau Company, Inc.* Dismissed by stipulation and order on May 12, 1977.

3,700,796, D. E. Griffey, D-C COUPLED SYNC CLIPPING VIDEO AMPLIFIER, **filed** Apr. 9, 1976, D.C. Del. (Wilmington), Doc. 76–138, *Mobil Oil Corporation* v. *E. I. du Pont de Nemours & Co., Inc.* Stipulation and order dismissing this action without prejudice, May 13, 1977.

3,723,989. (See 3,537,091.)

3,731,434, G. E. Korwinski, GRINDING MACHINE; **3,736,113,** Umbdenstock and Breitenstein, SPIRAL GRINDING RELIEVING MACHINE WITH TANDEM PLANETARY DIFFERENTIAL DRIVE, **filed** Oct. 24, 1973, D.C., N.D. Ill. (Chicago) Doc. 73c2731, *Spiral Step Stool Co.* v. *Metal Removal Div. Fed. Mogul Corp. et al.* Case closed October 1975, order not available.

3,733,657, G. B. Lankton, ASSEMBLY OF ATTACHMENTS AND METHOD OF MANIPULATING THE SAME, **filed** Mar. 22, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c951, *Dennison Mfg. Co.* v. *Tamp Corp.* Defendant is enjoined and restrained from making, using or selling any and all products covered by said patent. Defendant shall deliver to plaintiff all aforesaid infringing products now in its possession. Agreed order entered, May 12, 1977.

3,736,113. (See 3,731,434.)

3,772,132, G. N. Dulin, Jr., FLOCKED FABRIC AND METHOD FOR MAKING SAME, **filed** May 17, 1977, D.C., S.D.N.Y., Doc. 77–C–2434, *Madden Hills Inc.* v. *Flock Industries, Inc.*

3,826,068, Ballas and Geist, ROTARY CUTTING ASSEMBLY; **3,859,776,** same, **filed** May 6, 1977, D.C., S.D. Calif. (Los Angeles) Doc. CV77–1651–RJK, *Weed Eater, Inc.* v. *The Toro Company.*

3,859,776. (See 3,826,068.)

3,881,915, S. Proler, METHOD FOR ENHANCING REDUCTION OF ORES, OXIDES AND MELTING OF METALS BY MAGNETIC FORCES, **filed** May 6, 1977, D.C., E.D. Wis. (Milwaukee) Doc. 77–268, *Sam Proler* v. *Modern Equipment Company.*

3,905,349, Nielsen and Church, INDUCED AIR DEVICE FOR DISCHARGING SPHERICAL MEMBERS, **filed** May 13, 1977, D.C.N.J. (Newark) Doc. 77–093S, *Prince Manufacturing, Inc.* v. *Lob-ster, Inc. and Harry A. Giuditta.*

3,910,728, A. H. Sloan, DEWATERING PUMP APPARATUS; **3,957,402,** same, DEWATERING PUMP ASSEMBLY HAVING A HEAT EXCHANGER; **3,957,403,** same, DEWATERING PUMP ASSEMBLY, **filed** May 9, 1977, D.C., M.D. Fla. (Tampa) Doc. 77–22–C Ft.M.H., *Albert H. Sloan* v. *Mack Pump Co., Ronald F. Cox and Charles B. Cunningham.*

3,928,751. (See 3,537,091.)

3,939,815, D. K. Spivey, ENGINE STARTER AND BRACKET, **filed** May 2, 1977, D.C., S.D. Fla. (Fort Lauderdale) Doc. 77–1439–C–NCR, *Donald K. Spivey and Stefan M. Stein* v. *Power Lawnmower Parts, Inc. and Lee Rosenbaum.*

3,944,694. (See 3,442,692.)

3,957,402. (See 3,910,728.)

3,957,403. (See 3,910,728.)

3,968,256, E. L. Sing, PREPARATION OF COTTAGE CHEESE, **filed** Apr. 4, 1977, D.C., E.D. Mo. (St. Louis) Doc. 77–360C(4), *Edmond L. Sing* v. *Culture Products, Inc. and James G. Wright.*

3,972,207, J. Vinas, SELECTION DEVICE FOR THE NEEDLES OF A KNITTING MACHINE, **filed** May 18, 1977, D.C., S.D.N.Y., Doc. 77–C–2454, *Vinatex Knitting Systems, Inc.* v. *Jumberca (U.S.A.) Inc. et al.*

3,974,377. (See 3,537,091.)

4,009,799. (See 3,537,091.)

Re. 25,338, D. L. Olson, PRESSURE-OPERATED VALVE WITH MAGNETICALLY ACTUATED PILOT, **filed** May 12, 1977, D.C.N.J. (Newark) Doc. 77–0912, *Marotta Scientific Controls, Inc.* v. *Valcor Engineering Corp.*

Re. 25,536, D. T. Thompson, APPARATUS FOR MAKING AN ANNULUS, **filed** Sept. 28, 1976, D.C. Conn. (New Haven) Doc. N 76–329, *Thompson Bagel Machine Manufacturing Corporation* v. *Lender's Bagel Bakery, Inc.* Stipulated judgment entered that plaintiff is the exclusive licensee of said reissue and that the "Lugo" bagel machine manufactured and used by defendant is an infringement of claims 5, 7 and 12 of said reissue, Apr. 26, 1977.

D. 243,330, K. Pichler, EYEGLASS FRAME, **filed** Apr. 22, 1977, D.C., E.D.N.Y. (Brooklyn) Doc. 77CS44, *Optyl Corporation* v. *Swan Optical Corporation.* **Same, filed** Apr. 22, 1977, D.C., E.D.N.Y. (Brooklyn) Doc. 77CS45, *Optyl Corporation* v. *Styl-Rite Optics, Inc.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,253,921, Re. S.N. 818,696, Filed July 25, 1977, Cl. 96/73, NOVEL PHOTOGRAPHIC ELEMENTS PROTECTED AGAINST ULTRAVIOLET RADIATION, George W. Sawdey, Owner of Record: *Eastman Kodak Company, Rochester, N.Y.*, Attorney or Agent: Joshua G. Levitt, et al., Ex. Gp.: 166

3,727,059, Re. S.N. 820,228, Filed July 29, 1977, Cl. 250/108 R, CONTAINER FOR TRANSPORTING RADIOACTIVE MATERIALS, Stanton L. Reese, Owner of Record: *Inventor,* Attorney or Agent: Martin Fleit, et al., Ex. Gp.: 256

3,764,970, Re. S.N. 820,187, Filed July 29, 1977, Cl. 340/18 NC, WELL BORE DATA-TRANSMISSION APPARATUS WITH DEBRIS CLEARING APPARATUS, Kenneth G. Manning, Owner of Record: *Schlumberger Technology Corporation, New York, N.Y.*, Attorney or Agent: David L. Moseley, et al., Ex. Gp.: 222

PATENT NOTICES

Certificates of Correction for the Week of Sept. 27, 1977

Re. 28,620	4,022,989	4,028,035	4,033,454
D. 224,284	4,023,108	4,028,274	4,033,542
3,752,828	4,023,544	4,028,363	4,033,552
3,778,918	4,023,561	4,028,495	4,033,677
3,781,061	4,023,779	4,028,621	4,033,690
3,806,482	4,023,814	4,028,871	4,033,695
3,833,358	4,023,922	4,028,892	4,033,702
3,908,200	4,023,993	4,028,942	4,033,770
3,925,009	4,024,159	4,028,960	4,033,783
3,926,826	4,024,183	4,029,145	4,033,802
3,964,871	4,024,197	4,029,243	4,033,814
3,965,199	4,024,256	4,029,336	4,033,822
3,969,199	4,024,278	4,029,459	4,033,825
3,975,099	4,024,362	4,029,512	4,033,833
3,978,366	4,024,372	4,029,618	4,033,897
3,980,624	4,024,458	4,029,626	4,033,917
3,988,026	4,024,459	4,029,653	4,033,931
3,989,040	4,024,506	4,029,669	4,033,965
3,991,161	4,024,571	4,029,682	4,033,980
3,992,294	4,024,592	4,029,694	4,034,007
3,993,115	4,024,762	4,029,732	4,034,067
3,993,746	4,024,785	4,029,751	4,034,115
3,995,689	4,024,865	4,029,819	4,034,157
3,995,744	4,024,980	4,030,129	4,034,201
4,003,817	4,025,036	4,030,269	4,034,295
4,005,040	4,025,172	4,030,365	4,034,394
4,005,153	4,025,197	4,030,412	4,034,423
4,006,170	4,025,319	4,030,424	4,034,450
4,010,169	4,025,527	4,030,450	4,034,456
4,010,214	4,025,680	4,030,525	4,034,507
4,010,310	4,025,707	4,030,650	4,034,581
4,011,278	4,025,709	4,030,894	4,034,620
4,011,583	4,025,817	4,031,041	4,034,631
4,012,472	4,025,847	4,031,145	4,034,650
4,012,473	4,025,959	4,031,328	4,034,781
4,012,919	4,026,020	4,031,332	4,034,804
4,013,589	4,026,078	4,031,344	4,034,828
4,014,942	4,026,101	4,031,345	4,034,893
4,015,014	4,026,123	4,031,460	4,035,030
4,016,427	4,026,132	4,031,468	4,035,064
4,017,007	4,026,243	4,031,484	4,035,084
4,017,078	4,026,327	4,031,788	4,035,113
4,017,193	4,026,341	4,031,867	4,035,150
4,018,574	4,026,452	4,031,911	4,035,261
4,018,805	4,026,460	4,032,248	4,035,275
4,019,002	4,026,614	4,032,279	4,035,298
4,019,265	4,026,648	4,032,307	4,035,306
4,019,478	4,026,787	4,032,439	4,035,308
4,019,488	4,026,822	4,032,515	4,035,332
4,019,646	4,026,861	4,032,540	4,035,336
4,019,999	4,026,900	4,032,602	4,035,337
4,020,368	4,026,908	4,032,619	4,035,515
4,020,593	4,026,948	4,032,805	4,035,551
4,020,802	4,026,984	4,032,915	4,035,560
4,021,180	4,027,011	4,032,920	4,035,614
4,021,255	4,027,148	4,032,971	4,035,626
4,021,377	4,027,242	4,033,214	4,035,777
4,021,565	4,027,396	4,033,237	4,035,826
4,021,567	4,027,451	4,033,289	4,035,890
4,021,654	4,027,675	4,033,292	4,035,921
4,021,829	4,027,691	4,033,357	4,036,085
4,021,917	4,027,794	4,033,377	4,036,200
4,022,552	4,027,968	4,033,431	4,036,822
4,022,962	4,027,972	4,033,438	4,036,888

Title of Invention Carried on Office Records

The Patent and Trademark Office is experiencing an increased incidence in the number of newly filed applications in which the title of the invention is inconsistent within the papers. This has resulted in applicants requesting correction of the official filing receipt in many instances to indicate the title preferred by applicants.

Hereafter, whenever the title of the invention appears inconsistent within the papers of a newly filed application for patent, the records of the Office will carry the title as indicated on the first page of the specification and no corrected filing receipt will be issued to indicate another title. Note that 37 CFR 1.72(a) indicates that the title of the invention should appear as a heading on the first page of the specification.

It should also be noted that applicant may amend the title under 37 CFR 1.115 if any changes are subsequently desired before issuance of a patent.

BRADFORD R. HUTHER,
Acting Assistant Commissioner for Administration.

Aug. 31, 1977.

Public Hearing on Relocation of Offices

During the past eighteen months, the Patent and Trademark Office has been attempting to acquire additional office space. The PTO's Public Search Room for Patents currently lacks file expansion capability and its Patent Documentation staff has been seriously overcrowded for some time with some of the staff being located at an adjacent office complex.

Past efforts to locate space in the Crystal City area have not been successful and it appears unlikely that space will become available in this area within the foreseeable future. The General Services Administration recently offered the PTO approximately 36,000 square feet of space in the top four floors of a modern office building which is located at 1000 N. Glebe Road in Arlington, at the intersection of Glebe Road and Fairfax Drive and between Wilson Boulevard and Washington Boulevard. This site, which is approximately five miles from the PTO's Crystal Plaza location, is readily accessible by public transportation. In view of the PTO's urgent need for space, and after careful consideration of all possible alternatives, it has been decided to accept this offer of additional space.

Affected employees and members of the public will have an opportunity to comment before a decision is made on the units to move to the Glebe Road building. Two options are currently being considered and in each instance the number of employees involved is approximately 170. The first consists of shifting most trademark-related functions and the Board of Patent Interferences. The other option would include the Board of Appeals, the Office of Publications and the Board of Patent Interferences.

A public hearing on this subject will be held on October 7, 1977 in the Jefferson Room of the Hospitality House Motor Inn, 2000 Jefferson Davis Highway, Arlington, Virginia. The meeting will commence at 10:00 A.M. and terminate not later than 3:00 P.M. Individuals who wish to participate in this meeting should contact Bradford R. Huther (703) 557–2290 by noon, October 6, 1977.

Sept. 22, 1977. LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 27, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-30-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-17-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-21-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-6-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	7-26-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-7-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-17-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-8-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-25-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-15-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-5-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	11-24-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	9-3-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-16-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-3-77

Expiration of patents: The patents within the range of numbers indicated below expire during August 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,947,001 to 2,951,248, inclusive
Plant Patents..... Numbers 1,963 to 1,969, inclusive

REISSUES

SEPTEMBER 27, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

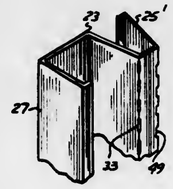
Re. 29,412
STUDS

Daniel L. Zinn, 2545 Beaufait, Detroit, Mich. 48207

Original No. 3,841,047, dated Oct. 15, 1974, Ser. No. 382,606, July 25, 1973. Division of Ser. No. 257,943, May 30, 1972, abandoned, which is a division of Ser. No. 74,022, Sept. 21, 1970, abandoned. Application for reissue Nov. 20, 1975, Ser. No. 633,748

Int. Cl.² E04C *3/07*

U.S. Cl. 52—720 **7 Claims**



1. An improved stud having a bearing flange, a mounting flange and a web joining the mounting flange to the bearing flange, said stud for use in a wall made up of a line of substantially identical studs and wall panels on opposite sides of the wall, with the studs alternated in reversed arrangement so that on each side of the wall the mounting flanges alternate with the bearing flanges; each pair of adjacent wall panels on each side of the wall having their adjacent panel edges fastened to a mounting flange and with each panel on each side of the wall having its central part bearing against a bearing flange; the improvement comprising:

said bearing flange and said mounting flange being substantially parallel and aligned on opposite sides of said web, said web including first and second legs interconnected by a transverse member, said transverse member being non-parallel relative to said bearing flange and said mounting flange;

each bearing flange and each mounting flange and its juncture with the web being so formed that the entire bearing flange will deflect a greater amount, from the web-flange juncture to the free end of the flange, than the deflection of the mounting flange from its web-flange juncture to its free end under the same loading at the same distance from the respective web-flange junctures;

said mounting flange providing a stiffer, less resilient mounting for the adjacent edges of a pair of panels so that when the panels are fastened to a mounting flange the panels are retained firmly and snugly against the mounting flange in a manner to avoid deflection inwardly or outwardly from the plane of such panels;

said bearing flange providing a more resilient bearing for the center of a panel having its edges fastened to a pair of mounting flanges, so that the center of the panel and the bearing flange flex inwardly resiliently for sound attenuation, but with the center of the panel being free of outward bias from the bearing flange, which bearing flange is formed to be free of a tendency to deflect outwardly, though it is resilient enough to be flexed inwardly by outward sound waves impinging against the panel, *said bearing flange and said mounting flange each being substantially smooth and substantially free of internal and external protuberances between its edges; so that substantially the entire area of such bearing flange provides a resilient overall bearing area for the adjacent central part of a panel.*

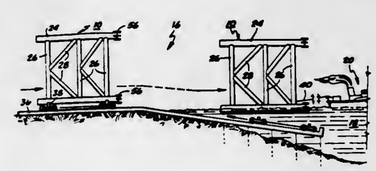
Re. 29,413
METHOD AND APPARATUS FOR FABRICATING AN OFF-SHORE STRUCTURE

Eero M. Hekkanen, Walnut Creek, Calif., and Alpo J. Tokola, Portland, Oreg., assignors to Kaiser Steel Corporation, Oakland, Calif.

Original No. 3,641,774, dated Feb. 15, 1972, Ser. No. 7,182, Jan. 30, 1970. Application for reissue Feb. 15, 1974, Ser. No. 443,003

Int. Cl.² E02D *21/00*; B63B *35/40*; B63C *13/00*

U.S. Cl. 61—96 **35 Claims**



1. The method of fabricating a modular offshore structure comprising the steps of transporting at least a pair of individual structural modules each of which is made up of interconnected and floatable watertight legs from an onshore site to a preselected offshore site, then while the said pair of modules are partially submerged in water at the offshore site selectively controlling the ballast in the watertight legs of each module of the pair of modules and maneuvering said pair of modules relative to each other until the legs of one module are fully aligned with the legs of the other and opposed module, progressively drawing said aligned legs of the pair of opposed modules together until they are abutted, and while holding the abutted legs of the modules firmly clamped together rigidly securing one leg of a pair of abutted legs to the other leg of said pair of legs.

Re. 29,414
SHIFT MECHANISM FOR MECHANICAL TRANSMISSIONS

Josef F. Prokop, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Original No. 3,730,010, dated May 1, 1973, Ser. No. 185,107, Sept. 30, 1971. Application for reissue July 2, 1975, Ser. No. 592,569

Int. Cl.² G05G *5/10*

U.S. Cl. 74—477 **8 Claims**



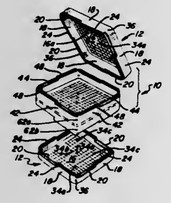
1. A shift mechanism for a mechanical transmission having several gear sets comprising:

a support shaft means,
a latch means,
a lever means *having a junction therein* for actuating said latch means [progressively] *by progressive pivoting* in a first and second plane, and being journalled by said support shaft means,
an outer lever means adapted to be connected to said transmission having a gap means capable of accommodating said latch and being journalled by said support shaft means;
an inner lever means adapted to be connected to said transmission having a gap means capable of accommodating said latch and being journalled by said support shaft means; and
a single gate means having a gap means capable of passing said latch means and a base fixed to said support shaft means whereby when said gaps are orientated in *the neutral position of* said second plane, said latch is movable in an up and down manner therein to engage a transmission gear set means [, and] *upon* said lever means [is moved] *pivoting about said junction* in said second plane.

Re. 29,415
FOOD CONTAINER ASSEMBLY

Sam Ricobese, 250 W. 26th St., and Lyman D. Dunn, 325 W. 25th Pl., both of Chicago, Ill. 60616

Original No. 3,908,852, dated Sept. 30, 1975, Ser. No. 287,651, Sept. 11, 1972. Application for reissue Sept. 20, 1976, Ser. No. 724,499
Int. Cl.² A45C *11/20*; B65D *1/24, 21/02*
U.S. Cl. 206—550 **4 Claims**

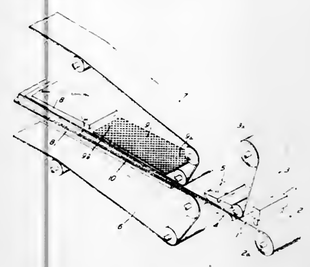


3. A container assembly comprising:
a bottom panel having a bottom wall with an inner face defining a support surface in the form of a plurality of intersecting channels, said channels in turn defining therebetween a plurality of pads for supporting a food product, a plurality of ports in said bottom wall for air communication of said channels with the exterior of said container for entry of air into said channels, said bottom panel also having upstanding side wall means terminating at an upper edge defining an irregular offset portion, vent ports in said side wall means for emission of vapors to the exterior of said container assembly; a top panel identical to said bottom panel to fit on top of the bottom panel and having an inner bottom face, and a plurality of side walls depending from the inner face and terminating in a downwardly facing lower edge identical to said upstanding side wall of said bottom panel edge and adapted to matingly interengage with said upstanding bottom panel side wall upper edge, a plurality of vents in the top panel side wall for emission of vapors to the exterior of said container assembly said top panel having on its upper surface a plurality of transverse intersecting channels defining a plurality of pads capable of supporting a food product when in use as a bottom panel with said channels forming conduits for air flow from the bottom panel vent ports through the container and exiting from said top panel vent ports and said side wall vent ports to keep the food product crisp.

Re. 29,416
EQUIPMENT FOR THE CONTINUOUS PRODUCTION OF PANELS OF SYNTHETIC MATERIAL

Jean-Marie Raymond Peille, Esperaza, France, assignor to Societe Industrielle de Stratifies, Esperaza, France

Original No. 3,841,811, dated Oct. 15, 1974, Ser. No. 224,055, Feb. 7, 1972. Application for reissue Mar. 17, 1976, Ser. No. 667,765
Claims priority, application France, Feb. 12, 1971, 71.04913
Int. Cl.² B29D *27/00*
U.S. Cl. 425—115 **1 Claim**



3. An apparatus for the continuous manufacture of panels comprised of expanded synthetic material of the type where a facing is applied to the upper and lower sides of the synthetic material comprising a flow path along which said panels are manufactured, means adjacent said flow path for supplying said upper and lower facings in continuous sheets along said flow path, means adjacent said supplying means for depositing said synthetic material between said sheets while said synthetic material is substantially in its liquid phase, first means for shaping said synthetic materials, said first means being disposed in contact with each of said facing sheets and having outlet through which said facing sheets, second means for shaping said synthetic material, said second means comprising first and second conveyor bands which are disposed above and below said flow path and which are in engagement with said upper and lower facing, said bands extending downstream from said outlet of said first means so that as said synthetic material expands, its shape is maintained by said conveyor bands, first and second shaping plates disposed above and below said upper and lower conveyor bands and in contact therewith, a flexible mesh form belt being applied to the outer surface of said first conveyor band, said belt extending from substantially the entrance of said facing sheets into said conveyor bands to said shaping plate disposed above said upper conveyor, the upstream portion of said flexible mesh form belt overlying that part of said flow path where said synthetic material is still in its liquid state, the downstream portion of said flexible mesh form belt being deformable in all directions and overlying that part of said flow path where the synthetic material is undergoing expansion, and the distance between the downstream end of said flexible mesh form belt and the upstream end of said shaping plate disposed above said conveyor is as small as possible to reduce the angle between the contacting face of said shaping plate and the facing sheet in contact therewith so that pockets and folds cannot form between said flexible mesh form belt and said shaping plate.

Re. 29,417
PAPERMAKING SYSTEM INCLUDING A FLEXIBLE CERAMIC MEMBER HAVING A PRE-LOADED TENSILE FORCE APPLYING MEANS

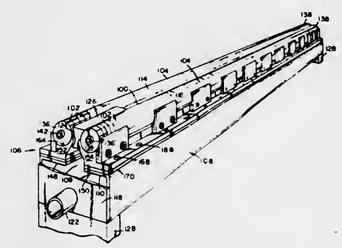
Charles A. Lee, Knoxville, and Robert F. Hunt, Concord, both of Tenn., assignors to International Paper Company, New York, N.Y.

Original No. 3,871,953, dated Mar. 18, 1975, Ser. No. 455,678, Mar. 28, 1974. Continuation-in-part of Ser. No. 273,027, July 19, 1972, abandoned, Ser. No. 273,307, July 19, 1972, abandoned, and Ser. No. 377,893, July 10, 1973, abandoned. Application for reissue Nov. 11, 1976, Ser. No. 740,932
Int. Cl.² D21F *1/48*; D21G *3/00*
U.S. Cl. 162—274 **13 Claims**

1. In a papermaking system including at least two members one of which is movable relative to the other and in frictional engagement therewith, and in which system at least one of said members is subjected to deflection, the improvement wherein said latter member comprises
an elongated flexible assemblage including a plurality of ceramic segments, each having at least two opposite surfaces that are substantially flat and parallel, said segments being aligned with their flat faces in abutting face-to-face relation and in respective planes that are oriented substantially perpendicular to the composite length of said plurality of segements,
tension means extending between opposite ends of said assemblage and forcing said segments toward each other in a direction along their composite length and substantially perpendicular to their respective parallel faces with a preload force on said tension means, when said latter member is in an undeflected condition, that is at least the force calculated by the equation:

$$P = [(E_c A_c)(8dh/l^2 + 4d^2)/2\ [(L)]] + [(a_s - a_c)\ \Delta T]/[(1/A_s E_s) + A_c E_c)]$$

where:
P is the preload of said tension means, in pounds;
E_c is the modulus of elasticity of the ceramic material;
A_c is the cross-sectional area of a ceramic segment in a plane perpendicular to the composite length of said assemblage, in square inches;
d is the maximum anticipated deflection of said assemblage, in inches,
h is the dimension of a ceramic segment in the plane perpendicular to the composite length of said assemblage and in alignment with the direction of said deflective force, in inches;
l is the overall length of said assemblage;

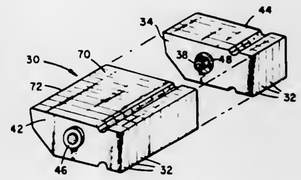


α_s is the coefficient of thermal expansion of said tension means;
α_c is the coefficient of thermal expansion of said ceramic;
ΔT is the degrees of temperature change anticipated, in degrees F.;
A_s is the cross-sectional area of said tension means;
E_s is the modulus of elasticity of said tension means, [and
L is the length of a ceramic segment, in inches,]
but less than the amount of force which will compress said ceramic to over about one-half of its maximum compressive strength,
an elongated smooth working surface extending along the length of said latter member and defining an area of contact with said other member, and
means supporting said latter member relative to said other member with its longitudinal dimension oriented generally transversely of the direction of relative movement of said members whereby loading forces exerted upon said latter member are directed thereagainst in a direction substantially perpendicular to the longitudinal dimension thereof and deflection of said latter member pursuant to such loading forces is compensated for in said compressed segments by further compression of said segments in those portions of the abutting faces thereof disposed along the inside of the line of curvature of said latter member and by relief of less than all of the compression in those portions of said abutting faces that are disposed along the outside of said line of curvature of said member without physical separation of said segments at their abutting faces.

Re. 29,418
FLEXIBLE CERAMIC MEMBER HAVING A PRE-LOADED TENSILE FORCE APPLYING MEANS

Robert F. Hunt, Concord, Tenn., assignor to International Paper Company, New York, N.Y.

Original No. 3,869,344, dated Mar. 4, 1975, Ser. No. 377,894, July 10, 1973. Continuation-in-part of Ser. No. 273,308, July 19, 1972, abandoned. Application for reissue Nov. 11, 1976, Ser. No. 741,049
Int. Cl.² D21F *1/48*; D21G *3/00*
U.S. Cl. 162—274 **7 Claims**



1. In a system including at least two members one of which is movable relative to the other and in frictional engagement therewith, such as members in a papermaking system, the improvement wherein the other member is an elongated flexible ceramic element comprising
a plurality of ceramic segments, each having at least two opposite surfaces that are substantially flat and parallel, said segments being aligned with their flat faces in abutting face-to-face relation and in respective planes that are oriented substantially perpendicular to the composite length of said plurality of segments,
tension means anchored to opposite ends of said element and forcing said segments toward each other in a direction along their composite length and substantially perpendicular to their respective parallel faces with a preload force on said tension means, when said latter member is in an undeflected condition, that is at least the force calculated by the equation:

$$P = \frac{\frac{E_c A_c \frac{8dh}{l^2 + 4d^2}\ [(L)]}{2}}{\frac{1}{A_s E_s}} + \frac{(a_s - a_c)\Delta T}{\frac{1}{A_c E_c}}$$

where:
P is the preload of said tension means, in pounds;
E_c is the modulus of elasticity of the ceramic material;
A_c is the cross-sectional area of a ceramic segment in a plane perpendicular to the composite length of said elongated ceramic element in square inches;
d is the maximum anticipated deflection of said elongated ceramic element, in inches;
h is the dimension of a ceramic segment in the plane perpendicular to the composite length of said elongated ceramic element and in alignment with the direction of said deflective force, in inches;
l is the overall length of said latter member;
α_s is the coefficient of thermal expansion of said tension means;
α_c is the coefficient of thermal expansion of said ceramic;
Δ_T is the degree of temperature change anticipated, in degrees F.;
A_s is the cross-sectional area of said tension means,

E, is the modulus of elasticity of said tension means, [and L is the length of a ceramic segment, in inches,]

but less than the amount of preload force which will compress said ceramic to over about one-half of its maximum compressive strength,

whereby loading forces exerted upon said elongated ceramic element are directed thereagainst in a direction substantially perpendicular to the longitudinal dimension thereof and deflection of said elongated ceramic element pursuant to such loading forces is compensated for in said compressed segments by further compression of said segments in those portions of the abutting faces thereof disposed along the inside of the line of curvature of said elongated ceramic element and by relief of less than all of the compression in those portions of said abutting faces that are disposed along the outside of said line of curvature of said elongated ceramic element without physical separation of said segments at their abutting faces.

Re. 29,419

FINELY DIVIDED RuO_2/PLASTIC MATRIX

Denis F. DeCraene, Elkridge, Md., assignor to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Original No. 3,798,063, dated Mar. 19, 1974, Ser. No. 203,059, Nov. 29, 1971. Application for reissue Mar. 16, 1976, Ser. No. 667,454

Int. Cl.[2] B44D *1/34, 1/18;* **C25B** *11/08*

U.S. Cl. 204—290 F **11 Claims**

10. An electrocatalytic material consisting essentially of a solidified intimate mixture of a substantially chemically and mechanically inert organic polymer and an electrocatalyst of finely divided RuO_2 having a particle size of less than 0.5 microns.

Re. 29,420

SINTERED CEMENTED CARBIDE BODY COATED WITH TWO LAYERS

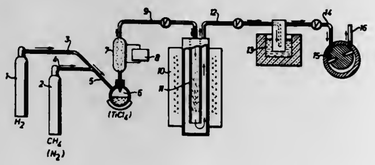
Jan Nils Lindstrom, Hagersten; Bo Folke Jonsson, Huddinge, and Fall Johan Olof William Ohlsson, Enskede, all of Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Original No. 3,837,896, dated Sept. 24, 1974, Ser. No. 303,362, Nov. 3, 1972. Application for reissue Mar. 26, 1975, Ser. No. 562,013

Claims priority, application Sweden, Nov. 12, 1971, 14479/71

Int. Cl.[2] C23C *11/14, 13/02;* **C23D** *5/00*

U.S. Cl. 428—336 **4 Claims**



1. Compound body consisting of a core or substratum of sintered cemented carbide containing a small quantity of a binder metal, on which core or substratum is a very thin and extremely uniform surface coating with higher wear resistance than that of the core or substratum, in which said thin coating consists of two layers applied one above the other by chemical vapor deposition, neither of the layers containing binder metal, the outer layer having a thickness of 0.2–20 μm and consisting of at least one extremely wear resistant deposit consisting essentially of ceramic material selected from the group consisting of aluminum oxide and zirconium oxide and the inner layer lying next to the core or substratum having a thickness of 1–10 μm and consisting of at least one coat of at least one member selected from the group consisting of the carbides and nitrides of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Si and B.

4. Compound body consisting of a core or substratum of sintered cemented carbide containing a small quantity of a binder metal, on which core or substratum is a very thin and extremely uniform surface coating with higher wear resistance than that of the core or substratum, in which said thin coating consists of two layers applied one above the other by chemical vapor deposition, neither of the two layers containing binder metal, the outer layer having a thickness of 0.2–20 μm and consisting of at least one extremely wear resistant deposit consisting essentially of a member of the group consisting of aluminum oxide, titanium oxide and zirconium oxide, and the inner layer lying next to the core or substratum having a thickness of 1–10 μm and consisting of at least one coat of at least one member selected from the group consisting of the carbides and nitrides of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Si and B.

Re. 29,421

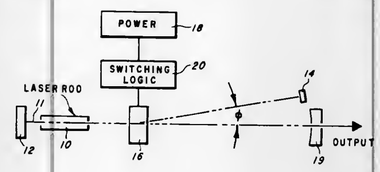
LASER SYSTEM HAVING ELECTRONICALLY SELECTABLE GAIN

Warner C. Scott, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Original No. 3,725,812, dated Apr. 3, 1973, Ser. No. 147,049, May 26, 1971. Application for reissue Sept. 4, 1973, Ser. No. 394,001

Int. Cl.[2] H01S *3/11*

U.S. Cl. 331—94.5 Q **19 Claims**



1. A laser system for selectively producing variable energy laser pulses at variable time intervals comprising:

a. a laser cavity that includes a lasing medium *and at least one reflecting means positioned along a line intersecting the longitudinal axis of the lasing medium and angularly displaced from said longitudinal axis to form a preselected angle therewith;*

b. means for increasing the population inversion in said lasing medium to stimulate emission of a beam of energy therefrom;

c. control means disposed within said laser cavity for selectively controlling both the energy level of respective output pulses and the time duration between successive pulses, said control means effective to deflect a fraction of said beam at [a] *said* preselected angle responsive to application of ultrasonic power thereto, said fraction being a monotonic increasing function of said ultrasonic power; and

d. logic circuitry connected to said control means for selectively applying said ultrasonic power at selected power levels to control the fraction of said beam deflected at said angle, said deflected fraction being reflected *by said at least one reflecting means* to provide energy feedback to said lasing medium, a laser output pulse being produced responsive to said reflected fraction lowering the lasing threshold of said cavity to a value below the level of population inversion in said lasing medium at that time, the energy of said pulse being defined by the amount that said lasing threshold is lowered below the population inversion level.

PLANT PATENTS

GRANTED SEPTEMBER 27, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,111

PIERIS JAPONICA - ZEBRIS VARIETY

Alex J. Zebehazy, Perry, Ohio, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed May 20, 1976, Ser. No. 688,365

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct variety of *Pieris japonica* of the evergreen shrub type substantially as shown and described, characterized particularly as to novelty by the unique combination of the new shoots having brilliant reddish-purple color on the new leaves and stems; the highly decorative growth of even, compact, upright habit, vigorous and freely branched; greater winter hardiness and disease resistance; with more abundant leaves of larger size with darker green color and which hold this color over the winter; with flowers which open and mature 7 to 10 days later, and young stems and branches having a more even reddish winter color.

4,112

AZALEA PLANT NAMED COTTON CANDY

Alfred N. Roberts, Corvallis, Oreg., assignor to Geo. J. Ball, Inc., West Chicago, Ill.

Filed Oct. 1, 1976, Ser. No. 728,952

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—56 **1 Claim**

1. A new and distinctive variety of azalea plant substantially as herein shown and described, characterized by its prolific production of delicate pink and creamy white, ruffled and puckered, semi-double blossoms; and by its vigorous, well branched growth habit under pot-forcing procedures in greenhouse culture.

4,113

AFRICAN VIOLET PLANT NAMED RACHEL

Arnold W. Fischer, Fallbrook, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.

Filed Oct. 7, 1976, Ser. No. 730,662

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct variety of African violet plant substantially as herein shown and described, characterized by its soft blue flowers which are delicately margined with a narrow band of white, by its strong and durable growth habit which performs well under much less than optimum conditions, and by its abundant year around production of flowers which are held on strong stems well above the foliage.

4,114

AFRICAN VIOLET PLANT NAMED DOLLY

Arnold W. Fischer, Fallbrook, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.

Filed Oct. 7, 1976, Ser. No. 730,663

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet substantially as herein shown and described, characterized by its medium to large blue and white bi-colored blossoms, its very fast and vigorous growth habit, and its profuse year around blooming capability.

4,115

AFRICAN VIOLET PLANT NAMED ABBY

Arnold W. Fischer, Fallbrook, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.

Filed Oct. 7, 1976, Ser. No. 730,664

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinctive variety of African violet plant, substantially as herein shown and described, characterized by its relatively large and uniquely displayed white flowers which are borne on sturdy stems and arranged in a circular pattern above an abundant array of large foliage.

4,116

ALMOND TREE

Samuel M. Reynolds, 3804 Washington Blvd., Livingston, Calif. 95334

Filed Nov. 10, 1976, Ser. No. 740,474

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—30 **1 Claim**

1. A new and distinct variety of almond tree, substantially as illustrated and described, which is of medium size, dense, vigorous, spreading, abundantly foliated with medium size, acuminate, acutely pointed leaves having a crenate, finely serrate margin, and alternate, globose glands on the petiole, blooms heavily with white flowers, and regularly heavily bears large, well-distributed nuts having a medium size kernel; the variety being particularly characterized, in comparison to the Nonpareil, by sturdier branches, denser growth, more upright tree structure, a blooming period about one week later, less pre-harvest nut drop and easier harvest detachment, a harvest period about a week later, higher crack-out of kernels, and kernels which are more plump.

PATENTS

GRANTED SEPTEMBER 27, 1977

ERRATA

For CLASS	See PATENT NO.
407–107	4,050,127
407–059	4,050,128
407–045	4,050,129
057–058.89	4,050,235
072–037	4,050,271
090–001.6 R	4,050,350
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362–363	4,051,360
362–211	4,051,361
362–432	4,051,362
361–415	4,051,414
363–131	4,051,426

PATENTS

GRANTED SEPTEMBER 27, 1977

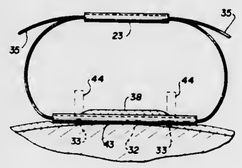
GENERAL AND MECHANICAL

4,050,099
SHOULDER PROTECTOR
Nel E. David, 1342 SW. 17th St., Miami, Fla. 33145
Filed Jan. 15, 1976, Ser. No. 649,536
Int. Cl.[2] A41B *13/10*
U.S. Cl. 2—46 **7 Claims**



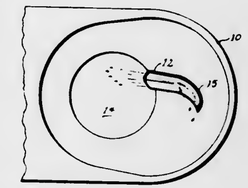
1. A protective garment for the shoulder of a wearer comprising; a first liquid impervious layer, a second padded layer, and a third liquid absorbing layer, each of said layers being secured to the others by fastening means along at least some of the outside edges of said layers, means for positively securing said garment on a person wearing same, the first and third layers are of long substantially rectangular shaped pieces with stitching completely along the outside edges thereof to firmly fasten said layers together, and the second padded layer being much shorter than the first and third layers and being secured in place at the mid-portion only and between said first and third layers by the same stitching that secures them together.

4,050,100
PERMANENTLY IMPLANTED HAIR PIECE ATTACHING MEANS
Robert J. Barry, 76 Cedargrove Road, Little Falls, N.J. 07424
Filed May 12, 1976, Ser. No. 685,650
Int. Cl.[2] A61F *1/00*; A61B *17/00*
U.S. Cl. 3—1 **7 Claims**



1. A scalp implant for attaching a hair piece to the scalp comprising a needle adapted to puncture the scalp generally parallel to the surface of the skull and thereby form entrance and exit puncture openings in the scalp, a trailing tube of tissue-compatible material attached to the needle and adapted to be severed therefrom after the needle has drawn said tube into implanted relationship with the scalp with opposite ends of the tube extending substantially equidistantly outside of the scalp beyond said entrance and exit puncture openings, a metallic sleeve bushing contained bodily within said tube and having a central main portion substantially equal in length to the distance between said entrance and exit puncture openings and comparatively short end portions adapted to be bent upwardly approximately at right angles to said central main portion to thereby project outwardly of and above the scalp, said comparatively short end portions of the bushing being substantially equal in length to corresponding end portions of said tube within which said metallic sleeve bushing is contained, and said tube end protions being bendable with said short end portions of the metallic bushing, a substantially straight tubular lock formed separately from and substantially equal in length to said central main portion of said metallic bushing, and a lock bar attaching wire threadable through said bushing and said lock bar and adapted when tightened and secured to position said lock bar between the tops of the comparatively short upwardly bent bushing and tube end portions with the lock bar outside of the scalp and substantially parallel to said central main portion of the bushing and spaced therefrom, whereby said implant is in the form of a closed substantially rectangular loop.

4,050,101
BAFFLE FOR TOILET BOWL
Clyde Sherman Logue, 119 Minerva Road, Daytona Beach, Fla. 32020
Filed May 21, 1975, Ser. No. 579,713
Int. Cl.[2] A47K *17/00*
U.S. Cl. 4—1 **6 Claims**



1. A baffle adapted to divert water in a conventional toilet bowl, wherein the said bracket is located in a commode equipped with an exit waste conduit at the base thereof, consisting of a base member and a contiguous wall member secured to one edge of said base member forming an angle therebetween in the range of from 90° to 135° wherein, the base member and the wall member each comprise a straight section and an adjacent curved section, the said base member having a forward edge and the contiguous wall member having an upward edge, wherein, in the curved section of the base member and in the curved section of the wall member the forward edge of the curved section of the base member and the upward edge of the wall member diverge at one end to a rounded point.

4,050,102
RECIRCULATING TOILET SYSTEM
James M. Kemper; Robert J. O'Neill; Bruce E. Wagenhals, and Jack W. Adams, all of Santa Monica, Calif., assignors to Monogram Industries, Inc., Los Angeles, Calif.
Filed Mar. 5, 1976, Ser. No. 664,299
Int. Cl.[2] E03D *5/16*
U.S. Cl. 4—10 **8 Claims**

1. In a recirculating toilet system comprising at least one human waste receiving receptacle, separating means including a separating tank coupled to said receptacle for receiving human waste therefrom, a layer of non-aqueous flushing fluid, substantially immiscible with water and human waste and having relatively lower density and specific gravity and a conductivity different than water, disposed in said tank, flushing fluid intake means in said separating tank including a float member capable of floating substantially at the surface of said flushing fluid for withdrawing flushing fluid therefrom, and motor activated flushing fluid recirculating means coupled to both said intake means and said receptacle for withdrawing

flushing fluid from said tank into said receptacle, the improvement which comprises:

detecting means associated with said intake means for detecting the presence of wastewater in the flushing fluid adjacent said intake means and deactivating the motor of said recirculating means when the presence of a predetermined amount of wastewater is detected in said flushing fluid, said detecting means including a pair of spaced probes extending down into said flushing fluid to a depth at least normally above the interface between said flushing fluid and said water and human waste, and circuit means operatively connecting each of said probes to said motor creating a potential across said probes normally retaining said motor in operative condition when said probes contact said flushing fluid and said circuit means further including sensing means adapted to sense the current flow between said probes and deactivate said motor when the sensed current between the probes indicates the presence of sufficient water and human waste therebetween.

4,050,103

URINATING RECEIVER

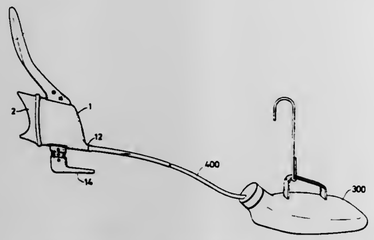
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Kenshun Ishii, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1976, Ser. No. 739,378

Claims priority, application Japan, Nov. 10, 1975, 50-152823[U]; Nov. 10, 1975, 50-152824[U]; Nov. 10, 10, 1975, 50-152825[U]; Nov. 21, 1975, 50-158134[U]; Nov. 27, 1975, 50-160601[U]; Mar. 10, 1976, 51-28240[U]; Mar. 10, 1976, 51-28241[U]

Int. Cl.² A61G *9/00*; A47K *11/12*

U.S. Cl. 4—110 **12 Claims**



1. A urinating receiver comprising: a receiver body having an open front end and a closed rear end, a connecting pipe for connecting said receiver body to a urine storing tank through a urine discharge pipe protruding from the lower portion of said rear end; a contact frame made of elastic material, said contact frame having a base end detachably secured to the front end of said receiver body, and a front end recessed in the form of a curve; and holding and positioning means secured to said receiver body for placing said frame in contact with the circumferential area of a sexual organ.

4,050,104

TWO-IN-ONE PERIMETER GUTTER FOR SWIMMING POOLS

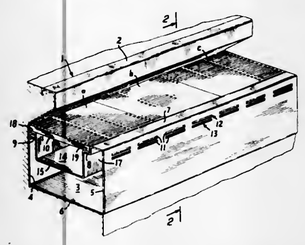
William H. Baker, 911 Rawlinson Road, Rock Hill, S.C. 29730

Continuation-in-part of Ser. No. 579,997, May 22, 1975. This application June 23, 1975, Ser. No. 589,725

Int. Cl.² E04H *3/20*

U.S. Cl. 4—172.17 **22 Claims**

1. A perimeter gutter for swimming pools comprising, in combination, first and second gutter conduits for disposition about the perimeter of a swimming pool, of which conduits at least one is an open gutter trough nested in and supported by the other gutter conduit; a retaining wall on the pool-side of the gutter conduits, over the top of which wall water may flow from the pool into the open gutter trough; the open gutter trough having at least one wall in common with the other gutter conduit separating available space of the other gutter conduit from available space of the gutter trough, of which



common wall at least a portion is removable, so that upon removal of the wall, said available spaces are combined and form a single gutter whose available space is at least the aggregate of the available space of both gutter conduits.

4,050,105

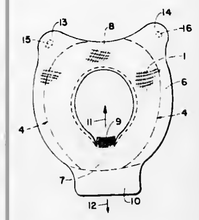
DISPOSABLE TOILET SEAT COVER

Lionel J. Marceaux, Abbeville, La., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 31, 1976, Ser. No. 672,052

Int. Cl.² A47K *13/14*

U.S. Cl. 4—243 **1 Claim**



1. A disposable toilet seat cover for a toilet seat having a top surface area for accommodating a user, a front central part, a back part, an inner side and an outer side providing a specific contour and shape, and a bottom surface area opposite the top surface area, said disposable toilet seat cover comprising

a cover having the contour and shape of the top surface area of a toilet seat but larger dimensions so that it hangs over the outer side of the toilet seat, said cover comprising paper flushable in a toilet, said paper being positionable on the top surface area of the toilet seat, foldable over the outer side of the toilet seat, and positionable on the bottom surface area of the toilet seat to maintain it in position, said cover having an inner center flap and an outer center flap consisting solely of paper and positioned at the front central part of the toilet seat, extending beyond said cover inwardly and outwardly, respectively, and foldable over the front central part of said toilet seat and positionable on the bottom surface area of said toilet seat, and having a pair of spaced flaps consisting solely of paper and positioned at the back part of the toilet seat, extending beyond said seat outwardly and foldable over the back part of said toilet seat and positionable on the bottom surface area of of said toilet seat, said flaps having self-adhesive thereon for removely affixing the cover to the bottom surface area of the toilet seat.

4,050,106

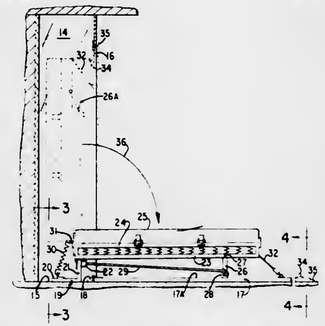
FOLDING BED ASSEMBLY

Lester Wolfe, 870 United Nations Plaza, New York, N.Y. 10017

Filed Apr. 28, 1976, Ser. No. 681,349

Int. Cl.² A47C *13/18*

U.S. Cl. 5—10 R **6 Claims**



1. A wall bed pivotable between a vertical position into a wall recess and a substantially horizontal position out of the wall recess, comprising a mounting frame fixed to a floor within a wall recess, a bed frame having one end thereof pivotally connected to said mounting frame and pivotable between vertical and horizontal positions, first tension spring means interconnecting said one end of said bed frame and the floor of the wall recess, a panel having one end pivotally mounted to the floor and said panel being pivotable to a vertical position to close the wall recess and to conceal the bed therein and to a horizontal position upon the floor, means supporting said bed frame upon said panel when said bed frame and panel are both pivoted to their horizontal positions, and second tension spring means connecting the other end of said bed frame to said panel near the other end of said panel for pulling said other end of said bed frame and said panel toward each other such that said bed frame and panel are pivotable together simultaneously between vertical and horizontal positions, and said second tension spring means acting upon said other end of said bed frame to facilitate the pivoting of said bed frame from its vertical to its horizontal position upon pulling down on said other end of the panel.

4,050,107

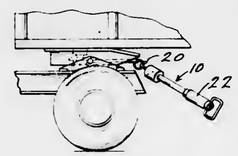
TOOL FOR TRUCK OPERATORS

John N. Parma, 6749 Lincoln Green Road, Holland, Ohio 43528

Filed Apr. 30, 1976, Ser. No. 682,142

Int. Cl.² B25F *1/04*

U.S. Cl. 7—1 E **1 Claim**



1. A combination tool for truck operators comprising in combination an elongate tubular rigid body, a pivoted handle at one end extending transversely normal to the axis of said body and movable from a position across said extended axis to either side thereof, a telescoping graduated depth gauge positioned on said rigid body at the handle end thereof and movable from a retracted position within said pivoted handle to an extended position beyond said pivoted handle when said pivoted handle has been pivoted to either side of said body axis, a second fixed handle circumjacent said one end of said body, a coaxially positioned cylindrical weight circumjacent said body at the other end thereof, and an extensible hook secured at said other end movable from a recessed position within said body and its cylindrical weight to an extended position axially outward from said other end of said body.

4,050,108

METHOD OF MANUFACTURING OF SHOES AND SHOES THUS MANUFACTURED

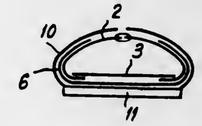
Rosette Londner, 32, rue du Calvaire, Saint-Cloud, Hauts de Seine, France

Filed Nov. 3, 1976, Ser. No. 738,542

Claims priority, application France, Nov. 13, 1975, 75.34652

Int. Cl.² A43D *9/00*; A43B *1/10*

U.S. Cl. 12—142 E **5 Claims**



1. A method of manufacture of shoes by overmolding of a layer of plastic material on a starting element, wherein said method consists in making use of a starting element in the form of a high-cut sock lining of flexible material such as leather, for example, and in a first overmolding operation in employing a rigid plastic material, in coating the starting element with a composition which permits bonding of the corresponding material and then in overmolding on said starting element a part which forms both an instep shank for the sole, a rear stiffening counter and the heel seat or heel body, then in a second overmolding operation which entails the use of a relatively flexible plastic material and, after a second coating with a composition which permits bonding of the corresponding material, the complete assembly is overmolded with an outer coating which forms a covering for the upper and gives said upper its final shape and for the main body of the sole.

4,050,109

SELF-PROPELLED AND CONTAINED TRAILER WASHING MACHINE

Samuel M. Learned, R.D. No. 1, Port Townsend, Wash. 98368

Filed Dec. 2, 1976, Ser. No. 747,017

Int. Cl.² B60S *3/06*

U.S. Cl. 15—53 A **5 Claims**



1. A self-propelled and contained trailer washing machine powered by an integrally assembled internal combustion engine which also concurrently drives an auxiliary electrical generator power unit and a hydraulic pump power unit respectively regulated through an integral machine drive and operational unit control console installed within a protectively enclosed driver/operator station wherein said machine is adapted

to mobily straddle the lateral rectangular shaped width and height configuration of a statically positioned over-the-road commercial trailer unit body and operable to successively and selectively accomplish a sequential low-pressure spray application of washing material upon and then brushing of the opposing longitudinal sides followed by a high-pressure water spray rinsing of the rear doors continuing in a longitudinally progressive simultaneous high-pressure water spray rinsing of the top and opposing longitudinal sides and finally a high-pressure water spray rinsing of the front panel of said trailer unit body during a single self-propelled laterally straddling longitudinally displaced driven pass of said machine along said trailer unit body, said machine comprising in combination:

a. an inverted U-shaped longitudinally disposed support frame structure having interconnected horizontal and vertical members assembled upon a plurality of driven wheels wherein said support frame structure is reinforced by a plurality of diagonally assembled threadably adjustable structural support brace struts,

b. a low-pressure detergent material spray application means wherein an integral detergent material storage tank assembled within and carried upon the support frame structure of said machine communicates by a conduit means to the intake of a variable speed low-pressure centrifugal pump powered by a first direct current electric motor variably regulated through said machine drive and operational unit control console, further communicating through said pump to a discharge side conduit extending therefrom in the form of an inverted U-shaped arch structure having a plurality of spaced longitudinally aligned spray nozzles threadably assembled in opposing relationship thereto along the interior vertical leg members thereof,

c. a low-pressure brightener material spray application means wherein an integral impervious plastic brightener material storage tank assembled within and carried upon the support frame structure of said machine communicates by a plastic conduit means to the intake of a variable speed low-pressure plastic centrifugal pump powered by a second direct current electric motor variably regulated through said machine drive and operational unit control console, further communicating through said plastic pump to a discharge side plastic conduit extending therefrom in the form of an inverted U-shaped arch structure having a plurality of spaced longitudinally aligned spray nozzles threadably assembled in opposing relationship thereto along the interior vertical leg members thereof.

d. a set of laterally spaced vertically disposed rotary brushes carried upon the support frame structure of said machine and adapted to simultaneously engage and scrub the opposing longitudinal sides of said trailer while being individually and respectively arcuately deflectable unidirectionally rearward of the direction of travel of said machine about a plurality of axially aligned pivot bolts and against the resistant force of a hydraulic compression cylinder wherein each of said set of rotary brushes is provided with an arcuate deflection tensioning means being a laminated shim bearing washer respectively insertably assembled upon said axially aligned pivot bolts and compressively engaged respectively against a vertically disposed rotary brush mounting bracket by means of a nut threadably assembled respectively upon each of said pivot bolts, and

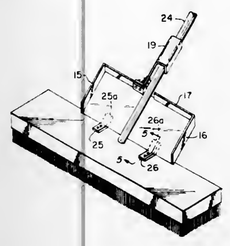
e. a high-pressure water spray rinsing means wherein a plurality of conduit communicating interconnected integral water rinse storage tanks assembled within and carried upon the support frame structure of said machine communicate by a feed conduit means to the intake of at least one of a constant speed high-pressure piston pump respectively powered by a fixed speed direct current electric motor operable through said machine drive and operational unit control console, further communicating through said piston pump to a discharge side conduit extending therefrom in the form of an inverted U-shaped arch structure having a plurality of spaced longitudinally aligned spray nozzles threadably assembled thereto interior of the upper leg member and in opposing relationship thereto along the interior of the respective vertical leg members thereof.

4,050,110

DUST PAN-PUSH BROOM APPARATUS

Gerard J. Donnelly, 151 Oakwood Drive, Wayne, N.J. 07470

Filed Sept. 14, 1976, Ser. No. 723,093
Int. Cl.² A47L *13/52*
U.S. Cl. 15—105 **5 Claims**



1. A dust pan comprising

a. a pan portion defined by a bottom wall, a pair of end walls and a rear wall, and having an open top and front,

b. the rear wall containing a centrally located aperture which opens through its upper margin and is sized to freely receive a push broom handle; and

c. a handle portion which includes a downwardly opening channel section which is joined to the pan portion solely by an upright connecting member which projects rearwardly from said rear wall and is positioned adjacent one side of said aperture,

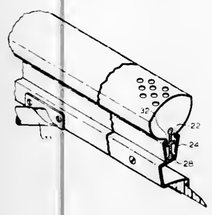
d. the channel section being axially aligned with said aperture, being sized to freely receive a push broom handle, and being spaced from said rear wall a distance greater than the diameter of a push broom handle.

4,050,111

WINDOW CLEANING DEVICE

George Raeburn Mallory, Blenheim, Canada, assignor to Mallory Hardware Products Limited, Blenheim, Canada

Filed Mar. 8, 1976, Ser. No. 664,571
Claims priority, application Canada, Mar. 2, 1976, 246987
Int. Cl.² A47L *1/08*
U.S. Cl. 15—232 **2 Claims**



1. In a window cleaning device of the type consisting of a handle, a head mounted on the handle, the head having a longitudinally elongated channel formed therein, the channel having an inner wall and oppositely disposed side walls, a flange on each of its oppositely disposed side walls projecting inwardly therefrom to form a narrow passage therebetween, a longitudinally elongated sponge having a longitudinally extending mounting portion and a longitudinally extending wiping portion, the mounting portion being mounted within said channel to secure the sponge with respect to the head, the sponge having a slit formed in the mounting portion and extending into the wiping portion thereof to receive a stiffener, the improvement of a stiffener member formed from an elongated body of stiff material comprising

a. a pair of shoulders extending longitudinally of the body and projecting outwardly from the opposite sides of the body to divide the body into a spacer web on one side of the shoulders and a stiffener web on the other side thereof,

b. the shoulders having a combined width which is greater than the width of said narrow passage,

c. said stiffener member being located within said slit of said sponge with said shoulder portions thereof disposed within said channel in a face-to-face relationship with said flanges,

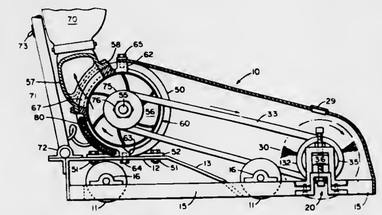
d. said spacer web projecting from said shoulders into engagement with the inner wall of said channel to prevent movement of the shoulders inwardly with respect to the channel such that the sponge is tightly clamped between the shoulders and the flanges, said stiffener web projecting outwardly from said channel to stiffen the wiping portions of the sponge, the stiffener being movable in a direction outwardly of the channel upon distortion of the sponge during use.

4,050,112

INDUSTRIAL FLOOR CLEANING MACHINE WITH VACUUM DUST COLLECTOR

Bernhard Saxon, 170 Concord St., Nashua, N.H. 03060

Filed June 14, 1976, Ser. No. 695,972
Int. Cl.² A47L *5/30, 5/34*
U.S. Cl. 15—300 A **5 Claims**



1. A floor-cleaning machine comprising:

a. a housing, said housing being supported by wheels mounted to said housing and spacing said housing a fixed distance from a floor to be worked on;

b. a horizontally-positioned, elongated, cylindrical cleaning member in the forward part of said housing, the lower edge of said cleaning member extending through an opening in the bottom of said housing into a position to contact to said floor, a first shaft mounting said cylindrical cleaning member, a driven pulley on each side of said cylindrical cleaning member and affixed to said first shaft, a bearing on each side of said cleaning member mounting said first shaft for rotation, and a manually adjustable mounting means mounting each of said bearings to said housing, each mounting means having adjustable chocks holding said bearings and permitting setting of the spacing of said cylindrical cleaning member from said floor, said mounting means comprising upper and lower opposed vertically disposed threaded screws acting on such chocks; and

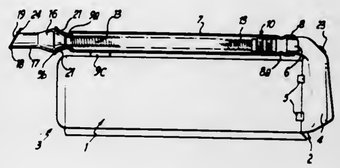
c. an electric motor driving unit mounted in said housing rearward of said cylindrical cleaning member, said driving unit having a drive shaft, an air impeller mounted to and driven by said drive shaft on each side of said driving unit and configured to expel air from said housing, a drive pulley mounted on each end of said drive shaft to the outside of said air impellers, a drive belt connecting said drive pulley to said driven pulley, and ducts guiding air flowing from said impellers to the exterior of said housing, said housing having a baffle plate for the bottom side thereof that is parallel to and spaced from said floor and supports said driving unit, the forward edge of said baffle plate ending in a downwardly directed ramp that guides debris and air flowing from said lower edge of said cylindrical cleaning member up towards said air impellers.

4,050,113

VACUUM CLEANERS

Gordon Thomas Wright, 55 Windemere Avenue, Burnley, Lancashire, England, and Eric George Doubleday, am Kraherwald 167, D-7000 Stuttgart-West, Germany

Filed Jan. 21, 1976, Ser. No. 650,967
Claims priority, application United Kingdom, Jan. 24, 1975, 3287/75
Int. Cl.² A47L *9/00*
U.S. Cl. 15—315 **5 Claims**



1. A vacuum cleaning apparatus of the kind comprising a suction device connected to a suction inlet and to a filtration device whereby contaminated fluid can be drawn through said inlet and passed through said filtration device to remove contaminants therefrom, said apparatus having:

an elongated chamber having first and second ends, said first end being connected to said suction inlet;

a resiliently extensible and contractable flexible hose self-biased to an extended state having first and second ends, said first end of the hose being held captive within said chamber and in sealed communication with the first end of the chamber and said second end of the hose being extendable beyond the outlet end of the chamber and being adapted for detachable attachment of a contaminated fluid pick-up tool thereto; cooperating retention means on the second end of the chamber and on the second end of the hose for releasably holding the second end of hose in retracted position at the second end of the chamber against said self-bias;

and closure means at said second end of the hose which is opened on connection of said tool to said second end and which can be closed to seal the hose on detachment of the tool;

whereby on release of said retention means and opening of said closure means the hose is extended from the chamber in response to the extensive self-bias thereof and on closure of said closure means the hose is contracted and drawn back into said chamber by suction from the suction device overcoming said extensive self-bias to be held therein by the retention means.

4,050,114

DOOR CLOSER ASSEMBLY

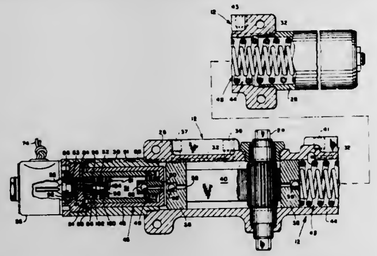
Richard L. Zunkel, Marshville, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 30, 1976, Ser. No. 718,493
Int. Cl.² E05F *15/20*
U.S. Cl. 16—48.5 **23 Claims**

1. A door closer hold open assembly connectable to a door for closing the door in response to a control signal comprising,

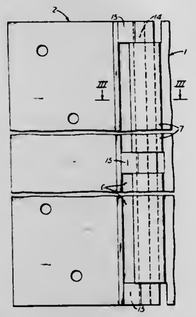
a housing, a linkage assembly connectable to the door to transmit door movement from a closed position to an open

position, biasing means providing a restoring force to move the door to the closed position, a main piston assembly disposed in said housing and actuatable by said linkage assembly to move said main piston assembly against the force of said biasing means as the door moves from said closed position, a fluid chamber disposed in said housing and having fluid disposed therein for exerting a force on said main piston to balance the force of said biasing means in any desired door position to maintain said main piston in the position it was last moved to by said linkage assembly, and release means for releasing the fluid disposed in said chamber to dissipate the balancing force of said fluid to



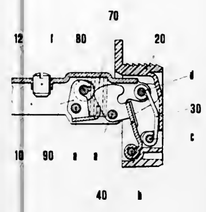
allow the door to return to the closed position, said release means including first and second valve means disposed in a parallel circuit each of which is independently operable to control the flow of fluid from said chamber, said first valve means being electrically controlled from a closed position prohibiting flow therethrough from said chamber to an open position providing flow therethrough from said chamber, said second valve means being resiliently biased toward a closed position prohibiting fluid flow therethrough from said chamber and being operable upon a predetermined increase in the fluid pressure in said chamber to open against said resilient biasing force and provide for fluid flow therethrough from said chamber.

4,050,115
DOOR HINGE
Joseph W. Gwozdz, Clark Summit, Pa., assignor to McKinney Manufacturing Company, Scranton, Pa.
Filed Oct. 14, 1976, Ser. No. 732,353
Int. Cl.[2] E05D *9/00, 15/00*
U.S. Cl. 16—128 R **10 Claims**



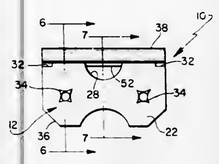
1. A door hinge comprising a pair of parallel hinge leaves adapted to be fastened to a door and a door jamb, an integral open outer loop extending along one edge of one of the leaves, and integral inner loop extending along one edge of the other leaf and disposed inside said outer loop, a hinge pin extending through said inner loop in engagement therewith and having longitudinally spaced exposed areas, and spacing members rigidly mounted in said outer loop and encircling said exposed areas of the hinge pin in engagement therewith to hold the pin in predetermined position in the outer loop, and the opposed surfaces of the two loops being held apart by said pin and spacing members to prevent the loops from rubbing together when the hinge is opened and closed.

4,050,116
SELF-CLOSING HINGE
Luciano Salice, Carimate (Como), Italy, assignor to S.A.R. L. Salice France, Nice, France
Filed Jan. 7, 1976, Ser. No. 646,991
Claims priority, application France, Jan. 20, 1975, 75.01671
Int. Cl.[2] E05D *3/06*
U.S. Cl. 16—163 **7 Claims**



1. A self-closing hinge mechanism having a fixed portion adapted to be mounted to a fixed member and a movable portion adapted to be mounted to a movable member for movement therewith comprising:
- a pair of links, each pivotally connected by points to each of the fixed portion and movable portion to define a quadrilateral link mechanism;
- a first of said links including cam means extending from that end of the first link which is adjacent its pivot to the fixed member;
- a bellcrank pivotally mounted at a point between its ends to the fixed member;
- roller means rotatably carried by one end of the bellcrank;
- spring means in engagement with the other end of the bellcrank to bias the bellcrank in a direction which will cause engagement of the roller means with the cam means.

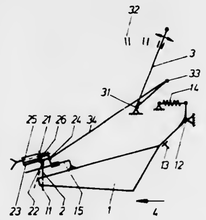
4,050,117
EASEL HINGE CONSTRUCTION
Leo T. Roy, South Attleboro, Mass., assignor to Craft, Inc., South Attleboro, Mass.
Filed Sept. 7, 1976, Ser. No. 721,177
Int. Cl.[2] E05D *1/04*
U.S. Cl. 16—178 **10 Claims**



1. An easel hinge comprising an outer hinge plate and an inner hinge plate directly interconnected to each other for relative arcuate movement therebetween without a hinge pin, said outer hinge plate having a relatively flat leaf portion terminating in a curled barrel at one end thereof, said inner hinge plate also having a relatively flat leaf portion terminating

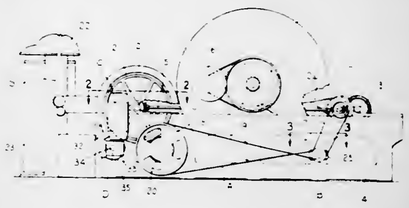
in a curled barrel at one end thereof, said inner hinge leaf portion having at least one opening therethrough, said opening adjacent to and disposed longitudinally of said inner barrel, said outer barrel terminating in a longitudinal free edge directed towards the inner side of said outer leaf and having at least one portion thereof proximate said inner side to define a closed barrel portion, the remaining portions thereof spaced from said inner side to define an open barrel portion, said closed barrel portion being aligned with and projecting through said inner leaf opening and generally completely enveloping portions of said inner barrel positioned therewithin, while permitting relative rotational movement therewith and preventing longitudinal movement of said plates with respect to each other, such respective barrel positioning also permitting angular separation between said plates from a fully closed position wherein the inner sides of said leaves are face-to-face to a fully open position wherein the outer side of said inner leaf abuts the longitudinal free edge of said outer barrel open portion.

4,050,118
FISH PROCESSING MACHINES
Werner Wenzel, Lubeck, Germany, assignor to Nordischer Maschinenbau Rud. Baader, Lubeck, Germany
Filed Apr. 8, 1976, Ser. No. 674,839
Int. Cl.[2] A22C *25/00*
U.S. Cl. 17—54 **6 Claims**



1. A device for controlling a tool of a fish processing machine in which fish are fed along a feed path, said device comprising
- control means for generating a signal to control said tool,
- a first sensing element pivotably mounted on said machine and positioned along said feed path for pivotal displacement in response to engagement with a fish fed along said feed path,
- a second sensing element operatively coupled to said control means for actuating the latter to generate said signal,
- carrier means movably mounted on said first sensing element, with said control means immovably mounted on said carrier means and said second sensing element movably mounted on said carrier means,
- said second sensing element being positioned to engage said fish downstream of said first sensing element for movement of said second sensing element relative to said control means in a direction to actuate said control means,
- actuating means for displacing said carrier means on said first sensing element in response to the pivotal displacement of said first sensing element and in a preset proportionality ratio to the extent of said pivotal displacement of said first sensing element, whereby to vary the position of said second sensing element relative to said first setting element in accordance with the size of the fish sensed by said first sensing element,
- and adjustment means to vary the setting of said proportionality ratio.

4,050,119
TEXTILE CARDING MACHINE OPERATING SYSTEM AND METHOD
Joseph L. Freeman, Greenville, S.C., assignor to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.
Filed Jan. 31, 1977, Ser. No. 763,965
Int. Cl.[2] D01G *15/46*
U.S. Cl. 19—106 R **7 Claims**



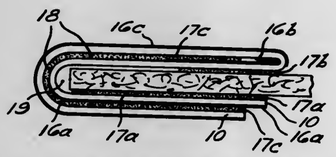
1. An operating system for a textile card having a doffer gear for driving a doffer gear and a driven licker-in comprising:
- drive means between said licker-in and said doffer gear for driving the doffer from the licker-in at operating speed;
- means for engaging and disengaging the drive means;
- a direct current motor for driving said doffer gear when said drive means is disengaged;
- means for engaging and disengaging said direct current motor with said doffer gear; and
- control means for engaging said drive means and de-energizing the direct current motor when said direct current motor has returned the doffer to operating speed.

4,050,120
FASTENER
Takehisa Yamaguchi, Yokohama, Japan, assignor to Kato Hatsujyo Co., Ltd., Japan
Filed Apr. 5, 1976, Ser. No. 674,031
Claims priority, application Japan, Dec. 9, 1975, 50-165288[U]
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—73 HS **5 Claims**



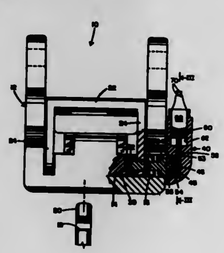
1. A fastener integrally formed of a flexible material comprising a tubular base portion, a tubular inner portion formed within the base portion, and a connecting portion connecting the base portion with the inner portion, the spacing between the inner portion and the base portion being substantially uniform, the connecting portion having at its center an opening for receiving a projected leg member therethrough, the top of the inner portion being formed with an opening in alignment with the opening in the connecting portion, and a peripheral flange extending outwardly from the top of said base portion.

4,050,121
SINGLE SUBSTRATE TAB FASTENER
Edward B. Richman, Shaker Heights, Ohio, assignor to Avery International Corporation, San Marino, Calif.
Filed Jan. 10, 1977, Ser. No. 757,910
Int. Cl.² A44B 21/00
U.S. Cl. 24—73 VA 8 Claims



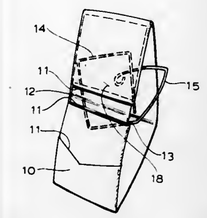
1. A web construction of linerless diaper tab stock made up of a single flat but flexible coated substrate suitable to be formed in long passes along the machine direction of a coating and laminating line and to be rolled up for storage and shipment, and unrolled for use by diaper manufacturers, and fabricatable completely by web coating and slitting operations and without the necessity for laminating or folding operations, and suitable for high speed dispensing on automatic equipment, including a substrate extending, transversely to machine direction, along first, second, third, fourth and fifth endwise length portions, said first and third length portions including adhesive on the top side of the substrate and release means on the bottom side, said second length portion having no release means on the bottom side of the substrate to thereby define an anchoring portion where release means is absent, said fourth length portion being sufficiently wide for the bottom side of the substrate at the fourth length portion to be folded across said third length portion and reach and at least partially cross said anchoring portion, said fourth length portion having adhesive on the bottom side of the substrate and release means on the top of the substrate at at least the part of the fourth length portion which is capable of crossing said anchoring portion when said fourth length portion is so folded, said fifth length portion including adhesive and release means on opposite sides of the substrate.

4,050,122
SIDE-MOUNTED AUTOMATIC POWER RELEASE ATTACHMENT FOR MANUAL CONNECTORS
James Wesley Turner, deceased, late of El Centro, Calif., by Thomas M. Helm, executor, and Ray E. Spinks, El Centro, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 25, 1975, Ser. No. 607,316
Int. Cl.² B64D 17/32
U.S. Cl. 24—230 A 8 Claims



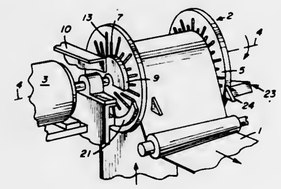
8. A quick-release connector comprising:
a male connector half fitting having at least one longitudinally extending prong having a recess at its free end;
a female connector half fitting having at least one longitudinal opening to receive said prong;
a shaft rotatably mounted transversely in said female fitting and engageable with the recess in said prong for releasably locking together said connector fittings;
said female fitting having a side opening through which an end of said rotatable shaft is accessible;
manual lever means for actuating the rotatable shaft to disengage said prong to permit the fittings to be separated;
said connector having a housing on one side of the female fitting provided with a transverse opening adjacent to and aligned with said side opening in the female fitting;
said housing having a cylinder;
a piston slidably mounted in the cylinder in a direction normal to said side opening;
a fluid power source for driving the piston;
a driving member rotatably mounted in said housing adjacent to said side opening and connected to the end of said rotatable shaft;
said driving member being aligned with the piston and engageable thereby for rotation;
whereby activation of the power source will cause the piston through said driving member to rotate the shaft and unlock said fittings;
said driving member having means for securing the rotatable shaft and the connector in the unlocked position.

4,050,123
BILLFOLD PROTECTIVE DEVICE
Charles Lindberg Okerblom, 20 Welch Road, Warwick, R.I. 02889
Continuation-in-part of Ser. No. 510,699, Sept. 30, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 611,637
Int. Cl.² A45F 5/02; A45C 13/18
U.S. Cl. 24—3 D 5 Claims



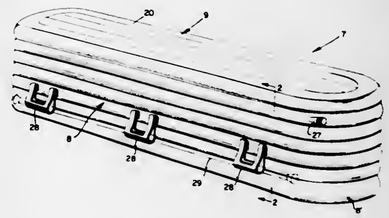
1. An accidental loss or theft preventing guard which is readily insertable or removable from a card pocket or unused pocket behind said card pocket formed by the center partition and the card pocket material fold of a center folding trouser pocket billfold comprising: a single strand of bendably resilient wire consisting of a straight portion forming one side of a frame, a second portion bent at 90° to form a second side, substantially level, a third portion bent back at 90° to form a third side of the rectangular frame, a fourth portion bent back at 90° to complete the rectangular frame, a fifth portion bent back at approximately 45° and having some curvature such that it is essentially diagonal and then parallel to said frame, and a sixth portion bent back towards said frame and overlapping said frame and ending in a loop.

4,050,124
WEB STRETCHING APPARATUS
Clive D. Barnsbee, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed July 30, 1975, Ser. No. 600,667
Int. Cl.² D06C 3/00; B29D 7/24
U.S. Cl. 26—73 9 Claims



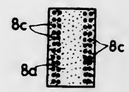
1. An apparatus for stretching a web in which longitudinal stretching of the web is accomplished comprising:
a pair of spaced apart rotatable members each having an axis of rotation;
means for rotating said members in unison about their axes of rotation;
a plurality of angularly spaced primary clamps carried and guided by each of said members for generally radial movement outward from a primary web engaging position;
means for actuating each of said primary clamps at its primary web engaging position when moved into overlapping alignment with the edges of a web transported between said members for successively engaging the edges of the web;
a plurality of angularly spaced secondary clamps carried and guided by each of said members for generally radial movement outward from a secondary web engaging position radially spaced from said primary web engaging position, said secondary clamps being angularly interposed between said primary clamps;
means for actuating each of said secondary clamps at its secondary web engaging position when moved into overlapping alignment with the intermediate edges of the web extending between a pair of web engaged primary clamps for successively engaging the intermediate edges of the web;
a stationary cam associated with each of said members and adapted upon rotation of said members to successively contact and cam (1) each of said primary clamps radially outwardly from its primary web engaging position whereupon initial stretching of the web takes place, and (2) each of said secondary clamps radially outwardly from its secondary web engaging position whereby continued stretching of the web occurs with minimum scalloping of the web edge,
each of said primary clamps being actuated at a primary web disengaging position for successively disengaging the edges of the web,
means operative in response to rotation of said members to return said primary clamps after disengagement to their primary web engaging positions,
each of said secondary clamps being actuated at a secondary web disengaging position for successively disengaging the intermediate edges of the web, and
means operative in response to rotation of said members to return said secondary clamps after disengagement to their secondary web engaging positions.

4,050,125
INFLATED CASKET
Clifford B. Malbon, 2140 Palmetto Ave., Apt. No. 1, South Daytona, Fla. 32019
Filed June 17, 1976, Ser. No. 696,833
Int. Cl.² A61G 17/00
U.S. Cl. 27—2 9 Claims



1. A casket comprising a body and a cover each formed in part of a hollow inflatable material, said body comprising a bottom and an upstanding surrounding wall including at least one inflated chamber by which said wall is supported, said bottom and wall defining the interior of the casket, said cover having a marginal portion engaging an upper surface of said surrounding wall, and means sealing the connection between said marginal portion of the cover and said surrounding wall to provide a hermetic seal for the chamber defined by the casket.

4,050,126
METHOD FOR ADJUSTING FREQUENCY-TEMPERATURE CHARACTERISTIC OF GT CUT QUARTZ OSCILLATOR
Hitoshi Ikeno, Koganei; Mitsuyuki Sugita, Ichikawa, and Hirofumi Yanagi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Seikosha, Japan
Filed Sept. 9, 1976, Ser. No. 721,783
Claims priority, application Japan, Sept. 10, 1975, 50-109803
Int. Cl.² H01L 41/22
U.S. Cl. 29—25.35 6 Claims



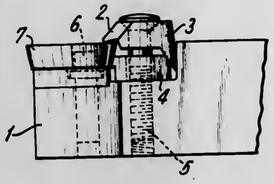
1. A method of adjusting the frequency-temperature coefficient and the frequency of a GT cut quartz oscillator which comprises providing a GT cut quartz crystal blank of approximately the frequency desired, depositing an electrode film on front and rear faces of said blank, adjusting the side ratio between a longer side and a shorter side of said blank while measuring the frequency-temperature coefficient of said blank to obtain a zero frequency-temperature coefficient and thereafter adjusting the area of said electrode film on said blank to obtain the desired frequency without changing said side ratio of said blank and thus without disturbing said zero frequency-temperature coefficient.

4,050,127

CLAMPING TOOL HOLDER

Johann Bodem, Reutte, Austria, and Thomas Raine, Stockport, England, assignors to Schwarzkopf Development Corporation, New York, N.Y.

Filed Nov. 19, 1976, Ser. No. 743,503
Claims priority, application Austria, Nov. 21, 1975, 8865/75; Feb. 6, 1976, 850/76
Int. Cl.² B26D *1/00*
U.S. Cl. 407—107 **7 Claims**



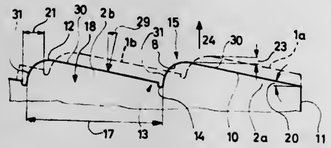
1. A clamping tool holder comprising a tool shank equipped on its front end with a stepped recess, into the horizontal frontal lower face of which there is set a pin, on which a disposable pin-type cutting insert is placed, and from the rear upper face of which a screw thread extends into the shaft, in which a clamping screw is inserted which passes through a clamp; wherein a positioning block is located below the clamp which is slidably arranged in relation to said clamp, and which is fitted with an oblong hole, through which said clamping screw extends, and elements having a wedging action on the clamp and positioning block and rear wall of the shank recess, by means of which a clamping of the positioning block against one or more lateral faces of the disposable cutting insert is effected.

4,050,128

MILLING CUTTER

Klaus Lange, Vaihingen, Enz, Germany, assignor to Biax-Werkzeuge K.G. Wezel & Co. Prazisionswerkzeug-Fabrik, Maulbronn, Germany

Filed June 29, 1976, Ser. No. 700,961
Claims priority, application Germany, July 24, 1975, 2533079
Int. Cl.² B26D *1/12*
U.S. Cl. 407—59 **10 Claims**



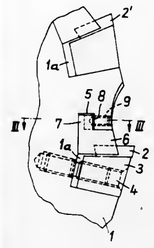
1. A milling cutter rotatable about a central axis in a predetermined rotational sense and having an axially extending shaft adapted to be held in a chuck and a plurality of helical blades separated by helical flutes and each formed as a row of teeth each having an axially directed end flank turned toward said shaft and a radially outwardly turned side flank, each of said side flanks being inclined toward said axis away from said shaft from a high end at the respective end flank to a low end, each of said teeth further being formed with a rounded chamfer at said high end and between said flanks, each of said rows of teeth being axially offset from the circumferentially flanking rows with the rounded chamfers of each row being aligned circumferentially relative to said sense behind the respective low ends of the row in front.

4,050,129

MILLING CUTTER

Willi Jester, Herten-Westerholt, and Hans Tack, Heiligenhaus, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed June 1, 1976, Ser. No. 691,445
Claims priority, application Germany, June 12, 1975, 2526345
Int. Cl.² B26D *1/12*
U.S. Cl. 407—45 **7 Claims**



1. In a milling cutter including a disc-shaped cutter body having an axis; means defining a plurality of circumferentially spaced openings provided in the periphery of the cutter body; a separate stop received in each opening of the cutter body; a cutter blade received in each stop and being axially adjustable therewith; and a separate wedge member received in each opening of the cutter for tightening each cutter blade to the respective stop; the improvement comprising

a. means defining a recess forming a generally circumferentially oriented extension of each said opening;

b. a projection attached to and extending from each stop at an angle of 90° with respect thereto; said projection being received in the respective recess;

c. at least two axially oriented clamping faces forming part of each said projection; said clamping faces being inclined with respect to one another; and

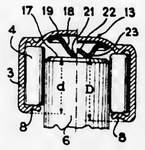
d. a separate set screw cooperating with each clamping face; each set screw being supported in said cutter body in a substantially radial orientation with respect to said axis and protruding into the respective recess; each clamping face being obliquely disposed with respect to the orientation of the associated set screw for effecting an axial shift of said stop upon tightening the respective set screw.

4,050,130

METHOD FOR MOUNTING A BEARING IN A UNIVERSAL JOINT

Alfred Pitner, Paris, France, assignor to Nadella, France, a part interest

Filed Aug. 20, 1974, Ser. No. 499,011
Claims priority, application France, Aug. 23, 1973, 73.30579; Dec. 28, 1973, 73.47062
Int. Cl.² B21D *53/10*
U.S. Cl. 29—149.5 R **2 Claims**



1. In a method for mounting a cylindrical bearing around a

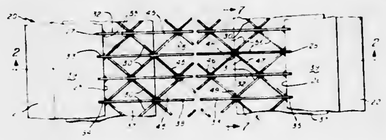
trunnion having an end face of a cross member of a universal joint, the cylindrical bearing being open at one end and closed by an end wall at the other end of the bearing, by fitting the bearing in a bore of a corresponding yoke of the joint so that, in a final position of the bearing in said bore, the end wall of the bearing affords an elastic support for said end face of the trunnion, the end wall having a center portion which initially forms a depression having a convex side facing said end face and which, by the effect of plastic deformation, has its profile inverted resulting in a dome which has a concave side facing said end face and is connected to an outer peripheral portion of the end wall by a convex annular portion facing said end face, comprising bringing said center portion of said end wall initially merely in contact with said end face in a first stage of said fitting so that a first axial distance between the open end of the bearing and said end face is distinctly less than a second axial distance which must be finally obtained in said final postion of the bearing in said bore; the improvement comprising plastically deforming said center portion by plastically displacing the center portion of said end wall throughout the thickness of the center portion of said end wall relative to the outer peripheral portion of said end wall axially of the bearing by applying a force on said outer peripheral portion said said end face of the trunnion exerting a reaction on said center portion so that said end wall is made to bend in all diametral planes of said end wall by urging the bearing still further into said bore in a final stage of said fitting so as to eliminate the difference between said first and second axial distances and invert said profile and produce said dome and make said end face bear against said convex annular portion and thereby achieve the required elastically yieldable support under the effect of plastic partial return consecutive to said plastic deformation of said center portion.

4,050,131

ROLL WITH INNER AND OUTER, SPACED AXIALLY EXTENDING TRIANGULAR MESH STRIPS

Edward T. Bryand, Saco, Maine, assignor to Honeycomb Systems, Inc., Biddeford, Maine

Filed Dec. 6, 1976, Ser. No. 747,607
Int. Cl.² D21F *3/10*
U.S. Cl. 29—121.3 **11 Claims**



1. A roll comprising

a pair of shaft-supported, end rings each having an inner peripheral face with a plurality of radial grooves spaced therearound and

an elongated hollow cylindrical grid-like shell said shell having:

a plurality of straight, wide, thin, planar, strips, each extending axially of said roll, each opposite end of alternate straight strips being seated in one of the radial grooves in said end rings and said strips having inner, intermediate and outer portions,

and a plurality of pairs of undulated, narrow, thin strips, one strip of each pair extending axially of said roll between the opposite inner portions of each adjacent pair of said straight strips, the other strip of each pair extending axially of said roll between the opposite outer portions of each said adjacent pair of said straight strips, and the intermediate portions of said straight strips being free of any undulated strips,

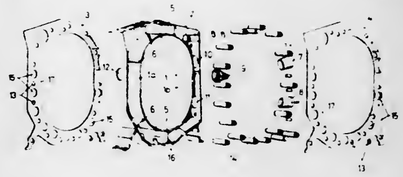
said undulated strips having V-shaped undulations with sharp apex portions, each said apex portion being cut away for at least half its width and said undulated strips being interconnected with said straight strips at said sharp, cut away, apex portions to form triangular shaped open mesh therewith.

4,050,132

METHOD OF PRODUCING A HOUSING FOR CIRCULAR PISTON COMBUSTION ENGINE OF TROCHOID TYPE

Werner Wieland, Obereisesheim, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm and Wankel GmbH, Lindau Bodensee, both of Germany

Division of Ser. No. 427,417, Dec. 21, 1973, Pat. No. 3,942,917.
This application Nov. 28, 1975, Ser. No. 635,950
Claims priority, application Germany, Dec. 21, 1972, 2262620; June 30, 1973, 2333364
Int. Cl.² B23P *17/00*
U.S. Cl. 29—156.4 R **6 Claims**



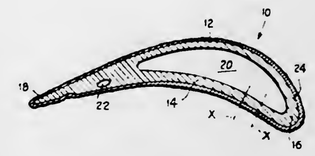
1. A method for producing the annular shell of a housing for a rotary combustion engine of trochoid type said shell comprising an inner peripheral wall in the shape of a multi-arcuate trochoid, an outer peripheral wall and two end walls parallel to each other, spacers between the inner and outer peripheral walls and at least one insert to accommodate a sparkplug, and lengths of pipes between the end walls for accommodating through bolts, comprising the following steps; accurately punching out from sheet steel said spacers and said walls with all openings for accomodating said pipes and insert, cutting said lengths of pipes, forming said insert, forming the inner and outer peripheral walls by bending the respective sheet steel parts, tack welding said spacers and insert between said inner and outer peripheral walls and tack welding said inner and outer peripheral walls as well as said lengths of pipes to one end wall in such a way that a soldering gap is left between these parts, applying a solder in paste form at the points of contact, adding the second end wall, soldering all parts together in a soldering furnace and finally plane-grinding the outer faces of the end walls.

4,050,133

METHOD OF REFURBISHING TURBINE VANES AND THE LIKE

Salvatore J. Cretella, 180 Fitch St., North Haven, Conn. 06473; Matthew Bernardo, 62 Lee St., West Haven, Conn. 06516, and Ralph T. DeMusis, 547 Foxon Road, North Branford, Conn. 06473

Filed June 7, 1976, Ser. No. 693,640
Int. Cl.² B23P *7/00*; B 23 P 1502
U.S. Cl. 29—156.8 B **14 Claims**



1. The method of refurbishing an airfoil-shaped metal alloy

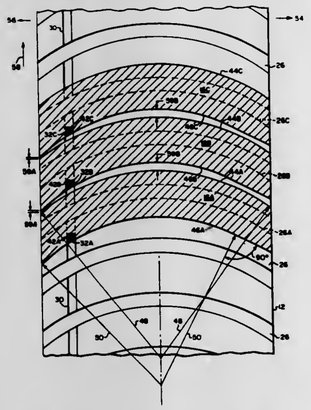
turbine part having a composition containing substantial quantities of cobalt, chromium, tungsten and nickel, with silicon present in an amount less than several percent, comprising the steps of mixing a preparation of an overlay metal alloy comprising substantially the same respective amounts of cobalt, chromium, tungsten and nickel as contained in said turbine part and with silicon present in an amount less than several percent, adding to said preparation an amount of silicon equal to essentially at least ten percent of the silicon content of the preparation, converting said preparation and added silicon into a molten alloy, applying said molten alloy to the eroded surfaces of the airfoil part to build-up the same beyond its original surface, sintering the airfoil part in a furnace at a temperature above 2,000° F and burning off substantially all of the added silicon contained in the molten alloy that was applied to said part such that the resultant overlay alloy has substantially the same composition as the turbine part, removing and cooling the airfoil part, placing the airfoil part in a high pressure furnace, and heating the airfoil part to a temperature above 2,000° F and simultaneously applying thereto a pressure in excess of 15,000 PSI, thereby effecting a densification of the applied overlay alloy and an improved bond of the applied alloy to the eroded airfoil surfaces, removing the airfoil part and cooling the same, and grinding the overlay surface of the airfoil part to restore the dimensions thereof substantially to those of a new part.

4,050,134

METHOD FOR REMOVING ROTATABLE BLADES WITHOUT REMOVING THE CASTING OF A TURBINE

Ronald E. Warner, Media; Francis J. Healey, Ridley Park, and Abel D. Grijalba, Swarthmore, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 518,909, Oct. 29, 1974, Pat. No. 3,986,793.
This application July 2, 1976, Ser. No. 702,258
Int. Cl.² B23P *15/04, 7/00*
U.S. Cl. 29—156.8 R **10 Claims**



1. A method for replacing a particular rotatable blade disposed on a rotor in an axial flow turbine apparatus, said method comprising the steps of

a. displacing a rotatable blade next proceeding in the direction of rotation of said rotor from said particular rotatable blade a predetermined distance in a direction opposite said axial flow,

b. removing said particular rotatable blade in said direction of said axial flow,

c. moving a replacement rotatable blade for said removed particular rotatable blade into said turbine apparatus in said direction opposite said axial flow, and,

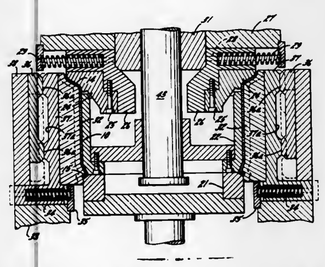
d. returning said displaced rotatable blade to its original position.

4,050,135

FLAT BASE TRUCK RIM FORMING SYSTEM

Hans R. Luedi, Highland Park, Ill., assignor to Grotnes Machine Works, Inc., Chicago, Ill.

Filed July 11, 1975, Ser. No. 595,064
Int. Cl.² B21K *1/38*
U.S. Cl. 29—159.1 **13 Claims**



1. A method of forming a flat base truck rim from a flat strip of hot rolled, rimmed, low carbon steel rolled into the form of a smooth cylinder and welded together along the abutting axial edges, said method comprising the steps of

a. advancing a plurality of dies located at opposite ends of the cylinder relatively toward each other in the direction of the cylinder axis to flare a first end of the cylinder radially outwardly while rough forming a rim gutter on the other end of the cylinder, increasing the radial thickness of the metal forming the rim gutter during the rough forming thereof by applying a compressive axial load to the cylinder and providing a gutter-forming die cavity wider than the starting thickness of the cylinder,

b. radially shifting the flaring die at said first end of the cylinder and again advancing said dies relatively toward each other in the direction of the cylinder axis to deform the outwardly flared portion of the cylinder to rough form a fixed flange at that end of the cylinder,

c. shear forming the flat base of the rim to reduce the radial thickness thereof in the low stress area between the gutter and the fixed flange, and

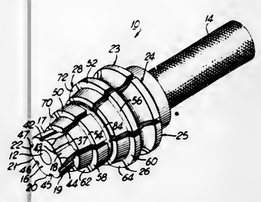
d. roll forming the rim to provide the desired final profile in the fixed flange and the gutter.

4,050,136

BEARING RACE DRIVER

William E. Shultz, 239 N. Main St., Lombard, Ill. 60148

Filed Feb. 10, 1976, Ser. No. 656,781
Int. Cl.² B21D *53/10*; B23P *19/04*
U.S. Cl. 29—724 **8 Claims**



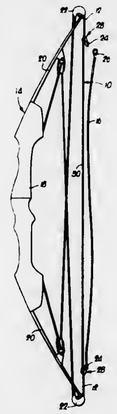
1. A tool for inserting bearings comprising a plurality of expandable segments, a shaft having a cam means attached thereto, said cam means including means for expanding each of said expandable segments radially outwardly from said shaft, each of said expandable segments having a first bearing drive shoulder and a second bearing drive shoulder, said second bearing drive shoulder disposed at a greater radial distance from a longitudinal axis of said shaft than said first radial drive shoulder, wherein said first bearing drive shoulders of said expandable segments form a first substantially flat annular drive surface lying in a plane substantially perpendicular to the longitudinal axis of said shaft, and said second bearing drive shoulders of said expandable segments form a second substantially flat annular drive surface lying in a plane substantially perpendicular to the longitudinal axis of said shaft, said second annular drive surface disposed at a greater radial disance from said longitudinal axis of said shaft than said first annular drive surface, said first and second annular drive surfaces capable of abuting bearing races of different diameters.

4,050,137

BOWSTRING CHANGER CABLE FITTING

John A. Carlson, Wichita, Kans., assignor to Conchemco, Incorporated, Lenexa, Kans.

Filed Mar. 15, 1976, Ser. No. 666,580
Int. Cl.² B23P *19/02*
U.S. Cl. 29—235 **5 Claims**



1. A bowstring changer for use with a compound bow of the type having the bowstring normally stretched between two oppositely biased tension cables and releasably coupled at opposite ends to the cables, said changer including:

a pair of normally spaced, substantially tubular members each having a generally cylindrical passage and a generally axially extending slot formed in the wall of said member,

each said slot being in communication with the passage for permitting selective placement of the tubular member around a respective tension cable,

each of said members having a face at one end of their respective passages for abutting against a holder on respective ends of each tension cable when the changer is positioned to join the cables; and

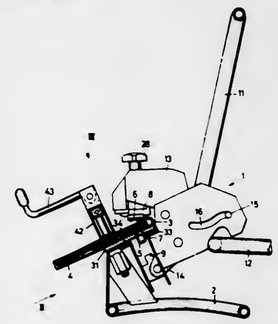
means for connecting and limiting the maximum spacing between said members to a predetermined distance, said last mentioned means, when connected to tension caables, permitting a strung bowstring to be removed from holders on the ends of the tension cables.

4,050,138

APPARATUS FOR ATTACHING CONNECTORS TO THE ENDS OF A CONVEYOR BELT

Hermann Stolz, Mulheim am Main, Germany, assignor to MATO Maschinen- und Metallwarenfabrik Curt Matthaei GmbH & Co. KG, Offenbach am Main, Germany

Filed Oct. 4, 1976, Ser. No. 729,397
Claims priority, application Germany, Oct. 10, 1975, 2545401; Oct. 10, 1975, 2545402; Oct. 10, 1975, 2545403
Int. Cl.² B23P *11/00*
U.S. Cl. 29—243.51 **12 Claims**



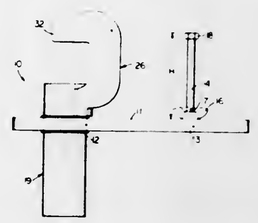
1. An apparatus for attaching connector means to the ends of a conveyor belt and for anchoring said connector means by securing elements, comprising frame means, clamping means including pressure applying upper and lower jaw means, a counter motion actuating lever mechanism supported on said frame means, said upper and lower jaw means being operatively connected to said counter motion lever mechanism for intermittently closing and opening said pressure applying upper and lower jaw means, said apparatus further comprising bending tool means, operatively connecting said bending tool means to said actuating lever mechanism for operating the bending tool means subsequently to the actuation of said upper and lower jaw means and in a direction extending perpendicularly to the direction of pressure application by said jaw means, said bending tool means being arranged on that side of said conveyor belt on which the free ends of said securing elements protrude from said conveyor belt whereby said free ends of the securing elements are bent over.

4,050,139

PISTON PIN INSTALLING AND REMOVING APPARATUS

James A. Okamuro, Kalamazoo, Mich., assignor to Borroughs Tool & Equipment Corporation, Kalamazoo, Mich.

Filed June 22, 1976, Ser. No. 698,671
Int. Cl.² B23Q *1/00*
U.S. Cl. 29—283 **7 Claims**



1. A component for use in a piston pin remover and replacer device for assembling and disassembling the piston pin connec-

tion between a connecting rod and a piston head, said piston head having spaced walls which each have a first opening therein aligned with the other first opening, wherein said connecting rod has an end having a second opening therein adapted to receive said piston pin therein and wherein a clearance space exists between said end and said spaced walls of said piston head which have said aligned first openings therein, said component comprising:

base means;

a hollow sleeve member mounted on said base and having an opening therein; and

an anvil member spaced from said hollow sleeve member and having a body portion and a bifurcated portion, said bifurcated portion being comprised of a pair of spaced apart legs spaced from said hollow sleeve member;

a rim of predefined uniform thickness thinner than the thickness of said legs mounted on the inside part of said legs and extending inwardly therefrom and coextensively therewith, the inner edge of said rim also extending in an arc between said legs at the bight portion of said bifurcated portion, both of the oppositely facing surfaces on said rim being flat and parallel with each other and contained in planes perpendicular to the extended axis of said opening in said hollow sleeve member which axis extends between said spaced apart legs and is equidistant from said rim throughout all parts of said arc whereby said rim directly engages and supports said end of said connecting rod with said first and second openings in alignment when a piston pin is forceably driven by drive pin means for movement relative to said end and said piston head to effect one of a removal and a replacement of said piston pin between said connecting rod and piston head; and

an arbor member reciprocally and slidably movable in said hollow sleeve member, stop means in said hollow sleeve member, resilient means for resiliently urging said arbor member away from said stop means and out of said hollow sleeve member, said arbor member having a diameter accommodating reception in said aligned first and second openings whereby said arbor member is urged toward said stop means in response to an engagement with a piston pin moving relative to said connecting rod and piston head during assembly, said arbor member having a sufficient length to engage said stop means and simultaneously limit the extent of travel of said piston pin.

4,050,140

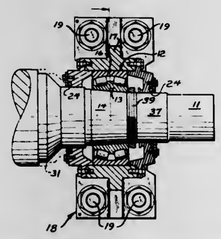
BEARING HOUSING ADAPTABLE TO REWORKED SHAFT BY REVERSAL METHOD OF REPAIR

Robert Keith Newell, Cedar Rapids, Iowa, assignor to Pettibone Corporation, Chicago, Ill.

Division of Ser. No. 472,303, May 22, 1974, Pat. No. 3,940,188. This application Nov. 28, 1975, Ser. No. 636,064

Int. Cl.² B23P 7/00

U.S. Cl. 29—401 B **3 Claims**



1. The method of repairing a shaft (having at one end portion surface-damaged bearing-contoured portions of increasing diameters inwardly from the shaft end) including the steps of reworking the original metal of the shaft by removing surface metal to provide new bearing-contoured surfaces relocated inwardly from the original bearing-contoured surfaces, and reversing parts of a bearing housing through which the shaft extends, and which has its bearing chamber located axially out of symmetry in relation to its securing formations which determine its axial position, to provide a matching inward shift of its bearing chamber.

4,050,141

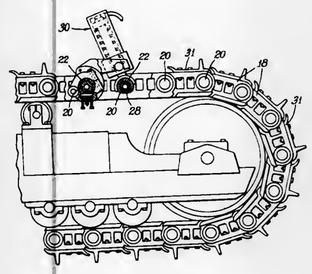
TRACK BUSH TURNING TOOL

Harold W. Vanlandingham, Washington; Roger L. Boggs; David A. Bullock, both of East Peoria, all of Ill., and James N. Maytum, Waverly, Iowa, assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 617,346, Sept. 29, 1975, abandoned, which is a division of Ser. No. 348,886, April 9, 1973, Pat. No. 3,915,036. This application Dec. 29, 1976, Ser. No. 755,412

Int. Cl.² B23P 7/00

U.S. Cl. 29—401 R **5 Claims**



1. A method of rotating a bushing of an assembled and in-place track of a tractor including a series of interconnected track links having track shoes and end supported bushings associated therewith, to define a new bushing sprocket engaging area by applying rotative force to the bushing with the track in its substantially assembled state, comprising the steps of disposing a bushing engaging tool about the periphery of the unsupported portion of the bushing, securing the tool in place, providing an opening in said tool corresponding to the worn part of said bushing, placing a wedging member in said opening in engagement with said worn portion for locking the bushing to the tool, securing levers to the bushing tool and disposing force applying means in engagement with said levers to rotate the same to thereby turn said worn part of said bushing out of alignment with said driving sprocket.

4,050,142

METHOD AND APPARATUS FOR MANUFACTURING EXTRUDED STRUCTURAL PROFILES FROM ALUMINUM BASED METAL SCRAPS

Toshiro Takahashi; Toshihiro Nagano, both of Shizuoka; Shozo Iguchi, Shizuoka; Masaru Kikuchi, Fiji; Katsuhiko Nakamura, Shizuoka, and Atsushi Mochizuki, Shimizu, all of Japan, assignors to Riken Keikinzoku Kogyo Kabushiki Kaisha, Shizuoka, Japan

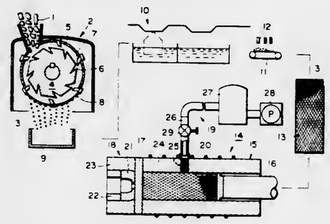
Filed June 11, 1975, Ser. No. 585,860

Claims priority, application Japan, June 14, 1974, 49-67944

Int. Cl.² B23Q 17/00

U.S. Cl. 29—403 **5 Claims**

1. A method of producing extruded structural profiles from aluminum based scrap materials comprising steps of; introducing aluminum based scrap materials into the extrusion chamber of an extruder housing having an extruder opening in communication with the chamber, exhausting air from the extruder housing chamber and from in and about the scrap materials in the extrusion chamber to substantially eliminate voids in the final profiles, preventing air from being drawn into the extruder housing chamber while air is being exhausted therefrom, extruding the scrap material through the extruder opening under a temperature suitable for hot extrusion, providing



scrap materials in the form of finely divided metal chips, packing such materials in a mesh cage consisting of the same material as the scrap metal chips, and inserting the packaged scrap metal chips and cage into the extruder housing chamber.

4,050,143

METHOD OF PRODUCING DENSE METAL TUBES OR THE LIKE

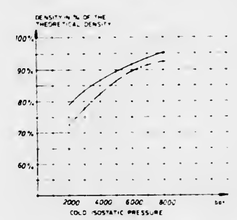
Christer Aslund, Torshalla, Sweden, assignor to Granges NYBY AB, Sweden

Filed Apr. 18, 1975, Ser. No. 569,264

Claims priority, application Germany, Apr. 19, 1974, 2419014

Int. Cl.² B22F 3/24

U.S. Cl. 29—420.5 **17 Claims**



1. In a method for producing an elongated dense metal object in which metal powder is sealed in a metal container, the metal container with the metal powder therein is partially compressed in a first compression step and the partially compressed metal container so formed is extruded at elevated temperature in a second compression step, the improvement wherein (1) the metal particles of said metal powder are substantially spherical, (2) said container is formed from a ductile metal, (3) the wall thickness of said container is at most 5% of the outer diameter of said container, (4) said metal contaner is subjected to cold-isostatic pressure acting on all surfaces of said container during said first compression step, and (5) said metal container is compressed until the density of the metal powder therein reaches at least 80% of the theoretical density during said first compression step.

4,050,144

METHOD OF AND APPARATUS FOR REMOVING PUNCTURE-RESISTANT TUBES FROM TIRES

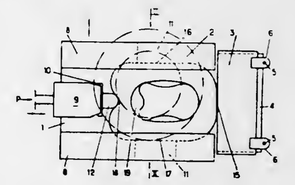
Guy de Massacré, Paris, France, assignor to Hutchinson Mapa, Paris Cedex, France

Filed Aug. 20, 1976, Ser. No. 716,342

Claims priority, application France, Sept. 19, 1975, 75.28719

Int. Cl.² B60C 25/00

U.S. Cl. 29—427 **9 Claims**



1. A method of removing puncture-resistant tubes from tires including a tire body having an outer wall, the method comprising:

subjecting a tire containing a puncture-resistant tube to be removed to the simultaneous action of lateral squeezing exerted on two diametrically opposite squeezing zones of the outer wall of the tire and to a thrusting action exerted on a zone of the outer wall of the tire located 90° from said squeezing zones, in order to cause the tube to begin to separate from the tire body, and thereafter subjecting the tire to a thrusting action exerted, during lateral squeezing on said squeezing zones, on a zone of the tire diametrically opposite the zone on which the thrusting action was first exerted, to cause the tube progressively to detach itself completely from the tire body.

4,050,145

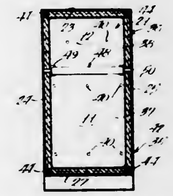
METHOD OF MAKING REFRIGERATION APPARATUS ENCLOSURE STRUCTURE

Arthur E. Benford, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Division of Ser. No. 601,636, Aug. 4, 1975, Pat. No. 3,989,329, which is a division of Ser. No. 433,071, Jan. 14, 1974, Pat. No. 3,913,996. This application July 19, 1976, Ser. No. 706,824

Int. Cl.² B23P 3/00, 19/04

U.S. Cl. 29—460 **2 Claims**



1. A method of constructing a refrigeration apparatus enclosure comprising the steps of:

fabricating an outer cabinet;

providing a flat laminate of sheet liner and insulation;

slitting said insulation along lines corresponding to the corners of said outer cabinet;

folding said sheet liner at the slits with the sheet liner disposed interiorly;

fitting the folded laminate within said outer cabinet with the insulation confronting the inner surface of the cabinet; and

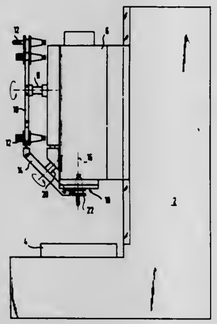
securing said laminate to said outer cabinet, including foaming plastic insulation in place within the cabinet in the voids formed between the sides of the insulation defining said slits resulting from said folding of the sheet liner.

4,050,146

SPINDLEHEAD WITH TOOL-CHANGING DEVICE

Michael Geiger, Munich, Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Germany

Filed May 10, 1976, Ser. No. 685,112
Claims priority, application Germany, June 6, 1975, 2525364
Int. Cl.² B23Q *3/157*
U.S. Cl. 29—568 **2 Claims**



1. In a spindlehead for a tool machine which is movable in at least one axial direction and has at least one spindle, comprising tool-changing means mounted on and movable with said spindlehead and includes a tool magazine and a changing arm which can be pivoted in front of said spindle and support means for supporting said changing arm for movement in a direction parallel to the spindle axis for effecting an insertion of a tool directly into said spindle and for removing said tool from said spindle and, simultaneously therewith, the removal of a tool from said tool magazine and a placement of said tool in said tool magazine, respectively, the improvement comprising wherein said tool magazine includes driving sleeve means receivable in said spindle, said changing arm being adapted to remove said driving sleeve means from said tool magazine and insert same into said spindle and wherein said spindlehead includes means for receiving a multiple-spindle unit which can be driven by said driving sleeve means mounted on said spindle, said multiple-spindle unit having a recess therein for receiving said changing arm when the multiple-spindle unit is mounted on said spindlehead.

4,050,147

METHOD FOR THE PRODUCTION OF DUCTILE AND STABLE PARTICLE-SUPERCONDUCTORS

Heinrich Winter, Kurt-Schumacherstr. 4, Eschborn, and Darius N. Sethna, Hedwig Dransfeldstr. 3, Frankfurt, both of Germany

Filed Apr. 13, 1976, Ser. No. 676,589
Claims priority, application Germany, Apr. 16, 1975, 2516747
Int. Cl.² H01L *39/12*; B22F *1/00*; H01L *39/24*
U.S. Cl. 29—599 **15 Claims**

1. A method for the production of ductile and stable particle-super conductors comprising the steps of:

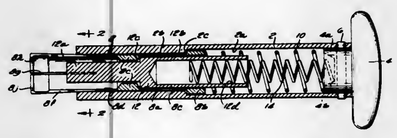
a. producing superconducting particles having an average particle diameter of 20 to 500 A by reacting, in a hydrogen plasma,
   i. a halogenide of niobium with nitrogen to give NbN;
   ii. a halogenide of niobium with nitrogen and methane to give $NbN_{1-x}C_x$ with x being less than or equal to 0.5;
   iii. a halogenide of niobium with a halogenide of aluminum to give Nb_3Al;
   iv. a halogenide of niobium with a halogenide of silicon to give Nb_3Si;
   v. a halogenide of niobium with halogenide of germanium to give Nb_3Ge;
   vi. a halogenide of niobium with a halogenide of tin to give Nb_3Sn;
   vii. a halogenide of vanadium and a halogenide of gallium to give V_3Ga; or
   viii. a halogenide of vanadium with a halogenide of silicon to give V_3Si;
b. incorporating the product particles produced in step (a) in a metallic matrix with distances between said particles between 20 and 500 A;
c. compacting the resulting metallic matrix; and
d. fabricating the product produced from step (c) into semi-finished products.

4,050,148

SNAP-IN BUSHING SWITCH REMOVAL TOOL

Jerome K. Hastings, Sussex, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed June 14, 1976, Ser. No. 695,915
Int. Cl.² B25B *27/14*
U.S. Cl. 29—764 **7 Claims**



1. A removal tool for releasing a snap-in bushing switch from its hole in a mounting panel comprising:

an elongated tubular compressor member having an open forward end and a closed rear end;

an elongated hollow chuck member in said tubular compressor member and having a divided and flared tubular section at its forward end forming a chuck normally projecting out from the open forward end of said tubular compressor member into its extended position and being rearwardly slidable within said tubular compressor member, said chuck being adapted to be placed about the snap-in bushing collar of a switch and to squeeze it small enough to re-enter the hole in the mounting panel for release therefrom;

a return spring within the rear portion of said tubular compressor member biasing said chuck member forwardly into its extended position;

a chuck stop between said compressor member and said chuck member limiting the amount that said chuck member extends from the forward end of said compressor member;

an ejector pin slidable within said chuck member and a stop therebetween that limits the forward movement of said ejector pin with respect thereto to retain it therewithin;

and an ejector operating spring between said compressor member and said ejector pin compressible upon forward sliding movement of said compressor member relative to said chuck member;

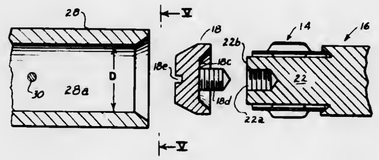
said chuck being adapted to be pressed against a mounting panel around the snap-in bushing collar of a panel-mounted switch to cause the switch actuator to depress said ejector pin whereafter depression of said compressor member causes the forward end thereof to slide over said chuck against the panel and to constrict said divided and flared section and causes said ejector operating spring to be compressed thereby to cause said chuck to squeeze the snap-in bushing collar of the switch small enough to allow said ejector pin to snap the switch out of the panel hole.

4,050,149

METHODS AND APPARATUS FOR ELECTRICAL CONTACT ASSEMBLY

Glenn E. Storck, Long Valley, and Andrew A. Kominiak, Flanders, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed May 6, 1976, Ser. No. 683,844
Int. Cl.² H01R *13/16*; B25B *27/00*
U.S. Cl. 29—630 R **10 Claims**



1. A method for making a contact assembly of type having a cylindrical terminal member and a contact element coaxially disposed relative to said terminal member and retained thereby, said contact element comprising a strip member with first and second contact finger sets extending respectively angularly outwardly of opposite surfaces of said strip member, said method comprising the steps of:

a. forming said terminal member in first and second releasably engageable parts, forming a contact element retention surface on each such part and forming a contact element support surface on at least said first part;
b. shaping said contact element into cyindrical configuration;
c. applying such cylindrically shaped contact element to said terminal member first part with said first contact finger set in engagement with said support surface and, while applying common force to the fingers of said second contact finger set selected to be no greater than the force applied to said second contact finger set by a further terminal member engaging said first-mentioned terminal member in circuit connection use of said contact assembly, advancing said contact element strip member into engagement with said retention surface of said terminal member first part; and then
d. engaging said terminal member second part with said terminal member first part in a manner providing engagement of said strip member with said retention surface of said terminal member second part.

6. A kit of parts for assembling an electrical terminal member, said kit comprising in first part a contact element comprising a strip member having first and second contact finger sets extending respectively angularly outwardly of opposite surfaces of said strip member, and in second part an assemby tool for applying said contact element to a terminal member having first and second separable parts defining contact element retention surfaces and a cylindrical contact element support surface therebetween, said assembly tool comprising a cylindrical body adapted to apply circumferential force to said contact element uniformly thereof, said circumferential force being substantially the same as that applied by a further terminal member when in mating engagement with said first mentioned terminal member, and said tool body further adapted to place said contact element in engagement with said retention surface of said terminal member first part.

4,050,150

MEDICAL NEEDLE HOLDER ASSEMBLY AND METHOD OF AND APPARATUS FOR MANUFACTURING MEDICAL NEEDLE HOLDING ASSEMBLY

Soji Ishikawa, No.85, 1 chome, Kamata, Setagaya, Tokyo, Japan

Division of Ser. No. 602,740, Aug. 7, 1975, Pat. No. 4,001,929.
This application Oct. 6, 1976, Ser. No. 730,251
Int. Cl.² B23P *19/04*
U.S. Cl. 29—777 **11 Claims**



1. Apparatus for assembling together a generally tubular needle holder, a filter element composed of a wad of a predetermined length of filament yarn and a generally tubular filter retainer adapted to be received in said needle holder with said filter element fitter to the needle holder, comprising (1) an elongated hollow transport tube having a longitudinal passageway which is open at its foremost end and having formed in its intermediate portion an opening which is sized to permit said filament yarn to pass therethrough, (2) first feeding and positioning means for feeding said needle holder in each cycle of operation into a predetermined position longitudinally aligned with said longitudinal passageway in said transport tube and having its rearmost end located at the open foremost end of said longitudinal passageway, (3) second feeding and positioning means for feeding said filter retainer in each cycle of operation into a predetermined postion within said longitudinal passageway in said transport tube, said predetermined position of the filter retainer being longitudinally spaced apart and aligned with said predetermined position of said needle holder across said intermediate portion of said longitudinal passageway, (4) third feeding and positioning means for feeding said filament yarn in each cycle of operation into a predetermined position in said intermediate portion of said longitudinal passageway of said transport tube through said opening formed in the intermediate portion, (5) pneumatic transfer means for producing in said longitudinal passageway in said transport tube a unidirectional stream of air flowing from said intermediate portion toward said predetermined position of said filter retainer for moving said filament yarn from said predetermined position thereof toward said filter retainer in said predetermined position thereof until the filter element is forced in the form of a tangle against the foremost end of the filter retainer, and (6) drive means for moving said filter retainer from said predetermined position thereof toward said needle holder in said predetermined position thereof with said tangle of said filament yarn carried on the foremost end of the filter retainer and forcing the filter retainer into said needle holder in said predetermined position thereof so that the tangle of the filament yarn is compacted into wad form within said needle holder.

4,050,151

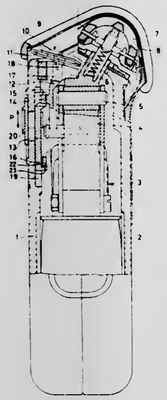
DRY-SHAVING APPARATUS

Jan de Boer, and Jan Reinink, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 22, 1976, Ser. No. 669,324
Claims priority, application Netherlands, Apr. 11, 1975, 7504322
Int. Cl.² B26B *19/10*
U.S. Cl. 30—34.1 **3 Claims**

1. A dry-shaving apparatus comprising a cutter for shaving off short hairs, an electric motor for driving said cutter, means for actuating said motor and movable between an "off" position and an "on" position, a trimmer for long hairs, a movable

element for coupling said trimmer to said motor, means for actuating said movable coupling element between a disengaged position and an engaged position with respect to the trimmer, and means associated with said motor-actuating



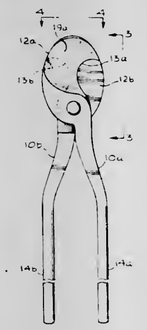
means and said movable coupling element, said associated means effecting movement of said coupling element into its disengaged position when said motor-actuating means is moved into its "off" position.

4,050,152

CABLE AND WIRE CUTTER

John R. Olson, 914 N. Lamer St., Burbank, Calif. 91506

Continuation-in-part of Ser. No. 627,663, Oct. 31, 1975, abandoned. This application Aug. 16, 1976, Ser. No. 714,480
Int. Cl.[2] B21F *13/00*; B26B *27/00*
U.S. Cl. 30—90.1 **5 Claims**



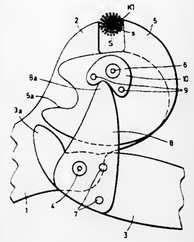
1. A hand tool for cutting wire, cable and the like comprising:
- a pair of cooperating, elongated members pivotally secured at a locus which separates said members into a pair of handles and a pair of primary cutting blades, said members being mutually pivotal between an opened and a closed position;
- each of said primary cutting blades comprises an inner sharpened edge, an outer blunt end having inbound and outbound edges, a back face extending from the sharpened edge to the inbound edge of the blunt end, and a front face extending from the sharpened edge to the outbound edge of the blunt end;
- each of said inner sharpened edges has a substantially semi-circular configuration and, in combination, define oppositely disposed curves;
- each of said back faces is substantially flat and said back faces are disposed in abutting relationship and traverse each other in such relationship; and
- each of said front faces comprises a curved ramp rising from the semi-circular sharpened edge and extending to the outbound edge of the blunt end, with the gradient of each ramp being substantially the same and in the range between 33% and 50%.

4,050,153

CABLE AND WIRE-ROPE CUTTER

Félix Flisch, Rue des Melezes, Geneveys-sur-Coffrane Cant. Neuchatel, Switzerland (2206)

Filed Aug. 19, 1976, Ser. No. 715,893
Claims priority, application Switzerland, Aug. 25, 1975, 11000/75
Int. Cl.[2] B26B *13/00*
U.S. Cl. 30—250 **4 Claims**



1. A cable and wire-rope cutter comprising first and second handles pivoted on one another, a first cutting jaw formed rigidly on said first handle, a second cutting jaw pivoted on said first handle, and tooth means operatively connecting said second handle with said second jaw, wherein said tooth means comprise two tooth elements disposed on said second handle one of which is attached to the second handle and the other being formed integral therewith, one of said tooth elements engaging said second jaw for moving it from a position in which it is spaced to a maximum extent from said first jaw into a position in which said second jaw is enabled to cooperate with said first jaw for enclosing a cable or wire rope on all sides, and the other of said tooth elements thereafter engaging said second jaw for moving it past said first jaw, whereby said first and second jaws are enabled to cooperate with cutting said cable or wire rope, said tooth elements having differing multiplying ratios respectively corresponding to the differing power requirements for enclosing and for cutting said cable or wire rope.

4,050,154

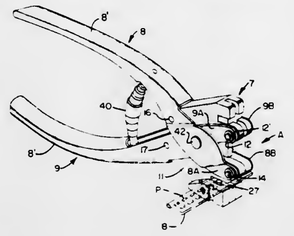
PERFORATING TOOL

Hans Oetiker, 21 Oberdorfstrasse, Horgen, Switzerland

Filed May 24, 1976, Ser. No. 689,048
Int. Cl.[2] B26F *1/00*
U.S. Cl. 30—363 **25 Claims**

1. A tool for perforating a clamping band or the like comprising:
- a first movable lever,
- a second movable lever,
- lever pivot means for pivotally connecting said first and second levers to one another for pivotal movement about a common lever pivot axis,
- first and second perforating tool means supported at said levers and being movable with respect to one another,

- said first tool means including a perforating plunger movable therewith,
- said second tool means including guide means for guiding movement of said plunger along a predetermined plunger travel path,
- and band support means carried by one of said tool means and including a support surface of supporting a band during perforating movement of an end portion of said plunger through said band during movement of said first and second levers with respect to one another,



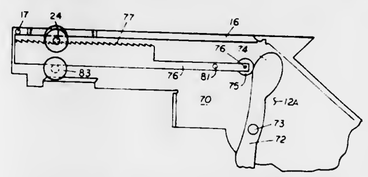
- said first tool means including a first rigid tool block which is pivotally connected to said first lever at a first tool block pivot axis,
- said second tool means including a second rigid tool block which is pivotaly connected to said second lever at a second tool block pivot axis,
- said first and second tool block pivot axes being at one side of said predetermined plunger travel path and said common lever pivot axis being at the other opposite side of said predetermined plunger travel path.

4,050,155

CAN OPENER GUN

Omero Pitocchi, Jersey City, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,297
Int. Cl.[2] B67B *7/30*
U.S. Cl. 30—400 **2 Claims**



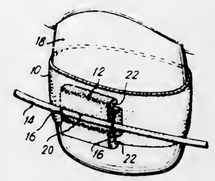
1. A portable can opener tool in the outline shape of a pistol comprising
- a pistol-shaped basic frame,
- a cutter wheel frame pivotably mounted to the main frame, and
- a trigger handle pivotably mounted to the main frame, together with cutting blade means mounted on the cutter frame and can rim rotation means mounted on the basic frame linked to the trigger handle, in which the can rim rotation means comprises a slidable bar formed with serrated teeth on one edge and located so that some of the said serrated teeth bear, in use, against the undersurface of the rim of a can, the top of which is engaged by the cutter wheel, with said bar slidably linked to the basic frame so as to maintain substantically uniform spacing between the cutter wheel and the slidable bar when the bar travels in response to rotation of the trigger handle.

4,050,156

DENTAL APPLIANCE

Daniel Chasanoff, 33 Ardsley Drive, and Myles Z. Schneider, 18 Windgate Drive, both of New City, N.Y. 10956

Filed June 28, 1976, Ser. No. 700,198
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—2 **6 Claims**



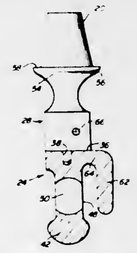
1. A dental appliance, for use in the mouth as an improvement over polymeric fluorocarbon appliances, comprising a metallic base material and a coating including a para-oxybenzoyl homopolyester, a polymeric fluorocarbon and a pigment for providing a tooth colored appearance.

4,050,157

DENTAL IMPLANT

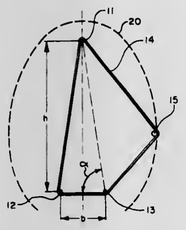
Maurice J. Fagan, Jr., and Maurice J. Fagan, III, both of 5360 Peachtree Dunwoody Road NE., Atlanta, Ga. 30342

Filed May 27, 1975, Ser. No. 581,419
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—10 A **6 Claims**



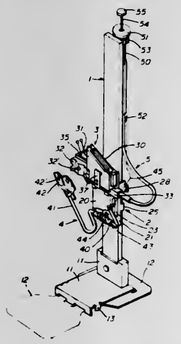
1. In a dental implant for anchoring an artificial tooth in the jawbone of a patient, having a substantially flat base embedded in the bone tissue and at least one substantially non-planar support connected to the base and projecting from the gingival line along a root axis of the tooth, the improvement including a shank extending between said support and the base along said root axis having a neck portion projecting from the ridge crest of the bone tissue toward said gingival line, said neck portion being dimensionally smaller than the base in a cross-sectional plane intersecting the lingual and buccal surfaces of the jawbone, said base including spaced edge portions extending in a mesial-distal direction from the shank transversely of the root axis and an intermediate portion, said intermediate portion being cross-sectionally thinner than the edge portions and having at least one opening formed therein, and a relatively rigid stabilizer connected to and spaced liqually from the base, said stabilizer being connected to one of the edge portions from which the shank projects and aligned with said opening in the base.

4,050,158
ARCH FORM COMPONENT
Allen C. Brader, 1350 Hamilton St., Allentown, Pa. 18102
Filed May 21, 1976, Ser. No. 688,786
Int. Cl.² A61C 7/00
U.S. Cl. 32—14 A **13 Claims**



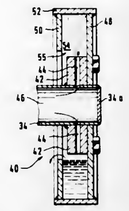
1. A method of making a compound elliptical arch form for use in an orthodontic system comprising the steps of, plotting three foci so that connections therebetween would generate an isoceles triangle, preparing a closed loop of string of a length greater than the sum of the sides of the triangle and such as to produce a given arch width, generating and recording an arch form by using the string and the foci, and bending a resilient wire according to the arch form.

4,050,159
HEM-LINE MARKER
Toshihide Kakinuma, No. 2-43, Kamiya Kita-ku, Tokyo, Japan
Filed Mar. 8, 1976, Ser. No. 664,788
Claims priority, application Japan, Mar. 13, 1975, 50-29531
Int. Cl.² A41H 9/02
U.S. Cl. 33—9 R **7 Claims**



1. A hem-line marker used with needles having a head portion and a shank portion, comprising a base having an upright; clamping means mounted on and slidable along said upright for clamping a portion of the cloth of a garment, said clamping means comprising a clamping member mounted for pivotal movement into and out of a position in which it clamps said cloth portion, and means permanently biasing said member out of said position; pin inserting means for inserting pins at an inserting position into the clamped cloth portion; pin storing and feeding means for feeding pins to said inserting position; operating means for operating said clamping means and said pin inserting means, comprising a first elongated flexible element having one end connected to said pin inserting means and another end provided with a release portion, and a second elongated flexible element having spaced end portions connected to said clamping member and said other end of said first elongated flexible element; and means on said upright for normally detachably holding said other end portion of said first elongated flexible element in an inoperative position in which said second elongated flexible element is stack so that, when a user detaches said other end portion from said holding means and raises said release portion to an operating level higher than the level of said holding means, said second elongated flexible element becomes tensioned and moves said clamping member into said position in which it clamps said cloth portion in preparation for operation of said pin inserting means by actuation of said release portion by a user.

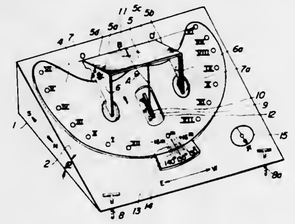
4,050,160
DEVICE FOR LINEAR MEASUREMENT
Ewald Schmitt, Maintal, Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Germany
Filed Apr. 9, 1976, Ser. No. 675,466
Claims priority, application Germany, Apr. 14, 1975, 1117394
Int. Cl.² G01B 3/12, 7/04
U.S. Cl. 33—141 B **8 Claims**



1. A device for the linear measurement of a hot workpiece to be separated by a torch-cutting machine comprising a water cooled measuring roller, a rotatable shaft, said roller being mounted on said shaft for rotation therewith, said shaft being rotatably mounted in tilting means, said tilting means moving said shaft and said roller to and form a position where said roller contacts the underside of the hot workpiece which in turn moves with respect to said roller whereby said roller is caused to rotate by the relative motion of the workpiece, transmitter means for said roller for determining a measuring length in accordance with said rotation of said roller and for connection with a control device of a torch cutting machine, said shaft having a cooling channel therein whereby said shaft is hollow, a water supply on said shaft communicating with said cooling channel, said cooling channel terminating in said roller whereby water may flow to said roller, said roller having a flange on one side of said roller to which said shaft is secured, and said roller being open to the atmosphere on the side of said roller opposite said flange whereby water flowing into said roller may be expelled to the atmosphere through said open side.

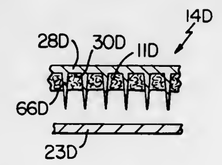
4,050,161
TRUE NORTH MERIDIAN INDICATOR
Tokutaro Yabashi, 265 Akasaka, Ogaki, Gifu, Japan
Filed Nov. 26, 1975, Ser. No. 635,308
Int. Cl.² G04B 49/04; G01C 17/34
U.S. Cl. 33—270 **1 Claim**

1. A meridian indicator comprising a base plate, an inclined plate disposed at a selected angle to said base plate, an hourly graduated arcuate plate, means rotatively supporting said arcuate plate upon said inclined plate, a rectangular style plate, means supporting a first edge of said style plate at a selected angle to the inclined plate, adjustable means for angularly positioning said style plate at a selected angle relative to a horizontal plane, a weighted string means attached to a second edge of said style plate which is perpendicular to said first edge, apertures in the inclined plate and the arcuate plate positioned so that said weighted string means adjustably passes therethrough, and a latitude scale means disposed on said inclined plate and juxtapositioned to said weighted string means as it passes through said apertures, and equation of time correction scale means disposed upon said arcuate plate, and a longitude scale means disposed upon said inclined plate in



juxtaposition to said equation of time correction scale means, said arcuate plate having hourly graduations so that when said first edge of said style plate is pointing to true north, the shadow cast by either the sun of said first edge or a third edge parallel to said first edge of said style plate falls correctly upon an hourly graduation upon said arcuate plate to read true solar time.

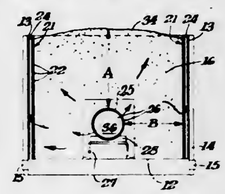
4,050,162
METHOD AND APPARATUS FOR REMOVING LIQUID FROM LIQUID BEARING MATERIAL
James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429
Continuation-in-part of Ser. No. 541,218, Jan. 15, 1975, Pat. No. 3,977,937, which is a continuation-in-part of Ser. No. 405,023, Oct. 10, 1973. This application June 11, 1976, Ser. No. 695,092
The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.
Int. Cl.² F26B 3/34
U.S. Cl. 34—1 **28 Claims**



1. In a method of moving retained liquid by electrostatic action in liquid bearing material of the liquid absorbing type, the improvement comprising the step of disposing a plurality of needle-like projections to extend completely through said material to assist said electrostatic action in moving retained liquid in said material.

4,050,163
PROCESS AND APPARATUS FOR DRYING GRAIN IN SITU
Clifton Stanley Short, P.O. Box 105, Kenton, Del. 19955
Continuation-in-part of Ser. No. 643,993, Dec. 31, 1975, abandoned. This application Sept. 30, 1976, Ser. No. 728,144
Int. Cl.² F26B 3/06
U.S. Cl. 34—22 **13 Claims**

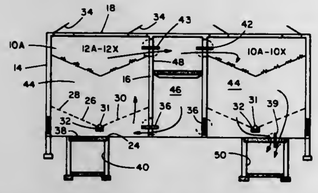
1. Apparatus for drying grains in situ in a grain bin having an upper grain surface when filled, comprising in combination:
   a. a generally rectangular bin of a substantial length and width comprising;
      1. a normally horizontal air impervious floor;
      2. vertical side panels running lengthwise of the bin to define the length of the bin, said side panels having a large number of perforations substantially throughout its surface, with said perforations being smaller in size than the grain to be dried to allow air to pass and prevent grain from passing therethrough; and
      3. vertical end panels normally perpendicular to the side panels to define the ends of the bin;
   b. perforated duct means adjacent the floor of said bin running longitudinally the length of the bin, said perforated duct means being spaced and located such that the horizontal distance from the perforations of the duct means to the nearest side panel is less than the vertical distance from the uppermost perforations of the duct means to the location of the upper grain surface, the perforations of said perforated duct means are of a size small enough to prevent the grain to be dried from entering said duct, said duct means further having hot air receiving means for receiving hot air under pressure from a source exterior of the bin into one end of the duct means and the other end of the duct means being in an airtight seal; and
   c. high-pressure power driven air fan means and associated air heater means arranged exteriorly of the bin and operatively associated with said hot air receiving means of the perforated duct means to force hot air under pressure into the perforated duct means, to provide lateral flow of hot dry air from the perforated duct means towards the perforated side panels whereby the hot air removes the moisture from the grain to be dried and the air and moisture pass both through the perforations of the side panels and through the top grain surface.



11. A process for drying moisture containing grain in situ in a grain bin having an upper grain surface, said bin having an air impervious floor, side panels defining the length of the bin with said side panels having perforations to allow air to pass there through without the passage of the grain to be dried, perforated duct means to convey heated air into said grain bin, said bin further having end panel to define the width of the bin, said process comprising in combination:
   a. heating and pressurizing air exteriorly of the bin;
   b. directing said heated air under pressure into the bin and along the longitudinal length of the bin near the floor at points nearer to the perforated side panels than the grain surface;
   c. directing the heated air under pressure both laterally and outwardly from the interior of the bin towards the perforated side panels and also upwardly towards the grain surface throughout the grain and contacting the heated air with the moisture containing grain to pick up moisture from the grain; and then
   d. further directing said heated air containing moisture both to and through the perforated side panels and also upwardly and out through said grain surface by:
      1. directing said heated air under pressure into said perforated duct means extending along the longitudinal length of said grain bin with said duct being located near the floor of the bin at a distance such that the vertical height from the perforations of the duct means to the grain surface is greater than the distance from the perforated side panels to provide sufficient confinement of the heated air to force said heated air outwardly laterally to and through the side panels while at the

same time a sufficient portion of the heated air moves upwardly throughout the grain and exits from the grain surface.

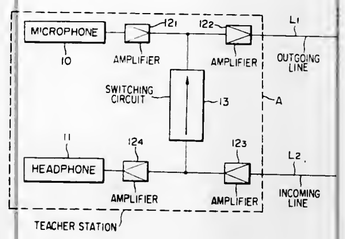
4,050,164
GRAIN DRYER CONSTRUCTION
Bowen Campbell, Des Moines, Iowa, assignor to Cromwell B. Campbell
Filed Mar. 8, 1976, Ser. No. 664,869
Int. Cl.² F26B *11/22*
U.S. Cl. 34—182 **6 Claims**

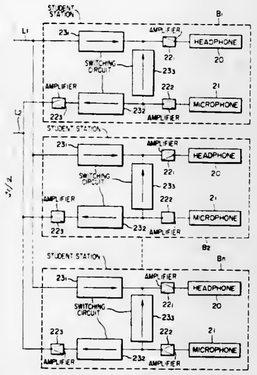


1. Improved apparatus for batch drying at least two batches of grain comprising, in combination:
first and second separate batch bins, each bin forming an enclosure for grain and having a top, a bottom and sides;
first and second separate air flow doors to each batch bin, at least one air flow door at the top of each bin and at least one air flow door at the bottom of each batch bin;
an air supply manifold connected to the bottom doors of each bin;
a second separate, air exhaust manifold connected to the top doors of each bin;
means for receiving, drying, reheating and discharging all of the air, the exhaust manifold being connected to said means for receiving all the air from the air exhaust manifold, said air supply manifold connected to said means for discharging all the air; and
fan means for circulating all of the air continuously through said supply manifold, into said bins, through said exhaust manifold and said means for drying and reheating, whereby the air is entirely and continuously recycled through the batches of grain to remove moisture therefrom, the air temperature and moisture content being entirely controlled within the apparatus for drying independent of ambient conditions external the apparatus for batch drying.

4,050,165
TEACHER-STUDENTS INTERCOMMUNICATION SYSTEM
Satoshi Yamauchi, Yokohama, and Shigeru Yamazaki, Tanashi, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan
Filed Feb. 20, 1976, Ser. No. 659,649
Claims priority, application Japan, Feb. 25, 1975, 50-23205
Int. Cl.² G09B *5/00*
U.S. Cl. 35—8 A **11 Claims**

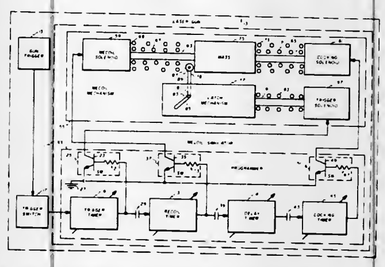
1. In an intercommunication system in which a teacher station and a plurality of student stations are interconnected with a common outgoing line and a common incoming line, the improvement wherein said teacher and student stations comprise:
a transmitter and a receiver, the transmitter and receiver in said teacher station being respectively connected to said outgoing line and said incoming line;
first switching circuit means in said teacher station for selectively connecting said incoming line to said outgoing line;
second switching circuit means in each student station for selectively connecting the corresponding receiver and transmitter respectively to said outgoing and incoming lines;
means in each student station for selectively controlling the corresponding second switching circuit means; and





means in said teacher station for selectively controlling all of said second switching circuit means.

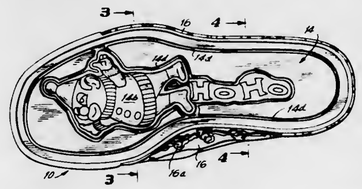
4,050,166
RECOIL SIMULATOR
Edmund Swiatosz, and Albert H. Marshall, both of Maitland, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sept. 30, 1976, Ser. No. 723,488
Int. Cl.² G09B *9/00*; F41F *27/00*
U.S. Cl. 35—25 **19 Claims**



1. A recoil simulator, comprising in combination:
a movable mass having a predetermined axis along which movement thereof may occur;
first resilient means effectively connected to said movable mass for timely effecting the urging thereof in a certain first manner in one direction along the aforesaid predetermined axis in effective response to a first signal;

first actuator means effectively connected to said movable mass for timely effecting the movement thereof in a certain second manner in timely conjunction with the urging thereof by said first resilient means in said one direction along the aforesaid predetermined axis in response to a second signal;
second resilient means playably spatially disposed from said movable mass for timely inhibiting and subsequently stopping the movement thereof in a certain third manner in said one direction along the aforesaid predetermined axis and for timely effecting the urging thereof in a certain fourth manner in the other direction along the aforesaid predetermined axis;
second actuator means effectively connected to said movable mass for timely effecting the movement thereof in a certain fifth manner in timely conjunction with the urging thereof by said second resilient means and in timely conjunction with the opposition to the urging thereof by said first resilient means in the other direction along the aforesaid predetermined axis in response to a third signal;
means releasably contacting said movable mass for timely effecting the holding thereof in a predetermined cocked position when said mass has been moved a predetermined distance in the aforesaid other direction along said predetermined axis by said second resilient and actuator means; and
third actuator means connected to said mass cocked position holding means for timely effecting the release of the aforesaid movable mass.

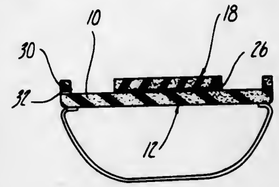
4,050,167
ARTICLE OF FOOTWEAR WITH A THREE-DIMENSION INSET FIGURE IN ITS RECESSED SOLE AND METHOD OF MAKING THE SAME
Jonas Senter, 910 Fifth Ave., New York, N.Y. 10011
Filed Mar. 1, 1976, Ser. No. 662,929
Int. Cl.² A43B *13/04, 23/28, 3/28*
U.S. Cl. 36—32 R **1 Claim**



1. An article of footwear including a sole having a walking surface, an upper, and having at least one recessed area in said sole, comprising three-dimensional inset figure secured in said recessed area, which figure is at least partly embossed with an overlay illustration on the exposed surface of said inset figure, said exposed surface being substantially flush with said walking surface, said inset figure being adapted to leave an imprint of said illustration when the wearer walks on soft ground, wherein said inset figure is slightly smaller in its outlines than those of said recessed area of the sole, thereby presenting a peripheral ridge about said recessed area that limits a set-off border in said sole and around said inset figure, which border makes for a secure, non-slip grip during walking even when said sole is wet.

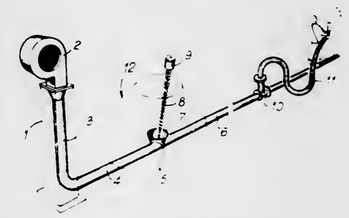
4,050,168
FOOTWEAR WITH DETACHABLE SYMBOLS
Carl E. Pace, 2059 N. Maple Trail, Wixom, Mich. 48096
Filed June 14, 1976, Ser. No. 695,796
Int. Cl.² A43B *23/00, 3/28, 13/12*
U.S. Cl. 36—136 **5 Claims**

1. A footwear having a sole adapted to engage a ground supporting surface, a raised border of resilient material detachably attached to and extending around the entire periphery of said sole, means for detachably attaching said border to said sole means detachably attached to said sole within said border



comprising at least one raised symbol and means for detachably attaching said symbol to the sole of said footwear whereby said symbol is imprinted on said ground supporting surface as said sole engages said ground supporting surface.

4,050,169
SNOW DISTRIBUTION SYSTEM
Armand René Pasquier, Annecy, France, assignor to Etudes Techniques et Realisations (E.T.R.), Dousl, France
Filed Oct. 29, 1975, Ser. No. 626,638
Claims priority, application France, Oct. 30, 1974, 74.36222; Oct. 10, 1975, 75.31099
Int. Cl.² F25C *3/04*
U.S. Cl. 37—1 **10 Claims**

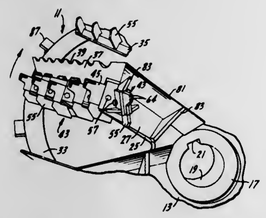


1. Apparatus for distributing snow from a storage area to a ski track comprising a motor assembly, a air lock manifold operated by said motor assembly and having a pair of inlets and an outlet, snow intake means operated by said motor assembly connected to one of said inlets for delivering snow to said manifold, an air blower operated by said motor assembly and connected to the other of said manifold inlets for ejecting said snow from said manifold outlet, an elongated main duct arranged at least in part to extend along the ground in association with said ski track, means connecting said main duct to said manifold outlet, a plurality of outlet mouths formed in said main duct, at least one secondary duct connected to selected ones of said outlet mouths of said main duct and extending away therefrom, a flexible distribution hose connected to said secondary duct, and a nozzle connected to said distribution hose, said nozzle being mounted on a movable support and having at least two degrees of freedom of movement.

4,050,170
DREDGE CUTTER HEAD
Norman P. Proehl, Lake Forest, Ill., assignor to Norman P. Proehl, Lake Forest, Ill.
Filed Feb. 17, 1976, Ser. No. 658,245
Int. Cl.² E02F *3/92*
U.S. Cl. 37—67 **8 Claims**

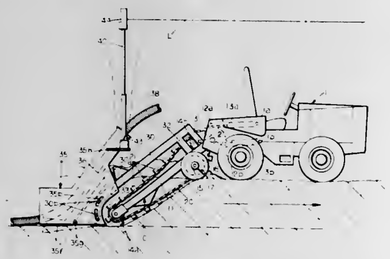
1. A cutter head for a suction dredge, including: a hub,

a plurality of generally radially extending spokes of substantially equal lengths mounted on said hub,
a back ring of greater radius than said spokes,
struts extending between said spokes and said back ring with said struts connected to said spokes at the outer ends thereof and to the back ring near the periphery thereof to form a truncated conical structure,
blades mounted on said struts and inclined in the direction of rotation of said cutter head, and



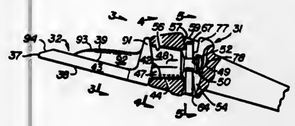
radially extending forwardly projecting scoop plates mounted on said spokes at the leading edges thereof with said scoop plates being inclined in the direction of rotation of said cutter head,
the radially outer ends of said scoop plates abutting and connecting with the forward ends of said strut blades to form generally L-shaped digging members.

4,050,171
DEPTH CONTROL FOR ENDLESS CHAIN TYPE TRENCHER
Ted L. Teach, Dayton, Ohio, assignor to Laserplane Corporation, Dayton, Ohio
Filed May 12, 1976, Ser. No. 685,528
Int. Cl.[2] E02F 5/06
U.S. Cl. 37—86 **6 Claims**



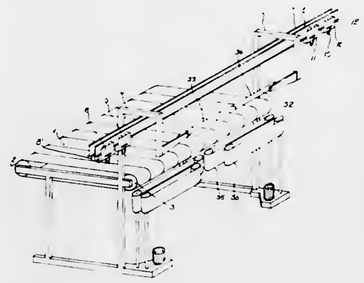
1. In a trencher of the type having an endless chain carrying a plurality of digging scoops peripherally around an elongated digging frame, said digging frame having the forward end thereof pivotally mounted on a vehicle for movements in a vertical plane parallel to the path of travel of the vehicle, and means on the vehicle for driving said chain, the improvement comprising:
1. a sub-frame overlying said digging frame and having its front end rigidly secured to said digging frame;
2. a trench bottom shoe having an elongated bottom surface adapted to ride on the bottom of the newly dug trench, and means for pivotally mounting said shoe to the trailing end of said sub-frame for pivotal movements about a single horizontal axis provided on said digging frame, whereby said bottom surface is immediately tilted by variations in vertical position of said axis;
3. a cylinder for positioning said digging frame relative to said vehicle, thereby controlling the effective depth of the trench being dug;
4. means for establishing a reference plane at a known elevation;
5. an upstanding mast having its bottom end rigidly secured to said shoe at a point horizontally ahead of said bottom surface of said shoe, said mast being perpendicular to said bottom surface, whereby any upward or downward pivotal movement of said shoe relative to the digging frame produces a reverse tilting movement of the top of said mast relative to said reference plane, and
6. means on the top of said mast for determining the height of said mast relative to said reference plane, and
7. means for supplying fluid to said cylinder to maintain the top of said mast in a fixed vertical position with respect to said reference plane.

4,050,172
EXCAVATOR TOOTH, HOLDER THEREFOR AND STAPLE RETAINER
Gerald A. Petersen, San Francisco, Calif.
Continuation of Ser. No. 431,509, Jan. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 330,050, Feb. 6, 1973, Pat. No. 3,826,024, which is a continuation-in-part of Ser. No. 215,739, Jan. 6, 1972, Pat. No. 3,751,834. This application Apr. 7, 1975, Ser. No. 565,776
Int. Cl.[2] E02F 9/28
U.S. Cl. 37—142 A **8 Claims**



1. In combination an excavating tooth having a proximal portion of non-circular cross-section and a distal portion, a tooth holder formed with at least one recess complementary to said proximal portion and opening inward from the forward end of said holder and extending inward from said forward end in a first direction, said recess having first side walls extending approximately parallel to said first direction, and a retainer, said retainer having a pair of legs and a connecting portion connecting one end of each said leg, said retainer being formed of a resilient material to resist movement of said legs toward and away from each other, said retainer being slideable in said holder between operative and retracted positions, said holder formed with an opening extending from a first side of said holder to the second side of said holder opposite said first side, said opening having opposed second side walls extending approximately parallel to said first direction, said opening being spaced back from said forward end, said opening extending parallel to a plane generally perpendicular to said first direction, at least one said second side wall having a first portion, a second portion laterally offset with respect to said first portion and a first shoulder interconnecting said first and second portions, said proximal portion of said tooth formed with a notch and having a second shoulder rearward of said notch, at least on leg of said retainer extending along one said second wall adjacent said first and said second sides and into said notch when said retainer is in operative position and abutting said second shoulder to restrain said tooth against dislodgment from said holder, said one leg being movable out of said notch without total removal of said one leg from said holder when said retainer is in retracted position, said legs biased to diverge from each other so that said legs engage said second walls to resist unintentional movement of said retainer, said one retainer leg being entirely inside said holder when said retainer is inoperative position, said retainer being assembled with said holder when either in retracted or in operative position, at least one leg of said retainer having an upper portion, a lower portion offset laterally relative to said upper portion and a third shoulder at the level of the interconnection of said upper and lower portions, said third shoulder being at all times within said opening when said retainer is either in operative or in retracted positions, said first shoulder engaging said third shoulder to limit outward movement of said retainer when said retainer is in retracted position, said distal portion of said tooth comprising a blade having substantially parallel top and bottom surfaces, and a transverse cutting edge at its distal end, said distal end located approximately at the level of said proximal portion, said top and bottom surfaces slanting downwardly-rearwardly, said top surface having a fourth shoulder extending across the width of said distal portion transverse to said proximal portion and extending to an elevation substantially higher than the elevation of said proximal portion to form a protection for the forward end of a holder in which said tooth is held.

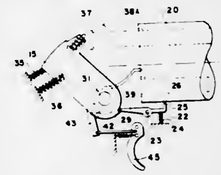
4,050,173
LAUNDRY FEEDING APPARATUS
Niels Johan Olsen, Akirkeby, Denmark, assignor to Firma Bora, S.A., Luxembourg
Filed Sept. 4, 1975, Ser. No. 610,373
Claims priority, application Denmark, Sept. 4, 1974, 4673/74
Int. Cl.[2] D06F 67/04
U.S. Cl. 38—143 **10 Claims**



1. Apparatus for spreading and feeding pieces of laundry, comprising:
a conveyor for receiving laundry from a spreading apparatus; said conveyor having an upstream and a downstream end;
a spreading apparatus comprising at least one pair of clamping devices; each said clamping device including means for holding a piece of laundry; said clamping devices being positioned upstream of said upstream end of said conveyor and above said conveyor; clamping device moving means for moving said clamping devices of said pair thereof apart and together crosswise to the motion of said conveyor and always upstream of said conveyor;
a blade positioned further upstream from said conveyor than said clamping devices and positioned above said conveyor; said blade being movable toward said conveyor to contact the piece of laundry held by said clamping devices and to move the piece of laundry onto said conveyor.

4,050,174
REVOLVER GUN
Robert J. Hubbs, Riverside, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed July 19, 1976, Ser. No. 706,208
Int. Cl.[2] F41C 1/00
U.S. Cl. 42—59 **2 Claims**

1. A revolver gun which ejects each spent cartridge immediately upon being fired, comprising a gun fitted with a revolver cylinder fitted with chambers for holding cartridges,
first spring-biased means to latch the revolver cylinder in a fixed position,
second means to rotate the revolver cylinder,
said first means linked to a breechblock pivotably mounted in said gun so as to release said latch when the breechblock is in a recoil position.
said second means linked to the breechblock so as to rotate



the revolver cylinder when the breechblock returns from the recoil position to a firing position,
said breechblock pivotably mounted and spring-biased to remain in the firing position except under the recoil forces of a fired cartridge in the revolver cylinder, which fired cartridge serves to rotate the breechblock to the recoil position while the fired cartridge is ejected out of the revolver cylinder.

4,050,175
LOADING DEVICES FOR MUZZLE LOADING RIFLES
Lavern F. Mulinix, 445 W. High St., Alliance, Ohio 44460
Filed Sept. 10, 1976, Ser. No. 722,025
Int. Cl.[2] F41C 27/00
U.S. Cl. 42—90 **9 Claims**



1. A loading device for a muzzle-loading rifle, comprising:
a tubular holder, adapted to contain gun powder and a ball shot,
an end cap for closing an end of said holder to contain the gun powder and ball therein, said end cap having a connection with said holder that may be broken by a pulling force applied in an axial direction on one of said end cap and holder while holding the other stationary to separate said end cap from said holder,
whereby to provide for transferal of said gun powder and ball from said holder through the opening of the barrel bore of said rifle and into said bore.

4,050,176
FLY TIE TOOL
William Asper, Englewood, Colo., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed June 14, 1976, Ser. No. 696,120
Int. Cl.[2] A01K 91/04
U.S. Cl. 43—1 **2 Claims**

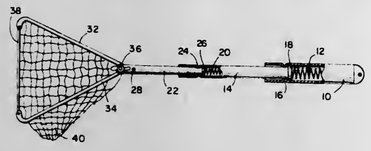
1. A clip which may be fastened to a line
said clip formed of a spring material of two flat legs joined together by a U-section, with an end of a first leg bent as

a flange, said flange extending generally perpendicularly to the plane of the first leg towards the second leg, with the edge of said flange normally maintained in contact with said second leg, with the two legs of said clip shaped to apply spring bias serving to normally hold said flange edge in contact with the second leg, in which



the first leg is formed with a V-section located at substantially the mid-section of said first leg between the flange and the U-section, said V-section oriented so that the tip of the V-section normally bears against the said second leg, such that manually compressing the section of the first leg lying between the U-section and the V-section towards the second leg serves to lift the flange edge completely from contact with said second leg.

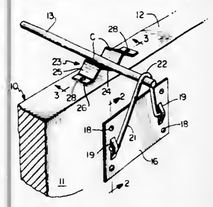
4,050,177
FOLDABLE FISH NET
Allen Gerritsen, 74 Heights Terrace, Middletown, N.J. 07748
Filed Feb. 20, 1976, Ser. No. 659,657
Int. Cl.[2] A01K *77/00*
U.S. Cl. 43—12 **2 Claims**



1. A foldable fish net comprising:
a. a hollow tubular handle;
b. a first tubular extension slidably secured within said handle between extended and retracted positions;
c. a pair of arms pivotably mounted at the end of said extension;
d. means for adjustably securing said arms in an open position;
e. a net mounted between said arms;
f. a storage compartment in said handle having an opening along a side of said handle to receive said net and arms;
g. wherein said open arms provide a triangular shaped support for said net; and
h. wherein a hollow portion of said handle receives said tubular extensions, said hollow portion being separated from said storage compartment.

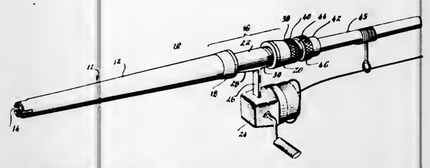
4,050,178
FISHING ROD HOLDER
Hugh T. Bryan, 1312 Third Ave., Albany, Ga. 31707
Filed Apr. 28, 1976, Ser. No. 681,015
Int. Cl.[2] A01K *97/10*
U.S. Cl. 43—212 **1 Claim**

1. A fishing rod holder for supporting a fishing rod in a cantilevered position from the gunwale of a boat with a minimum amount of protrusions extending from the gunwale, comprising a mounting plate, means for connecting said mounting plate in a generally vertical position on the gunwale, a generally U-shaped bail having outwardly extending opposite ends pivotally mounted to said mounting plate along a horizontal axis, said bail being normally urged by gravity into a vertical non-use position flush with said mounting plate and being selectively movable in a vertical arc to a use position to overlie the handle end of a fishing rod, cradle means mounted generally perpendicular to said mounting plate in a substantially horizontal plane along the upper surface of the gunwale with the uppermost portions of said cradle extending upwardly from the upper surface of the gunwale a distance of generally



one-half inch or less, said cradle means having a central generally U-shaped portion for receiving a portion adjacent said handle of said fishing rod in spaced relationship to said bail, whereby a fishing rod can be selectively supported by said bail and said cradle and said bail being movable by gravity to said non-use position when the rod is removed from engagement therewith.

4,050,179
ROD BUTT WITH INTEGRAL REEL SEAT
Frank W. Johnson, 2411 NE. 31st Ct., Lighthouse Point, Fla. 33064
Filed Mar. 31, 1976, Ser. No. 672,233
Int. Cl.[2] A01K *87/06*
U.S. Cl. 43—22 **8 Claims**

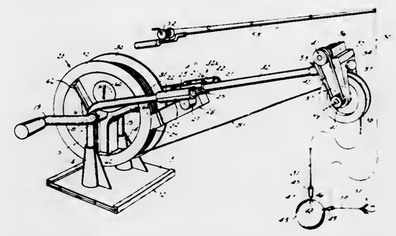


1. A fishing rod assembly including a rod butt and a reel seat and adapted to be fitted interchangeably to a rod tip, comprising a locating means adapted to locate a rod tip ferrule, said rod tip ferrule including means adapted to interact with said locating means for locating said rod tip ferrule with respect to said reel seat, mounting means for mounting said ferrule to said reel seat, and resilient water-tight sealing means interpositioned between said ferrule and said mounting means for sealing the mating surfaces between said ferrule and said reel seat, said rod butt, reel seat and ferrule all constructed of the same alloy.

4,050,180
DOWNRIGGER REEL AND TEMPERATURE INDICATOR
Jack C. King, 678 Massachusetts Ave., North Muskegon, Mich. 49445
Filed Aug. 10, 1976, Ser. No. 713,116
Int. Cl.[2] A01K *89/00*
U.S. Cl. 43—27.4 **9 Claims**

1. A downrigger structure for spoke wheeled downriggers comprising:
a downrigger reel having spokes and flanges;
a segment shaped two-piece case with flanges thereon; said case flanges engageable with the spokes and flange of said downrigger reel and said case nesting between adjacent spokes;
an electronic circuit in said case;

a battery inside said case and operably connected to said circuit;
a selectively operable switch in said case selectively permitting flow of power to said circuit;
a cable encased in an outer resin sheath and including plural unsheathed load bearing strands and one highly conductive copper strand which is resin coated, said cable operably connected at one end to said circuit;



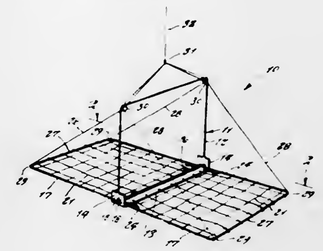
a thermal sensing element operably connected at the other end of said cable; and
a calibrated gage connected to said circuit whereby conductometric variances proportional to thermal variances in said sensor give a proportional read-out of thermal conditions at said sensor.

4,050,181
ARTIFICIAL FISHING WORM
Walter M. Young, 27 Anderson St., Piedmont, S.C. 29673, and Robert S. Young, Rte. 1, Pelzer, S.C. 29669
Filed Mar. 25, 1976, Ser. No. 670,264
Int. Cl.[2] A01K *85/01*
U.S. Cl. 43—42.06 **1 Claim**



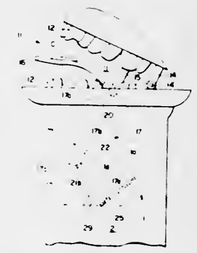
1. An artificial fishing lure comprising,
an elongated body member having a substantially circular cross section adjacent a front portion, said cross section adjacent said front portion being larger than the cross section adjacent the tail portion with there being a substantial taper from adjacent said front portion to said tail portion,
an enlarged portion adjacent the central portion of said elongated member,
an elongated slot extending through said enlarged portion with the surfaces adjacent the ends of said slot being smooth and rounded
a tablet which generates a gas when contacted by water carried in said elongated slot, and said slot being substantially rectangular with the width being less than the diameter of said tablet so that said tablet extends out beyond the sides of said lure for being exposed to water when said lure is drawn through said water,
said lure being molded of a flexible material so that the surfaces on opposite sides of said slot are stretched securely holding said tablet therebetween even as said tablet dissolves.

4,050,182
BOOK NET FOR CRABS, LOBSTERS, AND THE LIKE
Jerry Basile, 1840 67th St., 2nd Floor, Brooklyn, N.Y. 11204
Filed Jan. 24, 1977, Ser. No. 762,039
Int. Cl.[2] A01K *69/10*
U.S. Cl. 43—105 **1 Claim**



1. A book-net for catching crabs, lobsters and the like, comprising in combination, a central frame and a pair of pivotable frames, one of which is positioned adjacent each side of said central frame and both said pivotable frames being pivotable about one end of said central frame so to be provided between said position adjacent said central frame and a spread apart position 90 degrees away therefrom so that said pivotable frames are both on a common plane at right angles to said central frame, all said frames being made of a stiff material, said pivotable frames each having a loosely fitted rope net; spring means normally maintaining said pivotable frames in said spread apart position; a pair of nylon lines each having their opposite ends attached to opposite corners of a free end of each said pivotable frame and an intermediate portion of said nylon line extending through a loop at each corner of a free end of said central frame, while a center of each said nylon lines are attached to one end of a tethering line which at its other end can be held by a fisherman; said central frame being comprised of a U-shaped wire having said loops at its corners, and a U-shaped flat strip wherein bent over opposite flat ends are affixed to the opposite ends of said wire, said flat ends having bearings openings receiving opposite ends of said pivotable frames, and said flat ends also supporting a wire rod between said frames having bent up loops to which bait is attachable.

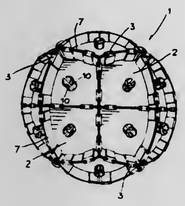
4,050,183
COIN TOY
Ietatsu Watanabe, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Dec. 29, 1975, Ser. No. 644,441
Claims priority, application Japan, Jan. 25, 1975, 50-10835
Int. Cl.[2] A63H *33/00*
U.S. Cl. 46—4 **5 Claims**



1. A coin toy, comprising:

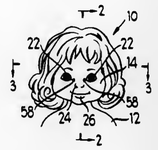
means for throwing said coin in a predetermined direction;
means for receiving said thrown coin;
said throwing means including:
a machine frame attached to said receiving means;
a coin-throwing actuation plate rotatably mounted in a vertical position in said machine frame;
a coin-holding lever attached to the upper portion of said coin-throwing actuation plate, for holding said coin to be thrown;
a suction cup mounted on said coin-holding lever;
an attracting plate fixedly disposed on said machine frame providing a smooth face below said lever in position to receive said suction cup;
first spring means attached to said machine frame and said actuation plate to provide a force pulling said actuation plate away from said attracting plate for movement in an upward direction when said suction cup is received and held against said attracting plate by suction forces;
said receiving means having a first portion fixedly attached to said machine frame, a second portion pivotally hinged to said first portion for rotation thereabout and means responsive to upward movement of said actuation plate for pivoting said second portion into an open position and subsequently pivoting said second portion into a closed position with respect to said first portion;
wherein said coin is placed on said coin-holding lever, said coin-holding lever is manually depressed, said suction cup held against said attracting plate by said suction forces and said receiving means is in a closed position, unitl said first spring means overcomes said suction forces of said suction cup against said attracting plate, causing said coin-throwing actuation plate and said coin-holding lever to rapidly rotate in an upward direction, throwing said coin in said predetermined direction and said second portion of said receiving means pivoting open, receiving said coin and closing.

4,050,184
MULTI-COMPONENT, SPHERICAL, ASSEMBLABLE TOY
Gervasio Chiari, via Antonelli 7, Cologne (BS), Italy
Filed Apr. 12, 1976, Ser. No. 676,286
Claims priority, application Italy, Jan. 28, 1976, 5118/76
Int. Cl.² A63H *33/06*
U.S. Cl. 46—17 8 Claims



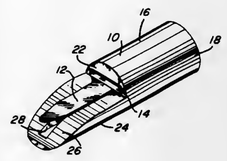
1. An assemblable, multi-component, spherical toy comprising a supporting inner structure consisting of a plurality of quadrilateral elements and a plurality of couplers connecting said elements to one another, and a plurality of quadrilateral cover plates connectable removably onto said elements of said supporting structure, said quadrilateral elements comprising a convex plate having two first adjoining sides equal to each other and two second adjoining sides equal to each other, an edge upwardly extending all around said plate, and a plurality of V-shaped notches in said edge.

4,050,185
FACIAL LIQUID EXCRETING DOLL
Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Jan. 26, 1976, Ser. No. 652,414
Int. Cl.² A63H *3/48*
U.S. Cl. 46—135 A 21 Claims



1. A tearing eye doll comprising:
a torso;
a unitarily molded head portion, said head including a flexible shell with a face on the front side thereof;
a unitarily molded interior wall spanning a portion of said shell and forming a liquid reservoir generally behind the face of the doll head;
deforming means secured to said torso for movably mounting the head thereon, said deforming means having a portion thereof extending into engagement with the interior wall for deforming said interior wall in response to movement of the head relative to the torso to reduce the volume of the reservoir;
inlet means formed in said head, in communication with said liquid reservoir, for introducing fluid into the reservoir; and
a plurality of apertures through said flexible shell generally in the facial area of the doll for the passage therethrough of liquid from the reservoir to simulate tearing.

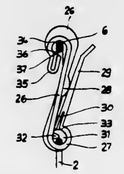
4,050,186
SOUND PRODUCER
Otto C. Shults, 2107 Manchester Circle, and Major L. Boddicker, 3836 S. Taft Road, both of Fort Collins, Colo. 80521
Filed Aug. 2, 1976, Ser. No. 710,608
Int. Cl.² A63H *5/00*
U.S. Cl. 46—180 9 Claims



1. A wildlife call comprising:
an elongated body of a size and shape to be grasped and held by the human hand;
one portion of said body constituting a barrel open at one end for the outlet of sound and including a bore extending from said one end to a transverse wall terminating said bore with said bore having a predetermined cross-sectional area;
another portion of said body projecting from said wall away from said barrel and constituting a mouthpiece having a working surface exposed for insertion between the lips of the user and of widthwise flat configuration but curving outwardly in a direction away from said wall;
a groove running lengthwise centrally of said mouthpiece and opening into said bore, said predetermined cross-sectional area of said bore being of the order of eleven times the maximum cross-sectional area of said groove;
and an elongated and planar reed, of laterally vibrant material, secured at one end in said wall in a position to overlie and substantially cover said groove when pressed thereupon by the lips of the user encircling said reed and said mouthpiece

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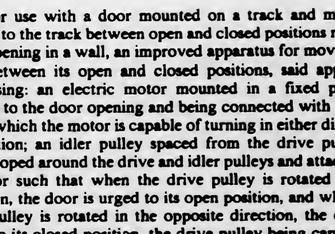
4,050,187
WIRE SUPPORT SYSTEM FOR TRAINING HOP VINES
Albert Geiger, Garmisch-Partenkirchen, and Peter Bruckmann, Grainau, both of Germany, assignors to Geiger Plastic KG, Garmisch-Partenkirchen, Germany
Filed Oct. 17, 1975, Ser. No. 623,453
Claims priority, application Germany, Oct. 22, 1974, 2450062
Int. Cl.² A01G *17/06*
U.S. Cl. 47—45 10 Claims



1. A trellis system for training hop vines comprising:
generally horizontal main wires and, connected therewith, generally vertical riser strands; each riser strand being a monofilament of plastic material having a pre-formed loop at its upper end,
a hook for each riser strand; said hook comprising narrow partially open eyes formed at opposite ends of said hook, and the said loop of the riser strands being adapted to be hooked into the lowermost eye of said hook, said hook being adapted to receive the generally horizontal main wires in its upper eye to connect said riser strands to said generally horizontal main wires,
the riser strand material being a smooth-surface synthetic degradable plastic material strong enough to support the plants during their normal growing season and subject to a loss of strength due to aging during said season between the time of installation of said riser strands and the harvesting of said hop vines such that said riser strands can be easily torn down at the harvest time; the material of the hooks being such that they will perform satisfactorily during several successive seasons.

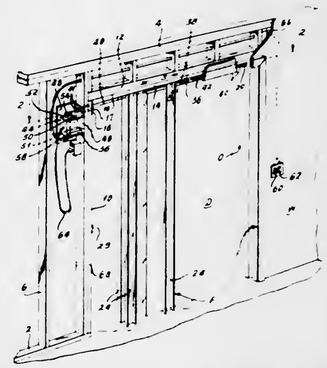
4,050,188
SEEDLING GROWING CONTAINER
Aart van Wingerden, R.R. 2, Fletcher, N.C. 28732
Filed Mar. 1, 1976, Ser. No. 662,369
Int. Cl.² A01G *9/02*
U.S. Cl. 47—85 7 Claims

1. A seedling tray for separating and subsequently removing plants and their respective entire root system comprising:
an open bottom tray having sidewalls and endwalls;
a number of spaced interior walls mounted within said tray; insert strip support means;
a removable insert strip adapted to be carried between adjacent interior walls by said support means;
said removable insert strip having spaced aligned sides mounted on an elongated bottom strip to define a series of compartments for containing said plants;
each of said compartments having a pair of opposed open sides between said aligned sides making each compartment accessible from a pair of opposed open sides to facilitate plant removal therefrom without shock; and



a channel open on one side formed in the bottom of each compartment to facilitate drainage therefrom.

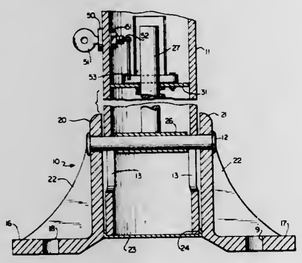
4,050,189
DEVICE FOR OPERATING A POCKET DOOR
Francis C. Peterson, St. Louis County, Mo., assignor to C. Hager & Sons Hinge Manufacturing Company, St. Louis, Mo.
Continuation-in-part of Ser. No. 473,003, May 24, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,133
Int. Cl.² E05F *15/14*
U.S. Cl. 49—26 14 Claims



1. For use with a door mounted on a track and movable parallel to the track between open and closed positions relative to an opening in a wall, an improved apparatus for moving the door between its open and closed positions, said apparatus comprising: an electric motor mounted in a fixed position relative to the door opening and being connected with a drive pulley which the motor is capable of turning in either direction of rotation; an idler pulley spaced from the drive pulley; a cable looped around the drive and idler pulleys and attached to the door such that when the drive pulley is rotated in one direction, the door is urged to its open position, and when the drive pulley is rotated in the opposite direction, the door is urged to its closed position, the drive pulley being capable of slipping relative to the cable; and timing means which when actuated causes the motor to undergo a single door operating cycle wherein the motor first rotates the drive pulley for a predetermined span of time in the direction which urges the door to its open position and thereafter rotates the drive pulley for a predetermined span of time in the opposite direction which urges the door to its closed position, said predetermined spans of time being sufficient in duration to under normal circumstances completely move the door from one position to the other, said predetermined times being constant and completely independent of the door position, whereby the time the

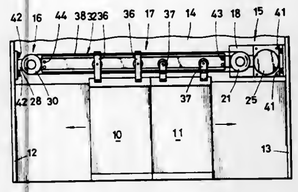
motor rotates the drive pulley in one direction and then in the other will be the same irrespective of the position of the door.

4,050,190
LOCKABLE OBSTRUCTION POST
Peter A. Mazzone, 395 Grove St., Apartment 1440, Reno, Nev. 89502
Filed Apr. 26, 1976, Ser. No. 680,143
Int. Cl.² E01F *13/00*
U.S. Cl. 49—35 **3 Claims**



1. An obstruction post mountable on a support surface to selectively prevent or permit access to an area adjacent the post comprising the combination of
a base member having a generally horizontal portion mountable on the support surface, upstanding, spaced apart walls, and a generally cup-shaped socket;
a pin passing through said walls and defining a pivot axis;
an elongated locking rod;
a sleeve attached to one end of said locking rod and rotatably surrounding said pin for coupling said rod to said pin to permit said rod to be pivoted about said pivot axis;
a tube surrounding said rod;
means in said tube defining transversely aligned openings for receiving said pin, said openings being elongated longitudinally relative to said tube to permit limited axial movement of said tube relative to said pin between a first position in which the axis of said tube is substantially vertical and the lower end of said tube engages said socket, and a second position in which the lower end of said tube is disengaged from said socket so that said tube is pivotable around said pivot axis to a substantially horizontal position;
first spring means for urging said tube axially toward said second position;
latch means within said tube and engageable with said rod for latching said tube in said first position,
said latch means comprising
a mounting plate fixedly attached to and movable with said tube and extending transversely across the interior of said tube, said plate having a central opening to slideably receive said rod,
a latch member pivotally mounted on said plate for motion in a plane perpendicular to the axis of said rod, and
second spring means for urging said latch member toward said rod,
said rod having a recess to receive said latch member when said tube is moved to said first position; and
means for manually releasing said latch means including
a key-operated lock mounted in said tube, said lock having a portion within said tube which is rotatable from a locked position to an unlocked position by a key inserted into said lock from outside said tube; and
link means connected between said rotatable portion and said latch member for moving said latch member out of said recess when said portion is rotated.

4,050,191
KNOCKDOWN APPARATUS FOR SUPPORTING AND DRIVING OVERHUNG DOORS
Akira Azuma, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan
Filed Oct. 20, 1975, Ser. No. 624,228
Claims priority, application Japan, Oct. 21, 1974, 49-127200[U]
Int. Cl.² E05F *15/14*
U.S. Cl. 49—360 **3 Claims**

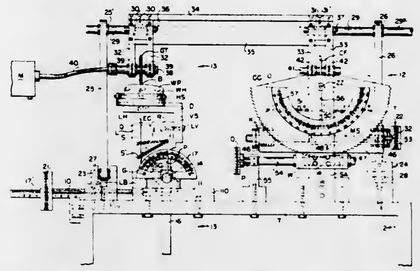


1. A door support apparatus for installation between a pair of side jambs of a doorframe to support and drive a suspended door, said apparatus comprising, in combination:
a. a drive assembly comprising,
1. a first bracket adapted to be removably fastened to one of said side jambs;
2. a drive wheel rotatably mounted on said first bracket; and
3. a drive mechanism mounted on said first bracket and drivably connected to impart rotation to said drive wheel;
b. a driven assembly comprising,
1. a second bracket adapted to be removably fastened to the other of said side jambs; and
2. an idler wheel rotatably mounted on said second bracket;
c. An endless flexible member interconnecting said wheels; and
d. a track assembly comprising,
1. a rail removably fastened at both ends to and supported by said first and second brackets to provide an overhead track for the door; and
2. at least a pair of door hangers in rolling engagement with said rail and adapted to suspend the door therefrom, said door hangers being attached to said endless, flexible member for moving the door along said track.

4,050,192
APPARATUS FOR FARMING OPHTHALMIC LENS FOR PRESBYOPIA AND APHAKIA
David Volk, 2460 Fairmount Blvd., Cleveland, Ohio 44106
Division of Ser. No. 535,519, Dec. 23, 1974, Pat. No. 4,002,439, which is a division of Ser. No. 322,488, Jan. 10, 1973, abandoned. This application May 27, 1976, Ser. No. 690,615
Int. Cl.² B24B *13/04*
U.S. Cl. 51—33 R **11 Claims**

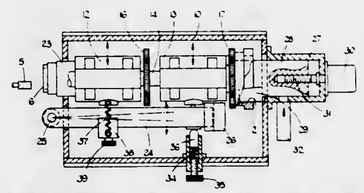
1. Apparatus for forming a convex front surface portion of variable curvature for use in the formation of spectacle lenses for correction of presbyopia and aphakia which surface is characterized by having a pair of orthogonal principal planes which intersect said front surface normally at all points, the first of said principal planes, generally horizontal, intersecting said front surface in a great arc, and the second of said principal planes, generally vertical, intersecting said front surface in a principal curve; comprising a base, a work-manipulating frame having a mounting on said base, a workpiece holder on said frame, a rotatable circular edged substantially planar abrading tool supported on mounting means above said frame with its axis parallel to said second plane and in position to cut a workpiece in said holder, means for rotating said tool, means on said frame for moving said workpiece holder incrementally

through the plane of said tool edge, cam means operatively associated with said moving means following the evolute of said principal curve, means mounting a conic-producing pattern on said base with a control point of said pattern at the level of the lower edge of said tool when said tool axis lies in said second plane, an oscillating frame pivotally mounted on said base on an axis parallel to said second plane, said mounting means for said tool being rigid with said oscillating frame, a cam follower circular in section rotatably mounted on a fixed



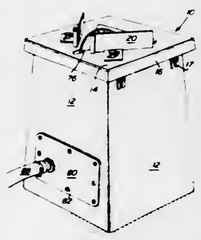
axis on said oscillating frame coaxial with said abrading tool, said follower being of the same diameter as said tool, said cam follower having its circular edge always in contact with said conic-producting pattern, said mounting means for said conic-producing pattern including means for moving said pattern to vary the eccentricity of said conic pattern projected on said first plane, and said mounting for said oscillating frame permitting oscillation of said tool edge completely across a workpiece in said holder.

4,050,193
GRINDING HEAD FOR MACHINING CONSTANT INTERNAL PROFILES
Jean Claude Bonin, Blois, France, assignor to Roto Diesel, Blois, France
Filed Jan. 7, 1976, Ser. No. 647,044
Claims priority, application France, Jan. 10, 1975, 75.00672
Int. Cl.² B24B *17/02*
U.S. Cl. 51—101 R **10 Claims**



1. An attachment for a grinding machine having a movable work table and a rotary grinding wheel rotatable about a first axis the attachment comprising a support frame for mounting on said table, first means carried by the support frame for holding a component upon an internal peripheral surface of which a profile is to be machined, said first means rotating said component about a second axis parallel to the axis of rotation of said grinding wheel, second means carried by the support frame for holding a master having an internal profile corresponding to the desired profile of the component, said second means rotating said master about an axis coincident with said second axis, a detector roll engageable with the internal profile of said master, said detector roll being of varying diameter throughout its axial length, mounting means for said detector roll, said mounting means being arranged to permit rotation of said roll about a third axis inclined relative to the second axis by an amount such that the line of contact between the roll and said internal profile extends paralled to said second axis, connecting means for transmitting movement between said first and second means whereby homothetic motion will be imparted to said first means as a result of movement of said second means by the interaction of the roll and the internal profile of the master, said mounting means being adjustable so that when the diameter of said grinding wheel is changed as a result of dressing or changing the wheel the homothetic relationship of the motion of the grinding wheel and the detector roll is maintained.

4,050,194
MULTI-ANGLE SANDER
Jessie A. Rice, 8427 Jamestown Drive, Austin, Tex. 78758
Filed Jan. 5, 1976, Ser. No. 646,590
Int. Cl.² B24B *7/16*
U.S. Cl. 51—128 **5 Claims**

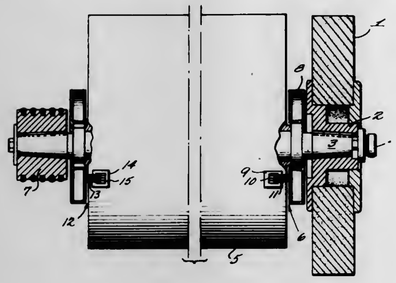


1. A multi-angle sander device comprising; a support structure, a removable top member on said support structure having a longitudinal aperture therein, a rotatably drive mounted within said support structure, sander means mounted on said rotatable drive and passing through said aperture for sanding angles on workpieces and running cool and not burning, and adjustable guide means mounted on the top member for guiding workpieces being sanded at the proper angle to the sanding means, the adjustable guide means includes at least one rectangular guide plate member pivotally mounted perpendicular to the surface of the top member and having a slotted adjusting flange integral therewith, and the adjustable guide means includes two of the pivotally mounted rectangular guide plate members and further includes an enlarged head locking screw guidingly mounted in the slot of the flanged member of each of the rectangular guide plate members and engaging with a screw-threaded member fastened in the removable top member for the purpose of positively locking the rectangular guide plate members once they are adjusted, and additional flat triangular shaped guide plates which complement the pivotally mounted rectangular guide plate members, said flat triangular shaped guide plates having adjusting apertures therein and being adjustably locked to the top member by enlarged head locking screws.

4,050,195
APPARATUS FOR COMPENSATING FOR UNBALANCE OF A ROTARY BODY
Dionys Hofmann, Darmstadt-Marienhohe, Germany, assignor to Gebr. Hofmann KG, Maschinenfabrik, Darmstadt, Germany
Filed Aug. 6, 1976, Ser. No. 712,359
Claims priority, application Germany, Aug. 30, 1975, 7527462[U]
Int. Cl.² B25B *41/04*
U.S. Cl. 51—169 **3 Claims**

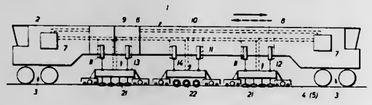
1. In an apparatus for mounting a grinding wheel of the type having a spindle, means for rotating said spindle, means for mounting a grinding wheel on one end of said spindle and balancing means comprising an annular housing having a plurality of radially divided chambers, each chamber communi-

cating with a respective inlet at a different radial distance and means for injecting a balancing liquid into said body as a function of unbalance, the improvement comprising means for



mounting said housing on said spindle for rotation therewith with said wheel being mounted between said housing and said end.

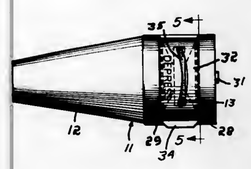
4,050,196
RAIL GRINDING MACHINE
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industrie-gesellschaft m.b.H., Vienna, Austria
Filed Oct. 22, 1976, Ser. No. 735,016
Claims priority, application Austria, Dec. 1, 1975, 9132/75
Int. Cl.[2] B24B *23/00*
U.S. Cl. 51—178 **16 Claims**



1. A mobile rail grinding machine for grinding the running surface and inside of the railhead of track rails, each track rail having a vertical plane of symmetry and respective halves of the running surface on each side of the plane of symmetry, comprising

1. a forward and a rear grinding module spacedly arranged in an operating direction, each of the grinding modules including
   a. a carrier associated with each running surface half of each of the track rails,
   b. power-driven means for moving the carriers,
   c. two rotatable grinding wheels on each carrier associated with respective ones of the running surface halves, the grinding wheels being spaced in the operating direction and each of the wheels having a circumferential grinding surface arranged for grinding the associated running surface half of the railhead of the associated track rail, and
   d. track rail engaging elements guiding each grinding module along the track rails;
2. an intermediate grinding module arranged between the forward and rear grinding modules, the intermediate grinding module including
   a. a carrier associated with each of the track rails,
   b. at least one grinding wheel on each carrier associated with the inside of the railhead of the associated track rail for grinding the associated inside, and
   c. power-driven means for moving the grinding wheels of the intermediate grinding module parallel with respect to the track;
3. shaping tools on the carriers for profiling the grinding surfaces of the grinding wheels; and
4. means for centering the forward and rear grinding modules with respect to the track rails and for pressing the track rail engaging elements without play against the track rails they engage.

4,050,197
BLADE AND SCISSORS SHARPENER
Willis F. Thompson, deceased, late of Portland, Maine, by Nelson L. Thompson, administrator, 8347 Wagon Wheel Road, Alexandria, Va. 22309
Continuation of Ser. No. 437,319, Jan. 28, 1974, abandoned. This application Aug. 14, 1975, Ser. No. 604,788
Int. Cl.[2] B24B *3/52, 3/54*
U.S. Cl. 51—208 **9 Claims**

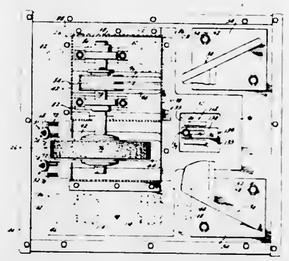


1. A blade sharpener comprising a holder including a pair of end wall members, a unit dimensioned to be a free but close fit between said walls and including an abrasive wheel the periphery of which is flat transversely considered, and a pair of blade supporting members, one at each side of said wheel and engageable by the side of a blade and downwardly inclined towards the wheel to enable one side of a blade to be seated thereon with the beveled edge of the other side of the thus held blade to be held in contact with the proximate side of the wheel, and axial supporting means between said end wall members and means for mounting said unit on said axial supporting means with a loose fit with respect thereto whereby said unit rotates as the thus held blade is reciprocted and is also free to wobble to a limited extent said blade supports of a diameter greater than that of the wheel and close to but below the upper edge of said wall members with the upper edges of said wall members each substantially in the plane inclusive of the thus positioned blade.

4,050,198
METHOD FOR SHAPING THE EDGE OF A BLADE ELEMENT
Louis S. Hales; Don R. Hamilton; Harry F. Weller, and Donald E. Burgbacher, all of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio
Division of Ser. No. 564,066, April 1, 1975, Pat. No. 4,001,978. This application June 2, 1976, Ser. No. 692,124
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—281 R **6 Claims**

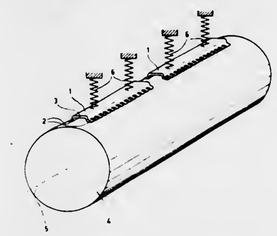
1. A method of shaping an edge of a blade having a leading edge and a trailng edge to a predetermined profile including:
   presenting successive portions of one of said edges for engagement with an abrasive element by translating said blade relative to said abrasive element;
   supporting and locating said blade such that said successive portions are presented to said abrasive element at a predetermined location;
   guiding said blade by engaging said blade with a cam surface configured to represent the loci of a portion of said blade such that said successive portions of said one of said edges are presented to said abrasive element at a predetermined angle at said predetermined location; and

represent at least one of said loci which does not occupy the same point in space as other of said loci as successive portions



of said blade are presented for engagement with said abrasive element at said predetermined angle.

4,050,199
METHOD OF GRINDING A TOOTHED CUTTER FOR HAIR-CUTTING APPARATUS
Otto Meier, Klagenfurt, Austria, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 23, 1976, Ser. No. 679,804
Claims priority, application Austria, Apr. 28, 1975, 3279/75
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—285 **3 Claims**



1. A method of grinding a toothed cutter for hair-cutting apparatus such as dry-shaving apparatus, said toothed cutter having a pair of longitudinally extending strip-shaped rows of cutting teeth, which comprises simultaneously pressing both entire rows of cutting teeth of the toothed cutter into engagement with the circumferential surface of a rotating grinding shaft, the diameter of said grinding shaft being great relative to the length of the individual teeth being ground, while longitudinally orienting said rows of cutting teeth parallel to the axis of the grinding shaft.

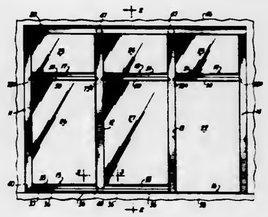
4,050,200
REMOVABLE HATCH STRUCTURE FOR AUTOMOBILES
Edward G. Beck, Jr., Fort Thomas, Ky., assignor to The Stolle Corporation, Sidney, Ohio
Filed Dec. 27, 1976, Ser. No. 754,102
Int. Cl.[2] E04B *7/18*; E04C *2/00*
U.S. Cl. 52—19 **4 Claims**

1. An assembly of a rigid sheet and rigid linear member, said linear member being in the form of a channel having a plurality of holes through one leg only thereof, said rigid sheet having a like number of holes aligned with the holes in said channel, a gasket member of compressible material in said channel extending between said channel walls and both sides and the edge of said sheet seated in said channel, and having openings aligned with said holes, and expandable shank rivets extending



into said aligned holes and lockingly securing said sheet in said channel.

4,050,201
WALL CONSTRUCTION HAVING A CONTINUOUS SILL WITH GUTTER MEANS
S. Eugene Hubbard, Niles, Mich., and Lawrence F. Biebuyck, Mesquite, Tex., assignors to Kawneer Company, Inc., Niles, Mich.
Continuation of Ser. No. 197,738, Nov. 11, 1971, abandoned, which is a division of Ser. No. 41,951, June 1, 1970, abandoned. This application Oct. 15, 1973, Ser. No. 406,212
Int. Cl.[2] E06B *7/14*
U.S. Cl. 52—97 **5 Claims**



1. A base assembly for a wall construction having a vertical mullion with at least one glazing pocket in its side face, said base assembly comprising:
   continuous sill means extending along the base of said wall construction and having upstanding leg portions onto which said vertical mullion rests and including portions defining spaced clip positioning shoulders,
   a gutter means snapped on said sill means, said gutter means having one end butt fitted against said side face of said vertical mullion, and
   a clip means resting on said sill means and engaged with said vertical mullion between said clip positioning shoulders, said clip means having upstanding leg portions abutting against the side wall of said glazing pocket of said vertical mullion.

4,050,202

METHOD AND ARRANGEMENT FOR ANCHORING AN OBJECT TO A SUPPORT STRUCTURE

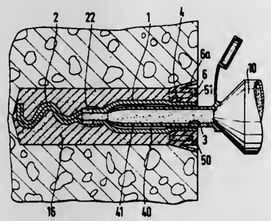
Artur Fischer, and Klaus Fischer, both of Tumlingen, Germany, assignors to Artur Fischer, Tumlingen, Waldachtal, Germany

Continuation-in-part of Ser. No. 631,153, Nov. 11, 1975. This application Sept. 17, 1976, Ser. No. 725,138

Claims priority, application Germany, Nov. 14, 1974, 2453957; May 26, 1975, 2523198; June 6, 1975, 2525220; June 7, 1975, 2525452; June 14, 1975, 2526744; June 21, 1975, 2527773; Sept. 19, 1975, 2541762

Int. Cl.² E04B *1/41*

U.S. Cl. 52—127 10 Claims



1. An arrangement for securing an object to a support structure having an anchoring hole, comprising an anchoring element having one part of transverse dimensions smaller than, and another part of transverse dimensions substantially corresponding to those of the anchoring hole, said anchoring element being insertable into the anchoring hole through an open end thereof so that said other part supports said anchoring element at the open end of the anchoring hole with clearance between the latter and said one part and closes the open end of said clearance upon insertion; means for introducing a body of hardenable material into said clearance for hardening therein about said one part of said anchoring element to thereby anchor the latter in the anchoring hole; and means for monitoring the degree of filling of said clearance by the hardenable material, including at least a translucent portion of said other part of said anchoring element through which said clearance and said body can be observed.

4,050,203

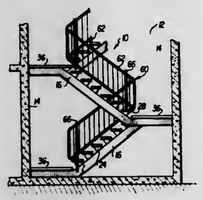
STAIRS AND RAILING SYSTEM FOR MULTI-FLOORED BUILDINGS AND METHOD OF CONSTRUCTING SAME

Thomas Souza, Jr., P.O. Box 579, 145 Hekili St., Kailua, Hawaii 96734

Division of Ser. No. 646,762, Jan. 6, 1976, Pat. No. 3,994,113. This application July 1, 1976, Ser. No. 701,631

Int. Cl.² E04F *11/00, 11/18*

U.S. Cl. 52—185 10 Claims



1. A stairs for multi-floored buildings having a walled stairwell, said stairs comprising:

1. a first set of parallel, spaced apart stringers having platform mounting means integrally formed with and extending a distance from each end thereof;
2. a second set of parallel, spaced apart stringers also having platform mounting means integrally formed with and extending a distance from each end thereof, said second set of stringers being positioned adjacent said first set and extending opposite thereto, said first and second set of stringers each having spaced apart tread mounting means secured to said stringers intermediate said platform mounting means;
3. a platform member having four sets of spaced apart threaded inserts formed integrally therewith, said platform being secured to said platform mounting means on said first set of stringers by bolts extending through said platform mounting means and tightened into two of said four set of inserts and said platform being secured to said platform mounting means on said second set of stringers by bolts extending through said platform mounting means and tightened into the remaining two of said four platform mounting means and tightened into the remaining two of said four sets of inserts; and
4. a plurality of tread members having at least two spaced apart threaded inserts formed integrally therewith, said tread members being secured to said tread mounting means by bolts extending through said tread mounting means and tightened into said inserts.

4,050,204

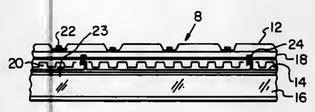
CONTROLLED DESTRUCTIVE PANEL ASSEMBLY

Harley D. Scott, Wexford, Pa., assignor to Cyclops Corporation, Pittsburgh, Pa.

Filed Apr. 30, 1976, Ser. No. 681,820

Int. Cl.² E04B *1/00*

U.S. Cl. 52—262 10 Claims



1. A wall panel construction comprising:

A. a plurality of spaced, horizontal structural girts secured to vertical, structural columns;

B. liner panels extending between each three girts with vertically adjacent panels terminating at end girts of the three in slightly spaced relationship;

C. a plurality of spaced, horizontal subgirts secured to the liner panels with certain of the subgirts positioned on either side of the end girts;

D. exterior panels extending between each of said three girts and connected to the subgirts with vertically adjacent panels overlapping in unattached relationship;

E. a clip having angular flanges and secured to said end girts between the adjacent spaced liner panels, the flanges of said clip pinching the adjacent liner panels against the end girts;

F. means to attach the liner panels to a middle girt of the three girts;

whereby an external force of predetermined magnitude against the wall panel construction causes the adjacent liner panels to deform about the middle girt as the liner panels pivot about and release from the clip flanges while simultaneously the overlapping, exterior panels pivot and release at their overlapping ends.

4,050,205

PROTECTIVE SHIELD FOR UTILITY OPENING IN A BUILDING FRAMING MEMBER

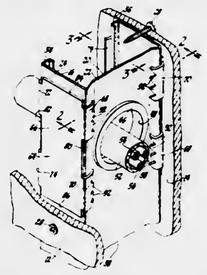
John P. Ligda, 53767 Kristin Court, Utica, Mich. 48087

Continuation of Ser. No. 605,344, Aug. 18, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,963

Int. Cl.² E04C *3/16;* E02D *35/00*

U.S. Cl. 52—357 10 Claims

1. A protective shield adapted to overlie the wall panel supporting face of a building framing member and prevent a wall panel fastener of the self-drilling type from entering a utility service opening provided in the framing member, said protective shield comprising: a generally planar body portion having opposed side edges defining a width sufficient to overlie substantially the full width of the wall panel supporting face of the framing member and upper and lower edges defining a length sufficient to overlie substantially the full extent of the utility service opening, and fastening clips means integral with the body portion and projecting generally perpendicularly from the opposed side edges thereof, said fastening clips being adapted for outward camming action during forced installation



of the protective shield over the face of the framing member and adapted for resilient clamping engagement on the building framing member to attach the body portion in juxtaposed relation with the wall panel supporting face of the building framing member and in overlying alignment with the utility service opening, said body portion being of material and thickness effective to provide resistance to penetration by the self-drilling type fastener which is greater than the resistance to penetration of the wall panel supporting face of the framing member whereby the presence of the protective shield is sensed and insertion of the self-drilling fastener is terminated prior to entry of the self-drilling fastener into the utility service opening.

4,050,206

EXPANSION JOINTING MATERIAL FOR PLACING CONCRETE, MORTAR OR THE LIKE

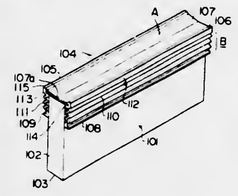
Akira Utsuyama, No. 2-22, Toyotama-Kita, Nerima, Tokyo, Japan

Filed Aug. 5, 1975, Ser. No. 601,984

Claims priority, application Japan, Nov. 26, 1974, 49-143555[U]

Int. Cl.² E01C *11/10*

U.S. Cl. 52—396 16 Claims



1. A joint forming and sealing assembly adapted to be laid in place on a surface prior to forming a slab of concrete or mortar, comprising: an elongated elastic compressible jointing member having substantially the shape of a board and having upper and lower edges and opposite sides; a plurality of support assemblies located at selected longitudinally spaced-apart positions along said jointing member, each support assembly comprising an upper portion of inverted substantially U-shape cross section and a pair of support legs extending downwardly from said upper portion and diverging with respect to each other, the lower ends of said support legs being adapted to rest on said surface and being adjustable toward and away from each other to adjust the height of said upper portion, the upper portion of said jointing member being snugly received within and substantially filling said upper portion of said support assembly and being compressed thereby, said support legs diverging away from the opposite sides of said jointing member in a direction toward the lower edge thereof; and an elongated cover member extending along the entire length of said jointing member and comprising a clamping section and an elastic reference section, said clamping section comprising a pair of downwardly extending legs snugly sleeved on the exterior of said upper portions of said support assemblies and extending downwardly therealong substantially to the positions at which said support legs begin to diverge, said legs of said clamping section also snugly contacting the opposite sides of said jointing member in the zones between the support assemblies, said reference section projecting upwardly from said clamping section and defining at its upper end a pair of longitudinally extending reference surfaces for use in smoothing the surface of the concrete or mortar, said support assemblies and said cover member having interengaging means for releasably coupling same together.

4,050,207

EXPANSION GAP SEALING DEVICE

Silvio Bertschmann, Meggen, Switzerland; Waldemar Koester, Forsbach, Germany, and Reinhold Huber, Rorbas, Switzerland, assignors to Firma Friedrich Maurer Soehne, Munich, Germany

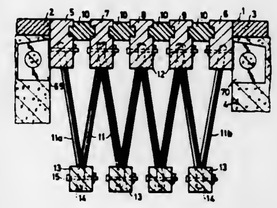
Continuation of Ser. No. 308,452, Nov. 21, 1972, Pat. No. 3,904,302. This application Jan. 24, 1975, Ser. No. 543,779

Claims priority, application Germany, Apr. 10, 1972, 2217151

The portion of the term of this patent subsequent to Sept. 9, 1992, has been disclaimed.

Int. Cl.² E04B *1/68*

U.S. Cl. 52—396 31 Claims



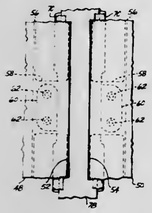
1. In an expansion gap sealing device for bridging an expansion gap between edges of structural members, wherein rigid gap strips and elastic strips are alternately arranged to extend in parallel to each other and longitudinally inside the gap, said rigid and elastic strips forming an expansion and sealing assembly which is connected along its outer sides to the edges of the gap, and which is carried by supporting structure means variable in its length across the gap and connected on both sides to the edges of the gap, the improvement wherein said supporting structure means comprises at least two supporting legs each having an upper end and a lower end, first means connecting said upper leg ends to said rigid gap strips so that the legs extend downwardly into the gap, and second holding means to which said lower legs are connected to form an elastically yielding supporting structure.

4,050,208

AIRCRAFT INTERIOR CEILING PANEL ASSEMBLY AND ATTACHMENT APPARATUS

Arturo Pompei, Rome, Italy, and Alden Bernard Winters, Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 4, 1976, Ser. No. 729,438
Int. Cl.[2] E04C 1/28; B64C 1/00
U.S. Cl. 52—460 8 Claims



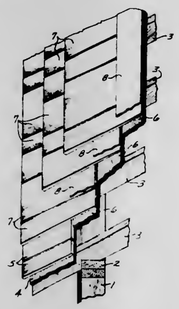
1. A ceiling panel assembly adapted to be attached to a supporting structure comprising:
- a plurality of ceiling panels having gaps therebetween and each panel having a plurality of edges;
- gap cover guides attached to the panels near the edges;
- gap covers extending between the guides on adjoining panels and urged into contact with the panels by the guides; and,
- attachment brackets mounted near the edges of the panels for attaching the panels to the supporting structure at points in between said panels and above said gap covers.

4,050,209

PREFABRICATED SHINGLE PANELS

Frank S. Barker, deceased, late of Pompano Beach, Fla. by Bayetta Barker, executrix; Willis G. Pehl, Chehalis, Wash., assignors to Shakertown Corporation, Winlock, Wash.

Continuation of Ser. No. 573,437, May 1, 1975, abandoned, which is a continuation of Ser. No. 48,255, June 22, 1970, abandoned. This application May 17, 1976, Ser. No. 687,344
Int. Cl.[2] E04D 1/20
U.S. Cl. 52—478 17 Claims



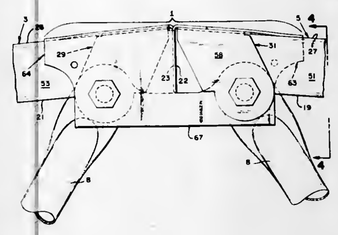
1. An assembly of prefabricated shingle panels in which each panel includes a backing board and a course of several wooden shingles, each shingle having a tip portion and a butt portion and being tapered in thickness away from said butt portion toward said tip portion, said shingles being arranged with their lengths extending transversely to the length of said backing board, with their tip portions overlying and secured to said backing board and with their butt portions overhanging one edge of said backing board in free cantilever fashion for a distance at least as great as the width of said backing board, each of said backing boards being of a horizontal lengths as great as the width of several shingles, the backing boards of adjacent upper and lower shingle courses being in edge-adjacent, substantially coplanar, nonoverlapping relationship, the overhanging shingle butt portions in each panel overlapping shingle tip portions and completely overlapping the width of the backing board of the panel in the next lower course, and a strip of flexible waterproof material of a length at least equal to the width of several shingles and having its length extending generally parallel to the length of a backing board, interposed between the overhanging butt portions of the shingles in one course and the tip portions of the shingles on the backing board of the next lower course, such strip being overlapped by such overhanging shingle butt portions.

4,050,210

RIDGE CONNECTOR FOR LIGHT COMPOSITE TRUSSES

Tyrell Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Feb. 22, 1977, Ser. No. 770,700
Int. Cl.[2] E04C 3/02, 5/18
U.S. Cl. 52—639 5 Claims



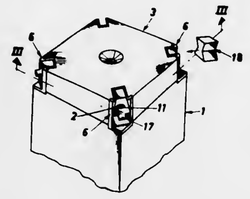
1. A ridge connector for light trusses having abutting wood top chords and metal webs having openings therein comprising:
- a. each of said chords is formed with a transverse semi-circular groove across its inside face adjacent its abutting end and slots joining said inner and outer faces at the approximate center lines of said chords,
- b. a pair of U-shaped grip-groove connectors formed with legs and mounted on said ends of said chords with one leg extending through said chord slot and one leg engaging the side of said chord and each grip-groove connector having an opening adjacent the end of each of said connector legs;
- c. a pair of U-shaped ridge connectors connecting the abutting ends of said chords and each including:
  1. an elongated base.
  2. a first leg formed with a pair of openings spaced from one another and adapted for insertion into said slots.
  3. a second leg formed with a pair of openings positioned in alignment with said openings in said first leg.
  4. said second leg has a first extension adapted for engaging the edge and a portion of the outer face of said chord, a second extension adapted for engaging the butt ends of said chords, and a third extension connected to said second extension adapted for engaging a portion of the outer face of one of said chords.
- d. a pair of pins inserted through the openings in said grip-groove connectors and said U-shaped ridge connectors and adapted for engaging said semi-circular grooves in said chords and said openings in said webs; and
- e. said U-shaped ridge connectors are mounted in side by side relation with said second extensions in alignment between the butt ends of said chords.

4,050,211

COUPLING DEVICE FOR JOINING TOGETHER REINFORCED CONCRETE ELEMENTS, SUCH AS CONCRETE PILES OR PILLARS

Lorentz Wahman, Viktoriagatan 32, Goteborg, Sweden (411 25)

Filed Dec. 3, 1975, Ser. No. 637,193
Claims priority, application Sweden, Dec. 12, 1974, 7415568; June 13, 1975, 7506781
Int. Cl.[2] E04C 3/30; E02D 35/00
U.S. Cl. 52—726 12 Claims



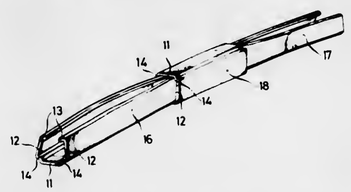
1. A coupling device for joining together reinforced concrete segments having axially protruding reinforcing rods extending therethrough comprising a plurality of pairs of separate first coupling means adapted to be secured to opposing faces of two concrete segments to be coupled together in register, each of said first coupling means being secured to the end of at least one axially protruding reinforcing rod, the number of first coupling means equaling the number of axially protruding reinforcing rods, and a plurality of second coupling means received in said first coupling means for axially and laterally coupling together said pairs of first coupling means and therewith said concrete segments.

4,050,212

PROFILE STEEL

Franz Gantke; Harald Walter, and Walter Zywietz, all of Dortmund, Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Germany

Filed Nov. 8, 1976, Ser. No. 739,641
Claims priority, application Germany, Nov. 11, 1975, 2550577
Int. Cl.[2] E04C 3/30
U.S. Cl. 52—726 2 Claims



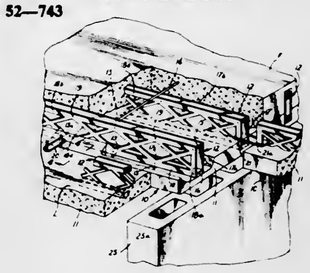
1. A structural frame member, especially for use in connection with the building of mine shafts and tunnels, which includes: two channel-shaped profile steel elements each of which comprises a bottom with lateral steps and lateral webs respectively forming extensions of said steps and being inclined toward each other while extending in a direction away from said bottom, the free ends of said webs forming flanges facing each other, each of said two profile steel elements having the lateral web portions at one end thereof bent together while the bent together web portions of one profile steel element are in alignment with and substantially abut the bent together web portions of the other profile steel element; and a third channel-shaped profile steel element corresponding in shape substantially to the shape of said first mentioned two channel-shaped profile steel elements but without bent together web portions, said third channel-shaped profile steel element in an upside down position with regard to said other two channel-shaped profile steel elements being common to and straddling said abutting and bent together web portions and holding them together, the inner surfaces of the flanges of said third channel-shaped profile steel element corresponding to the outer surfaces of said steps of said first mentioned two channel-shaped profile steel elements, and said flanges of said first mentioned two channel-shaped profile steel elements resting against the inner surface of the bottom of said third channel-shaped profile steel element, while the webs of said third channel-shaped profile steel element rest against the webs of said first mentioned two channel-shaped profile steel elements in the region of the steps thereof, and while the flanges of said third channel-shaped profile steel element rest against the outer surfaces of the steps of said first mentioned two channel-shaped profile steel elements.

4,050,213

METHOD OF ERECTING A MULTI-STORY BUILDING

Thomas J. Dillon, Akron, Ohio, assignor to Thomas J. Dillon & Co., Inc., Cleveland, Ohio

Continuation of Ser. No. 29,508, April 17, 1970, abandoned. This application Sept. 5, 1972, Ser. No. 286,443
Int. Cl.[2] E04B 1/35
U.S. Cl. 52—743 1 Claim



1. A method of erecting a multi-story building on a prepared foundation site, comprising the steps of
- A. erecting a plurality of pre-cast concrete wall panels in horizontally aligned, parallel relationship with each other, with each panel forming one wall of a room of said building and having at least one vertical void extending between the top and bottom surfaces thereof;
- B. spanning adjacent parallel wall panels with a series of partial thickness pre-cast concrete floor slabs of uniform thickness that have longitudinally extending reinforcing girder-like means provided therein, with at least a portion of said reinforcing means being embedded in said floor slabs projecting inwardly from the upper surface thereof and with opposed ends of said floor slabs resting on the top edges of said wall panels and being spaced from the ends of the slabs spanning the next adjacent pair of wall panels;
- C. transversely and longitudinally aligning the longitudinal ends of said floor slabs in non-covering relationship to said voids in said walls panels;
- D. securing by first securing means each said slab against lateral movement with respect to a laterally adjacent slab;
- E. securing by second securing means said longitudinally aligned floor slabs against longitudinal movement with respect to he longitudinally aligned slabs that are supported on said panels on the opposite side of said voids;
- F. pouring a substantially uniform thickness layer of concrete in situ onto the upper surface of said aligned slabs and into said voids so as to cover said slabs, said reinforc-

ing means and said positioned first and second securing means and simultaneously fill said voids with a column of site-poured concrete from top to bottom thereof and thereby effectuate concrete fusion between said wall panels and said floor slabs whereby a monolithic structure is formed; and

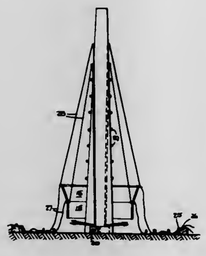
G. prestressing at least the portion of said reinforcing means that is embedded in said partial thickness floor slabs.

4,050,214

METHOD OF ERECTING A TOWER STRUCTURE

Roy W. P. Johnson, Greenwich, Conn., assignor to Tower Technology, Inc., Minneapolis, Minn.

Division of Ser. No. 541,587, Jan. 16, 1975, Pat. No. 3,994,108. This application July 22, 1976, Ser. No. 707,757
Int. Cl.² E04B 1/35; E04H 5/12, 12/00
U.S. Cl. 52—745 **4 Claims**



1. Method of erecting a structure comprising: positioning a series of sheave means at each of a plurality of levels on a vertical rigid member, positioning a first ring on the ground surrounding the base of said rigid member, raising said ring to a position above the ground by means of cable means reeved through one series of said sheave means, positioning a second ring below said first ring, inserting sealing means between adjacent circumferential ends of said rings to seal the same, raising said first and second rings by means of cables reeved through said one series of sheave means and a second lower series thereof, respectively, repeating said steps adding rings until said first ring reaches the desired height, and anchoring said cables.

4,050,215

PREMANUFACTURED MODULAR HOUSING BUILDING CONSTRUCTION

John Sergio Fisher, 2102 Euclid Ave., Syracuse, N.Y. 13224

Continuation of Ser. No. 243,750, April 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 36,175, May 11, 1970, abandoned. This application Apr. 8, 1974, Ser. No. 458,673
Int. Cl.² E04B 1/348
U.S. Cl. 52—79.3 **18 Claims**

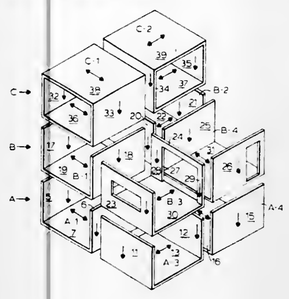
1. A modular building construction system including in combination:

a series of room-size rectangular first modules, each having in assembly only two vertical bearing planes parallel to each other, each said bearing plane having a plurality of vertical load-bearing structural members joined by a rectangular floor panel having a series of load-carrying spanning means running between said bearing planes, each said first module having said floor panel terminated at two sides at non-bearing planes, each said module being open on top, and

a series of room-size rectangular second modules, each having only two vertical bearing planes parallel to each other and provided with a plurality of vertical load-bearing structural members and joined by both a rectangular floor panel and a rectangular ceiling panel, both of which have a series of load-carrying spanning means running between their said bearing planes and both of which have two sides terminated at non-bearing planes,

a plurality of said modules being used at each story of a plural-story structure made by stacking some modules on others, each module of each upper story being placed on a module of a lower story with the bearing planes of those modules aligned to carry their load vertically,

means associated with each said floor panel and with each said ceiling panel for transferring the load from the said panel to the two bearing planes between which it extends, whereby substantially all the loads are transmitted vertically along the bearing planes,



said second modules being used only at the top of a vertical stack of said modules and the first modules being used on all stories except the top of said stack, and the floor panel for any one upper module forming a ceiling panel for a module on a lower story so that redundancy of floor-ceiling structure is avoided,

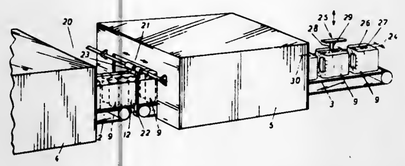
each said bearing plane of any one said module being perpendicular to the bearing planes of each adjacent module on the same story and adjacent a non-bearing plane side of said adjacent module, so that redundancy of bearing planes from module to module can be avoided and thereby, where walls are used at bearing planes, redundancy of such walls can be avoided and earthquake resistance of the building is enchanced.

4,050,216

METHOD OF PROVIDING A PACKAGE WITH A HANDLE

Folke Gustav Adolf Stenberg, Kungalv, Sweden, assignor to Iwema Forpacknings AB, Goteborg, Sweden

Continuation of Ser. No. 238,235, March 27, 1972, abandoned. This application Aug. 8, 1974, Ser. No. 495,795
Int. Cl.² B65B 61/14, 53/02
U.S. Cl. 53—14 **5 Claims**



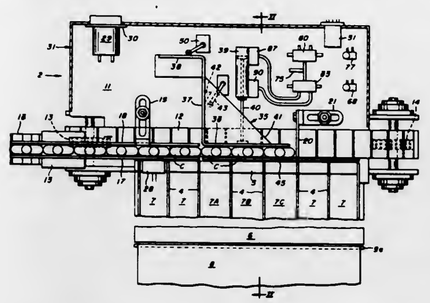
1. The method of manufacturing an article-enclosing package and carrier handle comprising the steps of arranging the articles in a desired packaging pattern, wrapping a film of shrinking type plastic around said articles, overlapping the longitudinal side edge portions of said film, heat sealing said overlapping side edge portions to form an elongate reinforced section of said package, and forming two longitudinal slits in said package in parallel relationship to the elongate reinforced section and on opposite sides thereof to form a strip integral with said reinforced section and suitable for use as a carrying handle, the longitudinal slits being formed of lesser length than the length of the reinforced section for transferring loads from the carrying handle to the remaining film through a portion of the reinforced section.

4,050,217

CASE PACKER CONTAINER FEEDING APPARATUS

Frank P. Alduk, New Castle, Pa., assignor to Newcastle Company, Inc., New Castle, Pa.

Filed Oct. 17, 1975, Ser. No. 623,379
Int. Cl.² B65B 57/14, 57/20
U.S. Cl. 53—62 **10 Claims**



1. For use with a case packer having a belt conveyor of a length sufficient to accommodate more than a single case load lot of containers thereon at one time with a receiving end and at discharge end and a plurality of spaced paralell partitions extending thereover from end-to-end providing a plurality of parallel lanes along which containers travel from one end of the conveyor to the other, there being a dump tray at the discharge end of the conveyor onto which the containers are collected in single case lots with the containers arranged in longitudinal and transverse rows, the dump tray being operable to discharge each case load before the next one starts to accumulate thereon, the case packer feeder being operable for depositing containers of either circular horizontal section or of elliptical or oval horizontal section on the case conveyor feeder belt of the successive rows and parallel lanes for assembly on the dump plate of the case packer in case lots of uniform pattern, said case packer comprising:

a. an intermittently operating feeder conveyor arranged to move a row of containers into position at the receiving end of the case packer with one container in front of each of said lanes,

b. counter means arranged to be actuated by containers on the feeder conveyor to stop said feeder conveyor when a row of containers has been carried by the feeder conveyor into position where one container of the row is aligned with one of the lanes of the case packer,

c. a pusher arranged to push the containers in each such row into the respective lanes of the case packer in front of which the containers are positioned during the time the feeder conveyor is stationary, and then retract, said counter means having a counter switch located along the feeder conveyor in advance of the pusher and arranged to be activated by each container on the feeder conveyor as it is carried by the belt past the switch, and

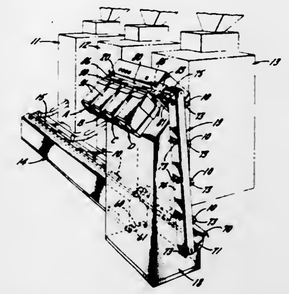
d. switch means positioned to be operated by the dump tray of the case packer arranged to stop the case packer feeder belt when the dump tray is operating to discharge a case load of cartons therefrom and restore operation of the feeder conveyor when the dump tray is in position to receive containers from the case packer belt conveyor.

4,050,218

COIN ROLL PACKAGING SYSTEM

Daniel D. Call, Sarona, Wis., assignor to Cummins-Allison Corporation, Gleaview, Ill.

Filed Dec. 22, 1975, Ser. No. 643,368
Int. Cl.² B65B 5/10
U.S. Cl. 53—167 **19 Claims**



19. An automatic packaging system for coin rolls formed by wrapping machines, said system comprising the combination of

a. a conveyor for transporting coin rolls in seriatim in the direction of the axes of the rolls, and

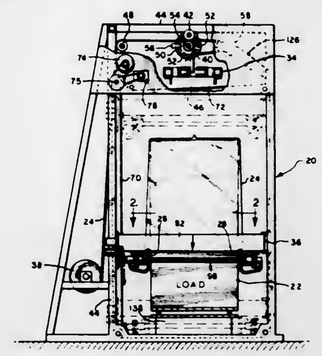
b. a plurality of packaging stations adjacent the conveyor for receiving coin rolls from the conveyor, each packaging station including means for positioning the last coin roll at a completely filled packaging station to shunt all succeeding coin rolls to the next packaging station along the conveyor.

4,050,219

BAGGING MACHINE

David M. Higgins, Arlington Heights, Ill., assignor to Comptex, Inc., Chicago, Ill.

Filed Feb. 19, 1976, Ser. No. 659,587
Int. Cl.² B65B 9/10, 43/30
U.S. Cl. 53—183 **20 Claims**



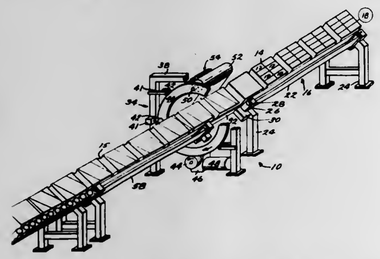
1. An improved bagging machine for covering a load with a bag formed from tubing of the type having

means for feeding tubing to a work area for receiving the tubing,
means for gripping the tubing, and spreading the tubing to an open position,
fingers which are insertable into the tubing which has been spread open,
means for severing the tubing and forming the bag therefrom, the bag being collected on the fingers,
and means for providing relative vertical movement between the fingers and the load to cover the load with the bag collected on the fingers, wherein the improvement comprises:
means for retracting the fingers simultaneously along mutually perpendicular horizontal components so that after the fingers have been inserted into the tubing, the tubing may be spread open outward to a position which will encompass the load.

4,050,220
SPIRAL BUNDLER

William G. Lancaster, 5101 Upper River Road, and Patrick R. Lancaster, III, 9410 Tiverton Way, both of Louisville, Ky. 40222

Filed Apr. 15, 1975, Ser. No. 568,269
Int. Cl.[2] B65B *13/12*
U.S. Cl. 53—198 R **11 Claims**

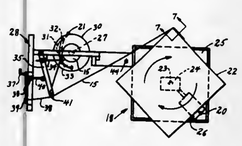


1. Apparatus for wrapping a plurality of loads and unitizing the loads into wrapped packages; comprising conveyor means adapted to receive a plurality of loads; each said load comprising a plurality of members, wrapping means positioned adjacent said conveyor means, said wrapping means comprising a frame, a circular roll dispenser means rotatably mounted on said frame, and guide wrapping rails axially aligned with said conveyor means adapted to receive said load from said conveyor means and substantially support said loads, said roll dispenser means being adapted to hold a roll of material and wrap said material around a load and guide wrapping rails supporting said load, said roll of material defining a path during the wrap cycle which path provides that the roll of material is always a constant distance from the center of the roll dispenser means, drive means connected to said roll dispenser means to drive said roll dispenser means so that it continuously deposits material around said guide rails and loads to form a spiral wrapped load, and brake means mounted to said roll dispenser means, said brake means being adapted to engage the outer surface of a roll of material mounted on said roll dispenser to place a constant and uniform tension on said rail substantially stretching material being dispensed from said roll onto said load; a second conveyor means positioned adjacent to said guide rail means adapted to carry said continuously wrapped bundle of a plurality of loads away from said wrapping means and cutting means positioned adjacent said second conveyor means, said cutting means comprising a frame, a cutting device reciprocally mounted in said frame and means to vertically reciprocate said cutting device in said frame to cut through said material overwrapping said loads to separate each load into a wrapped unitary package, said cutting means being operable in two directions such that a first separation is performed by the downward movement of said cutter means between the spacing formed between the loads and a second separation is performed by the subsequent upward movement of said cutting means between the immediately following spacing formed between the loads, and sensor means positioned next to said frame comprising light transmission means adapted to transmit light through said material overwrap to sense the spacing between loads, said spacing when sensed by said sensor means causing activation of said cutting means.

4,050,221
STRETCH-WRAPPED PACKAGE, PROCESS AND APPARATUS

Patrick R. Lancaster, III, and William G. Lancaster, both of Louisville, Ky., assignors to Lantech, Inc., Louisville, Ky.

Division of Ser. No. 347,873, April 4, 1973, Pat. No. 3,867,806, This application July 30, 1974, Ser. No. 493,050
Int. Cl.[2] B65B *11/04*
U.S. Cl. 53—211 **5 Claims**



1. Apparatus for making a unitary package comprising:
a. support means for supporting a load; said support means comprising a base, shaft means rotatably mounted to said base and platform means secured to said shaft means;
b. dispenser means for holding a rolled-up sheet of a stretchable material positioned adjacent to said support means; said dispenser means comprising a frame a second shaft means rotatably mounted to said frame, said second shaft means being adapted to hold said rolled-up sheet of a stretchable material;
c. drive means connected to said support shaft means for rotating said support means, said drive means being adapted to effect relative movement between said support and dispenser means to cause a sufficient amount of said material to be dispensed from said dispenser means when interconnected by said stretchable material to overwrap said load; and
d. brake means connected to said dispenser second shaft means, said brake means being adapted to assume a plurality of positions relative to said second shaft means including a first position spaced away from said second shaft means for effecting substantially unrestricted movement of said material from said dispensing means to said load when said dispensing means is rotated and a second position of engagement with said second shaft means for restricting subsequent continuation of material movement from said dispenser means to said load while said dispenser means is being rotated so that said material will then be stretched permitting a sufficient amount of said stretched material to be dispensed from said dispenser means to provide a band comprising plural layers of said material around said load.

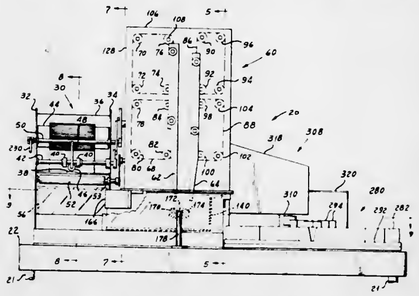
4,050,222
ENVELOPE OPENING APPARATUS

Frederick N. Stephens, Paola; Glenford Rowlett, Prairie Village, both of Kans., and James D. Beard, Independence, Mo., assignors to Stephens Industries, Inc., Lenexa, Kans.

Filed Aug. 29, 1975, Ser. No. 608,847
Int. Cl.[2] B65B *69/00*
U.S. Cl. 53—381 R **30 Claims**

1. Apparatus for opening an envelope previously slit along one edge thereof, comprising:
a pair of blades;

means for positioning the envelope with said one edge thereof adjacent said blades;
means mounting said blades for movement along respective paths, each including a first portion extending from a point outside the envelope to a second point within the envelope and a second and rectilinear portion extending from said second point through an edge of the envelope adjacent said one edge to a predetermined third point beyond said

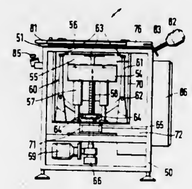


adjacent edge, said means mounting the blades for translational movement along the second portions of said paths; and
means for driving the blades along said paths with a sufficient driving force to move said blades from said second points through the edges of the envelope adjacent to said one edge to said predetermined third points to break said adjacent edges.

4,050,223
DEVICE FOR UNPACKING BOTTLES OR SIMILAR ARTICLES IN A SHRINK FOIL PACKAGE

Emil Steeg, Budenheim, and Uwe Hoffmeyer, Mainz, both of Germany, assignors to Automation Steeg and Hoffmeyer GmbH, Budenheim, Germany

Filed June 4, 1976, Ser. No. 692,761
Claims priority, application Germany, June 4, 1975, 7604334[U]
Int. Cl.[2] B65B *69/00*
U.S. Cl. 53—381 R **6 Claims**

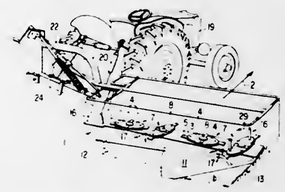


1. A device for unpacking bottles or similar articles in a shrunk foil package, characterized by a table adapted to receive the shrunk foil package, with a stationary table top, a turntable and a lifting table which can be raised and lowered in relation to the table top and the turntable in order to form a receiving niche, a cutting device for cutting open the shrunk foil along the periphery of the package, a gripping device, which after the foil covering has been cut can be moved from the side to a position adjacent to the rim or edge of the box-shaped lower part of the shrunk foil produced by the cutting and on lifting the lifting table strips off the rim, and a frame adapted to surround the package, which holds the bottles together and can be displaced with the latter from the lower part of the shrunk foil.

4,050,224
MOWING IMPLEMENT

Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Filed July 21, 1975, Ser. No. 597,780
Claims priority, application Netherlands, July 22, 1974, 7409898
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—295 **16 Claims**

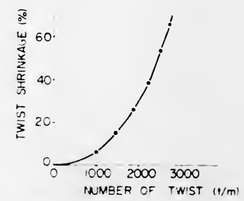


1. A mowing implement comprising, in combination:
an elongate housing adapted to be carried by a powered vehicle for movement over the ground surface with the housing extending transverse to the direction of movement effected by the powered vehicle;
gear means disposed within said housing and including at least one drive gear disposed along the length of the housing, said drive gear having a vertical shaft connected thereto and projecting upwardly through said housing, said gear means imparting rotation to said shaft;
horizontal pivot means attached to said shaft in closely overlying relation to said housing;
a pair of cutter supports pivotally engaged by said pivot means, said cutter supports projecting radially from said shaft and each carrying a cutter member which sweeps a circular path which extends forwardly of said housing, and each cutter support being freely pivotal on said pivot means about a horizontal axis whereby each cutter support is free to deflect upwardly out of the plane of said circular path and away from the top of said housing during operation of the mowing implement.

4,050,225
PROCESS AND APPARATUS FOR MEASURING FALSE TWIST IN THERMOPLASTIC SYNTHETIC YARN

Meiji Anahara, Kyoto, and Takayoshi Fujita, Takatsuki, both of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Feb. 21, 1975, Ser. No. 551,782
Int. Cl.[2] D01H *13/32*
U.S. Cl. 57—34 HS **13 Claims**



1. A process for false twisting a thermoplastic synthetic yarn wherein a yarn of thermoplastic synthetic fibers is fed through a feed roller, the fed yarn is false twisted by a false-twisting means while being heated and, then, the false twisted yarn is taken up through a delivery roller, which process comprises directly measuring, in a section within the twisting zone formed between the feed roller and the false-twisting means,

the speed of the yarn being processed under a normal operational condition with twisting to estimate the number of false twists actually imparted to the yarn by determining twist shrinkage of the yarn in said section from the measured yarn speed and the speed of the yarn being processed under the same condition as said normal operational condition but without twisting, which is measured in the same section as that wherein said speed of the yarn being processed under the normal operational condition with twisting has been measured and, then, estimating the number of twists from the determined twist shrinkage.

4,050,226

APPARATUS FOR TIMING A SPINNING-IN OPERATION OF A TEXTILE MACHINE

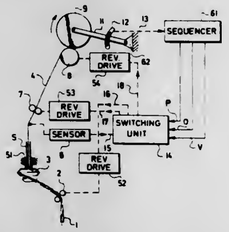
Marie Brozkova; Frantisek Burysek, both of Usti nad Orlici; Jan Janousek, Brandys nad Orlici; Karel Mikulecky, Chocen, and Stanislav Skoda, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Oct. 7, 1976, Ser. No. 730,593

Claims priority, application Czechoslovakia, Oct. 7, 1975, 6777/75

Int. Cl.² D01H *15/00*

U.S. Cl. 57—34 R **6 Claims**



1. In a textile machine having a spinning chamber, first draw-off roller means for withdrawing spun yarn from the spinning chamber in a forward advance direction, the first roller means being reversible into a spinning-in mode in response to a first and a second reversing signal, a take-up bobbin, and second distributing roller means disposed in driving relation with the bobbin for receiving withdrawn yarn from the first roller means and for winding the yarn in roving fashion about the bobbin to define a wound yarn package whose diameter increases in proportion to the quantity of the withdrawn yarn, the second roller means being reversible into a corresponding spinning-in mode in response to a first and a second reversing signal, the improvement which comprises, in combination, means responsive to a progressive increase in diameter of the wound package for generating a succession of the first and second reversing signals having progressive delays corresponding to the increase in diameter, sensing means coupled to the machine for providing a first indication upon the occurrence of a yarn breakage condition, and switching means coupled to the output of the generating means and to the sensing means and rendered effective upon the occurrence of the first indication for individually applying the first and second reversing signals to the first and second roller means, respectively.

4,050,227

SPINDLE HAVING AN UNDERWIND CROWN FOR RING SPINNING AND RING TWISTING FRAMES, ESPECIALLY FOR CORD TWISTING FRAMES

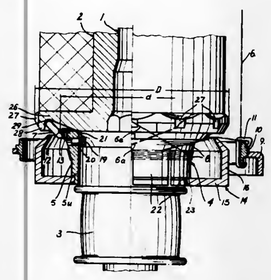
Wolfgang Berend, Durach, Germany, assignor to Saurer-Allma GmbH Allgauer Maschinenbau, Kempten, Germany

Filed Sept. 27, 1976, Ser. No. 726,917

Claims priority, application Germany, Oct. 6, 1975, 7531710[U]

Int. Cl.² D01H *11/00, 1/38*

U.S. Cl. 57—34.5 **14 Claims**



1. In a spindle for ring spinning and ring twisting frames for cord twisting frames having a bobbin, a whorl positioned beneath said bobbin, an underwind crown arranged coaxially on said spindle beneath said bobbin and above said whorl, said underwind crown having an extensively cylindrical sleeve part for the winding of a thread during underwind and an outwardly extending annular rim with recesses therein on the periphery thereof, and at least one knife having a cutting edge thereon projecting from the bases of said recesses comprising the improvement wherein around said cylindrical sleeve part of said underwind crown there is arranged an upwardly open thread catch box having an annular base which extends outwardly from the lower end of said sleeve part, the outer wall of said annular base extending to the height of the upper end of said sleeve part, an annular gap being defined between said outer wall and said annular rim on said sleeve part.

4,050,228

SLIVER SUPPLY APPARATUS FOR RESOLVING ROLLERS IN OPEN END SPINNING MACHINES

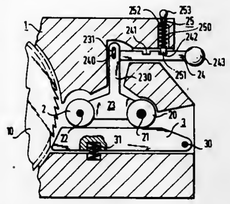
Hans Landwehrkamp, Lenting; W. Gerhard Hoeber, Ingolstadt-Oberhaunstadt; Georg Goldammer, Gaimersheim, and Rudolf Oexler, Ingolstadt, all of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed Feb. 13, 1976, Ser. No. 658,081

Claims priority, application Germany, Feb. 13, 1975, 2506058

Int. Cl.² D01H *1/12*

U.S. Cl. 57—58.95 **25 Claims**



1. In a spinning machine having sliver-resolving apparatus

including a resolving roller, a first member and a second member cooperating with the first member to form a first sliver-feeding champing nip spaced from the resolving roller at an interval corresponding to the length of long fibers to be spun, one of such members being a driven roller for feeding sliver to the resolving roller, the improvement comprising a third member cooperating with the first member to form a second sliver-feeding champing nip spaced from the resolving roller at an interval corresponding to the length of short fibers to be spun, and selecting means for rendering said second clamping nip active or inactive on sliver being fed to the resolving roller.

18. In a spinning machine having sliver resolving apparatus including a resolving roller and means for supplying fiber sliver to the resolving roller, the improvement comprising the sliver supply means including a plurality of fiber feeding clamping nips located at different intervals from the resolving roller, which intervals correspond to lengths of fibers to be spun, and selecting means for rendering the nip closest to the resolving roller active or inactive on sliver being supplied by the sliver supply means to the resolving roller.

4,050,229

FRICTION TYPE YARN FALSE TWISTING APPARATUS

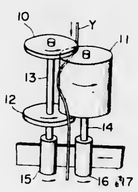
Nobuyuki Hayahusa, and Hiroaki Uno, both of Numazu, Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed June 7, 1976, Ser. No. 693,329

Claims priority, application Japan, June 10, 1975, 50-70496; July 28, 1975, 50-91714

Int. Cl.² D02G *1/08*

U.S. Cl. 57—77.4 **7 Claims**



1. Friction type yarn false twisting apparatus consisting essentially of two parallel spaced apart rotary shafts, means for rotating said shafts in the same direction, at least two relatively thin spaced apart discs mounted on one of said shafts and a relatively thick disc on the other shaft located between said thin discs with axial spaces therebetween so as to slightly overlap with each other to form intersections between the peripheral portions of respective discs at angularly spaced points of the peripheral portions thereof whereby yarn is threaded successively through one of said intersections, diagonally across the peripheral surface of said thick disc and then through the other intersection thereby applying a flase twist to said yarn.

4,050,230

ROPE

Tadao Senoo, Gifu, and Kenji Honda, Gamagori, both of Japan, assignors to Ube Nitto Kasei Co., Ltd., Tokyo and Toyo Rope Manufacturing Co., Ltd., Gamagori, both of Japan

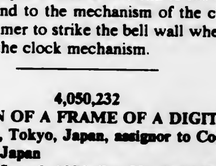
Filed Feb. 23, 1976, Ser. No. 660,406

Claims priority, application Japan, Feb. 24, 1975, 50-22651; Jan. 12, 1976, 51-1901[U]

Int. Cl.² D02G *3/04, 3/36*

U.S. Cl. 57—149 **5 Claims**

1. A rope comprising:
an inner core fiber bundle comprised of:
a plurality of first synthetic fibers,
a first thermosetting resin impregnating and connecting said first fibers, and
a first thermoplastic coating layer surrounding said first thermosetting resin impregnated fibers; and
a plurality of outer fiber bundles surrounding said core fiber bundles, each outer fiber bundle comprised of:
a plurality of second synthetic fibers,



a second thermosetting resin impregnating said second fibers, and
a second thermoplastic resin coating layer surrounding said second fibers impregnated with said thermosetting resin.

4,050,231

BICENTENNIAL EAGLE CLOCK

Aaron Lopez, and Juan Lopez, both of South Gate, Calif., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Oct. 4, 1976, Ser. No. 729,596

Int. Cl.² G04B *21/08, 37/00*

U.S. Cl. 58—13 **1 Claim**



1. A patriotic display clock assembly comprising a bell hung from a support member mounted on spaced pillars to a base, with a clock mounted on the wall of the bell, in which
a bell hammer is suspended inside the bell by a shaft to which it is fixed,
said shaft rotatably mounted at one end to the bell and fixed at the other end to the mechanism of the clock so as to cause the hammer to strike the bell wall when the shaft is oscillated by the clock mechanism.

4,050,232

CONSTRUCTION OF A FRAME OF A DIGITAL CLOCK

Jusuke Yaguinuma, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed June 2, 1976, Ser. No. 692,239

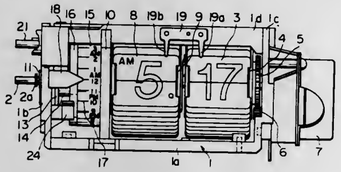
Claims priority, application Japan, June 5, 1975, 50-75299[U]

Int. Cl.² G04C *21/04*; G04B *29/02*

U.S. Cl. 58—52 R **3 Claims**

1. Construction of a frame of a digital clock having a preassembled assembly comprising of at least an indicating flap drum and a timer setting drum supported on a driving shaft and adapted to be mounted in said frame, said frame comprising: a frame member having opposite two side end plates integrally formed with a base plate of said frame member and a separate partition plate adapted to be detachably secured in position between said two side end plates, said assembly having a predetermined axial play between said indicating flap drum and said timer setting drum before said assembly is mounted in said

frame member for permitting said assembly to be mounted between said two side end plates by first inserting one of the opposite ends of said driving shaft through one of said side end plates and thereafter inserting the other end through the other



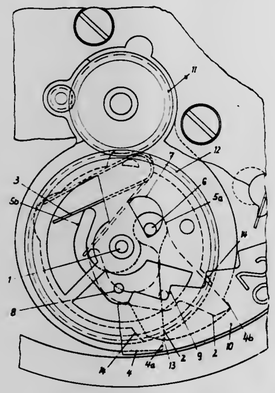
side end plate so as to be journaled thereby, said separate partition plate being attached in position to said frame member between said timer setting drum and said indicating flap drum for completing the assembling of said digital clock with said axial play being removed by said partition plate.

4,050,233

STEPPING MECHANISM FOR WATCHES

Kurt Murrie Ingenieur, Pforzheim, Germany, assignor to Pforzheimer Uhren-Rohwerke Rudolf Wehner, Pforzheim, Germany

Filed July 28, 1976, Ser. No. 709,399
Claims priority, application Germany, Sept. 27, 1975, 2543177
Int. Cl.² G04B *19/24*
U.S. Cl. 58—58 **13 Claims**



1. In a watch having a rotatably mounted date ring, the provision of a date-stepping mechanism for advancing said date ring, said mechanism comprising

a stationary peripheral first series of teeth,

a rotary drive element,

a date-stepping finger, which is mounted to be rotatable and radially displaceable relative to said rotary drive element into and out of engagement with said first series of teeth and comprises a stepping pin, a forked end portion having first and second prongs, and a drive pin carried by said first prong,

a one-way coupling element, which is in one-way coupling engagement with said drive pin and is eccentric with respect to and arranged to revolve with said rotary drive element in a predetermined direction of revolution and to repeatedly withdraw said date-stepping finger from said first series of teeth after respective intervals of time, and

spring means engaging said second prong and urging said date-stepping finger radially outwardly and in said predetermined direction of revolution,

said spring means being adapted to impart a rotary stepping movement to said date-stepping finger in said predetermined direction of revolution and into engagement with said first series of teeth when said date-stepping finger has thus been withdrawn from said first series of teeth,

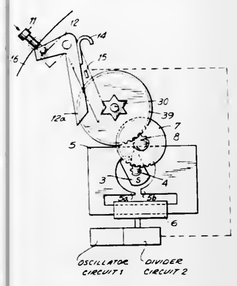
said mechanism also comprising a second series of teeth, which are carried by said date ring and arranged to be engaged by said stepping pin during said rotary stepping movement of said date-stepping finger.

4,050,234

ELECTRONIC TIMEPIECE HAND-RETURN MECHANISM

Mori Toshio, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Aug. 30, 1974, Ser. No. 502,133
Claims priority, application Japan, Aug. 30, 1973, 48-97748; Sept. 10, 1973, 48-101819
Int. Cl.² G04B *27/08*
U.S. Cl. 58—85.5 **15 Claims**



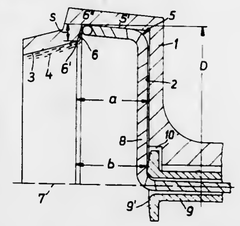
1. In a hand display electronic timepiece having a gear mechanically coupled to at least one of said hands, the rotational position of the gear determining the time indication position of said hand, an oscillator circuit for producing a high frequency time standard signal, divider circuit means for supplying an alternating polarity pulse signal of a predetermined low frequency in response to said high frequency time standard signal, said divider means being adapted to supply a pulse signal including first and second predetermined pulses in sequence immediately after resetting thereof, electro-mechanical converter means coupled to said divider circuit means to receive said pulse signal and including a rotor mechanically coupled to said gear to rotate said gear in response to said pulse signal, the improvement comprising manually operable resetting means mechanically coupled to said gear and electrically coupled to said divider means, said resetting means effecting a positioning of said gear and rotor to predetermined respective positions corresponding to $10n$ second positions of said hand, where $n = 1, 2, 3$, and resetting of said divider means so that the first pulse applied to said electro-mechanical converter means after release of said gear and rotor is adapted to retain said rotor at its predetermined position, the second pulse advancing said gear and said rotor.

4,050,235

SPINNING ROTOR FOR OPEN-END SPINNING UNIT

Rolf Neubert, Schwanewede, and Rolf Wehling, Bremen, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed June 28, 1976, Ser. No. 700,125
Claims priority, application Germany, June 28, 1975, 2528976
Int. Cl.² D01H *1/12*
U.S. Cl. 57—58.89 **10 Claims**



1. In a spinning rotor for an open-end spinning unit, the rotor defining a fiber collection trough and an intake portion whose cross section widens in the direction toward the fiber collecting trough, the intake portion being formed and disposed to provide a radially outwardly extending projecting portion presenting a surface which merges into and defines one boundary of the fiber collecting trough and which presents a region in which the rotor diameter is increased, the boundary of the fiber collecting trough opposite the projecting portion being defined by the spinning rotor bottom surface, the radially outermost end of the surface of the projecting portion defining the maximum diameter of the fiber collecting trough, and a portion of the trough between the outermost end of the projecting portion surface and the bottom surface, and adjacent the rotor bottom surface, presenting a region in which the diameter of the trough is less than such maximum diameter, the improvement wherein the axial distance between the projection of said rotor bottom surface and the radially innermost end of said projecting portion surface, measured at the level of the outermost end of said projecting portion surface, is between one-sixteenth and one-sixth of said maximum diameter of said fiber collecting trough.

4,050,236

CLOCK HAVING ORNAMENTAL PENDULUM WITH ADJUSTABLE PERIOD

Christian M. J. Jauch, Louisville, Miss., assignor to Spartus Corporation, Chicago, Ill.

Filed Apr. 8, 1976, Ser. No. 674,954
Int. Cl.² G04B *17/12*
U.S. Cl. 58—132 **2 Claims**



1. In a clock:

a shaft;

a pendulum having a bob;

means for oscillating said shaft to and fro about its axis and for controlling the speed of oscillation of said shaft, said controlling means being independent of said pendulum;

means, comprising bushing means fixed to said pendulum and having a loose friction fit on said shaft, mounting said pendulum on said shaft for free swinging movement of said pendulum in relation to said shaft;

said mounting means including means for imparting a driving force from said oscillating shaft to said pendulum, to provide continuous, uninterrupted swinging of the pendulum, when the shaft and pendulum oscillate in synchronism;

said loose friction fit between said bushing means and said shaft being the sole driving connection between said shaft and said bushing means and pendulum;

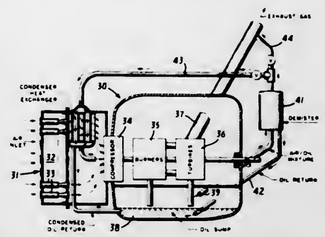
and adjusting means for adjusting the period of said free swinging pendulum, to synchronize said period with the oscillation of said shaft, without changing the distance between the axis of said shaft and the bob of said pendulum.

4,050,237

DEMISTER ASSEMBLY FOR REMOVING LIQUIDS FROM GASES

David B. Pall, Roslyn Estates, and Charles J. Roach, Brooklyn, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Continuation of Ser. No. 450,032, March 11, 1974, abandoned. This application Nov. 18, 1975, Ser. No. 633,062
Int. Cl.² F02C *7/06*; B01D *50/00*
U.S. Cl. 60—39.08 **6 Claims**



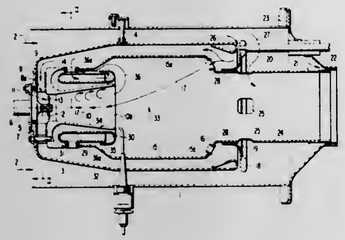
1. A gas turbine gas demister and recycle system capable of removing substantially all of the oil entrained as droplets in such gases, before the gases are vented to the atmosphere, comprising, in combination, a gas turbine engine including, in series flow connection, a gas compressor, a gas combustor and a gas turbine; and a lubricant storage supply for the engine in fluid flow connection therewith by gas and lubricant supply lines leading to the engine, and a return line leading from the engine, and a gas vent line in fluid flow connection with the lubricant storage supply for venting gas conveyed thereto by the return line; and a demister assembly in series in the gas vent line for coalescing and stripping gas-entrained liquid lubricant droplets from gas in this line, returning coalesced liquid lubricant to the lubricant storage supply, the demister assembly comprising, in combination, in series fluid flow, a primary coalescer composite folded in a corrugated configuration and comprising a nonwoven fibrous mat confined between rigid porous facing sheets to a density within the range from about 0.05 to about 0.5 g/cc, the fibers being sufficiently long so that they form a coherent nonwoven mat, and having a diameter within the range from about 0.25 to about 30 microns, and a secondary coalescer comprising a porous open-cell polyurethane foam sheet having a porosity within the range from about 50 to about 150 pores per square inch, and having an average density within the range from about 1 to about 3 lbs/cu ft.

4,050,238

FILM EVAPORATING COMBUSTION CHAMBER

Immanuel Holzapfel, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 15, 1976, Ser. No. 667,273
Claims priority, application Germany, Mar. 14, 1975, 2511172
Int. Cl.² F02C 7/22
U.S. Cl. 60—39.23 35 Claims



1. A film-evaporating combustion chamber, comprising an evaporator pipe means for evaporating a film of fuel distributed on an inner surface thereof, guide wheel means operable to produce a swirl of the combustion air and operatively connected ahead of an inlet opening of the evaporator pipe means, and tubularly shaped air guide housing means for guiding combustion air from outside in a substantially axial direction, the air guide housing means enclosing the evaporator pipe means and an adjoining reaction chamber means, characterized in that a radial guide cascade means having blade channel means is provided as guide wheel means, deflection means are arranged inside of the air guide housing means for supplying the substantially axially entering combustion air to the radial guide cascade means, the combustion air being deflected substantially in the axial direction after leaving the blade channel means of the radial guide cascade means, and in that an annular space means is provided for inducing a back flow of combustion air from the reaction chamber means to an area surrounding the evaporator pipe means, said annular space means is defined between an outer surface of the evaporator pipe means and an inner surface of wall means of the reaction chamber means which extend up to an inlet side of the blade channel means of the radial guide cascade means.

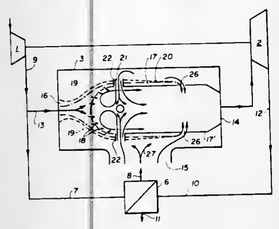
26. A film-evaporating combustion chamber, comprising an evaporator pipe means, guide wheel means operable to produce a swirl of the combustion air and operatively connected ahead of an inlet opening of the evaporator pipe means, and tubularly shaped air guide housing means for guiding combustion air from outside in a substantially axial direction, the air guide housing means enclosing the evaporator pipe means and an adjoining reaction chamber means, characterized in that a radial guide cascade means having blade channel means is provided as guide wheel means, deflection means are arranged inside of the air guide housing means for supplying the substantially axially entering combustion air to the radial guide cascade means, the combustion air being deflected substantially in the axial direction after leaving the blade channel means of the radial guide cascade means, and in that the deflection means is constructed as a hood means closed in a direction toward a side of an air inlet into the air guide housing means, the hood means surrounding the reaction chamber means with a spacing and being adjoined at an open end thereof by an axially displaceable throttle ring means.

4,050,239

THERMODYNAMIC PRIME MOVER WITH HEAT EXCHANGER

Guenter Kappler, Munich, and Adolf Fehler, Pfaffing, both of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH and M.A.N. Maybach Mercedes-Benz, both of Munich, Germany

Filed Sept. 8, 1975, Ser. No. 611,410
Claims priority, application Germany, Sept. 11, 1974, 2443363
Int. Cl.² F02C 7/10, 7/12
U.S. Cl. 60—39.51 R 8 Claims



1. A thermodynamic prime mover comprising a combustion chamber having cooling air inlet means and combustion air inlet means, an air compressor, and a heat exchanger, as well as a turbine, first conduit means operatively interconnecting said air compressor and said heat exchanger as well as said combustion chamber and said turbine, second conduit means branching off from said first conduit means upstream of said heat exchanger, a flame pipe located in said combustion chamber and having an upstream end facing said cooling air inlet means of said combustion chamber and a downstream end operatively connected to said turbine, said second conduit means being operatively connected to said cooling air inlet means of said combustion chamber, said second conduit means being dimensioned for directing about 3 to 10% of cool compressed air from said compressor toward and around at least the upstream end of said flame pipe whereby said 3 to 10% of compressed cool air forms a cooling jacket at least around the upstream end of said flame pipe without initially substantially participating in the combustion; said flame pipe further comprising substantially radially extending pipe sections adjacent the upstream end thereof and arranged for cooperation with said combustion air inlet means to receive preheated combustion air from said heat exchanger whereby the preheated combustion air enters the flame pipe through said pipe sections and thus through said cooling jacket, said pipe sections substantially separating said cool air of the cooling jacket from the preheated combustion air as the latter enters into said flame pipe.

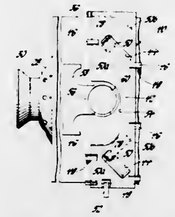
4,050,240

VARIABLE AIR ADMISSION DEVICE FOR A COMBUSTOR ASSEMBLY

John M. Vaught, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 26, 1976, Ser. No. 717,988
Int. Cl.² F02C 7/22
U.S. Cl. 60—39.65 2 Claims

1. A combustor assembly comprising a liner having an inlet and an outlet, a dome overlying the inlet and including means forming a passage for flow of primary combustion air into the liner, a fuel nozzle for directing fuel spray into a reaction mixing zone downstream of said dome, a plurality of slots with major and minor axes formed in said liner downstream of said dome, each of said slots having its major axis formed at an angle to the longitudinal axis of said liner, a control band rotatably supported on said liner in overlying relationship to said slots, a second plurality of slots in said band each having a major and minor axis, each of said second slots having its major axis intersecting the major axis of one of the first plurality of slots, said band being rotatable to cause first and second slots to define a radially overlapped opening for flow of primary combustion air into the liner downstream of said dome, said radially overlapped opening being axially shiftable on said liner in response to rotation of said band to alter the location of primary air admission with respect to the fuel spray and to alter the axial extent of the mixing zone between the dome and the overlapped radial opening.

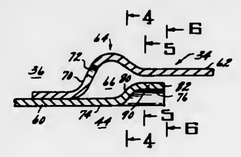


4,050,241

STABILIZING DIMPLE FOR COMBUSTION LINER COOLING SLOT

Thomas L. DuBell, Maineville, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 22, 1975, Ser. No. 642,727
Int. Cl.² F02C 7/18
U.S. Cl. 60—39.66 4 Claims



1. In a combustor liner film cooling slot of the variety including an annular space extending circumferentially of the liner and defined between overlapping portions of telescoping liner segments, a cooling fluid plenum substantially circumscribing the liner, means for transferring cooling fluid from the plenum to the space, means for exhausting fluid from the space onto the liner, and an overhanging lip extending substantially axially downstream of the space for facilitating attachment of the fluid to the liner in a protective film barrier, the improvement comprising:

a stabilizing dimple disposed within said lip, the dimple including a substantially radially depressed portion, the depressed portion having a first radial height proximate its upstream extremity, a second radial height at its downstream extremity, said second radial height being greater than said first radial height, said depressed portion further including an intermediate segment intermediate said upstream and downstream extremities and having a radial height substantially equal to said second radial height.

4,050,242

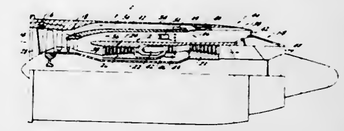
MULTIPLE BYPASS-DUCT TURBOFAN WITH ANNULAR FLOW PLUG NOZZLE AND METHOD OF OPERATING SAME

Donald J. Dusa, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 1, 1975, Ser. No. 636,442
Int. Cl.² F02C 3/06; F02K 3/06
U.S. Cl. 60—204 8 Claims

1. In a method of operating a propulsion nozzle for a gas turbine engine comprising a core engine, and two substantially coannular bypass flow ducts having a common wall therebetween, the steps of:

modulating the relative flow rates through the ducts with valve means disposed at the downstream end of the common wall; and



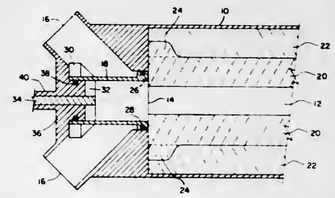
passing the sum of the duct flows through a variable area throat independent of the core engine and partially defined by an articulated plug and a cooperating circumscribing shroud.

4,050,243

COMBINATION SOLID FUEL RAMJET INJECTOR/PORT COVER

Allen L. Holzman, and William J. Corcoran, both of Palo Alto, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 17, 1976, Ser. No. 687,055
Int. Cl.² F02K 9/04; F02B 27/02
U.S. Cl. 60—245 4 Claims



1. An improved integral rocket-ramjet of a type in which a dual fuel system is burned in a combustion chamber having a nozzle at one end thereof, defined as the rear end, through which the gases of combustion are ejected to create thrust, one fuel of the dual fuel system containing sufficient oxygen to support combustion, the other fuel requiring air to support combustion, and having an injector port at the other end, defined as the forward end, of the combustion chamber and air inlet ports forward of said injector port and in communication with the outside atmosphere such that in flight, ram air enters the air inlet ports, wherein the improvement comprises;

a tube injector slidably mounted for axial movement in said injector port for translation from a first position during a boost phase when the fuel containing oxygen is combusting to a second position during a sustain phase when the fuel requiring air for combustion is combusting;

said tube injector comprising a substantially hollow cylinder having an annular nub at one end;

said annular nub having an outside diameter greater than said cylinder and essentially the same diameter as the inner diameter of said injector port;

an axially extending cylindrical step forwardly of said injector port and constituting a part of said rocket-ramjet;

the other end of said tube injector being supported interiorly on said axially extending cylindrical step;

the interior diameter of said tube injector conforming essentially to the exterior diameter of the step;

sealing means associated with said annular nub and said injector port;

other sealing means associated with said step and the interior circumference of said tube injector;

said sealing means and other sealing means in cooperation with said tube injector, step and injector port being operative to prevent outside air from entering the combustion chamber during the boost phase when said tube injector is in said first position;

stop means exteriorly mounted near the other end of said tube injector and having a dimension greater than the diameter of the injector port and adapted to abut the injector port and limit the axial travel of said tube injector when said tube injector moves to the second position;

centering means interiorly attached to said tube injector near said other end and having a portion thereof extending axially;

said step having a central bore extending therethrough;

said portion being carried and guided by said central bore in said step; and

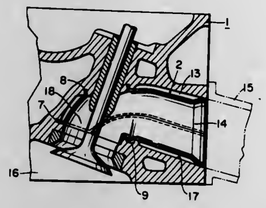
means for moving said tube injector from said first position to said second position during transition from said boost phase to said sustain phase.

4,050,244

CYLINDER HEAD

Nobutaka Morikawa, Aichi, and Susumu Tanaka, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 2, 1975, Ser. No. 637,015
Claims priority, application Japan, Sept. 17, 1975, 50-111773
Int. Cl.² F01N *7/08*
U.S. Cl. 60—282 **5 Claims**



1. A cylinder head having a cavity defined therein, one end of said cavity opening into a combustion chamber and the other end thereof opening into an exhaust pipe, a tubular port liner made of heat-resistant material positioned in said cavity with an annular space between the liner and the wall of the cavity, one end of said liner being adjacent said one end of said cavity and being rigidly secured to said cylinder head, the other end of said liner being adjacent the other end of the cavity and being flared to provide intimate contact between the liner and the wall of the cavity, said tubular port liner comprises upper and lower halves, each of which is semi-circular in cross-section, said upper and lower halves each having flanges of identical configuration extending outwardly from and along the edges thereof, and said flanges have portions at the other end of the liner which are wider than the other portions thereof.

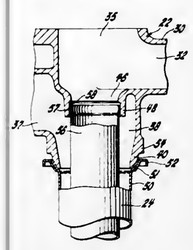
4,050,245

CONCENTRIC DUAL ENGINE EXHAUST SYSTEM

Harold A. Little, and Richard L. Balsley, both of Washington, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 11, 1976, Ser. No. 713,276
Int. Cl.² F01N *7/10*
U.S. Cl. 60—313 **6 Claims**

1. An exhaust manifold for a multi-cylinder internal combustion engine, said manifold defining two separate exhaust gas chambers, means for connecting said chambers to diverse ones of the engine cylinders to receive exhaust gas therefrom, an enlarged discharge passage extending from one of said chambers and terminating at a pipe fitting adapted to sealingly receive a first tubular exhaust pipe to carry exhaust gas from said one chamber, and a smaller discharge passage extending from the other of said chambers and terminating at a pipe



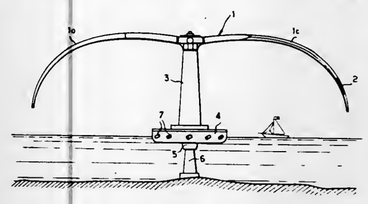
fitting disposed within the enlarged discharge passage and adapted to receive a second tubular exhaust pipe disposed within the first pipe to carry exhaust gas from said other chamber.

4,050,246

WIND DRIVEN POWER SYSTEM

Gaston Bourquardez, Vallon des Lauriers, Aix-en-Provence, France (13100)

Filed June 4, 1976, Ser. No. 692,823
Claims priority, application France, June 9, 1975, 75.17859
Int. Cl.² F03D *3/00*
U.S. Cl. 60—398 **18 Claims**



1. A wind driven power system having a rotor rotating about a vertical axis and power generating means operatively coupled to said rotor, said rotor having at least one blade, said blade being bowed in a vertical plane and torsionnaly soft along the full length thereof and provided with means for varying the pitch thereof according to a predetermined cyclic law of variation which has a frequency of pitch variation equal to the frequency of rotation of the rotor.

4,050,247

CONTROL VALVE FOR VARIABLE DISPLACEMENT PUMP OR MOTOR

Donald C. Connett, Huntington Beach, Calif., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 7, 1976, Ser. No. 730,558
Int. Cl.² F16H *39/46*
U.S. Cl. 60—444 **6 Claims**

1. A control valve for use with a hydraulic pump or motor having a swashplate movable from a neutral position to an actuated position to vary the displacement of said pump or motor in response to the porting of fluid from a relatively high pressure fluid source to one servo attached to the swashplate and the porting of fluid from another servo attached to the swashplate to a relatively low pressure fluid source, the control valve comprising:

a. a housing defining an axially extending spool bore;

b. a control spool located within said spool bore and having a pair of axially spaced lands engaging said spool bore, a reduced center portion intermediate said lands and spaced from said spool bore, and a pair of reduced end portions axially outwardly from said lands and spaced from said spool bore, each of said lands having a given axial width defined by an axially outer edge adjacent said respective reduced end portion and an axially inner edge adjacent said reduced center portion;

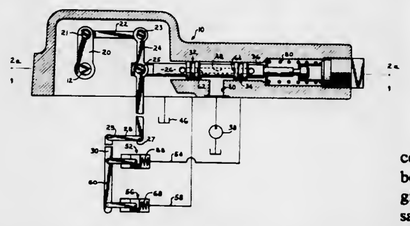
c. means to center said control spool relative to a given position within said spool bore;

d. linkage connected to said control spool and to said swashplate to move said control spool in response to movement of said swashplate;

e. a movable control handle;

f. linkage connected to said control spool and to said control handle to move said control spool in response to movement of said control handle;

g. a controlled pressure port in said housing adapted for fluid communication with said relatively high pressure fluid source and in fluid communication with said spool bore intermediate said lands when said control spool is centered;



h. means fluidly communicating said portion of said spool bore encircling said reduced end portions of said control spool with said relatively low pressure fluid source;

i. a first servo port in said housing adapted for fluid communication with one of said servos and in fluid communication with said spool bore at a position axially spaced in one direction from said controlled pressure port, said one servo port being partially covered by one of said lands when said control spool is centered;

j. a second servo port in said housing adapted for fluid communication with the outer of said servos and in fluid communication with said spool bore at a position axially spaced in the other direction from said controlled pressure port, said other servo port being partially covered by said other and when said control spool is centered; and

k. means providing fluid communication between said controlled pressure port and each of said servo ports, said fluid communication being provided via an orifice which has an area that is no greater than one-fourth of the area of the respective servo port which is not covered by the respective land when said control spool is centered.

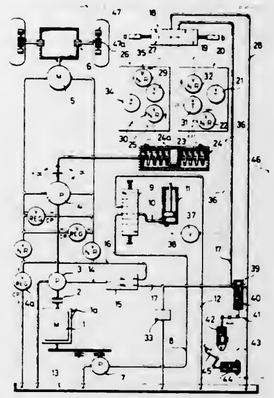
4,050,248

CONTROL DEVICE FOR HYDROSTATIC DRIVE, ESPECIALLY FOR FORK LIFT TRUCK

Friedrich Hachmann, Dortmund, Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Dortmund, Germany

Filed Sept. 9, 1976, Ser. No. 721,758
Claims priority, application Germany, Sept. 17, 1975, 2541398
Int. Cl.² F16H *39/46*; F15B *11/16*
U.S. Cl. 60—445 **9 Claims**

1. In a control system for a fork lift truck having a fluid operable lift cylinder and a fluid drive motor and a variable delivery reversible pump connected to the motor and a drive engine connected to drive the pump; said pump having a control element movable from a first position of maximum pump delivery in forward direction through a position of zero pump delivery to a second position of maximum pump delivery in reverse direction, a fluid operable reversible actuator connected to said control element and normally biased toward a center position in which said control element is in zero delivery position, a second pump and a reversing valve having an inlet connected to said second pump and a respective output connected to each side of said actuator, a third pump and a



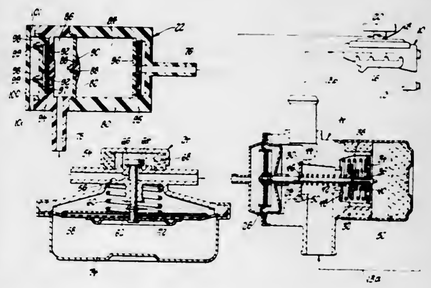
control valve connecting the third pump to the lift cylinder, both of said second and third pumps being driven by the engine, control means for controlling the rate of movement of said actuator at least toward said second position thereof in response to the supply of actuating fluid thereto from said reversing valve.

4,050,249

CONTROL UNIT

George R. Collins, Rochester, and William R. Large, Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1976, Ser. No. 681,785
Int. Cl.² F02B *75/10*
U.S. Cl. 60—290 **2 Claims**



1. A control unit for use on an internal combustion engine having an induction passage for combustion air flow to the engine, a throttle in said induction passage for controlling air flow therethrough, an exhaust passage for exhaust gas flow from the engine, a conduit for air flow to said exhaust passage to support oxidation of exhaust gases therein, and a pressure responsive valve assembly for controlling air flow through said conduit and adapted to permit air flow through said conduit in response to a control signal below a certain level and to divert

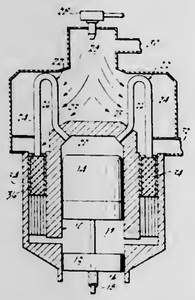
air flow from said conduit in response to a control signal above said certain level, said control unit comprising a housing, a partition secured in said housing and defining a first chamber for sensing the induction pressure in said induction passage downstream of said throttle and a second chamber for creating a control signal and transmitting such control signal to said valve assembly, said partition having at least one aperture, an umbrella check valve permitting flow from said second chamber through said aperture to said first chamber and obstructing flow from said first chamber through said aperture to said second chamber, said housing further having at least one sintered metal air bleed opening into said second chamber, a retainer plate overlying said air bleed and having at least one opening for admitting air to said air bleed, said retainer plate further having a projection surrounding said opening to inhibit passage of moisture through said opening, a dust cover overlying said retainer plate, and composite filter cartridges disposed between said retainer plate and said air bleed and between said aperture and said induction passage, said control unit defining means for responding when said induction pressure is constant or decreasing and is below said certain level to create a control signal conforming to said induction pressure and for transmitting such control signal to said valve assembly to permit air flow through said conduit, for responding when said induction pressure increases but is below said certain level to create a control signal which gradually increases toward said induction pressure and for transmitting such control signal to said valve assembly to permit air flow through said conduit, and for responding when said induction pressure increases from below said certain level to above said certain level to create a control signal which gradually increases to above said certain level and for transmitting such control signal to said valve assembly to divert air flow from said conduit upon elapse of an interval following said increase in said induction pressure to above said certain level.

4,050,250

HEAT TRANSFER ELEMENT

Louis J. Danis, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 30, 1975, Ser. No. 627,423
Int. Cl.² F02G *1/04*
U.S. Cl. 60—517 **10 Claims**



1. In combination, a Stirling cycle hot gas reciprocating engine and a heat transfer element for transferring heat formed by the combusting fuel to the pressurized contained working gas comprising:

an enclosure having an outer surface exposed to the hot gases caused by said combustion and defining an internal cavity;

a relatively gas impermeable, high strength container located within the cavity to hold the pressurized working gas to be heated; and

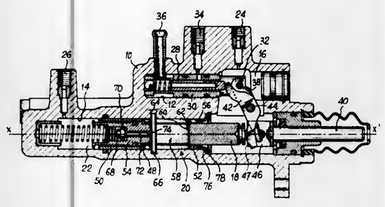
a low melting temperature metal disposed in the chamber defined between the inner surface of the enclosure and the outer surface of the container, the metal being a liquid at the operating temperature of the heat transfer element.

4,050,251

HYDRAULIC BOOSTER

Jean-Jacques Carre, Montreuil, and Roland Muterel, Bessancourt, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Jan. 26, 1976, Ser. No. 652,265
Claims priority, application France, Mar. 4, 1975, 75.06652
Int. Cl.² B60T *13/16*; F15B *7/00*
U.S. Cl. 60—550 **8 Claims**



1. In a hydraulic power system including a high pressure source and a low pressure fluid reservoir, a hydrauic servomotor comprising:

a housing defining an actuating chamber and a pressure chamber and having a bore communicating the actuating chamber and the pressure chamber;

piston means slidable in said bore and separating the actuating chamber from the pressure chamber;

said piston means including an outer piston and an inner piston disposed within the outer piston;

a distributing valve communicating with the high pressure source and the low pressure fluid reservoir to control the pressure in the actuating chamber;

operator actuating means cooperating with said distributing valve to communicate the actuating chamber with the high pressure source;

said piston means being responsive to the pressure in the actuating chamber to move in the bore and effect pressurization of said pressure chamber;

releasable coupling means between the inner piston and the outer piston to permit the inner and the outer pistons to move in unison when the pressure in the actuating chamber is above a predetermind value and to disengage the inner piston from the outer piston when the pressure in the actuating chamber is below the predetermined value and said operator actuating means is engageable with the inner piston to move the inner piston relative to the outer piston;

abutment means attached to said housing;

said inner and outer pistons having openings to receive said abutment means to limit the movement of the inner and outer pistons in the bore when said abutment means engages the inner and the outer pistons.

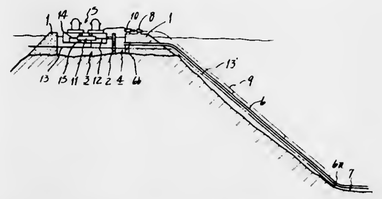
4,050,252

OCEAN NUCLEAR POWER EQUIPMENT

Tetsuichiro Nakanishi, Osaka, Japan, assignor to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Jan. 23, 1976, Ser. No. 651,892
Int. Cl.² F01K *23/04*; F03G *7/04*
U.S. Cl. 60—641 **11 Claims**

1. Ocean nuclear power equipment comprising a nuclear reactor power plant, a reservoir for storage of hot discharge water from cooling the nuclear reactor, the water pooled in said reservoir being circulatorily used as nuclear reactor cooling water, a source of cold water, a temperature differential power plant including electric generating means which makes use of a temperature differential between said hot discharge water and steam obtained from the nuclear reactor, and said cold water, means for conducting said hot discharge water through the temperature differential power plant to the reservoir whereby the temperature of said discharge water is lowered for recirculation to the nuclear reactor as said cooling water, and means for discharging said cold water from the temperature differential power plant.

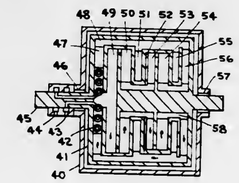


4,050,253

THERMODYNAMIC MACHINE

Michael Eskeli, 7994-41 Locke Lane, Houston, Tex. 77042

Continuation-in-part of Ser. No. 674,398, April 7, 1976. This application May 13, 1976, Ser. No. 685,998
Int. Cl.² F02C *1/04*
U.S. Cl. 60—650 **6 Claims**



4. In a power generator wherein within a rotating rotor a compressible working fluid is compressed and then expanded, the improvement comprising:

a. compressing said working fluid adiabatically by centrifugal force in an outwardly extending fluid passage within said rotor;

b. removing heat from said working fluid downstream of said compression in a heat exchanger carried by said rotor;

c. expanding said working fluid in an inwardly extending fluid passage with heat being added into said working fluid during the expansion by a heat exchanger being carried by said rotor.

4,050,254

MODULAR STRUCTURES, RETAINING WALL SYSTEM, AND METHOD OF CONSTRUCTION

Homayoun J. Meheen, Golden, and Farrel D. Nielson, Castle Rock, both of Colo., assignors to International Engineering Company, Inc., Denver, Colo., by said Farrel D. Nielson

Filed Aug. 13, 1975, Ser. No. 604,437
Int. Cl.² E02D *5/00*
U.S. Cl. 61—39 **13 Claims**

1. A tie-back element, for modular assembly of a wall for retaining soil along an embankment, such element to be used in combination with and in spaced relationship from other similar elements, with soil retaining panel means extending between each pair of such elements, comprising

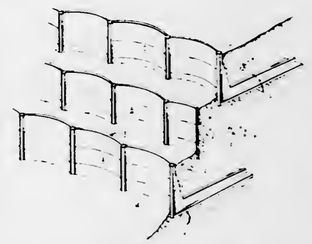
an elongated, rigid, vertically oriented column means having upper and lower longitudinal ends,

an elongated, rigid, horizontally extending leg means projecting in angled relationship to such column means from the lower longitudinal end of such column means, such leg means including horizontally oriented flange means, and

web means extending between the column means and the leg means within the interior angle formed by such column means and leg means,

such column means, leg means, and web means being unitary and sharing a common vertical plane when the element is in normal upright position for use in a retaining wall,

such column means including means extending along a major portion of its length for receiving an end of a soil retaining panel means,



such elongated leg means having an overall length which is greater than the height of such column means and including a terminal end longitudinally spaced from that end of the leg means contiguous to the column means, with cross-sectional dimensional characteristics of such leg means being greater at locations contiguous to the terminal end than corresponding dimensional characteristics of portions of such leg means contiguous to such column means,

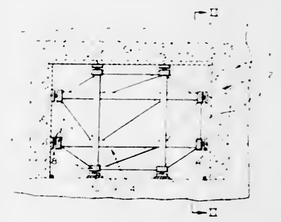
such web means extending along the leg means toward such terminal end.

4,050,255

METHODS OF SHIFTING HEAVY AND/OR LOADED STRUCTURES

Nils Harald Ahlgren, 22 Skyttevagen, 133 00 Saltsjobaden, Sweden

Continuation-in-part of Ser. No. 478,592, Dec. 6, 1974, abandoned. This application July 9, 1975, Ser. No. 594,516
Int. Cl.² E21D *11/10*
U.S. Cl. 61—45 C **5 Claims**



1. A method for shifting a heavy supporting structure used with a load carrying structure which remains stationary relative to shifting movements of said heavy supporting structure, a plurality of jack rods being carried by said load carrying structure and being secured against relative motion with respect thereto, said heavy supporting structure supporting said load carrying structure in a manner such that said heavy supporting structure is slideable relative to said load carrying

structure, a plurality of climbing jacks being secured to said heavy supporting structure, said climbing jacks being adapted to operatively engage said jack rods; said method comprising simultaneously operating said plurality of climbing jacks so that said climbing jacks move along said jack rods thereby sliding said heavy supporting structure relative to said load carrying structure which remains stationary, the reactive force in said jack rods caused by the operation of said climbing jacks being transferred to said load carrying structure by said jack rods.

4,050,256

MINE ROOF SUPPORT CONTROL SYSTEMS

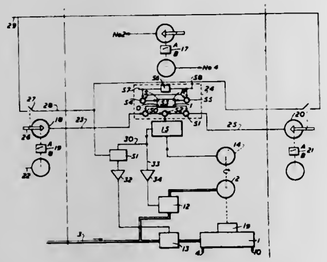
Reginald Andrew Phillips, Skelmersdale, and Kenneth Darbyshire, Wigan, both of England, assignors to Gullick Dobson Limited, Wigan, England

Filed Nov. 25, 1975, Ser. No. 635,148

Claims priority, application United Kingdom, July 29, 1975, 31625/75

Int. Cl.² E21D *15/44*

U.S. Cl. 61—45 D **16 Claims**



1. A control system for at least one self-advancing mine roof support comprising: remote selection means for providing a plurality of different coded electrical signals each of which represents a different desired function of said support, means interconnecting said remote selection means with apparatus at said support, said apparatus comprising function selection pressure fluid valve means responsive to at least one of said coded electrical signals for selecting a desired function of said support, signal generating means coupled to said valve means for generating a similar coded electrical signal which represents the instantaneous function state of said valve means, and comparator means connected to receive said at least one coded electrical signal from said remote selection means and said similar coded electrical signal from said signal generating means for determining when said valve means corresponds to said at least one coded electrical signal from said remote selection means.

4,050,257

DEMOUNTABLE DOCK ASSEMBLY

Blanchard St. Clair Parks, 311 Bunting Rd., Unit 22, St. Catharines, Ontario, and Bernette Frederick Parks, 35 Whyte Ave., Thorold, Ontario, both of Canada

Filed Dec. 3, 1975, Ser. No. 637,458

Int. Cl.² E02B *3/20*; E04B *1/00*

U.S. Cl. 61—48 **13 Claims**

1. A demountable dock assembly for use beside and in a body of water comprising:

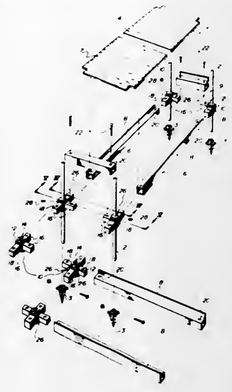
a. a plurality of anchor posts, the lower ends of each of which having associated therewith means for imbedding said post in a solid base;

b. a connector slidable along and about each of said anchor posts, said connector having at least two arms extending outwardly from a central portion of said connector, said arms lying at an angle to the direction of the longitudinal axis of the post when positioned thereabout;

c. means associated with each said connector to secure said connector at a predetermined position on said anchor post;

d. at least one open-ended tubular beam to extend between adjacent anchor posts, each of the end portions of each of said beams to receive in snug engagement one of the arms of said connectors, the cross-sectional outer profile of each of said arms being of slightly smaller size and conforming in shape to the cross-sectional inner profile of the cooperating tubular beams;

e. removable locking means to extend transversely through cooperating portions of said beams and said arms, to prevent unpurposeful longitudinal disengagement of each of said cooperating beams and connector arms from their position in snug engagement;



f. one or more panel sections supported by said beams each of said panel sections comprising a series of parallel spaced planks of common lengths and thicknesses, a U-shaped brace extending on opposite sides of the panel section embracing the ends of the planks to secure them in spaced relation;

g. said beams having associated therewith securing means comprising a longitudinal flange integral with and extending in the same plane as an exterior surface of said beams supporting outer edges of said panel sections, said plank braces seated on said beams and adjacent said flanges;

e. portions of said panel sections when in position supported by said beams lie above said removable locking means.

4,050,258

METHOD OF BUILDING EMBANKMENTS AND STRUCTURE SUPPORTS OF BACKFILLING

William E. Brewer, Toledo, Ohio, and Franklin V. Zimmer, Southfield, Mich., assignors to K-Krete, Inc., Toledo, Ohio

Division of Ser. No. 475,579, June 3, 1974. This application Dec. 3, 1975, Ser. No. 637,276

Int. Cl.² E02D *17/12*; C04B *13/22*

U.S. Cl. 61—50 **12 Claims**

1. A method of building an embankment, comprising defining the area to be filled and introducing a controlled density fill material into the area, such controlled density fill material consisting essentially of 2% to 6% by weight of Portland cement, 2% to 10% by weight of fly ash, 70% to 90% by weight of aggregate, and 5% to 15% by weight of water, the fill material being sufficiently placeable and flowable that tamping or vibrating is unnecessary and having a concrete-comparison 28-day compressive strength of less than 1400 psi, whereby the material may be easily re-excavated.

4,050,259

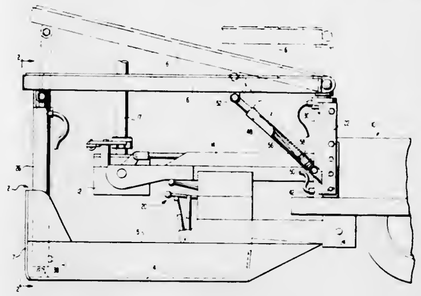
SAFETY SHIELD AND TEMPORARY ROOF SUPPORT

Ray Childress, P.O. Box 86, Richlands, Va. 24641

Filed Sept. 22, 1976, Ser. No. 725,648

Int. Cl.² E21C *11/02*

U.S. Cl. 61—63 **6 Claims**



1. A safety shield and temporary mine roof support comprising

a mounting assembly for attachment to a machine to be controlled,

a platform having inboard and outboard ends said platform having thereon between the ends thereof a control station for said machine and providing a support adjacent said control station for a machine operator,

means pivotally mounting the inboard end of said platform to said mounting assembly,

a canopy having a part thereof overlying the control station and the operator's support on the platform and having inboard and outboard ends, extensible-retractable hydraulic jacks means having opposite ends respectively pivoted to the outboard ends of the platform and canopy,

extensible-retractable hydraulic jack means having one end pivoted to the inboard end of the canopy and means supporting the other end from said mounting assembly,

and means for supplying pressure and return fluid to and from said hydraulic jack means.

4,050,260

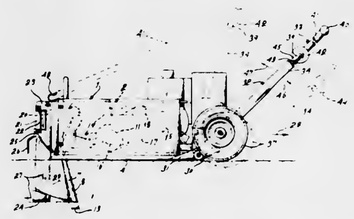
UNDERGROUND CABLE LAYING MACHINE

Denis Lemay, R. R. No. 1, Bromptonville, Canada

Filed July 6, 1976, Ser. No. 702,478

Int. Cl.² A01B *3/64, 11/00*; F16L *1/00*

U.S. Cl. 61—72.6 **5 Claims**



1. An underground cable laying machine comprising a body operatively defining a forward longitudinal direction, runners fixed under said body, extending lengthwise in said longitudinal direction and operatively supporting the whole cable laying machine on the ground, a cutter having an elongated cutting edge downwardly extending endwise below the runners, a cable guide including a pair of cable guide wings downwardly extending edgewise substantially co-extensive with said forward longitudinal direction and laterally guiding a cable in downwardly extending position rearward of said cutting edge, pivot means pivotally supporting said cutter on said body for pivotal movement of the cutter about a transverse axis relative to said body and to said longitudinal direction, reciprocation drive assembly mounted on said body, connected to said pivoted cutter, and reciprocatively pivoting the latter to and fro in said longitudinal direction, an elongated handle including a lower section and an upper section, ground-engaging wheels rotatably connected to said lower section and defining a wheel rotation axis extending transversely of said body, said lower section being pivoted to the assembly of said runners and body about a second pivot axis extending transversely of said runners and body at the opposite end of the latter relative to said cutter, a first abutment means operatively interposed between said lower section and said runners and limiting downward pivoting of said lower section relative to said runners and body, said upper section being pivoted to the upper end of said lower section about a third pivot axis extending transversely of said runners and body, and a second abutment means operatively interposed between said lower section and upper section and adjustably limiting the downward pivoting of said upper section relative to said lower section about said third pivot axis.

4,050,261

METHOD OF BACKFILLING

William E. Brewer, Toledo, Ohio, and Franklin V. Zimmer, Southfield, Mich., assignors to K-Krete, Inc., Toledo, Ohio

Filed June 3, 1974, Ser. No. 475,579

Int. Cl.² F16L *1/00*; C04B *7/02, 7/12*

U.S. Cl. 61—105 **5 Claims**

1. A method of backfilling a conduit wherein the conduit is installed in a trench, the method comprising installing the conduit, placing controlled density fill material over the conduit without compacting such fill material, such controlled density fill material consisting essentially of 2% to 6% be weight of Portland cement, 2 to 10% by weight of flyash, 70 to 90% be weight of aggregate and 5 to 15 % by weight of water, the fill material being sufficiently placeable and flowable that tamping or vibrating is unnecessary and having a concrete comparison 28-day compressive strength of less than 1400 psi, whereby the material may be easily re-excavated.

4,050,262

APPARATUS FOR EXTRACTING WATER FROM THE ATMOSPHERE

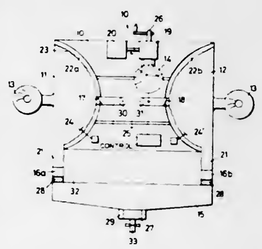
Walter Mehnert, Ottobrunn, Germany, assignor to Firma "Technico Development and Financing S. A.", Fribourg, Switzerland

Filed July 26, 1976, Ser. No. 708,875

Claims priority, application Germany, Aug. 9, 1975, 2535668

Int. Cl.² F25D *17/06*

U.S. Cl. 62—160 **10 Claims**



1. An apparatus for extracting water from the atmosphere,

comprising a heat pump including a compressor, drive means operatively connected to said compressor of the heat pump, chamber means including inlet ports, valve means connecting said chamber means to said heat pump at the heat withdrawing low pressure side thereof, suction means connected to said chamber means for transporting air therethrough, and means connected to said chamber means for withdrawing water from said chamber means, and wherein said chamber means comprise two separate chambers, said valve means comprising a multi-way valve connecting both chambers alternately to said heat pump in such a manner that heat is supplied to one chamber when heat is withdrawn from the other chamber and vice versa, said apparatus further comprising control means, sensing means responsive to an operating condition in said chambers, said sensing means being operatively connected to said control means, said valve means being operatively connected to said control means whereby the operation of said valve means depends on the operating conditions in said chambers.

4,050,263

ARRANGEMENT FOR CONTROLLING THE OPERATION OF A COOLING SYSTEM IN AN AUTOMOTIVE VEHICLE

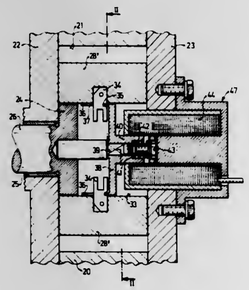
Gerhard Adalbert, Campinas, Brazil; Jürgen Hess, Baden-Baden, and Ulrich Hecht, Buhlertal, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Division of Ser. No. 650,762, Jan. 20, 1976. This application July 26, 1976, Ser. No. 709,167

Claims priority, application Germany, Jan. 21, 1975, 2502184

Int. Cl.² B60H *3/04*; F25B *27/00*; B63H *1/20*; F04B *49/00*

U.S. Cl. 62—243 **14 Claims**



1. A cooling-medium compressor, comprising, in combination, a stator housing having a housing chamber defined by an interior wall; a rotor mounted for rotation in the housing chamber, the outer surface of the rotor and the interior wall of the housing together defining between themselves crescent-shaped working spaces, the rotor having a plurality of generally radially oriented guide slits, the rotor further including sliding vanes in the guide slits guided by the latter for generally radial reciprocation between radially extended and radially retracted positions within the guide slits, the sliding vanes dividing the crescents-shaped working spaces into individual cells; and means for arresting the vanes in the retracted positions thereof, at least some of said vanes being provided with such arresting means, but at least one of the vanes not being provided with such arresting means, the number of crescent-shaped working spaces being equal to *n*, and the *n* crescent-shaped working spaces being arranged point-symmetrically with respect to one another relative to the rotation axis of the rotor, there being a plurality of groups of sliding vanes, each group of sliding vanes consisting of *n* vanes likewise arranged point-symmetrically with respect to one another relative to the rotation axis of the rotor, all the vanes of at least one group being provided with such arresting means, and all the vanes of at least one group not being provided with such arresting means.

4,050,264

REFRIGERATING CONTAINER

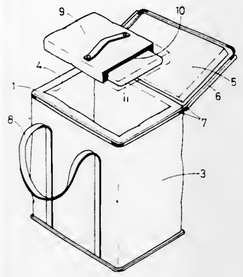
Mikio Tanaka, Kyoto, Japan, assignor to Makoto Takugyo Kabushikikaisha, Kyoto, Japan

Filed July 28, 1976, Ser. No. 709,404

Claims priority, application Japan, Aug. 4, 1975, 50-108510[U]

Int. Cl.² F25D *3/08*

U.S. Cl. 62—457 **9 Claims**



1. A portable refrigerating container comprising, in combination:

a bag member having outwardly facing side walls;

carrying straps fixed to said side walls;

an inner box removably positioned within said bag member, said inner box having an opening at one end thereof and inwardly facing inner side wall means defining a storage chamber having a given horizontal cross-sectional configuration along at least a substantially portion of its height;

a covering lid pivotally fastened to said bag member along a top, side edge thereof;

a lid member fixed to said covering lid for closing said opening at one end of said inner box when said covering lid is in its closed position; and

an inner lid slidably and closely engaged with said inner side wall means, said inner lid having a recess therein for holding cooling material;

whereby material to be refrigerated may be stored in the storage chamber to variable levels and the inner lid with the cooling material therein can be slid downwardly within the chamber and be positioned in contact with the material in the chamber.

4,050,265

FORCE-DISPLACEMENT CONTROLLER KNOB

Thomas G. Drennen, Ferguson, and Allen Neander, Bel-Ridge, both of Mo., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 3, 1976, Ser. No. 711,192

Int. Cl.² F16D *3/64*

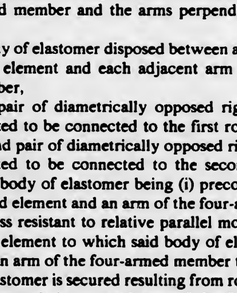
U.S. Cl. 64—11 R **6 Claims**

1. In combination with a control shaft for force controls:

an appendage having a chamber therein for receiving the free end of said shaft;

bifurcated compressible resilient means in said chamber for providing a selected resistance to force applied to said appendage;

rigid means secured to said shaft end and axially and laterally engaging said resilient means for transmitting selectively lesser force to said shaft than is applied to said appendage, said rigid means and said resilient means in part spaced from said appendage so as to permit selected movement of said rigid means in said chamber; and



means secured to said appendage for retaining said resilient means in said chamber.

4,050,266

DRIVE COUPLING

Lawrence A. Bergman, Euclid, Ohio, assignor to Lord Corporation, Erie, Pa.

Filed Nov. 21, 1975, Ser. No. 634,204

Int. Cl.² P16D *3/64*

U.S. Cl. 64—14 **15 Claims**

1. A drive coupling adapted to connect first and second rotatable shafts comprising:

a. a rigid member that has four coplanar radially extending arms, adjacent arms being oriented perpendicular to each other;

b. a rigid element disposed between each arm of the four-armed member and the arms perpendicular to said arm; and

c. a body of elastomer disposed between and secured to each rigid element and each adjacent arm of the four-armed member,

a first pair of diametrically opposed rigid elements being adapted to be connected to the first rotatable shaft and a second pair of diametrically opposed rigid elements being adapted to be connected to the second rotatable shaft, each body of elastomer being (i) precompressed between a rigid element and an arm of the four-armed member and (ii) less resistant to relative parallel movement between a rigid element to which said body of elastomer is secured and an arm of the four-armed member to which said body of elastomer is secured resulting from rotation of said rigid element relative to said arm of the four-armed member about a point disposed between said rigid element and a diametrically opposed rigid element than to relative movement of said rigid element toward said arm of the four-armed member resulting from rotation of said rigid element relative to said arm of the four-armed member about an axis that passes through said rigid element and through said diametrically opposed rigid element.

4,050,267

SLIVER HIGH PILE FABRIC KNITTING MACHINE

Rudolph S. Schaab, Rte. 2, Lakeview Road, Caryville, Tenn. 37714, and John C. Harralson, 7501 S. Whispering Oak, Powell, Tenn. 37849

Filed Mar. 25, 1976, Ser. No. 670,400

Int. Cl.² D04B *9/12*

U.S. Cl. 66—9 B **9 Claims**



1. In a sliver high pile fabric knitting machine having a rotatable circle of independent needles and a plurality of sliver and yarn feeding stations spaced circumferentially around the needle circle, the improvement comprising means for knitting a plurality of pile fiber-retaining fabric courses at one or more of said stations, said means including, at a single station,

a. a sliver feeding device for delivering a plurality of separate laterally spaced individual rovings of sliver fibers to separate arcuately spaced fixed locations of the needle circle;

b. a separate yarn feeding tube associated with each roving and disposed adjacent each said spaced location of the needle circle for delivering yarn to the needles; and

c. a separate set of knitting cams disposed adjacent each said spaced location of the needle circle for actuating the needles to receive sliver fibers and yarn and form said fibers and yarn into a course of pile fiber-retaining fabric.

4,050,268

PROCESS FOR FORMING PANTY HOSE AND AN ARTICLE FORMED THEREBY

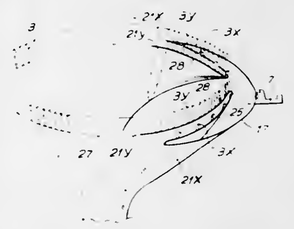
Jo Clara Boyer, Los Angeles, Calif., assignor to Saviano, A.G., Balzers, Liechtenstein

Filed Feb. 9, 1976, Ser. No. 656,739

Claims priority, application Germany, Feb. 10, 1975, 2505536

Int. Cl.² D04B *9/00*

U.S. Cl. 66—19 **5 Claims**



1. Process for forming a panty-hose type article with a continuous rotational motion of the needle cylinder, in a circular knitting machine which is provided with retaining means - such as sinkers with a rear recess - to support the knit fabric along the working area of the needles of the cylinder, in such a manner as to receive and retain said knit fabric from the needles and subsequently return it to the needles, said process including:

forming a first leg portion of tubular knit fabric by knitting with all the needles;

engaging a portion of the knit fabric working front on said retaining means along a first arc of needles corresponding to the crotch and retaining said knit fabric thereon, with the needles being free to knit fabric separator from the portion on said retaining means;

starting two initial edges of two disc - like areas along two

semiarcs wherein said first arc is divided by a central origin and retaining said initial edges;

forming the body portion by continuing knitting along the arc supplementary to said first arc and through pocket portions formed between said initial retained edges and the active needles of said both semiarcs, by cyclically activating and deactivating along each semiarc variable needle arcs starting from said origin, and by anchoring the produced partial courses to the contiguous ones thus forming two disc-like areas - front and rear - and an arcuated and tapered fabric;

connecting said initial edges and the corresponding end edges along said two semiarcs contiguous and symmetrical, to the origin, and forming a final lip for unthreading and clearing the needles of said two semiarcs;

resuming by the needles of said first arc the knitting along the line retained by said retaining means; and

starting a second tubular leg portion knit along said first arc of the crotch formed by said two contiguous semiarcs and by the origin included therebetween, said second tubular knit portion being partly formed as a continuation of the working front of the needles of the arc supplemental to said first arc of the crotch.

4,050,269

DRY THERMAL TRANSFER OF ORGANIC COMPOUNDS BY NEEDLE-BEARING SUPPORT

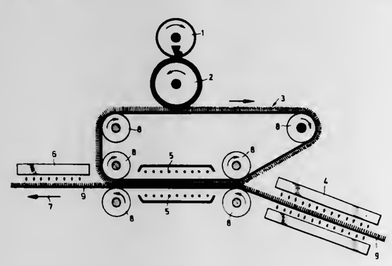
Fritz Mayer, Haltingen, Germany, assignor to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 571,651, April 25, 1975, Pat. No. 3,986,823. This application Apr. 27, 1976, Ser. No. 680,641

Claims priority, application Switzerland, Apr. 29, 1974, 5875/74

Int. Cl.² D06B *1/10*; D06P *5/15*

U.S. Cl. 68—5 D **1 Claim**



1. An apparatus comprising:

a. a longitudinally-movable web-like support, having metal needles mounted on one side thereof perpendicular to the plane of the support;

b. means for applying a heat-transferable organic compound to the needles of the support;

c. means for feeding a textile web into superposed contact with the needles of the support;

d. means for moving the textile web and the needle-bearing support in contact therewith, longitudinally, to pass both through a needle-heating zone and pass the textile web thought a warming zone;

e. means for heating the needles at a temperature high enough to cause the heat transference of the organic compound from the needles to the textile web;

f. means for separating the textile web, bearing the heat-transferred organic compound, from the needle-bearing support; and

g. means for warming the textile web at a temperature high enough to fix the heat-transferred organic compound to the textile web.

4,050,270

APPARATUS FOR WASHING AND SCOURING FABRICS

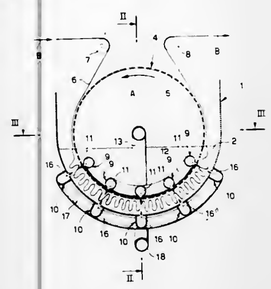
Gino Dalla Vecchia, Santorso (Vicenza), Italy, assignor to Sperotto Brevetti S.p.A., Carre', Italy

Filed May 4, 1976, Ser. No. 682,974

Claims priority, application Italy, May 5, 1975, 23008/75

Int. Cl.² D06B *3/28*

U.S. Cl. 68—158 **2 Claims**



1. Apparatus for washing and scouring fabric comprising

a tub containing washing liquid and having a wall with at least one opening therethrough,

a cylinder mounted for rotation in said tub and having a perforated side wall forming a driving element for the fabric to be washed and scoured,

said cylinder having its said side wall spaced from the interior of said tub forming a space therebetween to permit the fabric being washed and scoured to pass through said space between said cylinder side wall and the interior of said tub,

a series of pairs of washing liquid jet ejectors with each of one of the ejectors of said pairs of ejectors mounted inside said cylinder and communicating with said space between said cylinder side wall and the interior of said tub through said perforated wall of said cylinder, and with each of the other of the ejectors of said pairs of ejectors mounted outside said tub and communicating with said space between said cylinder side wall and the interior of said tub through said at least one opening in said wall of said tub,

said one of the ejectors and said other of the ejectors of each of said pairs of washing liquid ejectors mounted for emitting opposing jet flows of washing liquid toward each other from said ejectors, and

means for producing a pulsating flow of washing liquid from said ejectors, connected to said ejectors.

4,050,271

APPARATUS FOR REPAIRING INDENTIONS IN A RIGID SKIN

Noel C. Jones, Frederick, Okla., assignor to Noel C. Jones & Associates, Inc., Frederick, Okla.

Continuation-in-part of Ser. No. 481,168, June 20, 1974, Pat. No. 3,977,230. This application May 7, 1976, Ser. No. 684,399

Int. Cl.² B21D *1/12*; B21C *51/00*

U.S. Cl. 72—37 **7 Claims**

1. An apparatus for repairing a dented portion of a metal skin, comprising:

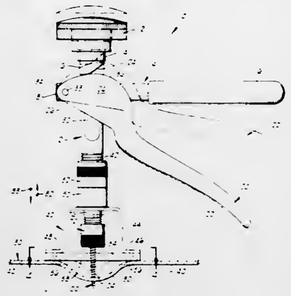
a frame;

a transparent base plate supported by the frame, the base plate having a clearance aperture extending through the medial portion thereof;

a chuck assembly slidingly supported on the frame on one side of the base plate for movement in a retracting direction away from the base plate;

a dent-engaging member supported by the chuck assembly, the dent-engaging member having a portion extending through the clearance aperture into engagement with the dented portion; and

means supported by the frame for moving the chuck assembly and the dent-engaging member in the retracting direction whereby the dented portion is drawn toward the base plate to a predetermined position as observed via the transparent base plate.



4,050,272

LOCK ASSEMBLY

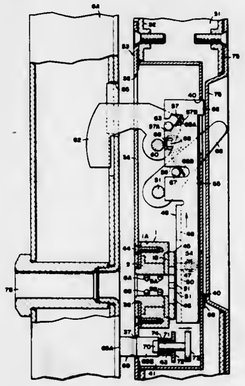
Hiroshi Tanaka, Yoro, Japan, assignor to K.K. Tokai Rika Denki Seisakusho, Japan

Filed May 12, 1976, Ser. No. 685,895

Claims priority, application Japan, May 20, 1975, 50-67459[U]

Int. Cl.² E05B *65/08*

U.S. Cl. 70—100 **5 Claims**



1. A lock assembly for sliding doors comprising:

a. a cylindrical lock having a rotor case and a rotor, said rotor having pin members disposed circumferentially about said rotor and configured such that upon insertion of an associated key into said rotor, said pin members retract and said rotor is rendered selectively rotatable in said rotor case;

b. a movable runner coupled to said rotor, said runner having a slot, said slot having a free-zone channel and a deadlock channel;

c. a rotatable hook member coupled to said runner, said hook member having a pin member configured such that when said hook member is in the unlocked position, said pin member fits into said free-zone channel, and when said hook member is in the locked position, said pin member fits into said deadlock channel; and

d. a driving means movable disposed and coupled to said hook member, whereby said hook member is rotatable by manually actuating said driving means.

4,050,273

CROSS-ROLL FORGING MACHINE

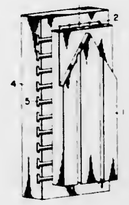
Seiji Tada, Toyama, Japan, assignor to Sato Tekko Co., Ltd., Toyama, Japan

Filed Feb. 13, 1976, Ser. No. 657,988

Claims priority, application Japan, Feb. 19, 1975, 50-23107

Int. Cl.² B21B *27/06*; B21D *37/16*

U.S. Cl. 72—69 **5 Claims**



1. In a cross-roll forging machine of the type comprising means for firmly gripping and rotating a cylindrical workpiece, a pair of holders each adapted to move in opposed relation in a direction transverse to the axis of said cylindrical workpiece and a pair of forging tools mounted on said tool holders, respectively, for forging said workpiece into a desired shape, the improvement comprising

a. electric resistance heating means embedded in each of said forging tools for heating the same,

b. control means for controlling the amount of heat applied by said heating means to said forging tools to control the temperature distribution over each of said forging tools, and

c. a plurality of grooves cut and equidistantly spaced apart from each other of the supporting surface of each of said tool holders.

4,050,274

APPARATUS FOR FORMING GROOVED WHEELS

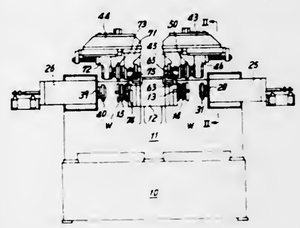
Yoshio Doi, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Japan

Filed Apr. 13, 1976, Ser. No. 676,519

Claims priority, application Japan, Mar. 22, 1976, 51-30943

Int. Cl.² B21D *22/14*

U.S. Cl. 72—82 **6 Claims**



1. An apparatus for forming a pair of disk-shaped metal blanks into grooved wheels comprising:

a support base;

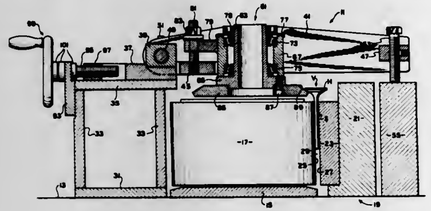
a spindle head mounted on said support base;
a spindle rotatably supported within said spindle head;
means for rotating said spindle;
a pair of mounting dies mounted on opposite ends of said spindle;
a pair of clamp heads mounted on said support base at opposite sides of said spindle head;
a sleeve slidably received in each of said clamp heads;
a clamp shaft rotatably journalled in said sleeve in coaxial relation with said spindle;
means for moving said sleeve in an axial direction;
a clamp die mounted on one end of said clamp shaft for clamping a blank in cooperation with said mounting die;
a pair of brackets rotatably supported on said support base;
a pair of carriers supported on each of said brackets and spaced from each other in an axial direction of said spindle;
a roller shaft rotatably journalled between said pair of carriers;
a roller carried on said roller shaft for forming the blank into a grooved wheel;
one of said pair of carriers being fixedly supported on said bracket and the other carrier being slidably supported in said bracket for a sliding movement in an axial direction of said roller shaft, whereby one end of said roller shaft is disengaged from said slidable carrier by a sliding movement thereof;
means for independently rotating said pair of brackets; and
means for individually restricting rotational movements of said brackets.

4,050,275

METHOD AND APPARATUS FOR ALIGNING A VALVE HEAD

Fred Schlegel, Ceresco, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 14, 1975, Ser. No. 632,125
Int. Cl.² B21B *1/20, 1/42*
U.S. Cl. 72—92 **13 Claims**



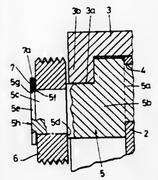
1. Apparatus for aligning the head of an engine valve in relation to the stem of the valve, said apparatus comprising:
a. a first frame;
b. a first die member fixed relative to said first frame;
c. a second die member mounted to be rotatable relative to said first die member and said first frame, each of said first and second die members including a die surface for engaging the stem, said die surfaces defining a gap for receiving the stem, said die surfaces cooperating to straighten the stem during rotation of said second die member;
d. a head straightening assembly adjacent said die members, said assembly including a second frame, and a straightening wheel freely rotatably supported by said second frame;
e. said straightening wheel including a surface disposed to rollingly engage the surface of the valve head as the stem is rolled between said die surfaces.

4,050,276

THREAD-ROLLING HEAD

Harold Habegger, Sous Graitery 10, 2738 Court, Bern, Switzerland

Filed Dec. 22, 1976, Ser. No. 753,527
Claims priority, application Switzerland, Dec. 23, 1975, 16725/75
Int. Cl.² B21H *3/04*
U.S. Cl. 72—104 **1 Claim**



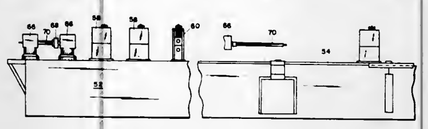
1. In a thread-rolling head of the type wherein three identical support pieces, each including a pivot pin, a supporting journal, and a crank cheek, are rotatingly and non-dispaceably mounted by means of said pivot pins in three respective bearing bores uniformly distributed in a bearing member about the longitudinal axis of said thread-rolling head, each said crank cheek resting against an associated portion of a control surface forming part of a control member rotatable with respect to said bearing member, and each said supporting journal being cantilevered and projecting beyond said control member, and wherein each of three thread rollers is rotatingly borne on a supporting surface of an associated said supporting journal and is held axially between a shoulder surface of a said support piece situated immediately adjacent to a said crank cheek and a circlip disposed on said associated supporting journal, the improvement comprising:
a V-shaped annular groove in each said supporting journal for holding a respective said circlip, each said groove having a flat side forming a shoulder situated adjacent to a said thread roller and a conical side having an outer diameter substantially equal to the diameter of said supporting surface of said associated supporting journal, each said circlip having a conical surface matching and resting against a said conical side of a said annular groove, and each said supporting journal having a flat end face situated flush with the face of each said circlip remote from each said thread roller.

4,050,277

METHOD AND EQUIPMENT FOR ROLL FORMING PRODUCTS OF COMPLEX SHAPE

Richard C. Malott, Spring Lake, and Donald J. Trainer, Ludington, both of Mich., assignors to Leigh Products, Inc., Coopersville, Mich.

Filed May 18, 1976, Ser. No. 687,511
Int. Cl.² B21D *5/08*
U.S. Cl. 72—129 **58 Claims**



39. A method fof forming a product having a complex cross-sectional shape from continuously moving initially flat stock material, comprising the steps of:
bending the stock by progressively varying the angular relationship of longitudinally extending portions of the continuously moving stock;

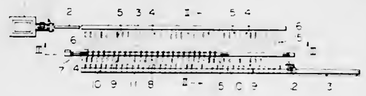
reverse bending portions of the stock while simultaneously varying the angular relationship of other portions of the stock until at least one portion of the stock is in a substantially vertical plane;
lancing areas of the portion of the stock in a vertical plane after portions of the stock have been reverse bent on themselves;
bending said stock further by progressively varying the angular relationship of portions of the stock;
supporting said stock adjacent its lateral edges so that the progressive bending into the final predetermined cross section may be accomplished without contact with the lanced portions of said stock; and
rotating, simultaneously with said supporting step, the lanced portions of the stock inwardly.

4,050,278

APPARATUS FOR CONVEYING PRODUCTS EXTRUDED OUT OF AN EXTRUDING PRESS

Toyohide Asano, and Masahiro Honda, both of Ube, Japan, assignors to Ube Industries, Ltd., Japan

Filed July 9, 1976, Ser. No. 704,063
Claims priority, application Japan, Aug. 29, 1975, 50-104021
Int. Cl.² B21C *35/02*
U.S. Cl. 72—257 **7 Claims**



1. An apparatus for conveying products extruded out of an extruding press intended for use with a stretcher which is positioned downstream from the extruding press for operations subsequent to the extrusion, comprising a number of beams provided on the side of the stretcher, said beams being reciprocally movable and being inclinable in a direction perpendicular to the axis of the stretcher, and driving means for each of said beams comprising a rack and a pinion, said pinions being rotatably connected to a common rotatable shaft by way of clutch means provided with lever mechanisms arranged between the latter and the side of the stretcher for controlling the clutch means, said lever mechanisms being operated by the displacement of the stretcher to operate the corresponding clutch means.

4,050,279

APPARATUS AND METHODS FOR FORMING AN ELONGATED PRODUCT

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed July 13, 1976, Ser. No. 704,873
Int. Cl.² B21C *25/02*
U.S. Cl. 72—261 **13 Claims**



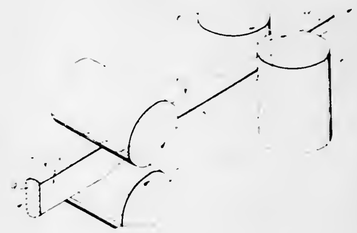
1. Apparatus for deforming a workpiece so as to form a product composed of one or more substantially adjacent, individual articles, the product having an overall cross-sectional shape which differs from that of the workpiece, said apparatus comprising:
a die having aperture means extending therethrough, said aperture means having an entrance end and including at least one aperture, with said aperture means providing an overall aperture configuration which differs from that of the workpiece and corresponds to said overall cross-sectional shape of the product to be formed, said die also including wall means which converge from an outer periphery of the die toward said entrance end of the aperture means, with each element of the surface of said wall means so converging continuously, along a single linear, substantially radially directed path, and with said elements generally defining a continuous, substantially smoothly flowing surface from element to adjacent element surrounding said entrance end of the aperture means, so as to build up pressure smoothly and continuously within the material of the workpiece as the workpiece is forced against the wall means, the surface of the wall means being further configured such that substantially all of the material of the workpiece first attains said overall cross-sectional shape of the product in substantially the same cross-sectional plane of the die at said entrance end of the aperture means; and
means for forcing the workpiece against said wall means with sufficient pressure to force the workpiece through said aperture means so as to form said product.

4,050,280

ROD ROLLING

Raymond Oliver Sayer, Townsville, Australia, assignor to M.I.M. Rolling Consultants (H.K.) Limited, Hong Kong, Hong Kong

Continuation of Ser. No. 489,059, July 16, 1974, abandoned.
This application Jan. 9, 1976, Ser. No. 647,770
Claims priority, application Australia, Aug. 6, 1973, 4351/73
Int. Cl.² B21B *1/04*
U.S. Cl. 72—234 **2 Claims**



1. A method of reduction of metal rod from stock initially of relative large transverse cross-sectional area, said method comprising:
shaping said stock into a substantially rectangular transverse cross-sectional profile, the longer sides of which are from one and one-half to two and one-half times larger than the shorter sides; then
guiding the stock into the space between a first pair of spaced parallel grooveless rolls with the shorter sides disposed substantially parallel to the work surfaces of the rolls and rollingly compressing the stock through the pair of rolls and with that pair of rolls only while not restraining lateral spreading thereof to reduce the length of the longer sides and increase the length of the shorter sides to the extent that the transverse cross-sectional area of the stock departing from said rolls is less than that of the stock approaching the rolls and the transverse cross-sectional profile of the stock departing from the rolls is substantially rectangular with the longer sides thereof substantially parallel to the work surfaces of the rolls and from one and

one-half to two and one-half times longer than the shorter sides thereof substantially perpendicular to the work surface of the rolls; then

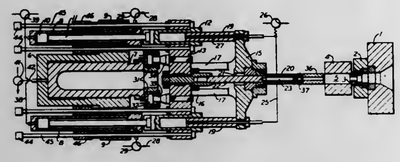
guiding the stock into the space between a second pair of spaced parallel grooveless rolls with the last-mentioned shorter sides disposed parallel to the work surfaces of the second rolls and rollingly compressing the stock through the second pair of rolls and the with second pair of rolls only while not restraining lateral spreading thereof to reduce the length of the last-mentioned longer sides and increase the length of the last-mentioned shorter sides to the extent that the transverse cross-sectional area of the stock departing from said second pair of rolls is less than that of the stock approaching said second pair of rolls and the transverse cross-sectional profile of the stock departing from the second pair of rolls is substantially rectangular with the longer sides thereof substantially parallel to the work surfaces of the second pair of rolls and from one and one-half to two and one-half times longer than the shorter sides thereof substantially perpendicular to the work surfaces of the second pair of rolls.

4,050,281

EXTRUSION PRESS WITH MULTIPURPOSE SIDE CYLINDERS

Guenter W. Sibler, Pittsburgh, Pa., assignor to Sutton Engineering Company, Pittsburgh, Pa.

Filed Jan. 2, 1976, Ser. No. 646,408
Int. Cl.² B21C *23/08;* B30B *11/30*
U.S. Cl. 72—265 **4 Claims**



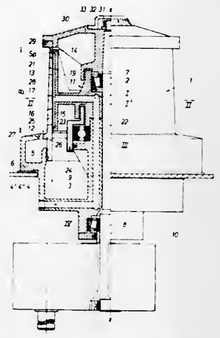
1. A press for extruding billets through a die, comprising an extrusion die holder, a billet container behind the die holder provided with a billet-receiving passage therethrough aligned with the die holder, a stationary main cylinder spaced behind the container and aligned with the container passage, the cylinder having an open front end, a ram slidably disposed in the cylinder, a piercer cylinder rigidly mounted at each side of the main cylinder parallel thereto and having an open front end, a piston in each piercer cylinder, a piston rod connected to each piston and extending out of the front end of the surrounding cylinder, a coupling cylinder mounted on the front end of each rod and extending forward therefrom and having an open front end, a piercer crosshead in front of the ram rigidly connected to said coupling cylinders, an extrusion crosshead in front of the piercer crosshead, means extending past the piercer crosshead and rigidly connecting the extrusion crosshead to said ram for movement by it, plungers slidably disposed in said coupling cylinders and rigidly connected with the extrusion crosshead, a hollow stem mounted on the extrusion crosshead and extending forward therefrom in axial alignment with said container passage for insertion therein, the extrusion crosshead having an opening through it behind the stem, a mandrel holder carried by the piercer crosshead and extending forward through said opening, a mandrel in said stem supported by said mandrel holder and having a tip at its front end of smaller diameter than the mandrel body behind it, means for supplying hydraulic fluid to the rear ends of the piercer cylinders while fluid is locked in the coupling cylinders to move said stem forward to the billet container, means for then exhausting fluid from the coupling cylinders to permit the forwardly moving piercer crosshead to move the mandrel forward from the stem into said container, stops behind the piercer crosshead connected with that crosshead for movement thereby, abutment means engageable by said stops to arrest the forward movement of the piercer crosshead as soon as only said tip of the mandrel projects into a die in the die holder, and means for then supplying hydraulic fluid to said main cylinder and the coupling cylinders to move said stem forward into the container with the full power of the press to extrude a billet through the die while the piercer crosshead and mandrel are held stationary by said stops.

4,050,282

INNER COOLING SYSTEM ON DRAWING DIE DRUMS

Günter Herzog, Hemer-Deilinghofen, Germany, assignor to Ernst Koch & Co., Hemer-Ihmert, Germany

Filed Nov. 29, 1976, Ser. No. 745,798
Claims priority, application Germany, Nov. 27, 1975, 2553215
Int. Cl.² B21C *9/00*
U.S. Cl. 72—286 **8 Claims**



1. Inner cooling system on drawing die drums, particularly for the working of wires, comprising

a rotating drawing die drum having an inner jacket wall,

an inner insert extending substantially across the width of said drawing die drum and slightly spaced from said inner jacket wall of said drawing die drum defining a small rotational gap therebetween, said inner insert being stationarily mounted relative to said rotating drawing die drum,

said inner insert including vertical axially extending ribs dividing said inner insert into a plurality of individual chambers lying angularly spaced one behind the other in a peripheral direction by said axially extending ribs,

said inner insert including circumferential peripheral ribs extending in a peripheral direction on an upper and lower edge, respectively, closing said individual chambers at said upper and lower edges, respectively,

all of said ribs having free ends being adjusted to said inner jacket wall of said drawing die drum spaced opposite therefrom defining said small rotational gap therebetween, said free ends of said axially extending ribs constituting scrapers extending along the axial length of said inner jacket wall and scraping the latter clean during rotation of said drawing die drum,

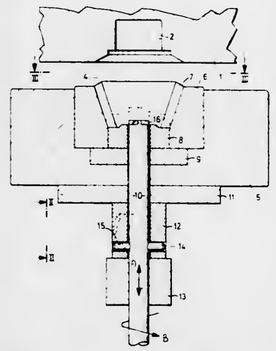
feed conduit means for a continuous refreshing cooling medium flow-wise communicating with said individual chambers for supplying cooling medium thereto.

4,050,283

METHOD AND APPARATUS FOR FORGING BEVEL GEARS

Franz Schober, Munich, Germany, assignor to Bayerisches Leichtmetallwerk Graf Blucher von Wahlstatt KG, Munich, Germany

Filed June 12, 1975, Ser. No. 586,216
Claims priority, application Germany, June 20, 1974, 2429543
Int. Cl.² B21D *22/02, 45/00;* B21K *1/30*
U.S. Cl. 72—344 **6 Claims**



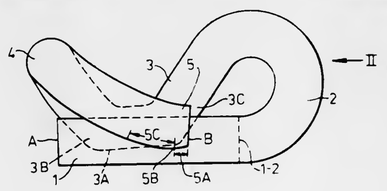
1. Apparatus for forging helical-toothed or spiral-toothed gear elements comprising a mold having an axially movable die and a stationary die, said stationary die having a peripheral wall and a bottom wall of an internal configuration for forming the teeth of said gear elements, an ejector pin mounted to extend freely through the bottom wall of said stationary die along the central axis thereof, the front face of said ejector pin being provided with means for forming a cooperating keying means with the gear being formed and means for supporting said ejector pin in fixed position during formation of said gear element and for axially and rotationally moving said ejector into said die on completion thereof, said means for moving said ejector pin including means for limiting said movement to a vector corresponding to the pitch of the teeth formed on said gear, thereby simultaneously rotating and ejecting said gear from the stationary die.

4,050,284

FASTENING MEMBER FOR ANCHORING A RAILWAY RAIL

David William Miller, Retford, England, assignor to Pandrol Limited, London, England

Filed May 3, 1976, Ser. No. 682,792
Claims priority, application United Kingdom, May 7, 1975, 19251/75
Int. Cl.² B21D *11/10*
U.S. Cl. 72—384 **19 Claims**



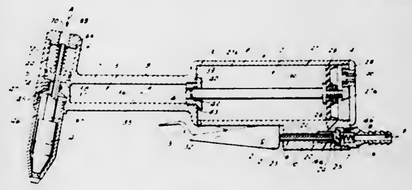
1. A method of making a railway rail-fastening clip comprising subjecting a rod of resilient metal at least 0.8 centimeter thick to a first bending operation which results in the rod having, proceeding from one end of the rod to the other end, a first portion which is a substantially straight leg, a second portion which is a reverse bend, a third portion which is beside the first portion, then a fourth portion and then a fifth portion, the bent rod being such that when it is placed in a particular orientation with the first portion horizontal and the rod is viewed from above the third and fifth portions appear to be on opposite sides of the axis of the first portion, and then subjecting the bent rod to a second bending operation which results in said other end of the rod being up-turned and which comprises causing a first shaping tool to force into contact with a second shaping tool the whole of that part of the length of the rod which, when the finished clip is in a particular position, in which the lowermost points on both ends of the first portion lie in a horizontal plane, the lowermost points on the third and fifth portions lie in another horizontal plane and the fourth portion crosses and lies above the axis of the first portion, is between the lowermost point on the fifth portion and said other end of the rod.

4,050,285

AIR-HYDRAULIC BLIND-RIVETING TOOL WITH SHORT RESET TIME

Karl Bosch, Hermaringen, Brenz, and Max Fritzenschaft, Giengen, Wurttemberg, both of Germany, assignors to Adolf Diener, Apparate- U. Maschinenbau, Hermaringen, Germany

Filed Apr. 21, 1975, Ser. No. 569,709
Claims priority, application Germany, Apr. 20, 1974, 2419190; Apr. 20, 1974, 7413845[U]
Int. Cl.² B21J *15/34*
U.S. Cl. 72—391 **6 Claims**



1. A tool for setting a blind rivet, said tool comprising:

a housing forming an air chamber, a liquid-filled hydraulic chamber adjacent thereto, and a liquid-filled working chamber communicating with said hydraulic chamber;

a working piston in said working chamber and carrying a chuck for grasping a mandrel of a blind rivet, said piston being displaceable in said working chamber between a ready position wherein a mandrel can be fitted into said chuck and an actuated position wherein said chuck is retracted;

an air piston in said air chamber subdividing same into a front compartment and a rear compartment and displaceable between a front position of maximum volume of said rear compartment and minimum volume of said front compartment and a rear position of minimum volume of said rear compartment and maximum volume of said front compartment, said housing being formed at the front end of said front compartment with a first throughgoing hole for gas flow between same and the atmosphere and at the rear end of said rear compartment directly in a wall thereof with a second throughgoing hole for gas flow between same and the atmosphere;

a hydraulic piston carried on said air piston and displaceable in said hydraulic chamber between an advanced position pressurizing said hydraulic chamber and corresponding to said front position of said air piston and a retracted position corresponding to said rear position of said air piston;

first valve means for admitting, when actuated, pressurized

air into said rear compartment and thereby displacing said air piston into said front position, displacing said hydraulic piston into said advanced position, and displacing said working piston into said actuated position;

second valve means on said wall in said second hole and responsive to air pressure for blocking air flow from said rear compartment out through said second hole when said first valve means is actuated to admit compressed air to said rear compartment and for opening and allowing air flow from said rear compartment out through said second hole when said first valve means is not actuated, said air chamber being generally cylindrical and said housing having an end cap constituting a rear wall of said air chamber, said second valve means being provided in said end cap; and a spring braced between said housing and said working piston and urging same into said ready position, whereby displacement of said working piston from said retracted position into said ready position by said spring absent actuation of said first valve means automatically displaces said air piston into said rear position and forces air out of said rear compartment through said second hole, said second valve means including:

a valve seat formed at said second hole,

a valve disk sealing engageable over said seat to block gas flow from said rear compartment,

a valve spring braced between said housing and said disk and urging same away from said seat,

an abutment element, said valve spring normally pressing said disk against said element, said element being formed with at least one gap for air flow through said second hole when said disk lies against said element, and

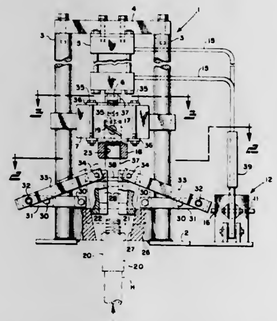
a tubular spring housing fixed in said end cap and formed with a shoulder having said seat, said spring housing having an inner diameter greater than the outer diameter of said disk, said element being a washer having a plurality of angularly spaced and radially outwardly extending tabs engaging the inner wall of said tubular housing.

4,050,286

SWAGING APPARATUS

James Mills Gasier, Timberlake, and William Edgar Currie, Cleveland Heights, both of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Oct. 15, 1976, Ser. No. 732,758
Int. Cl.² B21D *41/00*
U.S. Cl. 72—416 **22 Claims**



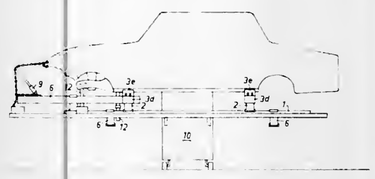
1. In swaging apparatus of the type wherein a pusher pushes an article to be swaged downwardly into a cavity of a closed die defined by mating segmental die members and wherein die opening means are operative during upward retraction of said pusher to open said die by upward and lateral separating movement of said die members thus to release the swaged article for downward discharge from between said die members; the combination therewith of actuating means on said pusher engageable with said die opening means to open said die in response to upward retraction of said pusher; and means for disengaging said actuating means and die opening means prior to downward movement of said pusher in swaging direction to release said die members for movement into mating engagement.

4,050,287

METHOD FOR VEHICLE ALIGNMENT

Jörgen Borup, Vaxjo, Sweden, assignor to AB Nike Hydraulik, Eskilstuna, Sweden

Division of Ser. No. 551,193, Feb. 19, 1975, Pat. No. 4,023,394.
This application Sept. 7, 1976, Ser. No. 720,525
Claims priority, application Sweden, Feb. 20, 1974, 7402252
Int. Cl.² B21D *1/12*
U.S. Cl. 72—457 **1 Claim**



1. A method of mounting a motor vehicle upon frame apparatus of the type adapted for applying forces to selected portions of the damaged vehicle body structure to restore the vehicle body and/or frame to its original configuration and for concurrently making measurements relative to selected datum points, said method comprising the steps of:

securing to the underside of the vehicle body a plurality of parallel, generally horizontal spaced rigid supporting beams each transverse to the longitudinal axis of the vehicle,

raising the vehicle with the transverse beams secured thereto a sufficient distance to permit the insertion underneath said transverse beams of a rigid, substantially rectangular frame whose width is less than the length of the transverse beams and whose length exceeds that of the vehicle body,

rigidly securing each said transverse beam to said rigid frame at each intersection of a transverse beam with a structural member of the rigid frame,

and securing force-applying means to said rigid frame for application of forces to selected portions of the vehicle body.

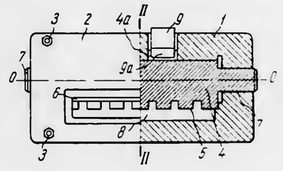
4,050,288

DIE FOR EXTRUDING ARTICLES WITH VARIABLE CROSS-SECTION PROFILE

Vladimir Borisovich Zaikovsky, ulitsa Mishina, 12, kv.19; Jury Prokhorovich Kutuzov, ulitsa Gvardeiskaya, 1, kv.90; Mikhail Fedorovich Zakharov, ulitsa Tolbukhina, 12, Kv.19, all of Moscow; Evgeny Emelyanovich Kavtaev, ulitsa Karla Marxa 3, kv.34, Verkhnaya Salda Sverdlovskoi oblasti; Jury Grigorievich Poedinschikov, ulitsa Karla Libknekhta, 8, kv.1, Verkhnaya Salda Sverdlovskoi oblasti; Jury Mikhailovich Bazhanov, ulitsa Karla Libknekhta, 12, kv.11, Verkhnaya Salda Sverdlovskoi oblasti, and Valentin Andrianovich Schapov, ulitsa Vostochnaya, 12, kv.10, Verkhnaya Salda Sverdlovskoi oblasti, all of U.S.S.R.

Filed Apr. 21, 1976, Ser. No. 678,885
Int. Cl.² B21C *3/06*
U.S. Cl. 72—468 **4 Claims**

1. An extruding die for extruding articles with a variable cross-sectional profile, comprising: a stationary bearing component; a pair of components mounted on said bearing component and together forming a hole or aperture for said extruding die; one of said components is rigidly mounted on said bearing component; and the other of said components is rotatably mounted opposite said rigidly mounted component, and is provided in the form of a component with a periphery repre-



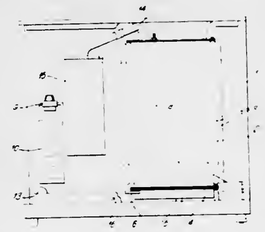
senting by itself a variable profiled surface, and rotatable component is adjusted to a predetermined profile by rotation about its axis to effect changing of the cross-sectional profile of said aperture or hole of said die.

4,050,289

METHOD FOR TEMPERATURE CALIBRATION OF PROBES AND THE LIKE

Geoffrey Fairbairn, Chesterton; George Frederick Cooke, Royston; Reginald Winkworth, Western in Gardano, and Jan Koreki, Portishead, all of England, assignors to Techne (Cambridge) Limited, Duxford, England

Filed Oct. 8, 1976, Ser. No. 731,086
Int. Cl.² G01K *15/00*
U.S. Cl. 73—1 F **14 Claims**



1. A method for calibrating at least one temperature sensor in a fluidized bath, comprising the steps of:

embedding said to-be-calibrated at least one sensor and a reference temperature sensor in a medium having low thermal capacity and high thermal conductivity; placing said embedded sensors and said medium within a mass of confined particulate material which is in an at least partial fluidized state;

subjecting said mass for a predetermined period of time to a controlled rate of flow of a gaseous medium to establish and maintain said mass in a fluidized state while simultaneously the said gaseous medium is performing heat exchange with said particulate material until a first selected value of temperature of said particulate material has been attained, the rate of flow of said medium being maintained constant and the rate of flow being according to the temperature developed in the heat exchange to compensate for thermal expansion of said gaseous medium in order to maintain said fluidized bath at a substantially constant level;

increasing the heat exchange between said gaseous medium and said material while changing the rate of flow according to the temperature of the gaseous medium for said thermal expansion compensation until a second temperature value of said material is attained, said second temperature value being a predetermined incremental change from said first temperature value, said second value being that at which said calibration is to be made;

simultaneously terminating the rate of flow of said gaseous medium to, and heat exchange with, said particulate material to change said material from a fluidized state to a quiescent state for a predetermined period of time to complete heat exchange transfer between said material and said embedding medium until the temperature of said embedding medium surrounding said sensors becomes substantially stabilized at said second temperature value;

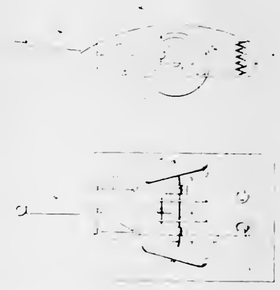
recording the indications of said temperature sensors while the supply of gaseous medium to, and the heat exchange with, said particulate material remains terminated and said second temperature value is stabilized.

4,050,290

DEVICE FOR MEASURING FRICTION BETWEEN WHEEL AND SUPPORT

Börje Arne Gunnar Lonnroth, Abiskovagen 6, Vallingby, Sweden (S-162 25)

Filed Nov. 26, 1975, Ser. No. 635,352
Claims priority, application Sweden, Nov. 27, 1974, 7414859
Int. Cl.² G01N *19/02*
U.S. Cl. 73—9 **8 Claims**



1. A device for measuring friction between wheel and support comprising:

a. at least one wheel with a wheel suspension means permitting the wheel to rotate about a rotation axis line;

b. means for moving the wheel suspension means with the wheel rolling on the support and somewhat inclined to the direction of movement; and

c. measuring means for measuring the turning moment about a line being on the whole horizontal and substantially perpendicular to the direction of movement, which moment is produced on the wheel suspension means by the forces arising at the movement in the contact surface between the wheel and support.

4,050,291

FILTER CONDITION RESPONSIVE DEVICE COMPENSATED FOR CHANGES IN MEDIUM FLOW

Lorne W. Nelson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

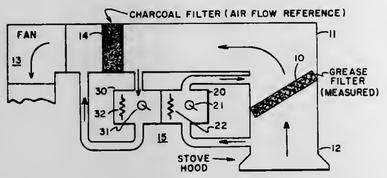
Filed Sept. 27, 1972, Ser. No. 292,575
Int. Cl.² G01N *15/08*
U.S. Cl. 73—38 **6 Claims**

1. A filter condition responsive apparatus for responding to the presence of a predetermined collection of material in a filter from the medium flowing through a pipe and through the filter comprising,

differential pressure responsive means adapted to be connected to the pipe on each side of the filter to respond to the drop in pressure of the medium flowing in the pipe due to the restriction produced by the filter, said differential

pressure increasing as the filter collects material from the medium and being effected by a change in the rate of flow of the medium through the filter, said means providing a first output,

flow responsive means adapted to be connected to the pipe to provide a second output indicative of the rate of flow of medium through the pipe,



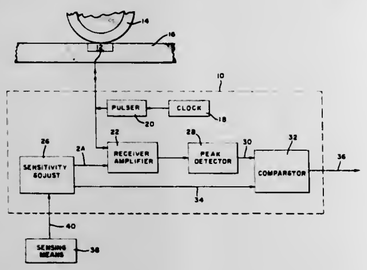
and comparison means connected to said differential pressure response means and said flow responsive means for comparing said first and second outputs, said comparison means providing an output only indicative of the change in pressure drop across said filter due to the presence of material collected in the filter from the medium as the effect of a change in rate of medium flow is cancelled.

4,050,292

METHOD AND APPARATUS FOR TESTING RAILROAD WHEELS

Peter K. Bloch, Old Greenwich, Conn., assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed Oct. 18, 1976, Ser. No. 733,444
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.5 R **9 Claims**



1. A method for testing railroad wheels in a test zone comprising the steps of:

sensing the presence in the test zone of a wheel falling within a first category or a wheel falling within a second category and providing a corresponding control signal;

transmitting an acoustic energy search signal into the wheel and receiving defect responsive echo signals therefrom;

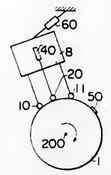
selectively detecting responsive to said control signal defects of a first magnitude in a wheel falling within said first category and defects of a second magnitude in a wheel falling within said second category.

4,050,293

DEVICE FOR DETECTING THE UNEVENNESS OF A CURVED SURFACE

Raiji Shimomura, Kokubunji; Toru Habu, Hachioji; Hisaaki Itoh, Mie; Naomi Sakai, Kanagawa, and Tatsuo Goto, Hamura, all of Japan, assignors to Hitachi, Ltd. and Hitachi Metals, Ltd., both of, Japan

Filed Nov. 20, 1975, Ser. No. 633,715
Claims priority, application Japan, Nov. 27, 1974, 49-135491
Int. Cl.² G01B *5/28*
U.S. Cl. 73—105 **18 Claims**



1. A device for detecting the unevenness of a circumferential surface of a cylindrical-like member comprising:

means for seizing the cylindrical-like member;

means for rotating said seizing means such that said cylindrical-like member is rotated about an axis of rotation;

means for detecting at least one projection or recess on the circumferential surface of said cylindrical-like member;

supporting means including at least two contact members which contact the circumferential surface of said cylindrical-like member for supporting said detecting means at a position relative to the surface of said cylindrical-like member; and

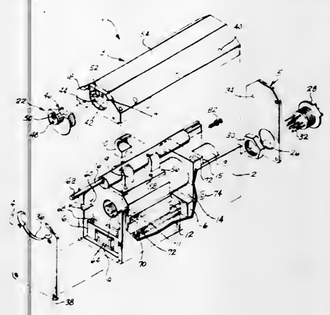
means for guiding said supporting means so as to maintain contact of said contact members with the circumferential surface of said cylindrical-like member.

4,050,294

APPARATUS AND METHOD OF MEASURING SURFACE ROUGHNESS

Michael Joseph Andrews, Seattle; William Allen Davis, North Bend, and Roger Alvin Senske, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed July 6, 1976, Ser. No. 702,840
Int. Cl.² G01B *5/28*
U.S. Cl. 73—105 **10 Claims**



1. An apparatus for measuring the finish of the interior surface of a fastener hole comprising:

a case;

a probe containing a stylus and transducer therein to convert vertical motions of said stylus as it traverses surface irregularities into electrical signals by said transducer, said probe mounted to a carriage means slidably mounted within said case;

a pilot adapted to removably fit upon said case, said pilot containing a cylindrical extension thereupon with a diameter substantially equal to that of a fastener hole and adapted to fit within said hole, said extension containing a hole therein to encompass said stylus and probe such that when said extension is inserted into said fastener hole said stylus and probe pass through said hole and contact the interior portion of said fastener hole;

reciprocating means contained within said case, said means secured at one end to said carriage and at the other end to said case, said reciprocating means adapted to slidably move said carriage means within said case;

means for determining the position of said carriage means as said carriage means slidably moves within said case;

means for electronically presetting the position of said carriage;

means for electronically comparing the position of said carriage means with a plurality of selectable carriage positions, said means causing said carriage means to slidably reverse its direction of travel when said carriage means reaches said positions; and

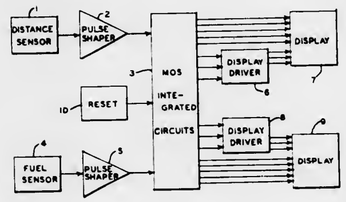
means for displaying said electrical signals produced by said stylus and said transducer.

4,050,295

DIGITAL MEASURING SYSTEM FOR ENGINE FUEL PERFORMANCE

Norman L. Harvey, 381 Ocean Ave., Marblehead, Mass. 01945

Filed Sept. 12, 1975, Ser. No. 612,682
Int. Cl.² G01F *9/00*
U.S. Cl. 73—114 **23 Claims**



1. A fuel consumption measuring apparatus for fuel powered vehicles comprising; a distance traveled sensor connected to the kinetic system for said vehicle which produces electric pulses, the number thereof in proportion to the distance traveled by said vehicle; a fuel flow sensor connected to the fuel system for said vehicle which produces electric pulses, the number thereof in proportion to the per unit fuel flow therein; counting means to count separately the distance pulses and the fuel flow pulses over a selected time period and calculating means to compute the ratio of the two counts for a selected time period to obtain the fuel consumption per distance rate for said vehicle.

4,050,296

RELATIVE COMPRESSION OF AN INTERNAL COMBUSTION ENGINE

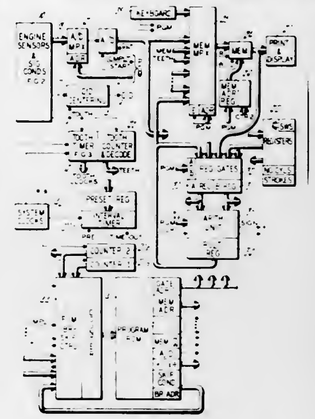
Richard S. Benedict, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 7, 1976, Ser. No. 684,038
Int. Cl.² G01M *15/00*
U.S. Cl. 73—116 **10 Claims**

1. In a method for providing an indication of relative cylinder compression of a reciprocating internal combustion engine, the steps of:

determining in turn the maxima and minima in the speed of a rotating engine from excursions in magnitude of a signal derived from an engine parameter, the magnitude of which follows excursions in engine speed as a consequence of successive cylinder-related compression strokes, and providing successive manifestations thereof referred to hereinafter as "max" and "min", respectively;

providing the difference between the magnitudes of each



max and the next succeeding min after sensing each min and before sensing the next max; and

comparing each provided difference with a predetermined difference to thereby determine when the speed excursions are sufficiently small that detection of the next succeeding max may be impaired, and in response thereto, utilizing the last min sensed as the next succeeding max and next sensing thereafter the next succeeding min.

4,050,297

MEASURING ELECTRICAL PARAMETERS OF AN INTERNAL COMBUSTION ENGINE DURING CRANKING

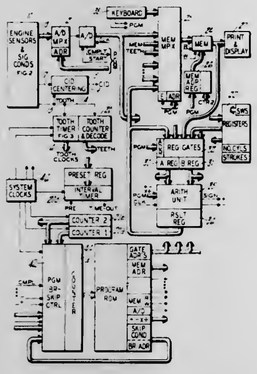
James R. Pettingell, Granby, and Lee R. Armstrong, Enfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 7, 1976, Ser. No. 684,032
Int. Cl.² G01M *15/00*
U.S. Cl. 73—117.2 **9 Claims**

7. In a method of recording the magnitudes of electrical parameters of a reciprocating internal combustion engine having an electric starter motor, during cranking of the engine, the steps of:

determining the time of an extreme magnitude in the excursions of magnitude of an engine parameter which varies in conjunction with the power required to crank the engine, said magnitude having maxima and minima associated with each cylinder thereof; and

recording in timed relationship with said extreme magnitude of said engine parameter the magnitude of each of a plural-



ity of electrical parameters of various portions of the electric system associated with the engine.

4,050,298

MANUALLY OPERATED CONTROL VALVE AND TESTING APPARATUS INCORPORATING SUCH VALVE

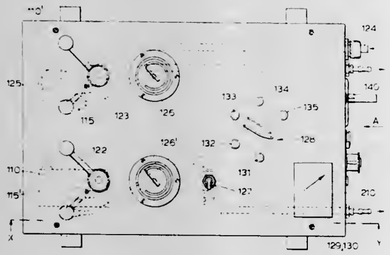
Frederick John Charles Hope, Chobham, and James Malcolm Pigney, Bracknell, both of England, assignors to Hope Technical Developments Limited, Ascot, England

Filed May 10, 1976, Ser. No. 684,823

Claims priority, application United Kingdom, May 8, 1975, 19506/75; Aug. 29, 1975, 35759/75

Int. Cl.² G01L *5/28*

U.S. Cl. 73—121 **9 Claims**



1. A manually-operated control valve including manual operating means for controlling the supply and exhaust of a working fluid to and from a fluid operable system which comprises a housing having an inlet for the working fluid and an outlet for delivering working fluid to the system, a pressure-regulating valve disposed between said inlet and said outlet and an exhaust valve for exhausting fluid from the system, said regulating valve and said exhaust valve each including actuating means comprising plungers which are operable by a single manual operating means.

4,050,299

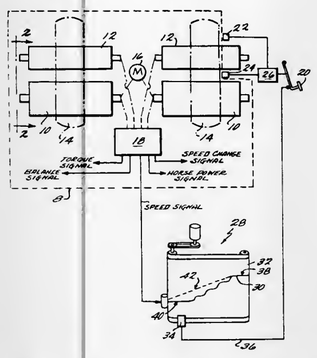
BRAKE TESTING METHOD

Lloyd R. Maxwell, Bradford Hills, Downingtown, Pa. 19335

Continuation-in-part of Ser. No. 555,813, March 6, 1975, Pat. No. 3,979,950. This application Sept. 7, 1976, Ser. No. 720,642

Int. Cl.² G01L *5/28*

U.S. Cl. 73—126 **3 Claims**



1. A method of testing an anti-skid brake system installed in a wheeled vehicle, said brake system including a driver-actuated brake pedal and a control system having first and second sensors associated with the first and second wheels respectively for sensing a condition of the respective wheel which is indicative of imminent lock-up and a control circuit which in its normal operating mode is responsive to both sensors to release brake force to both wheels in response to the occurrence of said condition at either wheel and to rapidly reapply brake force in response to the disappearance of said condition, said method comprising: engaging the peripheries of the first and second rolls with the peripheries of first and second motor-driven rolls respectively, driving the rolls up to a high peripheral speed typical of high speed road driving thereby driving the wheels at a simulated high road speed, maintaining the motor drive to the rolls and actuating the brake system sufficient to apply the vehicle brakes and insufficient to produce said wheel condition which is indicative of imminent wheel lock-up, effecting said condition at said first wheel by releasing the motor drive to said first roll while maintaining the motor drive to said second roll, generating a signal at least in part from the sensed speed of either of the wheels, said signal having a predetermined characteristic which varies with said speed whereby said signal indicates whether said control system has been operated in its normal mode by the sensor associated with said one wheel, reapplying the motor drive to said one roll, effecting said condition at said second wheel by releasing the motor drive to said second roll while maintaining the motor drive to said first roll, and generating a system at least in part from the sensed speed of either of the wheels, said signal having a predetermined characteristic which varies with said speed whereby said signal indicates whether said control system has been operated in its normal mode by the sensor associated with said second wheel.

4,050,300

TORQUE INDICATING ASSEMBLY

John W. Turner, and Russell A. McLaughlin, both of Houston, Tex., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Apr. 28, 1976, Ser. No. 681,870

Int. Cl.² G01L *5/24*

U.S. Cl. 73—139 **8 Claims**

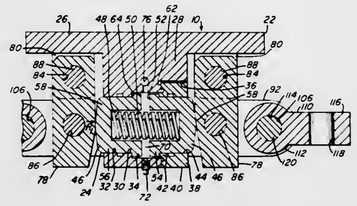
1. A torque indicator assembly comprising:

a body member;

variable volume chamber means carried by said body member and operable to receive a fluid therewithin;

said chamber means having a pair of opposed oppositely biased movable portions;

force responsive means carried by said body member and operable to increase the pressure of the fluid within said chambers by moving one of said opposed portions when an external force is applied in a first direction and by moving the other of said opposed portions when such an external force is applied in a direction opposite said first direction;



said force responsive means including spaced portions pivotally carried by said body member and responsive to such an external force in a manner that one of said spaced portions pivot to move a first of said opposed portions while the other of said spaced portions simultaneously pivots in a direction away from the second of said opposed portions;

indicating means communicating with said chamber means and responsive to the pressure of the fluid within said chamber means;

and at least one link portion communicating between said spaced portions and pivotally carried thereby adjacent respective end sections of said link portion.

4,050,301

ELECTROMAGNETIC WATER CURRENT METER WITH SYNTHETIC DIRECTION FIELD

Vincent J. Cushing, 410 Standish Drive, Deerfield, Ill. 60015

Filed May 27, 1976, Ser. No. 690,747

Int. Cl.² G01F *1/58*

U.S. Cl. 73—189 **19 Claims**



1. A device for producing signals representative of orthogonal flow velocity components with reference to a known coordinate system, including an electromagnetic flow transducer, producing signals representative of orthogonal flow velocity components with reference to an unknown coordinate system, which further includes,

an artificial field generator for producing a field with predetermined orientation relative to said known coordinate system,

sensing means, integral with said transducer, for sensing orthogonal components of said field in said unknown coordinate system, and producing signals related thereto,

signal responsive means, responsive to said transducer-produced signals, and to said sensing means-produced signals for providing signals representative of orthogonal flow velocities in said known coordinate systems.

4,050,302

THERMOELECTRIC HEAT FLOW TRANSDUCER

Warren E. Haupin, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 548,401, Feb. 10, 1975, abandoned. This application Feb. 23, 1976, Ser. No. 660,264

Int. Cl.² G01K *17/00*

U.S. Cl. 73—190 H **5 Claims**



1. A thin, rugged, heat resistant device for measuring the rate of heat flow passing through a structure having a surface exposed to ambient conditions comprising

a first, relatively thin metal plate adapted to be placed in direct physical contact with the exposed surface of the structure passing heat,

a second, relatively thin metal plate located in spaced, rigid, parallel relation with said first plate and generally coextensive therewith to form a sandwich-like structure having a relatively narrow space between the plates,

a plurality of spaced openings provided in and extending through said first and second places, and

a plurality of relatively short, structural, thermal conductors extending through said openings and plates and bridging the narrow space therebetween to provide a plurality of heat paths between the plates, the conductors being made of a material having a relatively high coefficient of thermal conductivity, and capable of supporting the plates in said rigid, parallel relation, said conductors in combination with at least one of said plates providing a plurality of differential thermocouples, the conductors being in intimate, physical contact with each plate so that, in addition, good heat conduction is provided between each conductor and each plate whereby the impedance to and the disturbance of the rate of heat flow through the structure being measured is such that a temperature drop is established between the metal plates to provide a temperature representing signal without substantially altering normal heat flow through the structure.

4,050,303

FLUID FLOW METERS

John Hemp, Marston, and Derek Gerald Wyatt, Oxford, both of England, assignors to National Research Development Corporation, London, England

Filed May 27, 1976, Ser. No. 690,784

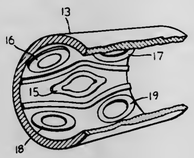
Claims priority, application United Kingdom, May 27, 1975, 23179/75

Int. Cl.² G01F *1/58*

U.S. Cl. 73—194 EM **5 Claims**

1. An electromagnetic flowmeter for measuring the rate of fluid flow in a duct of circular cross-section, comprising a pair of electrodes disposed at diametrically opposed positions on the duct, main winding means for producing a main magnetic field in the duct extending transversely between the electrodes to establish a signal across the electrodes, and first, second,

third and fourth subsidiary winding means spaced around the main winding means for producing respective subsidiary magnetic fields having components parallel to but in the opposite direction to the main magnetic field in the duct, the first and



second subsidiary (magnetic fields) winding means each being disposed adjacent to a respective electrode upstream thereof and the third and fourth subsidiary (magnetic fields) winding means each being disposed adjacent to a respective electrode downstream thereof.

4,050,304

APPARATUS FOR MEASURING MASS FLOW OF FLUIDS

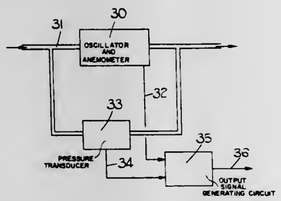
Alan Thomas, Stratford-on-Avon, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Sept. 27, 1976, Ser. No. 727,229

Claims priority, application United Kingdom, Oct. 4, 1975, 40704/75

Int. Cl.² G01F *1/32, 1/76*

U.S. Cl. 73—194 B **3 Claims**



1. An apparatus for measuring the mass flow rate of fluids, comprising a fluidic oscillator, the frequency of oscillation of which is a function of the volume flow rate therethrough, means for generating a first electrical signal dependent on said frequency of oscillation, means for generating a second electrical signal dependent on the pressure difference across said oscillator, and means, responsive to said first and second electrical signals, for generating an output signal proportional to

$$2Sc_o^{3/2}A_o^2 \cdot P/f$$

where

S = Strouhal number of said oscillator

c_o = coefficient of said oscillator

A_o = equivalent area of said oscillator

and are fixed functions of said oscillator, and P and f respectively are said pressure difference and said frequency of oscillation.

4,050,305

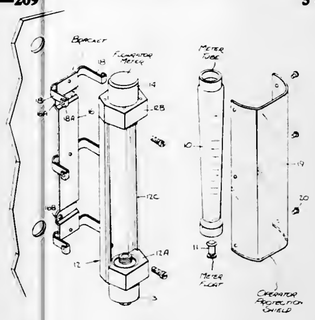
SHIELD AND BRACKET ASSEMBLY FOR FLOWMETER

Daniel J. Evans, Feasterville, and Hubert Riester, Huntingdon Valley, both of Pa., assignors to Fischer & Porter Company, Warminster, Pa.

Filed Oct. 6, 1976, Ser. No. 730,073

Int. Cl.² G01F *15/10*

U.S. Cl. 73—209 **5 Claims**



1. In combination with a standard flowmeter in which an open-ended variable-area flow tube subject to breakage is supported in an upright position within a meter body having a rear wall in a manner exposing all but the rear portion of the tube, whereby the vertical position of a float within the tube may be observed to provide a reading of flow rate, a shield and bracket assembly cooperating with said flowmeter to protect personnel in the vicinity of the flowmeter should the tube break in the course of operation, said assembly comprising:

A. a bracket formed by a vertical strip which is secured to the rear wall of said meter body and is provided with resilient arms which project forwardly from opposite sides thereof in spaced relation to the meter body, said arms terminating in fingers; and

B. a channel-shaped transparent plastic shield whose opposing margins are attachable to said fingers of said resilient arms, said shield enveloping the exposed portion of the meter tube to define a safety chamber thereabout which confines explosion products resulting from breakage of the tube and exhausts fluid discharged from the shattered tube rearwardly from the chamber in the space between said arms and said meter body to prevent injury to personnel, said shield being formed of flexible material such that when it is subjected to an outward pressure by the force of an explosion, the shield supported on the resilient arms of the machine is not ruptured by this pressure but yields to accommodate itself thereto.

4,050,306

METHOD AND APPARATUS FOR MEASURING PRESSURES

Syed J. Khalid, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Feb. 27, 1976, Ser. No. 661,980

Int. Cl.² G01L *7/00;* **G05D** *11/00*

U.S. Cl. 73—212 **12 Claims**

1. An improved pressure sensing probe of the type for placement within a fluid flow chamber downstream of a plurality of spaced obstructions, and delivery of the flow to a pressure sensitive device to obtain an indication of pressure wherein the improvement comprises:

a. a pair of probe tubes having open ends for placement at spaced positions within a fluid chamber for conducting the flow of fluid therefrom; and

comparing means interconnecting the tubes' other ends and adapted to discharge to the pressure sensitive device the flow only from the tube having the higher pressure when there is a variance of pressure between said spaced positions.

4,050,307

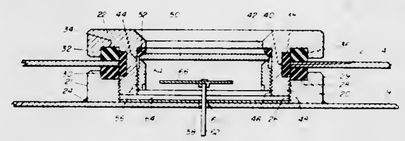
DIAL HUMIDITY INDICATOR FOR CONTAINERS

Willard C. McMullen, Little Falls, N.J.; Samuel Gee, Sr., deceased, late of Denville, N.J.; by Patricia E. Whitney, legal representative, Frankfort, Ill., and by Joan E. Bennett, legal representative, Chula Vista, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 3, 1975, Ser. No. 610,026

Int. Cl.² G01N *19/10*

U.S. Cl. 73—337 **5 Claims**



1. A dial humidity indicator for attachment to a container which comprises:

dial indicating and sensing means adapted to be disposed within said container for measuring the percentage of relative humidity therein;

sealed viewing means for observing said indicating means from outside said container; and means, for holding said sensing means and said viewing means to said container so that they are shock isolated therefrom and hermetically sealed thereto.

4,050,308

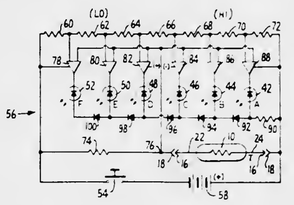
ELECTRONIC FISH LOCATOR

Jimmy Luther Lee, 1045E Shary Court, Clayton, Calif. 94518

Filed July 22, 1976, Ser. No. 707,563

Int. Cl.² G01K *7/24*

U.S. Cl. 73—362 AR **2 Claims**



1. An electronic fish locator, comprising:

a first conductor;

a second conductor;

voltage divider means having a first end terminal connected directly to said first conductor, a second end terminal connected directly to said second conductor, and a plurality of intermediate terminals for producing reference voltages;

temperature signal conductor means;

fixed resistance means having a first terminal directly connected to said first conductor and a second terminal directly connected to said temperature signal conductor means;

temperature sensitive resistance means;

flexible cable means for connecting said temperature sensitive resistance means directly between said second conductor and said temperature signal conductor means;

switch means for connecting a battery between said first conductor and said second conductor;

comparing means for comparing said reference voltages with the voltage of said temperature signal conductor means when said switch means is closed; and

indicating means for indicating the ones of said reference voltages between which the voltage of said temperature signal conductor means lies;

said comparing means comprising a plurality of integrated comparator circuits, said indicating means comprising a plurality of light-emitting diodes, each of said light-emitting diodes being connected to the output terminal of one of said integrated comparator circuits to receive current therefrom, and each pair of light-emitting diodes controlled by signals from adjacent terminals of said voltage divider means being provided with a diode connected between the light-emitting diode terminals which are not connected directly to integrated comparator circuits.

4,050,309

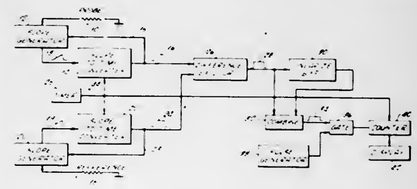
METHOD AND APPARATUS FOR MEASURING TEMPERATURE

Kenneth G. Junkert, Manhattan Beach, and Henry P. Voznick, Arcadia, both of Calif., assignors to William Wahl Corporation, Los Angeles, Calif.

Filed Nov. 4, 1974, Ser. No. 520,232

Int. Cl.² G01K *7/16*

U.S. Cl. 73—362 AR **29 Claims**



1. A temperature measuring instrument comprising

first and second resistors,

first and second slope generators connected with said first and second resistors respectively, for generating first and second ramp signals, each having a slope determined by a corresponding one of said resistors,

first and second slope to time converters responsive respectively to said first and second ramp signals for generating first and second time intervals respectively indicative of the slopes of said first and second ramp signals,

timing means for simultaneously repetitively triggering said first and second converters,

means responsive to said first and second converters for repetitively actuating said first and second slope generators in synchronism with each other,

means responsive to both said converters for combining the time intervals produced thereby to generate a measurement signal representative of the difference between said first and second time intervals, and

means for indicating the duration of said measurement signal.

4,050,310

EXERCISING APPARATUS

Dennis L. Keiser, 14634 E. Annadale Ave., Sanger, Calif. 93657

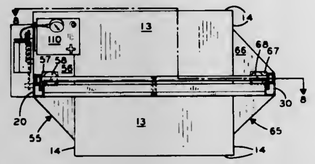
Filed Mar. 17, 1976, Ser. No. 667,611

Int. Cl.² G01L *5/02;* **A63B** *21/20*

U.S. Cl. 73—379 **12 Claims**

6. In an exercising apparatus having a frame, a member

borne by the frame for movement in opposite directions along a substantially upright path of travel, means including a fluid pump operably connected to the member for resisting movement of the member in an upward direction along the path of travel for the application of muscular force to the member in said upward direction against the action of the resisting means, the improvement comprising a latch assembly pivotally mounted on the frame for movement between a raised position in said path of travel and a lowered position out of said path of travel and said latch assembly having an end portion engageable with the member in the raised position to retain the member in a ready position and releasable therefrom by upward movement of said member for gravitational movement of the latch assembly to the lowered position.



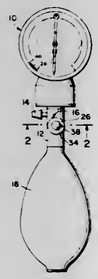
7. An exercising apparatus comprising a fluid system containing a fluid, a fluid pump having a plurality of pistons connected to the system and adapted for operation to pump fluid through the system developing a fluid pressure within said system resistant to operation of the pump, a drive assembly linked to the pump and operating the pump only when said assembly is operated in a driving mode, a substantially upright frame, a member mounted on the frame for movement along a substantially upright path of travel, and means interconnecting the member and the drive assembly and operating the drive assembly in said driving mode only when the member is moved in an upward direction along the path of travel and permitting substantially unrestricted gravitational movement in a downward direction along the path of travel.

4,050,311

SPHYGMOMANOMETER

John Meredith Leach, Box 341, Port Jefferson, N.Y. 11777

Filed Jan. 21, 1976, Ser. No. 651,207
Int. Cl.² G01L *19/00*
U.S. Cl. 73—389 **10 Claims**



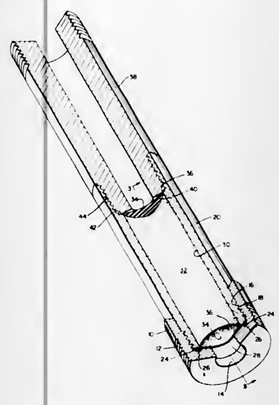
1. A rigidly structured, functionally stable, manually hand held measuring instrument comprising a manifold, a gauge directly and rigidly mounted on and functionally connected to said manifold, a squeeze bulb also directly and rigidly mounted on and functionally connected to said manifold, and a short stroke, quick action press type air escape valve also directly and rigidly mounted on and functionally connected to said manifold at a position where it can be freely operated to permit air escape or stop air escape instantly at the will of the operator by a very slight up or down but no extending, contracting nor sidewise movement of the operator's thumb on one hand(either right or left) alone so as to leave the other four fingers of the same hand free to securely and motionlessly support the instrument by said bulb and at the same time also squeeze or release the bulb while the operating hand and the thumb and all four fingers thereon are in a completely natural position so that no movement of the instrument in any direction is caused thereby, and also the said gauge is in a perfect and natural, unobstructed viewing position by said operator whose other hand is left entirely free constantly throughout a measuring operation.

4,050,312

GAUGE PROTECTOR SEAL

Alma Lillian Myrick, Rte. 8, Box 67, Texarkana, Ark. 75501

Filed Mar. 19, 1976, Ser. No. 667,762
Int. Cl.² G01L *7/08, 7/16*
U.S. Cl. 73—395 **3 Claims**



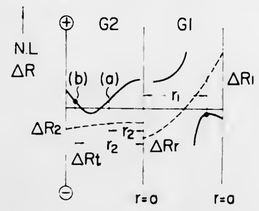
1. Apparatus for transferring pressure from a flow line having a first fluid therein to a standby line having one end in communication with said flow line, said standby line having a closed column of a second fluid and a pressure indicating means therein, said apparatus comprising a flexible piston of elastomeric material mounted for limited axial movement in daid standby line when subjected to pressure, said piston being disposed between said flow line and said indicating means and having curved concave ends which terminate in thin pointed piston edges, said standby line comprising a sleeve having said piston mounted therein, and means for limiting the axial movement of said piston in said sleeve to a short distance, the normal diameter of said piston being slightly in excess of the inside diameter of said sleeve, and flexible means for sealing the junction between said flow line and said standby line, said sealing means being disposed between said flow line and said piston, whereby pressure in said flow line is transferred to said sealing means to effect limited movement of said piston and to subject said second fluid and said fluid indicating means to said pressure.

4,050,313

SEMICONDUCTOR PRESSURE TRANSDUCER

Satoshi Shimada; Kazuji Yamada; Yasumasa Matsuda, all of Hitachi; Ichiro Kimura, Mito; Michitaka Shimazoe, Hitachi, and Yukio Takahashi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 3, 1976, Ser. No. 692,368
Claims priority, application Japan, June 4, 1975, 50-66449; June 4, 1975, 50-66450
Int. Cl.² G01L *9/06*
U.S. Cl. 73—398 AR **9 Claims**



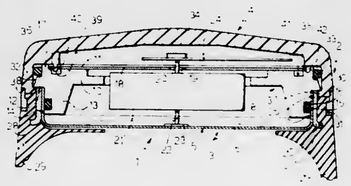
1. A semiconductor pressure transducer comprising a pressure-responsive circular diaphragm made of a single crystal of semiconductor material, a first strain gauge unit including at least one strain gauge element formed by injecting an impurity into a linear region extending on a surface of said diaphragm in parallel with a predetermined crystallographic axis and having a piezoresistance effect, a second strain gauge unit including at least one strain gauge element formed by injecting an impurity into a linear region extending on said surface of said diaphragm perpendicularly to said axis and having a piezoresistance effect, and means for fixing said diaphragm at the outer peripheral portion thereof, wherein the gauge elements of said first and second gauge units are disposed such that the numerical value representing the non-linearity of the stress-resistance change characteristic of the gauge elements of said first gauge unit is substantially equal in its absolute value to and opposite in sign to the numerical value representing the non-linearity of the stress-resistance change characteristic of the gauge elements of said second gauge unit.

4,050,314

PRESSURE GAUGE

Francesco Longhetto, Turin, Italy, assignor to Semperit Anstalt, Schaan, Liechtenstein

Filed Mar. 31, 1976, Ser. No. 672,269
Claims priority, application Italy, Apr. 4, 1975, 67866/75
Int. Cl.² G01L *7/08*
U.S. Cl. 73—406 **8 Claims**



1. Pressure gauge of the type comprising a cup-shaped case closed at the front by a cover consisting at least partly of transparent material; a dial provided on the front with a graduated scale and disposed in the case so as to be visible through the cover; measuring means disposed in the case to measure the pressure of the external environment; a pointer mobile along the graduated scale under the control of the measuring means; the cover being mounted rotatably on the case in an axially fixed position with respect thereto, and seal means being interposed between the cover and case; said seal means being disposed in such a manner as to be directly influenced by the pressure to be measured, and being elastically deformable by the effect thereof to angularly lock the cover relative to the case when said pressure exceeds a determined value.

4,050,315

REMOTELY ACTUATED SAMPLING APPARATUS

Reinhold S. Markfelt, Minneapolis, Minn., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 6, 1976, Ser. No. 748,257
Int. Cl.² G01N *1/12*
U.S. Cl. 73—425.4 R **7 Claims**



1. A sampling device for taking a sample of liquid at any desired level in a well and sealing the sample against possible contamination by liquid at a higher level as the device is withdrawn; said device having an average density greater than the liquid and including an integral sample receiving chamber portion intermediate its ends which is closed at the lower end of said chamber portion and has an opening at the top of said chamber portion which may be selectively closed; said opening being formed in a ring-like portion which includes upper and lower valve seat portions; a ball having a density lower than said liquid positioned in said chamber and adapted to be lifted by liquid entering said opening until said ball rests on said lower valve seat portion; an upper valve member mounted on an upwardly extending rod member for movement into or out of engagement with said upper valve seat portion; said rod member having first detent means thereon engageable with second detent means in an upper housing portion of said device to normally selectively lock said rod with said upper valve member in its position of engagement with said upper valve seat portion; and cable means extending upwardly from said rod for lowering or raising said device, said cable means being sufficiently strong as to resist breakage when a snapping force is applied thereto to cause said first and second detent means to become disengaged.

4,050,316

PIPETTE ASPIRATOR DEVICE

Edward J. Rapoza, Butler, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Nov. 3, 1975, Ser. No. 628,078
Int. Cl.² B01L *3/02*
U.S. Cl. 73—425.6 **12 Claims**

1. An aspirator device comprising:
a hollow elongated body member terminating in a tip portion at one end and being open at both ends;

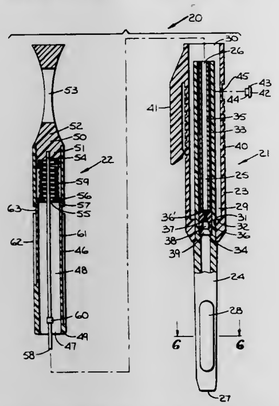
a hollow plunger and pin guide open at both ends and extending rearwardly from the tip portion concentrically within the body portion;

a plunger rod and pin assembly reciprocally mounted in the body and having a handle portion thereon;

the guide cooperating with the body to control the direction of travel of the plunger rod and pin assembly;

stop means limiting the amount of axial movement of the plunger rod and pin assembly;

pipette receiving means in the body adjacent the tip so that when a pipette is placed in the tip through the open end thereof it can be extended until it is gripped by the pipette receiving means and held in position for use;



the plunger being movable away from the tip until stopped so that withdrawal thereof will aspirate a predetermined amount of fluid into the pipette from a fluid source and being movable thereafter toward the reduced tip until stopped thereby projecting the fluid from the pipette; and

the pin having a piston mounted intermediate its ends for slidably sealing engagement with the walls of the guide with the guide having sufficient resilience and flexibility to permit reciprocal movement of the pin and piston therein with the piston slightly deforming the walls of the guide as it passes therethrough to facilitate the sealing interengagement therewith thereby reducing the need for strict coaxial alignment of the piston and the hollow guide.

4,050,317

CENTRIFUGAL WEIGHTS ORIENTING SYSTEM

Arthur V. Brandt, 88 Atlantic Place, Hauppauge, N.Y. 11787

Continuation-in-part of Ser. No. 436,748, Jan. 25, 1974, abandoned, and a continuation-in-part of Ser. No. 486,183, July 5, 1974, abandoned. This application Oct. 1, 1974, Ser. No. 511,047

Int. Cl.² F16H *33/02*

U.S. Cl. 74—64 **5 Claims**

1. A centrifuging weights orienting system comprising:

a rotor mounted about a first axis for rotation at a fixed angular velocity;

first driving means for driving the rotor to rotate about the first axis;

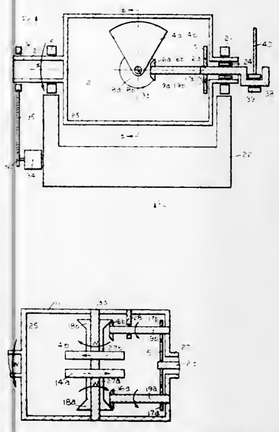
two centrifuging weights rotatably mounted about a common, second axis which is anchored at its ends to the rotor and intersects at right angles to the first axis;

second driving means for driving the two centrifuging weights into oppositely directed rotations about the second axis at substantially the same fixed, angular velocity;

control means actuated by the rotation of the rotor at activate the second driving means for achieving the oppositely directed rotations;

said second driving means including a set of two driven gears each fixedly attached to one of the centrifuging weights, and also including means for synchronizing the oppositely directed rotations so that at periodic, predetermined time intervals the centrifuging weights are oriented in a common and fixed, prespecified spatial direction;

said control means comprising a common driving mechanism mechanically coupled to the driven gears for simultaneously driving these gears and the two attached centri-



fuging weights thereby achieving the oppositely directed rotations;

said common driving mechanism comprising a stationary anchor shaft inside the rotor and an anchor gear attached onto the anchor shaft which has an axis of rotation substantially coinciding with the first axis;

said anchor shaft being adjustable in rotational angular position to thereby define the common and fixed, spatial direction toward which the two centrifuging weights are periodically oriented; and

means for adjusting the angular position in a predetermined manner.

4,050,318

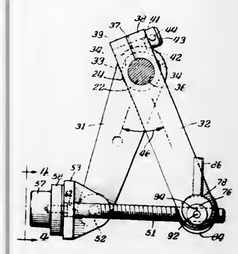
SIDEREAL RATE DRIVE MECHANISM FOR A TELESCOPE MOUNT

Kenneth J. Wolf, 3727 W. Wilson, Chicago, Ill. 60645

Filed May 8, 1975, Ser. No. 575,787

Int. Cl.² F16H *27/02*

U.S. Cl. 74—89.15 **7 Claims**



1. A drive mechanism for a telescope mount, the mount including a polar axis member and a polar support member,

said axis member being rotatably supported by said support member, said drive mechanism comprising a first elongated arm adapted to have one end portion thereof secured to said axis member, a second elongated arm adapted to have one end portion thereof secured to said support member, said first and second arms extending outwardly in different directions from said polar and support members and forming an angle therebetween, and drive means interconnecting the outer end portions of said first and second arms for moving said outer end portions relative to each other and thereby changing said angle at about the sidereal rate, and further including adjustment means connected to one of said arms and to said drive means for changing the distance from said polar axis member to said drive means.

4,050,319

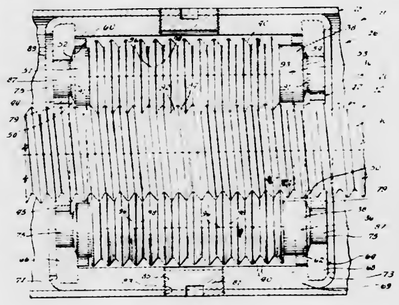
LINEAR ACTUATOR

Richard B. Stanley, 17763 G Drive North, Marshall, Mich. 49068

Filed Jan. 16, 1976, Ser. No. 649,693

Int. Cl.² F16H *27/02*

U.S. Cl. 74—89.15 **10 Claims**



1. In a linear actuator including a threaded shaft member, a bearing unit mounting member having a portion of same disposed in substantial concentric relation to the shaft member, a bearing unit operatively interposed between said mounting member and said shaft member for moving one of said members linearly and axially of said shaft member when the other member is rotated about the longitudinal axis of the shaft member, and means for rotating said other member about said axis of said shaft member, with said bearing unit comprising a plurality of discrete rollers each defining a force transmitting surfacing about each end of same and a plurality of thrust transmitting faces intermediate said bearing surfacings of the respective rollers that are angled relative to the longitudinal axis of the respective rollers and that are in rolling substantially complementing engagement with the shaft member threading, and an outer race structure defining spaced apart raceway surfacings about the shaft member axis about which said roller bearing surfacings ride, with said roller faces being free of engagement with said outer race structure and the mounting member and said rollers being in free rolling nonjournalled relation to said outer race structure, the improvement wherein:

said roller bearing surfacings each define at the respective ends of said rollers:

a radial load transmitting bearing surface and a thrust transmitting bearing surface intermediate said radial load transmitting surface and said faces at the respective ends of the respective rollers,

said outer race structure raceway surfacings each defining a radial load transmitting surface on which the respective roller radial load transmitting bearing surfaces respectively ride and a thrust transmitting surface on which the respective roller thrust transmitting bearing surfaces respectively ride in substantial complemental relation thereto,

said roller thrust transmitting bearing surfaces at either end of the respective rollers being substantially equally angled relative to the longitudinal axis of the respective rollers and at an angulation up to ninety degrees that exceeds said roller thrust transmitting face angulation.

4,050,320

TRANSMISSION MECHANISMS

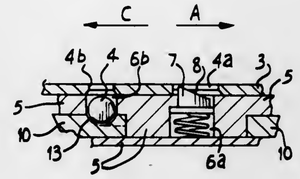
Frederick James Hawksworth, Crewe, England, assignor to Rolls-Royce Motors Limited, Crewe, England

Filed Feb. 13, 1975, Ser. No. 549,748

Claims priority, application United Kingdom, Feb. 20, 1974, 7654/74

Int. Cl.² F16H *27/00*

U.S. Cl. 74—112 **6 Claims**



1. A transmission mechanism comprising a reversible motor, a driving member rotatably driven from the motor, a rotor member non-rotatable with respect to and eccentrically mounted on the driving member and arranged to rotate therewith, a further member eccentrically mounted with respect to and selectively rotatable with respect to the rotor member, and output member operatively supported by and selectively rotatable relative to said further member, a first means, automatically operable when said motor is driving in a reverse direction of rotation and said output member is in one position, to provide a positive mechanical connection between the rotor member and the further member, said first means being biased to its operative position, and a second means automatically operable, when said motor is driving in a forward direction of rotation and said output member is in another position, to provide a positive mechanical connection between the further member and the output member, said second means being also employed firstly, when the direction of rotation of the motor is changed from reverse to forward rotation, so as to enable the rotor member to carry the further member to its correct position for the second means of positive mechanical connection to take place, and secondly, when the direction of the motor is changed from forward to reverse rotation, so as to hold the further member to the output member until such time as the rotor member is moved to the position where it can be engaged by the first means of positive mechanical connection.

4,050,321

MULTI V-GROOVED PULLEY STRUCTURE AND METHOD OF MAKING SAME

Derald H. Kraft, Canton, Ohio, assignor to Aspro, Inc., Canton, Ohio

Filed Mar. 15, 1976, Ser. No. 666,931

Int. Cl.² F16H *55/44*; B21D *53/26*

U.S. Cl. 74—230.8 **18 Claims**

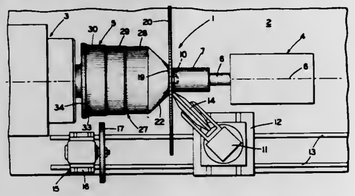
1. A one-piece, sheet metal multi V-grooved pulley structure including:

a. a circular hub wall;

b. an annular flange wall connected with the hub wall and

extending generally axially from the hub wall and terminating in an open end opposite the hub wall;

c. a series of outwardly opening V-shaped grooves formed in the annular flange wall, said grooves each being defined by a pair of inwardly angled side walls;



d. and each of the pairs of angled side walls increasing in metal thickness from the open end toward the hub wall of the annular flange wall.

4,050,322

BELTING

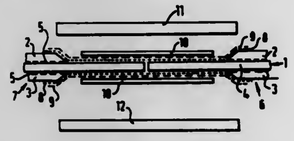
Peter Lothar Ernst Möring, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Filed Sept. 27, 1976, Ser. No. 726,782

Claims priority, application United Kingdom, Oct. 3, 1975, 40500/75

Int. Cl.² F16G *1/00*

U.S. Cl. 74—231 J **22 Claims**



1. Belting having a layer of covering material and a compression resistant longitudinal reinforcement structure as hereinbefore defined, the belting being formed with a joint region at which ends of the reinforcement structure are in end-to-end relationship with a layer of jointing fabric as hereinbefore defined overlying the ends of the reinforcement structure and positioned with warp members of the jointing fabric lying parallel to the length of the belting.

4,050,323

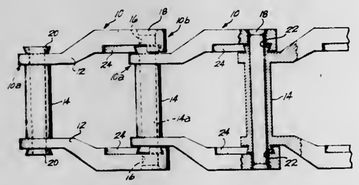
PINTLE-TYPE INDUSTRIAL CONVEYOR CHAIN

Thomas I'Anson, 4014 Hunts Point Road, Bellevue, Wash. 98004

Filed Jan. 12, 1976, Ser. No. 648,457

Int. Cl.² F16G *15/12*; B65G *17/40*

U.S. Cl. 74—251 C **5 Claims**



1. A chain for industrial conveyors and the like comprising a succession of links pivotally interconnected including a first link and an adjoining second link having mutually adjacent ends each with transversely opposite side portions overlappingly confronting and pivotally joined to the respective side portions of the other by sets of pivotally engaged connecting elements formed integrally with the respective link side portions, said sets of connecting elements each comprising a stub journal porjecting transversely from one such side portion and a socket bearing, conformed to and pivotally receiving said stub jorunal, said projecting stub journals being of conically divergent form and the socket bearings being of complemental conically convergent form.

4,050,324

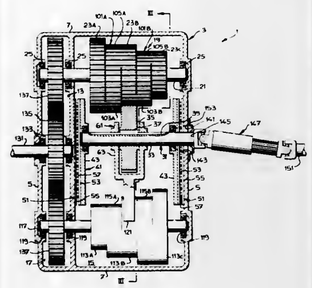
TRANSMISSION GEAR MECHANISM

Gaston Teyssandier, 1645 Maisonneuve Blvd., Apt. 2110, Montreal, Quebec, Canada (H3H 2N3)

Filed Oct. 12, 1976, Ser. No. 731,508

Int. Cl.² F16H *35/06, 35/02, 55/04*

U.S. Cl. 74—397 **8 Claims**



1. A transmission gear mechanism comprising:

drive means including a drive shaft and drive gears of gradually differing diameters mounted for rotation on said drive shaft;

driven means including a driven shaft, parallel to and movable toward and away from said drive shaft, and a driven gear mounted on said driven shaft to be movable axially therealong and to be kept in mesh with said drive gears, selectively;

means for so moving said driven gear along said drive shaft to shift it from one drive gear to the next, wherein said drive means comprises transfer means to assist the driven gear in moving from one drive gear to the next during said shifting; and

means to hold the driven gear in mesh with the drive means at all times.

4,050,325

SPEED CHANGE GEAR APPARATUS FOR AN AUTOMOBILE TRANSMISSION

Yoshio Shishido, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoto, Japan

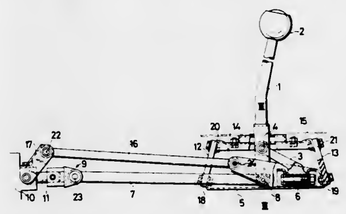
Filed Feb. 24, 1976, Ser. No. 661,016

Claims priority, application Japan, May 30, 1975, 50-65559

Int. Cl.² G05G *1/04, 7/00*

U.S. Cl. 74—473 R **45 Claims**

1. A speed change gear apparatus for an automobile transmission including a shift lever having its one end pivotally connected with one end of a control rod, the other end of which is connected with one end of a control shaft extending from a transmission through a joint; the apparatus comprising a pair of support members of an oscillation isolating material, one end of the support members being connected with a car body while their other ends carry a shift lever housing which supports the shift lever in suspension in a pivotal manner, and a support rod disposed substantially in parallel relationship with the control rod, the support rod having its opposite ends



pivotally connected with the shift lever housing and the transmission, respectively.

4,050,326

SAFETY STEERING COLUMN FOR PASSENGER MOTOR VEHICLES

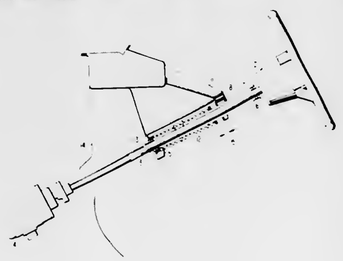
Wolfgang Köpf, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Feb. 9, 1976, Ser. No. 656,524

Claims priority, application Germany, Feb. 8, 1975, 2505340

Int. Cl.² B62D *1/18*

U.S. Cl. 74—492 **5 Claims**



1. A safety steering column assembly for a vehicle comprising in combination

steering shaft means for connecting a steering wheel with a steering gear mechanism, said steering shaft means being axially collapsible,

deformation means surrounding at least a portion of said steering shaft means for absorbing axial impact forces on said steering shaft means, said deformation means including an undulated tubular member having different axial rigidity values along different axial sectional portions of said undulated tubular member,

guide means including a second tubular member interposed betwen said steering shaft means and said undulated tubular member for guiding said undulated tubular member only in the axial direction, said second tubular member having a greater axial extent than said undulated tubular member, wherein said second tubular member is axially movable upon impact against said steering wheel,

support means for maintaining a first end of said undulated tubular member whch is remote from said steering wheel at a distance from an end wall of the vehicle, and

bracket means for releasably securing said second tubular member to a fixed vehicle part at a position between the steering wheel and a second end of said undulated tubular member which faces said steering wheel, said bracket means being rigidly secured to said second tubular member at a predetermined axial distance from said second end of said undulated tubular member such as to be carried by said second tubular member against said second end of said undulated tubular member upon axial movement of said second tubular member occurring by said impact against said steering wheel,

wherein said predetermined axial distance delays deformation of said undulated tubular member such that initial impact force peak is reduced.

4,050,327

FAST-MAKE CONNECTION FOR A PUSH-PULL CONTROL CABLE ASSEMBLY

Robert J. Thomas, Kent, and Marvin H. Jones, Ravenna, both of Ohio, assignors to Samuel Moore and Company, Mantua, Ohio

Filed Mar. 21, 1975, Ser. No. 560,582

Int. Cl.² F16C *1/12, 1/14, 1/16*

U.S. Cl. 74—502 **5 Claims**



1. A connector for operatively securing a push-pull cable assembly having a core reciprocably slidable in a casing to a control device having at least a sheath member and a plunger means movable longitudinally in the sheath member, a connector housing secured to the push-pull cable casing, means releasably securing said connector housing to the sheath member, a shuttle plug fixedly secured to the push-pull cable core and reciprocably slidable within said connector housing and the sheath member releasably secured thereto, lug means presented from the plunger means, and means in the shuttle plug releasably to engage said lug means and permit relative rotation therebetween.

4,050,328

FOUR-WHEEL DRIVE VEHICLE WITH DRIVE TRANSFER GEAR ASSEMBLY

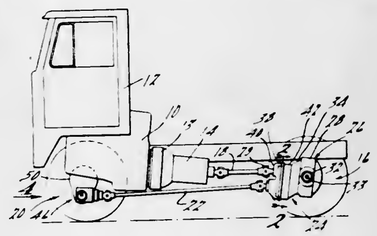
Rowland C. Romick, Mount Clemens, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 296,360, Oct. 10, 1972, Pat. No. 3,901,092.

This application May 22, 1975, Ser. No. 580,113

Int. Cl.² F16H *1/44*

U.S. Cl. 74—711 **15 Claims**



1. In a motor vehicle of the type including a prime mover, front and rear drive axles; drive means interconnecting said prime mover and said front and rear axles and including a drive transfer assembly comprising:

A. an input shaft drivingly connected to said prime mover;

B. a first output shaft drivingly connected to said rear axle;

C. a second output shaft rotatable relative to said first output shaft and drivingly connected to said front axle;

D. means operative in response to relative rotation between

said output shafts in one directional mode to preclude such relative rotation; and

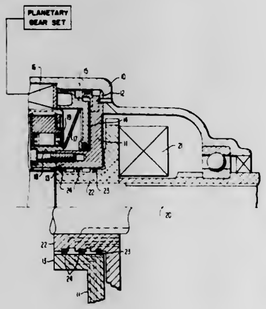
E. means drivingly interconnecting said shafts and operative to apportion the torque received by said input shaft between said first output shaft and said second output shaft and including means operative during operation of said rotation precluding means to limit the magnitude of the torque transmitted to one of said output shafts from said input shaft.

4,050,329

PLANETARY GEAR CHANGE-SPEED TRANSMISSION FOR VEHICLES

Wolfgang Zaiser, Althutte, and Helmut Diegelmann, Grunbach, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Sept. 8, 1972, Ser. No. 287,218
Claims priority, application Germany, Sept. 9, 1971, 2145107
Int. Cl.² F16H *3/44*
U.S. Cl. 74—750 R **10 Claims**



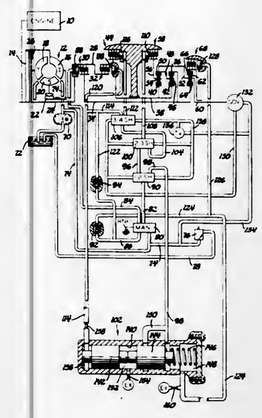
1. A planetary gear change-speed transmission for vehicles, which includes input and output means, transmission housing means including a fixed annular surface means, a planetary gear set operatively connected with the output means, a frictional engaging means and a free-wheeling means operatively connected with the planetary gear set, the frictional engaging means being actuable by an actuating piston means arranged in an annular cylinder, the output means driving a controller means, and feed and discharge lines leading to and from the controller means, the improvement comprising: a sleeve-like extension provided at the controller means and extending in a direction of the input means of the transmission, the feed and discharge lines to and from the controller means being disposed in said sleeve-like extension, a support flange means for supporting the frictional engaging means, the free-wheeling means and the actuating piston means, said support flange means being inserted into the transmission housing means from the input side thereof, said support flange means having an annular portion secured to a fixed annular surface of the transmission housing means and a sleeve portion at an inner circumference of the annular portion facing the input means of the transmission, said sleeve portion surrounding said sleeve-like extension and engaging at least portions thereof, said sleeve portion being provided at its inner circumference with transfer means for transferring the pressure medium to and from the feed and discharge lines leading to and from the controller means.

4,050,330

TRANSMISSION CONTROL WITH GOVERNOR DISCONTINUANCE CONTROL VALVE

Nathaniel B. Kell, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 12, 1976, Ser. No. 741,222
Int. Cl.² F16H *57/10*
U.S. Cl. 74—759 **5 Claims**



1. A transmission control for controlling the interchange of a plurality of fluid actuated friction drive establishing devices in a power transmission comprising: a source of fluid pressure; first shift control valve means for controlling the operation of one friction drive establishing device to establish one drive ratio; second shift control valve means for controlling the operation of another friction drive establishing device to establish another drive ratio, said one drive ratio being a lower speed ratio than said other drive ratio; third shift control valve means for controlling a drive ratio intermediate said drive ratios controlled by said one and other friction drive establishing devices; governor means in fluid communication with said source and said first, second and third shift control valve means and being operable to generate a fluid pressure proportional to vehicle speed which pressure is operable on said shift control valve means to control operation thereof; and control valve means disposed in series flow relation between said first shift control valve means and said one friction drive establishing device, and in parallel flow relation with said second shift control valve means and said other friction drive establishing device, said control valve means having an actuated position for preventing fluid flow to said one friction drive establishing device and an unactuated position for permitting fluid flow to said one friction drive establishing device, said control valve means being moved to said actuated position when fluid pressure is directed to said other friction drive establishing device and being maintained in said actuated position to prevent an interchange from said other ratio to said one ratio if the pressure of said governor means decreases sufficiently rapidly to permit immediate operable interchange of said first and second shift control valve means.

4,050,331

CYCLOIDAL GEARS

Rudolf Braren, Kienaderweg 17, 8061 Gunding, Germany

Filed July 14, 1975, Ser. No. 595,729
Claims priority, application Germany, July 12, 1974, 2433675
Int. Cl.² F16H *1/28*
U.S. Cl. 74—804 **18 Claims**

1. A planetary gear comprising at least one planet wheel moved with the aid of an eccentric and at least one concentric wheel, said wheels engaging by means of a closed cam plate cycloid constructed on one wheel and a ring of rollers constructed on the other wheel, and the tangency points of the rollers with the cam plate cycloid describing points of a reference cycloid whereby both cycloids can be mathematically expressed as follows:

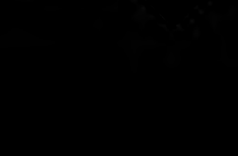
$$x = r\cdot\cos\alpha \pm e\cdot\cos(\beta \pm \alpha) \mp q\cdot\cos(\gamma \pm \alpha)$$

$$y = r\cdot\sin\alpha + e\cdot\sin(\beta \pm \alpha) - q\cdot\sin(\gamma \pm \alpha)$$

where:

x, y = abscissa and ordinate of the plane of said cycloids;
r = sum of the radii of a circle rolling without sliding on the outer circumference of a fixed base circle;
α = angle subtended between said abscissa and a line passing through the center of said cycloids, through a point of tangency of said rolling circle and fixed base circle, and through the center of said rolling circle;
e = eccentricity of the gear arrangement;
β = rolling angle;
q = equidistant spacing;
γ = transmission angle;

and wherein the value of the parameter q for the cam plate cycloid is larger than for the reference cycloid, and the value of the parameter r in the case of the construction of the cam plate cycloid as an epicycloid is larger, and in the case of the construction of the cam plate cycloid as a hypocycloid is smaller than for the reference cycloid.



18. A planetary gear arrangement comprising: at least one planet wheel, eccentric means for moving said planet wheel, at least one further wheel concentrically mounted with respect to said planet wheel, means for engaging said at least one planet wheel including a closed cycloid cam means provided on one of said planet wheel and said further wheel and roller means provided on the other of said planet wheel and said further wheel, said roller means and said cam engaging at contact points describing points of reference cycloid, wherein distance values $\Delta\mu$ occurring between said roller means and said contact points on said cam means and the reference cycloid, respectively, are defined as follows:

$$\Delta\mu = (\Delta q - \Delta r \cdot \cos\gamma/\sin\gamma),$$

where:

Δq = difference of values of an equidistant spacing of the cam means and reference cycloid,
Δr = difference of values of the sum of the radii of a circle rolling without sliding on the outer circumference of a fixed base circle respectively defining the cam means and the reference cycloid, and
γ = the transmission angle.

4,050,332

OIL PRESSURE CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION SYSTEM

Yutaka Taga, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

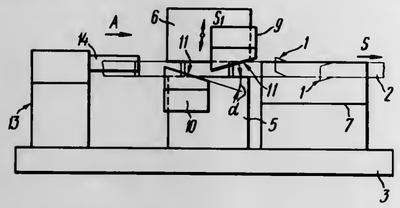
Filed Oct. 7, 1975, Ser. No. 620,344
Claims priority, application Japan, Dec. 23, 1974, 49-147900
Int. Cl.² B60K *41/08*
U.S. Cl. 74—869 **13 Claims**



1. An oil pressure control system for an automatic transmission system which includes a fluid torque converter, a transmission gear and friction engaging means for establishing a selected transmission engagement in said transmission gear, comprising:

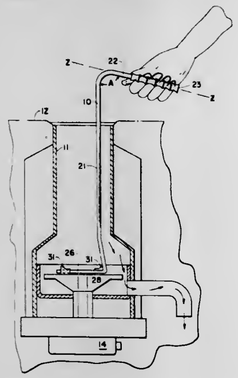
a source of oil pressure;
a line pressure regulating valve which generates a line pressure from the oil pressure of said source, said line pressure being regulated to be suitable for operating said friction engaging means;
a throttle pressure regulating valve which generates a throttle pressure from said line pressure, said throttle pressure increasing as the engine torque increases;
a governor pressure regulating valve which generates a governor pressure from said line pressure, said governor pressure increasing as the vehicle speed increases;
a plurality of speed shift valves which are shifted according to said governor pressure and said throttle pressure so as to change over the supply of oil pressure to said friction engaging means for shifting transmission between lower and higher speed stages;
a manual shift valve which is shifted by hand among a plurality of ranges for effecting a selected transmission; and
a speed shift timing valve which is related to upper and lower speed shift valves and is shifted for variably restricting supply and exhaust of oil to and from upper and lower speed stage friction engaging means which are alternately actuated according to the shifting of said speed shift valves in the manner such that in the upshifting process the rate of supplying oil to said upper shift stage friction engaging means is gradually decelerated while the rate of exhausting oil from said lower speed stage friction engaging means is gradually accelerated, said speed shift timing valve comprising a valve element, first and second port means adapted to be controlled by said valve element, said first port means providing a middle portion of a passage means for supplying oil to said upper speed stage friction engaging means while said second port means providing a middle portion of a passage means for supplying oil to said lower speed stage friction engaging means, and a third port means connected with said passage means for supplying oil to said upper speed stage friction engaging means, wherein the pressure applied to said third port drives said valve element towards a shift position where said valve element applies more restriction to said first port means and applies less restriction to said second port means.

4,050,333
METHOD OF SETTING SAW TEETH AND DEVICE FOR REALIZATION THEREOF
Vladimir Viktorovich Idel, ulitsa Gertsena, 3, kv. 37, Zavolzhie Gorkovskoi oblasti, U.S.S.R.
Filed Mar. 5, 1975, Ser. No. 555,611
Claims priority, application U.S.S.R., Mar. 12, 1974, 2006502; Mar. 12, 1974, 2006504
Int. Cl.² B23D *63/00*
U.S. Cl. 76—112 2 Claims



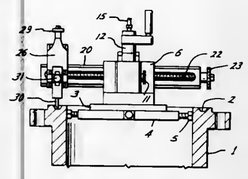
1. A method of setting the teeth of a saw comprising the step of applying a dynamic effect to only the edge of the flank of a free positioned saw tooth, at a predetermined distance from the point of said tooth for bending and twisting of the latter.

4,050,334
ZEE WRENCH
Robert Davis, Jr., Nashville, Tenn., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed May 12, 1976, Ser. No. 685,711
Int. Cl.² B25B *13/48*
U.S. Cl. 81—119 1 Claim



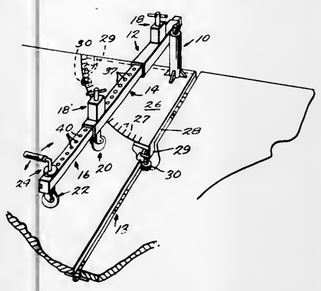
1. A tool for use in freeing the rotor of a garbage disposal unit installed in the drain of an attached sink comprising
a shaft member joined at a first end to a handle section and at a second end to a jaw section,
said jaw section of a size to fit within a drain pipe and to fit against upraised detents on the rotor of a garbage disposal unit installed in said drain pipe,
said jaw section oriented to extend in a straight line and in a radial perpendicular direction to the axis of the shaft section, and at a perpendicular angle to the shaft axis,
said handle section bent to extend in a radial direction and at an acute angle to the shaft section so as to extend from the shaft section towards the jaw section,
said shaft section of a length to extend from the surface of the rotor to beyond the drain opening of the drain pipe, in which
the jaw section is joined to the shaft section by a length of bar which extends away from the axis of the shaft section so that the attached jaw section intersects the axis of the shaft section.

4,050,335
PORTABLE GROOVING TOOL
Guy T. Gilmore, Crosby, Tex., assignor to Multi-Fab, Inc., Houston, Tex.
Filed Mar. 10, 1976, Ser. No. 665,859
Int. Cl.² B23B *5/16*
U.S. Cl. 82—4 C 1 Claim



1. A portable grooving tool having means for mounting same in a tubular work piece, a base member fixedly centered in said work piece, a shaft mounted vertically in said base member, a ring gear fixedly mounted on said base member and coaxially with said base member, a rotatable member mounted on said shaft and means for rotating said rotatable member around said shaft including a gear in mesh with said ring gear, means for controlling the speed of rotation of said rotating member, a transversely adjustable arm mounted on said rotating member and a vertically movable cutting tool mounted on said arm, said rotating member having coaxial, antifriction bearings therein, a bushing coaxially mounted in said housing and between said bearings, and means for placing a drag on said bushing to control the speed of rotation of the rotating member.

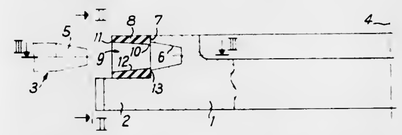
4,050,336
INSULATION CUTTER
James H. Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.
Filed Mar. 5, 1976, Ser. No. 664,173
Int. Cl.² B23D *19/00*; B26D *1/18*
U.S. Cl. 83—486.1 7 Claims



1. Apparatus for cutting insulation sheet material or the like, comprising:
a pivot post,
a first trammel tube,
a second trammel tube,

means for mounting said first trammel tube for radial movement with respect to said pivot post,
means for retaining said first trammel tube in any one of a plurality of radial positions with respect to said pivot post,
means for mounting said second trammel tube for radial telescoping movement with respect to said first trammel tube,
means for maintaining said second trammel tube in any one of a plurality of telescopic positions with respect to said first trammel tube,
a first cutter wheel mounted on said first trammel tube on a portion thereof remote from said pivot post,
a second cutter wheel mounted on said second trammel tube on a portion thereof remote from said first trammel tube, and
means for mounting said second cutter wheel so that it is movable from a first position wherein it is latched in line with said first and second trammel tubes and may make cuts in insulation sheet material or the like extending radially from said pivot post, to a second position wherein it is disposed at 90° with respect to said first position and may make cuts in insulation sheet material or the like that are arcuate, said means for mounting said second cutter wheel including a rod member associated with said second trammel tube, a handle extending upwardly from the top portion of said rod member, and cooperating detent means operatively associated with said rod member and said second trammel tube for providing latching of said second cutter wheel in either said first or said second position thereof, and means providing for vertical movement of said second cutter wheel with respect to said second trammel tube so that said second cutter wheel may be lifted generally out of contact with insulation sheet material or the like to be cut during movement of said cutter wheel from the first position thereof to the second position thereof.

4,050,337
TURRET ALIGNMENT SYSTEM
Pierre M. Allemand, Cires-les-Mello, France, assignor to S.A. Beauplat Fils & Cie, France
Filed June 30, 1976, Ser. No. 701,103
Claims priority, application France, July 9, 1975, 75.21586
Int. Cl.² B26F *1/04*; B23B *29/32*
U.S. Cl. 83—552 6 Claims



1. In a capstan tool holder for a punching machine comprising two chucks spaced apart for the passage of sheets to be machined, one chuck being equipped with punches and the other chuck being equipped with dies, a selection device for selecting the position of the chucks, each chuck being connected to a rotary drive mechanism that selectively disengages the drive mechanism under control from the selection device, an indexing device controlled by the selection device and having a displaceable pin on a fixed portion of the machine to penetrate a selected bore on the periphery of the chuck the improvement comprising the provision of: shock absorber means made from a relatively elastic material on the periphery of the chuck about each bore for absorbing shocks when the pin penetrates the bore to stop the chuck, the shock absorber means comprising an orifice aligned with the bore, the cross-section of the orifice at the end adjacent the bore being substantially the same as the cross-section of the bore adjacent the orifice, the outside of the orifice having a cross-section which, at least in the direction of rotation of the chuck is larger than the cross-section of the pin, and wherein each orifice has a sloping wall which converges toward the central area of the chuck.

4,050,338
POWER KNIFE ADJUSTMENT FOR A SHEAR MACHINE
Eugene Walford Pearson, Orinda, Calif., assignor to Canron, Inc.
Filed May 19, 1975, Ser. No. 578,886
Int. Cl.² B26D *5/12*
U.S. Cl. 83—641 5 Claims

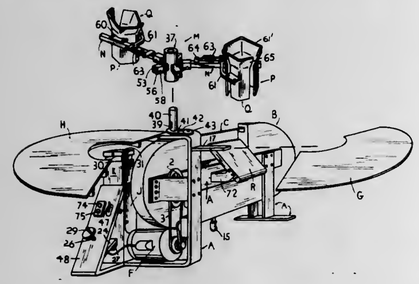


4. In a machine embodying a horizontal fixed element of substantial length, a movable element cooperating therewith to perform a change on a piece of work, a pair of mounting walls extending to the front of said machine and terminating in sloping front edges, each edge including an upstanding lug, a front wall carrying said fixed element, said front wall spanning said mounting walls and having end slots receiving said lugs, said end slots being longer than said lugs to permit of limited sliding movement of said front wall on the sloping edges of said mounting walls; a power operated wedge assembly at each end of said front wall and adjustably spacing the upper edge of each slot from the proximate lug to slidably adjust said front wall and fixed element carried thereby, along the proximate mounting wall whereby to alter the horizontal spacing between said fixed and movable elements, each said power operated wedge assembly extending in a frontal direction through one of said end slots, between the upper edge of said slot and the proximate lug and comprising power drive means including a piston rod, a cylinder slidably mounted about said piston rod, a piston within said cylinder and fixedly secured to said piston rod, a fluid passageway into said cylinder and terminating toward one end thereof, a second fluid passageway into said cylinder and terminating toward the other end thereof, whereby to provide for two-way hydraulic control of said power drive means; a wedge; means coupling said wedge to said cylinder; a pump; a hydraulic line to each of said fluid passages from said pump, and a reversing valve in said lines.

4,050,339
AUTOMATIC CAROUSEL-TYPE MEAT CUTTING MACHINE
Richard A. Soleri, 5614 N. Rock Creek Road, Agoura, Calif. 91301
Filed Jan. 7, 1976, Ser. No. 647,320
Int. Cl.² B26D *4/50*
U.S. Cl. 83—703 5 Claims

1. An automatic carousel-type meat cutting machine comprising:
a. a rotatable carousel having a central vertical drive shaft with a hub keyed to said shaft and a plurality of radially extending arms projecting from said hub and lying in a horizontal plane;
b. a pair of meat engaging jaws carried by each arm, one of the jaws in each pair being spring-biased, each pair of jaws adapted to receive a bulk meat item therebetween;

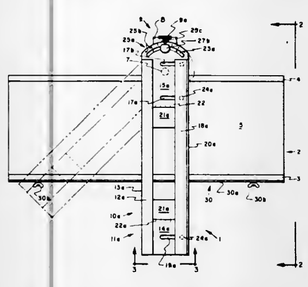
c. a circular meat supporting horizontal surface made up of an arcuate-shaped stationary platform with radially extending ends and a vertically adjustable arcuate-shaped platform with radially extending ends disposed close to the adjacent ends of the stationary platform;
d. means for rotating said drive shaft and carousel for moving said arms and pairs of jaws in a circular path for causing the bulk meat items to move over said platforms in a circular path while being slidably supported by said platforms;
e. means for mounting an endless bandsaw so that it has one of its two longitudinal reaches lying in a horizontal plane substantially parallel with the plane of said stationary platform and adjacent to one of its radial ends so that the teeth on the bandsaw will face away from the edge of this radial end;



f. means for lowering said adjustable platform below said stationary platform to a distance equal to the thickness of the slices of meat desired to be cut from the bulk meat items;
g. said carousel hub having a plurality of outwardly projecting clevises extending radially from the hub axis, each clevis extending radially from the hub axis, each clevis having a base portion that extends beyond the clevis;
h. a socket pivotally connected to each clevis and overlying its associate base, said socket being U-shaped in cross section with the sides of the socket normally facing downwardly and resting on its base; and
i. each radially extending arm being removably received in said socket.

4,050,340
POWER TOOL TRACK
Robert D. Flanders, 28035 SW. Parkway, Wilsonville, Oreg. 97070
Division of Ser. No. 454,980, March 26, 1974, Pat. No. 3,983,776. This application July 25, 1975, Ser. No. 599,123
Int. Cl.² B27B *9/04*
U.S. Cl. 83—743 **10 Claims**

1. A power tool track system comprising a support substructure, means connected to said substructure for supporting a power tool above said substructure in a substantially horizontal plane with respect to the vertical axis of said substructure, said power tool track being adjustably mounted on said support means for angular movement in a horizontal plane with respect to the vertical axis of said substructure, and including longitudinally-extending base and adjustable frame members, respectively, which provide a support surface for carrying power tools thereon, the frame member having an outer edge forming a longitudinally-extending straight edge for maintaining the accuracy in use of said power tools and, attached to the frame member, a longitudinally-extending guide means, raised above the surface of said frame member, for maintaining a power tool in proper alignment for traversing a straight predetermined, longitudinal path, the distance from the guide means to the outer edge of said base member, the predetermined support surface on which said power tool will ride, being such that said power tool will be in close proximity with, and more



parallel to, said outer edge, and said frame member being laterally adjustable for providing a laterally-extending support surface capable of carrying a plurality of power tools.

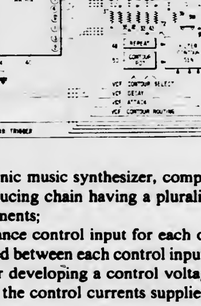
4,050,341
ELECTROMAGNETIC PICKUP FOR STRINGED MUSICAL INSTRUMENTS
John F. Underwood, 530 S. Hampton, Orlando, Fla. 32803
Filed Feb. 11, 1976, Ser. No. 657,266
Int. Cl.² G10D *5/00*; G10H *3/08*
U.S. Cl. 84—1.15 **21 Claims**



1. An electromagnetic pickup device for musical instruments of the type having elongated magnetizable vibrating elements, said device comprising
a single permanent magnet including a configured surface adjacent to all of the magnetizable vibrating elements, said configured surface providing a variation of the magnetic field effecting respective ones of said elements in accordance with the magnetizability of said elements, and
a low impedance coil surrounding said permanent magnet.

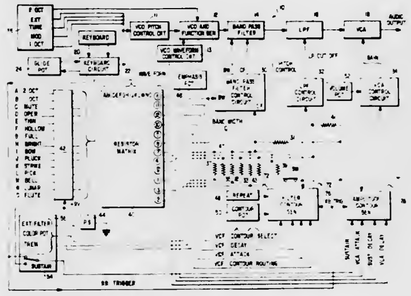
4,050,342
MUSIC BOX TOY
Ikuo Suzuki, Urawa, and Shuji Nishiyama, Okaya, both of Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan
Filed July 2, 1976, Ser. No. 702,023
Claims priority, application Japan, July 5, 1975, 50-93363[U]
Int. Cl.² G10K *1/06*
U.S. Cl. 84—95 C **9 Claims**

1. In a music box toy of the type including a movable appendage which projects externally of the body of the toy and which is adapted to be moved by a drive source contained within the music box during the playing thereof, the improvement comprising a drive unit for the appendage, and means for connecting the drive unit and the appendage, said connecting



means being disengageable from the drive unit when the appendage is moved by an external force.

4,050,343
ELECTRONIC MUSIC SYNTHESIZER
Robert A. Moog, Williamsville, N.Y., assignor to Norlin Music Company, Lincolnwood, Ill.
Continuation of Ser. No. 396,323, Sept. 11, 1973, abandoned. This application Dec. 29, 1975, Ser. No. 644,864
Int. Cl.² G10H *1/00*
U.S. Cl. 84—1.01 **12 Claims**



1. An electronic music synthesizer, comprising:
a sound producing chain having a plurality of voltage-controlled elements;
a low impedance control input for each of said elements;
means coupled between each control input and its respective element for developing a control voltage proportional to the sum of the control currents supplies to the respective input;
means including a resistor matrix coupled to said control inputs for supplying predetermined control currents to said inputs to control the functions of said elements, wherein said matrix comprises a set of rows and a set of columns, means for coupling one of said sets to a source of constant voltage, and means coupling the other of said sets to said control inputs; and
means coupled to said inputs for supplying pitch-related control currents to said control inputs in parallel with said resistor matrix.

4,050,344
EXPANSIBLE NAIL LIKE PLUG
Roger Dorgnon, St. Peray, France, assignor to Olin Corporation, New Haven, Conn.
Filed Mar. 26, 1976, Ser. No. 670,786
Claims priority, application France, Apr. 25, 1975, 75.13071
Int. Cl.² F16B *13/04, 15/04*
U.S. Cl. 85—68 **2 Claims**

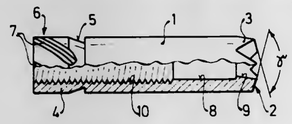


1. An expansible nail-like plug comprising:
a. an elongated body having a pointed end which can penetrate and form a blind hole in a supporting material upon application of blows to an opposite end thereof, said body having an axial bore extending from said opposite end for approximately one-half of the length of said body, and said body having at least one radial slot extending laterally through said body to form adjacent, expandible portions of said body, said radial slot extending for approximately two-thirds of the length of said body from said bore toward said pointed end, and said slot terminating short of said pointed end whereby the latter is uninterrupted, and said slot having a width which is smaller than the diameter of said bore; and
b. an elongated expansion core having a pointed end and a cylindrical shank the diameter of which is sufficiently less than the diameter of said bore to permit ready insertion and removal of said core into and from said bore, said shank diameter being greater than the width of said slot and said core having a length which is greater than the length of said bore but less than the length of said elongated body, said core forming means for driving into said bore and slot operable to radially separate said body portions when said body is disposed in a blind hole in a supporting material to cause said body portions to grip the sides of the hole and cause said body to anchor in the blind hole.

4,050,345
SELF DRILLING ANCHORING DOWEL
Wilbert Reibetanz, Leinfelden; Karl Wanner, Echterdingen, and Reinhard Hahner, Ostfildern, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Feb. 11, 1976, Ser. No. 657,106
Claims priority, application Germany, Feb. 28, 1975, 2508635
Int. Cl.² E04B *1/48*; F16B *13/06*
U.S. Cl. 85—68 **14 Claims**

1. A self drilling anchoring dowel adapted to drill, when rotated about its axis, a hole into a hard support structure and to remain anchored in said hole as a fixture for attachment to said structure of an object which is to be coupled thereto, said dowel comprising an elongated substantially cylindrical dowel body having a longitudinal axis and axially spaced front and rear ends; an annular drilling head at said front end, said drilling head being provided at its front end with an annular projecting collar having a plurality of peripherally distributed

substantially conical teeth having cutting edges, the cutting edges of each of adjacent pairs of said teeth including with one another an angle of between 120° and 160°, each adjacent pair of said conical teeth forming a root region, said cutting edges extending to said root region and thereat also including an angle of between 120° and 160° with one another; and means



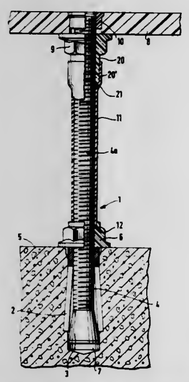
for removing drilling dust and chips, said means including a bore axially extending between said front end and said rear end of said dowel body and a constricted part located within the confines of said drilling head defining a port communicating with said bore, the diameter of said port being smaller than the diameter of said bore.

4,050,346

ANCHORING DEVICE FOR USE IN MASONRY AND LIKE STRUCTURES WITH CORROSION-PROTECTION FEATURE

Artur Fischer, Weinhalde 34, D-7244 Tumlingen, Waldachtal 3, Germany

Filed July 6, 1976, Ser. No. 702,859
Claims priority, application Germany, July 8, 1975, 2530361
Int. Cl.² F16B *13/06*
U.S. Cl. 85—69 **13 Claims**



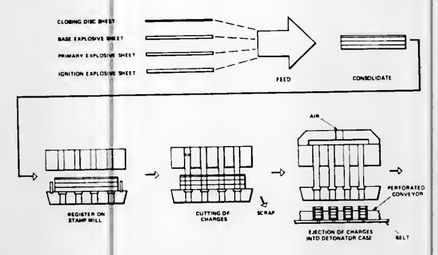
1. An anchoring device for use in mounting an object to a supporting structure, comprising a first element adapted to be received and anchored in a hole of a structure; a second element having a first portion located in said hole and secured in said first element, and a second elongated portion extending outwardly from said hole; means for positioning an object to be mounted at any of a plurality of distances from the structure, comprising an adjustable element in engagement with the object and being mounted on said second portion for movement in direction of the elongation of the latter; means for preventing access of corrosion-producing media to said first and second elements at any of said distances, said preventing means comprising a protective sleeve surrounding said second portion intermediate the structure and the object and having a longitudinally-extending tubular end section, and a tubular extension section extending from said adjustable element in direction towards said first element and sealingly engaging said tubular end section, at least one of said tubular sections overlapping the other of said sections so as to provide sealing contact with the latter at any selected distance determined by said adjustable element; and an abutment member mounted on said second portion and engaging the structure in the region of the hole opening, said abutment member being formed with an annular recess for receiving another tubular end section of said protective sleeve in sealing relationship.

4,050,347

METHOD FOR PRODUCING EXPLOSIVE TRAINS

Stanley M. Adelman, Randolph Township, Morris County; Donal G. Ellington, Wharton, and Philip J. Quatrochi, Stanhope, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 9, 1976, Ser. No. 703,992
Int. Cl.² C06B *21/00*
U.S. Cl. 86—20 R **4 Claims**



1. A method for producing at least one explosive train which comprises superposing

a. a first layer of sheet explosive comprising finely divided particles of an ignition explosive and a binder therefor; and

b. a second layer sheet explosive comprising finely divided particles of a primary explosive and a binder therefor;

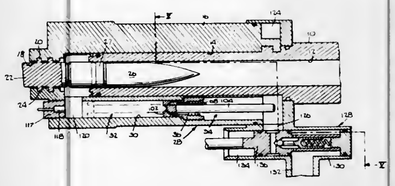
coring the resulting structure of superposed sheets and ejecting said core of explosive train into a cup container.

4,050,348

LIQUID PROPELLANT GUN (CONTROLLED LEAKAGE REGENERATIVE PISTON)

Alfred Rapp Graham, Burnt Hills, N.Y., assignor to General Electric Company, Burlington, Vt.

Filed June 10, 1976, Ser. No. 694,866
Int. Cl.² F41F *1/04*
U.S. Cl. 89—7 **6 Claims**



5. A process of chargir.g a liquid propellant gun having a differential piston with propellant injection bores therethrough for regenerative injection of propellant into the combustion chamber from a propellant pumping chamber, wherein said piston interfaces both said combustion chmber and said pumping chamber, comprising:

translating said piston to provide said pumping chamber with substantially zero volume and said combustion chamber with its maximum volume;

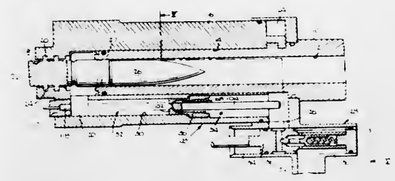
admitting liquid propellant under pressure into said pumping chamber to translate said piston to increase the available volume of the pumping chamber and to decrease the volume of the combustion chamber and to concurrently force a quantity of propellant from said pumping chamber through said injection bores and atomizing said quantity of propellants into droplets and into said combustion chamber.

4,050,349

LIQUID PROPELLANT GUN (SCALING WITH MULTIPLE COMBUSTION ASSEMBLIES)

Alfred Rapp Graham, Burnt Hills, N.Y., assignor to General Electric Company, Burlington, Vt.

Filed June 10, 1976, Ser. No. 694,869
Int. Cl.² F41F *1/04*
U.S. Cl. 89—7 **2 Claims**



1. A liquid propellant gun comprising:

a gun barrel having a bore and a projectile receiving chamber, both disposed along a first longitudinal axis;

an annular row of a plurality of combustor assemblies, each respectively comprising a liquid propellant supply chamber, a combustion chamber and a regenerative piston for pumping liquid propellant from said supply chamber into said combustion chamber, each respectively disposed along a respective one of a like plurality of second longitudinal axes, said second longitudinal axes being uniformly spaced apart, parallel to each other and to said first longitudinal axis and uniformly spaced from said first longitudinal axis, each of said plurality of combustion chamber also including a respective one of a like plurality of igniter means; and

conduit means coupling each of said combustion chambers to said projectile receiving chamber for transmitting combustion gas from each said combustion chamber to said projectile receiving chamber.

4,050,350

GEAR FINISHING

Richard W. Tersch, Grosse Pointe Woods, and Arthur B. Bassoff, Oak Park, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Aug. 4, 1975, Ser. No. 601,915
Int. Cl.² B23F *19/06*
U.S. Cl. 90—1.6 R **10 Claims**

1. A gear honing machine comprising

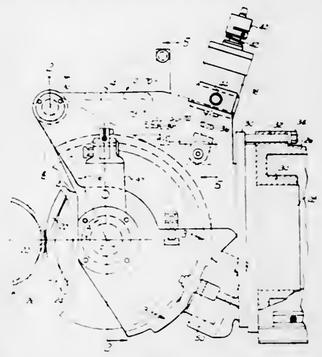
a rotary work support having means to support a work gear member for rotation on the rotation axis of said work support,

a rotary tool support positioned relative to said work support to support a honing tool member in mesh with a gear member on the rotary work support for rotation on the rotation axis of said tool support,

a gear-like honing tool member on said rotary tool support,

means operative to drive one of said supports in rotation to rotate the gear and tool carried thereby in tight meshed relation,

pivot mounting means pivotally mounting one of said supports, the pivot axis of said mounting means being located at a position displaced substantially from the line which is perpendicular to the line of centers of the rotary supports and which passes through the center of the pivotally mounted support, the displacement being in a direction toward the line perpendicular to the line of centers which bisects the acute angle between the lines of action of the



gear and tool members, and occupying a position substantially within such acute angle.

4,050,351

ASSEMBLY FOR LAUNCHING A PROJECTILE

Emile J. Stauff, Versailles, France, assignor to Societe Anonyme Dite: Societe Europeenne dePropulsion, Puteaux, France

Filed May 4, 1976, Ser. No. 683,001
Int. Cl.² F41F *3/02, 15/00*
U.S. Cl. 89—1.701 **17 Claims**



1. A projectile launching assembly including a launch tube, a charge of gunpowder located in said launch tube for communication therewith upon ignition and for firing from said tube a projectile which is placed in said tube in front of said gunpowder charge, means permitting, upon firing, the application of pressure of gases from said gunpowder charge against the rear of the projectile and the inner wall of the launch tube, a braking propellant located in said launch tube behind said gunpowder charge, a ballast material carried by said braking propellant, and means for sequential ignition of said gunpowder charge followed by ignition of said braking propellant.

4,050,352

RENEWABLE LIQUID INVESTMENT SEAL

Douglas Pray Tassie, St. George, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Mar. 19, 1976, Ser. No. 668,546
Int. Cl.² F41F *1/04*
U.S. Cl. 89—7 **15 Claims**

5. An engine comprising:

a combustion chamber having an outlet port;

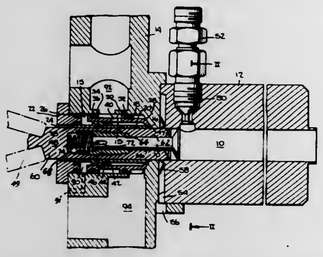
a conduit for juxtaposition with said outlet port;

said conduit, when juxtaposed with said outlet port, having a common interface therewith;

first means for providing combustion gas at a variable first pressure in said chamber;

second means for providing a liquid into said common inter-

face at a variable second pressure which is always greater than said first pressure, whereby said liquid seals said



common interface and a portion thereof flows into said combustion chamber.

4,050,353

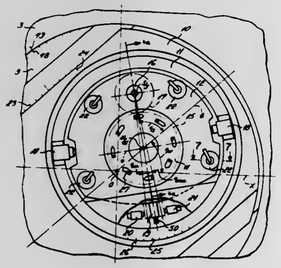
INDEX GENERATION METHOD AND MACHINE FOR PRODUCTION OF BEVEL GEARS

Lothar Bachmann, and Karl-Heinz Engemann, Karl-Marx-Stadt, Germany, assignors to Veb Werkzeugmaschinenkombinat "7.Oktober, Karl-Marx-Stadt, Germany

Continuation-in-part of Ser. No. 433,626, Jan. 16, 1975, abandoned. This application June 9, 1975, Ser. No. 585,169

Int. Cl.² B23F *9/10*

U.S. Cl. 90—5 **15 Claims**



1. In the rolling method for producing spiral and hypoid bevel gears wherein a cradle supported in a tool holder is rotatable about a cradle axis and supports a spread blade cutter head rotatable about a cutter axis spaced from and parallel to the cradle axis and together with the cutter moves in one rolling direction relative to the tool holder and to the turning work piece to cut one tooth flank of a tapering tooth gap and moves in the opposite rolling direction relative to the tool holder and to the turning work piece to cut the other tooth flank of the tapering tooth gap; the improvement in that the work cycle comprises:

cutting the one tooth flank by rolling the rotating cutter head in the first direction with a specific ratio of roll between the cradle and the workpiece so that the axis of the cutter head rolls from a first position along a first arcuate path about the cradle axis to a second position at the end of the first arcuate path;

then, swinging the rotating cutter head toward the other tooth flank about a swivel axis parallel to and offset from the axes of the cradle and cutter head so that the axis of the cutter head is swung to a third position, the second and third position of the cutter head axis lying along the path of a swivel arc generated about the swivel axis and also lying along an arc intersecting the swivel arc at the second and third positions of the cutter head axis and generated about an axis situated on the center line of the tapering tooth gap at the narrowest location thereof;

then, cutting the other tooth flank by rolling the rotating cutter head in the opposite direction with the same ratio of roll between the cradle and work piece so that the axis of the cutter head rolls from the third position to a final position along a second arcuate path spaced from and concentric with the first arcuate path;

then, in the final position of the cutter head, swinging the cutter head about the swivel axis to dispose the axis of the cutter head in the first position.

4,050,354

MACHINE TOOL EQUIPPED WITH A MAGAZINE

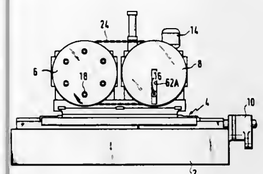
Hans Kuhnert, Munich, Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Germany

Filed Oct. 3, 1974, Ser. No. 511,686

Claims priority, application Germany, Nov. 13, 1973, 2356612

Int. Cl.² B23C *1/04, 1/16*

U.S. Cl. 90—13 C **9 Claims**



1. A machine tool, comprising:

base means;

at least one tool magazine movably mounted on said base means and rotatable about a horizontal axis, said tool magazine having a plurality of separately drivable tools and tool spindles therefor disposed parallel to and spaced from the axis of said tool magazine;

guide drum means disposed alongside said tool magazine and movably mounted on said base means and rotatable about a horizontal axis; and

control means for controlling translatable movement of said tool magazine and said guide drum means for simultaneous movement and so that said movements of said tool magazine are the same as said guide drum means in all the directions of motion, said guide drum means including tracer means spaced from the axis of rotation thereof and rotatable therewith for tracing the profile or contour of a master or pattern.

4,050,355

INDEXING DEVICE

Karl G. Niskanen, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Aug. 16, 1976, Ser. No. 714,606

Int. Cl.² B23F *23/08;* B23Q *17/00*

U.S. Cl. 90—56 R **5 Claims**

1. In combination; a rotary table and an indexing device therefor, said table having follower elements thereon in circumferentially distributed relation, a drive block adjacent the table having a slot therein for receiving a follower and movable for engaging a said follower, and actuating means connected to said block and operable for moving said drive block

bodily in an orbital path without rotation during which said slot in the drive block engages a follower and moves it and the

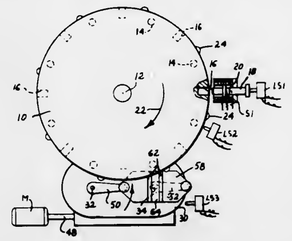


table in one direction a distance equal to the spacing between said followers and then releases the follower from the slot.

4,050,356

APPARATUS FOR CONTROLLING A FLUID MEDIUM

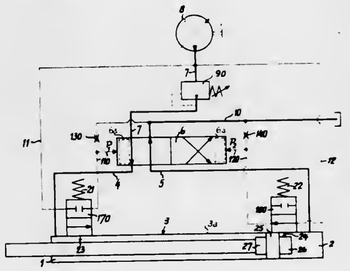
Hans Jaggi, Wolfhausen, and Hans Heimgartner, Jona, both of Switzerland, assignors to Haeny & Cie AG, Meilen, Switzerland

Filed Mar. 7, 1975, Ser. No. 556,395

Claims priority, application Switzerland, Mar. 11, 1974, 3345/74

Int. Cl.² F01L *25/06*

U.S. Cl. 91—306 **7 Claims**



1. An apparatus for the control of a fluid medium, comprising a double-acting reciprocating piston, a cylinder for housing said piston, a switching element actuated by a pressurized fluid medium, pressure source means for supplying pressurized fluid medium to the switching element, a pair of actuation elements working in opposed relationship to one another, said switching element being reversible between two switching positions by means of said two actuation elements, an actuation line provided for each actuation element for connecting the pressure source with each such actuation element, a respective normally closed shutoff valve having an inlet side and an outlet side for admitting pressurized fluid from the pressurized source means to the actuation line of each actuation element, said shutoff valves having only two positions defining an open position communicating said inlet and outlet sides and a normally closed position blocking flow between said inlet and outlet sides, means normally closing the shutoff valves, a respective throttle means provided for each actuation element and shutoff valve and connected with the outlet side of its associated shutoff valve for increasing the pressure in the actuation line to thereby operate its associated actuation element, each said actuation element being directly connected to its associated actuation line between the outlet side of its associated shutoff valve and its associated throttle means, the inlet side of each shutoff valve being directly connected to the pressure source, said shutoff valves being arranged respectively at the region of the end positions of the stroke of the reciprocating piston, each shutoff valve having a respective plunger laterally extending into the cylinder and cooperating with a control surface of said reciprocating piston for operating said shutoff valve.

4,050,357

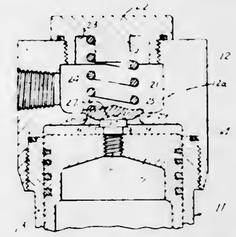
STEAM ADMISSION VALVE AND VARIABLE CLEARANCE VOLUME STEAM CYLINDER

J. Warne Carter, Sr., and J. Warne Carter, Jr., both of 2206 Weeks Park Lane, Wichita Falls, Tex. 76354

Continuation of Ser. No. 483,046, June 25, 1974, abandoned, which is a continuation of Ser. No. 321,375, Jan. 5, 1973, abandoned. This application Dec. 10, 1975, Ser. No. 639,585

Int. Cl.² F15B *13/04;* F01L *1/20*

U.S. Cl. 91—410 **20 Claims**



1. In a steam engine, a cylinder containing a reciprocable piston, a steam admission chamber communicating with the cylinder through a circular valve port in an end wall of the cylinder, an annular surface portion of the end wall surrounding the port forming a valve seat in said chamber, a valve element in the chamber having an annular sealing surface to engage the valve seat, spring means biasing the valve element into seated position to close the valve port, and a substantially rigid valve lifter member fixed to an uppermost portion of the piston, the piston, the valve element, spring means and valve lifter member being disposed on a common longitudinal axis, the lifter member having an abutment surface for engaging a cooperable surface on the valve element to unseat the valve element against the force of said spring means to open the valve port, the spring means having sufficient strength to maintain the abutment surface and the cooperable surface in engagement while the valve element is unseated, said abutment surface and said cooperable surface comprising non-planar conforming surfaces of revolution coaxially related to said valve seat, whereby the sealing surface of the valve element is maintained both parallel to and centered in relationship to the valve seat in the seating of the valve element.

4,050,358

DIAPHRAGM AND METHOD OF MAKING

John Humberstone, Westminster; William L. Deal, El Segundo, and Arthur E. Edgington, Westminster, all of Calif., assignors to Harbor Products, Inc., Long Beach, Calif.

Filed Sept. 22, 1976, Ser. No. 725,364

Int. Cl.² F01B *19/00;* F16J *3/02*

U.S. Cl. 92—103 F **14 Claims**

1. A diaphragm comprising:

a. a deformable base member having a substantially U-shaped surrounding fold;

b. a plurality of axially superimposed members of a woven fabric material molded to said base member, each of said members being preformed to provide:

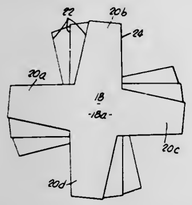
a central area, and a plurality of integral radially extending spaced apart arm portions;

c. said superimposed members being in stacked relation with the arm portions of the adjacent members being succes-

sively overlapped and relatively offset, and extending across and being conformed to said U-shaped fold.

9. The method of fabricating a diaphragm, which comprises the steps of:

a. cutting cross-shaped members with radiating spaced arms from an elastomer-coated sheet material of woven fabric in which the threads are in crossing relation;



b. stacking a plurality of the cut members in superimposed axial relation with the radiating arms of adjacent cut members in successively overlapped and angularly offset relation; and

c. thereafter subjecting the stacked members to a molding operation to encase the stacked members with an elastomeric material.

4,050,359

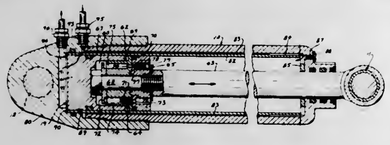
HYDRAULIC POWER TRIM AND POWER TILT SYSTEM SUPPLY

William B. Mayer, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 610,415, Sept. 4, 1975, Pat. No. 3,999,502. This application May 17, 1976, Ser. No. 687,383

Int. Cl.² F01B *3/00*; F16J *1/10*

U.S. Cl. 92—113 **7 Claims**



1. In a combined trim and shockabsorbing piston-cylinder apparatus comprising a cylinder having end closure walls at the opposite ends, means to supply hydraulic fluid to the opposite ends of said cylinder for oppositely positioning of a shock piston assembly and piston rod, said piston assembly comprising a shock piston slidably mounted within the cylinder with a sliding seal between the periphery of the piston and the cylinder, a piston rod being secured to the piston and extending out of one end of the cylinder, said shock piston having a valve means responsive to shock forces on said piston rod and cylinder to establish a shock absorbing fluid flow from one side to the opposite side of the piston, a trim piston unit located to the cylinder side of the shock piston and slidably sealed to the cylinder, said trim piston unit and shock piston being mounted in releasable telescoped relation to define a variable sized reservoir therebetween to the one side of the shock piston and minimizing the overall length of the piston assembly, whereby said shock piston and said trim piston unit can move together through abutment with one another or be spaced from one another.

4,050,360

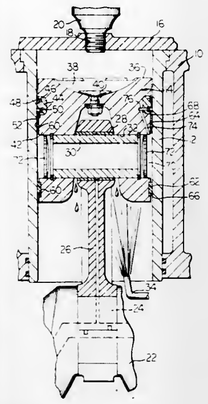
OIL DAMPED PISTON

Harold C. Powers, and Robert B. Cambron, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 19, 1975, Ser. No. 615,019

Int. Cl.² F01B *31/00*; F16J *1/02*

U.S. Cl. 92—127 **1 Claim**



1. A piston assembly for lunbricated internal combustion engines, pumps, compressors, or the like, comprising:

a. a generally cylindrical piston body having a crown and a depending skirt;

b. a pair of annular grooves on said skirt, said grooves being spaced from each other to define an annular receiving space;

c. a ring of heat resistant, low friction, polymerized, inert bearing material in each of said grooves and having a portion extending outwardly therefrom, each ring having a chamfered surface on said portion and remote from said space;

d. a cross bore in said body for receiving a wrist pin; and

e. an additional annular groove in said piston body and located between said pair of grooves and said crown, an oil ring disposed in said additional groove, and a conduit in said body interconnecting said additional groove and said annular lubricant receiving space between said pair of grooves.

4,050,361

PLOW FOLDING AND HEAT SEALER APPARATUS FOR CONTINUOUS BUSINESS FORMS

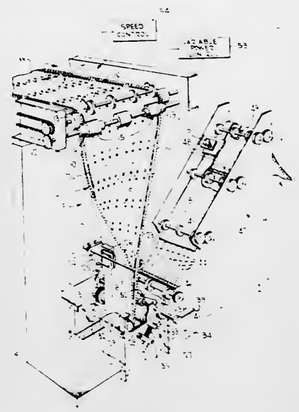
John E. Traise, Niagara Falls, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 653,882, Jan. 30, 1976, abandoned. This application Jan. 17, 1977, Ser. No. 760,020

Int. Cl.² B31B *23/00*

U.S. Cl. 93—1 F **12 Claims**

1. An apparatus for effecting plow folding and subsequent heat sealing of a continuous web, comprising, a plow folding station for effecting a longitudinal folding of the web about a longitudinal line of weakening thereof, a heat sealing station for effecting a sealing together of the folded-over portions of the web as hot-melt adhesive disposed between the portions is melted by heating, first means for feeding the web in a flat and unfolded condition at a first rate of speed into said plow folding station, second means at said heat sealing station for feeding the folded and sealed web outwardly of the apparatus at a second rate of speed faster than said first rate to thereby tension the web at said heat sealing station to a greater extent than at said folding station, and a combined wb drive and snubber roll means disposed between said stations for initially feeding the folded web into said second feed means at said heat sealing station and for subsequently snubbing the web, whereby the higher tensioned web at said heat sealing station is isolated



from the lesser tensioned web at said folding station, said web drive and snubber roll means including a roll mounted for movement between a drive and a snubbing position.

4,050,362

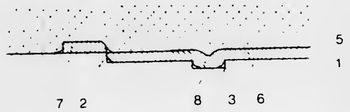
PROCESS AND APPARATUS FOR BLANKING CARDBOARD AND THE LIKE

Friedrich Schröter, 3004 Isernhagen, NB-Sud am Waldchen 8, Germany

Filed July 5, 1974, Ser. No. 485,776

Int. Cl.² B31B *1/20*

U.S. Cl. 93—58 R **3 Claims**



1. A process for cutting a sheet of low tensile strength material such as paper or cardboard including the steps of, contacting a first side of said sheet with a cutting die formed with a cutting zone having a die step with a die surface extending away from one side of said die step at a first height and a die surface extending away from an opposite side of said die step at a height differential from the first named die surface, contacting an opposite side of said sheet with a resiliently displaceable elastic member positioned in juxtaposed relation to said cutting zone, and pressing said sheet by said elastic member against a higher of the die surfaces by relative displacement of said cutting zone and said elastic member toward each other, wherein the improvement of said process is comprised of the steps of:

pressing said sheet by said elastic member against a lower of said die surfaces by relative displacement of said cutting zone and said elastic member toward each other until said sheet assumes the profile of said die in said cutting zone and across said die step; and

thereafter pressing said sheet by said elastic member against said die step by further relative displacement of said cutting zone and said elastic member toward each other while said sheet is supported between said elastic member and the surfaces of each side of said die step until pressure from said elastic member causes parting of said sheet precisely at said die step.

4,050,363

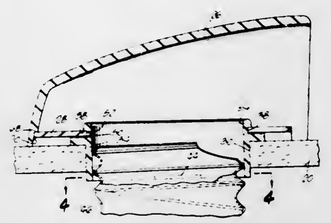
AIR VENT COVER ASSEMBLY

Harry W. Fuerst, 1740 Albion, Los Angeles, Calif. 90031

Filed Jan. 29, 1976, Ser. No. 653,441

Int. Cl.² F24F *7/00*

U.S. Cl. 98—37 **3 Claims**



1. A detachable deck vent assembly comprising:

a connecting ring positionable in a vent opening of a deck;

means for affixing said connecting ring to said deck;

said connecting ring having a groove therein positioned external to said deck and an opening through said ring within said groove;

a scoop member for said vent opening releasably connected to said deck by attachment to said connecting ring groove, through a snap ring affixed to said scoop member and adapted for clamping engagement with said connecting ring groove to attach said scoop member to said connecting ring, and said snap ring having an orientation lug formed on the inner edge thereof and adapted to engage said groove opening to prevent rotation of said scoop member about said connecting ring.

4,050,364

VENTILATING DEVICE

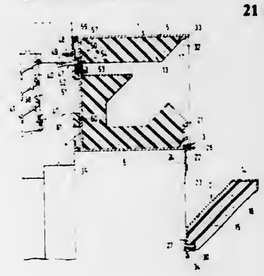
Julius Maus, Stuttgart, Germany, assignor to Gretsch-Unitas GmbH Baubeschlagfabrik, Germany

Filed Feb. 11, 1976, Ser. No. 657,220

Claims priority, application Germany, Feb. 12, 1975, 7504175[U]

Int. Cl.² F24F *7/00*

U.S. Cl. 98—37 **21 Claims**



1. A ventilating device for mounting on a wall, support frame, which has an air flow passage therein, comprising a housing having a back wall adapted to be mounted on the wall having the air flow passage, said back wall having at least one inlet opening, a top and a bottom wall extending outwardly from the back wall adjacent the top and bottom thereof respec-

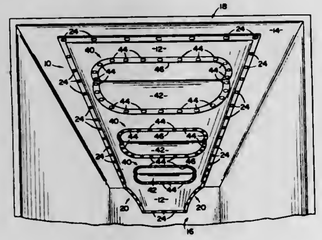
tively, an outlet between said top and bottom walls at the opposite ends thereof to said rear wall, a cover hinged at at least one of said top and bottom walls and adapted to close the outlet, a top, bottom and a cover layer of insulating material secured respectively to said top wall, said bottom wall and said cover, a layer of insulation material on said cover sealing with a portion of the layer secured to one of said top and bottom walls, said layers of insulation on each of said top and bottom walls and said cover being spaced apart in areas to define a continuous meandering air flow passage from said inlet to said outlet, said insulating layer connected to said top wall comprising a substantially straight piece having an oblique edge adjacent said outlet, said insulating layer covering said bottom wall comprising a substantially C-shaped portion having spaced apart legs and having a top portion spaced from said layer of insulation material covering said top wall, said cover having an obliquely extending insulation portion having an area sealing with the oblique portion of said layer covering said top wall and having a portion extending between the legs of the C-shaped layer covering said bottom wall, the air flow passage including a straight passage defined between the top portion of said insulation covering said bottom and the insulation covering said top wall and a generally U-shaped flow passage between the insulation covering said cover and the insulation covering said bottom wall between the leg portions thereof.

4,050,365

AIR DISTRIBUTION ASSEMBLY

Eugene J. Freeman, Jr., Tampa, Fla., assignor to Ever-Wear Products, Inc., Tampa, Fla.

Filed July 15, 1976, Ser. No. 705,624
Int. Cl.² G03C *9/00*
U.S. Cl. 98—40 C **4 Claims**



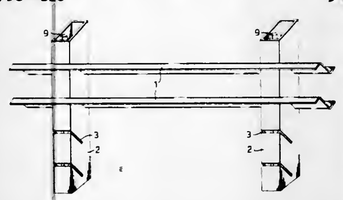
1. An air distribution assembly of the type primarily designed to disperse air at predetermined locations throughout a defined space, said air distribution assembly comprising: conduit means formed from a substantially flexible material and comprising base means disposed in fluid communicating relation with a source of conditioned air; connection means attached at least in part to said conduit means and being disposed and configured for mounting of said conduit means on a wall surface, said connection means each comprising two connector portions, one of said connector portions being attached to said conduit means and the other of said connector portions of a given connection means being attached to the wall surface of the defined space, each of said two connector portions dimensioned and configured for removable attachment to one another, a plurality of said connection means being mounted in spaced relation to one another along a major portion of the peripheral edge of said conduit means; and at least one vent means formed in said conduit means and disposed in interconnecting fluid communication between the interior of said conduit means and the defined space, said vent means comprising a vent flap and aperture means formed in said conduit means and defined by removal and displacement of said vent flap externally of said conduit means, at least one of said plurality of said connection means attached to said vent means, one of said connector portions being attached to said vent flap and the other of said connector portions being attached to the surrounding portion of said conduit means defining said aperture means and disposed thereon in engageable relation to said one connector portion of said vent flap; wherein each said connector portion of each said connection means comprises a platform portion, a plurality of fingers extending outwardly from said platform portion and in laterally spaced relation to one another, each of said plurality of fingers on each said platform portion outwardly extending in substantially parallel relation to one another, said fingers on each said platform portion being configured and dimensioned for engagement with said fingers of the oppositely disposed of said connector portions, whereby two connector portions defining a connection means are removably engageable with one another.

4,050,366

GRATING

Curt Helmer Wiklund, and Gunnar Sten Frodin, both of Vattugatan 14A, Sundbyberg, Sweden

Filed Nov. 26, 1975, Ser. No. 635,353
Claims priority, application Sweden, Nov. 27, 1974, 7414864
Int. Cl.² F24F *13/00*
U.S. Cl. 98—110 **9 Claims**



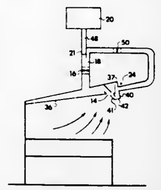
1. A grating structure comprising two tubular carrying bars each provided with a plurality of parallel grooves, a plurality of ribs each inserted into said grooves in such a manner so as to support said bars in a substantially parallel position one to the other near the ends of said ribs and being substantially perpendicular to said ribs, each of said ribs having a hole on each end which, upon the insertion of said ribs into said grooves, is at least partially located inside the walls of each carrying bar, square rods inserted into each carrying bar through the holes in said ribs, turned about their longitudinal axis so as to abut those parts of the grating which define the portions of the holes which are located inside the walls of the carrying bars.

4,050,367

VENTILATING SYSTEM FOR INDUSTRIAL MACHINES

Marion L. Eakes, Greensboro, N.C., assignor to Marion L. Eakes Co., Greensboro, N.C.

Filed May 6, 1976, Ser. No. 683,733
Int. Cl.² F23J *11/00*
U.S. Cl. 98—115 LH **2 Claims**



1. An improved process for collecting, cleaning up, and disposing contaminated exhaust gases generated at a work table comprising the steps of:

a. collecting the contaminated exhaust gases in an exhaust hood having a longitudinally extending inlet above at least one edge of said work table by applying negative pressure to said inlet thereby entraining said exhaust gases at a capture point below said inlet and above said work table;

b. directing said collected gases toward a gas separating means between said collecting point and the outside atmosphere;

c. drawing off a portion of said collected gases upstream of said gas separating means;

d. returning said drawn off portion of contaminated gases and directing said portion of contaminated gases generally upwardly toward said inlet as an air stream from a nozzle positioned closely adjacent, but slightly downwardly and outwardly from said inlet;

e. whereby said returned air stream causes the capture point of the contaminated exhaust gases to be lowered, and the capacity of said gas separating means to be reduced.

4,050,368

EXHAUST SYSTEM FOR INDUSTRIAL PROCESSES

Marion L. Eakes, Greensboro, N.C., assignor to Marion L. Eakes Co., Greensboro, N.C.

Filed Jan. 2, 1976, Ser. No. 645,997
Int. Cl.² F23J *11/00*
U.S. Cl. 98—115 LH **14 Claims**

1. In combination with industrial machines of the type having a work table surrounded on two sides, the back, and top by a wall-like enclosure leaving an open front side, and generating a substantial amount of contaminated exhaust gases, an improved ventilating system comprising:

a. an air exhaust means positioned above said enclosure communicating with the air space above said work table along said open front side and including a first fan for removing said exhaust gases from said air space and a gas separating means for cleanup of said contaminated exhaust gases prior to delivery to said outside;

b. an air delivery means including a second fan for drawing in makeup air from a source other than the atmosphere surrounding said work table and introducing said makeup air from a point below the front edge of said work table in a direction toward said exhaust means and including a second fan for drawing in makeup air from a source other than the atmosphere surrounding said work table and;

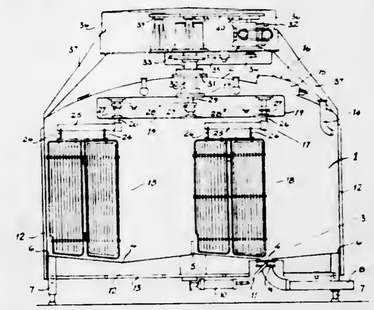
c. the air from said air delivery means forming a generally vertical air curtain extending between said delivery means and said exhaust means, whereby said exhaust gases are confined within the air space above said work table until withdrawn through said exhaust means, and further whereby said air delivery means provides a source of replacement air to replenish the volume of air withdrawn, so that conditioned air in the work room surrounding said industrial machine is substantially unaffected.

4,050,369

CHEESE VAT

Thomas Kevin Mulvihill, Limerick, and Denis Murphy, Charleville, both of Ireland, assignors to Golden Vale Food Products Limited, Ireland

Filed Nov. 3, 1972, Ser. No. 303,616
Claims priority, application Ireland, Nov. 4, 1971, 1395/71
Int. Cl.² A01J *15/02*; B01F *7/00*; B29B *1/10*
U.S. Cl. 99—463 **7 Claims**



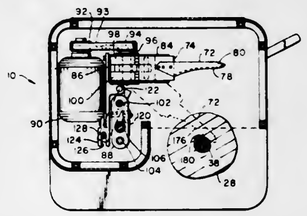
1. An enclosed vat comprising a vessel, stirrer means in said vessel for stirring contents therein, aid vessel being cylindrical and having a base portion, said base portion having a bottom wall, said bottom wall being in the form of a continuous annular upwardly opening trough, and said trough having a lowermost portion concentric with and equidistant from both the center and periphery of said bottom wall.

4,050,370

SPIRAL MEAT SLICER WITH IMPROVED RECIPROCATING KNIFE STRUCTURE

Louis Charles Schmidt; Bloomfield Hills, Mich., and Richard P. Farbolin, Lilburn, Ga., assignors to Schmidt, Trustee under Harry J. Hoeselaar Trust Agreement of Oct. 4, 1973, Mary Jane, Troy, Mich.

Filed Mar. 11, 1976, Ser. No. 665,800
Int. Cl.² A23N *23/00, 7/00*; A47J *17/16*
U.S. Cl. 99—538 **2 Claims**



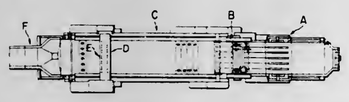
1. A spiral meat slicer for forming a continuous spiral slice on a cut of meat having an irregularly shaped bone extending therein comprising means for mounting the meat with the bone as a substantially vertical axis about which to rotate the meat, a vertically movable carriage, a knife for slicing the meat mounted on said carriage, said knife being positioned with respect to the axis of rotation of the bone to enable a spiral cut to be made in the meat, said knife being an elongated member having a relatively wide base for mounting on said carriage said knife including an inner end and an outer end and a rearward edge and a forward edge, said forward edge including a cutting edge for slicing the meat, said cutting edge comprising a first portion extending from the base and curving toward said

rearward edge and a second straight portion extending therefrom to near the outer end of the knife blade, means for longitudinally reciprocating the knife against the meat, means for automatically tensioning said knife against the meat, means for rotating the meat, and means for relatively moving said carriage vertically with respect to the meat to advance the knife along the axis of rotation of the meat to form a continuous spiral slice in the meat, further characterized in that said curved portion of the cutting edge extends to about the midpoint of the cutting edge and is curved to be complementary to the shape of the meat and to the path of rotation whereby the operational vibration level is reduced.

4,050,371
FRUIT TREATING APPARATUS

Yasuhiro Sato, Sendai; Toshio Sato, Izumi; Shuichi Kawasaki, Kawasaki; Toshio Takaishi, Izumi; Sadao Okuyama, Sendai, and Norio Yamanashi, Shimizu, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Division of Ser. No. 485,556, July 3, 1974, Pat. No. 4,013,001. This application Sept. 30, 1975, Ser. No. 618,123
Claims priority, application Japan, July 5, 1973, 48-79887; July 6, 1973, 48-80349
Int. Cl.² A23N *4/12, 4/22*
U.S. Cl. 99—550 **5 Claims**

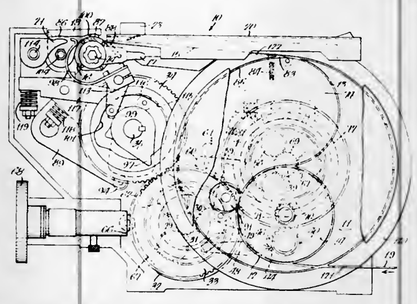


1. A fruit treating apparatus for fruits each having an indent therein and a sature line comprising a fruit treating mechanism including a tank having a water level therein for receiving and advancing fruits to be treated in such a manner that the fruits are longitudinally aligned in the water for preventing the fruits from bridging one another, said tank having an inlet end for introducing fruits into the tank and an outlet end for removing fruits from the tank, a lifter at the outlet end of said tank; a connecting mechanism for receiving fruits from said lifter and for smoothly conveying the fruits received from said lifter; a fruit posture control mechanism arranged to receive the fruits from said connecting mechanism and including cup-shaped receivers for receiving the fruits and means cooperating with said cup-shaped receivers for orienting the fruits in such a manner that the indents of the fruits are oriented substantially in the vertically downward direction, said means including a finder gear mechanism which operated only when the fruits are placed thereon and said finder gear driving mechanism including a plurality of finder gears arranged with a phase difference of 90° to each other and disposed in successive order, said finder gear driving mechanism also including a wedge-shaped projection so that the combination of said finder gears and said projection orient the sature line of the fruits in a predetermined direction with said wedge-shaped projection registering with the stem indent of the fruits; fruit slivering mechanism for slivering the posture-control fruits on said receivers including an upper cutter and a lower cutter; a fruit pitting mechanism arrange to receive the fruits from said fruit slivering mechanism for severing each of said fruits slivered and separating the flesh and pit, said fruit pitting mechanism including an upper rotary cutter and a lower rotary cutter; and a flesh-pit separating and recovering mechanism arranged to receive the separated flesh and pits for separating the flesh and pits and for recovering the flesh, said flesh-pit separating and recovering mechanism including means for flowing the flesh along a path of travel while the pits are dropped out of the path of travel.

4,050,372
AUTOMATIC STRAPPING MACHINE

Robert J. Kobiella, Rolling Meadows, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Jan. 21, 1976, Ser. No. 650,891
Int. Cl.² B65B *13/02*
U.S. Cl. 100—2 **12 Claims**



10. A method for securing a thermoplastic strap around a package comprising the steps of
forming a length of strap roll into a loop around the package to provide overlapping strap portions;
gripping the leading strap end of said length of strap;
tensioning the loop around the package by pulling on said strap in a direction opposite from the strap feed direction;
gripping the overlapping strap portions so as to maintain tension in the loop and to provide an untensioned, underlying, exposed trailing strap end portion;
severing the forming loop from the strap roll; thereafter pressing an inner face region of the extreme end of the untensioned, exposed trailing strap end portion against an inner face of an overlying loop strap in tension; and
causing relative longitudinal oscillatory motion between the extreme end of the untensioned, exposed trailing strap end portion and the overlying loop strap section in tension to generate heat and to fuse the trailing strap end portion with the overlying loop strap section.

4,050,373
MANUAL TRASH COMPACTOR

James J. Hellmann, 6600 SW. 127th St., Miami, Fla. 33156

Filed July 8, 1976, Ser. No. 703,352
Int. Cl.² B30B *15/06*
U.S. Cl. 100—240 **4 Claims**

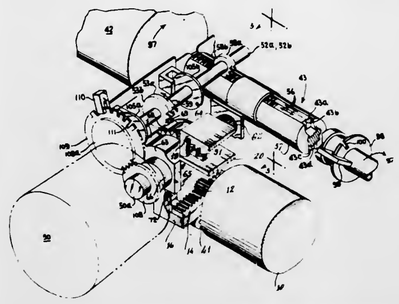


1. A manual trash compactor comprising:
a. a housing adapted to receive therein an exchangeable bag for containing the trash;
b. access means associated with said housing to gain entrance thereto for depositing of trash within the bag, said access means includes a hingeably mounted door on the front of said housing;
c. pressure applying means for compacting the trash within the bag, said pressure applying means including,
i. a plunger having a compacting head for engagement with the contents of the bag, said plunger includes a recess thereon,
ii. means for supporting said plunger for axial movement,
iii. gripping means extending outwardly of said housing for moving said plunger axially to reciprocate said head in a compacting direction,
d. weighting means associated with said pressure applying means to increase the weight thereof to facilitate the compacting of the trash within the bag;
e. said weighting means includes:
i. an aperture axially extending in said plunger,
ii. a cavity in said compacting head connected to said aperture at one end thereof to receive therein sand or other material for weight, and
iii. a cap for closing off said aperture at the other end thereof,
f. exit means associated with said housing to provide an opening for removal of the bag filled with compacted trash from within said housing, said exit means includes a hingeably mounted panel on one side of said housing adjacent to the bag so as to permit the removal of the bag with the compacted trash contained therein;
g. locking means for releasably retaining said pressure applying means at a height relative to the open end of the bag to permit the placement of trash through said access means below said compacting head;
h. said locking means includes a latch which is adapted to retain said plunger in a releasably fixed position; and
i. said latch includes a member movable between an extended position within said recess for locking said pressure applying means in a fixed position, to a retracted position out of bridging relation with said plunger, said latch member being spring loaded to automatically enter said recess at the desired level of said plunger.

4,050,374
METER SETTING MECHANISM

Frank T. Check, Jr., Hamden, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed June 21, 1976, Ser. No. 698,261
Int. Cl.² B41J *1/22*
U.S. Cl. 101—91 **10 Claims**

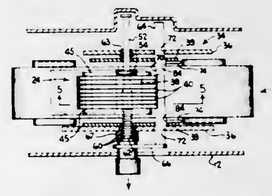


1. For use in a printing device having a rotatable printing drum and means for rotating said drum and further having banks of print wheels which may be set to different positions through a gearing assembly including a number of laterally-spaced, independently-rotatable gears, an improved gear-setting mechanism including:
a. a laterally-moveable yoke including restraining means for normally preventing rotational movement of the independently-rotatable gears;
b. a master gear rotatably mounted within said yoke for engaging a single one of the independently-rotatable gears at a time, during which time the engaged independently-rotatable gear can be rotated by the master gear;
c. a print interlock means for normally preventing printing by the printing device, said print interlock means further comprising:
1. a shutter bar which can extend into and block the path of movement of said means for rotating said printing drum;
2. an extension of said laterally-moveable yoke for holding the shutter bar in a blocking position when said yoke is in any position other than an enabled position;
3. means for driving said shutter bar from the blocking position to a released position only when said laterally-moveable yoke is in said enabled position; and
d. means for urging said yoke laterally into said enabled position wherein said print interlock means is released but each of the independently-rotatable gears continues to be restrained from rotational movement.

4,050,375
LABEL PRINTING APPARATUS

Alfreds Oriens, Old Greenwich, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Feb. 5, 1976, Ser. No. 655,480
Int. Cl.² B41J *1/60;* B41K *1/12*
U.S. Cl. 101—110 **1 Claim**



1. In an apparatus for sequentially printing at least two areas with characters such as one area with first bar code characters and a second area with second corresponding alpha-numeric characters, said apparatus comprising a main frame; a drum housing pivotably mounted in the main frame, said drum housing comprising two pivot plates, mounted for simultaneous pivoted movement in the frame, each having a locking bar receiving slot therein, the printing drum being mounted between portions of the pivot plates, and said locking bar spanning the distance between the slots on the pivot plates to pivot therewith, means for pivoting the drum housing; and a printing drum, mounted in the drum housing, including a plurality of annular printing discs each having a series of die groupings about its periphery, said discs having gear teeth about their inner peripheries and a generally axially extending groove associated with each die grouping, each die grouping having at least a first character printing die and a second peripherally displaced character printing die; an assembly for individually setting each disc, for locking all discs in relatively non-rotatable position and for simultaneously shifting all of the discs to place the first and then the second character printing die in printing position; said assembly comprising:
A. setting means for selectively engaging and rotating each individual printing disc to set one die grouping thereon for printing, said setting means further being disengageable simultaneously from all of the discs, and said setting means comprising a shaft mounted for rotation and for reciprocal movement in the direction of the axis of the printing drum, and a spur gear mounted for rotation and reciprocation with the shaft to selectively engage the inner gear teeth of each disc and to disengage from the inner gear teeth of all

discs, said spur gear having thickness less than the thickness of any disc, a detent means for positioning said spur gear in operative relation to the inner gear teeth of one disc at a time; and

B. locking bar means linked to said setting means for projecting into the axially extending disc grooves which correspond to all set die groupings, with the exception of the groove in the individual disc with which said setting means is engaged, and for projecting into the disc grooves which correspond to all set die groupings without exception when said setting means is disengaged from all of the discs to thereby lock all discs in relatively non-rotatable position, said disc grooves being formed on the outer periphery of each disc, said locking bar means also being relatively non-rotatably coupled to the drum housing to pivot therewith, said locking bar means having an elongated locking bar, having a notch with width greater than any disc, linked to said shaft for reciprocal movement therewith to position the notch adjacent the disc with which said spur gear is engaged and to position the notch non-adjacent all discs when said spur gear is disengaged from all discs, whereby pivoted movement of the drum housing causes simultaneous pivoted movement of said locking bar means and, hence, causes the discs to shift to place the first and then the second character printing dies of the set die groupings in printing position for sequential printing thereby; and

C. loading means for urging said locking bar means into the generally axially extending disc grooves, said loading means comprising, lever means mounted with said drum housing for pivoted movement about a fulcrum; spring means for urging said lever means to pivot about the fulcrum to urge said locking bar means into the disc grooves; and raised load bearing pad means formed with said locking bar means to engage said lever means when said setting means is disengaged from all discs to increase the force of urging said locking bar means into the disc grooves; and indicator means for visually indicating the individual disc with which said setting means is engaged and for indicating the die grouping set in printing position by the setting means, each die grouping including an indicating character and wherein said indicator means comprises a pointer mounted with said locking bar means to point to the disc with which said setting means is engaged and to point to the indicating character indicative of the die grouping in printing position.

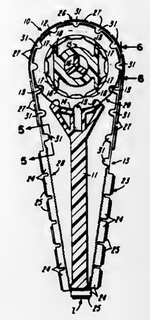
4,050,376

SELECTIVE PRINTING APPARATUS

Jack D. Keefe, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 406,532, Oct. 15, 1973, abandoned. This application Jan. 17, 1975, Ser. No. 541,962
Int. Cl.² B41J *1/20*
U.S. Cl. 101—111 **29 Claims**

1. Selective printing apparatus, comprising: a stationary support disposed adjacent a printing zone, a rotatably mounted drive wheel, a printing band extending under tension about the support and the wheel, the printing band having a printing section and a non-printing human readable section, printing characters on the outer surface of the printing section, corresponding human readable indicia on the outer surface of the human readable section, only small lugs on the underside of the printing section, large lugs on the underside of the human readable section, large notches at the peripheral surface of the wheel, and small notches at the peripheral surface of the wheel between the large notches, whereby the large notches in the wheel can mesh with the large lugs to enable the selected printing character to be advanced to the printing zone while the small lugs can pass readily about the support, but in the event the printing section is brought into engagement with the wheel and a large notch in the wheel no longer meshes with a large lug then the small notches in the wheel can mesh with the



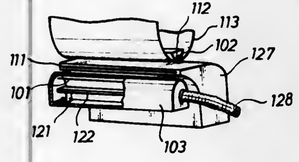
small lugs to enable the band to be returned to the position wherein a large notch can again mesh with a large lug.

4,050,377

HIGH SPEED PRINTER WITH HEATED APERTURE BOARD

Akinori Watanabe; Katsuhide Tanoshima; Matsusaburo Noguchi, and Kinya Hattori, all of Tokyo, Japan, assignors to Oki Electric Industry Company, Ltd., Tokyo, Japan

Filed Oct. 3, 1975, Ser. No. 619,259
Claims priority, application Japan, Oct. 30, 1974, 49-124271
Int. Cl.² B41F *15/00*; H01J *1/02*
U.S. Cl. 101—114 **4 Claims**



1. A high speed printer of the type using an ink mist formed of charged ink particles, said printer comprising electrodes having high voltage impressed thereon to produce ions, an aperture board having electric fields selectively applied therein to modulate said ions to form cations passing through said aperture board, said cations combining with said ink mist for effecting printing, and heating means located in said aperture board for heating the air received in said aperture board to effect a heating of the aperture board.

4,050,378

METERED SPRAY DAMPENING SYSTEM

Roy R. Smith, Jr., Leawood, Kans., assignor to Smith R.P.M. Corporation, Lenexa, Kans.

Continuation-in-part of Ser. No. 515,688, Oct. 17, 1974, Pat. No. 3,949,668. This application Oct. 2, 1975, Ser. No. 618,962
The portion of the term of this patent subsequent to Apr. 13, 1993, has been disclaimed.
Int. Cl.² B41F *7/30*; B41L *25/06*
U.S. Cl. 101—147 **7 Claims**

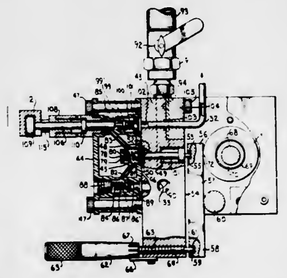
1. For use in combination with an offset printing press, a lithographic dampener system, said dampener system comprising:

a. a spray member having a plurality of dampening liquid atomizing spray nozzles, individual dampening liquid output conduit means connected at one end thereof to said nozzles,

b. a pump member having a plurality of individual, bubble and particle sensitive, reciprocal metering pumps respectively including an input portion containing a loaded input valve and an output portion containing a loaded output valve which periodically opens as a result of metering pump operation, said output valve being loaded to a substantially greater opening pressure than said input valve and a pump pathway extending between said input and output valves,

c. said output conduit means being respectively individually connected at the other end thereof to one of said metering pump output portions whereby each spray nozzle is connected to a separate metering pump, said metering pumps respectively having reciprocating pump means communicating with said pump pathways between said input and output valves and alternately increasing and decreasing the dampening liquid volume of the respective pump pathway,

d. a source of dampening liquid susceptible to bubble formation and particle inclusion therein, input conduit means connected between said liquid source and said respective



input portions, a feed pump operably located in said input conduit means,

e. pressure regulator means associated with said feed pump and together controlling the feed pressure of said dampening liquid into said respective input portions to a point above atmospheric pressure an amount sufficient to suppress the formation of bubbles and greater than that required to open said loaded input valve but less than the sum of the opening pressures of said input plus output valve, thereby causing said dampening liquid to be maintained substantially above atmospheric pressure during flow from said feed pump and through said metering pumps, whereby bubbles tending to form in said dampening liquid are urged to remain in solution permitting accurate metering by said respective metering pumps, and

f. means selectively maintaining said loaded output valves simultaneously in an open position independently of pump function and without blocking said output portions, whereby bubbles and particulate matter in said dampening liquid are driven by said feed pressure through said pump pathways and past said output valves.

4,050,379

INKING APPARATUS

James H. Smith, Harford, and Sherman S. Kumpf, Dryden, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed May 17, 1976, Ser. No. 687,288
Int. Cl.² B41F *1/40*
U.S. Cl. 101—327 **3 Claims**

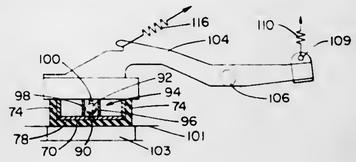
1. An inking device operable between first and second positions comprising an

elongated porous printing member having a printing surface thereon, a

backing plate member having a plurality of spaced apertures therein and in contact with said porous printing member and distal from said printing surface,

means supporting said porous printing member for operation between said first and second positions, said backing member and said supporting means defining an ink reservoir therebetween, and

means including a cylindrical member defining lengthwise



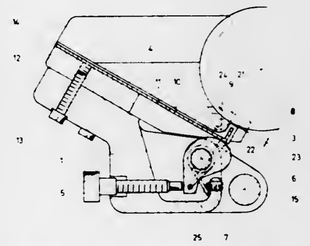
slots therein for flow of ink from said reservoir into said cylindrical member and associated with each of said apertures and spacing said plate member and said supporting means, and a circular member positioned in each of the cylindrical members and operable in relation to a respective aperture for metering ink from said reservoir to said porous printing member upon movement of said inking device from the first to the second position.

4,050,380

INK FOUNTAIN FOR PRINTING MACHINE

Wolfgang Pfizenmaier, Seebeim, Bergstr., Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Mar. 29, 1976, Ser. No. 671,112
Claims priority, application Germany, Apr. 3, 1975, 2514509
Int. Cl.² B41F *31/04*
U.S. Cl. 101—365 **10 Claims**



1. Ink fountain for printing machines having a fountain chamber for receiving a supply of ink therein comprising an elongated ink knife forming the base of the fountain chamber, a rotary fountain roller forming a side of the fountain chamber, and means for zonewise adjusting the thickness of a film of ink on said fountain roller, said ink knife having a fixed end and a free end cantilevered therefrom, said free end being yieldable relative to said fixed end, said ink knife having a wiper edge adjacent to fountain roller for wiping ink therefrom, and being bent along the length thereof in direction toward said fountain roller at a location in vicinity of said wiper edge, the bent portion of said ink knife adjacent said wiper edge having an end face opposite to said fountain roller, said adjusting means underlying said yieldable free end of said ink knife and coacting therewith for adjusting the spacing of said end face relative to said fountain roller, said bent ink knife also having a wiper surface adjacent said wiper edge and partly defining the interior of said fountain chamber, said wiper surface being disposed at an angle larger than an acute angle to said fountain roller and

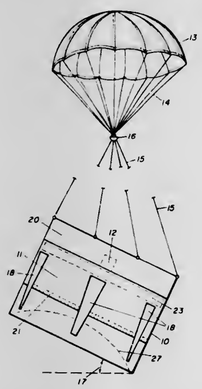
being streamlined for facilitating a return flow to said interior of said fountain chamber of the ink wiped from said fountain roller.

4,050,381

LOW DENSITY INDIRECT FIRE MUNITION SYSTEM (U)

Robert W. Heinemann, Dover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 12, 1972, Ser. No. 246,090
Int. Cl.² F42B *25/02*
U.S. Cl. 102—4 **6 Claims**



1. An indirect fire munition system for deployment from the atmosphere for defeating armor and vehicular military type ground targets without the use of guidance or homing devices, which comprises in combination:

a directional firing explosive warhead,

a directional target sensing fuze coupled with said warhead;

a housing for said warhead and fuze;

a parachute attached to said housing for retarding the descent of the munition on deployment; and

vane means for inducing rotation of said housing during descent; wherein

said fuze comprises an electric detonator coupled to a directional electronic sensing system containing a detector element, which is responsive to a characteristic signature of such a military target but is unresponsive to background and nonmilitary type targets, and which on detecting a military type target generates an output voltage which functions the electric detonator and explodes the warhead;

said warhead comprises a projectile and an explosive propellant for directionally propelling said projectile at the target in alignment with the viewing axis of said directional sensing system; and

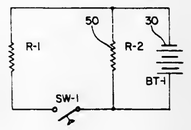
said vane means is adapted to induce rotation of said housing by aerodynamic forces at a predetermined rate during descent and thereby cause the directional sensing element to scan the ground along a spiral path.

4,050,382

ELECTRICALLY DETONATED EXPLOSIVE DEVICE

John M. Power, Hull, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed July 22, 1976, Ser. No. 707,658
Claims priority, application Canada, Aug. 18, 1975, 233671
Int. Cl.² F42C *3/00*
U.S. Cl. 102—16 **3 Claims**



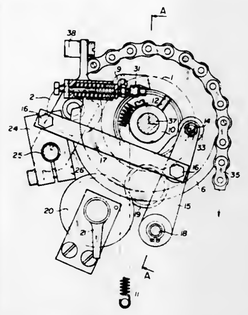
1. An electrical circuit for use in detonating an explosive device under water said circuit comprising a battery, a water pressure operated switch, an electric blasting cap wired in series with said switch and said battery and a resistor of selected value connected across terminals of said battery whereby decay of said battery takes place as soon as said battery is activated by salt water so that if said explosive device fails to detonate at its operating depth, on closing of contacts of said pressure switch, said battery will have less than a minimum voltage required to detonate the device within a selected time period after the firing should have taken place.

4,050,383

ARRANGEMENT FOR GENERATING A ROCKING MOTION OF A TRANSFER CYLINDER OF AN INKING SYSTEM

Karel Hynst, Adamov, Czechoslovakia, assignor to Adamovske strojirny, narodni podnik, Adamov, Czechoslovakia

Filed June 16, 1976, Ser. No. 696,636
Claims priority, application Czechoslovakia, June 23, 1975, 4403/75
Int. Cl.² B41F *31/14*
U.S. Cl. 101—349 **4 Claims**



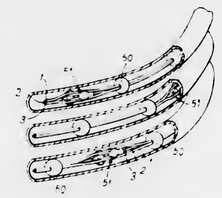
1. Arrangement for generating a rocking motion of a transfer cylinder of an inking system derived from an intermittent motion of a ductor cylinder, in a printing machine, comprising a transfer cylinder with a shaft, a supporting rod pivotably supported in a side wall of the printing machine, holders fixed on this supporting rod rotatably supporting the transfer cylinder, a ductor cylinder on a shaft, a chain wheel rotatably supported on the ductor cylinder shaft, a connecting bolt rotatably supported on this chain wheel, a first pawl and a second pawl fixed on this connecting bolt, a thumb provided on the first pawl, a stable first cam fixed on the shaft of the ductor cylinder, a supporting sleeve with an adjustable second cam rotatably supported on the shaft of the ductor cylinder, the thumb on the first pawl adapted to bear alternately on the working surface of the first and second cam, a first ratchet wheel fixed on the shaft of the ductor cylinder, the first pawl adapted for selective engagement with this first ratchet wheel, a second ratchet wheel rotatably supported on the shaft of the ductor cylinder, the second pawl adapted for selective engagement with this second ratchet wheel, a cam track provided on the hub of the second ratchet wheel, a stable supporting bolt rockingly supporting a first control lever, a roller rotatably arranged on this first control lever, this roller bearing against the cam track on the hub of the second ratchet wheel.

4,050,384

TUBE INSPECTION AND SERVICING APPARATUS

John Edward Chapman, London, England, assignor to Babcock & Wilcox Limited, London, England

Filed Sept. 4, 1975, Ser. No. 610,237
Claims priority, application United Kingdom, Sept. 9, 1974, 39317/74
Int. Cl.² B61B *13/10*
U.S. Cl. 104—138 G **4 Claims**



1. An apparatus for conveying a device for inspecting or performing operations on the interior of a tube wall together with a trailing length of connecting lead along the bore of a tube which apparatus includes the connecting lead for the device and a plurality of traction units secured at spaced locations along said lead, each traction unit including an electric motor connected through a reduction gear train to one or more drive means, and biasing means adapted to urge one or more of the drive means into frictional driving contact with the internal tube wall, electrical leads for supplying power to said traction units from an external source, and said traction units being electrically connected in parallel to said electrical leads for supplying power to said units.

4,050,385

HIGH CAPACITY PASSENGER TRANSPORT APPARATUS

Robert H. Gurr, Los Angeles, and Roger E. Broggie, Carmel, both of Calif., assignors to Walt Disney Productions, Burbank, Calif.

Filed Sept. 29, 1975, Ser. No. 617,437
Int. Cl.² B61B *11/00*
U.S. Cl. 104—173 ST **13 Claims**



1. High capacity passenger transport apparatus comprising: endless high speed cable means including a cable running from a loading to an unloading station and having transport and return runs and means for driving it at high speed;

intercept means for intercepting trucks from said return run;

a plurality of chair trucks including releasable gripper means for selectively gripping said high speed cable and, truck support means;

a plurality of loading station shuttle tracks at said loading station for receiving truck support means of said trucks intercepted by said intercept means to transport them to respective spaced apart loading areas and then to the transport run of said high speed cable and including means for feeding said trucks sequentially into said high speed cable transport run;

a plurality of chairs suspended from said respective trucks, including frames and respective back walls pivotally mounted from said frames for being pivoted away to clear a through path from the rear of said chairs, said chairs further including seats mounted from said walls;

gripper release means for engaging said releasable grippers to release said grippers from said high speed cable as said trucks feed onto said respective shuttle tracks;

gripper actuation means to activate said grippers as said trucks are fed onto said transport run;

selector means for intercepting chair trucks from said high speed cable and directing them sequentially onto each shuttle track of said plurality of shuttle tracks; and

loading escort means for engaging said trucks as they are received on said shuttle tracks, advancing said trucks along said shuttle tracks at a relatively low speed to said respective loading areas and then back to said transport run of said high speed cable to feed said trucks sequentially from each shuttle track of said plurality onto said high speed cable means whereby said high speed cable may be run at a higher speed than said shuttle drive means and said trucks may be fed sequentially from the shuttle tracks onto said cable means to position the suspended chairs in spaced relationship on said cable for advancement thereof with said high speed cable means.

4,050,386

SHELVING APPARATUS

Harlan F. Kellogg, 1617 Sprucewood, Rockford, Ill. 61107

Filed June 30, 1976, Ser. No. 701,072
Int. Cl.² A47B *3/00*
U.S. Cl. 108—111 **12 Claims**



1. In a free-standing shelving apparatus including a plurality of shelves of polygonal configuration disposed in vertically spaced relation and a plurality of uprights extending between each shelf and the next lower shelf, the improvement comprising said uprights each including a solid core having a multi-sided configuration and panel members adhesively joined to each of the side faces of the core, one end of the core being spaced axially outwardly from one end of the panel members to provide a multi-sided tongue at one end of each upright and the other end of the core being spaced axially inwardly of the other end of the panel members to provide a multi-sided socket at the other end of each upright dimensioned to non-rotatably receive the tongue on an axially aligned upright, at least some

of said shelves having openings adjacent each corner thereof inwardly of the periphery of the shelf for receiving the tongues on the uprights, and said tongues having a length to extend through said openings in the shelves and into the socket in an axially aligned upright.

4,050,387

FLUID INDUSTRIAL WASTE INCINERATOR AND ITS METHOD OF OPERATION

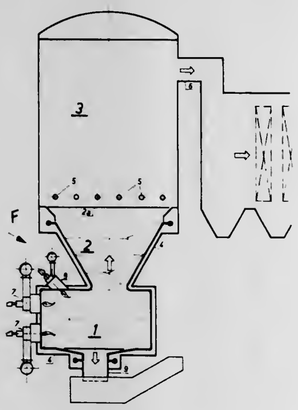
Peter Luchsinger, Zurich, Switzerland; Heribert Muckenheim, Offenbach, Germany; Hanns-Helmut Riemann, Bochum-Querenburg, Germany; Hans Sonnenschein, and Erich Michel, both of Essen, Germany, assignors to Von Roll AG, Switzerland and Gelsenberg Mannesmann Umweltschutz GmbH, Germany

Filed Mar. 17, 1976, Ser. No. 667,592

Claims priority, application Switzerland, Mar. 18, 1975, 3434/75

Int. Cl.² F23G *5/12*; F22B *33/00*

U.S. Cl. 110—8 A **12 Claims**



1. A liquid bath furnace for the combustion of pumpable, fluent waste comprised of organic compound and mineral substance, said furnace comprising:

a primary hot liquid bath combustion chamber for the combustion of said waste;

wall-cooling tubes disposed on the inside surface of said chamber;

a corrosive-inhibiting, heat conductive ramming mass cladded to said wall-cooling tubes to thereby provide an inner chamber surface within said primary combustion chamber that is maintainable at a temperature below the melting temperature of said mineral substance in said waste;

a secondary combustion chamber connected downstream of said primary combustion chamber for the combustion of gaseous products from said primary combustion chamber; and

a post-combustion chamber connected downstream of said secondary combustion chamber for the combustion of gaseous products from said secondary combustion chamber.

4,050,388

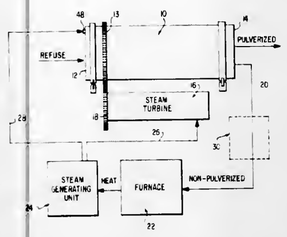
REFUSE TREATMENT APPARATUS

John A. Boyd, 4500 S. Four Mile Run Drive, Arlington, Va. 22204

Filed Sept. 9, 1976, Ser. No. 721,698

Int. Cl.² F23G *7/00*

U.S. Cl. 110—8 P **7 Claims**



1. In an apparatus for treatment of refuse, which apparatus includes a rotatable drum having an inlet end and an outlet end, a perforated drum wall section adjacent the outlet end for separation of refuse pulverized by rotation of the drum, and vane means within said drum at the perforated wall section which direct refuse back toward said inlet end as said drum rotates, the improvement which comprises:

a furnace means which is adapted to burn and at least partially consume the non-pulverized refuse which emerges from the outlet end of said drum;

means for directing the non-pulverized refuse which emerges from the outlet end of said drum to said furnace means;

steam generating means coupled with said furnace means to produce a supply of steam in response to heat supplied by said furnace means;

steam turbine means connected with said drum to cause rotation of said drum; and

means for directing at least a portion of said steam supply to said steam turbine means to power the same.

4,050,389

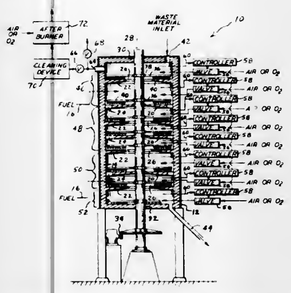
METHOD AND APPARATUS FOR INCINERATING WASTE MATERIAL

Charles F. von Dreusche, Jr., Ramsey, N.J., assignor to Nichols Engineering & Research Corporation, Belle Mead, N.J.

Filed July 19, 1976, Ser. No. 706,637

Int. Cl.² F23G *5/04*; F27B *9/22*

U.S. Cl. 110—12 **15 Claims**



1. In a multiple hearth furnace having a plurality of vertically spaced hearths, wherein waste material is introduced to the furnace at the top thereof and moves downwardly in a generally serpentine fashion moving alternatively inwardly and outwardly across the hearths and is discharged at the bottom of the furnace, a method comprising the steps of introducing towards the lowermost hearth thereof air in a quantity less than that theoretically required for complete combustion of the material being processed, thereafter at successively higher hearths ascertaining the temperature at each hearth and adding air thereto in quantities only sufficient to support combustion thereon, and on each hearth in the middle portion of said furnace adding only enough air to each hearth as to maintain the temperature on that hearth under a maximum predetermined limit, and thence discharging exhause gases at the top of said furnace.

8. Apparatus for incinerating waste material comprising, in combination, a multiple hearth furnace having a plurality of vertically spaced hearths, a rotatable center shaft extending through the center of the furnace and passing through each hearth, a plurality of spaced rabble arms secured to the center shaft and extending radially outwardly over each hearth, alternate hearths having drop holes disposed towards the center shaft and the other hearths having drop holes disposed toward the outer periphery thereof, said furnace having an upper material inlet and a lower material dispensing outlet, and said furnace having an upper exhaust gas outlet, means for introducing towards the lowermost hearth thereof air in a quantity less than that theoretically required for complete combustion of the material being processed, means disposed on successively higher hearths for ascertaining the temperature at each hearth and means for adding air thereto in quantities only sufficient to support combustion thereon, means disposed on each hearth in the middle portion of the furnace for adding only enough air to each hearth to maintain the temperature on that hearth under a predetermined maximum limit.

4,050,390

METHOD OF TREATING SEWAGE SLUDGE

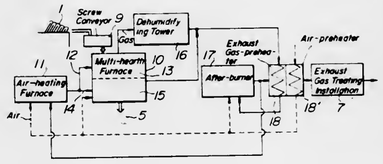
Shinichi Hara, Handa, and Taro Kato, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Aug. 30, 1976, Ser. No. 718,559

Claims priority, application Japan, Sept. 18, 1975, 50-112064

Int. Cl.² F23G *5/12*

U.S. Cl. 110—15 **2 Claims**



1. A method of treating sewage sludge comprising

drying sewage sludge in an upper part of a multi-hearth furnace,

subjecting the sewage sludge to pyrolyzation in a lower part thereof to cause it to reduce to ashes,

extracting from the multi-hearth furnace both exhaust gas produced during the drying of the sewage sludge and the exhaust gas produced during the pyrolyzing independent of each other,

dehumidifying the exhaust gas produced during the drying of the sewage sludge,

mixing the exhaust gas thus dehumidified with the exhaust gas produced during the pyrolyzing of the sewage sludge,

adding preheated gas to the mixed exhaust gas and burning the preheated mixed gas in an after-burner and

discharging the combustion gas into atmospheric air, heat generated in the after-burner being used again to preheat gas to be fed into the after-burner and to an air-heating furnace and preheat the exhaust gas to be fed into the after-burner and a part of the exhaust gas burned in the after-burner together with the preheated air being heated in the air-heating furnace and then fed into the multi-hearth furnace.

4,050,391

BUTTONHOLE STITCHING DEVICE FOR ZIGZAG SEWING MACHINE

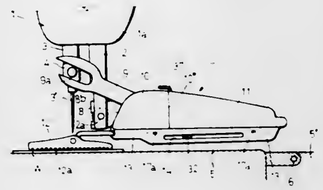
Katsuji Mori, 12-2, Chidori-cho 3-chome, Ogaki, Gifu, Japan

Filed Mar. 8, 1976, Ser. No. 664,855

Claims priority, application Japan, Mar. 12, 1975, 50-30476

Int. Cl.² D05B *3/24*

U.S. Cl. 112—77 **4 Claims**



1. A buttonhole stitching device to be attached to a zigzag sewing machine, the bottonhole stitching device comprising:

a forked member consisting of a forked front portion forming a long notch and a rear portion provided with an upstanding shroud frame wall defining a nearly recatangular aperture, said long notch having a width which corresponds to an amplitude of a laterally moving sewing machine needle;

a base plate, said forked member in facing contact with said base plate for sliding movement relative thereto, said base plate having guide hook means at its front edge which extends into said notch of said forked member for guiding said forked member in reciprocating and swinging movement;

a rotative axis to which a pinion is fixed at the upper portion thereof, said axis penetrating the central portion of said base plate;

driving means attached to said rotative axis beneath said base plate so as to rotate said axis in cooperation with the up-and-down movement of said sewing machine needle;

a cam plate removably fitted into said walled aperture, said cam plate including a loop channel, the shape of which corresponds to the shape of a buttonhole, and a rack surrounding said loop channel and engaging with said pinion; and

cam plate retaining means for preventing said cam plate from being dislocated from said framed aperture of said forked member and selectively movable between a first position preventing said movement of said cam plate and a second position permitting said movement of said cam plate.

4,050,392

BUTTON SELECTOR FEED FOR A BUTTON SEWING MACHINE

Hermann Taddicken, Schwabisch Gmund, Germany, assignor to Eisele Apparate-und Geratebau GmbH, Germany

Filed July 22, 1976, Ser. No. 707,506

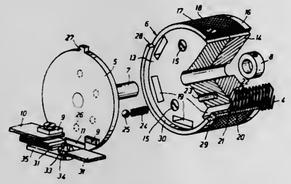
Claims priority, application Germany, Dec. 2, 1975, 7538335[U]

Int. Cl.² D05B *3/22*

U.S. Cl. 112—113 **4 Claims**

1. A button selector feed for a button sewing machine having a button clamp plate with a feed slot and a driver having a button engagement means movable along the feed slot with a selected button, comprising a button selector mounted on the clamp plate adjacent the feed slot and having a fixed part with

a button delivery slot adjacent the feed slot, and a movable part movable relative to said fixed part having a plurality of button feed channels defined therein and accommondating distinctive buttons in respective channels, and means mounting said movable part for movement relative to said fixed part so as to



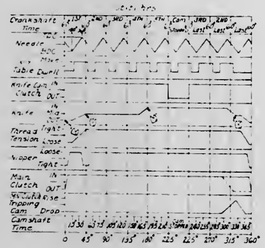
present each channel selectively into alignement with the delivery slot of the fixed part whereby the buttons in the aligned channels may be fed in succession from the associated aligned feed channel through said delivery slot and into the feed slot.

4,050,393

METHOD AND APPARATUS FOR CONTROLLING AN AUTOMATIC BAR TACKING MACHINE

Ray E. Welcher, Danvers, and Roger E. Lemay, Beverly, both of Mass., assignors to USM Corporation, Boston, Mass.

Filed Sept. 29, 1975, Ser. No. 617,445
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—121.12 **3 Claims**



1. In a bar tacking sewing machine having a needle bar drive shaft operatively connected through a clutch to a motor to provide reciprocating motion to a needle, and a workpiece clamp constructed to releasably secure and support a workpiece under the needle, said clamp being slidably and pivotably mounted on the sewing machine for movement relative to the needle along first and second axes, said movement being driven by stepping motors which are operatively connected to the clamp through a non-linear linkage assembly, a method for controlling the stepping motors to provide movement of the workpiece through a predetermined pattern comprising:

A. digitizing the pattern to provide a point by point definition of the path of the workpiece movement;

B. modifying the digitized pattern to compensate for the non-linearity of the clamp drive linkage assembly;

C. coding a Programmable Read Only Memory with the modified digitized pattern;

D. reading the Programmable Read Only Memory by the generation of delayed enabling signals transmitted to said Memory at intervals within the period of needle retraction;

E. generating a train of drive pulses according to the coded digitized pattern;

F. counting each rotation of the needle bar drive shaft and generating timing pulses according thereto; and

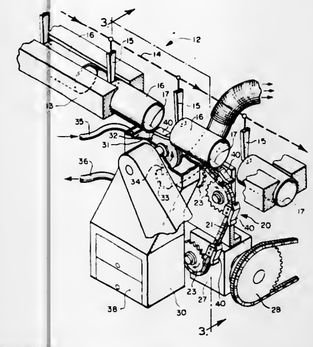
G. transmitting the drive pulses to the stepping motors in times relation to the timing pulses.

4,050,394

CAN FABRICATION SYSTEM

Raymond J. Alleman, Evergreen Park; Raymond T. Batina, Homewood, and Ralph J. Clark, Tinley Park, all of Ill., assignors to Libby, McNeil & Libby, Worth, Ill.

Filed Apr. 9, 1976, Ser. No. 675,276
Int. Cl.[2] B21D *51/26*; B23K *3/00*
U.S. Cl. 113—120 R **12 Claims**



1. In combination:

an article of manufacture for shielding the interior of one of a succession of container bodies from impurities present during the fabrication thereof comprising base means and a substantially U-shaped first impurity deflection member having a pair of arms and an intermediate portion defining a transition edge, extending from said base means;

means for wiping the exterior of said container bodies;

means for moving said transition edge of said impurity deflection member in close predetermined spaced relation with an edge defining a forward open end of said one of said succession of container bodies thereby defining an air gap between said transition edge and said edge defining said forward open end; and

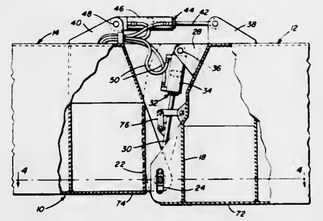
means for moving said succession of container bodies so that said wiping means can be guided from said transition edge over said air gap onto said one of said container bodies without substantial contact with said edge defining said forward open end, whereby said article of manufacture prevents impurities from passing into said one of said container bodies with minimal application of force thereto.

4,050,395

ARTICULATED HULL CONSTRUCTION

Thomas M. Anderson, P. O. Box 2593, Kodiak, Alaska 99615

Filed Mar. 29, 1976, Ser. No. 671,364
Int. Cl.[2] B63B *3/02*
U.S. Cl. 114—77 R **11 Claims**



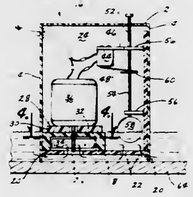
1. In combination, a boat hull including fore and aft hull sections, pivot means pivotally interconnecting said sections for relative angular displacement of said sections about a horizontal transverse axis between predetermined limits, and connecting means interconnected between said sections remote from said pivot means operative to adjustably yieldingly resist relative angular displacement of the hull sections, said pivot means including adjustment means for adjustably vertically shifting one of said sections and said axis relative to the other of said sections.

4,050,396

PORTABLE WATER BAILING DEVICE FOR A BOAT

Rex L. Ridgeway, 1301 S. D St., Fairfield, Iowa 52556

Continuation of Ser. No. 537,333, Dec. 30, 1974, Pat. No. 3,941,073. This application Mar. 2, 1976, Ser. No. 663,082
The portion of the term of this patent subsequent to Mar. 6, 1993, has been disclaimed.
Int. Cl.[2] F04B *49/04*
U.S. Cl. 114—183 R **1 Claim**



1. A portable water bailing device for a boat having a bottom wall and gunwales above said bottom wall, said device comprising; a housing having sidewalls, a top wall and a bottom wall forming

a compartment, said bottom wall being spaced upwardly from the lower edges of said sidewalls, said lower edges of said sidewalls being provided with a plurality of apertures therein positioned below said bottom wall;

a water pump mounted within said housing, said water pump having a cylindrical chamber therein with an inlet opening and an outlet opening, said outlet opening extending tangentially outwardly from the cylindrical wall of said cylindrical chamber;

said housing having at least one opening at the lower end thereof for permitting water to enter said compartment;

a flat blade being rotatably mounted within said cylindrical chamber of said pump for rotation about the cylindrical axis of said chamber;

a direct current motor drivingly connected to said blade;

a limit switch within said compartment and movable between open and closed positions, said limit switch being normally biased toward to its open position;

said limit switch having a switch arm thereon which is movable upwardly to cause said switch to move to said closed position;

a direct current power source connected in series with said limit switch and said direct current motor;

float means movably mounted within said compartment for vertical movement from a lower position to an upper position;

said float means comprising a vertically extending rod having a float on the lower end thereof and a flange positioned intermediate the ends thereof;

said limit switch arm being in engagment with said flange of said rod whereby said flange will move said switch arm upwardly to close said switch whenever said float moves to said upper position; and

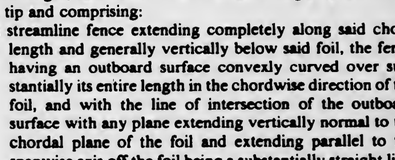
tube means connected to said outlet of said pump for directing water from said pump upwardly over said gunwales of said boat.

4,050,397

FOIL FENCE FOR HYDROFOIL CRAFT

Siebold Vanderleest, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 26, 1976, Ser. No. 680,627
Int. Cl.[2] B63B *1/24*
U.S. Cl. 114—274 **14 Claims**



1. A vortex control means fora a hydrofoil craft lifting foil arranged to generate lift when moved horizontally through water, the foil having an outboard tip with a predetermined chord length, said vortex control means being attached to the foil tip and comprising:

a streamline fence extending completely along said chord length and generally vertically below said foil, the fence having an outboard surface convexly curved over substantially its entire length in the chordwise direction of the foil, and with the line of intersection of the outboard surface with any plane extending vertically normal to the chordal plane of the foil and extending parallel to the spanwise axis off the foil being a substantially straight line, a substantially planar inboard surface, a chordwise dimension corresponding to the chord length of said outboard tip of said foil, and a maximum vertical dimension as measured from the foil chord corresponding generally to one half the chord length of said outboard tip of said foil.

4,050,398

PONTOON BOAT GUIDANCE SYSTEM

Carl F. Holliday, Las Vegas, Nev., assignor to Holliday Guidance Systems, Inc., Las Vegas, Nev.

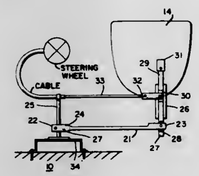
Filed May 14, 1976, Ser. No. 686,461
Int. Cl.[2] B63H *5/13*
U.S. Cl. 115—18 R **1 Claim**

1. An improvement to a guidance system used in a pontoon boat which is powered by an outboard motor wherein the guidance system includes:

a. a steering wheel mechanically coupled and mounted to the pontoon boat;

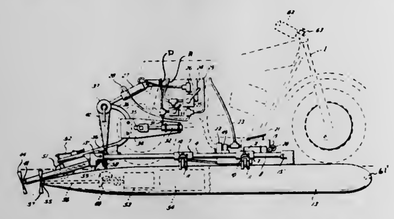
b. a push-pull cable mechanically coupled to the steering wheel and operated in response to movement thereof;

c. a push-pull cable mounting mechanically coupled to the push-pull cable and rigidly mounted to the pontoon boat;
d. an outboard motor having a lever arm disposed a particular distance from its vertical axis; and
e. a base rigidly mounted to the pontoon boat and mechanically coupled to the outboard motor, said base adapted to allow the outboard motor to pivot about its vertical axis, said improvement comprising:
a. a first member having a first U-shaped end mechanically coupled to the push-pull cable mounting and a second U-shaped end;



b. a second member having a first end mechanically coupled to said second U-shaped end and a second end, said second member also having a slot disposed between said first and second end;
c. coupling means for connecting the push-pull cable to said slot and thereby mechanically coupling said second member to the push-pull cable; and
d. connecting means for connecting said second end of said second member to the lever arm of the outboard motor.

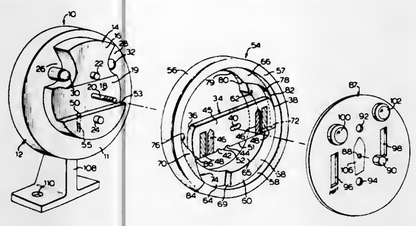
4,050,399
ATTACHMENT FOR MOTORCYCLES
Ashton Mochel, Rte. 7, Forest Road, Conroe, Tex. 77301
Filed Jan. 5, 1976, Ser. No. 646,664
Int. Cl.² B63H *1/00*
U.S. Cl. 115—71 **4 Claims**



1. In an attachment for motorcycles, a frame adapted to be mounted on the framework of a motorcycle, pivotal supporting arms on said frame, the extended ends of said arms supporting flotation means, a propulsion framework pivotally mounted on said motorcycle framework, having propulsion means mounted thereon, and means for selective transmission of power to said propulsion means from said motorcycle, pneumatic means mounted on said frame having conduits on said motorcycle for selectively actuating said arms and said propulsion framework.

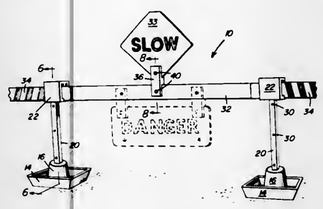
4,050,400
MARINE NAVIGATION INSTRUMENT
Nelson Tatton, Palgrove, Ontario, and James Tatton, 74 Gunn Street, Barrie, Ontario, both of Canada
Filed May 17, 1976, Ser. No. 687,367
Int. Cl.² B63B *45/00*
U.S. Cl. 116—26 **9 Claims**

1. A buoy for determining a navigable channel reminder comprising an indicator having spaced depictions of pairs of nun and can buoys thereon, a mounting member for supporting the indicator for lateral reciprocal movement, a frame secured to the mounting member for rotational movement of the frame, the frame having on its inner surface a first cam and the mounting member having a first recess diametrically opposed the first cam, a second cam adjacent the first recess and the mounting member having a second recess diametrically opposed the



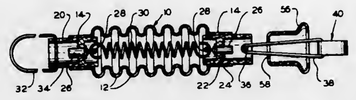
second cam and adjacent the first cam, the distance between each cam and its diametrically opposed recess being such to accommodate the indicator, a face cover having two spaced display windows therein to alternately display nun and can buoys and can and nun buoys respectively in the windows when the frame is rotated in one direction, then the reverse direction, causing the cams to alternately move the indicator in one direction then the return direction.

4,050,401
BARRICADE SYSTEM
Henry W. Kelly, Cottage Grove, Oreg., assignor to Wanda McCullough, Felton, Calif., a part interest
Filed Dec. 22, 1975, Ser. No. 643,130
Int. Cl.² E01F *9/01, 9/10*
U.S. Cl. 116—63 P **21 Claims**



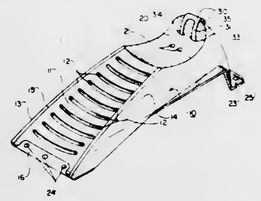
1. A barricade system comprising: means for warning traffic of a dangerous situation and to protect them therefrom including; base means having at least two easily separable and connectible units, one unit being a base pan unit with a flat bottom portion and a center portion for connection to a second unit of cone shape, both units arranged for receiving removable support means, support means mounted thereon, head means on said support means for mounting barricade devices at an easily visible height, and the base pan unit has a raised outer edge forming a pan-like structure and a raised inner cylindrical portion for supporting the cone unit, the support means comprising a support tube unit, and the head means including a double-slotted body member having mounting means at the bottom thereof for engagement with the support tube, with the double-slotted body member having a mounting socket at the bottom thereof to provide the mounting means.

4,050,402
BURGLAR ALARM FOR DOORS
Henry H. Merriman, 751 W. Washington St., Jackson, Mich. 49203
Filed July 1, 1976, Ser. No. 701,900
Int. Cl.² G08B *13/08*
U.S. Cl. 116—86 **8 Claims**



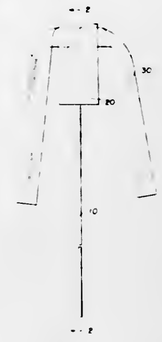
1. A burglar alarm for indicating the opening of a building closure comprising, in combination, an elongated bellows having an axis, first and second ends and expansible and contractable in its axial direction, a tension spring within said bellows having first and second ends, said first spring end being affixed to said bellows' first end and said second spring end being affixed to said bellow' second end whereby said spring biases said bellows toward its connected condition, an air passage communicating with the interior of said bellows, a vibratable read within said air passage producing an audible signal during movement of said member from the expanded condition to the contracted condition, first anchor means defined upon said first end, and second anchor means defined on said second end.

4,050,403
AUTO REPAIR RAMP WITH SIGNAL
Jack V. Miller, Sierra Madre, Calif., assignor to Acroform Corporation, Los Angeles, Calif.
Filed Aug. 20, 1975, Ser. No. 606,301
Int. Cl.² B66F *19/00*
U.S. Cl. 116—124 R **10 Claims**



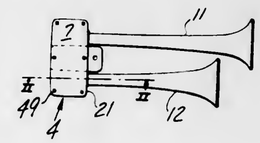
1. An automobile service ramp comprising a unitary sheet metal body member including a ramp portion, a wheel rest portion and a support portion;
said ramp portion having a concave track portion having a number of transverse extending corrugations, and
a pair of integral ribs extending longitudinally with respect to said ramp portion along each side thereof;
said longitudinal ribs upstanding above the level of the transverse corrugations and said longitudinal ribs including depending extensions constituting continuations of said longitudinal ribs having a length below the neutral fiber of a cross section of the ramp portion at least three times the maximum distance of the longitudinal rib above the neutral fiber; and
wherein said rest portion is a surface that is in the form of a portion of a sphere.

4,050,404
SURVEY MARKER
Edwin E. McMackin, 131 Yorktown, Dallas, Tex. 75208
Continuation of Ser. No. 554,188, Feb. 28, 1975, abandoned.
This application Mar. 15, 1976, Ser. No. 666,759
Int. Cl.² G01C *15/06*
U.S. Cl. 116—124 R **8 Claims**



1. A survey marker comprising, in combination
a stake comprising an elongated small-gauge metal rod, having a sufficient stiffness to be driven into the ground;
an indicia member comprising a laminate of two pliant sheets, each sheet initially having an adhesive coating on one face, with its other face adapted to receive written indicia;
said pliant sheets being bonded to each other and to said rod, adjacent to one end of said rod, by means of said adhesive coatings; said rod being disposed between said bonded sheets, generally centrally of opposite edges thereof;
an elongated ribbon secured to said indicia member, having a portion passing transversely between said laminated sheets and secured by means of the adhesive thereon; and said ribbon extending for a substantial length in at least one direction from the edge of said indicia member;
and said laminated indicia member providing a relatively firm surface capable of receiving written indicia.

4,050,405
SINGLE-HOUSING MULTI-TRUMPET AIR HORN
Walter C. Palm, Grand Rapids, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed Mar. 29, 1976, Ser. No. 671,593
Int. Cl.² G10K *9/04*
U.S. Cl. 116—142 FP **8 Claims**



1. A multiple-trumpet air horn comprising:
a housing comprising a body and a cap defining a plurality of laterally spaced air pressure chambers, each centered with respect to an axis in parallel relation with the axes of the other chambers and extending generally perpendicularly to mutually-facing planate face surfaces of the cap and the body;

a diaphragm for each chamber adapted to be peripherally confined between said body and said cap;

said body defining portions of said chambers in the form of a cavity for each chamber spaced one from the other, each cavity extending inwardly from said face surface of the body and being perimetrically defined by a continuous rabbet extending axially inwardly from said face surface and then laterally inwardly of the cavity toward the axis thereof to provide a narrow continuous perimetric seating surface;

said body defining longitudinally-angled air escape ducts, each of which extends inwardly from an outer lateral surface of the body and terminates centrally inwardly of said cavity in a portion formed by an annular boss of substantially less diameter than any transverse dimension of the respective encircling seating surface extending through said boss, said boss terminating in an annular diaphragm-engaging end surface extending within a plane and parallel adjacent relation to, or within, the general plane of said seating surface, said air ducts terminating at said outer surface in substantially right angle relation with the portions thereof formed by said bosses in means for connecting the body with a pair of horn trumpets;

said cap defining portions of said chambers as a corresponding plurality of recesses having perimeters generally matching those of said cavities when the cap is operatively positioned on said body, each of said recesses being peripherally bounded by a continuous ridge of a height beyond said face surface of the cap at least equal to the depth of the rabbet of the respective opposed cavity, said ridge being shaped complementary to said seating surface of the rabbet for continuously engaging the entire peripheral edge of one of said diaphragms confined therebetween, each of said diaphragms being thereby confined in central engagement with one of said bosses in a condition of resilient deformation;

duct means extending within said body from an exterior surface to portions of each cavity radially outwardly of said boss therein for supplying air to the cavities; and

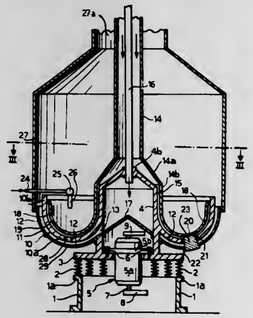
fastening means for securing said cap to the body to affect sealing of all chambers along junctures of the diaphragms, cap ridges, and body seating surfaces of said chambers.

4,050,406

COATING MACHINE FOR CONFECTIONERY, PHARMACEUTICALS AND SIMILAR PRODUCTS

Mario Reni, Brugherio (Milan), Italy, assignor to Reni-Cirillo S.r.l., Milan, Italy

Filed June 3, 1976, Ser. No. 692,527
Int. Cl.² B05C *5/00*
U.S. Cl. 118—19 **4 Claims**



1. A machine for coating articles of confectionery, or pharmaceutical or like products, said machine comprising:

a support structure;

an annular receptacle having a bottom and an upwardly open channel section;

means defining a closable discharge aperture in one wall of said receptacle, said closable discharge aperture serving, when open, for the discharge of articles from said annular receptacle;

resilient suspension means interconnecting said annular receptacle and said support structure;

vibration generator means operating to cause said annular receptacle to vibrate with respect to said support structure;

at least the bottom of said receptacle is perforated or has a mesh structure;

a container surrounding and locating the said annular receptacle such that there is a space between said bottom of said receptacle and said container;

an air duct communicating with said space between said bottom of said receptacle and said container; and

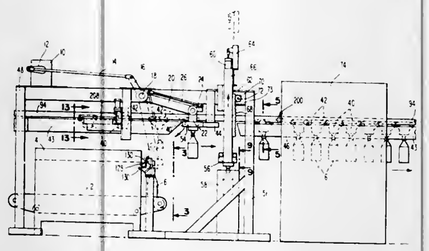
a source of air under pressure connected to said air duct, whereby in use of said machine air can be blown into said space between said perforated or mesh structure bottom of said receptacle and said container.

4,050,407

APPARATUS FOR FLUID BED COATING OF GLASS BOTTLES

George Garwood, Wynnewood, Pa., and Joseph C. Flynn, Millville, N.J., assignors to Wheaton Industries, Millville, N.J.

Filed Dec. 8, 1975, Ser. No. 638,679
Int. Cl.² B05C *3/10*
U.S. Cl. 118—58 **37 Claims**



1. Bottle holding chuck including

1. a horizontally disposed U-shaped member adapted to support a bottle resting thereon at a generally horizontal surface feature on the outer surface near the top of said bottle and

2. a cap member adapted to fit loosely over the top of said bottle to prevent horizontal movement thereof

said horizontally disposed member and said cap member being cooperatively arranged and adapted to carry a bottle positively positioned thereon and suspended therefrom with substantially all of said bottle below said surface feature free of contact with any part of said chuck.

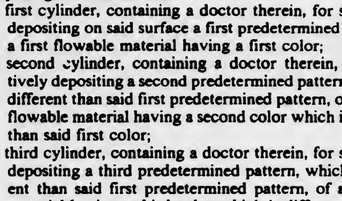
4,050,408

APPARATUS FOR DEPOSITING THIN LAYERS OF MATERIALS BY REACTIVE SPRAYING IN A HIGH-FREQUENCY INDUCTIVE PLASMA

Pierre Beucherie, Biandronno (Varese), Italy, assignor to European Atomic Energy Community (EURATOM), Kirchberg, Luxembourg

Filed Nov. 19, 1975, Ser. No. 633,263
Claims priority, application Luxembourg, Nov. 22, 1974, 71343
Int. Cl.² C23C *13/12*; B23K *5/00*
U.S. Cl. 118—49.1 **9 Claims**

1. An apparatus for depositing thin layers by reactive spraying a high frequency inductive plasma comprising a sealing-tight vessel connected to a vacuum generation system containing means which are adapted to produce a high-frequency electromagnetic field and comprise a material which can be sprayed by the field, at least one surface serving as a substrate for the thin layer deposition, means for injecting gas into the vessel near the surface and means for injecting a gas into the vessel near the means applying the electromagnetic field, the gases comprising a reactive gas and an inert gas which can be ionized by the electromagnetic field, said vessel comprising partition means dividing it into a first chamber which contains



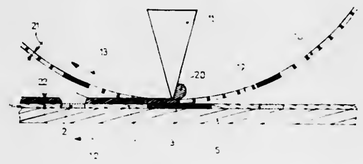
the means applying the electromagnetic field and is connected to the means supplying an ionizable inert gas and at least a second chamber which contains the substrate or substrates and is connected to the means for supplying reactive gas, the partition means being formed with an aperture which connects the chambers and is disposed on the straight path between the substrates and the means for applying the electromagnetic field, the vessel being provided with connecting ducts to the vacuum generation system, the ducts being so disposed with respect to the chambers that the reactive gas cannot flow into the first chamber.

4,050,409

CYLINDER FOR REPRODUCING RAISED PATTERNS ON ALL SURFACES

Alain Duchenaud, and Roger Duchenaud, both of 3 rue de Funas, Bourgoin Jallieu (Isere), France

Filed Oct. 7, 1974, Ser. No. 512,725
Claims priority, application France, Oct. 24, 1973, 73.38567
Int. Cl.² B05C *1/16*
U.S. Cl. 118—406 **12 Claims**



1. An apparatus for imparting relief to a pattern on a surface, comprising, in combination:

a first cylinder, containing a doctor therein, for selectively depositing on said surface a first predetermined pattern of a first flowable material having a first color;

a second cylinder, containing a doctor therein, for selectively depositing a second predetermined pattern, which is different than said first predetermined pattern, of a second flowable material having a second color which is different than said first color;

a third cylinder, containing a doctor therein, for selectively depositing a third predetermined pattern, which is different than said first predetermined pattern, of a flowable material having a third color which is different than said first color; and

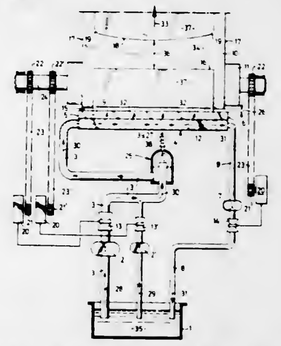
a fourth cylinder, containing a doctor therein, for selectively depositing a fourth predetermined pattern, which is different than said first predetermined pattern, of a substantially thick layer of said flowable material on only those preselected portions of said patterns which are to be raised.

4,050,410

APPARATUS FOR THE MANUFACTURE OF A SERIES OF PHOTOCONDUCTOR WEBS

Joachim Stroszynski, Naurod, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Wiesbaden, Germany

Filed May 25, 1976, Ser. No. 689,869
[62] Division Of Serial No. 584,692, June 6, 1975, Now Pat No. 3,973,961
Claims priority, application Germany, June 7, 1974, 2427515
Int. Cl.² G03G *5/04*; B05C *3/02, 5/02*
U.S. Cl. 118—410 **4 Claims**



1. An apparatus for the manufacture of a series of photoconductor webs spaced apart from each other on a carrier web by electrically conductive spacing strips extending transversely to the carrier web, comprising

a. a movable backing member for supporting and transporting said carrier web;

b. a slot die extending parallel to said backing member and having an orifice located directly contiguous said backing member;

c. means positioned at one front edge of said slot die for supplying a photoconductive coating solution to said slot die, said supplying means including at least one first infinitely variable dosing pump and at least one valve positioned between each first dosing pump and said slot die, said valve being capable of operating without causing displacement; and

d. means positioned at the front edge of said slot die opposite to said supplying means for discharging excess coating solution from said slot die, said discharging means including a second infinitely variable dosing pump and a valve positioned on the side of said second dosing pump opposite said slot die, said valve being capable of operating without causing displacement.

4,050,411

APPARATUS FOR MARKING INSULATED ELECTRICAL CONDUCTORS

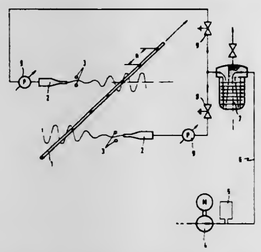
Klaus Kimmich, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,301
Claims priority, application Germany, May 14, 1976, 2521529
Int. Cl.² B05B *5/00*
U.S. Cl. 118—625 **4 Claims**

1. Improvements in apparatus for marking insulated electrical conductors with a stream of color material continuously emerging under pressure from a spray nozzle disposed with respect to an electrical conductor, which stream is deflected

under the action of an electrical alternating field, said stream of color material being supplied by supply means for said color material including a supply pipe leading from said supply of color material to said nozzles, said improvement comprising:

insertion of a straining filter having an opening at its highest point positioned in said pipe leading from said supply of color material to said spray nozzles; and



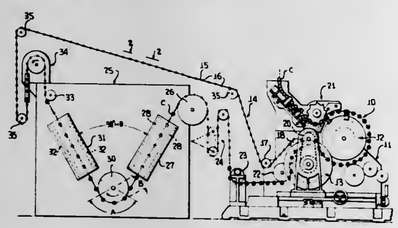
said straining filter having a connection at said highest point to a return supply pipe for returning a small portion of said color material to said supply color material along with any gas bubbles which form during the course of said supply to said spray nozzles.

4,050,412

U.V. CURING MACHINE

Frederick H. Bantz, Hazel Crest, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,837
Int. Cl.² B05C *13/02*
U.S. Cl. 118—642 **19 Claims**



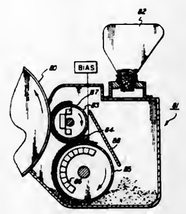
12. An ultra-violet curing machine for curing the exterior surface of can bodies coated with photopolymerizable ink, said curing machine comprising; a conveyor chain, pins mounted at spaced intervals along said conveyor chain and extending laterally from said conveyor chain whereby said pins each may receive a can body for supporting can bodies on said pins, a first expanse of conveyor chain, first and second ultra-violet lamps mounted on opposite sides of the plane of said first expanse of conveyor chain and said pins for applying radiant energy to first and second opposed side areas of can bodies, a sprocket for accommodating said conveyor chain around it and changing the direction of movement of said conveyor chain, a section of conveyor chain extending from said first expanse of conveyor and around part of said sprocket, a second expanse of said conveyor chain extending from said section of conveyor chain and in a direction relative to said first expanse of conveyor chain so that the direction of the conveyor chain is altered by an angular amount to rotate said can bodies through an angle of ninety degrees about their axes relative to their positions in said first expanse of said conveyor chain, and third and fourth ultra-violet lamps mounted on opposite sides of the plane of said second expanse of conveyor chain for receiving can bodies in their newly rotated positions and said pins for applying radiant energy to third and fourth side areas of said can bodies whereby said third and fourth ultra-violet lamps apply radiant energy to can body side areas rotated at 90° from the can body exposed to said first and second ultra-violet lamps, and all exterior portions of the curved areas of said can bodies are exposed to about the same intensity of radiant energy so that curing of the photopolymerizable ink on said exterior surface of said can bodies is effected.

4,050,413

MAGNETIC BRUSH CROSSMIXING SYSTEM

Delmer G. Parker, Irondequoit, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 22, 1975, Ser. No. 615,658
Int. Cl.² G03G *13/00*
U.S. Cl. 118—647 **17 Claims**



1. In a system for developing latent images carried by an imaging surface including multiple donor members adjacent said imaging surface which carry developer particles through a development zone to said imaging surface to develop the latent image, the improvement comprising:

a homogenizing means interposed between at least two adjacent donor members for homogenizing developer particles being carried between said donor members, and

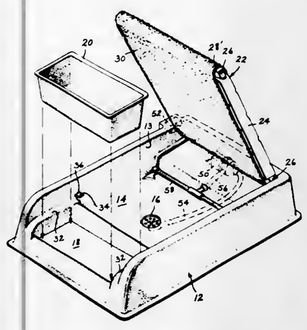
an oscillating means connected to said homogenizing means which mixes the developer as it flows through the development zone whereby the developer is maintained in a homogeneous state throughout the development zone to produce images of uniform quality.

4,050,414

ANIMAL TOILET

Wayne L. Knochel, and Robert S. Traeger, both of Rochester, Ind., assignors to KLT Industries, Inc., Rochester, Ind.

Filed May 17, 1976, Ser. No. 687,161
Int. Cl.² A01K *29/00*
U.S. Cl. 119—1 **4 Claims**



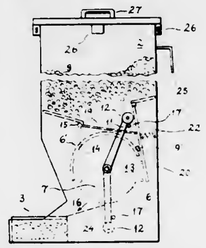
1. An animal waste disposal unit which includes a housing having two side walls and a bottom wall defining a fluid collector; a conveyor including an endless belt supported between spaced rollers and having an upper run where the animal stands to deposit its excreta; said conveyor having a discharge end; the improvement comprising means connecting said conveyor at its opposite end from said discharge end thereof to said housing for pivotal movement of the conveyor relative to said housing over said fluid collector; means for rotating said belt; said belt having a lower run spaced from said upper belt run; spray means located within said fluid collector for directing fluid against said lower belt run to cleanse said belt; a trip lever means carried by said housing at the discharge end of said conveyor for contacting and yieldably supporting said conveyor discharge end in an elevated position; said trip lever means being yieldable into a depressed position when an animal steps upon said belt upper run to allow slight pivotal movement of said conveyor about its housing pivot connection means; switch means associated with said trip lever means for activating said belt rotating means and spray means; and receptacle means located at said conveyor discharge end for receiving any solid excreta carried upon said upper belt run as the belt is rotated.

4,050,415

SELF-CLEANING ANIMAL FEEDER

Robert Arthur Conger, 51 Upper Welden, St. Albans, Vt. 05478

Filed June 7, 1976, Ser. No. 693,715
Int. Cl.² A01K *5/00*
U.S. Cl. 119—51.5 **1 Claim**



1. A self-cleaning animal feeder, comprising:

a cylindrical measuring trough for food, having a lengthwise slot as a food gate, and being mounted to be turned about a horizontal axis, so that the slot can be turned upward or downward;

a housing whose walls form a bin for food chunks in an upper story, provide seats for the rotatable trough in an intermediate part of the housing, and give room lower than the measuring trough to a food tray for an animal;

a first hinged flap, braced by a pressure spring against the inner housing, to slide along the outer surface of the spinning trough, but holding back any food chunk, caught between said surface and the flap, until the slot comes up, setting the food chunk free;

a second hinged flap, being lifted by the slot edge after the food exit to where this flap butts with the first hinged flap, thus shutting off the food stream (FIG. 2);

a downward opening in the food bin, aligned with the slot of the measuring trough in its upturned position, while the round trough wall is keeping the outlet hole of the feeder shut;

two disk-shaped side walls of the measuring trough, of which one is fastened to a crank handle, adapted to turn the trough between two stops, one stop defining the upturned slot position for filling of the trough, the other marking the downturned position of the trough for emptying it;

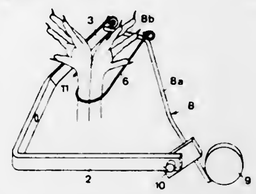
and a cover over the animal feeder, which cover may be removed, to supply food and water, the cover having latches, to fasten it to the feeder, and a handle on top, to transport the animal feeder.

4,050,416

SLING DEVICE FOR SUSPENDING ANIMALS OR ARTICLES

Patrick Amaudric du Chaffaut, Domaine St Aries, and Georges Petrulacci-Stephanopoli, Domaine de l'Etang, both of 84500 Bollene (Vaucluse), France

Filed Apr. 13, 1976, Ser. No. 676,422
Claims priority, application France, Apr. 17, 1975, 75.12038
Int. Cl.² A01K *37/00*
U.S. Cl. 119—97 R **12 Claims**



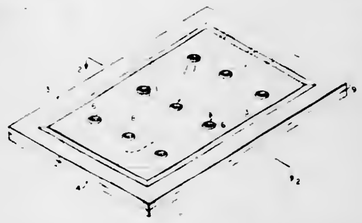
1. A sling device for suspending an animal or article comprising a generally C-shaped bracket member, a movable arm, means mounting said movable arm on said bracket member for movement between a rest position and an operative hanging position through an intermediate position, biasing means tending to urge said movable arm toward its rest position, a cordlike flexible member having a first point of attachment effectively connected to said bracket member remote from said movable arm mounting means and a second point of attachment on said movable arm, in said rest position, said biasing means pulling said cordlike flexible member taut with said points of attachment relatively remote from each other, in said intermediate position said points of attachment being brought into relative proximity of each other in response to a part of the animal or article being urged against the flexible member so as to start a loop therein, and in said operative hanging position said points of attachment being once again relative remote from each other owing to the hanging weight of the animal or article on said movable arm, thereby tightening the loop in the cordlike flexible member about said part of the animal or article.

4,050,417

CAT AND DOG COMBINATION STRETCHER AND SCRATCHER

Robert P. Ellis, 350 Lomas Santa Fe Drive, Solana Beach, Calif. 92075

Filed June 29, 1976, Ser. No. 700,761
Int. Cl.² A01K *29/00*
U.S. Cl. 119—156 **1 Claim**



1. A combination cat and dog stretcher and scratcher pad comprising two sheets of smooth flexible material of equal size and configuration with their edges securely bonded together to

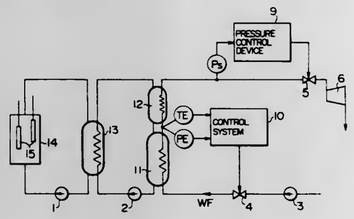
form a closed container, an inner flexible element impregnated with insecticide and encapulate within the two bonded sheets, said two sheets including holes therein which extend entirely therethrough for establishing a passageway between said inner flexible element and the exterior of said sheets, roughened projections extending outwardly from one sheet at each hole therein whereby said one sheet with said roughened projections may be used by an animal as a scratching pad with the weight of the animal causing insecticide vapors to be emitted through passageways onto said animals or the other smooth side may be used by an animal as a stretching pad with the weight of the animal causing insecticide to be emitted through passageways onto said animals.

4,050,418

CONTROL SYSTEM FOR STEAM GENERATOR

Takao Watanabe, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed July 8, 1975, Ser. No. 594,002
Claims priority, application Japan, July 8, 1974, 47-77285
Int. Cl.² F22B *1/06*; F22D *5/26*
U.S. Cl. 122—451 R **10 Claims**



1. In a steam generator having an evaporator for producing steam by heat-exchange between alkaline metal and feed-water and a super-heater for further heating the steam by heat-exchange between the steam produced by said evaporator and alkaline metal, an improved control system for the steam generator comprising:

a vapor temperature detector for detecting the vapor temperature at the outlet of said evaporator;

a vapor pressure detector for detecting the vapor pressure at the outlet of said evaporator;

first means receiving the outputs of said vapor temperature detector and said vapor pressure detector to thereby detect the fact that the vapor is in such a condition that liquid water may possibly enter into said super-heater and produce an output; and

second means for reducing the flow rate of the feed-water to be supplied to said evaporator, in response to the output of said first means.

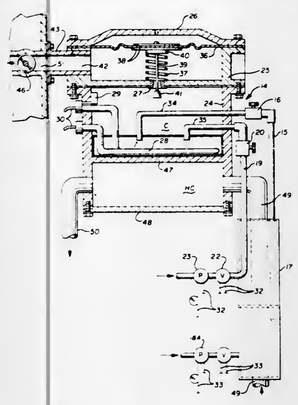
4,050,419

HOT FUEL GAS GENERATOR

Webster B. Harpman, Poland, Ohio, and Fred G. Mahoney, Pittsburgh, Pa., assignors to Econo Fuel Systems, Inc., Latrobe, Pa.

Filed Oct. 24, 1975, Ser. No. 625,565
Int. Cl.² F02B *43/00*
U.S. Cl. 123—3 **2 Claims**

1. A generator for producing superheated fuel gas for an internal combustion engine having an intake manifold, comprising, a vertical closed pressure vessel having a horizontal wall dividing said vessel into upper and lower chambers, electric resistance heating means in said lower chamber, means for energizing said heating means to generate and maintain temperatures between 600° and 1800° F therein, separate means for simultaneously continuously injecting predetermined amounts of gasoline and water into said lower chamber against said heating means so as to simultaneously change said gasoline to a gas and said water to steam, means for controlling the energization of said heating means and the amounts of water and gasoline injected for maintaining a desirable working pressure and volume of the superheated fuel gas in said lower chamber, whereby the molecules of the super heated fuel gas in its heated pressurized gaseous condition are caused to be spaced apart a sufficient degree of support substantially complete combustion in said engine, a pressure responsive device comprising a valve element in said lower chamber movable into and out of an opening located in said wall, a diaphragm in said upper chamber, an arm on said valve element attached to said



diaphragm for movement of said valve element thereby, said valve element being arranged to move into and restrict said opening upon an increase in gas pressure in said upper chamber moving said diaphragm away from said opening and to move out of said opening upon a reduction in gas pressure in said upper chamber moving said diaphragm toward said opening, means located between said diaphragm and said wall balancing said diaphragm and said valve element so as to permit said diaphragm to move responsive to pressure changes in said upper chamber, and an outlet in said upper chamber located between said diaphragm and said wall in communication with said inlet manifold.

4,050,420

CONSTANT PRESSURE-TEMPERATURE DELAYED COMBUSTION HIGH COMPRESSION RATIO ENGINE AND METHOD

Roy S. Cataldo, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 2, 1975, Ser. No. 574,046
Int. Cl.² F02N *35/02*
U.S. Cl. 123—30 C **3 Claims**

1. A method of burning air-fuel mixtures in an internal combustion engine to obtain efficiency and power while controlling emissions, said method comprising the steps of

supplying a lean combustible air-fuel mixture to a closed variable volume combustion chamber,

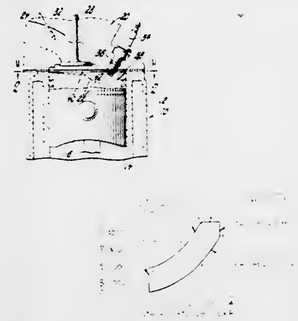
compression said air-fuel mixture through a predetermined volume ratio in the range between about 17 and 30 to 1, said combustible mixture being prepared with a combination of lean air-fuel ratio and fuel octane sufficiently high to prevent preignition and detonation when so compressed,

igniting said mixture other than by the heat of compression near the end of said compression step and burning said mixture following the end of said compression step,

expanding said mixture during and after combustion through said predetermined volume ratio with an output of work

to a movable wall associated with said combustion chamber, and

controlling the burning of said mixture to provide an initial phase of rapid combustion under substantially constant



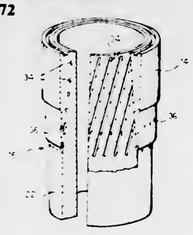
pressure conditions while raising the combustion gas temperature to a predetermined maximum temperature with the remainder of the fuel being burned under substantially constant temperature conditions at about said predetermined temperature.

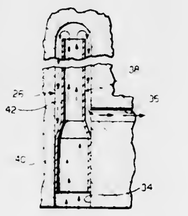
4,050,421

CYLINDER LINER WITH INTERNAL COOLING DUCTS FOR INTERNAL COMBUSTION RECIPROCATING ENGINES

Bruno Cendak, Trieste, Italy, assignor to Grandi Motori Trieste S.p.A. G.M.T. - Fiat, Ansaldo, C.R.D.A., Trieste, Italy

Filed Aug. 5, 1976, Ser. No. 711,897
Claims priority, application Italy, Aug. 27, 1975, 69144/75
Int. Cl.² F02F *1/10*
U.S. Cl. 123—41.72 **4 Claims**





1. A cylinder liner for internal combustion reciprocating engines, of the type having a neck which in use of the liner extends between a cylinder block and a cylinder head of the engine and means defining a number of internal cooling ducts in the neck for the through flow of a cooling liquid which in use of the liner enters these ducts from a means forming an annular space surrounding the part of the cylinder liner located within the cylinder block and which emerges from the said ducts into a means forming a collection chamber which surrounds the neck and from which the cooling liquid is directed towards the cylinder head,

wherein the improvement consists in the means defining each of the internal ducts in the liner comprising:

means defining a blind hole communicating with the said part of the liner and extending towards the cylinder head;

means defining a hole extending transversely with respect to the blind hole and communicating with the latter to provide communication between the blind hole and the collection chamber, the transverse hole being located adjacent the open end of the blind hole and debouching on the outside of the cylinder liner in a region different from that of the neck, and

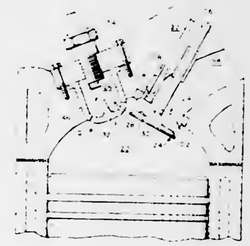
baffle means extending longitudinally within the blind hole and subdividing it into a flow passage extending from the end of the blind hole which communicates with the annular space up to a point adjacent the blind end of the blind hole, and into a return passage extending from said point adjacent the blind end, at which it communicates with said flow passage, to the associated transverse hole which communicates with the collection chamber.

4,050,422

APPARATUS FOR SUPPLYING RICH AIR/FUEL MIXTURE IN AN INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, Okazaki; Setsuro Sekiya, and Katsuhiko Motosugi, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 6, 1975, Ser. No. 629,229
Claims priority, application Japan, Nov. 13, 1974, 49-130014
Int. Cl.² F02B *19/10*
U.S. Cl. 123—75 B **9 Claims**



1. An apparatus for supplying a rich air/fuel mixture for an internal combustion engine comprising:

a. an air/fuel intake;

b. an intake valve for controlling said air/fuel intake; and

c. a tube for supplying a rich air/fuel mixture, said tube terminating at the back surface of the intake valve when said valve is closed, the wall of the outlet end of said tube being reduced in thickness for adapting itself by deformation to recession of the intake valve due to wear.

4,050,423

IGNITION TIMING ADJUSTING DEVICE FOR INTERNAL COMBUSTION ENGINES

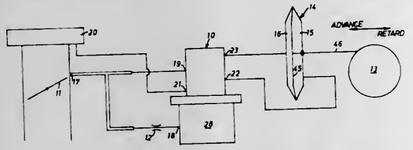
Masami Inada, Toyoake; Yasuhiro Kawabata, Toyota; Katsujiro Sato, Toyota, and Akinori Osanai, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, BoliviaTH OF JA

Filed Oct. 23, 1975, Ser. No. 625,054

Claims priority, application Japan, Oct. 23, 1974, 49-122281; Oct. 29, 1974, 49-125206; Oct. 29, 1974, 49-125207

Int. Cl.² F02P 5/02

U.S. Cl. 123—117 A **8 Claims**



1. An ignition timing adjusting mechanism in combination with an internal combustion engine having a carburetor with a throttle valve and a distributor with a breaker plate for the engine, comprising:

a vacuum actuator provided therein including a diaphragm piston forming first and second servo-chambers in said actuator and operatively connected to said breaker plate of said distributor, said diaphragm piston being moved in one direction from an original position to move said breaker plate in a retarding direction and being moved in the other direction to move the breaker plate in an advancing direction;

a change-over valve means interposed between said vacuum actuator and said throttle valve of said carburetor for selectively connecting said first and second servo-chambers to atmospheric air and a negative pressure port upstream of said throttle valve therethrough, said valve means being changed-over from a first position, in which said first and second servo-chambers are respectively connected to the atmospheric air and said negative pressure port to move said diaphragm piston in one direction, to second position in which said first and second servo-chambers are respectively connected to said negative pressure port and the atmospheric air to move said diaphragm piston in the other direction; and

means for delaying the switchover timing of said valve means to provide a predetermined time lag after occurrence of negative pressure at the throttle valve;

whereby when the throttle valve is closed and said valve means is conditioned in said first position, the breaker plate is positioned by said actuator in said original position, and when the throttle valve is opened with said valve means in said first position, the breaker plate is moved by said actuator in the retarding direction and subsequently moved in the advancing direction with the time lag upon switching-over of said valve means to said second position from said first position.

4,050,424

CARBURETOR AUTOMATIC CHOKE CONSTRUCTION

Thomas A. Nelson, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 194,935, Nov. 2, 1971. This application Aug. 24, 1973, Ser. No. 391,410

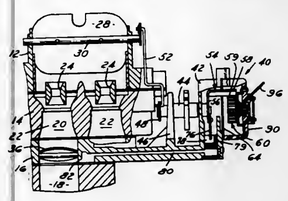
Int. Cl.² F02D 11/08; F02M 1/10, 23/04

U.S. Cl. 123—119 F **13 Claims**

1. An automatic choke system for use with a carburetor having an air/fuel induction passage and

an unbalance mounted, air movable, choke valve mounted for variable movement across the passage to control air flow through the passage,

thermostatic spring means operably connected to the choke valve urging the choke valve towards a closed position with a force increasing as a function of decreases in the temperature of the spring means from a predetermined level,



and a self-limiting output temperature heater device located adjacent the spring means operable to transfer its heat output thereto up to its limit to reduce the choke valve closing force of the spring means and permit opening of the choke valve by air flow through the passage against it.

4,050,425

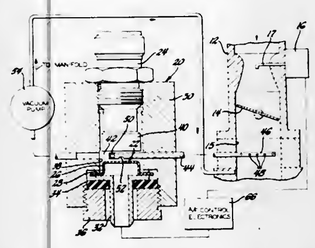
AIR-FUEL RATIO CONTROL SYSTEM

Bruce W. Holleboom, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 24, 1975, Ser. No. 634,605

Int. Cl.² F02M 7/00, 13/04

U.S. Cl. 123—119 EC **2 Claims**



1. An air-fuel ratio control system for a throttled internal combustion engine comprising air-fuel ratio sensing means, means for supplying an unaltered sample of the throttled air-fuel mixture being inducted into said engine to said air-fuel ratio sensing means and then returning the sample for induction into the engine, ignition means for igniting the air-fuel mixture sample at said air-fuel ratio sensing means, and fuel system control means controlled by said air-fuel ratio sensing means for adjusting the fuel flow and thereby the air-fuel ratio of the mixture being inducted into the engine toward the stoichiometric value.

4,050,426

METHOD AND APPARATUS FOR TREATING LIQUID FUEL

Charles H. Sanderson, 3717 Frictcha Ave., Fort Wayne, Ind. 46806

Continuation-in-part of Ser. No. 518,243, Oct. 29, 1974, Pat. No. 3,951,807, which is a continuation-in-part of Ser. No. 399,164, Sept. 20, 1973, abandoned. This application Sept. 10, 1975, Ser. No. 612,212

Int. Cl.² F02B 75/10; B01D 35/06; F23D 21/00

U.S. Cl. 123—119 E **14 Claims**

1. In an internal combustion engine including fuel/air mixing means and a fuel supply line in fluid communication with said mixing means, a fuel treating device in said fuel line, said device comprising:

an elongated hollow outer casing made of a magnetic material,

an elongated inner casing made of a non-magnetic material positioned within said outer casing,

a single elongated magnet received in said inner casing, said magnet being magnetized along its longitudinal axis and having at least two successive magnetic domains of alternating alignment so that there exist at least three longitudinally spaced apart sections of alternating north and south polarity,

means for supporting said inner casing in spaced relation to said outer casing to form an annular chamber therebetween,

inlet and outlet means connected to said fuel line for providing fluid flow from said fuel line through said annular chamber,

said inlet and outlet means being located near opposite ends of said annular chamber.

14. In a combustion process wherein a liquid fuel and an oxygen-containing gas are first mixed and then ignited, a method for treating the fuel just prior to mixing it with the gas comprising:

flowing liquid fuel over an elongated magnet in a direction substantially parallel to the longitudinal axis of said magnet, said magnet being magnetized along its longitudinal axis and having at least two successive magnetic domains of alternating alignment so that there exist at least three longitudinally spaced apart sections of alternating north and south polarity.

4,050,427

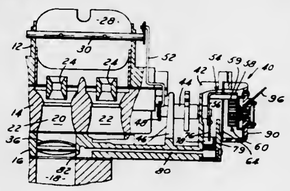
CARBURETOR AUTOMATIC CHOKE CONSTRUCTION

James E. Hollins, Inkster, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 2, 1971, Ser. No. 194,935

Int. Cl.² F02D 11/08; F02M 1/10, 23/04

U.S. Cl. 123—119 F **4 Claims**



1. An automatic choke system for use with a carburetor having an air/fuel induction passage and

an unbalance mounted, air movable, choke valve mounted for variable movement across the passage to control air flow through the passage,

thermostatic spring means operably connected to the choke valve urging the choke valve towards a closed position with a force increasing as a function of decreases in the temperature of the spring means from a predetermined level,

and a self-limiting output temperature heater device located adjacent the spring means operable to transfer its heat output thereto up to its limit to reduce the choke valve closing force of the spring means and permit opening of the choke valve by air flow through the passage against it,

including means rendering the heater device operable above a predetermined ambient temperature level to begin transferring its heat output to the spring means,

and a heat sink secured to the heater device for uniformly radiating the heat of the heater device to the spring means.

4,050,428

CARBURETOR INTAKE AIR FLOW MEASURING DEVICE

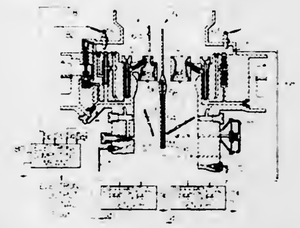
Kenji Masaki, Yokohama, Japan, assignor to Nissan Motor Co., Limited, Yokohama, Japan

Continuation of Ser. No. 396,368, Sept. 12, 1973, abandoned. This application Mar. 12, 1976, Ser. No. 666,316

Claims priority, application Japan, Sept. 13, 1972, 47-91253

Int. Cl.² F02B 3/00, 33/00

U.S. Cl. 123—119 EC **4 Claims**



1. A carburetor intake air flow measuring device for electronically measuring an instantaneous flow rate of intake air introduced into an internal combustion engine under all varying engine operating conditions, which device comprises:

a two-barrel carburetor having a primary venturi and a secondary venturi:

first sensing means for sensing atmospheric pressure to produce an electric atmospheric pressure signal;

second sensing means for sensing intake air temperature to produce an electric air temperature signal;

third sensing means for sensing a primary differential pressure between said primary venturi and an upstream point and a secondary differential pressure between said secondary venturi and an upstream point to produce an electric differential pressure signal representing a difference between said primary and secondary differential pressures, said third sensing means having a primary mechanical differential pressure sensor responsive to said primary differential pressure to provide a primary analog mechanical output, a secondary mechanical differential pressure sensor responsive to said secondary differential pressure to provide a secondary analog mechanical output, and a mechanical-to-electric analog converter means to convert said primary and secondary mechanical analog output to the electric differential pressure signal, each of said primary and secondary mechanical pressure sensors comprising a respective diaphragm; and

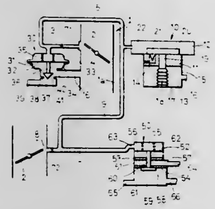
electronic computing means responsive to said electric atmospheric pressure, intake air temperature and differential pressure signals, received as separate signals directly from each sensing means, to produce an electric output signal representing the instantaneous flow rate of said intake air.

4,050,429

EXHAUST GAS RECIRCULATION SYSTEM FOR AN AUTOMOBILE ENGINE, INCLUDING A HIGH ALTITUDE COMPENSATOR

Ikuta Yasuhiro, and Shimo Hitomi, both of Toyoda, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoda, Japan

Filed May 24, 1976, Ser. No. 689,541
Claims priority, application Japan, Feb. 17, 1976, 51-16851
Int. Cl.[2] F02B 33/00
U.S. Cl. 123—119 A 8 Claims



1. In an exhaust gas recirculation system for an automobile engine, the improvement comprising:

a first valve having a first atomspheric pressure chamber having means to receive an increasing air flow therethrough in proportion to an increase of the altitude;

a second valve having a negative pressure chamber communicating with a first pressure sensing port opening to a carburetor, said second valve having means to control the amount of exhaust gas recycled into an intake manifold according to variation in the pressure of said negative pressure chamber; and

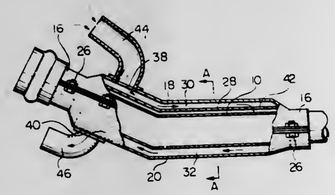
a third valve having a negative pressure chamber communicating with a second pressure sensing port opening to said carburetor, said third valve having means to control the amount of air supplied into the exhaust side of said engine according to variation in the pressure of said negative pressure chamber of said third valve, wherein said atmospheric pressure chamber of said first valve is connected with both said negative pressure chambers of said second and third valves.

4,050,430

INTAKE AIR WARMING DEVICE

Susumu Amagai, and Shigeru Oikawa, both of Yokohama, Japan, assignors to Nissan Motor Co., Limited, Japan

Filed Aug. 6, 1976, Ser. No. 712,052
Claims priority, application Japan, Aug. 8, 1975, 50-110362[U]
Int. Cl.[2] F02M 31/00
U.S. Cl. 123—122 D 10 Claims



1. An internal combination engine including an intake air warming device for warming intake air to be supplied to an intake system of comprising:

an exhaust gas conduit communicated with exhaust ports of the engine and through which hot exhaust gas is emitted to the atmosphere;

an elongated hollow housing surrounding said exhaust gas conduit to define therebetween an enclosed space;

at least one partition member disposed within said housing and spaced apart from the inside wall of said housing for radially separating said enclosed space surrounding said exhaust conduit into at least first and second air-warming chambers, said first air-warming chamber defined radially outside of said partition member and said second air-warming chamber defined radially inside of said partition member;

an air inlet opening into said first air-warming chamber and allowing air to flow therein;

an opening provided in said partition member and allowing the air having entering said first air-warming chamber to flow therefrom into said second air-warming chamber; and

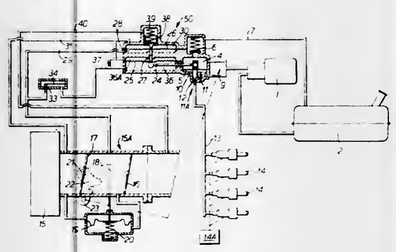
an air outlet opening into said second air-warming chamber and allowing the warmed air to be conveyed therefrom to the intake system.

4,050,431

FUEL INJECTION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Harold Ernest Jackson, Plymouth, England, assignor to Tecalemit Limited, England

Filed May 12, 1976, Ser. No. 685,444
Claims priority, application United Kingdom, May 15, 1975, 20646/75
Int. Cl.[2] F02M 39/00
U.S. Cl. 123—139 AW 14 Claims



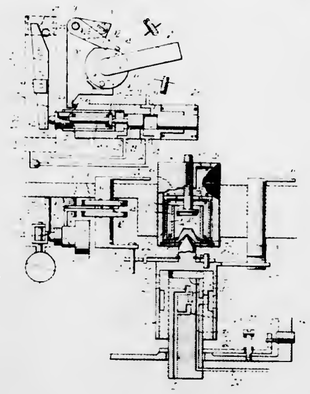
1. A fuel injection system for an internal combustion engine, including at least one injector nozzle, a fuel store, and at least one injector valve which is connected to receive fuel from the fuel store and which, when open, allows fuel from the store to be discharged by the said at least one injector nozzle, a metering valve operable to meter fuel continuously to the store at a rate dependent on an engine operating condition, and control means operable to open the injector valve intermittently whereby when the injector valve is closed, fuel delivered by the metering valve to the store is stored therein, the amount stored being dependent on the length of time during which the injector valve is closed and the metering rate of the metering valve, and when the injector valve opens, the stored amount of fuel is discharged by the injector nozzle, fuel being thereafter metered directly by the metering valve, through the store and injector valve, to the injector nozzle and discharged thereby until the injector valve closes.

4,050,432

FUEL INJECTION PUMP AND GOVERNOR AND TIMING CONTROL SYSTEM THEREFOR

Charles W. Davis; Robert Raufeisen, both of Simsbury, and Daniel Edwin Salzgeber, Windsor, all of Conn., assignors to Stanadyne, Inc., Hartford, Conn.

Filed July 22, 1975, Ser. No. 597,974
Int. Cl.[2] F02M 59/20
U.S. Cl. 123—139 AQ 25 Claims



1. A liquid fuel injection pump suited for the sequential delivery of measured charges of liquid fuel under high pressure to an associated engine in timed relationship therewith comprising pump chamber means wherein the charges are pressurized to high pressure, a passage for delivering the fuel to said pump chamber means, a metering valve in said passage for regulating the amount of fuel in said measured charges of fuel, said metering valve comprising a pair of relatively movable members respectively having ports in the adjacent surfaces thereof adapted for registry, first means to vary the amount of overlap of said ports in a first direction to control the quantity of fuel in each measured charge of fuel in accordance with the load on the associated engine, and second means for controlling the relative movement of said members in a second direction transverse to said first direction to vary the amount of overlap of said ports in said second direction in accordance with the speed of the associated engine to increase the amount of overlap in said second direction with increased engine speed to maintain the quantity of fuel in sequential charges of fuel at a substantially constant level for a given setting of said first means regardless of changes in engine speed.

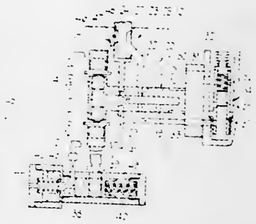
4,050,433

LIQUID FUEL PUMPING APPARATUS

Kanenobu Tokashiki, Kanagawa, Japan, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 15, 1975, Ser. No. 640,858
Claims priority, application United Kingdom, Oct. 22, 1975, 43282/75
Int. Cl.[2] F02M 39/00
U.S. Cl. 123—139 AQ 6 Claims

1. A liquid fuel pumping apparatus for supplying fuel to internal combustion engines, the apparatus comprising a first piston slidable within a cylinder, means coupling said first piston to a component of an injection pump whereby movement of said piston will alter the timing of delivery of fuel by the injection pump, first resilient means biasing said first piston towards one end of the cylinder, conduit means through which the pressure of fuel delivered by a feed pump can be applied to said first piston to move said first piston against the action of the resilient means and in a direction to advance the timing of delivery of fuel, a second piston housed within a further cylinder, second resilient means urging said second piston in the direction to engage said first piston to assist the action of fuel pressure acting on the first piston, said fuel pressure also acting on one side of said second piston to oppose the force exerted by the second resilient means, a further conduit through which a control pressure can be applied to the other side of said second piston and valve means operable in conjunction with throttle means for generating said control pressure, said valve means being arranged so that said control pressure is substantially equal to the output pressure of the feed pump when said throttle means is set to provide a low quantity of fuel and is substantially zero when the throttle means is set to provide a high quantity of fuel.

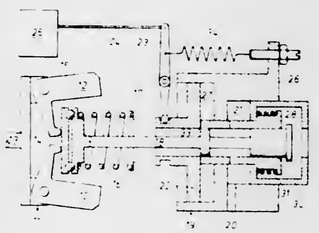


4,050,434

HYDRAULIC SERVO-MOTOR

Gerhard Zbikowski, Friedrichshafen, and Salahaddin Geafer, Markdorf, both of Germany, assignors to Motoren- und Turbinen-Union Friedrichshafen GmbH, Germany

Filed June 2, 1975, Ser. No. 582,688
Claims priority, application Germany, June 22, 1974, 2430044
Int. Cl.[2] F02D 1/06
U.S. Cl. 123—140 FG 16 Claims



1. A hydraulic servo-motor for the control of an internal combustion engine which comprises a servo-piston means adapted to be operatively connected with a fuel quantity control means of the internal combustion engine, control slide valve means adapted to be operatively connected with a centrifugal governor means of the internal combustion engine, and pump means providing a working medium under pressure, characterized by an auxiliary piston means which is acted upon by the pressure of the working medium and which is operable to enable with an existing pressure of the working medium, a stroke of the control slide valve means in one direction limited by the servo-piston means and a stroke thereof in the other direction limited by the auxiliary piston means, and spring means supported at the servo-piston means and acting on the auxiliary piston means opposite the pressure of the working medium, said spring means being operable to effectively clamp together the control slide valve means and the servo-piston

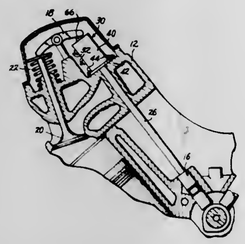
means by way of the auxiliary piston means when no pressure is present in the working medium.

4,050,435

VALVE CONTROL FOR CYLINDER CUTOUT SYSTEM

Harold L. Fuller, Jr., Washington, D.C., and Joseph E. Stubbs, Wheaton, Md., assignors to Harold L. Fuller, Jr., Washington, D.C.

Filed Dec. 2, 1975, Ser. No. 636,982
Int. Cl.² F02B 77/00
U.S. Cl. 123—198 F **11 Claims**



1. A device for selectively coupling or uncoupling a reciprocating pushrod member from a driven member, and for holding such driven member at an end-of-stroke position with respect to the pushrod member while the pushrod member motion is uninterrupted, the driven member having a return stroke driving means, comprising:

a. a support means disposed between a pushrod member and a driven member;

b. a variable length member connected to said support means and relatively movable with respect thereto;

c. coupling means on said variable length member for engaging a pushrod member;

d. means for selectively operating or deactivating said coupling means, whereby the variable length member may be selectively driven by a pushrod member when coupled thereto or, when uncoupled, not driven by same while the motion of the pushrod is unimpeded with respect to the variable length member;

e. length varying means movably attached to the variable length member for permitting relative motion between first and second limit positions, the variable length member being at minimum and maximum lengths, respectively, when said length-varying means is disposed at its first and second limit positions;

f. extension actuating means for selectively extending said length-varying means to its second limit position relative to said variable length member and holding the length-varying member at such position; and

g. said length varying means being drivingly connected to said driven member.

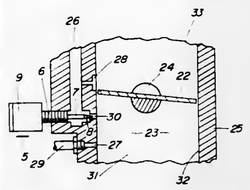
4,050,436

IDLE SYSTEM BLOCKING MEANS

Roger A. Crabtree, Rte. 1, Box 471, Summerville, S.C. 29483

Filed Mar. 17, 1976, Ser. No. 667,845
Int. Cl.² F02B 77/08; F02M 3/02
U.S. Cl. 123—198 DB **12 Claims**

1. A device which may be attached to an existing carburetor and which controls the discharge of idle system fuel mixture into said carburetor comprising blocking means placed into the idle fuel discharge port of said carburetor whereby idle system fuel mixture cannot pass said blocking means to be discharged into said carburetor; a power source; switch means responsively closed at ignition turn-off, operative to activate said blocking means through said power source simultaneously with ignition turn-off whereby excess idle system fuel mixture can be prevented from entering said carburetor to prevent engine dieseling; and time delay means connected in a series circuit with said power source and said switch means, operative to control the length of time said series circuit is closed after said switch means is closed responsive to the turn-off of said ignition, whereby said device prevents engine dieseling by



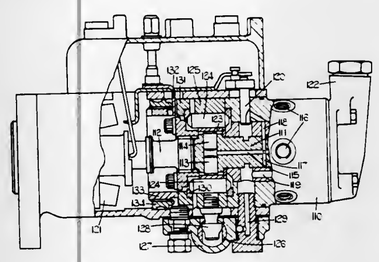
holding said blocking means within said idle fuel discharge port for a pre-determined time after said ignition is turned off, and then opening said series circuit by said time delay means, after said pre-determined time, thereby removing said blocking means from said idle fuel discharge port.

4,050,437

LIQUID FUEL INJECTION PUMPING APPARATUS

Reginald Hollett, Rochester, and James Charles Potter, London, both of England, assignors to CAV Limited, Birmingham, England

Filed Dec. 5, 1975, Ser. No. 638,155
Claims priority, application United Kingdom, Apr. 1, 1975, 13304/75
Int. Cl.² F04B 19/02
U.S. Cl. 123—139 AC **10 Claims**



1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine the apparatus comprising a housing, an injection pump located in the housing and including an annular cam, cam lobes defined on said cam, a roller engageable with said cam, a pumping plunger mounted in a bore and movable by the roller as the latter engages a cam lobe to displace fuel from the bore, fuel feed means for supplying fuel to the bore to displace the plunger towards the cam, tapered end portions at the ends of the roller, a pair of stop rings positioned in the housing on the opposite sides of the roller, inclined surfaces on said rings for co-operation with said end portions of the roller to limit the movement of the roller and plunger when fuel is supplied to the bore, the spacing between said stop rings determining the allowed movement of said roller, a first adjustment means which is adjustable to determine the normal permitted maximum movement of the plunger, second adjustment means operable to allow an increased movement of the plunger whereby an increased amount of fuel can be supplied by the apparatus, said first adjustment means comprising first and second ring members mounted within the housing, said first ring member being accommodated within said second ring member, a screw

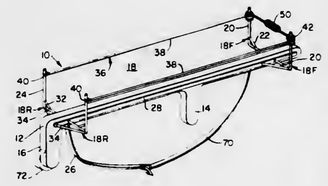
thread connection between said ring members, means restraining said second ring member against axial movement, further means restraining said first ring member against angular movement, an adjustment member operable to vary the angular setting of said second ring member thereby to adjust the axial setting of said first ring member, said first ring member engaging one of said stop rings, said second adjustment means comprising means operable to adjust the angular setting of said one stop ring, and interengageable formations on the presented faces of said first ring member, said formations acting in one position of the one stop ring to increase the spacing between said one stop ring and said first ring member.

4,050,438

SPRING TYPE PROJECTING DEVICE

James M. Pfotenhauer, 1302 N. 19th St., Escanaba, Mich. 49829

Filed July 14, 1976, Ser. No. 705,008
Int. Cl.² F41B 7/00
U.S. Cl. 124—20 R **7 Claims**



1. A slingshot comprising:

a stock having front and rear ends;

manual gripping handle means disposed at the rear end of said stock;

a pair of sheaves rotatably mounted adjacent the front end of said stock on opposite sides of the fore-to-aft longitudinal axis of said stock;

said sheaves being rotatable about generally upright parallel axes of rotation;

elastic band means having outer free ends thereof anchored at points disposed adjacent the rear end of said stock on opposite sides of said fore-to-aft longitudinal stock axis;

said elastic band means extending forwardly from said anchoring points and being wrapped around said rotatable sheaves;

said elastic band means including a pouch capable of carrying an object to be propelled;

said pouch disposed for manual rearward displacement in a direction parallel to said axis to stretch said elastic band means in an energy-storing fashion throughout the length thereof so as to propel said object forwardly upon release; and

front and rear support frames mounted on opposite sides of said fore-to-aft extending stock axis; each front frame including:

a front sheave mount section rotatably carrying one of said sheaves above the plane of said stock, and

a front section extending generally at a right angle from said front mounting section generally at a right angle from said front section and fixedly connected to said stock,

each rear frame comprising a rear section extending generally parallel to said front section and rear mounting section extending generally at a right angle from said rear section and being fixedly connected to said stock;

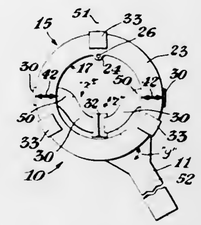
each of said free ends of said elastic band means being connected to one of said rear upright sections.

4,050,439

ACCURATE ADJUSTABLE SLING-SHOT

Christopher John Rudy, Midland, Mich., assignor to Thresher Institutes Incorporated, Midland, Mich.

Filed Nov. 6, 1975, Ser. No. 629,103
Int. Cl.² F41B 7/00
U.S. Cl. 124—20 R **36 Claims**



1. In a sling-shot assembly having a frame head portion with a handle portion depending therefrom to which frame head portion there is attached an aligned extensible elastic sling band for generally non-elongate missile hurling without physical missile guide means thereabout which extensible sling band is securely attached by the disconnected ends of said sling band at spaced points on and to the frame head portion of the body of the sling-shot that is over it's handle portion:

means rotatable in a substantially vertical plane in combination in said sling-shot for adjusting the points at which said disconnected ends of said sling band are secured and fixed to said frame head so that,

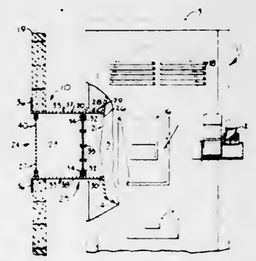
during operational usage of the sling-shot disposed in given situation according to the mode of grasp and stance employed by the user, the said points are disposed and situate relative to one another and to level ground in a plane that is at least substantially parallel to and with the plane of the level ground.

4,050,440

COMBINATION FIREPLACE/FURNACE

Charles L. Lessin, Rte. 1, Cohasset, Minn. 55721

Filed Sept. 28, 1976, Ser. No. 727,438
Int. Cl.² F24B 1/18
U.S. Cl. 126—120 **29 Claims**



1. A combination fireplace/furnace comprising:

a. a woodburning furnace having a firebox defining a fire chamber, said firebox having an opening therein;

b. means attached to said firebox and extending generally horizontally outwardly therefrom for defining a hollow tunnel surrounding the opening therein, said means being adapted for extension through a partition wall;

c. said tunnel having an open end spaced from said furnace for permitting viewing of said fire chamber through said

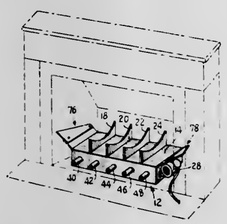
tunnel whereby said firebox may be disposed on one side of a partition wall and said open end may be disposed on the opposite side of said partition wall.

4,050,441

GRATE AND STOVE HEATING UNIT

Elwood R. Horwinski, Cheshire, Conn., assignor to Automobile Corporation of America, New Haven, Conn.

Filed Jan. 12, 1976, Ser. No. 648,316
Int. Cl.² F24B *7/00*
U.S. Cl. 126—121 **14 Claims**



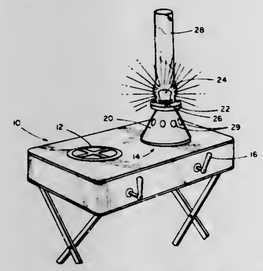
1. A high efficiency heating unit for extracting heat from a fire, comprising in combination:
   a. an enclosure having fluid inlet and fluid outlet ports, and having an expansive top wall constituting a grate for holding fire logs and coals,
   b. a plurality of separate and distinct heat collector plates secured directly to the top wall and extending upwardly therefrom, said plates having means constituting a contoured top edge provided with raised front and rear end portions and depressed intermediate portions aligned with said raised portions for cradling and supporting logs placed on the grate to effect intimate, heat-exchanging contact with said logs, said plates being disposed in spaced relation with one another,
   c. means connected with the fluid inlet port for supplying pressurized fluid to the same,
   d. means connected with a fluid outlet port for channeling heated fluid in directions away from the enclosure, and
   e. a plurality of heat-dissipating plates disposed in the enclosure and secured to the expansive top wall thereof, said heat-dissipating plates being arranged for intimate contact with the fluid passing through the enclosure to supply heat thereto.

4,050,442

EMERGENCY MANTLE LAMP FOR A GAS STOVE

John S. Seiverling, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.

Filed Mar. 5, 1976, Ser. No. 664,379
Int. Cl.² F24C *15/00*
U.S. Cl. 126—213 **5 Claims**



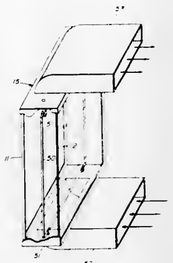
1. In combination with a gas cooking stove having a burner a portable lamp for converting a burner of said stove to a source of light, said lamp comprising:
   a. a formed upright mantle to produce light when heated,
   b. a conically shaped hollow base having perforations therethrough open at its top and bottom and dimensioned to cover the burner for conveying the gas flame from an ignited stove burner to the mantle,
   c. a transparent chimney open at the top positioned about said mantle, and
   d. connecting means for securing the base and chimney to the mantle.

4,050,443

SOLAR ENERGY DEVICE AND SYSTEM

John F. Peck, and Carl N. Hodges, both of Tucson, Ariz., assignors to University Patents, Inc., Stamford, Conn.

Filed June 27, 1975, Ser. No. 590,809
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **2 Claims**



1. A system which constitutes a see-through portion of an enclosure and is operative to collect heat from solar radiation and transfer it to a utilization location comprising:
   a light-transmissive exterior wall member;
   a light-transmissive interior wall member spaced from said exterior wall member and substantially parallel thereto;
   a see-through heat-absorbing pane of tinted glass mounted between said wall members in spaced substantially parallel relationship to both said wall members, the combination of said wall members and said pane providing unobstructed visibility;
   a heat conducting fluid disposed between said heat absorbing pane and said light transmissive exterior and interior members; and
   means for recirculating said fluid between the utilization location and said space between said inner and outer wall members.

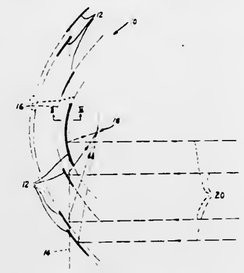
4,050,444

REFLECTIVE DEVICE

Peter William Dolamore, P.O. Box 10142, Johannesburg, South Africa

Filed May 22, 1975, Ser. No. 579,850
Claims priority, application South Africa, May 22, 1974, 74/3309
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **11 Claims**

1. A reflective device which includes a plurality of concave reflective regions arranged in sets, with the reflective regions of each set having a single co-incident focal region, the device having as many focal regions as there are sets and any two consecutive reflective regions of one set being separated from each other by a reflective region of another set, the reflective regions being disposed adjacent each other along a reference line to have a linear extended configuration.

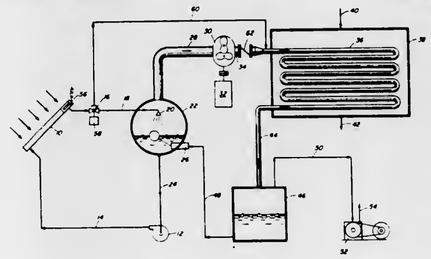


4,050,445

SOLAR ENERGY COLLECTION SYSTEM

Henry Huse, Darien, Conn., assignor to Atlantic Fluidics, Inc., Stamford, Conn.

Filed July 23, 1976, Ser. No. 708,205
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **13 Claims**



1. A solar energy collection system including in combination a liquid containing solar heat collector, a vacuum chamber, a nozzle within said vacuum chamber receiving warmed liquid from said solar heat collector and spraying it into said vacuum chamber, a fluid containing vessel, passage-conduit means within said fluid containing vessel, means for transferring heat from said passage-conduit means to the fluid in said fluid containing vessel, vapor compression means receiving vapor from said vacuum chamber and delivering it to said passage-conduit means and means for delivering fluid from said vessel to use.

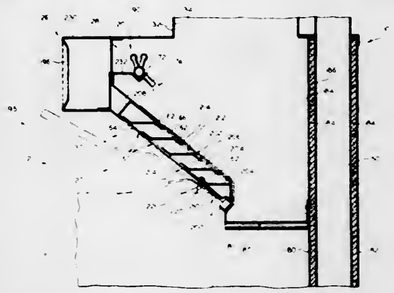
4,050,446

ENVIRONMENTAL HOOD AND DUCT STRUCTURE FOR GRIDDLES

Anthony A. Giuffre, 4344 N. 70th St., Milwaukee, Wis. 53216

Filed Aug. 4, 1976, Ser. No. 711,623
Int. Cl.² F24C *15/20*
U.S. Cl. 126—299 E **10 Claims**

1. An environmental hood and duct structure for griddles and the like, comprising:
   a hood defining a spraying chamber having front portion including an air intake forwardly directed opening,
   grilleing mounted in said opening and formed to define a plurality of grille openings each shaped to define a venturi fluid flow way between the air intake and discharge sides of the grilleing and having a venturi ratio in the range of from about three to one to about four to one,
   said grilleing being forwardly and upwardly inclined at angle in the range of from about thirty degrees to about sixty degrees with respect to the horizontal,
   said grille openings comprising air intake ports to said spraying chamber,
   an upwardly open trough open to said chamber and positioned adjacent the lower end of said grilleing,
   nozzle means positioned adjacent the upper end of said grilleing for directing a water spray across said grilleing toward said trough,



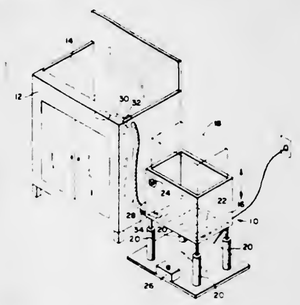
   blower means for drawing air through said grille openings and said hood at a rate at least on the order of 1,000 cubic feet per minute,
   and means for conducting from the trough water collecting therein,
   whereby, grease ladened air drawn through the grilleing openings is wet scrubbed of the grease, and the water carrying the grease collecting in the trough is conducted therefrom.

4,050,447

DEEP FAT FRYER HEATED FAT SUPPLY RESERVOIR AND FAT REPLENISHMENT DEVICE

Andrew Terracciano, 32 Wayhill Road, Waterford, Conn. 06385

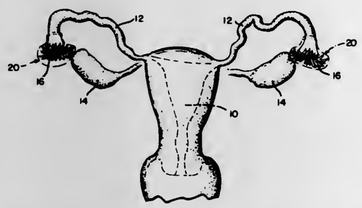
Filed May 24, 1976, Ser. No. 689,084
Int. Cl.² A47J *27/14*
U.S. Cl. 126—374 **4 Claims**



1. In a deep fat fryer system, a heated fat supply reservoir and fat replenishment device comprising:
   a. a supply vessel;
   b. a deep frying vessel
   c. means for heating the contents of said supply vessel;
   d. means for sensing the fat level in said deep frying vessel, and
   e d. means responsive to said sensing means for transferring an amount of fat from said supply vessel to said deep fat fryer;

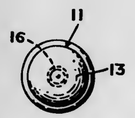
f. said sensing means comprising an electrical signal generating means operative to generate at least two electrical signal levels responsive to fat levels;
g. means responsive to one of said two electrical signals to raise said supply vessel;
h. means responsive to another of said two electrical signals to lower said supply vessel; and
i. a feed tube connecting said supply vessel and said deep fat fryer.

4,050,448
METHOD OF REVERSIBLE STERILIZATION
Jennings O. Borgen, 1100 University, Apt. 3J, Seattle, Wash. 98101
Division of Ser. No. 579,484, May 21, 1975. This application July 26, 1976, Ser. No. 708,552
Int. Cl.² A61F 5/00
U.S. Cl. 128—1 R **3 Claims**



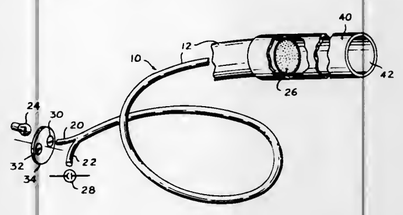
2. A method of temporarily and reversibly capping the ends of the Fallopian tubes of a human female for reversible sterilization, comprising:
gaining access to the ends of the Fallopian tubes by incision,
capping the fimbriated ends of the Fallopian tubes with a cap of inert, medical grade, flexible, elastomeric material, and
suturing the cap around the tubes so that the cap encloses the fimbriated end of the tubes and provides an impervious barrier to the passage of sperm and ova therethrough without interfering with the perastolsis action of the ciliated cells of the Fallopian tubes.

4,050,449
APPARATUS FOR EXERCISING MUSCLES OF A FEMALE PATIENT'S PELVIC DIAPHRAGM
Frank S. Castellana, Bronx; John C. Byrne, Larchmont, both of N.Y., and Charles E. Huckaba, Washington, D.C., assignors to Medical Products Development Corporation, Larchmont, N.Y.
Filed Feb. 25, 1976, Ser. No. 661,104
Int. Cl.² A61B 5/00
U.S. Cl. 128—2 S **7 Claims**



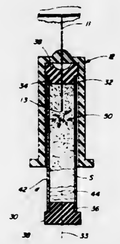
1. Apparatus for exercising and measuring contractile power of muscles of a female patient's pelvic diaphragm, most particularly her vaginal wall muscles; the apparatus comprising:
an elongated balloon having a substantially cylindrical elastomeric wall and a first closed end,
the balloon having a second end which reduces in section to form a shoulder and a tube,
retainer means for the patient to maintain manually the balloon in her vagina,
the balloon having an interior with a gas therein,
pressure measuring means connected in flow communication with the interior of the balloon whereby exertions of the patient's vaginal wall and pelvic diaphragm muscles are transmitted through the balloon and the gas and are measured by the pressure measuring means; the apparatus characterized in that the elastomeric cylindrical wall is provided with sufficient rigidity for the balloon to be insertable manually closed endwise uniflated into the patient's vagina.

4,050,450
REFLECTION STANDARD FOR FIBER OPTIC PROBE
Michael Lajos Polanyi, Webster, and David Stanley Ostrowski, Dudley, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.
Filed Mar. 5, 1976, Ser. No. 664,345
Int. Cl.² A61B 5/00
U.S. Cl. 128—2 L **17 Claims**



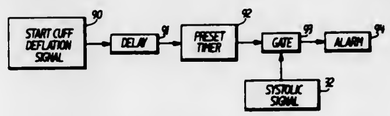
1. In a fiber optic probe for use in measuring amounts of diffuse reflection of light from a target medium, said probe having light conducting fiber means and a housing tubing surrounding said light conducting fiber means, said light conducting fiber means extending between the proximal and distal ends of the housing tubing with the corresponding end faces thereof exposed at said proximal and said distal ends of the probe respectively, the improvement comprising:
reflecting means for establishing a calibration standard, said reflecting means having a generally tubular passage therein defining an interior surface, said tubular passage having a diameter at least as great as said light conducting fiber means, said reflecting means extending distally from the end face of said light conducting fiber means at the distal end of the housing tubing with said passage in registry with said light conducting fiber means, at least said interior surface of said reflecting means being a material which characteristically diffusely reflects and returns a fixed ratio of at least two preselected wavelengths of light directed thereupon from said exposed face of said light conducting fiber means at said distal end of said probe when said distal end exposed face of said fiber means and said reflecting means is disposed in air and clear fluids, said returned fixed ratio of light providing a calibration standard.

4,050,451
BLOOD COLLECTION AND SEPARATION DEVICE
Richard Lewis Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 13, 1976, Ser. No. 714,433
Int. Cl.² A61B 5/10
U.S. Cl. 128—2 F **19 Claims**



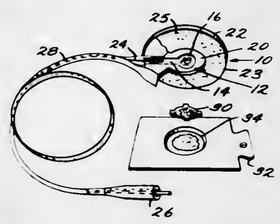
1. A blood collection and separation device for use with a blood-delivering cannula having a penetrating portion extending a predetermined penetrating length to an apertured tip, said device comprising
an elongated compartment having opposite end portions, one of which is for confining separated cells and the other of which is for confining separated serum;
closure means in at least said one end portion for admitting a cannula and for closing the compartment;
a vent aperture extending to the exterior of the device at said other end portion; and
a microporous filler confined within said compartment, said filler
1. filling said compartment at at least the point occupied by the cannula tip when inserted through said closure means,
2. being wettable by and inert to blood, and
3. being provided with open pores sufficiently small in diameter as to provide a capillary draw on blood deposited therein by the cannula.

4,050,452
ALARM ACTUATION ARRANGEMENT FOR AN AUTOMATIC BLOOD PRESSURE RECORDER
Arnold S. J. Lee, Englewood, N.J., assignor to Milstein Medical Research Foundation, Inc., New York, N.Y.
Division of Ser. No. 617,175, Sept. 26, 1975, which is a continuation-in-part of Ser. No. 378,167, July 11, 1973. This application Apr. 21, 1976, Ser. No. 678,989
Int. Cl.² A61B 5/02
U.S. Cl. 128—2.05 A **3 Claims**



1. In an apparatus for automatically detecting and recording a succession of time-spaced blood flow surges occurring while a variable external pressure applied to a patient's artery is decreased over a first range including the systolic to diastolic pressure range of the patient, the apparatus comprising an inflatable cuff for applying the external pressure to the artery, means for pressurizing the cuff to a first predetermined value corresponding to the upper end of the first range, means operative when the cuff has reached the first value for depressurizing the cuff, and means for detecting successive blood flow surges caused by successive movements of the artery as the cuff is depressurized the improvement comprising an arrangement for actuating an alarm means if the first blood pressure surge during said depressurization does not occur within a prescribed interval commencing a fixed time after the start of depressurization of the cuff, when said depressurization proceeds at a substantially linear rate, the prescribed interval being indicative of an acceptable range of systolic pressures, the arrangement comprising, in combination, means coupled to the detecting means for generating an indicating pulse upon the occurrence of the first blood flow surge, normally enabled gating means interconnecting the output of the indicating pulse generating means and the alarm means for normally operating the alarm means upon the occurrence of the indicating pulse, means rendered effective upon the start of depressurization of the cuff for generating an auxiliary pulse having a duration equal to the prescribed interval, means for delaying the auxiliary pulse by the fixed time, and means applying the delayed auxiliary pulse to the gating means for disabling the gating means for the duration of the auxiliary pulse.

4,050,453
RADIOTRANSPARENT ELECTRODE
Horace T. Castillo, and Henry J. L. Marriott, both of St. Petersburg, Fla., assignors to Concept, Inc., Clearwater, Fla.
Filed Feb. 3, 1976, Ser. No. 654,911
Int. Cl.² A61B 5/04
U.S. Cl. 128—2.06 E **7 Claims**

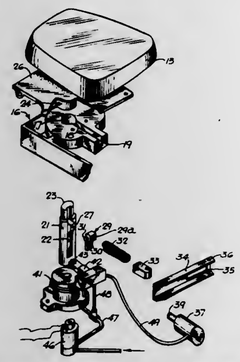


1. A disposable radiotransparent electrode which presents a substantially invisible image in X-ray photographs comprising a foam container provided with an adhesive surface, a first well cut in the adhesive surface of said foam container, a layered conductive structure mounted in said first well, said layered conductive structure comprising a plastic base and a gold metallic film layer deposited thereon of about 3,000 angstroms in thickness, an insulated wire with one end connected to said gold metallic film layer and the other end extending from said foam container, an electrical connector assembly, the other end of said insulated wire being secured to said electrical connector assembly, said insulated wire being constructed of an electrically conductive material and having a thickness not exceeding 36 AWG allowing it to be radiotransparent, a mounting board mounted to said adhesive surface, said mounting board defining a second well, a sponge received in said second well, said sponge projecting into said first well and engaging the gold metallic film layer of said layered conductive structure and electrode gel located in the well of the mounting board.

4,050,454
CHIROPRACTIC TABLE
Carl Roger Ekholm, Elgin, Ill., assignor to Williams Manufacturing Company, Elgin, Ill.
Filed June 23, 1976, Ser. No. 698,963
Int. Cl.² A61F 5/00
U.S. Cl. 128—70 **7 Claims**

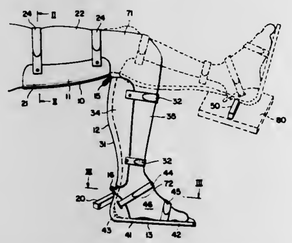
1. In a table for use in administering chiropractic adjustments, a base member having a bore, a vertical column slidably mounted in said bore, a body support mounted on said column, detent means bearing against said vertical column, a first air

cylinder for elevating said vertical column, a second air cylinder bearing against said detent means to provide a braking effect to hold said column at the upper limit of travel when raised with a patient lying in part on said body support, conduit means connecting said first and second cylinders to a source of air pressure, means for retracting said first cylinder when said



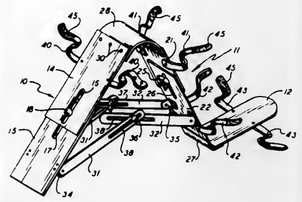
column has reached its upper limit of travel, means for cutting off the supply of air pressure to said second cylinder and for trapping air pressure in said second cylinder substantially proximate the upper limit of travel of said column, the trapped air pressure in said second cylinder being substantially equal to the air pressure in said first cylinder required for lifting the weight of the patient carried on said body support.

4,050,455
FOOT AND LEG BRACE
Leonie R. Smith, Kansas City, Kans., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed July 26, 1976, Ser. No. 708,511
Int. Cl.[2] A61F 3/00
U.S. Cl. 128—80 F **2 Claims**



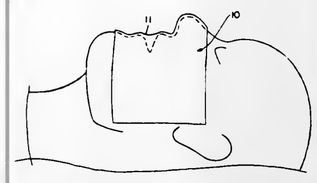
1. A brace assembly adaptable for fastening about the thigh, leg and foot of a user comprising a thigh section joined by a flexible strap to a leg section which is joined by a flexible strap to a foot section, each said section formed of a shaped plate, and each fitted with straps to fasten to the user, in which
- the thigh section plate is shaped to fit about the rear of a user's thigh and the leg section plate is shaped to fit about the rear of a user's leg, with foot section shaped of a flat section adaptable for fastening to the sole of a user and joined to a heel section of a shape to fit about the sides and rear of a user's heel, and in which
- a bar member is hinged to the exterior of the heel section to project laterally on each side of the heel section, together with tension spring means to bias the bar along an axis perpendicular to the longitudinal axis of the foot section.

4,050,456
KNEE SPLINT
Robert L. Cornue, 3 Austin Road, Tully, N.Y. 13159
Filed July 21, 1975, Ser. No. 597,514
Int. Cl.[2] A61F 5/04
U.S. Cl. 128—88 **1 Claim**



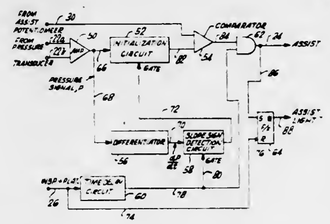
1. An adjustable knee splint including:
- an upper leg engaging portion comprising a first pair of overlapping rigid plate members, and means for adjusting the extent of overlap of said first pair of plate members to adjust the overall length of said upper leg engaging portion;
- a lower leg engaging portion comprising a second pair of overlapping rigid plate members and means for adjusting the extent of overlap of said second pair of plate members to adjust the overall length of said lower leg engaging portion;
- a foot engaging portion hingedly connected to one end of said lower leg engaging portion;
- a flexible, elastic sheet member connecting the other end of said lower leg engaging portion with one end of said upper leg engaging portion to separate the connected ends of said leg engaging portion, said sheet member having a non-metallic leg engaging surface;
- connecting means for interconnecting said upper and lower leg engaging portions, said connecting means comprising pairs of slide members, each pair of slide members including first and second elongated, longitudinally slotted overlapping slide members connected respectively at one end to said upper and lower leg engaging portions, and releasable fastening means extending through the slots of the respective pairs of slide members to interconnect the other ends of slide members, said other ends being connected only to each other;
- and straps connected to said upper and lower leg engaging portions and to said foot engaging portion, respectively, for securing a person's leg and foot to said splint.

4,050,457
SANITARY MOUTH-TO-MOUTH SHIELD
Stacy D. Davidson, 3240 Aden St., Memphis, Tenn. 38127
Filed Sept. 23, 1974, Ser. No. 508,247
Int. Cl.[2] A61M 16/00
U.S. Cl. 128—145.5 **5 Claims**



1. A device for use in mouth-to-mouth, mouth-to-trachea or mouth-to-nose resuscitation comprising a one piece sheet of thin flexible material capable of assuming complementary sealing relationship over the contour of a person's face and of sufficient dimensions to cover the face in the mouth and nose area and including an unobstructed opening located substantially centrally of said sheet and sized to be operably positioned over a patient's mouth, trachea or nose whereby an effective seal can be made between said patient's mouth, trachea or nose and a rescuer's mouth through the portion of said sheet surrounding said opening when said rescuer presses his mouth against said patient's mouth, trachea or nose through said sheet to prevent air escape around said patient's mouth, trachea or nose and to permit air to be blown therethrough into said patient's lungs in mouth-to-mouth, mouth-to-trachea, or mouth-to-nose resuscitation.

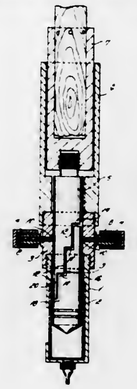
4,050,458
RESPIRATION SYSTEM WITH PATIENT ASSIST CAPABILITY
Jack M. Friend, West Hollywood, Calif., assignor to Puritan-Bennett Corporation, Kansas City, Mo.
Filed Jan. 26, 1976, Ser. No. 652,073
Int. Cl.[2] A61M 16/00
U.S. Cl. 128—145.8 **8 Claims**



1. For use in a respiration system, apparatus for detecting a patient's inspiratory effort independently of absolute pressure, said apparatus comprising:
- pressure sensing means, for sensing system pressure near the point of delivery of gas to the patient, including means for generating a pressure signal therefrom;
- first electrical means for generating from said pressure signal a first output signal indicative of a first time differential signal;
- second electrical means for generating a second output signal indicative of the sign of the second time differential of said pressure signal, whereby said second output signal is indicative of an increase in the rate of pressure drop during an expiration phase of the patient breathing cycle;
- third electrical means responsive to said second output signal, for generating a third output signal indicative of the change in the system pressure; and
- comparator means for comparing said third output signal with a reference value indicative of a predetermined pressure drop, and developing a control signal to initiate an assisted inspiration phase of the breathing cycle when said third output signal reaches said reference value.

4,050,459
HYPODERMIC SYRINGE
Anacleto Montero Sanchez, Maria Auxiliadora 35, Salamanca, Spain
Filed May 20, 1976, Ser. No. 688,193
Claims priority, application Spain, May 23, 1975, 212610
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—218 C **5 Claims**

1. A hypodermic syringe comprising a barrel and a plunger slidably and rotatably received in said barrel, said barrel and plunger having cooperating cylindrical surfaces, one of said surfaces having track means comprising a circumferential section and two axially extend- and radially off-set sections, adjacent terminal portions of said axial section being connected by said circumferential section and said axial sections extending in opposite axial directions from said circumferential section, and track follower means on the other of said surfaces, whereby said plunger may be moved axially in said barrel with said track follower means engaging a first axial section of said



track and thereafter moved further axially with said track follower means engaging said other axial track section to dispense, sequentially, doses of a medication in amounts related to the lengths of said track sections, said track follower means comprising a ball engaging in said track and spring means urging said ball radially into engagement with said track.

4,050,460
DEVICE AND METHOD FOR FEEDING FLUIDS TO CALVES AND THE LIKE
Joseph M. Magrath, P.O. Box 148, McCook, Nebr. 69001
Continuation of Ser. No. 543,990, Jan. 1, 1975, abandoned. This application Apr. 26, 1976, Ser. No. 680,380
Int. Cl.[2] A61D 7/00
U.S. Cl. 128—223 **10 Claims**



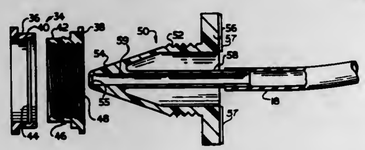
1. A device for the manual feeding of fluids to animals which comprises:
- a stiff esophageal probe tube having a protective enlargement at its discharge end;

a flexible and collapsible fluid reservoir having a relatively rigid outlet collar;
a detachable outlet fitting on said collar having an outlet nipple extending therefrom; and
a short length of flexible tubing fitted on said nipple at one end and on the inlet end of said probe at the other leaving a short length of free tubing therebetween affording swinging movement of said probe with respect to said nipple; said device being so constructed and arranged and the free length of said flexible tubing being sufficiently short that the tubing is collapsed and the passage therethrough closed by the swinging of said probe through a substantial angle from its unbent position whereby the passage of fluid therethrough is prevented.

4,050,461
STOMA IRRIGATION SYSTEM

Max H. Ruby, 170 Hillside Ave., Waterbury, Conn. 06710

Filed Apr. 23, 1976, Ser. No. 679,672
Int. Cl.[2] A61M *3/00*
U.S. Cl. 128—227 2 Claims



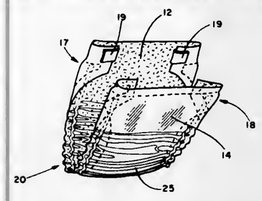
1. A stoma irrigation device for use with a plastic drain sleeve of tubular configuration, whereby a colostomy patient is enabled to use said sleeve in the cone or combination cone-and-catheter irrigation methods under closed system condition, said device comprising
a coupling unit comprising a pair of axially interengageable annular members adapted to be axially slidably interfitted, one within the other from opposite sides of a plastic drain sleeve to encompass a section of the sleeve wall and form a fluid-tight seal about said wall section, one of said annular members being formed with attachment means for coupling a closure member thereto in fluid-tight relation, said annular members including complementary frictional interference elements which are engaged in the fully axially interfitted position of said members to frictionally retain them in such position and also to maintain said seal with the wall of said plastic sleeve; and
a closure member adapted to mate with said one annular member and detachably engage said attachment means to form a fluid-tight joint with said annular member after the encompassed section of plastic sleeve wall has been cut away, said closure member comprising a cone which is formed in its apical region to be received in said inner annular coupling member and to project inwardly beyond the inner end of said coupling member, said cone having at its base attachment means for detachably engaging said engagement means of said coupling to cause said apical region to protrude internally of the inner face of said coupling, said cone being formed with a passage extending axially therethrough and being formed with a tube for connection to a source of irrigating fluid.

4,050,462
DISPOSABLE DIAPER WITH ELASTICALLY CONSTRICTED CROTCH SECTION

Lin-Sam Woon, and Dan D. Endres, both of Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 29, 1976, Ser. No. 671,177
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—287 14 Claims

1. In a disposable, unitary and generally elongate diaper having a substantially planar waist-band section at each end and a narrow substantially non-planar crotch section disposed between said ends in which said diaper is comprised of a porous facing sheet, a fluid-impervious backing sheet and an absorbent batt disposed between said sheets and in which the peripheries of said facing and backing sheets adjacent said batt are joined to each other, the improvement wherein said narrow crotch section is longitudinally contracted over its entire width by elastically extendible means, said contraction being

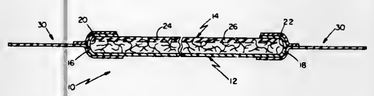


obtained by having at least one each of said elastically extendible means secured while in extended condition to at least one of said facing sheet or said backing sheet along the entire length of and adjacent each edge of said crotch section whereby when said elastically extendible means are relaxed and unextended the bonded together diaper structure across the entire width of the crotch section is contracted by said means into a plurality of gross transverse rugosities adjoining each other along the length of said crotch section.

4,050,463
DIAPERS

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 20, 1976, Ser. No. 716,094
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—287 10 Claims



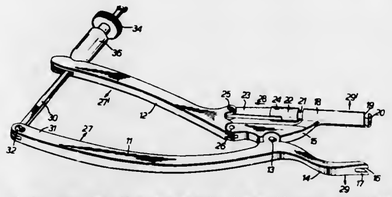
1. In a disposable diaper for contact with the body skin comprising a highly porous absorbent pad of cellulosic fibers and a water-impervious backing sheet adjacent and bonded to one side of said pad, that improvement wherein:
the fibers of said pad at the surface thereof opposite said backing sheet are bonded together with a resinous binder, said binder and said fibers bonded thereby forming a porous matrix and defining the top body contacting surface of said diaper.

4,050,464
SURGICAL CABLE TENSIONING INSTRUMENT

John Emmett Hall, Boston, Mass., assignor to Downs Surgical Limited, Mitcham, England

Filed Apr. 26, 1976, Ser. No. 680,235
Claims priority, application United Kingdom, Apr. 28, 1975, 17613/75
Int. Cl.[2] A61B *17/00*; A61F *5/00*
U.S. Cl. 128—303 R 13 Claims

1. A surgical instrument for applying tension to a cable for straightening a spinal column, said instrument having first and second handle hinged together at a main hinge, each handle having an extension beyond the hinge so arranged that movement about the hinge of the two handles toward one another causes the two extensions to move away from one another, wherein one extension has, at the end remote from the hinge, cable receiving means consisting essentially of a bifurcated arm defining a slot open at one end to receive a cable, and wherein the second extension has, at the end remote from the hinge, two jaws between which a metal cable can be gripped, the instrument having means to ensure that movement togeth-

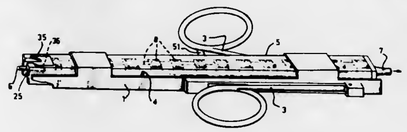


er of the two handles causes the jaws, if open, to close and movement away from one another of the two handles causes the jaws, if closed, to open prior to causing any movement of the two extensions relative to one another.

4,050,465
AUTOMATIC SURGICAL APPARATUS FOR LIGUTARING BLOOD VESSELS

Pierre Perisse, 8 rue du Strade, 31370 Rieumes, France

Filed Mar. 11, 1976, Ser. No. 665,900
Claims priority, application France, Mar. 14, 1975, 74.08039
Int. Cl.[2] A61B *17/12*
U.S. Cl. 128—326 7 Claims



1. A surgical apparatus for use with knot carrying cartridges and intended for repetitively and instantly making ligatures on blood vessels which are cut, which has substantially the appearance of a haemostatic clamp, comprising a hollow elongate support, slidable means slidably mounted in said support, two arms each having one end pivotally mounted on respective sides of said elongated support and having a rug on the other end for receiving fingers of a user and including means for actuating said slidable means, a hollow elongate charger removably fixed within said elongate support said charger and support being complimentary to each other said charger including a tubular shaft having knot-carrier cartridges slidably mounted thereon that are threaded with a small clearance thereonto, said tubular shaft being arranged co-axially within said charger and connected by its rearward end to a vacuum source so that a suction force will be created at its front end, said charger including at its front end a cartridge disengaging means, each said cartridge comprising a single tubular part having a front end and deflection points diametrically opposed adjacent said front end and carrying a preformed knot within said tubular portion adjacent the front end, which is initially loose, and whose strands extend radially in opposite directions, and bear against said deflection points each of said strands coextending said cartridge to a point adjacent the rear end thereof, each of said strands coextending from said point in a direction transverse with respect to the axial direction of the cartridge, defining a catching portion thereof, each of said strands extending from said catching portion and being fixed on an anchoring portion of the cartridge, each cartridge including two slidable blades, one slidably mounted on each side of said cartridges and extending from the rear end thereof, the front portion of said blade for cutting the strands of the knot at the level of the radially directed portions of the strands, cooperating coupling means and disengagement means extending from the rear end of said cartridges beyond said cutting blades by means of which each cartridge is removably coupled to the preceding and the following cartridges so that the train of cartridges can be displaced as a group, and a heel on each said cartridge at the rear end thereof, gripping means mounted on said sliding means for gripping said heel when the corresponding cartridge arrives at the front end of the charger, link means connected between said arms and said slidable means for movement thereof in an alternating longitudinal movement which includes a first advance movement in the course of which said disengagement means provided on each cartridge and said disengaging means at the front end of the charger disengage the first cartridge of the train, or leading cartridge, from the following cartridge, and abutments on the front end of the charger to intercept the transverse catching portions of the strands, thereby tightening the knot, said link means further providing a first return movement of the leading cartridge so that its said respective cutting blades come into abutment with the following cartridge and are caused to slide from a retracted position to a cutting position to cut the strands of the tightened knot, a second advance movement in the course of which the leading cartridge is expelled from the charger, and a second return movement at the end of which the apparatus returns to its initial condition, the second cartridge assuming the position of the cartridge which had been expelled.

4,050,466
ENDOTRACHEAL TUBE

Kathleen C. Koerbacher, 636 Boaneau Lane, Mount Pleasant, S.C. 29464

Filed Oct. 8, 1975, Ser. No. 620,562
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—351 7 Claims



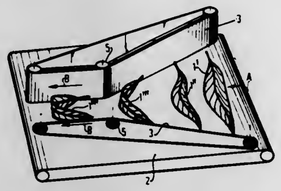
1. An endotracheal tube comprising a unitary tubular body member, said body member having an elongated arcuately shaped rear portion for insertion into the trachea, said rear portion having a beveled distal end, with side wall opening therein said body member further having an accordion pleated mid portion and a substantially straight, elongated front portion, said mid portion being yieldable to define an angle between said rear and front portions of at least about 90° to about 110°, and said front section being adaptable to receive a coupling member at a proximal end and being sufficient in length to place said coupling at a point away from a patient's mouth to avoid physical or visual impairment during use.

4,050,467

APPARATUS FOR ORIENTING TOBACCO LEAVES

Jan Adolf Van Sluis, Groningen; Frans Remko Reinhart, Leek, both of Netherlands; Johan Peter Johansen, Hon, and Rolf Pedersen, Oslo, both of Norway, assignors to Koninklijke Bedrijven Theodorus Niemeyer B.V., Groningen, Netherlands and Joh. H. Andresen, Oslo, Norway

Filed May 28, 1976, Ser. No. 691,213
Claims priority, application Norway, May 28, 1975, 751889
Int. Cl.[2] A24B *5/08*
U.S. Cl. 131—147 A 30 Claims



1. Apparatus for conveying tobacco leaves to a shredding machine while orienting them such that the stems of the tobacco leaves will in large part be presented essentially perpendicular to the cutting plane of the shredder, comprising in combination:

horizontally extending conveyor means for receiving tobacco leaves in randomly distributed fashion and conveying them along a predetermined path;

tobacco leaf feed means for feeding tobacco leaves loosely onto said conveyor means at one region thereof; and

compressing means extending downstream of said one region for laterally compressing the loose tobacco leaves while displacing and deforming tobacco leaves which reside generally transverse to said path into a disposition in which the stems thereof largely extend longitudinally with respect to said path, said compressing means comprising upstanding conveyor elements extending first convergently with respect to each other and then in generally parallel relation whereby to define a trough-like channel having a tapered entrance section, means for driving said upstanding conveyor elements in the same direction and at essentially the same speed as said horizontally extending conveyor means, and said horizontal conveyor means including a portion which angles downwardly away from said upstanding conveyor elements beyond said tapered entrance section of the channel, and including deflector means disposed between said upstanding conveyor elements for crowding the compacted tobacco leaves downwardly to escape from between said upstanding conveyor elements.

4,050,468

REUSABLE POCKET ASH RECEPTACLE

Eugene E. Wynnyk, 17 Berlin St., Binghamton, N.Y. 13905

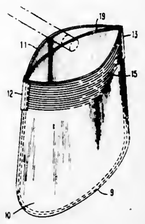
Continuation-in-part of Ser. No. 589,797, June 24, 1975, abandoned. This application Oct. 28, 1976, Ser. No. 736,399
Int. Cl.[2] A24B *5/02*
U.S. Cl. 131—232 1 Claim

1. A pocket ash receptacle for receipt of ashes from smoking materials, said receptacle comprising:

a generally U-shaped pouch of flexible material, said pouch having a front side and a rear side, said front and rear sides being joined at their edge portions along the periphery of said U to provide said pouch with an openable mouth portion;

a resilient, U-shaped wire frame corresponding to the U-shape of said pouch, said frame being secured within the edge portions of said pouch and exerting outward pressure against said periphery of said pouch to maintain said mouth portion closed; and

a transverse wire loop member secured to lower leg portions of said U-shaped wire frame and extending upwardly therebetween, an upper portion of said loop member being of a size to fit within the bowl of a pipe, at least a portion of said transverse wire loop member extending within said pouch adjacent a portion of said mouth of said pouch



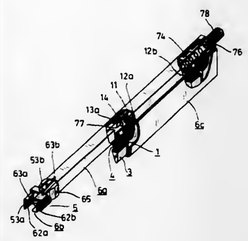
centrally between said front and rear sides of said pouch when said legs of said resilient wire frame are moved toward each other to open said mouth of said pouch, whereby said transverse wire loop member is disposed centrally in said mouth of said pouch to facilitate ash removal from said smoking material placed in contact with said transverse wire loop member, said ashes so removed being collected in said pouch.

4,050,469

COMB WITH DISPOSABLE COMB-TEETH MODULE

Chung-Sing Lin, 182-2 Chung Shan Rd., Shan Hua Chen, Tainan Hsien, Taiwan, China /Taiwan

Filed Sept. 7, 1976, Ser. No. 721,051
Int. Cl.[2] A45D *24/00*
U.S. Cl. 132—11 R 5 Claims



1. A comb comprising:

a comb back portion;

a case member connected to one end of the comb back portion for serving as a handle; and,

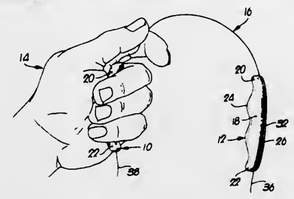
a plurality of comb-teeth modules arranged inside the case member; wherein each one of the comb-teeth modules includes a continuous wire wound helically into a plurality of normally-spaced apart coil-shaped comb tooth elements and a cap member removably capping the comb tooth elements in a compacted condition, thereby preventing the comb teeth from collecting dirt which may enter during opening of the case member and from an unintentional breakage of the case member and isolating the compacted comb-teeth modules from each other to prevent them from passing over or entangling with each other, each of the comb-teeth modules being adapted to be moved, by means of a dispensing mechanism in the case member, onto the portion of the comb back outside the case member to resume an extended condition having comb teeth spaced apart for use after the cap member is removed.

4,050,470

DENTAL FLOSS HOLDER AND APPLICATOR ASSEMBLY

Ercell Lynn Miller, 500 Westwood Ave., Columbia, Mo. 65201

Filed Feb. 20, 1976, Ser. No. 659,662
Int. Cl.[2] A61C *15/00*
U.S. Cl. 132—89 3 Claims



1. A dental floss holder and applicator assembly comprising:

a pair of separate, elongate members, each of said members being adapted to be individually grasped within a hand of a user whereby to position said members in spaced apart relationship during application of the floss to the user's teeth;

a length of floss extending between said members when the assembly is in use;

a pair of spaced apart end portions on each member, the distance between said end portions being sufficiently great to normally permit grasping of each member by three fingers of the hand of the user with the end portions extending oppositely beyond said three fingers;

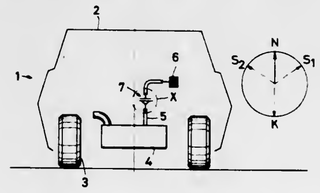
retaining means on each member extending the length thereof between said end portions, said retaining means comprising a slot formed in said member along one elongate edge thereof.

4,050,471

CLOSING APPARATUS FOR VENTILATION LINES OF FUEL TANKS IN MOTOR VEHICLES

Sigmund Anbegger, Reutlingen, and Hans Colell, Schwieberdingen, both of Germany, assignors to Dr. -Ing. H.c.F. Porsche Aktiengesellschaft, Germany

Filed Jan. 21, 1976, Ser. No. 650,856
Claims priority, application Germany, Jan. 30, 1975, 2503731
Int. Cl.[2] F16K *17/36*
U.S. Cl. 137—39 5 Claims



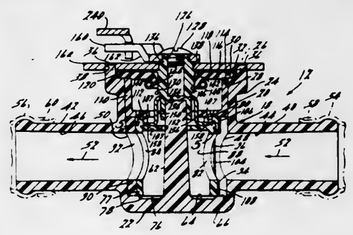
1. In a closing apparatus for ventilating lines of fuel tanks in vehicles, said closing apparatus comprising a housing in a ventilating line and movable closing means within said housing for closing said ventilating line in accordance with the position of a vehicle, the improvement comprising said closing means including a first ball-shaped movable member and a second movable member, said first member being disposed in a depression of a horizontal top surface of said second member above said second member, said second member being a conically configured mass body resting matingly on a conically configured guide wall of said housing, said mass body being guided in slidable movement along said guide wall, and said first member being movable to close said ventilating line at an exit opening of said housing.

4,050,472

FLUID VALVE

William L. Sheppard, Romulus, Mich., assignor to AVM Corporation, Jamestown, N.Y.

Continuation-in-part of Ser. No. 450,555, March 13, 1974, abandoned, which is a division of Ser. No. 263,863, June 19, 1972, Pat. No. 3,807,245. This application Nov. 11, 1975, Ser. No. 630,785
Int. Cl.[2] F16K *3/36*
U.S. Cl. 137—242 13 Claims

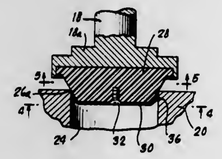


1. A fluid valve comprising: a housing having a valve chamber therein; means defining inlet and outlet passageways communicating with said chamber; a valve element disposed in said chamber rotatable generally about an axis between a closed position in which flow from said inlet passageway to said outlet passageway is blocked and an open position in which said flow is not blocked, said valve element having a generally hollow shape; and elastomeric sealing element disposed about the periphery of said outlet passageway between the adjacent wall of the said chamber and said valve element; spring means for biasing said valve element toward said sealing element in all positions of said valve element, said spring means comprising a generally flat spring member disposed between said valve element and a wall of said chamber, said valve element being arranged so that said valve element is urged against said sealing element by the pressure of inlet fluid in all positions of said valve element whereby sealing between said valve element and said sealing element is enhanced by the fluid pressure at said inlet passageway; actuating means actuable for rotating said valve element about said axis and including an actuating member and support means for mounting said actuating member for rotational movement about said axis, said support means including an elongated spindle-like member extending substantially along said axis and operatively connected at one end to said actuating member, the opposite end of said spindle-like member extending completely through said valve element and being operatively connected to said housing for maintaining said opposite end substantially free from transverse movement relative to said axis; and connecting means for operatively connecting said actuating member and said valve element for rotation about said axis and permitting transverse movement of said valve member relative to said axis towards and away from said sealing element.

4,050,473
VALVE SEAT CLEANING MECHANISM

Nakwon Cho, Knoxville, Tenn., assignor to Electro-Nucleonics, Inc., Fairfield, N.J.

Filed May 15, 1975, Ser. No. 577,947
Int. Cl.² F16K 1/38
U.S. Cl. 137—244 4 Claims

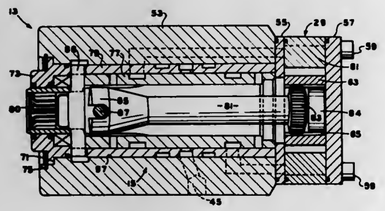


1. A valve comprising a valve head of resilient material in the shape of a frustum of a cone having first and second spaced apart transverse sections, the diameter of said first transverse section being less than the diameter of said second transverse section, and a flexible circular disk forming a part of said valve head and coaxial therewith and positioned against said first transverse section and of a diameter greater than that of said first transverse section, in combination with a circular valve seat of a diameter intermediate those of said first transverse section and said circular disk, in which said valve seat leads into a valve passage of circular section, in which said circular disk is puckered along the edge thereof against the surface of said valve passage when said valve head is in a valve closed position so as not to form a seal between said disk and said valve passage surface, a seal being formed between points on the frusto-conical surface of said valve head and said valve seat.

4,050,474
CONTROLLER FOR FLUID PRESSURE OPERATED DEVICES PROVIDING HIGH PRESSURE TO AN AUXILIARY DEVICE

David F. Morgan, Minnetonka, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 507,041, Sept. 18, 1974, Pat. No. 3,960,234. This application Apr. 16, 1976, Ser. No. 677,656
Int. Cl.² B62D 5/08
U.S. Cl. 137—596 2 Claims



1. A controller including a housing having an inlet for receiving a system fluid flow and an outlet, a pair of control fluid ports adapted for connection to a primary fluid pressure operated device and an auxiliary fluid port adapted for connection to an auxiliary fluid pressure operated device, said controller comprising:

a. valve means rotatably disposed within said housing and defining a neutral position, an operating position, and a central plane oriented generally perpendicular to the axis of rotation of said valve means;

b. a fluid meter associated with said housing and including a movable member operable to measure the volume of fluid passing through said fluid meter;

c. said valve means cooperating with said housing to define first and second supply passages in continuous open communication with said inlet and a first flow path including said inlet, said first and second supply passages, said fluid meter, one of said control fluid ports, the other of said control fluid ports, and said outlet when said valve means is in said operating position;

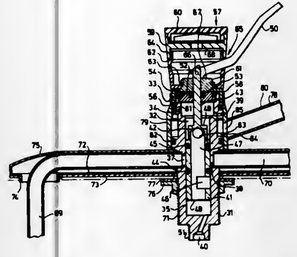
d. said valve means cooperating with said housing to define a second flow path communicating between said inlet and said auxiliary fluid port when said valve means is in said neutral position, said valve means defining first and second auxiliary passages communicating between said auxiliary fluid port and said first and second supply passages, respectively, when said valve means is in said neutral position, said first and second supply passages and said first and second auxiliary passages being oppositely and approximately equally disposed about said central plane; and

e. said second flow path being capable of communicating substantially all of said system fluid flow and said system fluid flow being progressively redirected from said second flow path to said first flow path as said valve means shifts from said neutral position toward said operating position.

4,050,475
MIXING FAUCET

Horace Watts, Pinner, England, assignor to H. & D. E. Watts Limited, England

Filed Aug. 19, 1975, Ser. No. 605,919
Claims priority, application United Kingdom, Sept. 13, 1974, 39957/74
Int. Cl.² F16K 11/07
U.S. Cl. 137—625.17 10 Claims



1. An hydraulically unbalanced type of hot and cold water mixing and flow control faucet dimensioned for use in a kitchen or bathroom, said faucet comprising:

a. a housing structure including a valve chamber having a cylindrical bore of a specific diameter;

b. inlet means in said housing structure connectible to hot and cold water supplies of said kitchen or bathroom and including respective hot and cold water inlet ports opening laterally into said bore;

c. outlet means in said housing structure for discharging said supplies to atmosphere and including an outlet port opening into said valve chamber at a point spaced axially from said inlet ports;

d. valve means movable relative to said housing structure comprising a one-piece cylindrical piston and a coaxial stem, the piston being disposed in said bore and the stem passing through one end of said valve chamber for connection to an actuating member, said piston and stem being movable as a unit in said bore by said actuating member in a rotary mode to control the relative degree of opening of said inlet ports and in an axial mode to control the absolute degree of opening thereof, and being movable in at least one of said modes between two spaced limit positions, said faucet including stop means provided on the actuating member and said housing structure to define at least one of said two spaced limit positions, said stop means preventing excessive operator-induced stresses occurring in said cylindrical stem portion when said valve means is in said at least one limit position, and said valve means being axially movable from open position to closed position irrespective of its angular orientation in said bore;

e. first sealing means surrounding said stem and providing a seal between said housing structure and said stem to prevent water leaking along the stem from said valve chamber to atmosphere, said first sealing means being of a self-energising nature and said stem having a cylindrical portion of smaller diameter than said bore which moves in said first sealing means as said valve means is moved axially;

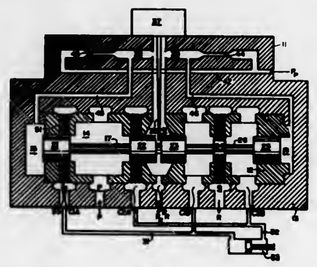
f. opposed transverse surfaces of different areas on said valve means which always remain in communication with said outlet means and which, whenever the valve means is moved axailly from said closed position, are subject to the line water pressure of at least one of said water supplies, th difference in areas of said opposed surfaces being equal to the cross-sectional area of said cylindrical stem portion, whereby whenever said valve means is moved axailly from said closed position to an open position it becomes biased axially by a nett force equal to the product of the cross-sectional area of said cylindrical stem portion and the water pressure then obtaining in said valve chamber, the diameter of said cylindrical stem portion being at most 6 millimeters in order to limit said nett force and so limit the frictional drag it is necessary to have between said valve means and said housing structure to prevent inadvertent axial shifting of said valve means when it is in a position intermediate said open and closed limit positions; and

g. drip-tight second sealing means isolating said inlet means from said opposed transverse surfaces and from said first sealing means whenever said valve means is in said closed position, whereby when said valve means is in said closed position said piston is relieved of said nett force and said first sealing means is relieved of the pressure of said water supplies.

4,050,476
LOW NOISE HYDRAULIC SERVO VALVE

Paul F. Hayner, Lexington, Mass.; David G. Eldridge, Nashua, N.H.; Edgar R. Bernier, Nashua, N.H., and Richard B. Henderson, Nashua, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Continuation of Ser. No. 93,308, Nov. 27, 1970, abandoned. This application July 10, 1972, Ser. No. 277,455
Int. Cl.² F15B 13/042; F16K 11/07
U.S. Cl. 137—625.62 2 Claims

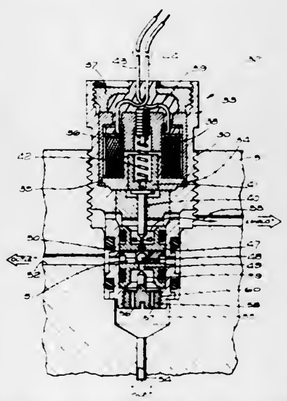


1. A valve for controlling the flow of fluid from a source of fluid under pressure to a load and from said load to a return, including a valve body formed to define an interior chamber having ports communicating with said chamber for connection to said source, to said return and to first and second load conduits and including a valve spool having lands positioned relative to each other and to said ports so as to define a neutral position at which the flow of fluid from said source to said load and from said load to said return is blocked and also positioned so that upon displacement of said spool from said neutral position flow of fluid from said source to said load and from said load to said return is initiated in a sense and an amount determined by the direction and magnitude of such displacement, characterized in that said lands and said ports are also relatively positioned and said ports are adapted to be connected to said source, said return and said first and second load conduits so that, when connected, pressure differentials are established such that through any one port fluid tends to flow in but one direction, never tending to flow in the reverse direction and so that in said neutral position said lands block only those ports through which fluid tends to flow in the direction from said chamber to said ports, while displacement from said neutral position variably unblocks selected ones of said same ports as said spool is displaced in one or the other direction, leaving completely unblocked for all operative positions of said spool those ports across which the pressure differentials are such that fluid tends to flow from said ports into said chamber, and further characterized in that a restrictor matrix is included in each of those ports which is blocked by a land when said spool is in said neutral position, each of said restrictor matrices comprising a plurality of plates, each formed with a central bore having a diameter to form a sliding fit with said lands, and each formed with a plurality of raised baffles on one side thereof, said plates being positioned coaxially to form a stack having a central bore and defining a plurality of restrictive passages between each pair of adjacent plates for the passage of fluid radially outwardly.

4,050,477
VALVE

Ali Acar, Los Angeles, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 31, 1975, Ser. No. 627,479
Int. Cl.² F15B 13/044
U.S. Cl. 137—625.65 7 Claims



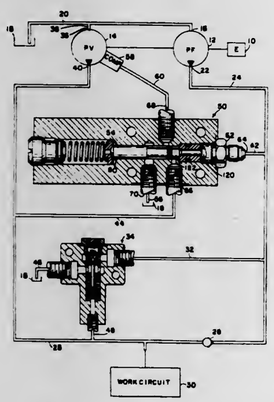
1. A three-way valve comprising: a body; a spherical ball; retaining means in said body slightly larger than said ball to trap the same in a confined space in said body, said retaining means having an inlet port, an outlet port, and an exhaust port; a solenoid mounted on said body; a ferromagnetic plunger slidable in said body; spring means to bias said plunger in one direction, said solenoid, when energized, pulling said plunger in a direction opposite said one direction, said plunger having

a cross section smaller than that of said exhaust port and movable in spaced relation thereto therethrough to a position contiguous to said ball, said outlet port being in communication with said confined space, said ball being movable to a position substantially covering said inlet port, said body having a passage in communication with said inlet port; input means connected to said solenoid to energize the same cyclically; electrical control means connected to said input means to vary the frequency at which the same energizes said solenoid; utilization means connected with at least one of said ports; and restriction means adjustable on said body to vary the amount of fluid pressure in said inlet port.

4,050,478
COMBINED FIXED AND VARIABLE DISPLACEMENT PUMP SYSTEM

Eugene P. Virtue, Tinley Park, and Richard J. Lech, Lockport, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 570,970, April 23, 1975, Pat. No. 3,985,472. This application May 4, 1976, Ser. No. 683,124
Int. Cl.² B67D *5/46*
U.S. Cl. 137—625.66 **3 Claims**

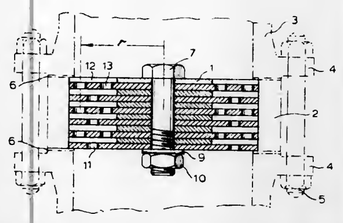


1. A pressure responsive fluid compensator for metering fluid flow between a source of fluid and a pressure responsive actuator, the pressure responsive fluid compensator responsive to one or more than one fluid pressure input source comprising:
a housing having a plurality of ports including a first inlet port, a second inlet port, a first outlet port, and a second outlet port; the housing also provided with a bore therethrough having several concentric diameters;
spool alignment collar having an aperture therethrough carried in one of said concentric diameters;
a spool slidably carried in said bore of said housing, said spool equipped with a first end slidably carried in said spool alignment collar, a second end and a land between said first and said second ends having a diameter greater than the diameter of said first end of said spool, said spool further having a core portion on which said first end, said land and said second end are formed, an arcuate portion at the end of said second end portion of said spool, said land having a circumferential groove formed therein, and an internal passage open at each end thereof between said circumferential groove of said land and said arcuate portion at the second end of said spool;
a biasing assembly carried in said housing urging said spool to its normal position in said bore of said housing whereby said land of said spool prevents fluid flow from said second inlet port to said first inlet port;
a first chamber formed in the housing accommodating said first end of said spool, said first chamber accessed only through said first inlet port;
a second chamber formed in said housing, said second chamber accessed only through said second inlet port when said land of said spool is urged to its normal position.

4,050,479
FLUID RESISTANCE DEVICE

Hans D. Baumann, Foxboro, Mass., assignor to Masonellan International, Inc., Norwood, Mass.

Continuation of Ser. No. 591,172, June 27, 1975, abandoned. This application June 7, 1976, Ser. No. 693,420
Int. Cl.² F15D *1/02*; F16K *47/08*
U.S. Cl. 138—42 **11 Claims**



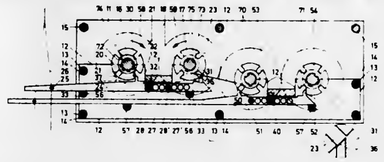
1. A fluid resistance device comprising:
a vertical axis stack of coaxial, abutting horizontal circular plates,
each plate being subdivided into first and second, wedge-shaped segments,
at least one first segment per plate having a number of small, vertical, flow throttling holes therethrough,
at least one second segment per plate having at least one large, vertical, flow passing opening therethrough, said large vertical opening have a cross-sectional area exceeding the combined cross-sectional areas of the small vertical holes of said at least one first segment,
all stack plates being angularly displaced with respect to each other about the vertical stack axis so that in successive stack plates the large opening second segments overlap the small hole first segments, and
the small holes of successive vertically overlying small hole first segments being angularly displaced with respect to each other about the vertical stack axis
whereby are provided a number of tortuous fluid passageways extending through said stack in a vertical direction generally perpendicular to the horizontal plane surfaces of said plates.

4,050,480
APPARATUS FOR SELECTIVE MOVING OF LAMELLA SHAPED HEDDLES

Alois Steiner, Riedea, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland

Filed Apr. 6, 1976, Ser. No. 674,128
Claims priority, application Switzerland, June 6, 1975, 7328/75
Int. Cl.² D03C *13/00*; D03D *47/26*
U.S. Cl. 139—55.1 **16 Claims**

1. An apparatus for selective movement of individual lamella shaped heddles for the formation of a shed on a loom, in which the heddles are arranged between flat guide elements and are movable between them to form the shed, the apparatus comprising adjacent guide elements having a space therebetween the size of which permits two predetermined different lateral positions for each of the heddles; means provided to displace each heddle selectively into one of the two predetermined lateral positions, and for each heddle a drive means so provided by which the heddle is driven in one direction when

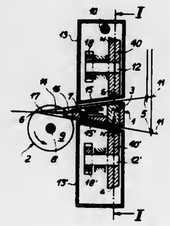


displaced in one of the predetermined positions and in the opposite direction when displaced in the other predetermined position.

4,050,481
UNDULATED SHED LOOM WITH ELECTROMAGNETIC SHUTTLE DRIVE

Walter Muller, Taan-Ruti, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland

Filed Sept. 29, 1975, Ser. No. 617,688
Claims priority, application Switzerland, Oct. 24, 1974, 14223/74
Int. Cl.² D03D *47/26, 49/44*
U.S. Cl. 139—436 **16 Claims**



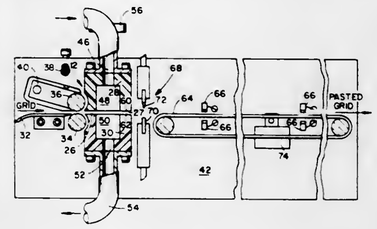
1. An arrangement for the transporting of shuttles filled with filling thread through the sheds of an undulated shed-type loom by fixed permanent magnetic means along the shuttle path of the loom, said magnetic means capable of producing varying magnetic fields with resultant components of force on the shuttles over the entire weaving width of the loom as the shuttles move along the shuttle path, and having means for the beat-up of the filling threads introduced against the fell of the cloth, the beat-up of the filling threads advancing synchronously with the movement of the transportation of the shuttles over the width of the loom: comprising a mechanical coupling means acting between the shuttles and the beat-up means in order to maintain the synchronism between the movement of the transport of the shuttles and the beating up movement of the beat-up means.

4,050,482
BATTERY PLATE PASTING METHOD AND APPARATUS

Larry K. W. Ching, Littleton; Charles E. Coleman, Lakewood, and Toshio Uba, Denver, all of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Mar. 31, 1976, Ser. No. 672,104
Int. Cl.² H01M *7/00*; B05C *11/00*
U.S. Cl. 141—1.1 **35 Claims**

1. A method for applying an electrochemically active paste onto a grid substrate of determined thickness in the preparation of battery electrode plates, comprising:
positioning first and second nozzle halves in juxtaposed relation and spaced apart a distance greater than the determined thickness of the substrate to define a passageway, each nozzle half having a cavity therein in at least partial alignment with the cavity associated with the other nozzle half, one of the cavities being provided with an inlet for reception of paste;
advancing the grid substrate through the passageway;
supplying paste to the inlet of the one cavity and forcing

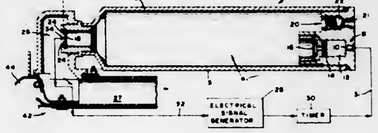


paste through interstices in the advancing grid substrate and into the other cavity; whereby said grid substrate floats in the paste present in said passageway substantially filling the intersticis of said grid substrate and forming uniform layers of paste on the surfaces of said grid substrate; and
withdrawing the thus pasted grid substrate through the passageway.

4,050,483
INFLATION SURGE DELAY

Robert J. Bishop, Rochester, Mich., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 14, 1975, Ser. No. 622,325
Int. Cl.² B65B *3/04*
U.S. Cl. 141—4 **6 Claims**



1. A method of delaying inflation of an air bag with an inflating gas supplied from a gas source through a plurality of manifold flow passages comprising the steps of restricting one of the flow passages during the time of initial flow to retard volumetric flow of gas into said bag and increasing gas pressure within said manifold to remove the restriction to flow and permit inflating gas to reach the bag through each of the flow passages a preselected period of time after release of said inflating gas therefrom.

4,050,484
LIQUOR-FLOATING DEVICE

Eugene Danyo, 1431 Windsor Drive, Toms River, N.J. 08753

Filed July 22, 1976, Ser. No. 707,869
Int. Cl.² B65B *1/14*
U.S. Cl. 141—34 **10 Claims**

1. A device for controlling the flow of a liquor into a glass comprising:
a funnel-like cup portion having an enlarged upper opening and a smaller lower end;
an elongated shaft portion having an upper end and a lower

end, said shaft portion extending axially through said smaller lower end of said cup portion; and

at least one orifice between said cup portion and said shaft portion, said orifice being directed toward, and extending into, said shaft portion, whereby said liquor, poured into said cup portion, will flow, at a controlled rate, through said orifice, down along the sides of said shaft portion.

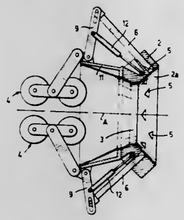


4,050,485

LOPPING MACHINE FOR STEMS OF TREES

Antti Tapani Valo, 08100, Lohja 10, Finland

Filed Apr. 13, 1976, Ser. No. 676,598
Claims priority, application Finland, May 5, 1975, 75/1319
Int. Cl.[2] B27L *1/00*
U.S. Cl. 144—2 Z 4 Claims



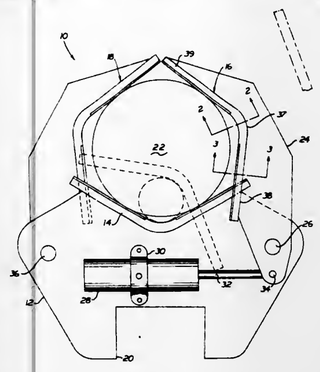
1. A lopping machine for stems of trees, which machine comprises an annular holder frame having an interior surface bounding a central opening for longitudinal passing of a tree stem to be lopped, said interior surface being frusto-conical and its diameter decreasing in the direction of movement of the tree stem, and a plurality of lopping rods each having a cutting end, said lopping rods being mounted in said annular holder frame with the cutting ends spaced apart from one another about the central opening and with each lopping rod being directed towards the central axis of the opening obliquely against the direction of movement of the tree stem, and each lopping rod being slidable in the axial direction thereof between a lopping position in which its cutting end projects through said interior surface into said central opening and a retracted position in which its cutting end is withdrawn from the central opening to a position beyond said interior surface, and the machine also comprising means connected to said rods for displacing said rods forcibly from said retracted position to said lopping position to engage a tree stem and for displacing said rods forcibly from said lopping position to said retracted position to wipe the rods free of branches and the like on movement through said interior surface.

4,050,486

APPARATUS FOR DELIMBING TREES

Paul H. Whitcomb, Attica, N.Y., assignor to Eaton Yale Ltd., Canada

Filed Dec. 6, 1976, Ser. No. 748,080
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—2 Z 6 Claims



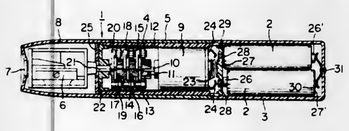
1. In apparatus for delimbing trees comprising a delimbing blade having an inner tree engaging surface, a parallel outer surface and a limb cutting edge formed on an edge of said blade between said parallel surfaces, the improvement wherein a central region of said blade is beveled at an angle from said outer surface to form said limb cutting edge substantially at said inner surface, and wherein second regions of said blade disposed on either side of said central region are beveled at a first angle from said outer surface and at a second angle from said inner surface to form said limb cutting edge along a line disposed between said inner and outer surfaces.

4,050,487

ELECTRIC SHARPENER

Kenichi Mabuchi, and Yoshihisa Tsuchimochi, both of Tokyo, Japan, assignors to Mabuchi Motor Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1975, Ser. No. 642,164
Claims priority, application Japan, Dec. 26, 1974, 50-3610[U]; Feb. 27, 1975, 50-27108[U]
Int. Cl.[2] B43L *23/02*
U.S. Cl. 144—28.5 7 Claims



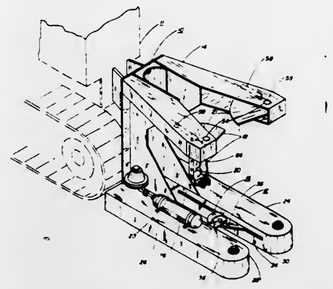
1. An electric sharpener, comprising: a battery section a sharpener section; a battery powered motor; a reduction means having planetary gears for transmitting the output of said motor to said sharpener section; and a switch section located between said motor and the battery section; whereby said sharpener section, said motor, and said reduction means define a slidable body which can move in the axial direction so that said switch is controlled by said movement in the axial direction.

4,050,488

CAM ACTUATED TREE CUTTING SHEARS AND BUNCHER

Alva Z. Albright, 2909 Monroe Highway, Pineville, La. 71360

Filed Apr. 23, 1976, Ser. No. 679,524
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—309 AC 5 Claims



1. Cam actuated tree cutting shears for continuously and automatically shearing and accumulating trees for bunching, in combination with a power train having an auxilliary hydraulic power system and a forward lift, comprising:

a. frame means having rear connections connecting it to said forward lift for moving and tilting said frame means for bunching, said frame means also having forwardly extending upper and lower pairs of arm means for receiving trees therebetween, and having raised floor means positioned rearwardly and between said lower pair of arm means;

b. openable and closable shear means mounted for forward and rearward motion in and between said lower pair of arm means;

c. camming means mounted rigidly in said lower pair of arms and a rotatably mounted follower means on said shear means for opening said shear means in said forward movement and closing said shear means in said rearward movement; and

d. hydraulically operable tree accumulating means for automatically engaging and lifting cut trees off said shear means and onto said raised floor means and for storing said cut trees thereon and between said upper pair of arms means.

4,050,489

METHOD FOR FABRICATING A LAMP BASE

Harvey Albert Werner, 6531 Kessler Ave., Woodland Hills, Calif. 91367

Division of Ser. No. 695,965, June 14, 1976. This application Nov. 15, 1976, Ser. No. 741,884
Int. Cl.[2] B27D *1/10*
U.S. Cl. 144—315 R 2 Claims

1. A method for making a lamp base comprising the steps of:

providing a polyhedronal block of wood having a cross-section which is symmetrical about a longitudinal axis and having plane faces whose vertical intersections are parallel to said longitudinal axis; and

cutting said plane faces to vary the cross-sectional area of said block along its height and to form sides on said block which are curved in the vertical direction and straight in the horizontal direction, said sides intersecting each other to form curved edges which lie in a vertical plane.

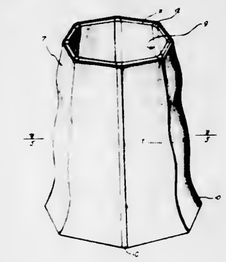


4,050,490

METHOD FOR FABRICATING A LAMP AND SHADE

Harvey Albert Werner, 6531 Kessler Ave., Woodland Hills, Calif. 91364

Filed June 14, 1976, Ser. No. 695,965
Int. Cl.[2] B27D *1/10*
U.S. Cl. 144—316 5 Claims



1. A method for making a lamp shade comprising the steps of:

providing a rectangular parallelepiped block;

cutting a plurality of nestable curved panels of similar shape from said block, said panels having vertical edges and being curved in a vertical direction with straight top and bottom faces in a horizontal direction;

providing a multi-faced form;

placing one of said multi-faced form;

joining the vertical edges of said panels together to form the shade; and

removing said form from said shade.

4,050,491

STORAGE BAG FOR USE WITH A STUDENTS CHAIR-DESK

Wilma Rae Hargrove, 1132 Livingston, Hurst, Tex. 76053

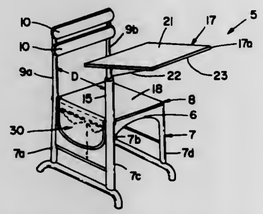
Filed June 21, 1976, Ser. No. 698,193
Int. Cl.[2] A45C *3/02*
U.S. Cl. 150—1.6 6 Claims

1. A storage bag for student school articles for use in conjunction with a chair-desk including a chair having a seat and back and a desk including a planar writing surface attached to an upright column support near a front edge of said seat, said column support being coplanar with a vertical back bracing

post member extending above a back edge of said seat and attaching to a supportive of said chair back, but separated from said column support by a distance D, comprising

a double fold of material such as denim or the like having first and second foldlines at top and bottom horizontal edges thereof so as to divide said bag into a front panel and a back panel, and a horizontal attachment line near said top foldline for permanently attaching said front to said back panel,

said attachment line also dividing said front panel into a bag-carrying subpanel above said attachment line and an article carrying stowage subpanel therebelow;



said carrying subpanel being horizontally closed by said first foldline and said attachment line but open along verticle sides thereof, to form a receptacle;

and a rod means positioned over its central portion within said receptacle of said carrying subpanel and having protruding, unobstructed, free ends, for engaging said column support of said desk and said bracing member of said chair;

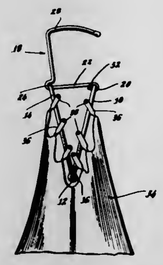
said article carrying subpanel being open at its top in the vicinity of said attachment line but closed along its vertical edges as well as along said bottom foldline to form an article stowage section for said school articles.

4,050,492

SUPPORT FOR FLEXIBLE BAG

Florian Leo Veilleux, Old Bridge Lane, Danbury, Conn. 06810

Filed Sept. 23, 1976, Ser. No. 725,975
Int. Cl.² B65D *33/16*
U.S. Cl. 150—4 **4 Claims**



1. A support for a flexible bag which comprises: a first partial ring member having diametrically spaced ends; a second partial ring member having diametrically spaced ends; means for hingedly interconnecting the ends of said first partial ring member with the ends of said second partial ring member whereby said members are movable from an open, closed ring, configuration to a collapsed, substantially side-by-side configuration; and an elongated member pivotally mounted on said first partial ring member including a curved latch portion engageable with said second partial ring member when in said collapsed configuration.

4,050,493

LADIES HANDBAG AND RADIO

Jin Sul Cho, G-3040 Bristol, Flint, Mich. 48507

Filed Jan. 5, 1976, Ser. No. 646,535
Int. Cl.² A45C *15/00*
U.S. Cl. 150—35 **7 Claims**



1. A combined handbag and audio emitting device, comprising, in combination:

a. a handbag having an open interior, the handbag comprising: a first sidewall, a second sidewall a pair of opposed end walls and a base,

b. a pocket formed in the interior of the handbag and being integrally formed with a sidewall thereof, the pocket comprising a pair of opposed sidewalls, a portion of the first sidewall of the handbag, a rotatable top wall, a base and an end wall, the edge of each of the sidewalls, the top wall and the base are secured to the first sidewall of the handbag above the bag thereof such that the pocket is elevated above the base thereof, the pocket being dimensioned to receive an audio emitting device therewithin,

c. an audio emitting device disposed within the pocket, the device comprising a volume control means and a station selecting means,

d. means formed through the handbag for permitting access to the volume control means and station control means exteriorly of the handbag, while the audio emitting device is disposed in the pocket, and

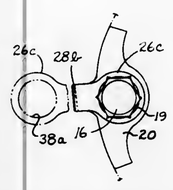
e. a mounting bracket extending between the end wall of the pocket and the base of the handbag.

4,050,494

ANTI-ROTATION LOCK FOR FASTENER BOLT

Robert B. de Claire, Grosse Pointe Woods, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 18, 1976, Ser. No. 697,588
Int. Cl.² F16B *39/10*
U.S. Cl. 151—49 **1 Claim**



1. In an engine-transmission assembly wherein the transmission includes a bell-like housing having a peripheral flange mating with an end face of the engine, the mating areas of the transmission flange and engine face having a number of aligned holes spaced therealong, a bolt having a threaded shank portion extending through each set of aligned holes for thereby rigidly connecting the engine and transmission together, each

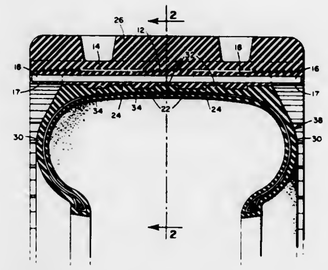
bolt having a head spaced outwardly from the exposed face of the transmission flange, and a washer associated with each bolt for preventing unthreading thereof from the transmission-engine assembly; each washer including a main plate section underlying the bolt head, and a blade section extending outwardly from said main plate section beyond the peripheral edge of the transmission flange; the main plate section of the washer including a wing area (23 or 25) extending along the surface of the transmission flange with one edge thereof located in near proximity to the transmission bell surface, to thereby prevent the washer from turning around the bolt axis; the head of each bolt having a non-circular outline defining a system of wrench flats on the bolt head side surfaces defing corners therebetween the blade section of each washer having a circular aperture with a diameter slightly greater than the diametrical spacing of the bolt head flats but less than the diametrical spacing of the corners between the flats; the washer being formed of a material that permits the blade section to be moved in hinge-like fashion around its connection with the main plate section, whereby the circular aperture axially aligns with the bolt head; the dimension of the circular aperture and the material of the washer enabling the blade section to be hammered down and around the bolt head so that the bolt head corners defined by the aforementioned flats pierce the blade material, thereby preventing relative rotation of the bolt and washer.

4,050,495

REMOVABLE TREAD BELT

Richard J. Olsen, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 5, 1976, Ser. No. 646,432
Int. Cl.² B60C *11/00*
U.S. Cl. 152—187 **17 Claims**



1. A removable tread belt for installing about the circumferential outer surface of a tire carcass, said removable tread belt comprising:

an annular belt matrix having a ground contacting tread portion on the outer surface thereof,

a plurality of rigid bars installed in said belt matrix at spaced intervals around the circumference thereof, said bars extending across substantially the entire axial width of said belt matrix and being spaced radially inwardly of said tread portion, and

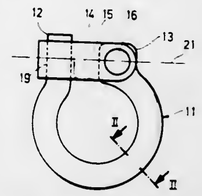
interlocking means on the inner surface of said belt matrix for engaging complementary interlocking means carried by said tire carcass.

4,050,496

CHAIN SHACKLE CONNECTOR

Erhard Alfred Weidler, Jahnstr. 32, 7084 Unterkochen, Germany

Filed July 31, 1975, Ser. No. 600,618
Claims priority, application Germany, Aug. 2, 1974, 2437815
Int. Cl.² B60C *27/06*
U.S. Cl. 152—241 **9 Claims**



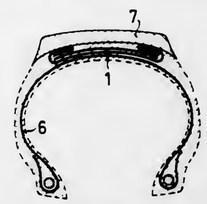
1. A chain shackle connector for link chains, particularly tire chains, having a substantially C-shaped main body with an inlet slot for chain links which are to be connected to each other, in which the inlet slot can be bridged over by a closure piece which is held at one of the two ends of the main body by a removable connecting part which is arranged transversely to the plane of the main body in aligned receiving hole means in the main body and one end of the closure piece, characterized by the fact that the closure piece is provided on its end facing away from its end which has the receiving hole means for the connecting part, with a recess which can be brought over the other end portion of the main body, which has no receiving hole, only when the connecting part is not in connecting position in the hole means and when said connecting part is in connecting position in the hole means, said other end of said connecting part cannot be removed from said other end portion of the main body.

4,050,497

BELT FOR BELTED TIRES AND METHOD OF MAKING SAME

Henryk Pakur, Buckeberg, and Reinhard Tiemann, Hemmingen, both of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Mar. 11, 1976, Ser. No. 665,951
Claims priority, application Germany, Mar. 12, 1975, 2510752
Int. Cl.² B60C *9/18*
U.S. Cl. 152—361 FP **3 Claims**



2. A belt for a belted tire which comprises an annular inner belt layer with first strength carriers extending over the width of said inner belt layer at a first angle and in a first direction with regard to the circumferential direction of said belt, an annular outer belt layer superimposed upon said inner belt layer with second strength carriers extending in a direction opposite to said first direction, the width of said outer belt layer being divided into two marginal sections and an intermediate section therebetween, said intermediate section having its strength carrier extending over the width of said intermediate section at the same angle as said first angle, and the strength carriers of said marginal sections extending only over the

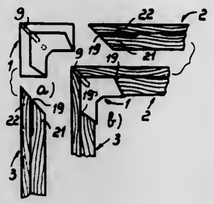
respective marginal section but at a second angle less than said first angle, said marginal sections and the outer marginal areas of said inner belt layer being folded over adjacent areas of said intermediate section.

4,050,498

FRAME PARTICULARLY FOR STRETCHING A PIECE OF PAINTING CANVAS

Renato Lacchetti, Via M. Generoso, 46, Lomazzo (Como), Italy

Filed Feb. 17, 1976, Ser. No. 658,568
Claims priority, application Italy, Feb. 18, 1975, 20361/75
Int. Cl.² B44D 3/18; E04C 2/38
U.S. Cl. 160—374.1 3 Claims



1. A frame particularly for stretching a piece of painting canvas laid thereon, which comprises four wooden strips or strips of an equivalent material arranged to form a quadrangle, the converging strips at each corner being jointed together by jointing in a right angle type of joint, said joint having a box-like structure provided with two converging channels or spaces, each receiving a strip longitudinally insertable thereinto with its end portion, wherein each strip has a prismatic configuration of generally rectangular cross-section, a step formed along the major surface thereof, thus defining a peripheral face which projects further out and whereon the piece of canvas can rest, and an underlying recessed face, underneath the canvas piece, and out of contact therewith when the canvas piece is stretched, each strip having at its end portions a 45° beveled end provided with a through slot extending longitudinally and parallel to the cross-section minor side of the strip and separating, at said step, the end of the strip into a rib portion and a tongue portion, each having a rectangular cross-section, and wherein, according to the improvement the joint is composed of a laminar or sheet material and comprises a flat base defining two converging and communicating channels at a right angle to each other, into which channels there are insertable and guidable, respectively, the tongue portions of the strips with the outer side wall of each channel inserted within said slot, said rib portion resting on and being guided by a portion of the base plane of the joint projecting beyond the channels, at the outer apex formed by the two channels a ridge perpendicular to the base plane in a diagonal direction externally to the box structure formed by the two channels, at the inner apex of the two channels converging portion a window and an adjusting element insertable through said window.

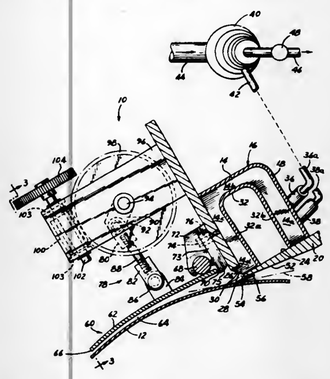
4,050,499

HEAD BOX FOR CYLINDER MOLDS HAVING A FLEXIBLE LID ELEMENT

A. Thomas Lacy, Kalamazoo, Mich., and Frederick S. Hite, Downingtown, Pa., assignors to Boxboard Research and Development Association, Kalamazoo, Mich.

Continuation of Ser. No. 486,303, July 8, 1974, abandoned. This application Jan. 29, 1976, Ser. No. 654,237
Int. Cl.² D21F 1/06
U.S. Cl. 162—317 9 Claims

1. In a papermaking machine of the cylinder type having a rotatable cylinder mold upon which fiber stock is deposited for forming a continuous fibrous web, the combination therewith comprising head box means supported adjacent said cylinder mold and including a dispersion chamber housing defining an internal stock dispersion chamber, said housing having an inlet for introducing fibrous stock into said internal chamber and having an elongated outlet located to deposit fibrous stock under pressure from said chamber onto the peripheral surface of said cylinder mold, said head box means further including a unitary curved lid element having a leading edge pivotally connected to said housing adjacent said outlet and having a trailing edge extending downstream from said outlet such that said lid element is in concave spaced relation to said cylinder mold, adjustment means secured to said lid element at a position intermediate said leading and trailing edges and operable to adjust selectively the spaced relation of said lid element to said cylinder mold, said unitary lid element being sufficiently



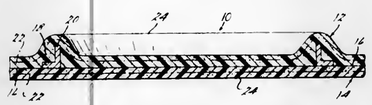
rigid to facilitate positioning of said lid element relative to said cylinder mold by said adjustment means to establish a pressurized stock formation area between said lid element and said cylinder mold but having a free cantilevered trailing edge portion spaced downstream from said adjustment means sufficient for predetermined flexing to vary the spatial relation of said cantilevered trailing edge portion to said cylinder mold in response to pressure changes within said stock dispersion chamber and to accommodate out-of-round cylinder molds, and at the same time maintain a substantially stable pressure within said pressurized stock formation area between said lid element and said cylinder mold from said outlet to said trailing edge of said lid element.

4,050,500

METHOD OF MAKING A SHELL MOLD

Jack T. Steinbacher, Vassar, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 15, 1976, Ser. No. 667,050
Int. Cl.² B22C 1/22, 1/18
U.S. Cl. 164—16 4 Claims



1. A method of making a thin reinforced shell mold from a resin-coated sand comprising the steps of:

A. investing a heated pattern with a mixture of sand and thermal setting resin to coat the heated pattern;

B. heating the coated pattern to cure the resin forming a base layer for the shell mold, the interior surfaces of the base layer being adapted to receive molten metal for forming a cast article;

C. applying a thin coating of a solution of inorganic silicate and a wetting agent to the external surfaces of the base layer opposite the internal surfaces, the material penetrating at least a portion of the base layer; and

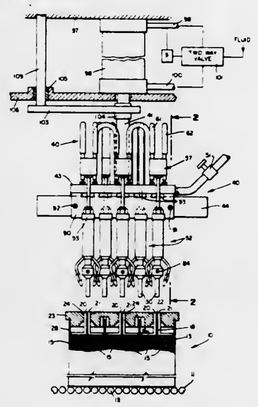
D. curing the inorganic silicate to form a reinforced thin shell mold.

4,050,501

METHOD OF FUSING A METAL BATTERY TERMINAL POST WITH A METAL BUSHING

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Division of Ser. No. 618,772, Oct. 2, 1975, Pat. No. 3,980,126, which is a continuation-in-part of Ser. No. 432,545, Jan. 11, 1974, Pat. No. 3,954,216, which is a continuation-in-part of Ser. No. 395,528, Sept. 10, 1973, Pat. No. 3,861,575, which is a division of Ser. No. 184,338, Sept. 28, 1971, abandoned. This application June 21, 1976, Ser. No. 697,759
Int. Cl.² B22D 25/04; B23K 5/00
U.S. Cl. 164—68 3 Claims



1. The method of fusing a lead alloy battery terminal post portion with a metal bushing portion which surrounds the post at a battery post hole, comprising the steps of: applying open flame to a heating element to raise the temperature of the heating element to a predetermined liquification temperature of portions to be fused and to directly heat at least a portion of said portions to be fused; bringing the element, post, and bushing into engagement and physically penetrating liquified portions of the post and bushing with the element for a desired depth to form a liquid melt; withdrawing the element from the liquid melt; and allowing the melt to solidify in connecting relation between unliquified portions of the post and of the bushing.

4,050,502

METHOD FOR CONTINUOUSLY CASTING A STRIP OF ALLOYED METAL

Jerome B. Allyn, Graytown; Richard D. Wileman, and John Kozak, both of Toledo, all of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Division of Ser. No. 536,485, Dec. 26, 1974, Pat. No. 4,010,939.
This application Aug. 10, 1976, Ser. No. 713,170
Int. Cl.² B22D 11/10; F27B 9/04
U.S. Cl. 164—68 1 Claim

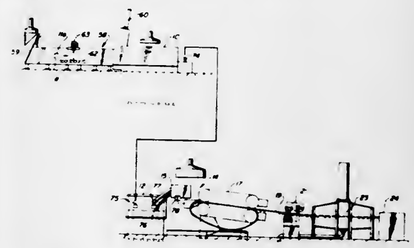
1. In a process for casting an alloyed metal such as calcium lead into a continuous strip for producing an end product such as battery grids and the like, said process casting a continuous strip of alloyed metal at a rate of at least 8 tons per hour by means of a casting machine and employing a tundish for feeding liquid alloyed metal into said caster and a holding box for metering at a constant rate liquid alloyed metal into said tundish, the improvement comprising the steps of:

charging, at predetermined intervals, metal and alloy hogs into a melting pot having a minimum liquid bath level therein by sliding said hogs down an inclined yieldable ramp, said ramp being submersed over a central portion thereof in said minimum bath level of said melting pot;

heating said bath level to a constant temperature of approximately 700° F. by electrical heating elements disposed within conventional protection tubes submersed entirely within said minimum bath level;

melting said hogs at said central portion of said ramp whereby said hogs are maintained at a constant elevation with respect to said minimum bath level;

maintaining a protective atmosphere substantially devoid of oxygen within said melting pot;



pumping said liquid metal from said melting pot to a holding pot through a closed conduit;

heating at a constant temperature said liquid metal in said holding pot by heating elements disposed within conventional pipes completely submersed within a minimum liquid metal bath level in said holding pot while maintaining a protective atmosphere withing said holding pot;

controlling the liquid levels in said melting and holding pots in dependent relationship with respect to one another by a float in each pot in contact with said bath level in each pot whereby said holding pot is effectively operated as a surge tank; and

pumping a portion of said liquid metal from said holding pot to said holding box through a closed conduit.

4,050,503

APPARATUS FOR CONTROLLING THE RATE OF FILLING OF CASTING MOLDS

Angel Tonchev Balevski; Ivan Dimov Nikolov; Dragan Iliev Nenov, and Emil Nikolov Momchilov, all of Sofia, Bulgaria, assignors to Institute po Metalozznanie i Technologia na Metalite, Sofia, Bulgaria

Division of Ser. No. 496,741, Aug. 12, 1974, Pat. No. 3,961,662.
This application Jan. 23, 1976, Ser. No. 651,691
Claims priority, application Bulgaria, Aug. 16, 1973, 24336
Int. Cl.² B22D 17/06, 17/32
U.S. Cl. 164—155 3 Claims

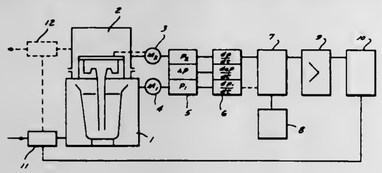
1. Apparatus for controlling the rate of filling of a casting mold, comprising:

a first chamber containing a crucible for the material to be cast and first pressure means operatively associated with the first chamber for supplying a pressure P_1 to the crucible;

a second chamber adjacent said first chamber and containing a casting mold and second pressure means operatively associated with the second chamber for supplying a pressure P_2 to the mold;

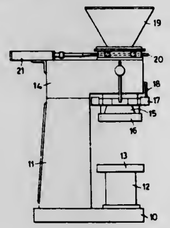
a tube extending between said chambers and connecting said crucible to said mold for conducting said material into said mold at a flow rate determined by the pressure differential $P = P_1 - P_2$; first signal-producing means connected to at

least one of said chambers for producing a first signal representing the time derivative of one of said pressures;
monitoring means connected to said signal-producing means for monitoring said first signal and controlling said one of said pressures to maintain the time derivative thereof substantially constant;
second signal-producing means connected to said first signal-producing means for providing a second signal representing the time derivative of one of the parameters con-



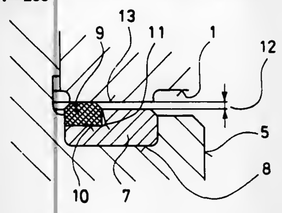
stituted by said pressure differential and the other of said pressures;
comparison means connected to said second signal-producing means for comparing said second signal with a set-point value in accordance with a predetermined program; and
control means connected to said comparison means for controlling said other pressure in response to a signal representing the comparison of said second signal and said set-point value.

4,050,504
CORE-BLOWING MACHINE FOR PREPARING MOULDS AND FOUNDRY CORES
Julius Hansberg, Via Bellinzona 31/2, Modena, Italy
Filed Apr. 30, 1976, Ser. No. 682,354
Claims priority, application Italy, Apr. 30, 1975, 22897/75
Int. Cl.² B22C *15/24*
U.S. Cl. 164—201 **9 Claims**



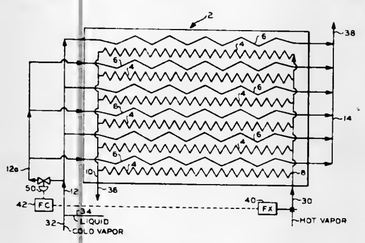
1. In a core-blowing machine for making moulds, foundry cores and the like, said machine comprising a forming mass container, a sandslinger head arranged below said container, a ramming frame slidably arranged externally to a lower end of said sandslinger head so as to be vertically displaceable from a lowered position in which said ramming frame projects downwardly from said sandslinger head to a raised position in which said ramming frame is retracted around said sandslinger head, and a flask supporting table arranged below said sandslinger head and provided with means for vertically displacing said flask supporting table towards said head, the improvement comprising said ramming frame having an inner wall formed by an inwardly projecting upper portion in slidable contact with the outer surface of the lower end of said sandslinger head and a recessed lower portion having air venting holes and spaced from said outer surface so that at least one air venting passage communicating with said holes is defined between said outer surfaces of said sandslinger head and said inner wall of said ramming frame when said ramming frame is in its raised position.

4,050,505
JARRING MOULDING MACHINE
Gert Kemper, Rosendorf, and Roland Melzer, Karlsruhe, both of Germany, assignors to Badische Maschinenfabrik GmbH, Germany
Filed May 5, 1975, Ser. No. 574,340
Claims priority, application Germany, May 10, 1974, 2422756
Int. Cl.² B22C *15/18*; B28B *1/08*
U.S. Cl. 164—206 **16 Claims**



1. Jarring moulding machine having a table and an anvil member disposed for relative movement with respect to one another, an impact receiving means disposed between said table and a supporting surface of said anvil member, said impact receiving means comprising at least one impact member arranged in said supporting surface, for impact contact with said table resulting from this relative movement of the table and anvil member, and at least one impact insert which is resilient relative to the impact member and arranged in said impact member so that the impact insert receives impact contact with the table before the impact member.

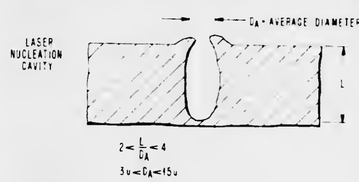
4,050,506
STEPWISE TURNDOWN BY CLOSING HEAT EXCHANGER PASSAGEWAYS RESPONSIVE TO MEASURED FLOW
William M. Small, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Mar. 25, 1976, Ser. No. 670,214
Int. Cl.² F28F *13/00*
U.S. Cl. 165—1 **10 Claims**

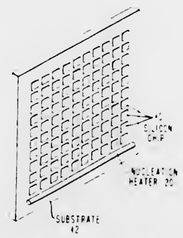


1. A plate type heat exchanger apparatus comprising in combination:
a plurality of elongated metallic plates disposed in spaced relationship defining a plurality of elongated platelike passages in spaces there-between;
said plurality of passages including a first group of passages and a second group of passages, the passages of said first group being disposed in alternate relationship with said second group so as to be in heat exchange relationship therewith;

end means extending between said plates along the periphery thereof defining the width and length of said passages;
first inlet header communicating with said frist group of passages;
first outlet means for removing fluid from said first group of passages,
a second header means having associated therewith a sparger means for introducing a vapor into said second group of passages and sparging a liquid into said vapor, said second header means being divided into means to separately communicate with at least two fractions of the total number of passages in said second group of passages;
second outlet means for removing spent refrigerant from said second group of passages;
means to measure the flow of fluid to said first inlet header; and
means to shut off flow through a uniformly spaced fraction of the total number of passages in said second group of passages responsive to a signal generated by said means to measure flow.

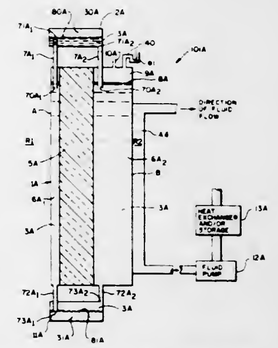
4,050,507
METHOD FOR CUSTOMIZING NUCLEATE BOILING HEAT TRANSFER FROM ELECTRONIC UNITS IMMERSED IN DIELECTRIC COOLANT
Richard C. Chu, Poughkeepsie, and Kevin P. Moran, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 27, 1975, Ser. No. 591,198
Int. Cl.² F28D *5/00*; F28F *13/18*
U.S. Cl. 165—1 **10 Claims**





1. A method of starting nucleate boiling at a predetermined temperature at nucleation sites on the walls of a unit to be cooled comprising:
drilling holes with a high energy beam to obtain an opening having a narrow top and opening up to a critical diameter then tapering off in diameter until a predetermined bottom or length is reached;
locating said holes in preselected positions on the walls to be cooled, the dimensions of said holes being selected to provide nucleate boiling at the predetermined temperature;
immersing the surface to be cooled in a dielectric liquid having a boiling point at the predetermined temperature;
orienting the walls to be cooled vertically in said dielectric liquid so that the nucleate boiling bubbles formed at said drilled holes when the surface reaches the predetermined temperature will wash liquid from the above located nucleation sites so that boiling will start at said predetermined temperature and thereby avoid temperature overshoot of the walls being cooled.
9. Apparatus for starting nucleate boiling at nucleate sites at a predetermined temperature comprising:
at least one electronic chip having nucleate boiling sites located on at least a back surface thereof and mounted so that the back surface is exposed and is oriented vertically,
a dielectric liquid covering at least the back surface of said electronic chip;
a pre-heater having nucleation sites therein located below said electronic chip for generating nucleate vapor bubbles which rise in said liquid and wash the liquid from the above located nucleate sites in said chip.

4,050,508
CONTROLLABLE HEAT TRANSMISSION PANELS
Bruce Shawn Buckley, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Oct. 28, 1975, Ser. No. 626,402
Int. Cl.² F24J *3/02*; F28D *21/00*
U.S. Cl. 165—32 **21 Claims**



1. Apparatus for controlling energy transmission between two closely-spaced regions in a system, that comprises: an isolating structure disposed in the space between the two closely-spaced regions, a liquid disposed within said structure and adapted to flow or move therein, control means other than the character of the liquid itself responsive to a temperature parameter of the system and using only thermal energy acting to control automatically the movement of the liquid flow in said structure, said liquid, mostly by virtue of the convective properties of the liquid, using only thermal energy and without change of state thereof, acting to modulate the energy transmission between the two closely-spaced regions of the system, said isolating structure comprising a thermal insulator interposed between the two regions and serving to divide the isolating structure into a first section adjacent the first region of the two regions and a second section adjacent the second region of the two regions, said liquid being disposed within the first section and the second section and adapted to flow by convective flow from one to the other of the two sections, the control means acting to affect said convective flow; and a heat transfer mechanism that comprises fluid means whereby a fluid is caused to flow adjacent to said second section to exchange energy with the liquid in said second section.

4,050,509

DOWN-PUMPING HEAT PIPES

Walter B. Bienert, and Milton F. Pravda, both of Baltimore, Md., assignors to Dynatherm Corporation, Cockeysville, Md.

Filed Oct. 28, 1976, Ser. No. 736,548
Int. Cl.² F28D 15/00
U.S. Cl. 165—45 10 Claims



1. A down-pumping heat pipe comprising a pair of angularly disposed upper and lower vessels, an elongated tube enclosed in the lower vessel and providing communication between the vessels, a working agent in the lower vessel able to flow through said tube to the upper vessel, a non-condensible gas in the lower vessel above the level of working agent therein but prevented by said agent from flowing into said tube and upper vessel, and said tube and vessels being substantially evacuated prior to introduction of said agent and gas.

10. In an improved roadway having means for melting ice and snow thereon comprising at least one paving slab supported on a foundation of earth, and wherein said means comprise a plurality of up-pumping heat pipes operatively associated with the roadway,

the improvement comprising a plurality of down-pumping heat pipes operatively associated with the roadway which in warm weather are capable of replenishing earth heat by adding thereto heat from the atmosphere and from solar radiation,

each said down-pumping pipe comprising two vessels one of which is disposable in the grond below and/or adjacent to the roadway and the other of which is disposable in the roadway just below the surface thereof,

an inner tube enclosed by said ground vessel and in communication therewith and also with said roadway vessel, a quantity of noncondensible gas in the ground vessel,

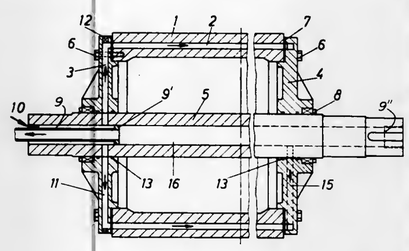
an amount of working agent in the down-pumping pipe which in warm weather is vaporizable in the roadway vessel by atmosheric and solar heat and is condensible in the ground vessel by the lower temperatures prevailing in the ground, the vaporized agent flowing from the roadway vessel through the tube to the ground vessel where it encounters said gas, at least part of the vaporized agent being condensed in the ground vessel, thereby releasing heat of condensation to walls of the ground vessel and the surrounding earth, and part of the vaporized agent mixing with said gas, thereby increasing the pressure of the resulting mixture, said mixture eventually receiving so much vaporized agent as to attain a pressure large enough to force condensed agent back to the roadway vessel where it may again be vaporized by the higher temperatures on the roadway surface, and said pipes being evacuated prior to introduction of said agent and gas.

4,050,510

CALENDER HEATING ROLL

Helmuth Theysohn, Wiehbergstrasse 25 C, 3 Hannover, Germany

Continuation of Ser. No. 463,825, April 24, 1974, abandoned.
This application Nov. 28, 1975, Ser. No. 635,868
Claims priority, application Germany, Apr. 27, 1973, 2321367
Int. Cl.² F28F 5/02
U.S. Cl. 165—89 1 Claim



1. A heating calender roll, comprising;

a hollow cylindrical shell comprising a chill casting large enough to calender thereon a rubber-asbestos sheet having a length of several meters on each side thereof, the shell being of cast iron and having a plurality of parallel tubular bores extending through the cast iron of the hollow shell parallel to the axis of the shell at locations regularly distributed circumferentially of the shell;

first and second end structures comprising chill castings of cast iron, having similar coefficients of thermal expansion as the shell, and provided respectively at first and second ends of the hollow cylindrical shell, each end structure extending inwardly from the respective end of the shell, and having (a) a plurality of radial passages, all extending through the end structure radially of the shell at locations regularly angularly spaced from one another to match the locations of some of the parallel tubular bores extending through the shell, and all connected to such parallel tubular bores; and (b) means for maintaining a meandering flow of heating medium through said parallel tubular bores to keep heating of the chill casting of said shell uniform at and between both ends thereof, said means comprising two sets of segmental grooves, one set for each end structure and disposed therein, angularly between said radial passages, to interconnect two of said parallel tubular bores of the chill casting of said shell;

means for fastening and sealing each end structure to the respective end of the shell; and

hollow shaft means centrally secured to the end structures for rotating them to rotate the shell, for passing the heating medium into the radial passages of one end structure and thereby, with assistance of the segmental grooves, into the meandering flow through the parallel tubular bores of the shell, and for receiving the heating medium from the parallel tubular bores of the shell through the other end structure,

to heat the large chill casting of the shell by said medium, to similarly heat the chill castings of both end structures, and thereby to enable the shell to calender the rubber asbestos sheets.

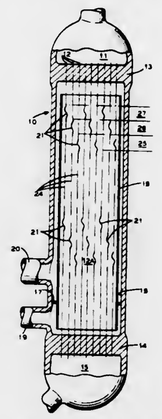
4,050,511

HEAT EXCHANGERS

Bertrand N. McDonald, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,366
Int. Cl.² F28D 7/10
U.S. Cl. 165—162 4 Claims

1. A heat exchanger including a plurality of substantially longitudinally aligned and spaced heat exchanger fluid flow tubes wherein at least some of said tubes each comprise a section thereof extending in the longitudinal direction of the tube and bent outwardly from the longitudinal tube axis in an



approximately helical shape about the longitudinal axis, said section being in continuous fluid flow relation with the remainder of the tube, and said section having longitudinally successive outwardly extending portions in tangential contact with at least some of the tubes adjacent thereto.

4,050,512

STROKE ACTUATED WELL TESTING TOOL

Bernhardt F. Giebeler, San Bernardino, Calif., assignor to BJ-Hughes Inc., Long Beach, Calif.

Filed July 6, 1976, Ser. No. 702,406
Int. Cl.² E21B 49/00
U.S. Cl. 166—128 6 Claims



1. A tubing string supported well testing tool, comprising:

a. a tubular structure having a series of control subassemblies, each having components capable of limited relative axial movement;

b. a tubular packer suspended from the tubular structure and adapted to be set in a well core;

c. a first of the control subassemblies having radially directed ports, said ports occupying an open position during movement of the tubular structure and packer through the well bore to permit passage of well fluid through the packer into the region surrounding the tubing string, said ports occupying closed positions when the packer is set in the well bore;

d. a rotatable main valve within the tubular structure;

e. a second of the control subassemblies for moving the valve successively between a position closing flow through the tubular structure and a position permitting flow through the packer and tubular structure;

f. said second control assembly including a driven gear carried by the main valve, an annular gear carried within the walls of the tubular structure, a multiple cam cylinder having a drive gear engagable with the the driven gear, longitudinally and circumferentially extending cam elements, and longitudinally movable cam driving elements for turning the cam cylinder to effect rotation of the main valve;

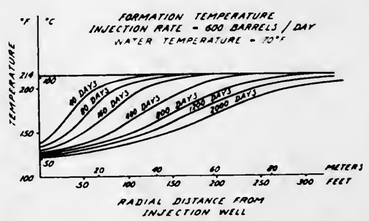
g. and a pressure counterbalancing means, operable when the main valve is closed and the well pressure below the main valve exceeds the pressure above, for applying a counter-force to facilitate movement of the main valve to its open position.

4,050,513

METHOD OF TREATING A HIGH TEMPERATURE FORMATION TO PERMIT THE USE THEREIN OF TEMPERATURE SENSITIVE HYDROPHILIC, VISCOSITY INCREASING POLYMERS

Ching H. Wu, Golden, Colo.; Alfred Brown, Houston, Tex.; Wann-Sheng Huang, Houston, Tex., and Yiek-Mow Shum, Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed July 15, 1976, Ser. No. 705,737
Int. Cl.² E21B 43/22
U.S. Cl. 166—274 13 Claims



1. In a method of recovering petroleum from a subterranean, petroleum-containing formation comprising injecting a viscous, aqueous fluid containing a hydrophilic, viscosity increasing polymer selected from the group consisting of polysaccharides, polyacrylamides, and mixtures thereof wherein the formation temperature exceeds the temperature at which the polymer is stable, wherein the improvement comprises:

introducing a cooling fluid into the formation at a temperature substantially lower than the temperature at which the polymer is stable for a period of time sufficient to reduce the portion of the formation to be contacted by the polymer to a temperature level at which the polymer is stable.

4,050,514

PARAFFIN SUCKER ROD SCRAPER AND ROD CENTRALIZER

Otto E. Preus, Sherwood Park, Canada, assignor to The Steel Company of Canada, Limited, Hamilton, Canada

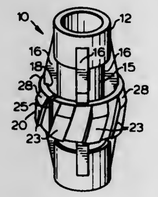
Filed Sept. 3, 1976, Ser. No. 720,253
Int. Cl.² E21B 37/02
U.S. Cl. 166—176 6 Claims

1. A sucker rod scraper comprising:

a plastic body member adapted to be affixed to the sucker

rod, the body member including an elongated, generally cylindrical portion to concentrically surround the sucker rod, a plurality of longitudinal fins extending radially from said cylindrical portion and spaced angularly from each other, the fins being indented between their ends,

a plastic ring member adapted to encircle said body member



adjacent the fins, within the indentations of the fins, the ring member having an inner diameter greater than the outer diameter of the adjacent part of the cylindrical portion,

the ring member being retained adjacent the fins by virtue of the indentations, and being capable of rotation with respect to the body member.

4,050,515

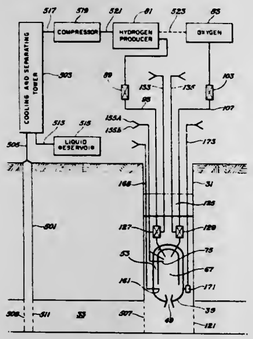
IN SITU HYDROGENATION OF HYDROCARBONS IN UNDERGROUND FORMATIONS

Joseph T. Hamrick, Roanoke, and Leslie C. Rose, Rocky Mount, both of Va., assignors to World Energy Systems, Fort Worth, Tex.

Continuation-in-part of Ser. No. 611,138, Sept. 8, 1975, Pat. No. 3,982,592, which is a continuation-in-part of Ser. No. 534,778, Dec. 20, 1974, Pat. No. 3,982,591. This application Sept. 27, 1976, Ser. No. 726,745

Int. Cl.² E21B *43/24*

U.S. Cl. 166—303 **12 Claims**



1. A process of hydrogenating hydrocarbons in underground formations penetrated by a borehole and wherein a gas generator is located in the borehole at or near the level of said formations, said gas generator comprising:

a housing forming a chamber defining a combustion zone and having an upper inlet end for receiving fuel and an oxidizing fluid for forming a combustible mixture of gases in said combustion zone for ignition, and

a restricted lower outlet for the passage of heated gases,

said process comprising the steps of: flowing through said borehole from the surface

to said gas generator, by way of separate

passages, hydrogen and oxygen to form a hydrogen-rich combustible mixture in said combustion zone, igniting and burning the combustible mixture

in said combustion zone, and

controlling the flow of hydrogen and oxygen to said gas generator to maintain the temperature of the gases and fluids flowing through said outlet at a level sufficient to cause hydrogenation of the hydrocarbons in said formations.

7. A system for recovering hydrocarbons or other materials from underground formations penetrated by a first borehole and a spaced production borehole comprising:

a hydrogen producer and a source of oxygen are located at the surface,

a gas generator is located in said first borehole at or near the level of said formations,

said gas generator comprising:

a housing forming a chamber and having an upper inlet end for receiving fuel and an oxidizing fluid,

said chamber defining a combustion zone,

an igniter for igniting combustible gases in said combustion zone,

a restricted lower outlet for the passage of heated gases, and

means for flowing through said borehole from said hydrogen producer and from said source of oxygen, by way of separate passages, hydrogen and oxygen to form a hydrogen-rich combustible mixture in said combustion zone,

means for igniting and burning the combustible mixture in said combustion zone,

means for controlling the flow of hydrogen and oxygen to said gas generator to maintain the temperature of the gases and fluids flowing through said outlet at a level sufficient to cause hydrogenation of the hydrocarbons in said formations,

means for recovering hydrocarbons from said production borehole, and

means for applying at least a portion of said hydrocarbons recovered, to said hydrogen producer for producing hydrogen for supplying hydrogen to said gas generator.

4,050,516

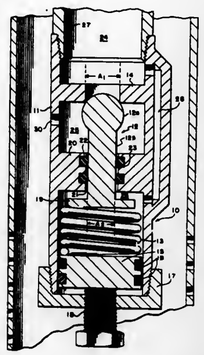
METHOD OF INJECTING FLUIDS INTO UNDERGROUND FORMATIONS

Robert Houston Canterbury, Hobbs, N. Mex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 555,778, March 6, 1975, Pat. No. 3,987,848. This application June 24, 1976, Ser. No. 699,280

Int. Cl.² E21B *43/25*

U.S. Cl. 166—305 R **9 Claims**



1. A method of injecting fluids into an underground formation penetrated by a wellbore, said method comprising:

predetermining the hydrostatic pressure of a column of fluid having a height equal to the depth of the underground formation;

providing a continuously partially pressure-balanced injection valve having a resultant differential pressure area responsive to the hydrostatic pressure of a colume of fluid thereabove to open said valve, and having an adjustable biasing means arranged to apply a closing force to said valve;

adjusting said injection valve biasing means to a force exceeding the resultant differential pressure on said valve which would arise from said predetermined hydrostatic pressure;

locating said injection valve in a tubing string in the under ground formation;

placing in the tubing string treating fluid to be injected into the formation;

filling any remaining portion of the tubing string with displacement fluid; and,

applying fluid pressure to the tubing string to open said injection valve and inject said treating fluid into the formation.

4,050,517

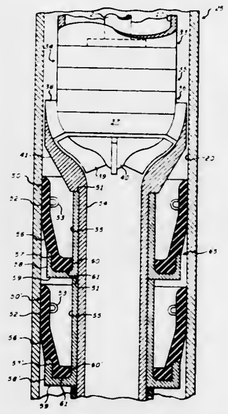
GEOTHERMAL ENERGY WELL CASING SEAL AND METHOD OF INSTALLATION

Hugh B. Matthews, Boylston, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,262

Int. Cl.² E21B *33/126, 43/00*; F01K *23/00*; F03G *7/04*

U.S. Cl. 166—315 **10 Claims**



1. In geothermal deep well pump apparatus of the kind including deep well pump means having input means for pumping a first fluid always in liquid state through well casing means in cooperative energy exchanging relation with respect to a second fluid for producing a working fluid:

turbine means at said deep well pump means for driving said deep well pump means in response to said working fluid,

first conduit means for passage of said working fluid between said turbine means and the earth's surface,

said turbine means being suspended within said deep well by said first conduit means,

second conduit means affixed to said input means and extending downward therefrom,

resilient seal means disposed around said second conduit means normally in contacting sliding relation with said well casing means, and

tension means for retracting said resilient seal means from contact with said well casing means while said turbine means, said deep well pump means, and said resilient seal means are being lowered upon installation into said geothermal deep well.

10. The method of installing geothermal fluid pumping apparatus at an operating location within the casing of a geothermal well, said fluid pumping apparatus comprising turbine motor means, turbine working fluid conduit means extending from said turbine means to the earth's surface and supporting said turbine means, pump means driven by said turbine motor means, resilient seal means at the inlet of said pump means for normally contacting in sliding relation at the operating location of said fluid pumping apparatus the inner surface of said casing, including the steps of:

mounting said resilient seal means at said inlet of said pump means,

applying tension to said resilient seal means to retract it to a stowed position from its normal contacting position by employing tension means adapted to release said resilient seal means under at least one influence of said geothermal fluid when immersed therein,

lowering said fluid pumping apparatus into said well by said working fluid conduit means, whereby said tension means becomes immersed in said geothermal fluid, thereupon releasing said resilient seal means from its stowed position into its normal contacting, sliding relation with the inner surface of said casing.

4,050,518

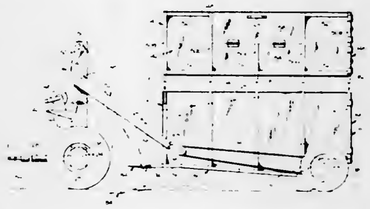
BEACH CLEANING APPARATUS

Richard C. Gilmour, 207 Weymouth Ave., Scullville, N.J. 08330

Filed July 1, 1976, Ser. No. 701,587

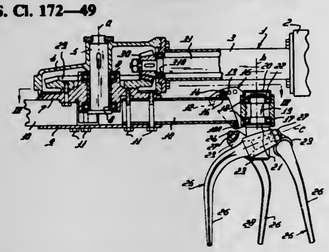
Int. Cl.² A01D *15/02*

U.S. Cl. 171—116 **11 Claims**



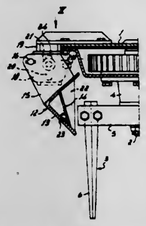
1. A beach cleaning apparatus comprising a forward assembly and a trailer member operatively connected thereto, said forward assembly comprising a body portion, means on the forward portion of said body portion for securing the beach cleaning apparatus to a motorized vehicle, and first rotatable means extending transversely of said body portion for rollably supporting said forward assembly on the ground; said trailer member comprising a bed comprising screen means adjacent the forward end thereof and having ground engaging means extending outwardly of said forward end, upstanding walls extending about the periphery of and mounted to said bed with the lower edge of the wall portion disposed adjacent said forward end of said bed beng spaced upwardly therefrom to provide a transversely extending opening, and second rotatable means extending transversely of the rear portion of said trailer member for rollably supporting said trailer member on the ground; and lift means operatively interconnecting the forward portion of said trailer member to said forward assembly for raising and lowering the forward portion of said trailer member to disengage and engage said ground engaging means with sand to be cleaned whereby engaged sand passes over said ground engaging means as the beach cleaning apparatus moves forwardly, through said opening and onto said screen means where it undergoes a sifting action to remove debris therefrom, the sand thereafter passing downwardly through said screen means onto a beach or the like.

4,050,519
SOIL CULTIVATING MACHINES
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland
Filed Oct. 9, 1975, Ser. No. 620,920
Claims priority, application Netherlands, Oct. 10, 1974, 7413313
Int. Cl.² A01B 33/06, 33/14
U.S. Cl. 172—49 15 Claims



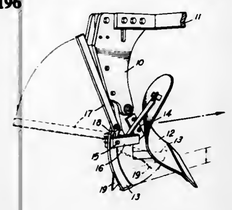
8. A soil-cultivating machine comprising a frame and at least one soil-working member being supported on said frame, said soil-working member being rotatable about at least one upwardly extending rotary axis and driving means connected to rotate said soil-working member about that axis, cultivating means being rotatable mounted on said soil-working member and spaced from said rotary axis, sid cultivating means being freely rotatable about a further, upwardly extending axis that is defined by a shaft, said cultivating means comprising a plurality of tines having elongated upper ends that extend upwardly, means adjusting the relative position of said shaft and the working position of said cultivating means, said soil-cultivating means comprising a plurality of arms that are inclined downwardly and away from said shaft, the outer free ends of said arms having corresponding downwardly extending tines secured thereon and said ajustment means including a pivot that is positioned nearer said rotary axis than said shaft of the cultivating means.

4,050,520
CULTIVATOR WITH SCREENING DEVICE
Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands
Continuation of Ser. No. 208,687, Dec. 16, 1971, abandoned.
This application Jan. 26, 1976, Ser. No. 652,098
Claims priority, application Netherlands, Dec. 21, 1970, 7018555
The portion of the term of this patent subsequent to Nov. 27, 1990, has been disclaimed.
Int. Cl.² A01B 33/06
U.S. Cl. 172—59 15 Claims



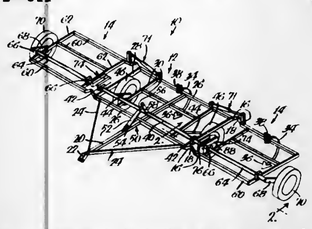
1. A cultivator having an elongated frame and a plurality of rotatable soil working members arranged in a transverse row, said soil working members being rotatable about upwardly extending axes and comprising downwardly extending tines mounted on supports, said supports with tines being in driving connection and rotated by driving means, screening means pivotably connected to said frame and extending substantially horizontally along the front of said frame relative to the direction of travel, a lower portion of said screening means during operation being located directly in front and adjacent the connections of said tines to their respective supports in the foremost positions thereof, said screening means being turnably connected to said cultivator with substantially horizontal pivots, spring means interconnecting said screening means with said frame and biasing said screening means to an operative protective position, a front side of said screening means affording a surface that engages the soil during operation and includes a portion that extends downwardly and rearwardly protecting the front of said frame and the connections of said tines with their supports from debris in and on the soil that would be encountered by the rotating tines during operation.

4,050,521
COMBINED TURNPLOW AND SUBSOILER
Robert A. Rowan, P.O. Box 68, Enigma, Ga. 31749
Filed July 12, 1976, Ser. No. 704,302
Int. Cl.² A01B 11/00, 13/14
U.S. Cl. 172—196 6 Claims



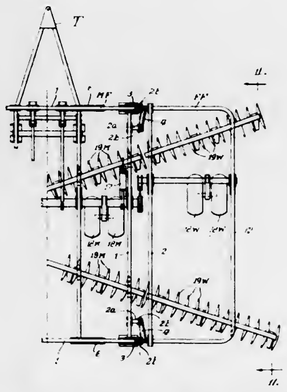
1. A plow device comprising a support means adapted to be raised and lowered, a main plow element attached to the support means, and a secondary counterweighted plow element movably connected with the support means and being shiftable relative to the main plow element to and from retracted and extended positions, raising of the plow device causing the secondary plow element to move by gravity to said retracted position, the secondary plow element having a part which contacts the soil when the plow device is lowered thereby moving the secondary plow element to said extended position, and wherein said secondary counterweighted plow element is pivotally mounted on the support means and swingable on its pivot axis automatically to said retracted position when the plow device is elevated.

4,050,522
MULTI-SECTION HARROW ASSEMBLY
Harold A. Ralston, Racine, and Alton B. Christensen, Kenosha, both of Wis., assignors to J. I. Case Company, Racine, Wis.
Filed Mar. 29, 1976, Ser. No. 671,626
Int. Cl.² A01B 15/14, 24/04
U.S. Cl. 172—311 8 Claims



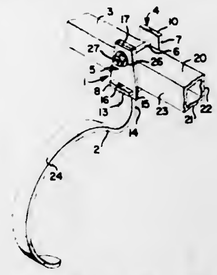
1. In a harrow assembly including a center main frame section and a pair of outer wing sections pivoted on the outer ends of said main frame section for articulated movement about hinge axes extending fore and aft of the path of travel of the assembly, a main shaft journaled for rotation on said main frame section about an axis extending transversely of a fore and aft path of travel of the assembly, a pair of wing shafts rotated on the respective wing sections and axially aligned with said main shaft when said sections are in end-to-end relation, means for rotating said main shaft on said main section, and connection means between said main shaft and said wing shafts for rotating said wing shafts with said main shaft, the improvement of each of said connection means including a first arm fixed to said main shaft and extending generally rearwardly with respect to said main shaft, said first arm having a downwardly directed convex, generally arcuate elongated surface defined thereon with a lowermost edge of said surface being vertically aligned with a fore and aft axis, and a second arm fixed to an adjacent end of a wing shaft and extending generally rearwardly with respect to said wing frame, said second arm having an elongated upwardly directed surface adapted to engage said arcuate surface along a line of contact between said surfaces defining extended surface contact which is generally aligned with said fore and aft axis when said assembly is in a normal earthworking position.

4,050,523
FOLDING WING DISC HARROW
Robert L. Poland, Kewanee, Ill., assignor to Claromalloy American Corporation, St. Louis, Mo.
Filed Sept. 18, 1975, Ser. No. 614,372
Int. Cl.² A01B 49/00, 63/32
U.S. Cl. 172—311 11 Claims



1. In an agricultural implement having a horizontally disposed tool supporting main frame, a tool supporting wing frame hinged to one side of the main frame to swing on a fixed hinge axis between a generally horizontal inverted rest position over the main frame and a generally horizontal working position outboard of the main frame, and extensible-retractable push-pull means to effect said swinging of the wing frame, the improvement wherein the wing frame is hinged to the main frame by a compound hinge connection which includes a lever having one end hingedly connected to the main frame to swing on said fixed hinge axis and having its opposite end hingedly connected to the wing frame to swing on a second hinge axis speced from said fixed hinge axis and parallel thereto, said compound hinge connection further including a thrust link pivotally connected to said level intermediate its hingedly connected ends, the thrust link being also pivotally connected to one end of the push-pull means, and a second link having one end pivotally connected to the wing frame, said second link containing a closed longitudinally extending slot spaced from its pivotal connection to the wing frame, the thrust link having an anchor pin slidably confined in said slot such that the wing frame when in its generally horizontal working position is free to swing within a limited angle about the second hinge axis to follow field contour, the outboard end of the slot in the second link being engaged by the anchor pin of the thrust link to retain the wing frame against rotation about the second hinge axis when the load of the wing frame is outboard of the second hinge axis as the lever is swung upwardly about the fixed hinge axis by the thrust link under the force of the push-pull means to raise the wing frame out of its working position, the thrust link further having means which capture the outboard end of the second link to resist rotation of the wing frame on said second hinge axis in the opposite direction as the load of the wing frame approaches and moves inboard of a vertical through said second hinge axis as the push-pull means acts on the hinge lever through the thrust link to lower the wing frame about said fixed hinge to its rest position over the main frame.

4,050,524
CULTIVATOR TOOTH CLAMP
Kenneth A. Hake, Tipton, Kans., assignor to Kent Manufacturing Co., Inc., Tipton, Kans.
Filed May 17, 1976, Ser. No. 687,311
Int. Cl.² A01B 23/02
U.S. Cl. 172—707 7 Claims



1. A clamp for mounting an agricultural implement to a square section tool bar, said implement being at times subject to transverse force components parallel to said bar and having a substantially planar mounting shank with opposite side edges, said clamp comprising:

a. an L-shaped bracket having planar legs disposed at substantially a right dihedral angle, said bracket being adapted for mounting on said bar with said legs engaging adjacent sides thereof;

b. one of said legs having an elongated shank slot adjacent a free end thereof and sized to closely receive said shank, the longitudinal dimension of said slot extending parallel to the dihedral vertex common to said legs;

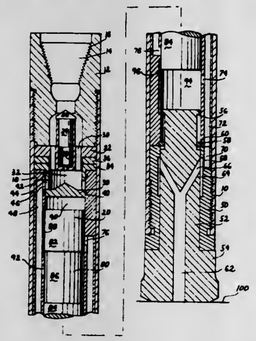
c. retaining clip adapted to engage said shank and having an elongated key slot adjacent one end thereof and sized to closely receive said one leg free end, said clip being mounted with said one leg free end recived in said key slot; and

d. fastening means for joining said bracket, clip, and shank to said bar in clamped engagement thereby resisting the pivoting of said implement about a horizontal axis perpendicular to said bar.

4,050,525
DOWN-THE-HOLE HAMMER
John F. Kita, Bedford, Pa., assignor to Keanametal Inc., Latrobe, Pa.
Filed Sept. 2, 1976, Ser. No. 720,057
Int. Cl.² B23Q 5/027
U.S. Cl. 173—17 7 Claims

1. In a down-the-hole hammer; a housing defining a cylindrical cavity and having first means at the upper end for connection to a source of air under pressure and second means at the lower end for connection to a bit having axial exhaust passage means therein and an upper working position and a lower idle position in said housing, a reciprocable piston dividing the cavity into upper and lower chambers and having retracted and advanced positions in the cavity and adapted in advanced position to strike the upper end of a bit in working position in the housing, said piston having end portions fitting said cavity

and a reduced diameter region between said end portions, first conduit means in the housing adapted for the continuous supply of air under pressure thereto, second conduit means in the housing continuously connected to exhaust, first port means connecting said first conduit means to the reduced diameter region of said piston, second and third axially spaced port means leading from said second conduit means into said cavity, said piston controlling said second and third port means and causing said second and third port means to communicate with

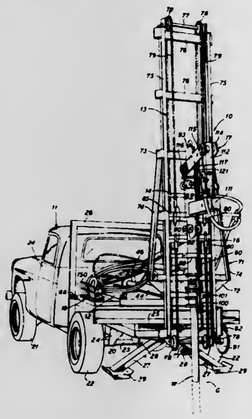


respective ones of the upper and lower chambers in advanced and retracted positions respectively of said piston, and channel means in said housing operable for connecting the reduced diameter region of said piston with a respective one of said upper and lower chambers in retracted and advanced positions respectively of said piston, the bit when in idle position in the housing permitting the piston to advance beyond said advanced position thereof and cause said reduced diameter region of said piston to interconnect said first port means and said second port means thereby exhausting said first conduit means.

4,050,526
POST DRIVING MACHINE

Robert F. Delke, Cheyenne, Wyo., assignor to Foresight Industries, Cheyenne, Wyo.

Filed May 7, 1975, Ser. No. 575,462
Int. Cl.² E21C *11/02*
U.S. Cl. 173—27 **16 Claims**

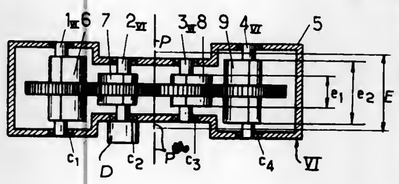


5. In a post driving machine having a hammer for delivering impact blows to a work piece to be driven into the ground, the improvements which comprise a tension spring linked to said hammer to provide the sole driving force for propelling said hammer, hydraulic means for loading said spring, a hydraulic circuit feeding hydraulic fluid to said hydraulic means to control loading and unloading of said spring, and a manually controlled adjustment means for said hydraulic circuit regulating the dumping of said hydraulic fluid to vary the stroke of said hammer.

4,050,527
VIBRODRIVER APPARATUS

Jean L. Lebelle, 92210 Saint Cloud, France

Filed Apr. 13, 1976, Ser. No. 676,507
Claims priority, application France, Apr. 23, 1975, 75.12622
Int. Cl.² E02D *7/18*
U.S. Cl. 173—49 **8 Claims**



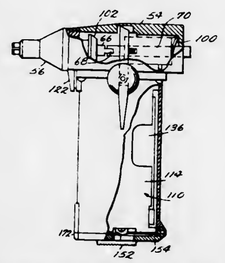
1. In combination, a vibrodriver for sinking or extracting a vertically elongated element of substantially uniform horizontal cross-section into or from the ground, said element being one of plural such elements arrayed in a line, said vibrodriver comprising at least three parallel eccentrics, means mounting said eccentrics for rotation about horizontal axes, at least two eccentrics or portion thereof being situated on a different sides of said element, means releasably clamping said vibrodriver on said element, so that said element is a clamped element, and means to rotate said eccentrics, whereby said clamped element is vibratorily sunk into or extracted from the ground, said clamped element having a maximum width along said line of elements, said at least two eccentrics or portion thereof having enlarged effective width dimensions exceeding the corresponding effective width dimension of a third of said eccentrics, said enlarged effective width dimensions being accommodated at zones spaced laterally from the clamped element, said vibrodriver being narrower than said clamped element at the zone adjacent said clamped element so that the vibrodriver has increased power due to the enlarged effective width dimensions yet will be clear of elements adjacent the clamped element.

4,050,528
WIRE INSERTER

Carl L. Foltz, Holiday; Vernon H. Troutner, Petersburg, and Arthur F. Trott, Largo, all of Fla., assignors to Concept, Inc., Clearwater, Fla.

Continuation-in-part of Ser. No. 610,869, Sept. 5, 1975. This application Oct. 17, 1975, Ser. No. 623,391
Int. Cl.² AG1B *17/18*
U.S. Cl. 173—163 **14 Claims**

1. A portable surgical wire inserting instrument comprising a housing, said housing defining a handle and a drive casing, a removable cassette comprising motor means, switch means and a source of electrical power, mounted in said housing and completely enclosed within said housing handle, said motor means mounted in said cassette, said electrical source of power mounted in said cassette and adapted to power said motor means when electrically connected to said motor means by said cassette switch means enclosed within said cassette, a wire holding tube means mounted in said housing, said wire holding tube means being provided with chuck means at one end, the chuck means being adapted to grab and hold a wire inserted in said wire holding tube in a fixed position, gear means connecting said motor means to said wire holding tube means adapted to rotate said wire holding tube means and external switch

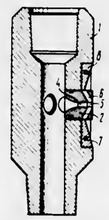


means movably mounted on said housing, said external switch means being connected to said cassette switch means and adapted to engage said cassette switch means to engage said motor means.

4,050,529
APPARATUS FOR TREATING ROCK SURROUNDING A WELLBORE

Kurban Magomedovich Tagirov, ulitsa Lenina, 408a, kv. 25; Nikolai Rubenovich Akopian, ulitsa Sochinskaya, 64; Valery Vasilievich Konontsev, ulitsa Serova, 181, and Jury Nikolaevich Lutsenko, ulitsa Lenina, 472, kv. 15, all of Stavropol, U.S.S.R.

Filed Mar. 25, 1976, Ser. No. 670,347
Int. Cl.² E21B *7/11*
U.S. Cl. 175—422 **22 Claims**

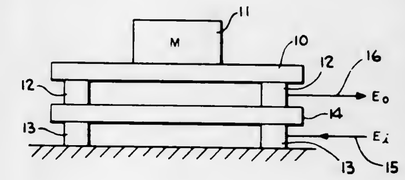


1. An apparatus for treating rock surrounding a cased wellbore, comprising: a hollow elongated housing; a plurality of nozzles radially arranged in said housing, and being mounted therein for free reciprocating movement from the center portion of said housing to the periphery thereof so as to project exteriorly of said housing; each said nozzle having a through passage communicating with the internal space of said housing for a flow therethrough of an abrasion laden fluid; said nozzles having their end portions facing exteriorly of said housing and being adapted to closely fit the casing wall, each said through passage of said nozzles having a larger diameter portion adjacent to said end portion; each said nozzle having additional passages one end of which communicating with said larger diameter portion of said through passage and the other end communicating with the space exteriorly of said nozzle, and said additional passages being adapted to provide an outflow of the abrasion laden fluid from the space defined by said larger diameter portion of said through passage and the adjacent casing wall, as said nozzles are pressed against said casing wall by said fluid; whereby said nozzles generally protect said casing from being washed away by said abrasive fluid, and enables perforating an opening in said casing of a diameter equal to about the diameter of said larger diameter portion and also provides where applicable for the utilization of substantially all of the kinetic energy of the flowing abrasive fluid for hydrofracturing of a formation without the need of packers.

4,050,530
METHOD AND APPARATUS FOR DETERMINING WEIGHT AND MASS

Anthony Storace, Tarrytown, N.Y., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed May 14, 1976, Ser. No. 686,475
Int. Cl.² G01G *3/14*; G01N *29/00*
U.S. Cl. 177—1 **22 Claims**

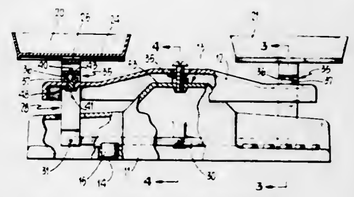


5. A method of weighing a mass, comprising the steps of:
A. supporting a mass to be weighed upon a first piezoelectric crystal means;
B. supporting said first piezoelectric crystal means upon a second piezoelectric crystal means;
C. causing said second piezoelectric crystal means to vibrate by applying an input voltage thereto, said first piezoelectric crystal means also being caused to vibrate at a frequency substantially corresponding to that of the second piezoelectric crystal means, said first piezoelectric crystal means providing an output voltage when it is caused to vibrate; and
D. measuring the output voltage of the first piezoelectric crystal means in order to determine the weight of the mass being supported by the first piezoelectric crystal means.

4,050,531
BEAM BALANCE WEIGHING SCALE WITH SELF-ALIGNING POINT CONTACT SUPPORT ELEMENTS

Clifford Logan Ashbrook, 7500 Callaghan Road, San Antonio, Tex. 78229

Filed Feb. 12, 1976, Ser. No. 657,672
Int. Cl.² G01G *21/08, 1/24*
U.S. Cl. 177—198 **23 Claims**



1. A beam balance weighing scale comprising:
a base having a fulcrum region extending transversely thereof;
a beam balance adapted to be supported on said base in said fulcrum region for oscillatory motion thereon;
first means for providing point contact support for said beam balance on said base, said first point contact support means including first and second pairs of mating members, each said pair being alternately spaced along said fulcrum re-

gion, each said pair comprising a male support member having a centrally arranged longitudinally extending portion tapering inwardly toward one end thereof and terminating in a rounded point having a first radius of curvature, and a coupling portion extending in a generally opposite direction from said one end; and a female support member having a coupling portion extending in a first direction and a body portion with a centrally arranged recess facing in a direction generally opposite from said first direction for receiving said rounded point, said recess having a radius of curvature greater than the radius of curvature of said rounded point;

said base and said balance beam each being provided with mounting apertures for receiving said coupling portions of said support members, a coupling portion of one of said male and female support members being received in said base mounting aperture and the coupling portion of the remaining one of said male and female support members being received in said balance beam mounting aperture; and

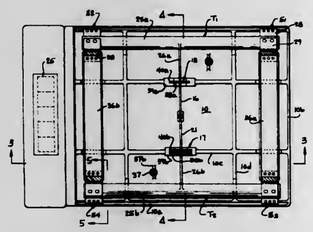
means for providing automatic alignment for said first point contact support means, said automatic alignment means being provided by a loose fit between one of said coupling portions of each of said pair and the corresponding mounting aperture.

4,050,532

PLATFORM TYPE WEIGHING SCALE

Mike A. Provi, and S. Robert Guinter, both of Rockford, Ill., assignors to The Brearley Company, Rockford, Ill.

Filed June 30, 1976, Ser. No. 701,114
Int. Cl.² G01G *3/14*
U.S. Cl. 177—211 **14 Claims**



1. In a platform type weighing scale including a base and a scale platform, first and second pairs of platform suspension for mounting the platform on the base at the four corners of a generally rectangular pattern, an elongated bendable load sensing beam, first and second beam suspensions engagin the beam at first and second spaced points therealong and supporting the beam on the base, a first means interconnecting said first pair of platform suspensions to each other and to the bendable load sensing beam at a third point thereon intermediate said first and second points to apply a first force to the beam at said third point in one direction transverse to the length of the beam and correlative with the sum of the loads applied to said first pair of platform suspensions, a second means interconnecting said second pair of platform suspensions to each other and to the bendable load sensing beam at said third point thereon to apply a second force to the beam at said third point in said one direction transverse to the length of the beam and correlative with the sum of the load applied to said second pair of platform suspensions, and electrical strain gauge means mounted on said load sensing beam for producing an electrical signal correlative with the bending stress produced in said beam by the sum of said first and second forces acting thereon at said third point on the beam.

4,050,533

POWERED WHEEL CHAIR

Woodrow Seamone, Rockville, Md., assignor to Government of the United States of America rep. Administration of Veterens Affairs, Washington, D.C.

Filed June 22, 1976, Ser. No. 698,688
Int. Cl.² B62D *11/04*
U.S. Cl. 180—6.5 **8 Claims**



1. In a powered wheel chair for providing transportation to human passengers including drive wheels rotatably mounted on said wheel chair, said drive wheels being independently powered by electric motors, said improvement comprising:

handrim means flexibly mounted on said wheel chair drive wheels for providing relative angular displacement to the drive wheels upon the application of torque thereto;

transducer means, responsive to said relative angular displacement, for providing an electrical output which is a function of torque applied to said handrim means; and

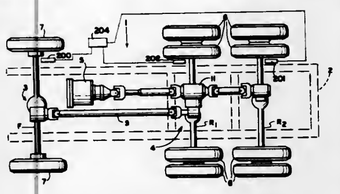
controller means, responsive to said transducer means electrical output, for providing electric power to said electric motors.

4,050,534

DRIVE AXLE SYSTEM USEABLE IN 6 × 6 VEHICLE

Robert K. Nelson, Shaker Heights, and James F. Mueller, Lakewood, both of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 549,592, Feb. 13, 1975, abandoned. This application July 23, 1976, Ser. No. 708,445
Int. Cl.² B60K *17/16*
U.S. Cl. 180—24.09 **10 Claims**



1. A tandem axle drive system operable to transmit torque from a vehicle transmission to first and second rear drive axles and a front drive axle, said drive system comprising:

a. means for dividing input torque received from said transmission, said torque dividing means including first and second torque transmitting means, said first torque transmitting means receiving substantially one-half of said input torque under ideal operating conditions and said second torque transmitting means receiving the remainder of the input torque;

b. first gear means in driving engagement between said first torque transmitting means and first rear drive axle;

c. second gear means in driving engagement between said second torque transmitting means and said second rear drive axle;

d. third gear means in engagement with said first gear means;

e. shaft means operable to be in driving engagement between said third gear means and said front drive axle; and

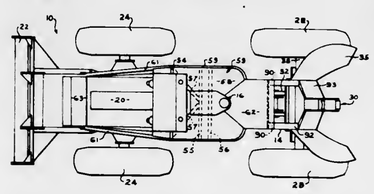
f. clutch means shiftable between a position permitting free running of said third gear means with respect to said shaft means, and a position providing driving engagement between said third gear means and said shaft means.

4,050,535

ARTICULATED VEHICLE

John H. Boeshart, Cambridge-Galt, and Emil J. David, Thunder Bay, both of Canada, assignors to Eaton Yale Ltd., Canada

Filed Mar. 5, 1976, Ser. No. 664,230
Int. Cl.² B62D *53/00*
U.S. Cl. 180—51 **5 Claims**



1. In an articulated vehicle having a first frame, and a second frame pivotally connected to said first frame about a substantially vertical axis of articulation: a canopy structure mounted on said first frame and defining an operator's station, first and second hinge assemblies defining said axis of articulation, said first hinge assembly comprising a first upper hinge plate attached to and supported by said canopy structure above said operator's station, a second upper hinge plate mounted on said second frame and a pin member connecting said hinge plates for rotation about said axis of articulation, and said second hinge assembly comprising a first lower hinge plate mounted at or adjacent the extreme lower end of said first frame, a second lower hinge plate mounted at or adjacent the extreme lower end of said second frame, and a pin member connecting said hinge plates for rotation therebetween about said axis of articulation.

4,050,536

POWER DRIVE SYSTEM

David J. Pristash, 930 Greener Place, Fairview, Pa. 16415

Filed Feb. 25, 1976, Ser. No. 661,290
Int. Cl.² B60K *3/00, 13/06*
U.S. Cl. 180—66 B **5 Claims**

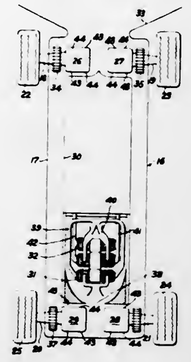
1. A vehicle comprising a frame, axles on said frame connected to wheels, air motors connected to each said axle, said frame defining and forming an essentially air tight enclosure,

an air reservoir in said enclosure,

an engine and an air compressor in said enclosure,

said air compressor being connected to drive air into said reservoir,

said engine having an exhaust directed into said compressor, and means to admit air into said enclosure between said reservoir and said frame for directing air to said engine



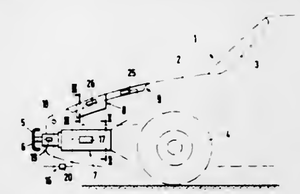
and to said air compressor, and means connecting said reservoir to said air motors.

4,050,537

INSTALLATION FOR THE ENERGY ABSORPTION OF VEHICLES

Ulrich Bez, Gerlingen, Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Germany

Filed Dec. 20, 1974, Ser. No. 534,789
Claims priority, application Germany, Dec. 22, 1973, 2364300
Int. Cl.² B60R *21/00*
U.S. Cl. 180—91 **15 Claims**



1. An energy absorbing installation for vehicles comprising:

means for increasing the denting and buckling stength of a vehicle body member including a deformation means having a wall structure defining a hollow space, and being associated with a vehicle body member, the vehicle body member in its undeformed configuration defining a portion of a vehicle body profile;

pressurizing means in communication with said hollow space for generating an increase in pressure within said space sufficient to outwardly deform said wall structure and said body member; and

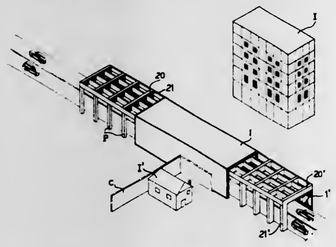
triggering means operatively connected to said pressurizing means and responsive to a vehicle collision for actuating said pressurizing means and thereby increasing the denting and buckling strength of said vehicle body member, and accordingly the energy absorbing ability by virtue of the changed shape produced.

4,050,538

NOISE REDUCING SCREEN

André L. Descanfant, Bures sur Yvette, France, assignor to Societe d'Etudes Generales de Communications Industrielles et Civiles-Segic, Rungis, France

Filed June 5, 1975, Ser. No. 583,911
Int. Cl.² E04H *17/00*; E04B *1/82*
U.S. Cl. 181—210 **4 Claims**



1. A noise reducing screen disposed between an elongated noise source and a building having a continuous wall portion to be shielded from the noise source and located along one side of the elongated noise source;

said noise reducing screen comprising:

a continuous wall portion having a whole length $2d$ which is built up between said elongated noise source and said building on both sides of a perpendicular drawn from the building point which is the most remote from the noise source and is located at a distance D therefrom to said elongated noise source;

a plurality of variably spaced apart posts aligned with said wall portion;

said posts having a length a and a width b respectively parallel and perpendicular to said elongated source;

the spacing between the nth and $(n-1)^{th}$ post being at most equal to

$dp^n + (a-d)p^{n-1}$ with $n \leqq 2$ (and $n=1:dp$) where p is the ratio $D/(D-b)$;

whereby all rectilinear noise propagation paths from said noise source to said building are intercepted by said posts; and

noise absorbent means on said posts.

4,050,539

EXHAUST APPARATUS FOR INTERNAL COMBUSTION ENGINE

Teruo Kashiwara, and Hiroshi Ichimaru, both of Osaka, Japan, assignors to Teruo Kashiwara, Osaka, Japan

Filed Mar. 15, 1976, Ser. No. 666,638
Claims priority, application Japan, Sept. 13, 1975, 50-111497
Int. Cl.² F01N *1/12, 1/00*
U.S. Cl. 181—280 **7 Claims**



1. Exhaust apparatus for use with internal combustion engines, comprising an outer pipe provided with opposite end portions having diameters nearly the same as that of the engine exhaust pipe, an intermediate portion having a diameter larger than that of said end portions, the respective opposite ends of the outer pipe being joined to said intermediate portion by a pair of oppositely directed tapered sections, an inner pipe contained within said intermediate portion and having a diameter substantially the same as that of said exhaust pipe, said inner pipe being disposed concentrically with respect to the outer pipe and in axial alignment with said exhaust pipe, the respective end margins of the inner pipe being spaced from the inner walls of said tapered sections to provide two parallel concentric spaces for gases moving between said opposite end portions of the outer pipe, means defining a plurality of parallel helical passages extending longitudinally between said end portions in the space between said inner and outer pipes, and at least two groups of helically disposed fins within said inner pipe and positioned respectively near the respective ends thereof.

4,050,540

MOVABLE DEVICE FOR GENERATING ACOUSTIC SHEAR WAVES IN THE EARTH

Jacques Cholet, Rueil-Malmaison, and Pierre-Claude Layotte, La Palmyre, both of France, assignors to Institut Francais du Petrole, France

Filed June 24, 1975, Ser. No. 589,676
Claims priority, application France, June 27, 1974, 74.22569
Int. Cl.² G01V *1/14*
U.S. Cl. 181—114 **25 Claims**



1. A device for generating seismic shear waves in the earth comprising a mobile supporting structure to which are secured a target-member having a surface of contact with the earth, a mass for striking the target-member and means for imparting to said mass a speed having a component parallel to said contact surface, including a rigid support-member orientable with respect to said supporting structure, an elongate rigid member supporting the mass at an end thereof and automatic means for moving the mass by rotation of said rigid member with respect to said support-member.

4,050,541

ACOUSTICAL TRANSFORMER FOR HORN-TYPE LOUDSPEAKER

Clifford A. Henricksen, Yorba Linda, Calif., assignor to Altec Corporation, Anaheim, Calif.

Filed Apr. 21, 1976, Ser. No. 678,873
Int. Cl.² G10K *11/06*
U.S. Cl. 181—159 **12 Claims**

1. An acoustical transformer for coupling sound from a dome shaped speaker diaphragm to the planar throat of a horn comprising a member having

a dome shaped surface having a curvature corresponding to that of said diaphragm,

a surface opposite said dome shaped surface having a truncated conical shape,

a central plug portion,

a plurality of radial slots formed in said member, said slots being spaced from each other around said member and extending through said member between the opposite surfaces thereof, running from said plug radially outwardly to the outer edges of said member,

sections of said member being formed between said slots, the opposite wall surfaces of adjacent member sections having an essentially exponential curvature, said slots forming essentially exponentially tapered sound channels, the sound entry end of said channels being along said dome shaped surface, the sound exit end of said channels being along the truncated end of said opposite surface, said truncated end being planar, the distances between corresponding points along the wall surfaces at the entry ends and the exit ends of said channels being substantially equal,

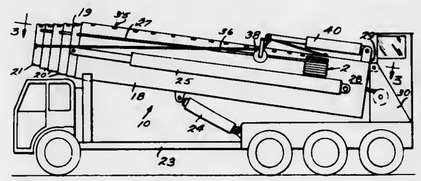
whereby sound waves generated by said diaphragm having a spherical wave front and entering the channels at the entry end thereof are transformed to waves having a planar wave front at the exit end thereof for coupling to the throat of said horn.

4,050,542

MOBILE RESCUE APPARATUS

Virgil D. Wilson, 8720 Selger Drive, Springfield, Va. 22153

Filed Dec. 17, 1975, Ser. No. 641,670
Int. Cl.² A62B *1/20, 1/02*
U.S. Cl. 182—10 **11 Claims**



1. A mobile rescue assembly comprising

an elongated chute adapted to be brought into operative association with a high-rise building or the like and adapted to receive an individual therein for removal from said building or the like, said chute having an open top and an open bottom, and

means for controlling the descent of an individual in said chute so that the individual will be slowed down and stopped when he approaches the bottom of the chute without injury to him, said descent controlling means including

cable means mounted to said chute and having a pair of opposed cable sections extending from the top of said chute to the bottom thereof, portions of said cable sections at the top of said chute being relatively closely spaced with respect to each other,

means located at the bottom of said chute for mounting portions of said cable lengths thereat in a relatively widely spaced position so that said cable lengths flare outwardly from the top of said chute to the bottom of said chute, so that an individual sliding down said chute in a device operatively engaging said cable sections will be slowed down automatically as the bottom of said chute is approached,

operator controlled means for moving the portions of said cable sections at the open bottom of said chute with respect to each other to control the amount said cable sections are flared with respect to each other and thereby the rate of descent of an individual sliding down said chute, and

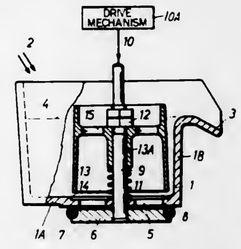
means for receiving an individual therein within said chute, said receiving means having readily detachable fastening means for connecting said receiving means to said cable means.

4,050,543

LUBRICATING DEVICE FOR GEARS

Wolfgang Schulz, Munich, Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik, Munich, Germany

Filed May 28, 1976, Ser. No. 691,015
Claims priority, application Germany, July 11, 1975, 2531029
Int. Cl.² F01M *9/00*
U.S. Cl. 184—6.3 **3 Claims**



1. A lubricating device for gears and the like in starting condition comprising a lubricant storage tank, which is filled during operation and emptied prior to or during the starting of the gear unit, with an automatic emptying device by means of a valve, in pregiven amounts wetting at least one of the gears to be lubricated, comprising the improvement wherein a storage tank which is open toward the lubricating place is closed off by the valve which can be opened during the starting condition, which valve is combined with a bell, ring or the like, which holds the one-time lubricating amount, the lower edge of which bell, ring or the like is spaced from the bottom of the tank when the valve is closed tq define a gap which surrounds the discharge openings adjacent the bottom of the storage tank, which gap is closed during opening of the valve.

4,050,544

LUBRICATION SYSTEM FOR AN AIR MOTOR

Jagdish C. Kalyan, 822 NE. 62nd, Seattle, Wash. 98155, and Bryan J. Dickinson, 24219 Marine View Drive, Des Moines, Wash. 98016

Continuation-in-part of Ser. No. 465,862, May 1, 1974, abandoned. This application Dec. 8, 1975, Ser. No. 638,850
Int. Cl.² F01M *1/04*
U.S. Cl. 184—6.6 **6 Claims**

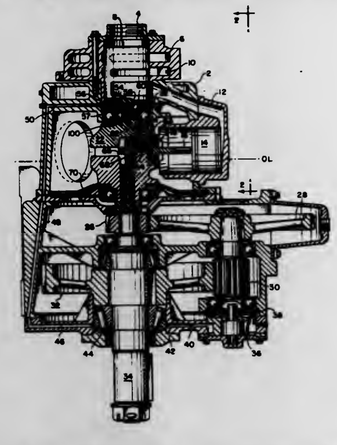
1. In an air motor having a rotary valve substantially coaxial with and adjacent to a crankshaft and including means drivingly interconnecting the two elements, a lubrication system to force-lubricate both elements, comprising:

a. a pump means to provide a continuous supply of lubricant under pressure,

b. conduit means to carry lubricant from the pump to a conduit along the axis of rotation interior of the rotary valve, and

c. means continuously conducting the lubricant from the rotary valve to the hollow interior conduit of the crank-

shaft during operation of the motor wherein the means for conducting the lubricant includes a hollow flexible mem-



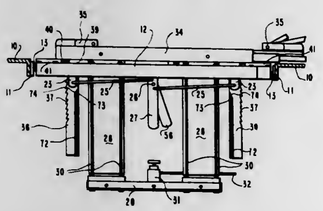
ber compressed between the two elements to form one continuous conduit between the conduits of the elements.

4,050,545

VEHICLE LIFTING JACK ASSEMBLY

Lee Hunter, 13501 Ladue Road, Ladue, Mo. 63141

Filed May 10, 1976, Ser. No. 684,495
Int. Cl.² B66F 7/00
U.S. Cl. 187—8.43 **6 Claims**



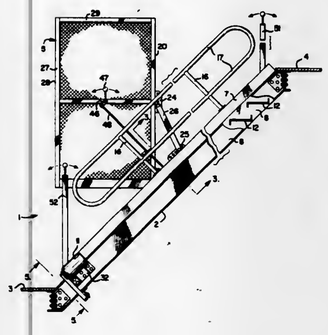
1. In a vehicle lifting jack assembly, lift rack runways to carry a vehicle, lifting jack means carried by said runways in position for movement between folded non-lift and operative lift positions to engage a vehicle, power operated means connected to said lifting jack means to effect vehicle lifting movement, safety means responsive to movement of said lifting jack means in lifting a vehicle to prevent accidental reverse movement of said lifting jack means, said safety means including cooperating ratchet and pawl means operable in response to lifting of a vehicle to prevent the accidental reverse movement and means to disable movement of said lift jack means toward folded position, said ratchet means and said pawl means being carried by said lifting jack means, and means carried by said power operated means and connected to said pawl means to disable the latter for lowering the vehicle.

4,050,546

ELEVATOR STRUCTURE

Woodrow Wilson, Jr., Brownsville, Tex., assignor to Deepwater Salvage, Inc., Brownsville, Tex.

Filed Aug. 19, 1976, Ser. No. 716,063
Int. Cl.² B66B 9/08
U.S. Cl. 187—12 **5 Claims**



5. An elevator structure for use on an inclined stairway extending between a lower landing and an upper landing, said elevator structure comprising:

a. an elevator car;

b. a pair of laterally spaced rail member extending between a lower landing and an upper landing;

c. means mounted on said elevator car and movable along said rail members for guiding said elevator car between the lower landing and the upper landing;

d. drive means mounted on said rail members and operatively connected to said elevator car for selectively moving said elevator car along said rail members, said drive means including a pair of ball screws;

e. control means mounted on said elevator car and on one of said rail members and operatively connected to said drive means for selectively activating same;

f. said rail members are each C-shaped members and include a pair of opposed guide flanges;

g. said means for guiding said elevator car between the lower landing and the upper landing includes:

1. a pair of side members mounted on said elevator car and each positioned adjacent a respective one of said rail members, said side members each being connected to said drive means;

2. a first and second plurality of longitudinally spaced rollers each mounted on a respective one of said side members, each of said rollers being in engagement with said opposed guide flanges of a respective one of said rail member;

h. said elevator car has opposite sides with including a leading portion and a trailing portion;

i. said elevator car and said side members include cooperating means for pivotally mounting one end of each of said side members on the leading portion of a respective one of the opposite sides of said elevator car; and

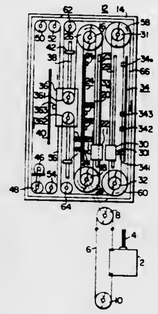
j. each of the opposite sides of said elevator car and said side members include cooperating means for connecting said elevator car to the other end of each of said side members whereby said elevator car is supported on said side members.

4,050,547

FLOOR CONTROLLER FOR AN ELEVATOR

Hiroyuki Katsoka; Seisosuke Yahiro, and Kazuo Suzuki, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 3, 1976, Ser. No. 663,252
Claims priority, application Japan, Mar. 5, 1975, 50-26000
Int. Cl.² B66B 1/52
U.S. Cl. 187—29 R **11 Claims**



1. A floor controller for an elevator car serving a plurality of floors comprising:

a sychronizer which is movable on a reduced scale in synchronism with the movement of the elevator car;

an advancer which is movable in advance of said synchronizer for detecting a call, said advancer being stopped upon detection of a call;

a difference detector;

a differential system for moving said difference detector in accordance with the relative distance between said sychronizer and said advancer;

first means for controlling the running speed of said elevator car in accordance with the position of said difference detector; and

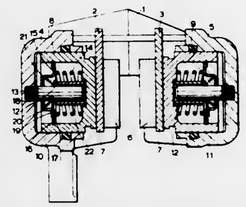
second means for driving said difference detector in a selected direction at the time of generation of a call so that said advancer is moved in advance of said synchronizer.

4,050,548

AUTOMATIC ADJUSTERS FOR HYDRAULICALLY OPERATED DISC BRAKES

Hugh Grenville Margetts, Leamington Spa, England, assignor to Girling Limited, Birmingham, England

Filed Aug. 6, 1976, Ser. No. 712,047
Claims priority, application United Kingdom, Aug. 9, 1975, 33308/75
Int. Cl.² F16D 65/50
U.S. Cl. 188—71.8 **16 Claims**



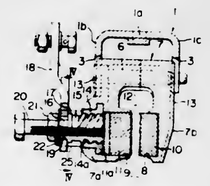
1. An hydraulically-operated disc brake for a vehicle comprising a rotatable disc, friction pad assemblies for engagment with opposite sides of said disc, an hydraulic cylinder on one side of said disc, a piston working in said cylinder to apply one of said pad assemblies to said disc, stop means incorporated in said piston for determing a retracted position of said piston, said stop means comprising a plate provided with an aperture, a pin fixed to said cylinder and projecting through said aperture in said plate, said pin having a section complementary to that of said aperture, an abutment member providing a first abutment for said plate, said abutment member being slidable relative to said piston, first spring means acting on said plate so as to urge said plate towards said pad and so as to urge said plate into a locked tilting position inclined with respect to said pin, and second spring means acting on said abutment member so as to urge it in a direction away from said pad a second abutment on said piston being adapted to limit movement of said abutment member.

4,050,549

DISC BRAKE DEVICE FOR MOTORCYCLES AND THE LIKE

Toshio Hori, Nagano, and Tadao Nakagawa, Ueda, both of Japan, assignors to Nisshin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Apr. 26, 1976, Ser. No. 680,512
Claims priority, application Japan, Jan. 6, 1976, 51-371[U]
Int. Cl.² F16D 55/08
U.S. Cl. 188—72.8 **1 Claim**



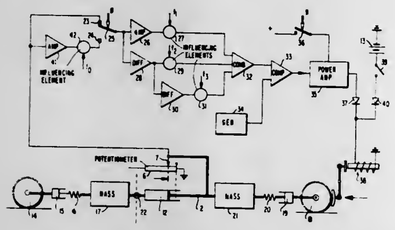
1. A disc brake device for motorcycles and the like, comprising: a fixing bracket of inverted U-shape; a brake caliper slidably carried by said bracket and having a pair of opposite arms disposed in straddling relation to a brake disc of a motorcycle; a friction pad fixed to one of said arms, a movable friction pad slidably inserted into a cylindrical bore formed in the other arm; said disc being interposed between said fixed and said movable friction pads so as to be clamped thereby; a threaded nut member provided in said other arm, a threaded screw member of a relatively large lead for screw engagement with said nut member and having a square shaft formed at the outer end thereof; a brake actuating lever fitted on said shaft, and an adjustment bolt screw-engaged through the center of said screw member and extending therethrough so as to contact at one end thereof the rear face of said movable friction pad; wherein said caliper includes a pair of separate halves that constitute said arms; a pair of sliding rods extend through said caliper halves, to be threadedly engaged by said halves for integral connection thereof; said rods have enlarged head portions and reduced tip-end portions, projecting from opposite side surfaces of said caliper halves so as to be fitted in associated guide holes formed in opposite side portions of said bracket for limited axial movement thereof along with said caliper halves; and wherein a lock nut is threadedly fitted on said bolt for tightly fixing said lever against a flanged portion of said shaft, and also for holding said bolt in a properly adjusted position against rotation thereof relative to said screw member.

4,050,550

PROCESS AND APPARATUS FOR CONTROLLING THE BRAKE FORCE ON THE WHEELS OF TRAILERS

Horst Grossner, Berglen-Lenzenberg; Hans Liebold, Adelberg, and Jurgen Wohnert, Stuttgart, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 12, 1975, Ser. No. 640,141
Claims priority, application Germany, Dec. 20, 1974, 2460450
Int. Cl.² B60T 7/20
U.S. Cl. 188—112 37 Claims



1. A method for controlling the brake force at the wheels of a trailer provided with a tow-bar in the sense of eliminating forces occurring between the towing vehicle and the trailer, comprising the steps of measuring a static characteristic magnitude and separately measuring at least one of the dynamic characteristic magnitudes, and combining said magnitudes at least indirectly to form the control magnitude for the brake force of the trailer brake.

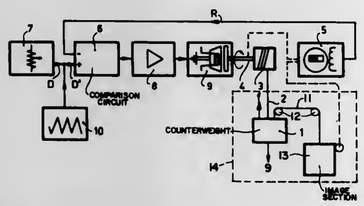
13. An apparatus for controlling the brake force at the wheels of a trailer provided with a two-bar means in the sense of eliminating forces occurring between the towing vehicle and the trailer, characterized by measuring means for measuring the static characteristic magnitude and measuring means for measuring at least one of the dynamic characteristic magnitudes, and combining means for combining at least indirectly said characteristic magnitudes to form thereby the control magnitude for the brake force of the trailer brake.

4,050,551

DEVICE FOR BRAKING A COUNTERWEIGHT IN AN X-RAY EXAMINING APPARATUS

Walter Schmedemann, and Wolfgang Hecker, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 13, 1975, Ser. No. 604,242
Claims priority, application Germany, Aug. 28, 1974, 2441265
Int. Cl.² B60T 8/02
U.S. Cl. 188—181 C 1 Claim



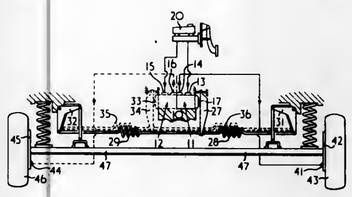
1. X-ray apparatus comprising:
an image section;
a counterweight for compensating for the weight of said image section, said counterweight being uncouplable from said image section when said image section is in an orientation not requiring weight compensation;
a speed detector adapted to generate a signal proportional to the difference in speed between said counterweight and said image section, said counterweight and image section having the same speed when coupled for weight compensation;
a brake for braking the speed of said counterweight; and
a control circuit responsive to said signal for actuating said brake when the amplitude of said signal exceeds a predetermined value.

4,050,552

INDIVIDUAL LOAD-SENSITIVE VALE DEVICES FOR VEHICLE FLUID PRESSURE BRAKING SYSTEMS

Alastair John Young, Leamington Spa, England, assignor to Automotive Products Limited, Warwickshire, England

Filed Jan. 6, 1977, Ser. No. 757,154
Claims priority, application United Kingdom, Jan. 27, 1976, 02977/76
Int. Cl.² B60T 8/22
U.S. Cl. 188—195 8 Claims



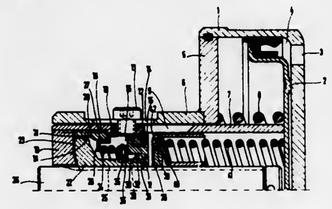
1. A vehicle fluid pressure braking system comprising:
a driver-controlled source of fluid pressure;
a first resiliently suspended wheel on one side of the vehicle;
a second resiliently suspended wheel on the other side of the vehicle;
a first brake acting on said first wheel;
a second brake acting on said second wheel;
a first brake actuator operative to apply said first brake;
a second brake actuator operative to apply said second brake;
first and second valve devices mounted on the vehicle body and interposed between the driver-controlled source and said first and second brake actuators respectively, each of said valve devices including a plunger and a valve such that the plunger is movable by fluid pressure transmitted to the respective brake actuator against a biassing load to close said valve and prevent the fluid pressure in the respective brake actuator increasing at the same rate as the driver-controlled source when the fluid pressure transmitted to the respective brake actuator exceeds a value which is dependent on said biassing load;
a first spring operatively connected to the first wheel and to the plunger of the first valve device to progressively increase the biassing load on said plunger at a high rate with respect to upward movement of the first wheel relative to the vehicle body;
a second spring operatively connected to the second wheel and to the plunger of the first valve device to progressively decrease the biassing load on said plunger at a low rate with respect to upward movement of the second wheel relative to the vehicle body;
a third spring operatively connected to the second wheel and to the plunger of the second valve device to progressively increase the biassing load on said plunger at a high rate with respect to upward movement of the second wheel relative to the vehicle body;
and a fourth spring operatively connected to the first wheel and to the plunger of the second valve device to progressively decrease the biassing load on said plunger at a low rate with respect to upward movement of the first wheel relative to the vehicle body.

4,050,553

AUTOMATIC BRAKE RESETTING DEVICE

Hans Pollinger, and Bernd Scheffel, both of Munich, Germany, assignors to Knorr-Bremse GmbH, Munich, Germany

Filed July 23, 1976, Ser. No. 708,022
Claims priority, application Germany, Dec. 5, 1975, 2554806
Int. Cl.² F16D 65/66
U.S. Cl. 188—203 7 Claims



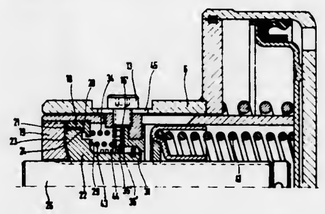
1. In an automatic brake resetting device particularly for brakes of railway vehicles the combination of a non-rotatable sleeve axially displaceable in the braking direction in response to a braking force and having abutment means thereon, an axially displaceable non-rotatable threaded shaft co-axially disposed within said sleeve, a coupling nut threaded upon said shaft and capable of rotary and axial movement thereon, means on said sleeve for defining a first rotary coupling with one side of said coupling nut and a second rotary coupling with the other side of said coupling nut, said rotary couplings being actuable by axial displacement of said coupling nut, a stop ring traversing said coupling nut and axially displaceable thereon, a fixed first stop to support said stop ring opposite to the braking direction, a second stop on said coupling nut spaced in the direction opposite to said braking direction relative to said first stop a distance approximately equal to the contact stroke of the vehicle brake when the brake resetting device is in the inoperative position, and spring means between said abutment means and said stop ring to act continuously upon said sleeve in the braking direction and to act on said stop ring opposite to the braking direction.

4,050,554

AUTOMATIC BRAKE RESETTING DEVICE

Bernd Scheffel, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed July 23, 1976, Ser. No. 708,047
Claims priority, application Germany, Dec. 5, 1975, 2554816
Int. Cl.² F16D 65/66
U.S. Cl. 188—203 5 Claims



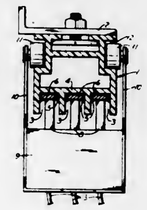
1. In an automatic brake resetting device particularly for brakes of railway vehicles the combination of a non-rotatable sleeve axially displaceable in the braking direction in response to a braking force, an axially displaceable non-rotatable threaded shaft co-axially disposed within said sleeve, a coupling nut threaded upon said shaft and capable of rotary and axial movement thereon, means on said sleeve for defining a first rotary coupling with one side of said coupling nut and a second rotary coupling with the other side of said coupling nut, said rotary couplings being actuable by axial displacement of said coupling nut, a stop ring traversing said coupling nut and axially displaceable thereon, a fixed first stop to support said stop ring opposite to the braking direction, abutment means on said sleeve, a second stop on said coupling nut spaced rearwardly of said first stop a distance approximately equal to the contact stroke of the vehicle brake, first spring means acting upon said stop ring opposite to the braking direction of said sleeve and acting upon said abutment means and said sleeve in the braking direction, and second spring means between said stop ring and said coupling nut mounted for rotation in at least one direction and acting upon said coupling nut in the braking direction.

4,050,555

TROLLEY RAIL ASSEMBLY

Donald R. Ross, Jr., Pittsburgh, Pa., assignor to U-S Safety Trolley Corporation, Pittsburgh, Pa.

Filed May 25, 1976, Ser. No. 689,782
Int. Cl.² B60M 1/34
U.S. Cl. 191—23 A 3 Claims



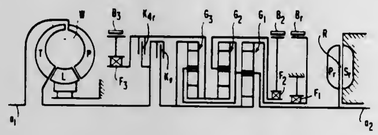
1. A trolley rail assembly comprising extruded plastic housing means of indefinite length for supporting an electrical conductor bar, the housing means having a back formed for fastening to a support, said housing means having a front side provided with a slot extending lengthwise thereof for receiving an electric current pick-up member movable lengthwise of the housing means, a pair of retaining ribs integral with the side walls of the slot and extending lengthwise thereof and projecting from those walls toward each other, a single continuous electric conductor bar disposed in said slot in operative position behind said ribs, the width of the bar being greater than the space between the ribs and less than the space between said side walls in front of the ribs, and said housing means being so formed that in assembling the housing means and the bar the distance between said ribs can be increased temporarily by pressure of the bar against them to permit the bar to be moved rearwardly past the ribs into said operative position, whereby the bar can be inserted from the front side of the slot, the ribs being the sole means for supporting the bar in said operative position, and flexible guard strips integral with the outer ends of the side walls of said slot and extending lengthwise thereof, said strips converging forward and being of less hardness than said housing means, said housing means and guard strips and conductor bar being flexible enough to be coiled before installation.

4,050,556

AUTOMATIC TRANSMISSION WITH RETARDER

Hans-Joachim M. Förster, Stuttgart-Riedenberg, and Ulrich Eitzu, Esslingen-Liebersbronn, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Continuation of Ser. No. 305,279, Nov. 10, 1972, abandoned. This application Mar. 13, 1975, Ser. No. 558,163
Claims priority, application Germany, Nov. 11, 1971, 2156002
Int. Cl.² B60K *41/26*
U.S. Cl. 192—4 B 86 Claims



1. A transmission arrangement for vehicles having a driving engine, the arrangement characterized in that a transmission is provided, the transmission includes an input means output means, and shifting means for selectively engaging the speeds of the transmission including free-wheeling means, in that a retarder means is provided and serves as an additional brake, the retarder means being disposed on the output side of the transmission, in that control means are provided for controlling the braking moment of the retarder means in dependence upon the magnitude of the rotational speed at the free-wheeling means of the engaged speed, and in that the free-wheeling means remain operable constantly with actuation of the retarder means.

4,050,557

TWO-SPEED TRANSMISSION HAVING ENCLOSED FLYWHEEL

Jess A. Bonske, Parker, Tex., and George J. Bozich, Chicago, Ill., assignors to Verson Allsteel Press Company, Dallas, Tex.

Filed July 23, 1975, Ser. No. 598,350
Int. Cl.² F16D *67/04*
U.S. Cl. 192—4 R 18 Claims

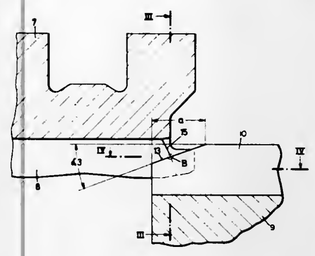
1. A transmission system for a press machine comprising:
an oil housing to provide lubrication therein,
a shaft rotatably mounted within said oil housing,
a flywheel rotatably mounted within said oil housing,
a motor located outside said housing,
a drive shaft rotatably extending through the wall of said housing,
oil seal means for preventing the passage of oil between said drive shaft and said housing wall,
means connected between said motor and said drive shaft for rotating said drive shaft,
a gear formed on the end of said drive shaft for causing rotation of said flywheel,
high speed and low speed clutches mounted adjacent said shaft within said housing, and
means for selectively operating said clutches to transmit rotative motion from said flywheel to said shaft through either of said clutches.

4,050,558

SYNCHRONIZING DEVICE

Robert Müller, Weissach, Germany, assignor to Dr. -Ing. H.c.F. Porsche Aktiengesellschaft, Germany

Filed June 1, 1976, Ser. No. 691,702
Claims priority, application Germany, May 30, 1975, 2523953
Int. Cl.² F16D *11/04, 23/08*
U.S. Cl. 192—53 G 7 Claims



1. Synchronizing device for change-speed gears comprising:
a gearshift sleeve carrier mounted for rotation with a shaft, said sleeve carrier having a sleeve carrier gear-tooth system;
a clutch body part of a gear to be shifted, said clutch body part including a clutch body gear-tooth system; and
a gearshift sleeve having a gearshift sleeve gear-tooth system drivingly connected with said sleeve carrier gear-tooth system and selectively drivingly engageable with said clutch body gear-tooth system upon axial movement of said gearshift sleeve, said gearshift sleeve gear-tooth system and said sleeve carrier gear-tooth system being engageable with one another at engagement surfaces which are in contact with one another when said gearshift sleeve is in a position drivingly engageable with said clutch body gear system;
wherein said engagement surfaces are geometrically configured to bias said gearshift sleeve in a direction corresponding to engagement to bias said gearshift sleeve in a direction corresponding to engagement thereof with said clutch body gear system, wherein, at the engagement surfaces, the engagement angle of the gearshift sleeve gear-tooth system is different than the engagement angle of the sleeve carrier gear-tooth system whereby unintentional disengagement of said gearshift sleeve from said clutch body gear system is prevented.

4,050,559

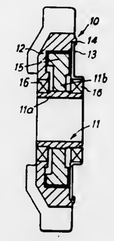
VISCOUS SHEAR FLUID COUPLING

Jeffery Frederick Andrews, Rochester; Harjinder Singh Chauhan, Ilford, and Ian Trevor Bristow, Rochester, all of England, assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 2, 1975, Ser. No. 619,122
Int. Cl.² F16D *31/00*
U.S. Cl. 192—58 B 1 Claim

1. A viscous shear fluid coupling comprising a rotary housing, a rotary member mounted within the rotary housing for rotation relative to the rotary housing, the member having a surface thereof close to but spaced from an internal surface of the housing, and a viscous fluid occupying the space between said surfaces in operation of the coupling, said rotary member

comprising an element which is generally of disc form and which is made from aluminum, and a shaft on which the aluminum disc element is secured, the housing comprising an aluminum part providing a recess for the disc element, a closure plate secured axially against the aluminum part to close off the recess, and a roller thrust bearing disposed between the closure plate and the facing surface of the aluminum disc element.

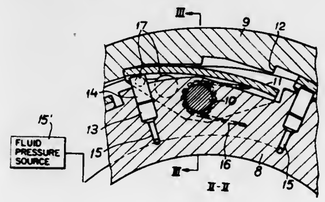


4,050,560

FLUID PRESSURE ACTUATED CLUTCH FOR STARTING MULTI-STAGE TURBINE

N. A. Ragnar Torstenfelt, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Feb. 17, 1976, Ser. No. 658,653
Claims priority, application Sweden, Feb. 19, 1975, 7501831
Int. Cl.² F16D *25/00*
U.S. Cl. 192—85 AT 4 Claims



1. A clutch apparatus for selectively connecting first and second concentric shafts in a multi-stage turbine, comprising:
a plurality of pawls pivotally mounted on said first shaft;
a plurality of gear teeth mounted on said second shaft in position to be engaged by said pawls;
first fluid pressure actuated means connected to said first shaft for selectively forcing said pawls into engagement with said gear teeth to connect said shafts; and
second resilient means for pivoting said pawls out of engagement with said gear teeth when said first means is depressurized and friction between said pawls and said teeth dissipates as said second shaft rotates faster than said first shaft.

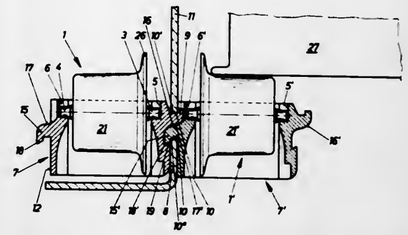
4,050,561

CONVEYOR FOR STACKING CASES IN A RUN-THROUGH STORAGE STRUCTURE

Peter Seitz, Bosgrander Weg 64, 6550 Bad Kreuznach, Germany

Filed July 14, 1976, Ser. No. 705,028
Claims priority, application Germany, July 24, 1975, 2533113
Int. Cl.² B65G *13/00*
U.S. Cl. 193—35 R 7 Claims

1. A conveyor for stacking cases in a storage structure or the like comprising:
a frame having spaced elongated members with a plurality of openings thereof,
a plurality of bearing cages, said bearing cages having at least one shaped projection extending to one side,
a plurality of locking members each having a complementary shaped projection, said projections on said bearing cages and complementary projections on said locking members arranged to interengage through said openings in said frame members to secure the bearing cages to said members,
a plurality of rollers having an axle therethrough extending to each side thereof, said axles being insertable in the journal bearings of said bearing cages.

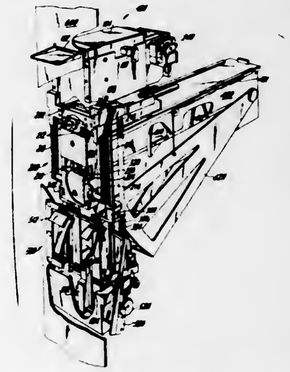


4,050,562

BANKNOTE ESCROW AND STACKER APPARATUS AND METHOD

Gunstaf Arthur Schwippert, Pijnacker, and Wilhelm Aart Van Zeggeren, Bleiswijk, both of Netherlands, assignors to Mars, Inc., McLean, Va.

Continuation-in-part of Ser. No. 569,155, April 18, 1975. This application Mar. 11, 1976, Ser. No. 665,914
Claims priority, application United Kingdom, Apr. 22, 1974, 17551/74
Int. Cl.² G07F *1/06*
U.S. Cl. 194—4 E 45 Claims



1. A banknote handling apparatus having a first container which is movable within the apparatus between a first position and a second position, the container having at least one opening through which banknotes can be moved,
a second container having an opening for receiving banknotes from the first container,
means for transporting received banknotes to a predetermined position adjacent the first position of the first container,

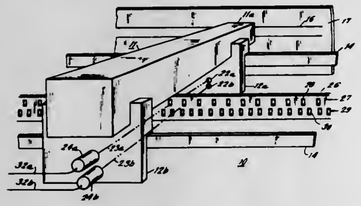
means for transporting banknotes from the predetermined position into the first container for stacking of the banknotes in facial contact therein,
means for transporting a stack of banknotes from within the first container into the second container,
means for moving the first container between its first position and its second position, and
refund means for removing a stack of banknotes from the first container in its second position and delivering the stack to the user of the apparatus.

4,050,563

APPARATUS FOR SELECTABLE FONT PRINTING

Herbert E. Meshenett, Windham, N.H., assignor to Centronics Data Computer Corporation, Hudson, N.H.

Filed Nov. 5, 1975, Ser. No. 629,020
Int. Cl.² B41J *3/04*
U.S. Cl. 197—1 R **16 Claims**



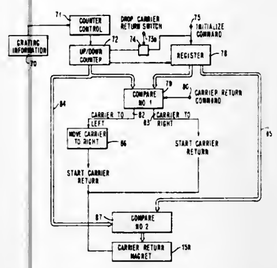
1. Apparatus for printing a line of characters on a paper document in a selected one of a plurality of character sizes for use in a dot-matrix printer having a print head assembly movable across the paper document and having a plurality M of print wire driving means, each of said characters formed within a predetermined dot matrix of N dot columns having M dots in each column, said apparatus comprising:
a registration assembly having a plurality of arrays of spaced indicia, the spacing between and among indicia in each of said arrays being different from the spacing between and among indicia in every other array, said arrays extending at least partially across the paper document;
a plurality of means mounted on said head assembly for respectively sensing the indicia in each of said arrays for respectively generating registration pulses;
an output line;
switching means for selectively coupling the registration pulses generated by one of said sensing means to said output line;
means responsive to the registration pulses coupled to said output line for cyclically generating a succession of groups of dot column selection signals;
character generator means;
means for storing character codes representing each character and symbol to be printed;
means responsive to each completed group of said dot column selection signals for applying the next character code to said character generator means;
said character generator means generating print signals representing a dot column pattern determined by the character code in said storing means and by the dot column selection signal coupled thereto;
said print wire driving means being adapted to receive said print signals for printing the dot column pattern outputted by said character generator means.

4,050,564

ELECTRONIC CONTROL FOR OPTIMIZING CARRIER TURNAROUND IN PRINTING APPARATUS

John Michael Carmichael, Nicholasville; James David Hill, and Donald Lee West, both of Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 418,797, Nov. 23, 1973, abandoned.
This application Dec. 4, 1975, Ser. No. 637,706
Int. Cl.² B41J *1/00*
U.S. Cl. 197—1 R **10 Claims**



1. Printing apparatus for printing information on a document during relative movement of said document and a print head assembly, wherein said relative movement involves movement of said assembly between left and right margin locations, printing of information occurring during a relative forward movement toward one of the left and right margin locations with printing of information beginning at the other of the left and right margin locations, and non-printing occurring during a relative return movement toward the other of the left and right margin locations, and said assembly going through a turn around interval representing a physical change in direction of relative movement between said document and said print head assembly from when said assembly starts to decelerate during relative return movement to the beginning of printing of information during relative forward movement, comprising:
test means for establishing a test mode of operation of said apparatus to determine the optimum point of initiation of said turn around interval to minimize the time required for said turn around interval to increase the time available for printing of information;
said test means includes storage means for storing data representative of said optimum point;
and means to initiate said turn around interval during printing operations in accordance with the data in said storage means.

4,050,565

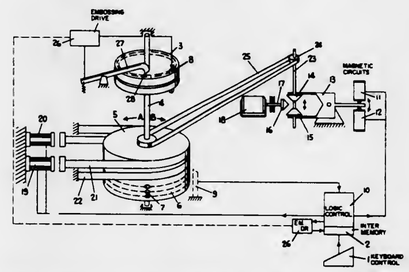
KEYBOARD CONTROLLED ELECTRONIC EMBOSSING MACHINE

Michael Helder, Stutensee, and Rainer Eberhard Gürgens, Berlin, both of Germany, assignors to Adrema Pitney Bowes, Berlin, Germany

Filed Apr. 23, 1976, Ser. No. 679,736
Claims priority, application Germany, Apr. 25, 1975, 2518590
Int. Cl.² B41J *1/22, 3/38*
U.S. Cl. 197—6.3 **4 Claims**

1. In an electronic embossing machine of the type having a keyboard which determines the character to be embossed, a memory electronically connected to the keyboard to receive information therefrom and store such information, a logic controller connected to the memory for receiving information and to inform the logic controller as to the character selected by the keyboard, a drum rotatably supported upon a rotatable shaft which has a plurality of numerically arranged code addresses about its perimeter, a scanner adjacent to the drum for reading the code addresses, the scanner being electrically connected to the logic controller for supplying information to

the logic controller as to the code address being read, a die head rotatably mounted on the shaft and bearing a plurality of dies thereon which have characters corresponding to the code addresses on the drum, brake means electrically connected to the logic controller and operative to brake the shaft upon receipt of a signal from the logic controller, and drive means operatively controlled by the logic controller and connected to the shaft for rotation thereof in either direction upon receipt of a signal from the logic controller to rotatably displace a keyboard selected die to the embossing position, the improvement residing in the logic controller having control means for selecting the shortest direction of rotation of the die head to locate a selected die in the embossing position, the control means comprising:
an intermediate memory electrically connected to the code drum;
a die position counter electrically connected to said intermediate memory to receive the code address of the die in the embossing position;
a first comparator electrically connected to said die position counter and to the memory associated with the keyboard to receive and compare a code address signal and a character select signal respectively;
an impulsing means electrically connected to the keyboard and said first comparator;
a control logic unit electrically connected to said impulsing means and said die position counter;
a step counter electrically connected to said impulse means, said control logic unit and said die position counter;



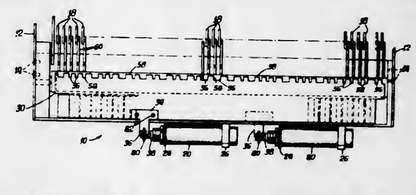
a gate circuit electrically connected to said step counter, said control logic and said die position counter;
a pair of intermediate memories, each being electrically connected to said gate circuit,
a second comparator electrically connected to said intermediate memories; and
a drive control circuit electrically connected to the intermediate memories and the drive means, whereby, upon selection of a character of the keyboard control,
said die position counter receives, through said intermediate memory, the code address corresponding to the die located in the embossing position and supplies such code address to said first comparator;
said impulsing means is enabled to deliver timing impulses to said die position counter and said step counter, each of which commence counting such impulses;
said first comparator compares the code address of the character selected through the keyboard control with the code address received from said die position counter until coincidence is obtained wherein said impulsing means is disabled;
said step counter counts the number of steps made by said impulsing means to reach said coincidence and supplies said number to a first of said pairs of intermediate memories through said gate circuit;
said control logic unit sets said step counter to zero and again triggers said impulsing means to count in the reverse direction of the first count;
said control logic unit enables the die position counter to count in the reverse direction timing impulses received from said impulsing means until said first comparator evaluates coincidence between the signal received from the keyboard control and said die position counter whereupon said impulsing means is disabled;
said step counter counts the steps of said die position counter in the reverse direction and supplies a corresponding signal to the second of said paired intermediate memories;
said pair of intermediate memories supply such respective counter readings to said second comparator;
said second comparator upon receiving the contents of said paired memories, delivers a pair of signals to said drive control circuit;
said drive control circuit selects the smaller number of steps represented by said pair of signals and enables the drive means to drive the die head in the selected direction in proportion to the signal selected by said drive control circuit; and
said motor control sends an enabling signal to the brake means when the selected die is located in the embossing position to terminate rotation of the die head.

4,050,566

MECHANICAL CODE CONVERTER FOR USE WITH A TYPEWRITER OR THE LIKE

William E. Webb, Hoffman Estates, and Stephen J. Elsea, Chicago, both of Ill., assignors to Hamilton Communications, Inc., Schaumburg, Ill.

Filed Nov. 18, 1975, Ser. No. 632,930
Int. Cl.² B41J *5/30*
U.S. Cl. 197—19 **12 Claims**



1. Apparatus for use with a typewriter or the like and adapted to decode unique combinations of electrical signals, the combinations identifying individual characters associated with a trip member of a particular typewriter hammer, said apparatus being adapted to actuate a particular trip member in response to receiving a combination of electrical signals identifying the same, the apparatus comprising:
a mechanism associated with each trip member and adapted to actuate the same in response to movement from a rest to an actuated position;
a plurality of aligned coded flat plates, said plates being in generally parallel planes, each of said plates having slots located along one edge of the length thereof, each said slot being in one of two positions relative to each trip member, said positions being separated from one another by a predetermined distance, said actuating mechanism for each trip member being adapted to move to said actuated position when the coded plates are selectively positioned in either a first or second position so that all of the slots in the coded plates associated with said particular trip member are in alignment, the nonalignment of any one of said associated slots being effective to preclude movement of said actuating mechanism;
at least two spaced mounting blocks to which support plates for each of said coded plates are rigidly mounted generally perpendicular to said coded plates, said support plates being fabricated of flexible material that permits generally lengthwise movement of said coded plates and also biases said coded plates in one of said first and second positions;
means associated with each of said plurality of coded plates for moving each of said plates between said first and

second positions to bring the slots into and out of alignment with the actuating mechanism in response to said electrical signals, a predetermined combination of electrical signals causing said moving means to selectively move said coded plates and align the slots so that a predetermined one of said actuating mechanisms moves to said actuating positions and causes the associated trip hammer to be actuated; and,

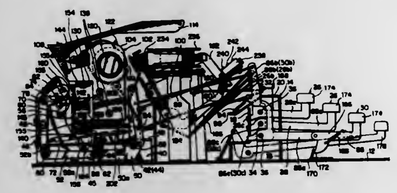
means for resetting said actuating mechanism subsequent to actuation of said associated trip member.

4,050,567

SHIFT MECHANISM FOR TYPEWRITER

Shigeaki Kuramochi, 24-17 5 Chome, Koishikawa Bunkyo, Tokyo, Japan

Continuation-in-part of Ser. No. 476,847, June 6, 1974, Pat. No. 3,934,697. This application Jan. 23, 1976, Ser. No. 651,920
Int. Cl.² B41J *11/14*
U.S. Cl. 197—72 **9 Claims**



1. In a typewriter comprising in combination a base having a front and rear portion, a carriage assembly located within and extending across said rear portion, said carriage assembly including a platen which is adapted for movement with said carriage assembly between a first position and either a second or third position located on opposite sides of said first position, a plurality of finger actuated members located within the front portion of said frame, said finger actuated members disposed in a plurality of tiers with each said tier including a plurality of said finger actuated members, means for supporting said finger actuated members of each tier for pivotal movement between a rest and an actuated position about pivot axes disposed substantially parallel to said carriage assembly, a plurality of type bars, a plurality of carriers upon which is disposed typing indicia at locations equal in number to the positions of said carriage assembly, each carrier mounted by one of said type bars, means supporting said type bars for pivotal movement toward said platen, means connecting respective ones of said finger actuated members and type bars so that when one of said finger actuated members is pivoted to said actuated position said type bar connected thereto also is pivoted whereby typing indicia at one of said locations strikes said platen, and wherein the improvement is in means for selective shifting of said carriage assembly from said first position to either said second or third position so that said platen may be struck by typing indicia at other of said locations, said shifting means comprising

a. mounting means, said mounting means carried on and extending upwardly of said frame within the region of said rear portion,

b. first means adapted for shifting said carriage assembly from said first position to said second position, said first means including a first lever,

c. means pivotally supporting said first lever between its ends on said mounting means,

d. second means cooperable with said first means adapted for shifting said carriage assembly from said first position to said third position, said second means including a second lever,

e. means pivotally supporting said second lever between its ends on said mounting means,

f. track means,

g. means mounting said carriage assembly on said track means for movement with and along said track means,

h. means connecting said track means and said first lever adjacent one end,

i. means connecting one of said finger actuated members to said first lever adjacent the other end so that upon movement of said finger actuated member to said actuated position said first lever pivots in one direction to move said carriage assembly to said second position,

j. means connecting another of said finger actuated members to said second lever adjacent one end, and

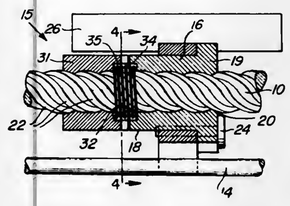
k. means connecting the other end of said second lever to said first lever so that upon movement of said lastnamed finger actuated member to said actuated position said first lever pivots in a second direction to move said carriage assembly to said third position.

4,050,568

STYLUS CARRIAGE DRIVE

Michael LaVar Davies, American Fork; Richard Servera Johnson; Alvin John Noker, both of Bountiful, and Veldon Lawrence Wilde, Centerville, all of Utah, assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 5, 1975, Ser. No. 637,973
Int. Cl.² B41J *19/20*
U.S. Cl. 197—90 **1 Claim**



1. In a printer a stylus carriage arrangement for moving a stylus into and out of engagement with a print medium during the print and return carriage cycle, respectively, comprising in combination;

an externally-threaded lead screw;

support means for supporting the ends of said lead screw for rotational movement therein;

motor means connected to said lead screw for rotating said lead screw in a clockwise direction for the print cycle and in a counterclockwise direction for the carriage return cycle;

a stylus carriage mounted on said lead screw through an opening having internal threads which mesh with the threads of said lead screw;

a nut mounted on said lead screw via an internally-threaded opening; and

a spring disposed on said lead screw between said nut and said stylus carriage creating an axial opposing force between said nut and said stylus carriage;

said stylus carriage and said nut having annular recesses concentric with the respective openings therethrough for receiving said spring enabling said stylus carriage and said nut to be disposed on said lead screw in contiguous relationship with said spring compressed therebetween;

each of said stylus carriage and said nut having semicircular portions extending therefrom forming complementary abutting edges to prevent relative rotational movement of said stylus carriage and said nut and to cause said spring to be substantially entirely contained in said annular recesses when said edges are in contiguous relationship;

a rod held stationary by said support means;

said stylus carriage having a slot formed therein having a width somewhat greater than the diameter of said rod;

said rod disposed within said slot enabling said stylus carriage to rotate on said lead screw only a predetermined distance in either direction; and

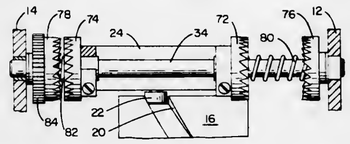
a stylus disposed on said stylus carriage which is moved into a print position and away from a print position when said lead screw is rotated in a first or second direction, respectively, by said motor means.

4,050,569

RECORD MEDIA ADVANCING MECHANISM

Leslie L. Crump, and Victor J. Italiano, both of Trumansburg, N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed June 4, 1976, Ser. No. 693,033
Int. Cl.² B41J *19/90*
U.S. Cl. 197—120 **17 Claims**



1. Means for advancing record media past a working station comprising:

support means mounted for rotational movement,

carriage means carried by said support means and movable therealong past said working station,

first clutch means secured to said carriage means for travel therewith,

second clutch means mounted on said support means for rotational movement of said second clutch means in response to engagement by said first clutch means, and

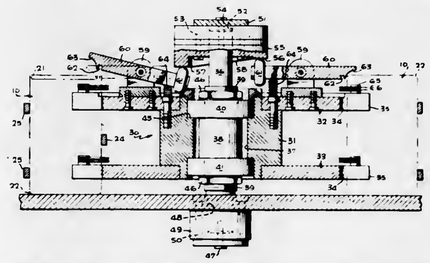
means operably associated with said second clutch means for causing incremental movement of said record media upon engagement of said second clutch means by said first clutch means during traversal of said carriage means along said support means.

4,050,570

CAN ORIENTING DEVICE

Norman C. Kramer, North Hollywood, Calif., assignor to Carnation Company, Los Angeles, Calif.

Filed June 4, 1976, Ser. No. 692,855
Int. Cl.² B65G *47/84*
U.S. Cl. 198—398 **7 Claims**



1. A can orienting device for use with cylindrical cans having a seamed top end and a rounded bottom edge which comprises

a rotatable wheel having a plurality of can receiving pockets around its periphery, said wheel being adapted to receive cans from an inlet chute and rotatably carry said cans to one of a pair of outlet chutes laterally spaced about the axis of rotation of said wheel, the wheel being disposed substantially parallel to the base of said chutes

lever means carried on said rotatable wheel and mounted for pivotal movement above each of said pockets,

said lever means having a can contacting end portion which is adapted to be pivotally moved toward the can receiving pocket to engage the seamed top end of the cans and hold in the pockets those cans which are positioned on the inlet chute with the seamed top end adjacent the lever means, and to urge out of the pockets those cans which are positioned on the inlet chute with the rounded bottom edge adjacent the lever means, and

means operatively connected to said lever means to maintain the can contacting end portion of the lever means in a can engaging position substantially parallel to said wheel when the lever means is rotatably carried on said wheel from the inlet chute to the outlet chute most remote from the inlet chute around the axis of rotation of the wheel and to pivotally move the lever means out of a can engaging position when the lever means is rotatably carried from said outlet chute to said inlet chute

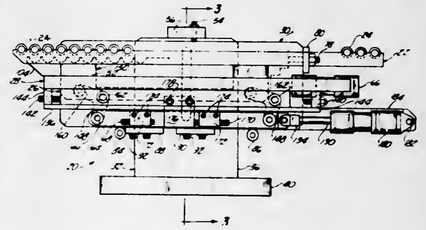
whereby cans received in the pockets of said wheel with the rounded bottom edge of the can adjacent the lever means are urged out of the pocket and are carried by the wheel to a first outlet chute, while cans received in the pockets of said wheel with the seamed top end of the can adjacent the lever means are held in the pocket by the lever means and carried to a second outlet chute more remote from the inlet chute around the axis of rotation of the wheel.

4,050,571

WALKING BEAM TRANSFER MECHANISM WITH SINGLE ACTUATOR MEANS TO CAUSE BOTH LIFTING AND CARRYING

Anthony Kushigian, 720 E. Baseline Road, Northville, Mich. 48167

Continuation of Ser. No. 485,793, July 5, 1974, abandoned. This application May 10, 1976, Ser. No. 685,126
Int. Cl.² B65G *25/02*
U.S. Cl. 198—774 **6 Claims**



1. A transfer mechanism comprising a bed, a slide carried by said bed for horizontally reciprocal movement relative to said bed along a first path between spaced-apart extended and retracted positions of said slide, a plurality of part supports equally spaced apart generally in one direction along said first path, a unitary walking beam having a plurality of part cradles equally spaced apart generally in one direction along said first path, said part cradles being integrally interengaged for comovement with each other, said walking beam being carried by said first slide for movement therewith along said path and for movement generally transverse to said path, a pair of bell cranks spaced from each other in said one direction, each of said bell cranks having a pair of rigidly integral lever arms joined at an apex and being pivotally fastened at its apex on said slide such that said bell cranks move horizontally in unison with said slide, one of said arms of each bell crank being pivotally fastened to said walking beam such that pivotal movement of said bell cranks on said slide moves said walking beam vertically relative to said slide, horizontally reciprocating actuating linkage comprising an actuating bar, each of said bell

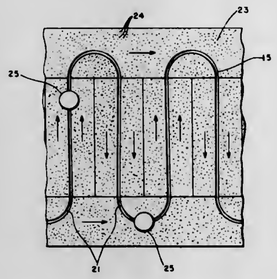
cranks being pivotally fastened to said linkage with at least one of said bell cranks being pivotally fastened to said actuating bar such that initial movement of said actuating bar in one direction pivots both bell cranks in unison to move said walking beam vertically, abutment means for interengaging said actuating bar and said slide at the completion of said initial movement of said bar so that continued movement of said bar in said one direction causes said slide, said bell cranks and said walking beam to move in unison in said one direction.

4,050,572

ACCUMULATOR AND FEEDER

Jack W. Armstrong, Baldwinsville, N.Y., assignor to Lipe-Rollway Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 460,606, April 12, 1974, abandoned. This application Aug. 4, 1975, Ser. No. 601,298
Int. Cl.² B65G *43/08*
U.S. Cl. 198—347 19 Claims



1. An object accumulator and feeder having an input end and an output end and comprising:

a. means for forming a relatively long path for said objects to move in succession in a row from said input end to said output end of said accumulator and feeder, said path being at least several times as long as the distance from said input end to said output end;

b. an upper surface of said path forming means bearing a pile material formed of bristles having tips supporting said objects and being inclined toward a direction of feed for moving said objects along said path from said input end toward said output end;

c. said path forming means being divided into a series of independently operable sections;

d. means for vibrating each of said sections independently for vibrating said pile bristles against said objects to advance said objects along said path;

e. a sensor arranged at a sensing region along said path in each of said sections, said sensor having an output distinguishably responsive to the presence or absence of one of said objects in said sensing region;

f. timing means arranged for receiving and respnding to said output from each respective one of said sensors;

g. said timing means being in circuit with said vibrating means;

h. said timing means being arranged for switching off a predetermined one of said vibrating means at the end of a predetermined interval of said output of a preassociated one of said sensors remaining responsive to the presence of one of said objects in said sensing region;

i. said timing means being arranged for switching on a predetermined one of said vibrating means at the end of a predetermined interval after said output of a preassociated one of said sensors changes from responsiveness to the presence of one of said objects in said sensing region to responsiveness to absence of one of said objects from said sensing region; and

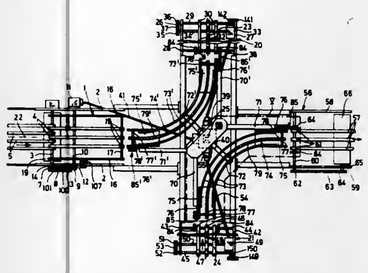
j. said switching of said vibrating means on and off by said timing means being arranged to accumulate said objects by successively filling up said sections with said objects lined up in said row along said path from said output end toward said input end, to feed said objects along said path toward said output end on demand, and to shut off selected ones of said vibrating means to reduce the feeding force on said objects for intervals during which said sections driven by said selected ones of said vibrating means are filled with said objects.

4,050,573

DISTRIBUTING STATION FOR PRINTED MATTER

Hans Müller, Zofingen, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Aug. 25, 1975, Ser. No. 607,837
Claims priority, application Switzerland, Aug. 27, 1974, 11642/74
Int. Cl.² B65G *47/00*
U.S. Cl. 198—366 10 Claims



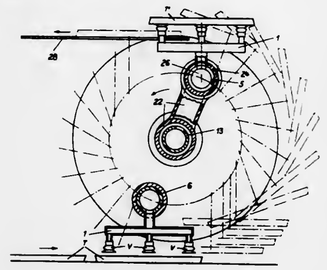
1. A station for distributing articles, particularly printed matter, comprising an intake conveyor having a first longitudinal axis and a discharge end; two receiving conveyors arranged symmetrically at opposite sides of said longitudinal axis and having respective receiving ends, said receiving conveyors having second longitudinal axes which intersect said first axis at a point longitudinally spaced from all of said conveyors; intermediate conveyor means; mounting means mounting said intermediate conveyor means for pivoting about a vertical pivot axis which passes through said point between a first position in which said intermediate conveyor means extends from said discharge end to one of said receiving ends and a second position in which said intermediate conveyor means extends from said discharge end to the other receiving end; drive means for said intake and receiving conveyors; first coupling members at said receiving ends of said receiving conveyors and driven by said drive means; cooperating second coupling members on said intermediate conveyor means and operative for driving the latter; and means for engaging said second coupling members with said first coupling members of the respective receiving end of the respective receiving conveyor to which said intermediate conveyor means extends for driving the latter proportionately to said respective receiving conveyor to obtain a continuous advancement of the articles from said intake conveyor to said respective receiving conveyor in each of said first and second positions of said intermediate conveyor means, and for disengaging said first and second coupling members from one another to free said intermediate conveyor means for pivoting between said first and second positions.

4,050,574

DEVICE FOR TRANSFERRING PRODUCTS BETWEEN MOULDS OF A PRODUCTION MACHINE AND A TABLE OF A WRAPPING MACHINE

Alexis Chesevard, Morges, and Jean Torres, Lausanne, both of Switzerland, assignors to SAPAL Societe Anonyme des Plieuses Automatiques, France

Filed June 15, 1976, Ser. No. 696,287
Claims priority, application Switzerland, July 30, 1975, 9954/75
Int. Cl.² B65G *47/08*
U.S. Cl. 198—458 3 Claims



1. Apparatus for removing tablets of chocolate from their respective molds as they issue from a production machine moving horizontally in mutually spaced relationship and transferring them to horizontal conveyor in a plane different from the plane of said path comprising a hollow shaft, cup supports, tubular arms mounting said cup supports for rotation about said shaft on opposite radii thereof in a path successively intersecting the moving tablets issuing from the production machine and said conveyor, means for driving said arms in synchronism with the spacing of said tablets issuing from said machine, means responsive to the angular position of said cups to provide vacuum to them from their intersection with said tablets issuing from said machine until intersection with said conveyor so as to suck up said tablets from said molds to hold them during angular transfer and to free them as they are supported by said conveyor, first cam means driven with said arms to impart to the cup supports an angular correction with respect to the radius of said shaft, in order to keep the longitudinal axis of the suction cups in a vertical position from the beginning of said suction zone until a locus beyond said suction zone, and furthermore in order to turn said axis around an angle of 180° and keep the axis in a vertical position from the beginning of a zone where the tablets or bars are given over to said conveyor until a locus beyond said last mentioned zone, and second cam means driven with said arms to move said arms parallel to the fixed shaft during their rotation in order to control the spacing of the tablets or bars during their transfer from said molds to said conveyor.

4,050,575

BELT CONVEYOR

John H. Roesio, Kalamazoo, Mich., assignor to LaRos Equipment Company, Inc., Portage, Mich.

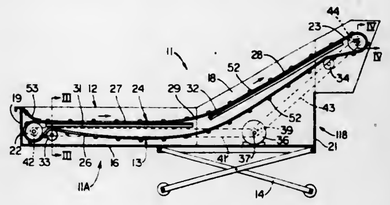
Filed Mar. 12, 1976, Ser. No. 666,343
Int. Cl.² B65G *23/06*
U.S. Cl. 198—834 11 Claims

1. In a belt conveyor having a housing, first and second elongated rollers supported on said housing for rotation about substantially parallel horizontal axes, an endless flat belt supported on and extending between said rollers, said belt being of substantial width and having an outer surface adapted to support articles thereon as they are being moved by said conveyor, and a drive device interconnected to one of said rollers for moving said belt, comprising the improvement wherein:

said second roller is displaced horizontally from and vertically above said first roller;

said belt having a non-straight upper reach which extends between said first and second rollers, said upper reach including first and second elongated and substantially straight belt portions which extend at a substantial angle with respect to one another, said first belt portion being positioned adjacent said first roller and extending outwardly therefrom in a direction which is generally toward said second roller, said second belt portion being positioned adjacent said second roller and extending outwardly therefrom in a direction which is generally toward said first roller, said second belt portion also being inclined at a substantial angle with respect to the horizontal, and a curved belt portion interconnected between said first and second belt portions;

guide means mounted on said housing and disposed for guidably supporting the upper reach of said belt as it extends between said first and second rollers, said guide means engaging the undersurface of said upper reach so



that as it extends between said first and second rollers it is supported solely by the guidable engagement of the undersurface thereof with said guide means;

said drive device causing simultaneous rotation of said first and second rollers in the same rotational direction for causing movement of the upper reach of said belt in a direction from said first roller toward said second roller so that articles supported on said upper reach are moved upwardly by said second belt portion; and

said drive device including a common drive motor, a second power train drivingly connected between said motor and said second roller for causing rotation thereof at a selected peripheral speed, and a first power train drivingly connected between said motor and said first roller for causing rotation thereof at a peripheral speed which is at least equal to said selected peripheral speed, whereby the upper belt reach is substantially free of tension and is maintained in a desired non-straight configuration due to said upper reach being supported solely by said first and second rollers and said guide means so that said upper belt reach does not require the use of any guiding structure disposed in engagement with the upper surface thereof.

4,050,576

POLYMERIC STERILANT ASSEMBLY

Joel L. Williams, Cary; Jerry J. Tulis, Raleigh, and Larry A. Taylor, Hillsborough, all of N.C., assignors to Becton, Dickinson and Company, Rutherford, N.J.

Filed Aug. 17, 1976, Ser. No. 715,162
Int. Cl.² B65D *81/24*; A61L *3/00, 13/02*
U.S. Cl. 206—210 13 Claims

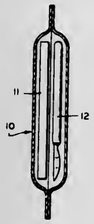
1. An article of manufacture, comprising:

a sterilant package, said sterilant package including in the interior of such package a polyacetal containing oxymethylene groups and stabilizing groups linked to the oxymethylene groups to prevent chain cleavage, said polyacetal having been subjected to high energy irradiation, prior to

subjecting said package to heat sterilization, in a dose of from 0.01 to 400 megarads sufficient to effect chain cleavage without depolymerization to increase formaldehyde release upon subsequent heating of the package.

9. In a process for producing a sterilant package including an article to be sterilized, the improvement comprising:

including in the interior of the sterilant package a polyacetal



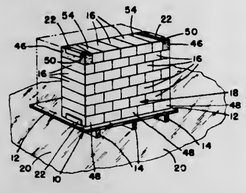
containing oxymethylene groups and stabilizing groups linked to the oxymethylene groups to prevent chain cleavage, said polyacetal having been subjected to high energy irradiation, prior to subjecting said package to heat sterilization, in a dose of from 0.01 to 400 megarads sufficient to effect chain cleavage without depolymerization to increase formaldehyde release upon subsequent heating of the package.

4,050,577

REFRACTORY STRUCTURE AND METHOD

John A. Boren, Greensboro, N.C., assignor to North State Pyrophyllite Company, Greensboro, N.C.

Continuation of Ser. No. 393,947, Sept. 4, 1973, abandoned. This application May 17, 1976, Ser. No. 686,929
Int. Cl.² B65D *85/46, 65/00*
U.S. Cl. 206—322 5 Claims



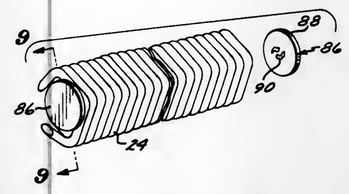
1. A package containing refractory blocks for transportation to a desired location for forming a monolithic wall comprising: a base support means, a plurality of massive plastic refractory blocks stacked on said support means, certain of said blocks being fired, and other blocks being unfired, a pair of complementary wedge shaped blocks, being located at each corner of the top of the stacked blocks, at least the outer of said pair being a fired block, lifting means being supported by said blocks, corner reinforcing means positioned to engage said fired blocks, and binding means surrounding said blocks and said lifting means whereby said blocks and said lifting means are rigidly united by said binding means, said pairs of blocks being located so as to urge the top of said stacked blocks into stacked alignment.

4,050,578

MANDREL AND CLIP MAGAZINE FOR CLIP DISPENSER AND APPLICATOR

Robert L. Eckert, 11231 Foster Road, Los Alamitos, Calif. 90720

Division of Ser. No. 517,516, Oct. 24, 1974, Pat. No. 3,945,238. This application Feb. 4, 1976, Ser. No. 655,081
Int. Cl.² B65D *83/00, 85/24, 85/62*
U.S. Cl. 206—340 6 Claims



1. A magazine comprising a mandrel and, supported thereon, a stacked array of a plurality of single-open-sided, diamond-shaped metal clips, said mandrel being an elongated rod member having opposite, coextensive rounded edges to engage only the inner wall of said clips adjacent the opposite side apexes of said clips,

a coextensive rounded edge along the side of said rod opposite of the open side of said clips to engage only the inner wall of said clips adjacent the other apex of said clips; and

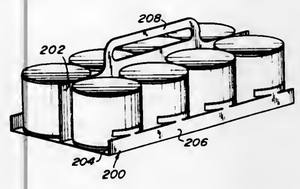
removable clip retainer means in the form of buttons with lock means permitting their removable engagement with each end of said rod and of sufficient lateral dimensions to function, when so engaged, as stop means preventing movement of said clips over the end of said rod.

4,050,579

PACKAGE FOR ORIENTING A PLURALITY OF ARTICLES

Dennis M. Gorski, Allendale; Dieter Neuber, Upper Saddle River, both of N.J., and Martin Michael Wildmoser, Staten Island, N.Y., assignors to Arenco Machine Company, Inc., Teterboro, N.J.

Filed Nov. 1, 1976, Ser. No. 737,836
Int. Cl.² B65D *73/00*; B65B *15/00*
U.S. Cl. 206—460 22 Claims



1. A package for packaging a plurality of articles in a fixed orientation with respect to each other comprising:

a rigid blank having first and second sides, said rigid blank being a T-shaped member including a base wall and a divider wall which define an article support member on each side of said divider wall;

each article support member including an adhesive strip on the divider wall of each of said article support members;

a row of articles disposed on one of said article support members and another row of articles disposed on the other of said article support members so that said articles adhere to the adhesive strip on each side of said divider wall and are thereby held in a fixed orientation with respect to each other, said rows of articles on either side of said divider wall being supported by the base wall of each of said article support members; and

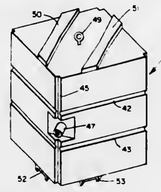
a wrapping film covering the four sidewalls of the package, with at least one end wall being exposed.

4,050,580

PROCESS CONTAINER

William Wilson, 716 Scott St., Stroudsburg, Pa. 18360

Division of Ser. No. 321,436, Jan. 5, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,354
Int. Cl.² B65D *21/02, 19/08, 7/34*
U.S. Cl. 206—511 10 Claims



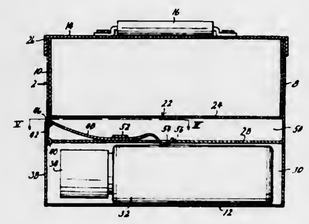
1. An enclosed multiwall container comprising: an upper end wall member; a lower end wall member; side wall members; each side wall member connected to said upper end wall member and said lower end wall member; at least one vertical channel member connected to said upper end wall member and said lower end wall member, each said channel member separating adjacent side wall members and turned outwardly to form a recessed corner along adjacent side wall members; at least two adjacent side wall members having horizontal means extending along each side wall member from a recessed corner, said horizontal means adapted for interconnection of the container with V-shaped arms of a retaining device; and said upper end wall member and lower end wall member each having two separate projecting hourglass shaped members positioned parallel to each other, each said hourglass shaped member being narrowest at the midsection of its hourglass shape, and the hourglass shaped member projecting from the upper end wall member are of slightly different size than the hourglass shaped members projecting from the lower end wall member such that hourglass shaped members on different containers will nest with each other when one container is stacked on another.

4,050,581

LUNCH BUCKET AND BEVERAGE BOTTLE COMBINATION

Raymond Sedlacek, 354 N. K St., Lakeview, Oreg. 97630

Filed June 11, 1976, Ser. No. 695,182
Int. Cl.² B65D *43/16*; H45C *11/20*
U.S. Cl. 206—544 5 Claims



1. A lunch bucket and beverage bottle combination comprising:

a. a lunch bucket having internal members dividing the interior thereof into a food compartment and a bottle compartment, said compartments being separate and unconnected with each other, sealed from each other internally of said bucket, and having separate, spaced apart openings outwardly from said bucket,

b. a beverage bottle carried removably in said bottle compartment, the separate relation of said compartment preventing any possibility of liquid leaking from said bottle reaching said food compartment,

c. a friction device operable when engaged to resist movement of said bottle from said bottle compartment through the outward opening of said compartment, and

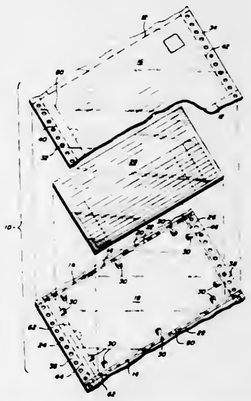
d. operating means carried by said bucket and operable selectively to engage or disengage said friction device.

4,050,582

SEALED ENVELOPE ASSEMBLY WITH LOCKING POCKETS FOR FREE INSERT MATERIAL

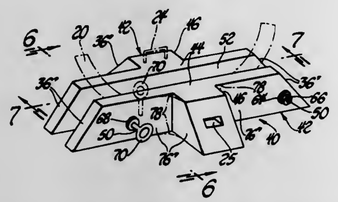
Uldis H. Kalve, Lisle, Ill., assignor to Wallace Business Forms, Inc., Hillside, Ill.

Filed Aug. 11, 1976, Ser. No. 713,539
Int. Cl.² B65D *27/34*
U.S. Cl. 206—627 12 Claims



1. A stuffed, sealed envelope assembly comprising an envelope having front and back plies and at least one insert ply between said front and back plies, said envelope having lines of adhesive adjacent the peripheral edges of said front and back plies for uniting said front and back plies to form a generally sealed assembly, said lines of adhesive being spaced from the periphery of said insert ply so that said insert ply lies wholly within the enclosure of said envelope bounded by said lines of adhesive, said back ply having a plurality of spaced embossments located inwardly of said lines of adhesive and adjacent the periphery of said insert ply, each of said embossments comprising a tab having a base portion integrally secured to said back ply along a substantially straight deflection line and a free portion deflected towards said front ply in substantial overlapping relationship with said insert ply so as to form a locking pocket therefor, said insert ply being maintained in desired registration within said envelope during machine processing by such locking pockets, said lines of adhesive being discontinuous, the discontinuities therein occurring at least adjacent said embossments, said front and back plies having corresponding lines of weakening disposed inwardly of the deflection lines of said embossments along at least one side of said envelope whereby separation of the plies along the lines of weakening opens said envelope assembly and frees said insert ply from the locking pockets along said one side.

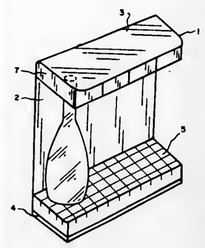
4,050,583
BICYCLE STAND
Michael V. Szabo, 109 N. Washington, Oxford, Mich. 48051
Filed Oct. 14, 1975, Ser. No. 622,028
Int. Cl.² A47F 7/00
U.S. Cl. 211—20 **4 Claims**



1. A bicycle stand, comprising a three-dimensional main body having length, width and height to provide a flat top, a flat bottom parallel to said top and oppositely-disposed flat sides and ends between said top and bottom, said sides and ends defining the periphery of said body, said body being adapted to be used either above ground level or buried below ground level and formed with a slot opening at least at said top, said slot being of a length, width and depth to receive a bicycle wheel in a manner to support the bicycle in its upright position, the lengths of said body and said slot being aligned, at right angles to said width of said body, said body being formed with means to (a) reduce the amount of material required to form the same, without decreasing the horizontal stability thereof, (b) improve anchoring of said body when buried and (c) reduce as a hazard certain upper edges and corners of said body on which leg injury to the user could occur when said stand is used above ground level and the user's foot is positioned closely adjacent certain pheripheral portions of said body, at or near said bottom periphery, said means comprising at least one of said ends and sides above said bottom periphery being formed so as to be disposed substantially inwardly from said bottom periphery, so that, in the top plan view of said body, not only does no portion of said ends and sides of said body lie outside said bottom periphery, but also said ends and sides lie entirely within said bottom periphery of said body, said body comprising a pair of substantially identical elongated body halves fixedly secured in aligned, spaced relation so as to provide said bicycle wheel-receiving slot therebetween extending along said length of said body, each of said body halves being formed with a passage extending transversely therethrough adjacent each end thereof and said stand further comprising a spacer with a passage therethrough disposed between said halves at said ends thereof adjacent and aligned with said passages in said body halves and a connecting member extending through each of said aligned passages and spacers, the distance between said spacers being less than the diameter of the bicycle wheel, whereby the bicycle wheel can be supported vertically by said spacers, between said body halves.

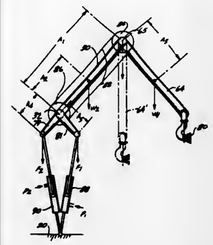
4,050,584
SELF-SEALING HOLDER FOR CONTAINERS
John Louis Lisa, 1535 Anderson Ave., Fort Lee, N.J. 07024
Filed Jan. 27, 1976, Ser. No. 652,830
Int. Cl.² A47B 73/00; A47G 23/02
U.S. Cl. 211—76 **10 Claims**

1. A self-sealing holder for containers comprising, a first support member having a generally planar surface and a first resilient deformable material having a generally planar surface and fixed to the first support member, said resilient deformable material being adapted to exert pressure against the open mouth of a container placed in contact therewith, a second support member having an adjustable leg that is approximately perpendicular to and secured to the first support member and with a base member extending from the second support member and having a flat surface that forms a second generally planar surface parallel to and spaced apart from the first planar surface with the resilient material facing said second planar surface so that the two facing surfaces will seal and retain in



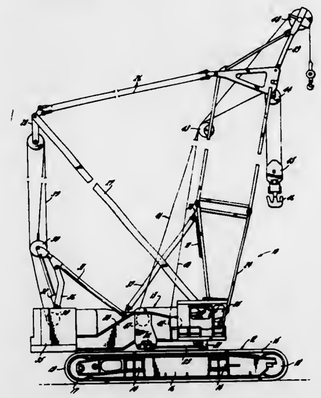
position a container inserted therebetween, said leg being adjustable so as to vary the parallel spacing between the first and second generally planar surfaces.

4,050,585
HYDRAULICALLY BALANCED MARINE LOADING ARM
Carl A. Wilms, La Habra, Calif., assignor to Ameron, Inc., Monterey Park, Calif.
Filed Nov. 7, 1975, Ser. No. 629,876
Int. Cl.² B67D 5/04; F16L 27/00
U.S. Cl. 212—48 **5 Claims**



1. An articulated loading arm structure for transferring fluid, comprising: a supporting base, a column rotatably supported on the base for rotation about a vertical axis, a boom means hingedly securing the boom at one end to the column for rotation of the boom about a first horizontal axis, an outer arm, means hingedly connecting one end of the arm to the outer end of the boom for rotation about a second horizontal axis parallel to the first axis of rotation of the boom, first means connected between the column and the boom means exerting a couple tending to rotate the boom about the first horizontal axis in the opposite direction from the couple produced by the weight of the boom and arm, said first means including at least one hydraulic cylinder having one end pivotally connected to the column and the other pivotally connected to the boom at a point offset from the first horizontal axis, and means including a volume of compressed gas for pressurizing hydraulic fluid in the cylinder, the volume of gas being large compared to the displacement volume of the hydraulic cylinder, second means connected between the column and the arm exerting a couple tending to rotate the arm about the second horizontal axis in the opposite direction from the couple produced by the weight of the arm, said second means including a lever arm rotatable about said first horizontal axis, and linkage means coupling the lever arm to the outer arm, the linkage means maintaining the lever arm and outer arm in fixed angular relationship relative to each other as they rotate about said first and second horizontal axes, the second means further including at least one hydraulic cylinder having one end pivotally connected to the column and the other end connected to the lever arm, and means including a volume of compressed gas for pressurizing hydraulic fluid in the hydraulic cylinder, the volume of gas being large compared to the displacement volume of the hydraulic cylinder, and means for adjusting the pressure of the gas for pressurizing the hydraulic fluid respectively in the first and second hydraulic cylinders.

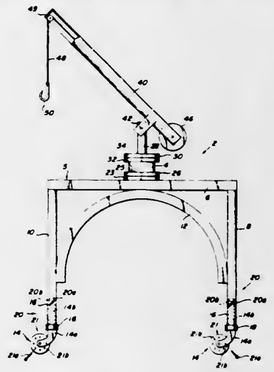
4,050,586
APPARATUS FOR RAISING & LOWERING A MAST AND BOOM ON A MOBILE CRANE
James G. Morrow, Sr.; David J. Pech; Charles A. Hunter, II, and Kenneth J. Porubcansky, all of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.
Filed Oct. 23, 1975, Ser. No. 625,197
Int. Cl.² B66C 23/54
U.S. Cl. 212—59 R **7 Claims**



1. A self-erecting mast and boom assembly for a lift crane having a supporting bed comprising, in combination, a mast and a gantry each pivotally mounted adjacent one end thereof on the bed such that the mast rests on a portion of the gantry when the mast and gantry are both pivoted down into substantially horizontal, rearwardly extending positions, means including a first hydraulic cylinder connected between the bed and the free end of the gantry for raising the gantry to working position and the mast to a rearwardly inclined intermediate position, and means including a second hydraulic cylinder connected between the bed and the mast for pivoting the mast from said intermediate position past vertical to a forwardly inclined position.

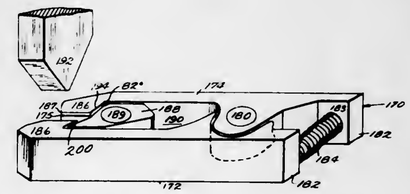
4,050,587
HOIST AND DOLLY APPARATUS
George A. Moen, 827 W. 26th Ave., Anchorage, Alaska 99503
Filed Aug. 16, 1976, Ser. No. 714,305
Int. Cl.² B66C 23/06
U.S. Cl. 212—59 R **5 Claims**

1. A hoist and dolly structure for raising and transporting an object relative to a horizontal surface, comprising
   a. a horizontal center bar body member (4);
   b. unitary leg means (5) arranged at each end of said body member for supporting the same relative to a fixed surface, each of said leg means including
      1. a U-shaped leg member having a pair of vertical leg portions (8, 10), and a horizontal bridging portion (6) connected between the upper ends of said leg portions, the length of said leg portions being at least as great as the length of said bridging portion; and
      2. a unitary U-shaped brace bar (12) having a curved central portion connected with the center of said bridging portion, and a pair of downwardly depending arm portions connected intermediate the ends of said leg portions;
   c. means (22) pivotally connecting the bridging portions of said leg means with opposite ends of said body member for pivotal movement about vertical pivot axes, respectively;



   d. wheel means (14) connected with the free lower ends of each of said leg portions, respectively; and
   e. lifting means connected with the center portion of said body member for raising the object relative to the horizontal surface, whereby the dolly structure may be transported either laterally or longitudinally in straddling relation to a position above said object, whereupon the object may be lifted by said lifting means for transport by said hoist and dolly structure.

4,050,588
AUTOMATIC MINE CAR COUPLING
Harry Miller, Scott Depot, WVa. assignor to Lester Construction Co., Hurricane, W. Va.
Filed Apr. 23, 1976, Ser. No. 679,765
Int. Cl.² B61G 1/36
U.S. Cl. 213—75 B **17 Claims**



1. A car coupling device comprising in combination a receiving assembly comprising a pair of jaw members pivotally mounted to each other, each jaw member including an arm having a hook shaped end, spring means mounted to each of said jaw members and acting upon the jaw members forcing their arms towards each other, a latch block assembly mounted to an adjacent car, said latch block assembly comprising an arrowhead shaped member mounted on said adjacent car, said arrowhead member comprising an arrowhead shaped portion and a "T" shaped stem secured to said arrowhead shaped portion, said arrowhead shaped portion defining an aperture

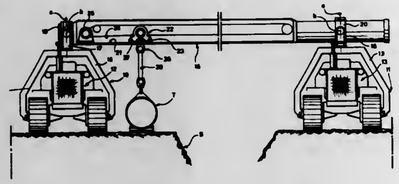
adapted to receive pin means to hold said arrowhead shaped portion pivotally in place on a car, a cam assembly moveably mounted on said car above said arrowhead member, said cam assembly having a wedge shaped portion adapted to be reciprocated downward so that the wedge portion strokes the end of the jaw members forcing them apart against the action of the spring means a distance at least equal to the width of the arrowhead shaped member to allow the arrowhead shaped member to be withdrawn from the jaw members after it has coupled with the receiving assembly.

4,050,589

PIPE LAYING MACHINES

Claudio Dolza, Strada del Nobile, 39, Turin, Italy

Filed Dec. 5, 1975, Ser. No. 637,946
Claims priority, application Italy, Dec. 9, 1974, 70565/74
Int. Cl.² B65G *7/00*
U.S. Cl. 214—1 PA **7 Claims**



1. A pipe-laying machine for laying large diameter pipe into an excavation, comprising in combination:
two self-propelled trucks adapted to traverse along the respective opposite banks of the excavation;
an upstanding supporting frame on each truck;
a transverse beam extending between the frames of the respective trucks to bridge the excavation;
means connecting the transverse beam with each of the two frames in such a manner as to permit the beam to adopt a variable inclination, at least one said connecting means permitting longitudinal sliding movement of the beam relative to the frame so that the beam can adopt a variable span, each connecting means comprising an articulation member in the form of a spherical joint consisting of a fork rotatably supported by the frame around an axis perpendicular to the base plane of the truck, said fork carrying a pivotably mounted ring capable of angular movement around an axis orthogonal to the first axis, whereby to permit the beam to assume any orientation relative to the vertical and horizontal planes, and the beam being supported by the pivotably mounted rings to be capable of rotating its own axis;
a pipe lifting device supported by the beam; and
means mounting the pipe lifting device for movement along the beam to traverse the width of the excavation which is bridged by the machine.

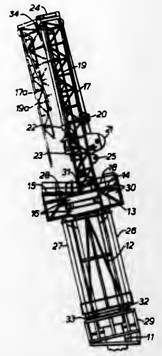
4,050,590

DRILLING RIGS

Joseph Reginald Benjamin, Fifth Floor, 38 Savile Row, London W1X 2QU, England

Filed June 28, 1976, Ser. No. 700,474
Claims priority, application United Kingdom, July 4, 1975, 28401/75
Int. Cl.² E21B *19/00*
U.S. Cl. 214—2.5 **4 Claims**

1. A drilling rig assembly comprising a drilling platform mounted on the casing of a pile through which drilling may be performed, storage means for elements of a drill string and lifting means on said platform for lifting said elements and transferring them to a bore within said pile, wherein said storage means comprises a rotatable cage mounted on said casing below said platform to rotate about the axis of said casing, said cage being arranged to carry a plurality of said elements located parallel to said axis, and means for rotating said cage to



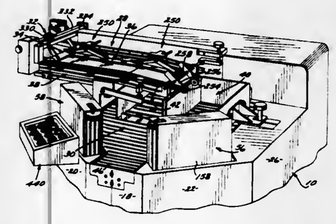
bring a selected element to a position in which it can be lifted by said lifting means.

4,050,591

STACKING APPARATUS AND METHOD

Clifford E. Dunlap, Pasadena, Calif., assignor to W. A. Krueger Co., Scottsdale, Ariz.

Continuation of Ser. No. 457,367, April 2, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,397
Int. Cl.² B65H *29/60, 31/30*
U.S. Cl. 214—6 D **12 Claims**



1. In an apparatus for stacking generally flat objects in separate first and second bins arranged generally side by side, each bin having a generally open front, a single upwardly facing forwardly moving output conveyor means disposed in front of said bins and adapted to receive stacks of said objects from the open fronts of said bins, first and second stack moving means operatively associated with the respective first and second bins for sequentially moving first and second completed stacks of said objects out of the respective first and second bins successively onto said forwardly moving output conveyor means, at least one of said stack moving means comprising upwardly facing, forwardly moving live roller means in the bottom of the respective bin, blades disposed between said live rollers and adapted to be adjusted vertically to extend above said rollers for supporting objects during the formation of a stack, and continuously rotating cam means directly supporting said blades and synchronized with the stacking of objects in the corresponding bins for raising said blades to an upper position during stacking of objects thereon and thereafter lowering said blades to drop the stack of objects onto said live roller conveyor means for removal of the stack from the corresponding bin.

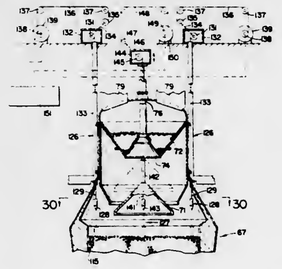
10. In apparatus for stacking generally flat objects in separate first and second bins arranged side by side, each bin having an open front, a single output conveyor extending forwardly from in front of said bins, means to move stacks alternately from said bins, and merging means disposed forwardly of at least one of said bins and operatively associated with said output conveyor so as to intercept each of said stacks from said one bin and deflect them laterally generally into alignment with said output conveyor while maintaining said stacks oriented as originally formed in said bins, said merging means comprising a pusher edge constituting abutment means extending vertically for the full height of a stack, and means to move said abutment means into engagement with a central portion of the side face of the stack as the latter moves from a bin toward said output conveyor means and to push said stack laterally to give it an angular component of movement to thereby align the same with said output conveyor means as it moves onto the same without distributing the orientation of the stack.

4,050,592

CHARGING APPARATUS FOR SHAFT FURNACES

Melvin J. Greaves, Cleveland, and Frank V. Razgaitis, Seven Hills, both of Ohio, assignors to Arthur G. McKee & Company, Cleveland, Ohio

Division of Ser. No. 604,328, Aug. 13, 1975, which is a continuation of Ser. No. 411,924, Nov. 1, 1973, abandoned. This application July 1, 1976, Ser. No. 701,954
Int. Cl.² C21B *7/20*
U.S. Cl. 214—18.2 **15 Claims**



1. Apparatus for charging particulate material into a receptacle to form a stockline in the receptacle, said apparatus comprising an inner wall of the receptacle defining a zone in which said stockline is to be located; distributor means for distributing particulate material in said receptacle to form said stockline comprising a bell in said receptacle and a member surrounding said bell, said member having a bottom opening into which at least a portion of said bell may extend during operation of said distributor means; means for causing relative movement between said bell and said surrounding member during the distributing operation; means for determining the configuration of said stockline comprising means for sensing the level of said stockline at a plurality of locations thereon near said inner wall of said receptacle and at a location substantially at the center of said stockline and beneath said bell, and means associated with said sensing means for indicating outside of said receptacle the level of the stockline in each of said locations to permit operation of said charging apparatus including said distributor means to be controlled to discharge particulate material to correct undesired deviations in the level of said stockline.

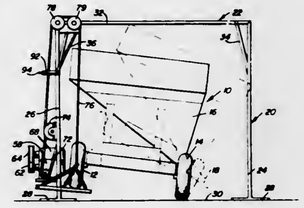
13. A process for charging particulate material into a receptacle comprising an inner wall defining a zone in which a stockline is to be located and distributor means for distributing particulate material in said receptacle to form said stockline comprising a bell in said receptacle and a member surrounding said receptacle, said member having a bottom opening into which at least a portion of said bell may extend during operation of said distributor means and means for causing relative movement between said bell and said surrounding member during the distributing operation, said process comprising the steps of sensing the level of the stockline at a plurality of locations thereon near the inner wall of said receptacle and at a location substantially at the center of said stockline and beneath said bell, receiving outside of the receptacle the information as to the stockline level at each of said locations, and controlling the operation of said distributor means for distributing particulate material to achieve a desired stockline configuration on the basis of information received from said sensing means.

4,050,593

SIDE LIFT FOR SIDE DUMPING WAGONS

Henry J. Kalke, Rte. 1, Box 24 12-6th St., NE., Nora Springs, Iowa 50458

Filed Feb. 23, 1976, Ser. No. 660,144
Int. Cl.² B65G *67/42*
U.S. Cl. 214—44 C **9 Claims**



1. A side lift for side dumping wagons of the type including opposite side front and rear wheels, said lift including upstanding support means having a pair of horizontally spaced elevated support portions, a pair of depending flexible tension members freely dependingly supported from said support portions and disposed in an upstanding plane spaced horizontally outwardly from one side of the lower end portion of said support means, an elongated horizontal lift member spaced horizontally outwardly from said one side of said support means, the lower ends of said tension members being anchored to opposite end portions of said lift member for support thereof solely from said tension members, force means connected between said support means and said tension members for selectively and equally elevating and lowering the lower ends of said tension members relative to said support portions, said lift member being adapted to have the adjacent side front and rear wheels of a side dumping wagon spaced outwardly of said one side of said support means roll thereonto from one end thereof and thereoff from the other end thereof when said lift member is disposed at least substantially at ground level.

4,050,594

REFUSE LOADING APPARATUS

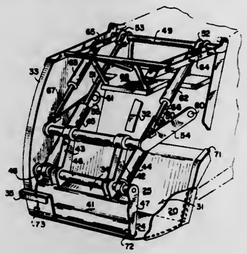
Cyril R. Gollnick, Oshkosh, Wis., assignor to Leach Company, Oshkosh, Wis.

Filed Oct. 20, 1975, Ser. No. 623,605
Int. Cl.² B65F *3/00*
U.S. Cl. 214—83.3 **4 Claims**

1. In a refuse collection and transport vehicle of the type having a refuse storage body and a hopper for receiving refuse therein, loading apparatus for transporting batches of refuse from said hopper to said storage body, said loading apparatus including:
means including a packer plate positioned in said hopper for removing refuse therefrom,
actuating means including means for supporting said packer plate in said hopper,
said actuating means having means including a first hydraulic ram mounted in operative communication between said packer plate means and either one of said hopper and said

storage body for controlling the vertical position of said packer plate in said hopper and means including a second hydraulic ram mounted in operative communication between said packer plate means and either one of said hopper and said storage body for urging said packer plate through said hopper;

said first hydraulic ram and said second hydraulic ram coacting to move said packer plate on an operating path therethrough so as to scoop batches of refuse contained therein into said storage body; and



the improvement wherein

said second hydraulic ram is dominant over said first hydraulic ram,

said second hydraulic ram including means acting through said packer plate means for changing the movement of said first hydraulic ram against the direction of energised movement thereof, and

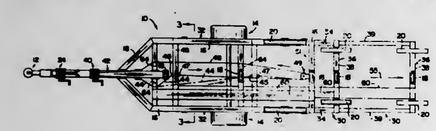
said change in movement of said first hydraulic ram being capable of extending over a substantial portion of the total operative length of travel thereof.

4,050,595

BOAT TRAILER EXTENSION ASSEMBLY

Leon M. Bussard, New Port Richey, Fla., assignor to Leon M. Bussard and C. Ed Smith, both of New Port Richey, Fla.

Filed Dec. 29, 1975, Ser. No. 644,971
Int. Cl.² B60P 3/10
U.S. Cl. 214—84 8 Claims



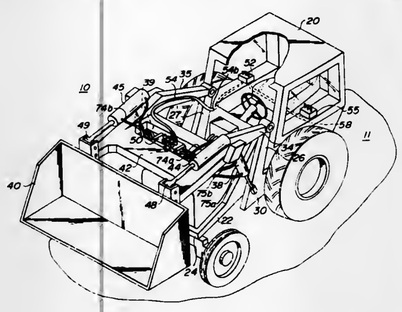
1. A removable accessory for a conventional boat trailer have rearwardly extending frame portions, said accessory including a support assembly comprising: casing means connected to the frame portions of the boat trailer and disposed substantially along either side of a longitudinal axis thereof, said casing means comprising at least two channel means interconnected to one another and each disposed in depending, suspended relation to correspondingly positioned elongated portions of the boat trailer frame, each channel means defining cradle passages; said support assembly further comprising cradle means including a cradle frame, said cradle frame including at least two arm elements each slidably mounted for rearward movement within one of said cradle passages; positioning means movably interconnecting said cradle frame to said casing means and said cradle passages attached thereto, said positioning means comprising a single winch assembly mounted on the boat trailer, cable means comprising a first cable portion interconnected between said single winch assembly and said cradle frame and a second cable portion disposed in attached relation to both said single winch assembly and said cradle frame, pulley means connected to the boat trailer frame and disposed in engagement with said second cable portion between said winch assembly and said cradle frame along the path of travel defined by said second cradle portion; said cradle frame including a strut means attached thereto, each of said first and second cable portions connected to said strut means, and both of said first and second cable portions additionally connected concurrently to said single winch assembly, whereby rotation of said winch assembly in either direction causes movement of said cradle means relative to the longitudinal axis of the boat trailer.

4,050,596

ELECTROHYDRAULIC VALVE ASSEMBLY FOR FRONT END LOADER ATTACHMENT TO FARM TRACTOR

Kenneth W. Zeuner, Newtown, and Alonzo B. Jarman, Wrightstown, both of Pa., assignors to Control Concepts, Inc., Newtown, Pa.

Filed July 24, 1975, Ser. No. 598,726
Int. Cl.² E02F 3/74
U.S. Cl. 214—131 A 12 Claims



1. In an attachment for converting a farm tractor having a cab to a front end loader, front frame members extending to the front of said tractor, upwardly extending frame members rigidly secured to said front frame members and providing a supporting pivotal connection for a pair of boom arms, a pair of hydraulic cylinders for actuating said boom arms, an implement pivotally connected to said boom arms and being actuated by at least one additional hydraulic cylinder, said front and upwardly extending frame members being secured to said tractor, in which the improvement combination comprises

an electrohydraulic valve assembly having solenoid operated valves, said valve assembly being hydraulically coupled to said pair of cylinders and said additional cylinder and rigidly secured to said attachment outside of said cab,

a switching assembly comprising a plurality of switching devices adapted for electrically switching said solenoid operated valves thereby to control said hydraulic cylinders, said switching assembly secured within said cab for easy access to the operator of said plurality of switching devices,

electrical cable means coupled between said switching assembly within said cab and said electrohydraulic valve assembly outside of said cab thereby avoiding hydraulic oil lines and valves within said cab, and

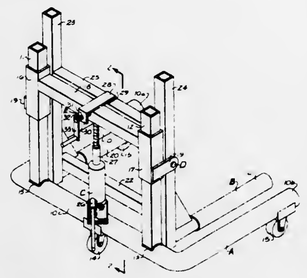
means directly electrically connecting only a first and a second of said switching devices respectively to a first and a second pair of said solenoid valves, said valve assembly including an unload valve normally maintained open and hydraulically coupling the pressure and tank of said tractor whereby upon actuation of each switching device one solenoid valve of the respective pair is energized and said unload valve is switched to the valve closed state.

4,050,597

DOLLY FOR LIFTING AND TRANSPORTING VEHICLE WHEELS

Wallace H. Hawkins, Rte. 7, Buncombe Road, Greenville, S.C. 29609

Filed Nov. 6, 1975, Ser. No. 629,587
Int. Cl.² B60B 29/00; B65G 7/00
U.S. Cl. 214—331 2 Claims



1. A wheel dolly including:

a substantially L-shaped wheeled outer support frame;

said support frame including a pair of spaced vertical posts and a pair of spaced legs extending horizontally therefrom;

an inner substantially L-shaped wheel carrying frame;

said inner wheel carrying frame including a pair of spaced vertical posts aligned with said first mentioned vertical posts and a pair of spaced load carrying legs extending horizontally therefrom within said first mentioned legs;

elongated vertical sleeves (means) carried by said first mentioned legs for vertical sliding movement on said outer support frame;

jacking means carried by said outer support frame for exerting a lifting force upon said inner wheel carrying frame;

a transverse horizontal pivotal connection between a lower portion of said sleeves (said means carried for vertical sliding movement) and said inner wheel carrying frame; (and)

a horizontal bridging member connecting upper portions of said sleeves;

a horizontal bridging member connecting said spaced vertical post of said inner wheel carrying frame opposite said first mentioned bridging member; and

threaded means exerting a force between said bridging members for tilting said inner wheel carrying frame about said pivotal connection restraining said inner wheel carrying frame in tilted position for maintaining a wheel supported thereby in proper position in respect to a vehicle axle.

4,050,598

BALE WAGON

James L. Schurz, New Hope, Miss., assignor to Farmhand, Inc., Hopkins, Miss.

Filed Apr. 14, 1975, Ser. No. 567,609
Int. Cl.² B60P 1/38
U.S. Cl. 214—518 5 Claims

1. A wheel supported bale wagon for loading and transporting bales of a size generally incapable of being handled and maneuvered by a single person, said bales having a pair of end surfaces defining the transverse dimension of such bale and at least one side surface extending between the end surfaces and defining the length of such bale, said wagon comprising:

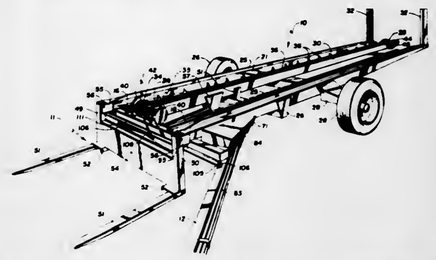
a generally elongated frame having a bale supporting portion;

loading means pivotally connected at the forward end of said elongated frame about a generally horizontal axis for loading the bale onto said bale supporting portion at the forward end of said elongated frame;

means for pivoting said loading means between a lower position and an upper position;

conveying means for conveying the bale from said one end of the elongated frame to a selected position along said elongated frame; and

a tongue section having hitch means for connection to a draft vehicle, said tongue section being movable between a trailing position in which the wagon trails approximately directly behind the draft vehicle and an operative position in which the wagon trails the draft vehicle generally to one side thereof;



a support means movable between a raised position and an operative position in which said support means functions to support the wagon and operatively connected with said elongated frame near its forward end and on the side of said frame opposite said tongue section for supporting said wagon when said tongue section is in its operative position; and

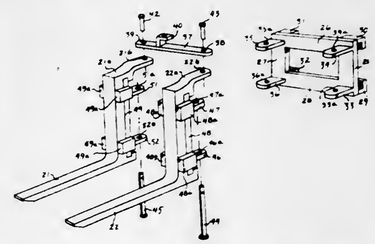
means operatively connected between said tongue section and said support means for moving said support means between said raised and operative position in response to movement of said tongue section between a trailing and operative position, respectively.

4,050,599

APPARATUS FOR ANGULATING FORKS ON A FORK LIFT TRUCK

Frank N. Bender, P.O. Box 11430, Reno, Nev. 89510

Continuation-in-part of Ser. No. 563,773, March 31, 1975, abandoned. This application Mar. 15, 1976, Ser. No. 666,698
Int. Cl.² B66F 9/14
U.S. Cl. 214—730 4 Claims



1. In a fork lift truck with a carriage for vertical movement, apparatus for remote control angulation of load bearing forks comprising: a frame with means for detachably mounting said frame to said fork lift truck carriage, the frame having at least two outwardly projecting elements; a first mounting for attaching a forwardly extending first fork, said first mounting having at least one rearwardly extending bracket to pivotally cooperate with at least one of the outwardly projecting ele-

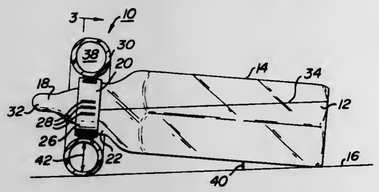
ments of the frame; a second mounting for attaching a forwardly extending second fork, said second mounting having at least one rearwardly extending bracket to pivotally cooperate with at least one of the outwardly projecting elements of the frame; each fork having an arm extending rearwardly to a greater extent than the respective rearwardly extending bracket; a device connected to both rearwardly extending arms; and, means attached to the device wherein the load bearing forks can be turned in equal angular proportions about their own individual pivot axis from a remote location, whereby said forks can be pivoted with a load resting on said pair of forks.

4,050,600

CONTAINER SPILLAGE PREVENTION SYSTEM

Martin C. Jennings, Rte. 1, Box 112, Port Deposit, Md. 21904

Filed June 15, 1976, Ser. No. 696,262
Int. Cl.[2] A61J 9/00
U.S. Cl. 215—11 R **8 Claims**



1. A container spillage prevention system for material within said container, comprising:

a. a cap member adapted to matingly engage said container adjacent an open end of said container, said cap member having a through opening for securement thereto of a material dispensing element, said cap member having an external diameter defining a cap member lateral wall, said cap member having radially directed extension members formed on said lateral wall; and,

b. means for elevating said material dispensing element a predetermined distance above a substantially horizontal surface, said elevation means being secured to said cap member lateral wall in deformable mating engagement with said extension members, said elevation means forming a doughnut shaped contour generated by a circle rotated about an axis in the plane of said circle, said elevation means having an external diameter substantially greater than a largest diameter of said container.

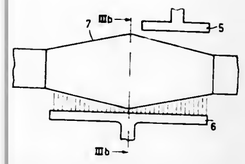
4,050,601

METHOD OF MANUFACTURING A BULB FOR A CATHODE-RAY TUBE, AND BULB OBTAINED BY MEANS OF THIS METHOD

Johan J. H. Bogaard, and Gerrit-Jan Korteling, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,741
Claims priority, application Netherlands, Aug. 27, 1975, 7510101
Int. Cl.[2] C03B 23/08
U.S. Cl. 220—2.1 A **5 Claims**

1. A method for manufacturing a bulb having a cylindrical neck joined to a polygonal section, comprising heating a central portion of a glass tubing to its softening temperature while rotating said glass tubing about its axis at a rate such that the softened portion of the tubing radially expands, simultaneously upsetting said softening of said glass tubing by axially displacing the end portions of said glass tubing at a rate to maintain the wall thickness of said central portion substantially constant, then stopping the rotation of said glass tubing and reshaping the radially expanded portion thereof to have a polygonal cross-section without varying the circumferential dimension of



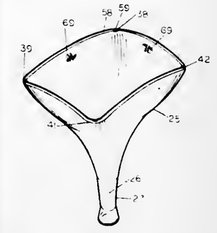
said radially expanded portion, and then cooling said reshaped glass tubing.

4,050,602

COLOR TELEVISION TUBE STRUCTURE AND METHOD OF MANUFACTURE

Elgin Megginson Tom, Toledo, and Roland L. Vogelpohl, Gahanna, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 594,531, July 9, 1975, Pat. No. 3,997,811.
This application June 1, 1976, Ser. No. 691,490
Int. Cl.[2] H01J 29/07
U.S. Cl. 220—2.1 A **7 Claims**



1. A color television picture tube funnel comprising a glass frusto-conical body; and a seal edge on the divergent end of said body of generally rectangular perimeter having a substantially uniform width around said rectangular perimeter and of scalloped spherical contour convexly related to a center in the vicinity of the convergent end of said body, said funnel including an inner wall of said body having a plurality of spaced reference faces directed radially outward of the convergent end of said body and defined by indentations in said seal edge, said indentations extending into said seal edge in a radially outward direction, and adapted to index the depth of entry of a shadow mask structure into the divergent end of said body.

4,050,603

CLAMP FOR SECURING BAR HANGER TO ELECTRICAL WIRING BOX

Robert M. Harris, Vienna, W. Va.; Gene F. Mills, Belpre, Ohio, and David T. Shaffer, Parkersburg, W. Va., assignors to Union Insulating Company, Parkersburg, W. Va.

Filed Oct. 6, 1976, Ser. No. 729,967
Int. Cl.[2] H02G 3/08
U.S. Cl. 220—3.9 **7 Claims**

1. An assembly comprising:

an electrical wiring box including a wall;

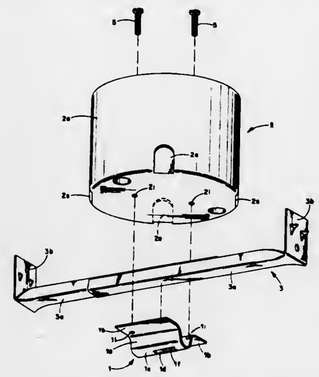
a clamp including a generally U-shaped portion;

a bar hanger disposed within the U-shaped portion of the clamp and captured between the generally U-shaped portion of the clamp and the wall of the wiring box; and

securing means securing the clamp and the bar hanger within the generally U-shaped portion of the clamp directly to the wall of the wiring box;

the improvement comprising:

the generally U-shaped portion of the clamp has deformable means directed, prior to the clamp being secured to the wall of the wiring box, into the region defined by



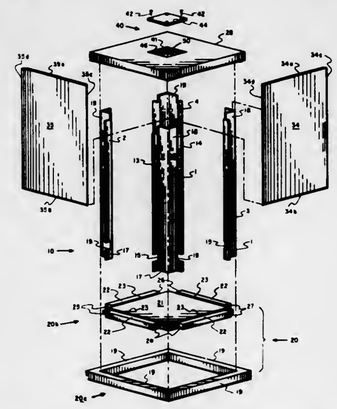
the generally U-shaped portion and bearing against the bar hanger, and operative during the securing of the clamp to the wall of the wiring box to deform and to move in a direction away from the wall of the wiring box and toward the generally U-shaped portion of the clamp.

4,050,604

DISASSEMBLEABLE, REUSABLE CONTAINER

Robert D. Flanders, 28035 SW Parkway Ave., Wilsonville, Oreg. 97070

Filed July 22, 1974, Ser. No. 490,497
Int. Cl.[2] B65D 9/18, 7/24, 19/12, 19/16
U.S. Cl. 220—4 F **6 Claims**



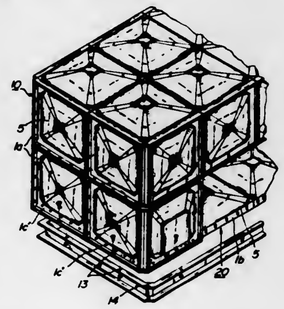
1. A disassemblable, reusable, container system which, when assembled, is storeable in a relatively small area compared to a conventional container system, for storing and shipping materials, which comprises a plurality of bracing support members, each of said bracing support members including, at its lower end, a support leg section for maintaining said container system above the level of the surface upon which it is supported; a floor member including upper and lower portions engaging and joining with said support members for supporting the material to be shipped located within the confines of said container system, and including means for engaging and joining with said bracing members; a plurality of sidewall members, having their vertical edges located within the confines of said bracing support members, said adjacent vertical edges of said sidewall members being in bearing relationship one against the other, said bracing support members interlockingly engaging said sidewalls and joining with said floor member to support said sidewall members, and an interlocking lid member, which serves as a cover for said container system by protecting said material and which interlockingly secures and maintains the container in proper vertical alignment, supported on said bracing support members and said sidewall members, respectively, each of said bracing support members including a pair of slots for receiving the lower portion of the floor member, and upon engagement thereof, interlockingly bracking and maintaining said container system in proper alignment, said upper support portion including a floor section surrounded by a peripheral groove which in turn is circumscribed by an outer floor section and having notches included in each of the corners of said upper floor portion for engagement with said bracing support members, and said lower support portion being comprised of a peripheral frame member fabricated to interlockingly engage the slots of said bracing members to further lock said support members in position.

4,050,605

PANEL ASSEMBLED TANK

Hiroshi Wakana, Fuchu; Isamu Harada, and Tsutomu Houma, both of Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed May 27, 1976, Ser. No. 690,819
Claims priority, application Japan, May 30, 1975, 50-71992[U]
Int. Cl.[2] B65D 7/24, 7/46
U.S. Cl. 220—5 A **10 Claims**



1. A panel assembled tank comprising square wall surface unit panels connected together, each unit panel formed with a pyramidal protrusion portion progressively increasing in height toward the panel center and having integral folded securing flanges at the peripheral edges thereof, said protrusion portion including corner section portions radially arranged at the unit panel corners and forming therebetween edges of the pyramidal protrusion portion, said wall surface unit panels comprising bottom wall panels, at least some of said bottom panels having securing flanges folded in a direction opposite to the extending direction of said protrusion portion thereof, said panels further comprising side wall panels, each side wall panel having securing flanges folded in the same direction as the protrusion portion of the side wall panel, said side wall panels being formed peripherally along the bottoms of said flanges with flat portions, and means for securing the

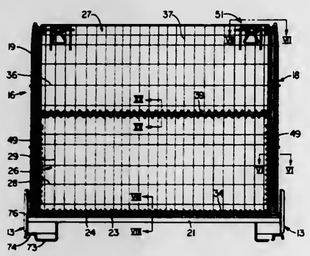
flanges of said bottom and side wall panels together and facing outwardly to form said tank.

4,050,606

COLLAPSIBLE MATERIAL HANDLING CONTAINER

Stanley J. Jurasek, Concord Township, Jackson County, Mich., assignor to Eagle Picher Industries, Inc., Cincinnati, Ohio

Filed June 2, 1975, Ser. No. 582,780
Int. Cl.² B65D 7/24
U.S. Cl. 220—7 **1 Claim**



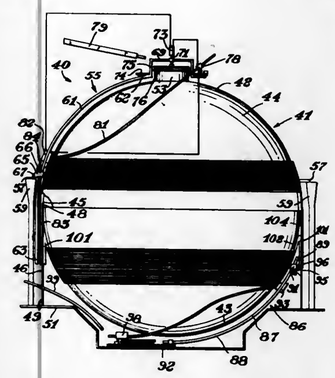
1. A collapsible container comprising base means defining a planar bottom wall, substantially parallel first and second planar side walls connected to said bottom wall and adapted to project substantially perpendicularly therefrom adjacent opposite edges thereof, said first side wall comprising a lower wall portion and an upper wall portion whose adjacent horizontal edges are hingedly connected together so that the upper wall portion can be swung outwardly relative to the lower wall portion, said first side wall having an inwardly directed offset portion on the lower end thereof which is substantially parallel to said bottom wall when said container is in an erected condition, the free edge of said offset portion being spaced inwardly from the upwardly extending portion of said first side wall, a pair of substantially parallel planar end walls adapted to project substantially perpendicularly from said bottom wall, said end walls each adapted to extend substantially perpendicularly between said side walls, said end walls having end portions which extend substantially perpendicularly to the planes of said end walls, said end portions extending inwardly toward each other and being substantially coplanar with said first side wall, said walls all being of a substantially rectangular configuration so that said container when in an erected condition defines an enclosure of an upwardly opening boxlike configuration, first hinge means defining a first substantially horizontal hinge axis and hingedly connecting the lower wall portion of said first side wall adjacent the lower horizontal edge thereof to said bottom wall to permit said first side wall to be vertically swung downwardly so as substantially to overlie said bottom wall, said first hinge means being hingedly connected between the free edge of said offset portion and said bottom wall, second hinge means defining a second substantially horizontal hinge axis and hingedly connecting said second side wall adjacent the lower horizontal edge thereof to said bottom wall to permit vertically swinging of said second side wall into a position wherein it overlies said bottom wall, said first and second horizontal hinge axes being substantially parallel to one another, third and fourth hinge means hingedly connecting the opposite side edges of the lower wall portion of said first side wall to the adjacent edges of said end walls to permit said end walls to be swingably displaced to substantially overlie said first side wall, said third and fourth hinge means defining third and fourth hinge axes which extend substantially vertically when the container is in an erected condition, said third and fourth hinge means hingedly connecting the inner edges of said end portions of said end walls to the opposing edges of the lower wall portion of said first side wall, first releasable latch means coacting between said upper wall portion of said first side wall and said end walls for releasably retaining said upper wall portion of said first side wall and said end walls together when the container is in an erected condition, said first releasable latch means comprising two latches respectively disposed adjacent the upper corners of said upper wall portion of said first side wall, each of said latches comprising a keeper having a first portion extending parallel to the plane of its associated end wall and secured thereto, a second portion extending inwardly and substantially parallel to the end portion of its associated end wall and spaced inwardly therefrom and a forwardly projecting loop portion which is substantially parallel to the plane of its associated end wall and is spaced inwardly therefrom and is also spaced inwardly from the edge of the end portion of its associated end wall and is adapted to extend through and project forwardly beyond the upper wall portion of said first side wall, and a latch member mounted on said upper wall portion of said first side wall and adapted to extend through said loop portion in the locked condition of said latch, said loop portion being shaped so that its associated end wall can be swung inwardly to a position substantially parallel to and overlapping said first side wall without interfering with said latch member, said upper wall portion of said first side wall being free of connection to said end walls except through said first latch means, and second releasable latch means coacting between said second side wall and said end walls for retaining these walls together when the container is in an erected condition, said second side wall being free of connection to said end walls except through said second latch means.

4,050,607

INSULATION OF VESSELS HAVING CURVED SURFACES

Hubert Stacy Smith, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 242,061, April 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 158,272, June 30, 1971, abandoned. This application June 28, 1974, Ser. No. 484,043
Int. Cl.² B65D 25/18
U.S. Cl. 220—9 LG **4 Claims**



1. A thermally insulated tank, the tank comprising
at least a first tank having an exterior curved surface,
a layer of synthetic resinous cellular foam thermal insulation disposed adjacent the exterior curved surface and covering at least a substantial portion thereof, the insulation being in the form of a plurality of loops or turns of a strip-like configuration, adjacent turns of the insulation being adhered to each other in edge to edge relationship, the adjacent turns define a plurality of spirally disposed slots facing the exterior curved surface of the tank and a plurality of loops or turns of a vapor barrier material overlying the loops of insulating material.

4,050,608

CROSS-SHAPED JOINT COVER MEMBER FOR GENERALLY RECTANGULAR COMPOSITE INSULATING PANELS FORMING WALL PORTION OF INSULATED CRYOGENIC LIQUID CONTAINER

Roy E. Smith, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 3, 1975, Ser. No. 628,297
Int. Cl.² B65D 25/18; E04C 1/00
U.S. Cl. 220—9 LG **95 Claims**

1. A joint cover member for sealing a cross- shaped space separating four rectangularly arranged composite insulating panels mounted on a supporting structure and forming a wall portion of an insulated cryogenic liquid container, the joint cover member comprising a cross-shaped body of insulating material and a cross-shaped outer facing secured thereto, the cross-shaped body of insulating material being insertable in a cross-shaped space separating four rectangularly arranged mounted composite insulating panels and the outer facing being sealable to the composite panels to form a primary barrier for cryogenic liquids therewith, and the dimension of the joint cover member from an outer end of any one leg portion to an outer end of an oppositely extending leg portion being substantially equal to the dimension of one of the composite insulating panels in the same direction.

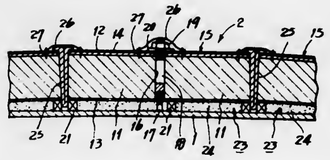
22. An insulated cryogenic liquid container comprising a supporting enclosure having a generally planar inner surface, a plurality of generally rectangular composite insulating panels each including a casing and insulating material in the casing, the panels being mounted in rows in a covering layer over the planar inner surface with a cross-shaped space separating the casings of each group of four rectangularly arranged mounted composite panels, and a plurality of joint cover members each including a cross-shaped body of insulating material and a cross-shaped outer facing, the cross-shaped bodies of insulating material being disposed respectively in the cross-shaped spaces and the outer facings covering the cross-shaped bodies of insulating material, bridging the space between casings, and being sealed to front panel portions thereof to form a primary barrier for cryogenic liquids therewith, the dimension of each joint cover member from an outer end of any one leg portion to an outer end of an oppositely extending leg portion being substantially equal to the dimension of one of the composite insulating panels in the same direction.

4,050,609

HEAT INSULATING DEVICE FOR LOW TEMPERATURE LIQUIFIED GAS STORAGE TANKS

Tomiyasu Okamoto; Tsunanori Nishimoto; Kaoru Sawada; Koji Hayakawa, and Tomomichi Kurihara, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Osaka, Japan

Filed Sept. 13, 1976, Ser. No. 722,718
Int. Cl.² B65D 87/24; B63B 25/16
U.S. Cl. 220—9 LG **9 Claims**



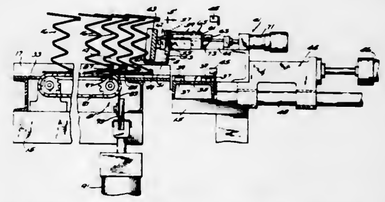
1. In a heat insulating device for the wall of a spherical low temperature liquified gas storage tank, the improvement comprising:
a plurality of heat insulating unit block plates each consisting of a rigid foam synthetic resin plate, inner and outer plywood members bonded to the inner and outer surfaces respectively of said resin plate, a gas-tight sheet bonded to the outer surface of said outer plywood member, and a hole disposed substantially centrally of said block plate and extending through said gas-tight sheet, said plywood members and said resin plate;
a plurality of point spacers disposed between the inner surface of each block plate and the outer surface of said tank wall to define a space between the block plates and the tank wall;
heat insulating connecting means inserted in said holes for fixing said unit block plates relative to the tank wall and said point spacers;
heat insulating filler means placed in the joints between said unit block plates; and
gas-tight means for covering the exposed outer portions of said connecting means and said filler means.

4,050,610

COIL SPRING FEEDING APPARATUS

Helmut Sturm, Kenosha, Wis., assignor to Frank L. Wells Company, Kenosha, Wis.

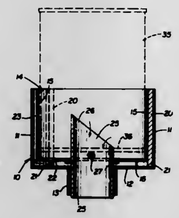
Filed Jan. 29, 1975, Ser. No. 545,095
Int. Cl.² B65H 3/16
U.S. Cl. 221—171 **10 Claims**



1. Coil spring feeding apparatus comprising a frame, a coil spring magazine supported by said frame, having a discharge end, and adapted to contain a plurality of coil springs, means on said frame for conveying the coil springs in said magazine toward said discharge end, a coil spring conveyor extending transversely of said magazine adjacent said discharge end, means for withdrawing the end coil spring from said magazine and for transporting the withdrawn end coil spring from said magazine onto said conveyor and including a magnet adapted for magnetically attracting and releasably holding the end coil spring and movable across said conveyor between a retracted position on the side of said conveyor remote from said magazine discharge end and an advanced position located adjacent to said magazine discharge end in position for magnetically attracting and releasably holding the end coil spring in said magazine, means for displacing said magnet between said advanced and retracted positions to withdraw the end coil spring from said magazine and to transport the end coil spring onto said conveyor, stripper means located adjacent to said conveyor along the side thereof remote from said magazine discharge end and in the path of travel of the coil spring magnetically held by said magnet during movement of said magnet from said advanced to said retracted positions, whereby to strip the coil spring held by said magnet when the coil spring is positioned on said conveyor, a retainer finger movable between a retaining position engagable with the inside surface of the end coil spring and a non-retaining position permitting movement into and out of the interior of the end coil spring between the convolutions thereof, and means for displacing said finger transversely of said conveyor in common with said

magnet and for displacing said finger between said retaining and non-retaining positions.

4,050,611
DEVICE FOR FILLING CRANK CASE OR TRANSMISSION OF INTERNAL COMBUSTION ENGINE WITH OIL
Joseph F. Frantz, 495 S. Dayton St., Denver, Colo. 80231
Filed Jan. 19, 1976, Ser. No. 650,470
Int. Cl.² B67B 7/28
U.S. Cl. 222—88 4 Claims



2. A device for filling a crank case or transmission of an internal combustion engine with oil dispensed from a can comprising:

a. an open top casing having a cylindrical side wall and a bottom with an opening therein,

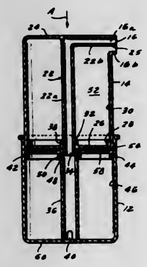
b. a cup member in the casing having an opening in its bottom registering with the opening in the casing bottom,

c. means spacing the cup member from the casing side wall and bottom providing air passages between them,

d. an oil dispensing tube having an oil can piercing upper end facing upwardly in the cup and extending downardly through the cup and casing bottom openings, and having an opening in its side communicating with said air passages between the cup member and casing, and

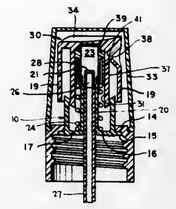
e. a pin mounting the tube in the cup to receive oil from a can pierced by the tube and to dispense it through the tube lower end, said pin extending through the tube and having ends bearing on the bottom of the cup member.

4,050,612
DISPENSING CONTAINER
Thomas Stone, Lisbon, Conn., assignor to Jules Silver, Norwich, Conn.
Filed May 25, 1976, Ser. No. 689,828
Int. Cl.² B67D 5/52
U.S. Cl. 222—135 11 Claims



1. A dispenser for flowable materials comprising a first, open-topped container, a second open-bottomed container dimensioned to be telescopically received in said open topped container with its open bottom therein, said open-bottomed container having a dispensing orifice formed therein and containing a hollow dispensing channel communicating at one end with at least a portion of said orifice and having its other end located adjacent the open bottom of said second container; a piston received in said second container for sliding movement therein with respect to said dispensing channel; a hollow rod operatively connected to said piston and telescopically engaging and receiving said dispensing channel, said hollow rod having a bottom end engaging the bottom of said first container and having an opening therein providing communication between the interior of said first container, said hollow rod and said dispensing channel and a separator-seal member located in said first container for movement relative to said rod and in position to be engaged by the edge of said second container surrounding the open bottom thereof, whereby material contained in said first and second containers will be simultaneously discharged upon depression of the first container into the second container.

4,050,613
MANUAL ACTUATED DISPENSING PUMP
Douglas F. Corsette, 6559 Firebrand St., Los Angeles, Calif. 90045
Filed Aug. 31, 1976, Ser. No. 719,236
Int. Cl.² B05B 11/00; B65D 47/34
U.S. Cl. 222—321 12 Claims



1. A dispensing pump of the pressure accumulating type comprising a pump body and means for securing same in fluid tight communication with the opening of a container of flowable product to be dispensed;

said body including an annular base and a piston affixed to and projecting upwardly therefrom;

an annular plunger mounted for reciprocation on said piston to therewith define a variable volume pump chamber;

a plunger spring for urging said plunger upwardly toward a fully raised position above the base;

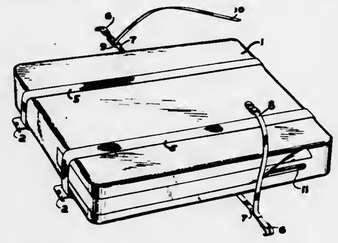
said piston and said base having a check valve controlled inlet passage therethrough for establishing communication between said pump chamber and a container of flowable product to be dispensed;

a plunger head having a downwardly directed blind socket slidably disposed on said annular plunger and therewith defining a variable volume accumulation chamber between said annular plunger and the blind end of said socket, and communicating freely with the pump chamber;

said plunger head being formed with a discharge passage extending therethrough from said socket to the atmosphere at a location to be opened and closed by relative movement between said plunger head and said plunger in the direction of said reciprocation;

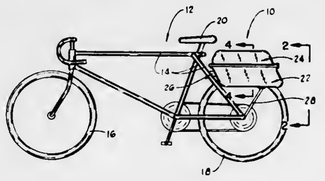
and means for arresting the upward movement of the plunger head at a predetermined position wherein said spring normally urges the said plunger fully into the said socket to function as a valve for closing said passage.

4,050,614
VEHICLE LUGGAGE CARRIER
Earl L. Simpson, 6814 Farragut Ave., Falls Church, Va. 22042
Filed Mar. 29, 1976, Ser. No. 671,064
Int. Cl.² B60R 9/04, 9/06
U.S. Cl. 224—29 R 13 Claims



1. A vehicle luggage carrier comprising a storage container having a front end, a rear end, lateral side portions, a top side and a bottom side, means for opening and closing said storage container, at least one front hook-type means operatively associated with the front end of said storage container for engagement with a portion of the vehicle, side straps attached to said storage container and extending laterally from each lateral side portion of the storage container, lateral hook-type mens operatively attached to said side straps for engagement with lateral portions of said vehicle, one of said lateral hook-type means being fixedly attached to a side strap on one side of said storage container with the free end of said side strap extending to the top side of the storage container, the other of said lateral hook-type means being slidably attached to a side strap on the other side of said storage container with the free end of said side strap extending to the top side of the storage container and means for securing said free ends of said straps together on the top side of said storage container, so that tightening the strap results in simultaneously tightening the lateral hook-type means in their lateral directions and the storage container in the vertical direction, relative to the vehicle.

4,050,615
RIGID SADDLE BAG TYPE CARRIER FOR BICYCLES
Melbert A. Kline, 1157 Silverdale, Wichita, Kans. 67218
Filed Sept. 15, 1975, Ser. No. 613,573
Int. Cl.² B62J 9/00
U.S. Cl. 224—32 A 3 Claims



1. A rigid saddle bag type carrier for a bicycle, the carrier comprising:

an elongated case secured to the rear portion of the bicycle and disposed above the rear wheel axle, the case having a front portion, a rear portion, an open top portion, a bottom portion, and two side portions with each side portion positioned adjacent to a side of the wheel, the bottom portion including two horizontal surfaces with each horizontal surface positioned adjacent a side of the wheel and a concave surface in the center thereof and extending therethrough for receiving a top portion of the rear bicycle wheel therebetween, the side portions of said case positioned on both sides of the rear bicycle wheel and open to one another via an open inner portion positioned above the top portion of the rear bicycle wheel, the front portion and rear portion of said case angled upwardly and forwardly toward the front of the bicycle;

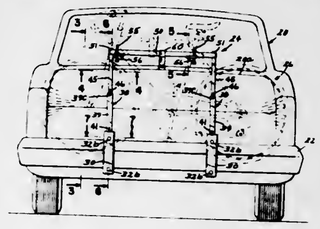
an elongated case lid hingedly mounted on the top of the open portion of said case, said case lid having a rear portion angled upwardly and forwardly toward the front of the bicycle;

a "U" shaped front mounting bracket attached to the front portion of said case, said front mounting bracket secured to the bicycle frame by a threaded bolt and nut attached to a mounting plate disposed adjacent the bicycle frame, the bolt received through an aperture in said bracket and said plate;

a pair of inclined, elongated mounting braces, one of said mounting braces positioned on one side of the rear wheel and having a horizontal upper end portion attached to one of said horizontal surfaces of the bottom portion adjacent to one of said side portions of said case and a lower end extending downwardly and bolted to one side of the rear wheel axle, and the other of said mounting braces positioned on the other side of the rear wheel and having a horizontal upper end portion attached to the other of said horizontal surfaces of the bottom portion adjacent to the other of said side portions of said case and a lower end extending downwardly and bolted to the other side of the rear wheel axle and;

flange portions extending outwardly around the periphery of said case lid, said flange portions overlapping flange portions extending outwardly around the periphery of the open top portion of said case, said flange portions of said case lid disposed against the flange portions of said case when said case lid is disposed adjacent said case.

4,050,616
BUMPER-STYLE BICYCLE CARRYING APPARATUS
Larry B. Mosow, 5620 Wycliffe Road, Edina, Minn. 55436
Filed Sept. 19, 1975, Ser. No. 614,947
Int. Cl.² B60R 9/10
U.S. Cl. 224—42.03 B 8 Claims



1. A collapsible bicycle carrying rack for attachment to a bumper of a motor vehicle, comprising:

a. a pair of low-relief bumperette housing members suitable for attachment to a bumper of a motor vehicle, each of said housing members defining an internal cavity, said housing members having a length approximating that of the vertical dimension of a bumper, said housing members being substantially U-shaped in horizontal cross-section and having an open face for addressing the bumper, said open face being defined by edges which engage said bumper;

b. means for mounting said housing members to a bumper of a motor vehicle, in spaced apart relationship relative to one another; and

c. vertically telescoping support means mounted to said housing members for supportingly carrying a bicycle in elevated position above the bumper, said support means including a pair of vertical support standards positionable

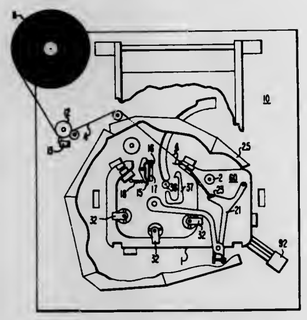
in an extended position telescopically projecting from said housing members, and positionable in a collapsed position for substantial encompassment within said cavities of said housing members, each of said vertical support standards cooperating with the respective housing member to provide vertically telescoping support means comprising at least three telescoping members.

4,050,617

METHOD AND APPARATUS FOR STUFFING RIBBONS

Donald William Biggs, Webster, and Wilson Parker Rayfield, Pittsford, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 28, 1976, Ser. No. 736,629
Int. Cl.[2] G03B *1/58*
U.S. Cl. 226—1 **10 Claims**



8. A method of stuffing ribbon in a cartridge comprising providing the cartridge to be stuffed to a cartridge stuffing apparatus having a supply of ribbon with the free end of the ribbon clamped to the clamp position thereon;

causing a threader cam follower pin to be positioned against the ribbon and drawn through its path and into the cartridge while the free end remains clamped;

releasing the clamped free end of the ribbon after the ribbon has been partially threaded into the cartridge; and

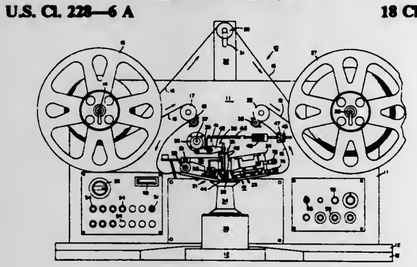
mechanically drawing the ribbon through the remaining portion of the cartridge along the path to be threaded.

4,050,618

FLEXIBLE LEAD BONDING APPARATUS

Thomas L. Angelucci, Sr., 89 Charlan Circle, Cherry Hill, N.J. 08003, and Joseph L. Angelucci, 1948 Little Drive, Deptford, N.J. 08096

Filed June 19, 1975, Ser. No. 588,289
Int. Cl.[2] H01L *21/60*
U.S. Cl. 228—6 A **18 Claims**



1. Apparatus for simultaneously bonding a plurality of electrical conductive flexible leads on a sprocketed lead frame tape to a rigid device comprising:

a support frame,

a tape supply reel rotateably mounted on said frame,

a sprocketed lead frame tape on said supply reel,

a first metering sprocket for pulling said lead frame tape from said supply reel.

a tape take-up reel rotatably mounted on said frame,

a second metering sprocket for paying out said lead frame tape to said take up reel,

said metering sprockets eliminating tension in said tape therebetween,

an index station intermediate said metering sprockets comprising a movable housing, having a tape transverse positioning guide for receiving said tape from said first metering sprocket, means for vertically positioning said lead frame tape, means for guiding said lead frame tape to said second metering sprocket and means for advancing said lead frame tape thereon.

said means for advancing said lead frame tape comprising an advancing tape means and a locking tape means,

a bonding station mounted on said support frame for bonding said flexible leads of said lead frame tape to said rigid device after said lead frame tape is advanced and positioned and locked in said indexing station by said advancing tape means and said locking tape means.

support means for said device, and,

means for vertically moving said indexing station independently of said tape reels between a position adjacent said support means and a position remote to said support means.

2. Apparatus for simultaneously bonding a plurality of electrical conductive flexible leads on a sprocketed lead frame tape to a rigid device comprising:

a support frame,

a tape supply reel mounted on said frame,

a sprocketed lead frame tape on said supply reel,

a first metering sprocket for pulling said lead frame tape from said supply reel,

a tape take-up reel rotatably mounted on said frame,

a second metering sprocket for paying out said lead frame tape to said take-up reel,

an index station intermediate said metering sprockets comprising a housing and means for advancing said lead frame tape.

said means for advancing said lead frame tape comprising an advancing tape means and a locking tape means, and

a bonding station mounted on said support frame for bonding said flexible leads of said lead frame tape to said rigid device after said lead frame tape is advanced and positioned and locked in said said indexing station by said advancing tape means and said locking tape means,

said bonding station comprising a guide arm mounted on said support frame, a vertically movable bonding tool holder slidably mounted on said guide arm, lever actuating means pivotably mounted on said support frame, said lever actuating means comprising a cam follower engaging a drive cam and spring means for urging said cam follower into engagement with said drive cam, and a load cell connected to said spring means for indicating the spring force being applied to said vertically movable bonding tool holder during a bonding operation of said flexible leads to said rigid device.

3. Apparatus for simultaneously bonding a plurality of electrical conductive flexible leads on a sprocketed lead frame tape to a rigid device comprising:

a support frame,

a tape supply reel mounted on said frame,

a sprocketed lead frame tape on said supply reel,

a first metering sprocket for pulling said lead frame tape from said supply reel,

a tape take-up reel rotatably mounted on said frame,

a second metering sprocket for paying out said lead frame tape to said take-up reel,

an index station intermediate said metering sprockets comprising a housing and means for advancing said lead frame tape,

said means for advancing said lead frame tape comprising an advancing tape means and a locking tape means, and

a bonding station mounted on said support frame for bonding said flexible leads of said lead frame tape to said rigid device after said lead frame tape is advanced and positioned and locked in said indexing station by said advancing tape means and said locking tape means,

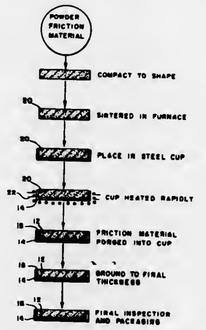
said index station further includes a tape guide shoe supported by said housing and having a contact surface thereon for engaging said lead frame tape at said flexible leads, and vacuum manifold means in said tape guide shoe for urging said flexible leads into a common horizontal plane parallel to the surface of said rigid device.

4,050,619

METHOD OF ATTACHING A FRICTION LINING TO A REINFORCING CUP

Walter R. Tarr, Green Island, N.Y., assignor to The Bendix Corporation, South Bend, Ind.

Filed May 4, 1976, Ser. No. 683,116
Int. Cl.[2] B23K *19/00*
U.S. Cl. 228—162 **6 Claims**



3. A method of manufacturing a brake pad assembly comprising the steps of:

placing a powder mixture of friction composition in a die;

compacting the powder mixture to form a preformed friction material;

conveying said preformed material through a furnace having a predetermined temperature to sinter said powder mixture;

removing said sintered preformed friction material from said furnace;

placing said sintered preformed friction material in a reinforcing cup;

rapidly heating said reinforcing cup to a predetermined temperature;

transferring the heated cup and sintered friction material to a press before significant thermal conduction takes place between said heated cup and said sintered friction material and

striking said sintered friction material and said heated cup with a single compressive blow to provide said friction material with a predetermined density and to establish a weld along the entire interface of said friction material and said retainer cup to produce said brake lining assembly.

4,050,620

METHOD OF WELDING A FRICTION MATERIAL TO A REINFORCING MEMBER

John P. Kwolek; William G. Urso, and Trevor D. Jones, all of Latham, N.Y., assignors to The Bendix Corporation, South Bend, Ind.

Filed May 4, 1976, Ser. No. 683,460
Int. Cl.[2] B23K *19/00*
U.S. Cl. 228—162 **6 Claims**



4. A method of manufacturing a brake pad comprising the steps of:

filling a mold with a copper base friction material;

densifying the copper base friction material in said mold;

placing the densified copper base friction material in a furnace;

raising the temperature in the furnace to sinter said copper base friction material;

removing the sintered copper base friction material from said furnace;

placing the sintered copper base friction material on a retainer;

heating said sintered copper base friction material and retainer until a uniform temperature between 1400° to 1900° F is reached; and

striking said heated retainer and sintered copper base friction material with a single compressive force to compact said copper base friction material to a predetermined density and to metallurgically bond said copper base friction material to said retainer.

4,050,621

METHOD AND APPARATUS FOR SOLDERING ELECTRIC TERMINALS TO DOUBLE-SIDED CIRCUIT BOARDS

Jean Claude Bouley, Dole, France, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

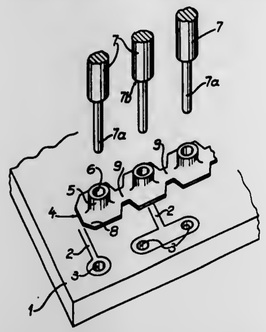
Filed Nov. 3, 1976, Ser. No. 738,220
Int. Cl.[2] B23K *1/02*; H05K *3/34*
U.S. Cl. 228—180 R **4 Claims**

1. A method for soldering elongate conductors perpendicular to a circuit board, comprising the steps of:

providing an elongate strip of fusable solder material comprising a plurality of interconnected sections each comprising a substantially flat base portion and a central portion protruding from one face of the base portion, each of said central portions defining a central opening through the base portion to receive an elongate conductor to be soldered to said board, and said base portions of adjacent sections being joined by neck portions of the solder material, said neck portions being narrower than said base portions;

placing said strip on a circuit board with said elongate con-

ductors passing through said openings in the strip at selected locations relative to the board; and

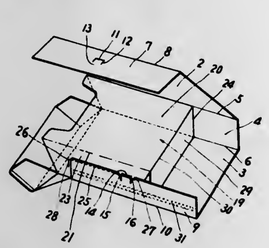


fusing said strip to sever said neck portions by surface tension of the fused solder material and to form each said section into a discrete meniscus about the conductor passing through said opening.

4,050,622
DRAWER-AND-SHELL TYPE CONTAINER WITH DRAWER STOP

Katsuji Shimada, 13-46-203, 2-chome, Nigawakita, and Katsuyuki Shimada, 13-46-203, 2-chome, Nigawakita, both of Takarazuka, Hyogo, Japan

Filed Aug. 31, 1976, Ser. No. 719,385
Claims priority, application Japan, Jan. 12, 1976, 51-2994
Int. Cl.² B65D 5/38
U.S. Cl. 229—19 **2 Claims**



1. A device for preventing a push-up drawer in an outer container from slipping out of the top or bottom of the container, said device comprising:

a drawer having a longitudinal slit through one side thereof, said slit being inclined at an angle with respect to the edges of said side and having an angled portion at the forward end of said slit; and

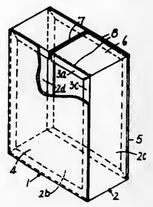
a shell folded around said drawer, the side of said shell, opposite the side of said drawer having said slit therethrough, having a tongue-shaped inserting piece cut therein and inserted into said longitudinal slit.

4,050,623
CONTAINING BOX FOR VARIOUS PRODUCTS

Giorgio Vacchi, Via G. Marconi, 7, Bologna, Italy

Filed June 25, 1976, Ser. No. 699,768
Int. Cl.² B65D 5/16, 5/32
U.S. Cl. 229—23 R **3 Claims**

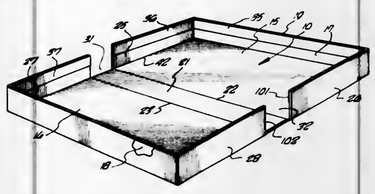
1. A containing box for various products comprising a strip of sheet material folded so as to form a peripherical rectangular element with a top wall, a bottom wall and side walls connecting said top and bottom walls, said peripherical element defining two opposite open faces and peripherical ribs circumscribing said open faces and folded towards the inside of the peripherical element and perpendicularly thereto, a pair of flaps having the same shape of said rectangular element and whose margins are jointed to said ribs thus determining closing of the open faces of the element, wherein according to the improvement the opposite ends of said strip abut each other to form a slit transversally crossing the top wall of said element and said closing flaps have their borders laterally defining said top wall connected together by a panel covering said top wall, a tearing portion being further provided in said top wall and in said covering panel adjacent to said slit and defined by perforation lines.



4,050,624
ONE-PIECE BOX WITH TAPERED SIDES AND METHOD OF MAKING SAME

Donald F. Williams, 15 West Mason St., P.O. Box 1527, Santa Barbara, Calif. 93102

Continuation of Ser. No. 287,045, Sept. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 241,320, April 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 163,789, July 19, 1971, abandoned. This application Nov. 29, 1974, Ser. No. 528,448
Int. Cl.² B65D 5/22
U.S. Cl. 229—33 **11 Claims**



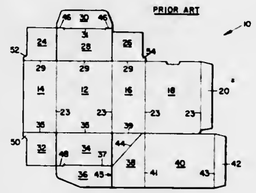
1. A one-piece folded box comprising a receptacle section having a bottom panel, a pair of spaced side flaps, a front flap and fold lines at the point of connection of said side flaps and front flap to said bottom panel; means fixing said front flap to said side flaps in folded and joined configuration at their mutual corners; a cover section having a lid panel, a pair of spaced side flaps, a front flap and fold lines at the point of connection of said side flaps and said front flap to said lid panel; means fixing said front flap and said side flaps in folded and joined configuration at their mutual corners; said side flaps of both said receptacle section and said cover section having a free edge opposite their respective fold lines; a hinge section including a hinge wall containing a pair of spaced fold lines each defining an active hinge, said hinge section connecting the receptacle and cover sections at said active hinges; means for reducing contact at closure between the cover and the receptacle side flaps to relieve that contact pressure resistance against maintaining proper closure of said cover section with respect to said receptacle section, said last-named means comprising

receptacle side flaps having a substantial portion of the depth between said free edge thereof and the respective fold lines of the receptacle section less than the between the fold lines of said hinge section; and means for arresting the closing cover short of enveloping the front flap of the receptacle section, said means for arresting comprising a hinge section having a greater depth than either of the front flaps, and at least one stop tab having a fold line connected to any one of said flaps, said bottom panel and said lid panel.

4,050,625
CARTON END CLOSURE AND REINFORCING CONSTRUCTION

Clifford Brant Rice, East Windsor, and David Paul Mastroianni, Ellington, both of Conn., assignors to Rice Packaging Inc., Ellington, Conn.

Filed Dec. 16, 1976, Ser. No. 751,466
Int. Cl.² B65D 5/06
U.S. Cl. 229—38 **2 Claims**



1. In a carton of the type comprising spaced front, rear and side panels, wherein a supplemental reinforcing panel is disposed within the carton immediately rearwardly of the front panel, with the supplemental reinforcing panel being hingedly connected to a first bottom dust flap which is hinged to one of the side panels, and a second bottom dust flap is hinged to the other of the side panels, and a bottom panel is hinged to the rear panel, the improvement which comprises, locking shoulders on the bottom dust panels and locking slots on the bottom panel, the locking shoulders being engageable with the locking slots for providing a double interlock on carton erection.

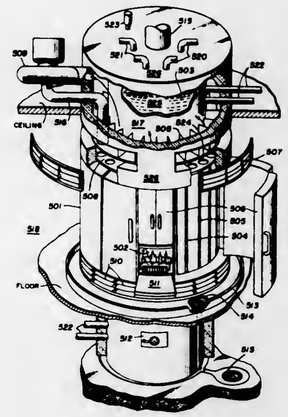
4,050,626
SUPPLEMENTAL HEAT AND HEAT TRANSFER SUBSYSTEMS FOR SOLAR AIR CONDITIONING SYSTEMS

Thomas Y. Awalt, Jr., 804 Poinciana Drive, Gulf Breeze, Fla. 32561

Filed Apr. 18, 1975, Ser. No. 569,556
Int. Cl.² F24D 3/00; F24J 3/02
U.S. Cl. 237—1 A **21 Claims**

1. A heating unit for space ambiant to said unit and for liquid medium heat storage comprising:

1. a combustion area;
2. a liquid circulating space providing circulation access to a first and second direct heat transfer means;
3. means proximate to said combustion area for a first direct transfer of heat of combustion from the area of combustion to the liquid medium in said circulating space;
4. Variably adjustable insulation shielding means for providing and controlling a second direct radiant heat transfer between the liquid medium within said circulating space and the ambiant space.
5. means proximate to the combustion area for a third direct heat transfer of heat of combustion to the ambiant space including radiant heat of combustion;
6. positive means, independent of combustion control, first heat transfer control and third heat transfer control and notwithstanding any inherent variable affect on amounts of heat in storage by the weather for substantially variably adjusting the amount of heat transferred by way of the second heat transfer whereby heat in excess of the comfort requirements of the living space may be conserved under variable conditions of weather and varying amounts of heat in storage without substantially diminishing the combustion potential for heat generation, the transfer potential for first direct heat transfer and the transfer potential for the third direct heat transfer.
7. feed and return means whereby liquid medium may be returned from the liquid circulating space to heat storage and fed from heat storage to the liquid circulating space;
8. circulation means within said circulating space whereby the liquid medium may circulate between the first and second direct heat transfer means, whereby the temperature of space ambiant to the unit may be regulated, to the extent permitted by the potential of the second direct heat transfer and the heat in storage, in the presence of and in the absence of combustion in the combustion area, and without substantially dimmishing the heat generating and storage potential of the first direct heat transfer, employing the liquid heat storage medium at varying temperatures by variably adjusting heat transfer between the liquid heat storage medium and the living space.



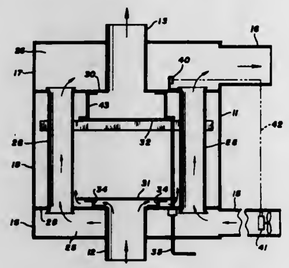
18. The method of heating a living space from a controlled heat source and storage of heat in liquid storage comprising the steps of intermittently heating a liquid in a first direct heat transfer from the controlled heat source to the liquid, heating the living space as required for comfort and conservation during heating of the liquid and during intervals in heating of the liquid by way of said first direct heat transfer in a second direct heat transfer between said liquid and said living space, and a third direct heat transfer between said heat source and said living space, said second heat transfer being controlled by an insulation shield which is substantially variably and independently of but coordinated with control of said controlled heat source, said third heat transfer, and variations in the amount of heat in said liquid storage, circulating the heated liquid during the first direct heat transfer to liquid storage to thereby store heat and, in the absence of first direct heat transfer, circulating the heated liquid from storage to the site of the first direct heat transfer for controlled heating of the living space as required through direct heat transfer.

4,050,627

ADJUSTABLE HEAT RECOVERY SYSTEM FOR FLUE STACKS

Joseph E. Mayer, Minnetonka, Minn., assignor to Kimball of Minnesota, Inc., Minneapolis, Minn.

Filed Aug. 20, 1976, Ser. No. 716,186
Int. Cl.² F24B 7/04
U.S. Cl. 237—55 4 Claims



1. Heat exchange means for use in combination with flue means conducted heated gases from a combustion zone and for extracting thermal energy therefrom; said means comprising:

a. casing means defining a enclosure with a central axis and having a first inlet and a first outlet generally concentric with said central axis for transmission of hot flue gas therethrough, and a second inlet and a second outlet for the transmission therethrough of fresh air to be heated, and fresh air inlet and outlet chambers at opposed ends of said casing and adjacent said second inlet and outlet respectively;

b. a heat exchange chamber therein and disposed between said opposed inlet and outlet chambers and having heat exchange conduits coupling said fresh air inlet chamber to said fresh air outlet chamber and extending through said heat exchange chamber about a generally annular zone spaced radially outwardly from the central axis of said heat exchange chamber, and radially inwardly from said casing means;

c. a pair of relatively movable baffle plates disposed within said heat exchange at opposed ends thereof and including a fixed baffle plate and a movable baffle plate with each of said baffle plates being disposed within said heat exchange chamber between said first inlet and first outlet and extending radially outwardly from said central axis to said annular zone for controlling the flow of hot flue gas out said heat exchange conduits, and radially outwardly of said annular zone;

d. baffle adjustment means for controllably positioning said movable baffle plate axially within said heat exchange chamber to define the axial length of said heat exchange conduits exposed to said heated flue gas between said heat exchange chamber inlet and said movable baffle.

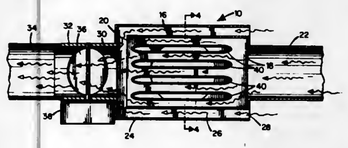
4,050,628

HEAT RECLAIMER

Andrew Kenneth, III, 9 Little Harbor Road, Woods Hole, Mass. 02543

Filed Jan. 28, 1977, Ser. No. 763,324
Int. Cl.² F24B 7/04
U.S. Cl. 237—55 4 Claims

1. Apparatus for reclaiming heat from and for controlling the flow of combustion gases passing through a flue from a heater to an exhaust stack, comprising: an inner housing having first inlet and outlet openings, said first inlet opening being adapted for connection to one section of said flue leading from said heater, whereby combustion gases from said heater will enter said inner housing through said first inlet opening and will exit from said inner housing through said first outlet opening; an outer housing at least partially surrounding said inner housing, said inner and outer housings being spaced one from the other to define an intermediate chamber therebetween which is in communication with said first outlet opening, a second outlet opening in said outer housing, said second outlet opening being in substantial alignment with said first outlet opening and being in communication with a damper housing which is in turn adapted for connection to another section of the flue leading to the exhaust stack; a plurality of conduit



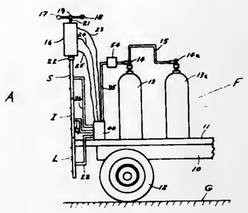
means spaced one from the other for directing a flow of ambient air through said inner housing, said conduit means having walls which receive heat from the combustion gases passing through said inner housing and which transfer said heat to said flow of ambient air; a second inlet opening in said outer housing, said second inlet opening being open to the ambient air; and a damper in said damper housing, said damper being adjustable between an open position allowing gases to flow through said damper housing and a closed position significantly retarding the flow of gases through said damper housing.

4,050,629

FLUID DISPERSION METHOD AND APPARATUS

Grady W. Query, 1725 Matthews Mint Hill Road, Matthews, N.C. 28105, and O. Grady Query, 768 Wakendaw Blvd., Mount Pleasant, S.C. 29464

Filed June 25, 1975, Ser. No. 590,219
Int. Cl.² A01C 23/00; B05B 17/04
U.S. Cl. 239—11 20 Claims



1. A method for dispersing a fluid in an area comprising:

a. determining the wind velocity of said area;

b. signalling through switching means, dependent on said wind velocity, to a plurality of solenoids;

c. distributing said fluid in said area through a plurality of valves controlled by said plurality of solenoids;

d. dispersing said fluid through a plurality of nozzles of a plurality of predetermined sizes; which are operatively associated with said plurality of valves;

e. arranging said plurality of nozzles into a plurality of nozzle assemblies, each of said plurality of nozzles being of a selected size; and

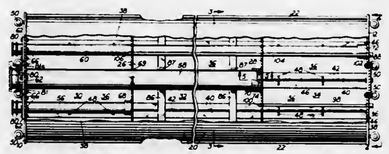
f. switching said plurality of valves in order to open said plurality of valves selectively for introducing a selected quantity of fluid into said area, which is proportional with said wind velocity.

4,050,630

COMPOSITE ELONGATED STEAM CHAMBER

Joseph H. Dupasquier, 5855 NW. Skyline Drive, West Linn, Oreg. 97068

Filed Aug. 1, 1975, Ser. No. 601,188
Int. Cl.² F26B 21/12; D21F 5/18; B05B 1/28
U.S. Cl. 239—121 3 Claims



1. A composite elongated steam chamber arranged to be mounted crosswise over a traveling wet mat and arranged to discharge steam down on the mat, comprising

a. elongated top, side, bottom and end walls forming a steam compartment,

b. a steam supply conduit leading into said compartment for directing steam into said compartment,

c. and means delivering steam to said conduit,

d. said bottom wall comprising upwardly and inwardly extending portions from each of said side walls extending the length of said chamber and at least one parallel substantially V-shaped trough also extending the length of said chamber between said inwardly extending portions,

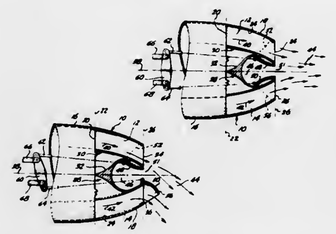
e. said inwardly extending portions and said V-shaped trough having adjacent upper terminal ends spaced a slight distance apart to form steam discharging slots extending the length of said chamber, said terminal ends being extended in opposite directions away from said slots and being rounded at said slots for providing rigidity to said inwardly extending portions and to said trough at said discharging slots and also providing quiet and low friction passage of steam therethrough.

4,050,631

JET ENGINE NOZZLE FOR CONTROLLING THE DIRECTION OF THRUST

Bjarne Elroy Syltebo, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 26, 1976, Ser. No. 670,633
Int. Cl.² B64C 15/06; F02K 1/20
U.S. Cl. 239—265.25 17 Claims



1. A jet nozzle for use with a jet propulsion engine for controlling the direction of the fluid discharged therefrom relative to a reference line extending rearwardly from said jet nozzle comprising:

outer housing means defining a fluid flow duct for rearwardly directing the fluid discharged by said jet engine, said outer housing means having an entrance orifice and an exit orifice;

bifurcation means mounted within said fluid flow duct for dividing said fluid flowing through said duct into first and second thrust producing fluid streams, said bifurcation means dividing said exit orifice into first and second spaced apart discharge orifices for respectively discharging said first and second fluid streams in a rearward direction, said bifurcation means defining a rearwardly opening cavity between said first and second discharge orifices, said duct in said housing means and said bifurcation means being so constructed and associated with one another to discharge said first and second fluid streams inwardly toward said reference line for impingement of said inwardly directed first and second fluid streams on each other at a location rearward of said discharge orifices, the interaction between said impinging first and second fluid streams re-directing said first and second fluid streams as a single rearwardly directed fluid stream that is substantially symmetrical about said reference line; and

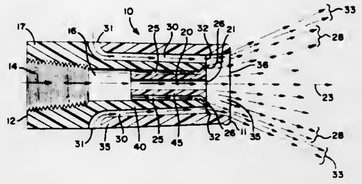
deflection means operable in a thrust vectoring mode of operation for angularly disposing said single thrust producing fluid stream relative to said rearwardly extending reference line, said deflection means operable from a stowed position within said rearwardly opening cavity of said bifurcation means to at least one deployed position wherein said deflection means extends into and intercepts at least one of said first and second fluid streams, each of said deployed position of said thrust vectoring mode redirecting the intercepted first and second fluid streams outwardly and away from said reference line for mergence with one another at a position rearward of said discharge orifices and outward of said reference line to form a single thrust producing fluid stream angularly disposed relative to said reference line.

4,050,632

LOW NOISE AIR NOZZLE

Harold G. Wyse, Dayton, Ohio, assignor to Gad-Jets, Inc., Dayton, Ohio

Filed Sept. 15, 1976, Ser. No. 723,435
Int. Cl.² B05B 1/34
U.S. Cl. 239—425 6 Claims



1. An air nozzle comprising:

a. a body,

b. means on said body for receiving a supply of compressed air,

c. means forming a central orifice having a discharge opening through said body on one side thereof and connecting to said compressed air receiving means for discharging a stream of compressed air through said central orifice opening,

d. means forming at least one secondary orifice having a discharge opening through said one side of said body adjacent to and surrounding said central orifice opening, said secondary orifice also connecting to said compressed air receiving means, and said secondary orifice opening being shaped to discharge compressed air therefrom in an outwardly expanding or diverging annular cone surrounding the stream of air from said central orifice,

e. means forming at least one tertiary air passage through said body, said tertiary air passage having an outlet through said one side of said body adjacent to and surrounding said secondary orifice discharge opening, and an inlet on the exterior of said body on another portion

thereof removed from said central, secondary, and tertiary discharge and outlet openings, and

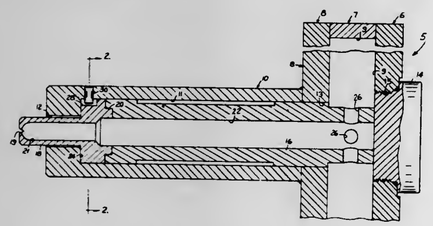
f. a shroud surrounding said central, secondary, and tertiary discharge and outlet openings and extending a predetermined distance outwardly therefrom to define a shroud outlet, said secondary discharge opening inducing a forward flow of low pressure air through said tertiary air passage from its inlet to its outlet as compressed air is discharged through said primary and secondary discharge openings, said flow of low pressure air accompanying and surrounding said compressed air discharges when said shroud outlet is not blocked, and said compressed air escaping from said nozzle by causing a reverse air flow through said tertiary air passage when said shroud outlet is blocked.

4,050,633

SPRAY BARS FOR METAL ROLLING

Richard B. Courson, Grosse Pointe Park, Mich., assignor to Almo Manifold & Tool Company, Center Line, Mich.

Filed Sept. 27, 1976, Ser. No. 726,985
Int. Cl.² B05B 1/14
U.S. Cl. 239—550 **10 Claims**



1. Improvement in a spray bar for metal rolling having a layered body and a plurality of spray nozzles carried thereon, said improvement comprising means providing access from the rear of said spray bar to said nozzles for servicing thereof, said means including for each nozzle an elongated housing fastened on said spray bar so that the former projects outwardly from the front face of the latter, an elongated member joined to said nozzle to form a cartridge nozzle which fits in said housing, and an access opening in the rear of said spray bar for inserting said cartridge nozzle into said housing or removing the same therefrom.

4,050,634

FIN TUBE DISTRIBUTION NOZZLE

John L. Sylvester, Santa Rosa, Calif., assignor to Ecodyne Corporation, Lincolnshire, Ill.

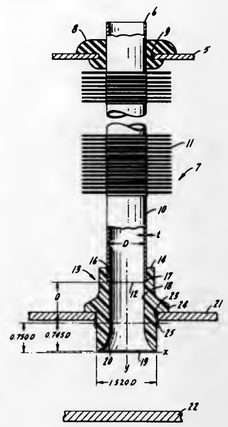
Filed May 20, 1976, Ser. No. 688,504
Int. Cl.² A62C 31/02
U.S. Cl. 239—601 **7 Claims**

1. An open ended nozzle for dispersing an umbrella-like spray from a thin film of liquid water flowing by gravity down a tube without creating sufficient back pressure to destroy such thin film, such tube having a predetermined wall thickness and an outside diameter sized to enable such tube to be received in an entrance opening at the upper end of said nozzle means for positioning said terminal end in said nozzle, the inner diameter of said nozzle being identical to the inner diameter of such tube for a distance equal to said tube outer diameter beginning at said terminal end, and the inner surface of the remainder of the cross sectional shape of said nozzle being defined by the following equation for an axial distance equal to 0.745 times said tube outer diameter:

$$x = \pm 0.875D - t - 0.5y - \sqrt{0.75Dy},$$

where

D = said outside diameter of such tube,
t = said wall thickness of such tube,



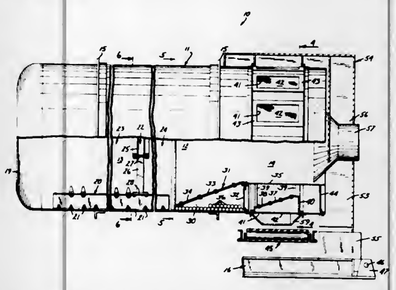
with the y axis being the longitudinal center line of said nozzle, and the x axis being located a distance equal to 1.750D from said tube terminal end, and the limits of the x axis being equal to the distance 1.520D centered on the y axis.

4,050,635

METHOD AND APPARATUS FOR RECLAIMING SAND

Edward E. Mueller, Tonka Bay; Thomas H. Painter, Bloomington, and Michael K. Harrod, St. Paul, all of Minn., assignors to Whirl-Air-Flow Corporation, Minneapolis, Minn.

Filed Aug. 19, 1976, Ser. No. 715,911
Int. Cl.² B02C 23/16
U.S. Cl. 241—24 **8 Claims**



1. Sand reclaiming apparatus comprising:

a. a longitudinal drum defining an internal chamber having first and second subchambers, said drum being mounted for rotation about a longitudinal axis;

b. means for rotating said drum;

c. inlet means communicating with said first subchamber;

d. a plurality of rib members located within said first subchamber and attached to the interior periphery of said drum, said rib members being spaced circumferentially therein and extending longitudinally of said drum;

e. partition means located within said first subchamber for dividing said first subchamber into first and second breaking zones, said partition means being constructed to permit only the passage of particles having a predetermined first maximum size therethrough;

f. a plurality of projection members attached to each of said rib members within said first breaking zone, said projection members extending inwardly within said drum;

g. first sizing means adjacent said second breaking zone for classifying material into a first part consisting of particles having a predetermined second maximum size and a second part consisting of oversized particles, said first sizing means in part defining a grinding zone containing a plurality of grinding balls;

h. second sizing means adjacent said grinding zone for further classifying the first part of material into a finished project and oversized particles;

i. first outlet means located in said second subchamber in communication with said second sizing means for discharging said finished product; and

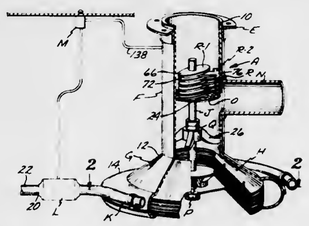
j. second outlet means located in said second subchamber in communication with said first and second sizing means for discharging said oversized particles.

4,050,636

ENERGY SAVING GARBAGE DISPOSAL UNIT

Clarence R. Possell, 4842 Viane Way, San Diego, Calif. 92110, and Robert J. Winkler, 2101 E. 4th St. No. 150, Santa Ana, Calif. 92704

Filed Mar. 29, 1977, Ser. No. 782,368
Int. Cl.² B02C 18/42
U.S. Cl. 241—46 B **12 Claims**



1. A garbage disposal unit of the type that includes a cylindrical shell that has upper and lower ends and is disposed in a substantially vertical position below a drain opening in a sink and said upper end in communication with said drain opening, said shell having a masticated garbage outlet intermediate said upper and lower ends that is in communication with a waste line, said garbage disposal unit being characterized by being driven by pressurized water from a source thereof adjacent said unit including:

a. garbage masticating means in said cylindrical shell, said garbage masticating means including a first bladed rotatable portion and a second bladed stationary portion secured to the interior surface of said cylindrical shell, said second portion defining a plurality of transverse spaces through which said first bladed rotatable portion rotates, said masticating means positionally mounted adjacent and in communication with said waste line, a first portion of said garbage being masticated, passing from said masticating means and a second portion of said masticated garbage passing below said mastication means;

b. a housing displaced below said shell and in communication with said lower end thereof, said housing defining a circular confined space;

c. a plurality of axially aligned turbine discs rotatably supported in said circular confined space below said masticating means, said discs being frusto-conical in contour having at least one set of axially aligned openings formed therethrough, aid frusto-conical contour defining an upward flow direction of water subsequent to said water interfacing with said turbine discs, said discs defining a plurality of radially extending spaces therebetween of sufficiently narrow width as to impose substantial drag on a stream of pressurized water flowing therethrough;

d. first means in communication with said source of pressurized water being coupled to said housing for providing at least one high velocity jet of water inside said housing that impinges on said turbine blades at an angle to subsequently flow through said radially extending spaces at a reduced velocity and an increased pressure to impart rotational energy to said turbine blades prior to exiting from said turbine blades through said axially aligned openings defined thereby, with said water after exiting through said opening flowing upwardly in said shell to said garbage masticating means to flush masticated garbage outwardly through said discharge opening, said exiting water to contact said first and second portions of said garbage for removal into said waste lines;

e. second means for transferring the rotational energy of said turbine blades to said first rotatable portion of said masticating means;

f. third means in said shell for preventing garbage that has not been masticated from moving downwardly in said shell substantially below said masticating means; and,

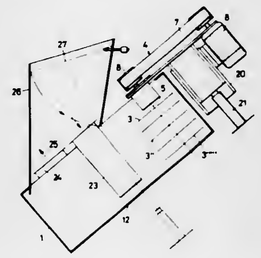
g. fourth means operatively associated with said first means and manually operable to control the flow of water from said pressurized source of water to said circular confined space in said housing, said fourth means including a first valve in communication with said pressurized water, said housing and a second normally closed valve, said second valve being manually operable to control flow from said source through said first valve and into said housing.

4,050,637

PULVERIZING APPARATUS WITH A TOOTHED DISC

Wilhelm Eirich, Bahnhofstr. 19, and Gustav Eirich, Walldurnerstr. 41, both of Hardheim, Germany

Filed Jan. 21, 1976, Ser. No. 650,904
Claims priority, application Germany, Jan. 29, 1975, 2503621
Int. Cl.² B02C 23/24
U.S. Cl. 241—56 **16 Claims**



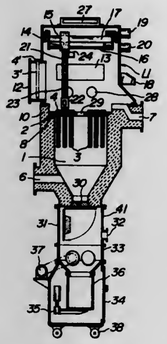
1. An apparatus for pulverizing elastic, viscous and bulky materials, refuse and other waste materials, comprising a high-speed driven container having at least one eccentrically disposed high-speed tool, said tool having a shaft disposed approximately parallel with the axis of the container and provided with a plurality of spaced apart toothed discs the plane of each disc being transverse to the tool shaft and which partially dips into the material present at the container wall, and in that the high-speed tool is radially displaceable in the container and rotates in a direction opposite to that of the adjacent container wall.

4,050,638

RADIOACTIVE MATTER CONTAINING WASTE GAS TREATING INSTALLATION

Isao Ito, Nagoya, and Yoichi Karita, Handa, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Apr. 21, 1975, Ser. No. 570,079
Claims priority, application Japan, Apr. 24, 1974, 49-45926; May 8, 1974, 49-51738; May 8, 1974, 49-50809
Int. Cl.² G21C *19/14*
U.S. Cl. 241—222 **11 Claims**



1. A radioactive matter containing waste gas treating installation comprising, in combination:

A. a ceramic filter element exchange device including;

1. an air-tight box means with a filter element supplying box having a sight glass
2. a traveling crane means driven by a driving shaft means arranged in the upper part of the box means, and
3. a lifting means carried by the frame means for suspending a chuck for holding a filter element and raising and lowering said element, to exchange it for a new element and;

B. a spent ceramic filter treatment system including;

1. a spent ceramic filter receiving chamber having an upper dimension with a bottom plate, said bottom plate openable and closeable in an air-tight manner
2. a crusher chamber, the top of which is defined by said bottom plate and including crusher means for pulverizing said filter element and,
3. a container means located closely adjacent to the bottom of the crusher means for receiving crushed pieces.

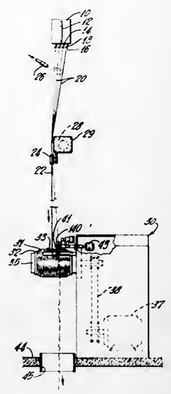
4,050,639

METHOD AND APPARATUS FOR ADVANCING STRAND

Robert R. Jackson, Aiken, S.C., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 5, 1976, Ser. No. 646,740
Int. Cl.² B65H *54/02, 54/86*
U.S. Cl. 242—18 G **8 Claims**

1. In an apparatus for advancing continuous glass strand wherein a winder collects the strand into a wound package, wherein a pair of rotatable rolls cooperate to advance the strand therebetween during times the strand is not collected on the winder and wherein at least one of the rolls is rotatably driven, the improvement comprising:



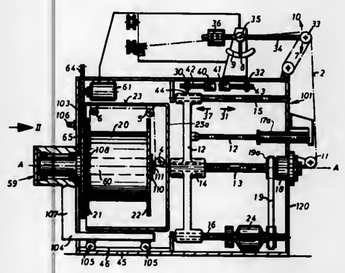
a plurality of helical teeth extending outwardly from each of the rolls adapted to concurrently advance the strand from the rolls and move the strand laterally between the rolls.

4,050,640

APPARATUS FOR WINDING WIRE AND THE LIKE

Werner Henrich, Horbach, Germany, assignor to Firma Henrich KG, Horbach, Germany

Continuation-in-part of Ser. No. 432,360, Jan. 10, 1974, abandoned. This application Aug. 26, 1975, Ser. No. 608,001
Claims priority, application Germany, Jan. 13, 1973, 2301594
Int. Cl.² B65H *54/02*
U.S. Cl. 242—25 R **3 Claims**



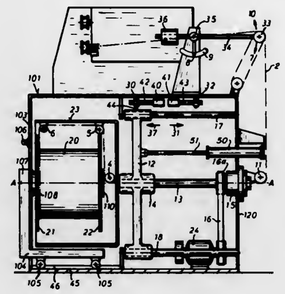
1. An apparatus for winding at a high speed a strand, such as wire, cable, rope and the like, upon a spool comprising means for fixedly supporting thereon a spool upon which a strand is to be wound, a rotatably mounted flyer movable around the spool to wind the strand thereon, said flyer comprising a cylindrical frame having a closed end and enclosing the spool and having roller means within the frame on the inner face thereof for guiding the strand entering the flyer at its rotary axis to the spool such that outward movement of the strand within the rotating flyer is limited by the inner face of the frame, means for rotating said flyer around said spool in a direction, said roller means comprising at least one guide roll rotatably mounted on said flyer to guide the strand during winding, and fan blades on said guide roller whereby air currents created by the rotation of the flyer cause the fan blades to rotate the roller.

4,050,641

APPARATUS FOR WINDING WIRE

Werner Hearich, Horbach, Germany, assignor to Firma Henrich KG, Horbach, Germany

Continuation-in-part of Ser. No. 427,327, Dec. 21, 1973, abandoned. This application Sept. 4, 1975, Ser. No. 610,408
Claims priority, application Germany, Dec. 22, 1972, 2262844
Int. Cl.² B65H *75/00*
U.S. Cl. 242—47 **6 Claims**



1. An apparatus for winding a strand, such as wire, cable, rope and the like, upon a spool comprising means for fixedly securing thereon a spool upon which the strand is to be wound, a rotatably mounted flyer movable around the spool to wind the strand thereon, and means for reciprocating said flyer between two end points in a direction parallel to the axis of the spool to wind the strand upon the spool and to control the axial movement of said flyer to wind the strand on the spool in uniform layers, said flyer comprising a cylindrical frame having a closed end and enclosing the spool at one of said end points, a hollow rotatable shaft attached to said frame closed end and the strand entering the closed end of said frame at the rotary axis to the spool through said hollow shaft, a plurality of rollers within the frame on the inner face thereof for guiding the strand entering the flyer such that outward movement of the strand within the rotating flyer resulting from centrifugal force is limited by the inner face of said frame whereby breaking of the strand is prevented and the strand is enclosed within said hollow shaft and frame during winding on the spool.

4,050,642

WINDING OR REWINDING FILM

Takuma Katsumata, Inazawa; Koji Kato, Aichi; Hisao Kishigami, Toki, and Noriyasu Kuroda, Nagoya, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

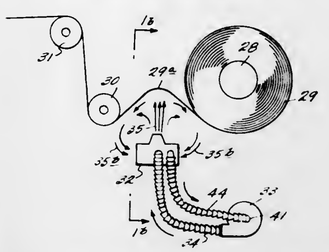
Filed Oct. 8, 1975, Ser. No. 620,916
Claims priority, application Japan, Nov. 13, 1974, 49-130616
Int. Cl.² B65H *75/02, 23/16*
U.S. Cl. 242—55 **1 Claim**

1. Apparatus for winding or rewinding a film comprising:

a spool;

a roll positioned adjacent said spool for guiding film being wound or rewound on the spool;

means for directing pressurized air against a surface of the film located between said spool and the guide roll and for collecting said air by suction on the same side of the film as said surface, said means including at least one nozzle formed to direct onto said film surface, and beyond the



edges thereof, a jet of air which is elongated transversely of the length of said film.

4,050,643

EXPANDABLE CORE-SHAFTS

Arthur D. Secor, Luna Pier, Mich., assignor to Great Lakes Industries, Inc., Toledo, Ohio

Filed May 15, 1975, Ser. No. 577,777
Int. Cl.² B65H *75/24*
U.S. Cl. 242—72 R **18 Claims**



1. A self-contained hydraulically expandable core-shaft having a closed fluid system comprising:

A. a shaft having a longitudinal manifold duct therein with a chamber at one end thereof and a plurality of radially extending ducts therealong,

B. a piston in said chamber to form a master cylinder,

C. a substantially stable liquid in said cylinder and said ducts,

D. separate rams at the outer ends of said radially extending ducts for projecting outwardly from the circumference of said shaft to grip the inside of a core surrounding said shaft,

E. separate diaphragm means in said radially extending ducts between the inner ends of each of said rams and said liquid in said radial ducts, whereby leakage of said liquid is prevented around said plungers regardless of the liquid pressure and variations in torque on said shaft by said core,

F. mechanical means for operating said piston in said master cylinder to pressurize said liquid to operate said rams,

G. resilient means for normally urging said rams inwardly of the circumference of said shaft, and

H. contractable and expandable means connected to said manifold ducts in said shaft for limiting and maintaining an upper maximum pressure up to about 1000 psi in said system that can be applied to said diaphragms.

4,050,644

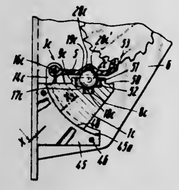
INERTIA RESPONSIVE CONTROL DEVICE

Artur Fohl, Schelmenwasenstr. 68, 7061 Haubersbronn, Germany

Filed Jan. 20, 1975, Ser. No. 542,381
Claims priority, application Germany, Jan. 22, 1974, 2402921
Int. Cl.² A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.4 A **19 Claims**

1. An inertia operated control device, especially for use in a vehicle for effecting locking of a vehicle safety belt when the vehicle acceleration exceeds a predetermined limit, said device

comprising in combination: an inertia element in the form of a ball movable toward several sides from stable rest positioning thereof, a control element pivotally supported at a point spaced generally horizontally from said ball and extending over said ball and having a region resting on top of said ball, a member on which the ball rests and having a recess including an opening with limiting edges forming a response threshold for the ball and located approximately in one plane relative to which the ball is disposed which distance between opposite



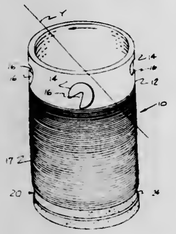
limiting edges of the opening is less than the radius of the ball, and wherein the maximum lift height of the ball corresponds to the depth of engagement of the ball in the recess, means limiting the movement of the ball on said member so the center of gravity of the ball is located always within the limiting edges, and means operated by upward tilting of said control element as brought about by movement of the ball on said member toward limiting edges of said recess for accurate and highly sensitive initiating of a locking control function as to a safety belt.

4,050,645

YARN CARRIER

Robert L. Burchette, Jr., Spartanburg, and Edward J. Harris, Clemson, both of S.C., assignors to Plastic Injectors, Inc., Spartanburg, S.C.

Filed Oct. 8, 1975, Ser. No. 620,561
Int. Cl.² B65H *75/28*
U.S. Cl. 242—125.1 **10 Claims**



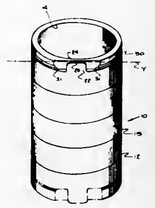
1. An improved yarn carrier comprising:
a. an elongated tubular body;
b. yarn hook means provided on said body adjacent, but away from an end thereof, said yarn hook means being engageable with a yarn passing thereby to initiate wrapping same around said body; and
c. a transfer tail receiving groove extending around said body, adjacent, but away from an opposite end of said body to said yarn hook means, said groove being defined by a sloped inner wall with respect to said opposite end of said carrier, an outer wall with respect to said opposite end of said carrier, said outer wall being generally perpendicular to an outer surface of said body and a bottom wall connecting said inner and outer walls and defining a yarn receiving surface, said groove having a height greater than the depth from the outer surface of the body to the yarn receiving surface.

4,050,646

YARN CARRIER

Robert L. Burchette, Jr., 570 El Paso St., Spartanburg, S.C. 29303

Filed Dec. 5, 1975, Ser. No. 638,141
Int. Cl.² B65H *75/28*
U.S. Cl. 242—125.1 **7 Claims**



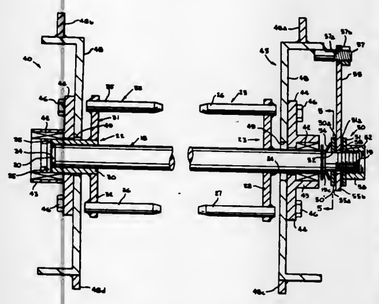
1. An improved yarn carrier comprising a tubular, open ended cylindrical body, said body having at least one yarn receiving slot extending axially therealong, said slot being sized to permit a yarn to pass freely therethrough, said body further having a circumferentially extending groove located at the base of said slot and communicating directly with said slot to receive a yarn transfer tail therein, said groove being defined by a sloped inner wall with respect to a nearest adjacent end of said carrier, an outer wall with respect to said nearest adjacent end of said carrier that is generally perpendicular to a peripheral surface of said body, and a bottom wall connecting said inner and outer walls and defining a yarn receiving surface, said groove having a height greater than the depth from the peripheral surface of the body to the yarn receiving surface.

4,050,647

SUPPORT WITH DRAG ARRANGEMENT

Richard L. Linam, League City, Tex., assignor to Kelso Marine, Inc., Galveston, Tex.

Filed Apr. 5, 1976, Ser. No. 673,587
Int. Cl.² B65H *49/00*
U.S. Cl. 242—129.8 **3 Claims**



1. A spool support bearing arrangement for feeding a continuous strand of welding rod including:
a. shaft means;
b. laterally extending means mounted on said shaft means and spaced from one end thereof;
c. spindle means mounted on said laterally extending means and extending in a plane spaced from and parallel to the longitudinal axis of said shaft means;
d. tubular housing means for receiving the other end of said shaft means;
e. a lateral extension on said tubular housing means;

f. spindle means mounted on said lateral extension and extending in a plane spaced from and parallel to the longitudinal axis of said tubular housing means;
g. said spindle means on said lateral extension and on said laterally extending means extending toward each other in the same plane and terminating in spaced relation;
h. means for positioning said tubular housing means with said shaft means;
i. longitudinally spaced bearing means for supporting said tubular housing means and shaft means to accommodate rotation thereof;
j. cooperating friction brake means mounted adjacent one end of said shaft means and on said bearing arrangement adjacent thereto for restraining rotation of said shaft means.

4,050,648

THREAD STORAGE AND DISPENSING SYSTEM

Stevan Tisma, Niles, Ill., assignor to John O. Butler Company, Chicago, Ill.

Filed Nov. 22, 1976, Ser. No. 743,693
Int. Cl.² B65H *75/14, 49/00*
U.S. Cl. 242—129.8 **9 Claims**



1. A thread holder comprising a two part shell, one of part of the holder shell including an integral central post coaxially located therein to enable a rotation of a bobbin mounted on said post, bobbin means having a hub region containing a split cylinder with a C-shaped cross section, said cross section embracing said central post, and means in said cross section for contacting and dragging with predetermined friction against the central post, the friction being great enough to prevent an unwanted and random unwinding of the thread from said bobbin and yet small enough to preclude any substantial opposition to a desired withdrawal of thread.

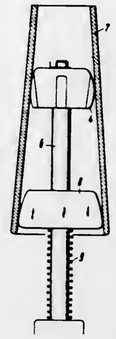
4,050,649

CREELING DEVICE FOR BOBBINS

Walter Haag, Weil der Stadt, Germany, assignor to Albert Haag KG, Weil der Stadt, Germany

Filed May 17, 1976, Ser. No. 686,950
Claims priority, application Germany, May 17, 1975, 7515903[U]
Int. Cl.² B65H *49/02; D03J 5/08*
U.S. Cl. 242—130.1 **5 Claims**

1. A creeling device for textile bobbins, especially for bobbins with conical sleeves, having an interior of differing tapering angle, consisting of a spindle upon which a clamping member of elastomeric synthetic material positively frictionally engaging the interior is arranged having a central section with an outer circumference as well as an axis and resilient ribs distributed outwardly away from though extending axially of the outer circumference of said central section in radially spaced relationshup thereto, said central section including



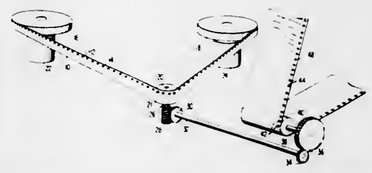
means for limiting the radially inward movement of said ribs resiliently toward the axis of said central section.

4,050,650

SYNCHRONATED INDEX FILM DRIVE MECHANISM

Edward R. Wadleigh, Star Route Box 279, Hemet, Calif. 92343

Filed Jan. 5, 1976, Ser. No. 646,708
Int. Cl.² G03B *23/12, 1/04;* G11B *15/32*
U.S. Cl. 242—206 **6 Claims**



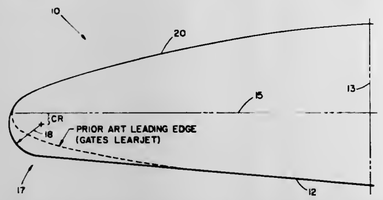
5. In a microfilm viewer or the like including: a microfilm supply reel, a microfilm take up reel, means for rotatably mounting said reels at spaced apart locations, a microfilm coupled at respective ends to said supply reel and said take up reel and reelable therebetween, motor means for selectively driving said reels to effect microfilm movement bidirectionally between said reels, the improvement comprising:
a data film capstan mounted on a shaft for rotation about an axis parallel to the axis of said reels and in periheral engagement with said mircofilm at a point intermediate of said reels,
an index film mounted within said viewer for movement, said index film carrying an index data corresponding to the microfilm data and adapted for viewing during movement of said index film,
an index film capstan mounted on a shaft for rotation about its axis and in peripheral contact with said index film for driving said film, and
geared transmission shaft means mechanically coupling the shaft of said data film capstan and that of said index film capstan for rotation of said index film at a slower speed than that of said data film;
whereby, energization of said motor means and movement of said data microfilm causes said data microfilm to directly drive through said gear transmission shaft means, said index film capstan and said index film in contact therewith at a speed permitting the index data to be visibly read from said moving index film during microfilm movement.

4,050,651

WING AND REDUCED AIRSPEED SYSTEM FOR JET AIRCRAFT

Ronald D. Neal, Wichita; Richard Ross, Sedgwick, and Joseph N. Hein, Wichita, all of Kans., assignors to The Gates Rubber Company, Denver, Colo.

Filed June 24, 1976, Ser. No. 699,391
Int. Cl.² B64C *13/16, 3/10*
U.S. Cl. 244—15 **13 Claims**



13. In a linearly tapered wing of the thin, high speed type having an airfoil section with a root cord of 100% length and a tip cord length as a fraction of the root cord length to define a taper ratio, and upper and lower surfaces defined as fractions of a cord length, the improvement comprising:

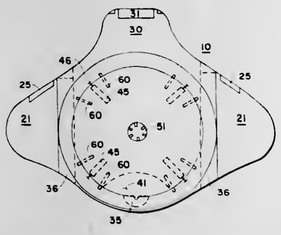
a contoured leading edge having a substantially constant radius dimension selected from the range of about 0.0070 to about 0.0129 of the tip cord divided by the taper ratio, the leading edge radius substantially tangent with the upper surface of the wing and the leading edge fared into the lower surface of the wing within a range of about 6 to about 15 percent of a cord.

4,050,652

GYRO FOIL

Vincent D. DeToia, Bronx, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed July 26, 1976, Ser. No. 708,345
Int. Cl.² B64C *29/00*
U.S. Cl. 244—23 C **1 Claim**



1. An air vehicle formed of a fixed structure to which one of a pair of solid rotatable convex discs is rotatably mounted externally above, and the other of a pair of said discs rotatably mounted externally below said fixed structure about a common vertical axis for providing stability and lift to said structure, together with means to rotate each disc with respect to the said structure in counter-rotating directions relative to each other, in which

the fixed structure is fitted with wings and a tail section that extend beyond the discs, and in which

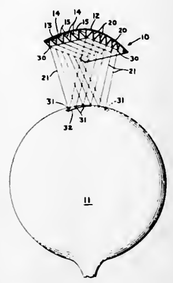
each disc is formed with a through concentric opening joining a through concentric opening in the fixed structure through said vertical axis, with the internal walls of said openings in the discs and fixed structure fitted with turbine blades to generate lift when the discs are rotated, and with the external surface of each disc shaped to provide aerodynamic lift characteristics when rotated.

4,050,653

BALLOON

Bernard Sayers, Sharp Lane, Newport, N.J. 08345

Filed Mar. 15, 1976, Ser. No. 666,889
Int. Cl.² B64B *1/40*
U.S. Cl. 244—32 **1 Claim**



1. An improved balloon comprising: a main portion for the containment therein of an inflating medium; and an airfoil-shaped member attached to the top surface of said main portion, said airfoil-shaped member comprising a curved skin having a mouth portion, a plurality of longitudinally extending partitions each having a first side member and a second side member, each first side member and each second side member having a first edge attached together to form a line of suspension and a second edge attached to the undersurface of said curved skin, said second edge of said first side member being spaced from said second edge of said second side member in a direction transverse to the longitudinal direction, each said line of suspension having a plurality of loops formed thereon, said plurality of loops of each line of suspension being spaced equally apart in the longitudinal direction, and a plurality of strings for said plurality of loops of each line of suspension, each string having a first end attached to one of said plurality of loops and a second end attached to said top surface of said main portion of said balloon, each of said plurality of partitions comprising a plurality of triangular-shaped reinforcements for each of its first and second side members, said second ends of those strings lying in the same transverse plane being attached to said top surface of said main portion of said balloon at the same point thereon and the points of attachment of said second ends forming a straight line, said top surface of said main portion of said balloon having a reinforcing plate thereon for the attachment of said second ends of said plurality of strings to said points.

4,050,654

HANG GLIDER

Ronald A. Heckman, 88 Crest Road, East, Rolling Hills, Calif. 90274

Filed Dec. 27, 1976, Ser. No. 754,572
Int. Cl.² B64C *3/40*
U.S. Cl. 244—49 **10 Claims**

1. A foot-launched, lightweight, person-carrying wing comprising:

a keel,

right and left leading edge members pivotally connected at their forward ends to the forward end of said keel,

a master hinge bracket slidable on said keel,

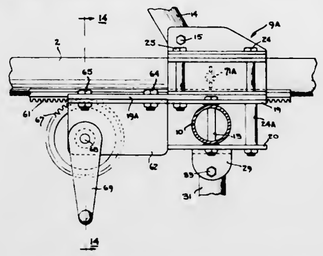
right and left cross brace members pivotally connected at their inner ends to said bracket and at their outer ends respectively, to said right and left leading edge members,

a king post pivotally connected to said bracket and extending upwardly and rearwardly therefrom,

said keel, leading edge members and cross brace members forming a frame,

a control bar pivotally connected to said bracket and having a right and a left leg which extend downwardly and outwardly from said bracket, and a base connecting the ends of said legs,

flexible cables connecting the lower end of the right leg of said control bar to, respectively; the front end of said keel, the rear end of said keel, and the outer end of said right cross brace member,



flexible cables connecting the lower end of the left leg of said control bar to, respectively; the front end of said keel, the rear end of said keel, and the outer end of said left cross brace member,

flexible cables connecting the top of said king post to; the front end of said keel, the rear end of said keel and the outer ends of said right and left cross brace members,

a wing sail covering said frame and connected to said leading edge members along their entire length and to the rear portion only of said keel,

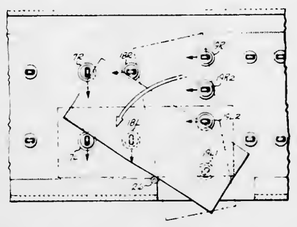
said bracket being movable (a) forwardly to pivot said leading edge members inwardly, said king post downwardly and said control bar upwardly to collapse said frame and (b) rearwardly to erect said frame into operative position.

4,050,655

CARGO LOADING METHOD AND APPARATUS

Robert Edgar Bogue, Seattle; Donald Keith Jones, Bellevue; Ray Vere Riggs, Seattle, and Bruno Joseph Vogele, Kirkland, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed June 1, 1976, Ser. No. 691,650
Int. Cl.² B64C *1/22*
U.S. Cl. 244—137 R **2 Claims**



1. In a cargo carrying airplane having a floor adapted to carry cargo containers which are longer than the width of the cargo floor, and having a side loading cargo doorway having a forward edge, and having an attenuated pivot-stop disposed at the forward edge of the doorway and protruding above the floor, the cargo floor having disposed therein a plurality of steerable, reversible, retractable, extendible cargo drive rollers including a first, second, third and fourth of the cargo drive rollers being disposed in a line across the width of the cargo floor at a first body station at the center of the doorway and spaced substantially equally from each other and the sides of the floor, the fifth and sixth of a cargo drive rollers being disposed at a second body station forward of the first station by a distance approximately one-half of the floor width, each of said fifth and sixth rollers being located inwardly from a side of the floor by a distance approximately one-fourth of the floor width, and a seventh and eighth of the cargo drive rollers at a third body station forward of the fifth and sixth cargo drive rollers by a distance approximately one-third of the floor width, a method of loading the cargo containers comprising the steps of:

steering said first, second, third and fourth cargo drive rollers in an athwartship direction perpendicular to the longitudinal axis of the fuselage;

powering said first, second, third and fourth rollers to drive a cargo container into the airplane and across said floor;

steering said drive rollers so that the three of said first, second, third and fourth rollers farthest from said doorway are aligned in a direction parallel to the longitudinal axis of the fuselage and retracting the fourth of said drive rollers which is the drive roller nearest the doorway and so that the sixth drive roller which is the drive roller of said fifth and sixth drive rollers farthest from the doorway is aligned in said parallel direction and said fifth drive roller is aligned in said athwartship direction, and so that said seventh and eighth drive rollers are aligned in said athwartship direction; powering said rollers so that said rollers aligned in said parallel direction are driving forwardly, and so that said rollers in said athwartship direction are driving towards the side of the fuselage adjacent said doorway, so that the cargo container is driven against said pivot-stop and is pivoted around said pivot-stop so that the length of said cargo container is aligned fore and aft and positioned on the side adjacent said doorway half of said cargo floor; and

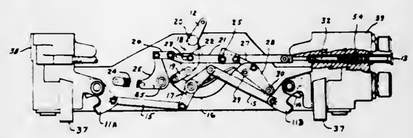
moving said cargo container into its intended location on said floor.

4,050,656

EJECTOR RACK

Paul F. Peterson, Rancho Palos Verdes, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 17, 1976, Ser. No. 687,283
Int. Cl.² B64D *1/02*
U.S. Cl. 244—137 R **6 Claims**



1. An ejector rack for releasably supporting, and selectively ejecting forcibly, a store from an aircraft, wherein said store has a plurality of lugs from which said store is removably engaged with and to said ejector rack, comprising:

a. means for releasably supporting said removably engaged store by said store lugs, wherein said means for releasably supporting said store includes:

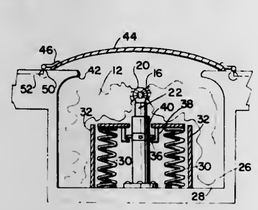
1. two oppositely disposed hooks configurated and dimensioned to accept and to removably engage said store by said store lugs, with said hooks at a preselected distance from each other;

2. suitably dimensioned and configurated linkage disposed between, and interconnecting, said oppositely disposed hooks, whereby said hooks are responsive simultaneously to any movement of said interconnecting linkage;

3. means, connected to said interconnecting linkage, for moving the interconnecting linkage to effect simultaneous movement of said hooks upwardly to close said hooks and thereby to removably engage said store and said store lugs by said hooks, and also to effect simultaneous movement of said hooks downwardly to open said hooks and thereby to disengage and to release said store lugs and said store from said hooks, wherein said interconnecting linkage moving means includes a selectively useable manually operated release handle;
4. means, connected to said interconnecting linkage for selectively preventing any movement of said interconnecting linkage, wherein said interconnecting linkage movement prevention means includes a manually operated safety lock assembly;
5. and, means, connected to said interconnecting linkage moving means, for preventing acceleration forces from acting on said interconnecting linkage moving means and inadvertently causing said interconnecting linkage moving means to move said interconnecting linkage to open said hooks and thereby to disengage and to release said store lugs and said store from said hooks, wherein said inadvertent release prevention means includes a counterbalance assembly;

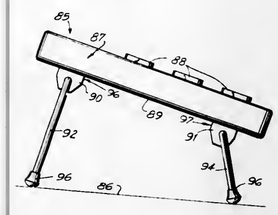
b. means for selectively ejecting said store forcibly, with said ejection means operatively associated with said support means;
c. and, means for attaching said support means and said ejection means to said aircraft.

4,050,657
AIRCRAFT PARACHUTE SAFETY SYSTEM
Philip Murphy, 902 Elm St., Alexandria, Minn. 56308
Filed Sept. 8, 1976, Ser. No. 721,426
Int. Cl.² B64D *17/70, 17/80*
U.S. Cl. 244—139 **2 Claims**



2. An aircraft parachute mechanism comprising:
a. wall means defining a compartment within an upper surface of the fuselage of said aircraft for housing said parachute mechanism, said wall means including a generally cylindrical wall and a base plate element;
b. cover means removably affixed to said fuselage above said compartment;
c. ejector means in said compartment including a horizontally disposed ejector plate member and means yieldingly urging said ejector plate member in an upward ejecting direction, said ejector plate member having a central opening therethrough;
d. a shock absorber having one end affixed to said base plate element and another end extending through said central opening;
e. a parachute stored in said compartment;
f. a plurality of shroud lines connected at one end to said parachute and at the other end to said shock absorber;
g. a remote controlled rotatable sheath on said shock absorber;
h. and cooperating flanges on said sheath and said ejector plate member for releasably holding said ejector plate member against parachute ejecting movements.

4,050,658
FOLDING STAND
Tracy H. Forman, 51 Summit Road, Parsipanny, N.J. 07054; Nat H. Herskowitz, 47 Bannehr St., Oakland, N.J. 07436, and Arthur E. Lawida, 28 Gabriel Way, Westwood, N.J. 07675
Division of Ser. No. 574,956, May 6, 1975, Pat. No. 3,984,074.
This application Apr. 14, 1976, Ser. No. 676,819
Int. Cl.² F16F *15/00*
U.S. Cl. 248—13 **1 Claim**

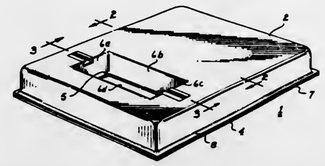


1. In a calculator, or the like, for imparting visual information to a viewer, a housing, internal electronic calculating means disposed within said housing for providing information to a viewer in response to input signals, said housing including foldable means for positioning said calculator upon a surface at an angle with respect to said surface such that the calculator may be operated in a conventional manner without slipping being induced as between the calculator and the surface upon which it is supported, said folding means comprising a first elongated supporting frame member extending from a left side to a right side, a first generally U-shaped leg assembly supported for pivotal movement between support and retracted positions by said first supporting frame member, said leg assembly including transversely spaced friction surfaces for engaging a surface upon which the calculator is to be positioned during use, said first supporting frame member including groove means within which said first leg assembly pivotally moves, said folding means comprising a second elongated supporting frame member extending from a left side to a right side, a second generally U-shaped leg assembly supported for pivotal movement between support and retracted positions by said second supporting frame member, said leg assembly including transversely spaced friction surfaces for engaging the surface upon which the calculator is to be positioned during use, said second supporting frame member including groove means within which said second leg assembly pivotally moves, first fastening means for holding said first frame member to the underside of the calculator housing at a first location, second fastening means for holding said second frame member to the underside of the calculator housing at a second location spaced from said first location, the length of said first leg assembly being greater than the length of said second leg assembly in order to create said angle of operation.

4,050,659
TRANSFORMER PAD
Ralph C. McCannon, 3841 W. Vista Ave., Phoenix, Ariz. 85021, and Jimmie D. Dixon, 4405 W. Berridge Lane, Glendale, Ariz. 85301
Filed June 30, 1971, Ser. No. 158,383
Int. Cl.² H02B *5/00;* **B65A** *19/24*
U.S. Cl. 248—19 **3 Claims**

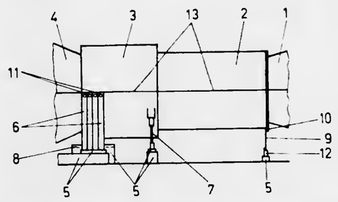
1. A pad for supporting an electrical transformer over a planar surface, said pad comprising in combination:
a. a high density upper surface of fiberglass reinforced plastic material, said upper surface defining a partially enclosed volume;
b. a high density lower surface of fiberglass reinforced plastic material, said lower surface being secured to said upper surface and fully enclosing the internal volume defined by said upper surface;

c. an internally disposed passageway through said fully enclosed volume for providing physical access between said transformer and said planar surface, said passageway being formed by (i) geometrically corresponding openings through said upper surface and said lower surface and, (ii) a transverse surface of high density, low porosity synthetic material, said transverse surface being integral with, and extending between, the periphery of said geometrically corresponding openings;



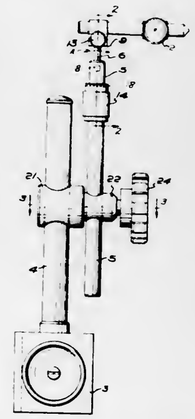
d. a low density core of expanded foam synthetic material disposed within and substantially filling the internal volume defined by said upper, lower and transverse surfaces;
e. connection means for connecting said electrical transformer to said pad; whereby said upper, lower and transverse surfaces and said core form an integral semi-rigid support structure.

4,050,660
CASING SUPPORT FOR HORIZONTAL-AXIS CASINGS EXPANDING IN OPERATION
Jean Eggmann, and Max Hartmann, both of Baden, Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland
Filed June 2, 1976, Ser. No. 692,235
Claims priority, application Switzerland, July 2, 1975, 8576/75
Int. Cl.² B63B *25/14*
U.S. Cl. 248—19 **19 Claims**



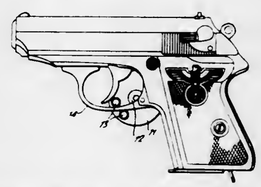
1. A composite support structure for and connected with the casing of a rotary machine operating on a horizontal axis which comprises a pair of vertically extending non-articulated pendulum supports located at opposite sides of said casing, the lower ends of said pendulum supports being secured to a support base and the upper ends to said casing, vertically extending sprung supports also located at opposite sides of said casing for relieving the load imposed by the machine on said pendulum supports, the lower ends of said sprung supports being secured to said support base and the upper ends to said casing, a flexible membrane mounted on said support base and extending horizontally between said pendulum supports beneath said casing, a pin depending from the bottom of said casing in a vertical plane through the axis of said casing and which is secured to said membrane, said pin and membrane acting conjointly to secure said casing against movement in all directions in a horizontal plane but permitting expansion of said casing in a vertical direction relative to said support base, and a metallic sheet structure disposed in a radial plane of said casing and located beneath said casing, the upper end of said metallic sheet structure being secured to the under part of said casing and the lower end being secured to said support base for permitting torsion and/or axial expansion of said casing.

4,050,661
ADJUSTABLE MOUNTING
John Wooldridge, Sheffield, England, assignor to James Neill Holdings Limited, Sheffield, England
Filed July 6, 1976, Ser. No. 703,020
Claims priority, application United Kingdom, July 8, 1975, 18708/75
Int. Cl.² A47F *5/00*
U.S. Cl. 248—285 **10 Claims**



1. An adjustable mounting comprising a stem, a mounting member pivotally secured to one end of the stem, a sleeve rotatably mounted on the stem, an inclined end face on the sleeve bearing against the adjacent end of the mounting member on each side of the center axis of the stem and spring means to urge the sleeve against the adjacent end of the mounting member.

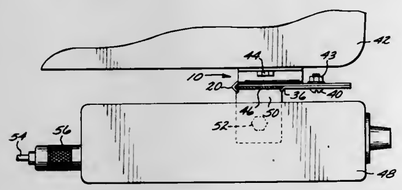
4,050,662
BRACKET
David Harrison Pickering, Five Farthings, Friston near Eastbourne, Sussex, England
Filed Mar. 4, 1976, Ser. No. 663,737
Int. Cl.² A47F *5/00*
U.S. Cl. 248—291 **2 Claims**



1. A support bracket for displaying firearms, said bracket comprising a back disc plate, means for securing same to a substantially vertical structure, a front disc plate, means for pivotally securing the front plate against the backplate at the centers of said plates and for locking said plates in adjusted relative rotational disposition, and two spaced apart forwardly projecting pegs from said front plate, said pegs located off-cen-

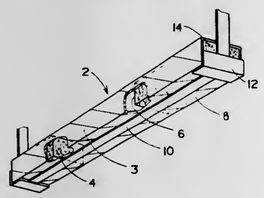
ter of the rotational axis and to receive therebetween a trigger guard of a firearm.

4,050,663
MOUNTING BRACKET
George Alvin Rogers, Yorba Linda, Calif., assignor to Modesett Engineering & Mfg., Yorba Linda, Calif.
Filed Mar. 5, 1976, Ser. No. 664,158
Int. Cl.[2] A47F 5/00
U.S. Cl. 248—316 A **9 Claims**



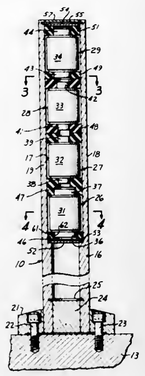
1. A universal mounting bracket, for the removable attachment of a radio and the like bearing a mounting bar bracket to a supporting structure, which comprises:
- a base member;
- tab support means laterally carried at opposite ends of said base member and bearing apertures for receiving fasteners to secure said base member to said supporting structure;
- first lip means extending longitudinally and substantially coextensively with one edge of said base member;
- mounting bracket retainer means carried on said base member;
- attachment means securing said retainer means to said base member including transverse slot means laterally spaced apart in said base member and first laterally spaced apart upright tab means carried by said retainer means and received in said slot means to permit a limited freedom of sliding movement of said retainer means relative to said base member in a direction normal to said first lip means;
- second lip means carried on said retainer means parallel to said first lip means; and
- second laterally spaced apart upright tab means carried by said base member in opposed alignment to said first upright tab means;
- resilient means retained between said first and second upright tab means and biasing said second lip means towards said first lip means whereby said mounting bar can be resiliently restrained therebetween.

4,050,664
OBJECT SUPPORT WITH STRAPPING MEANS
Thomas G. Daley, 9716 Lanesboro Way, Louisville, Ky. 40222
Filed May 27, 1976, Ser. No. 690,435
Int. Cl.[2] B65D 19/00
U.S. Cl. 248—346 **8 Claims**



1. A support for an object comprising: at least one conduit base member with means on the top side thereof for receiving an object thereon with securing means attached to the bottom side thereof, said securing means including means to secure said object to said base member, said securing means including a strap holding member adhesively secured to a bottom surface of said conduit member with a strapping member sandwiched therebetween, said strap holding member extending upwardly a preselected distance over a portion of at least one end of said conduit member; said conduit member having disposed at preselected portions therein a resilient foam material, said resilient foam material being affixed to the inner surface of said conduit member and serving to maintain said conduit member in a preselected configuration when said object is mounted onto said conduit member.

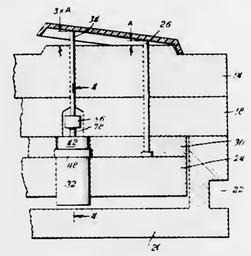
4,050,665
VIBRATION DAMPING APPARATUS
John W. Matthews, Fountain Valley; Harry Dennis Sigel, Santa Ana, and Peter Hauk, Huntington Beach, all of Calif., assignors to Newport Research Corporation, Fountain Valley, Calif.
Filed Feb. 11, 1976, Ser. No. 657,337
Int. Cl.[2] F16F 7/10; B23B 29/02
U.S. Cl. 248—358 R **31 Claims**



1. Apparatus for securing vibration sensitive equipment relative to a support, comprising in combination:
- a rigid structure comprising a rigid mounting rod having an outer surface for attachment of said vibration sensitive equipment, a hollow interior and a wall portion between said outer surface and said hollow interior;
- means for rigidly attaching said mounting rod to said support; and
- at least two dynamic damping systems in said hollow interior having different resonance characteristics;
- one of said dynamic damping systems comprising a first damping mass smaller than said hollow interior and first elastic mounting means for mounting said first damping mass in said hollow interior in spaced relationship to said wall portion; and
- the other of said dynamic damping systems comprising a second damping mass smaller than said hollow interior and second elastic mounting means for mounting said second damping mass in said hollow interior in spaced relationship to said wall portion.

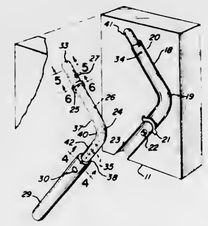
4,050,666
MOLD EJECTOR MULTIPLIER
Jake W. Van Tichelt, 7340 Garden Lane, Portage, Mich. 49081
Filed Nov. 19, 1976, Ser. No. 743,398
Int. Cl.[2] B28B 7/10; B29C 7/00; B29F 1/14
U.S. Cl. 249—68 **31 Claims**

1. In an apparatus for forming a workpiece which comprises separable forming elements in which a workpiece is formed and in which, when the elements are separated, the workpiece must be removed from one of them, ejector means adapted to engage said work piece and to dislodge it from said one element, ejector actuating means for engaging said ejector means to cause it to move to and from a position at which it engages



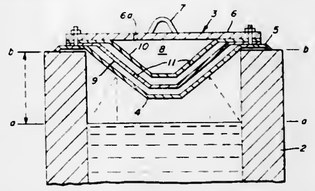
and dislodges said workpiece, ejector multiplier means responsive to the movement of said ejector actuating means to multiply the extent and speed of movement of said ejector means, the improvement in said ejector multiplier means which comprises hydraulic means for accelerating the movement of the ejector means responsive to the movement of said ejector actuating means.

4,050,667
TUBE MOLD
Allen J. Kossett, Libertyville, Ill., assignor to Will Ross, Inc., Milwaukee, Wis.
Filed Nov. 26, 1975, Ser. No. 635,683
Int. Cl.[2] B22C 9/24; A61M 25/00; B29F 1/00
U.S. Cl. 249—82 **7 Claims**



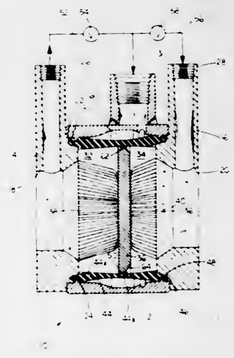
1. A molding apparatus comprising:
- a. a bottom plate having a first groove therein;
- b. a top plate having a second groove therein and overlaying said bottom plate such that said first groove and said second groove define a cavity, said cavity having a downstream end and an upstream end;
- c. first core means removably mounted within said cavity and in a spaced relationship from the walls of said cavity;
- d. annular means disposed between the walls of said cavity and said first core; and
- e. an injection port at said downstream end of said cavity between said annular means and said downstream end whereat material injection is initiated, said annular means being slidable by means of said injection fluid along said core from a first position adjacent said injection port to a second position remrote from said first position in the direction of the upstream end of said cavity.

4,050,668
INGOT MOLD WITH HEAT REFLECTING COVER
Joseph Perri, 10 Dendron Drive, Coraopolis, Pa. 15108
Filed Sept. 27, 1976, Ser. No. 727,281
Int. Cl.[2] B22D 7/06
U.S. Cl. 249—106 **8 Claims**



1. In the combination of an ingot mold having vertically extending side walls enclosing a mold cavity with the upper ends of the side walls defining a rim about the upper end of the mold cavity, and a reusable heat reflecting cover supported on the upper end of the side walls, the invention wherein the cover is of a size and shape to substantially close the upper end of the cavity when the cover is in position over the cavity and is seated on the upper ends of the side walls of the mold surrounding the cavity, the reusable cover comprising at least two members, one of which is a lower member and the other of which is a top plate, the lower member comprising a heat reflector arranged to reflect heat downwardly into the mold cavity and having a dished central area which extends down into the mold cavity when the cover is in place on the mold but which is at a level above the level to which hot metal is poured into the mold, the lower member being suspended around its edges from the undersurface of the top plate, and an insulating air space between the dished central area of the lower member and the top plate.

4,050,669
EXPANSIBLE TUBE VALVES
Richard S. Brumm, Orinda, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.
Filed Dec. 4, 1975, Ser. No. 637,820
Int. Cl.[2] F16L 55/14
U.S. Cl. 251—5 **2 Claims**



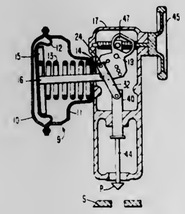
1. In an expansible tube valve comprising:
- a housing with inlet and outlet flow passageways therein:
- a core of circular cross-section in said housing with opposite open ends thereof aligned with said flow passageways;
- said core having two axially spaced series of inlet and outlet slots therearound;

a barrier across said core intermediate said inlet and outlet slots having a sealing surface therearound;
an expansible tube on said core having an intermediate sealing portion normally snugly embracing said sealing surface; and
a port in said housing for admitting pressure fluid therein against said expansible tube to construct it around said sealing surface;
the improvement comprising:
an annular groove with relatively sharp outer side edges extending completely around said sealing surface: and
venting slots in and around said barrier, from within said annular groove to the downstream side of said barrier communicating with outlet slots;
said slots tapering from said groove to a greater depth at the downstream surface of said barrier to provide gradually increasing flow passages as said expansible tube expands away from said sealing surface progressively from the upstream thereof.

4,050,670
VARIABLE FORCE ACTUATOR

Karl S. Borg, Sudbury, and Gareth A. Keith, Sherborn, both of Mass., assignors to Masonellan International, Inc., Norwood, Mass.

Filed Feb. 5, 1976, Ser. No. 655,453
Int. Cl.² F16K *31/115*
U.S. Cl. 251—14 **19 Claims**

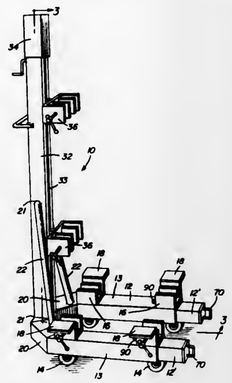


1. An actuator for stroking a valve having a body and a plug stem projecting on an axis therefrom and shiftable between initial and final limit positions, comprising
a yoke attached to said body and received over said plug stem;
a powerhead fixedly associated with said yoke;
an input thrust rod extending into said yoke from said powerhead and shifted by controlled fluid pressures on said powerhead; and
a variable force linkage between said thrust rod and said plug stem, said linkage comprising
a support shaft mounted in said yoke on said plug stem axis,
a main lever pivotally mounted on said support shaft for rotating about said plug stem axis,
a pivotal connection of said thrust rod to said main lever at a selected radius from said support shaft and at a selected angle from said plug stem axis,
an output thrust link pivotally connected at its one end for shifting said plug stem, and
a pivotal connection of the other output thrust link end to said main lever at a selected radius from said support shaft and at a selected angle from said plug stem axis,
said link-lever connection separated from said rod-lever connection by a least one of their said selected radii and angles being differently chosen,
for valve closing mechanical advantage of the output stroking of said thrust link over the input stroking of said thrust rod, and
such that in valve closing the actuator output shifting of said plug stem by said output thrust link is at an increasingly varying rate of change of force relative to the actuator input rotation of said main lever by said input thrust rod.

4,050,671
DOOR HANGER DEVICE

Ronald J. Coleman, Marrero, La., assignor to Victor S. Mott, Gretna; Gilbert Groetsch, Metairie; John R. Johnston, Gretna and Ewald Groetsch, Metairie, all of, La., part interest to each

Filed May 18, 1976, Ser. No. 687,544
Int. Cl.² B66F *3/08*
U.S. Cl. 254—7 R **2 Claims**

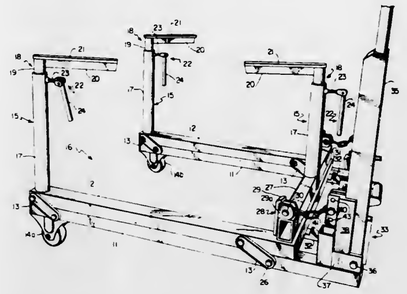


1. A dolly for transporting a plurality of doors and supporting a door while the latter is being hung, said dolly including horizontal and vertical support structures, said horizontal structure including a pair of side-by-side legs having front and rear ends interconnected by a transverse connecting structure extending and rigidly connected between the rear ends of said legs, the lower end of said vertical structure being anchored and braced relative to said connecting structure, said horizontal structure including depending support wheel assemblies supported from the front and rear ends of said legs, said vertical support structure including a pair of vertically spaced apart and aligned forwadly opening clamp structures supported therefrom for adjustable shifting therealong with said clamp structures spaced forwardly of said vertical support structure, said legs being free of transverse connections extending therebetween forwardly of a vertical transverse plane containing said clamp structures, said legs each being provided with longitudinally spaced and aligned upwardly opening front and rear clamp structures for support of a door therefrom in spaced relation relative to a door supported and projecting forwardly from said vertically spaced apart clamp structures in a vertical plane spaced between said legs, adjustment means operative to adjustably position said vertically spaced clamp structures along said vertical support structure, an upstanding extension removably supported from the upper end of said vertical support structure, horizontally forwardly opening clamp means mounted on said upstanding extension for adjustable shifting therealong, and connecting means connecting said clamp means and said vertically spaced clamp structures for simultaneous and equal shifting relative to said vertical extension and said vertical support member, said adjustment means including first screw shaft journalled from said vertical support structure and threadedly engaged with said vertically spaced clamp structures, second screw shaft means journalled from said upstanding extension and threadedly engaged with said forwardly opening clamp means, said second screw shaft member being vertically aligned with and disposed above said first screw shaft member and removably coupled thereto for rotation therewith.

4,050,672
TRAPEZOIDAL LIFTER

Perry Joe Lane, Rte. 1, Scobey, Miss. 38953

Filed Feb. 4, 1977, Ser. No. 765,698
Int. Cl.² B66F *7/26*
U.S. Cl. 254—10 R **5 Claims**

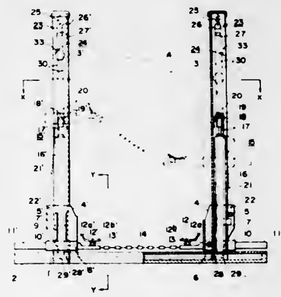


1. An apparatus for lifting and moving an object supported above a floor, said apparatus comprising:
a lower three-sided frame having an open forward end, two side portions, and a rear portion connecting said side portions;
an upper three-sided frame of smaller length than said lower frame above said lower frame, said upper frame having an open forward end corresponding to said open end of said lower frame, two side portions and a rear portion connecting said side portions;
shackle means pivotably connected between said upper frame and said lower frame for pivoting on said lower frame and lifting said upper frame from said lower frame and for supporting said upper frame above said lower frame;
wheel means beneath said lower frame for moving said connected frames from place to place;
upright support means connected to and extending upward from said upper frame and adjustable vertically and horizontally for supporting from beneath said object to be lifted and moved;
at least one chain connector attached above the rear portion of said upper frame;
a chain connected to each chain connected at one end thereof;
at least one angled latch member connected beneath and extending rearward from the rear portion of said upper frame;
handle mechanism means pivotably mounted on the rear portion of said lower frame and connected to the end of said chain opposite the end connected to said chain connector for pulling said chain and said upper frame backward and upward;
locking latch means connected to the rear portion of said lower frame opposite each angled latch member for engaging said angled latch member when said upper frame is pulled backward and for locking said upper frame in the raised position, said latch means having a first spring hole therethrough;
a rocker arm pivotably mounted onto the rear portion of said lower frame next to each locking latch means, one end of said rocker arm extending toward and underneath said locking latch means;
a spring guide mounted on the end of said rocker arm opposite the end extending toward said locking latch means;
foot pedal means mounted on the rear portion of said lower frame adjacent said rocker arm, a portion thereof extending over the end of said rocker arm having said spring guide for pressing against and depressing said rocker arm when said foot pedal is depressed, said foot pedal further having at least one spring hole therethrough;
a tension spring fitted through said spring hole in said foot pedal, said spring guide, and said spring hole in said locking latch means; and
combination member means pivotably mounted on the rear portion of said lower frame between said locking latch means and said handle mechanism means for pivoting upward against and unlocking said locking latch means, for locking said handle mechanism means in an upright position and for holding the end of said spring and being tensioned thereby;
whereby partially depressing said foot pedal means depresses said rocker arm and causes said rocker arm to pivot upward against said combination member means and causes said combination-member means to rotate away from and release said handle mechanism means,
whereby further depressing of said foot pedal means causes said rocker arm to pivot upward further against said combination member means and causes said combination member means to rotate against and lift said locking latch means, and
whereby upon removing pressure from said foot pedal means, said tension spring through said foot pedal means causes said foot pedal means to return to its upright position, causes said locking latch means to be pulled downward, and causes said combination member means to rotate toward said handle mechanism means and away from the position of lifting said locking latch means.

4,050,673
TWO-MASTED LIFTING APPARATUS

Matsuo Nishimura, Tokyo, Japan, assignor to Yasui Sangyo Col. Ltd., Japan

Filed Dec. 10, 1976, Ser. No. 749,364
Claims priority, application Japan, Sept. 17, 1976, 51-110864; Oct. 21, 1976, 51-125540
Int. Cl.² B66F *7/12*
U.S. Cl. 254—89 H **6 Claims**



1. A two-masted lifting apparatus particularly adapted to lift up a weighty object such as a vehicle or the like to a desired height and incline said lifted object at a desired angle, said apparatus comprising: a base,
a pair of upright masts disposed on said base and opposing each other,
a first carriage slidably mounted to one of said masts,
a second carriage slidably mounted to the other of said masts,
a pair of driving means adapted to hoist up or down said carriages independently of each other along the respective masts,
supporting arms for supporting the object to be lifted, each supporting arm being slidably supported on the carriage

so as to be movable toward or away from the opposing mast, and

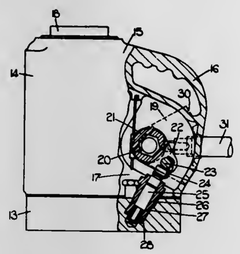
a height-difference detecting means adapted to detect the height difference between said carriages and restrict the further ascent or descent of one of the two carriages when the detected height difference between the two carriages has reached a predetermined limit.

4,050,674

HYDRAULIC JACK

Joseph Henry Robbins, deceased, late of Birmingham, England, by George Trevor Palfreyman and Roger Jerome Guy, executors, and John Edward Acton, Willenhal, England, assignors to Tangye Limited, Birmingham, England

Filed Dec. 27, 1976, Ser. No. 754,214
Int. Cl.² B66F *3/24*
U.S. Cl. 254—93 H **7 Claims**



1. A hydraulic jack comprising a cylinder, a piston slidable relative within the cylinder, an inlet in the cylinder, a pump for supply of fluid under pressure to said inlet to move the piston, a seal between the piston and the cylinder, means for limiting the stroke of the piston in the cylinder by permitting fluid pumped into the cylinder, once the piston reaches the end of its permitted stroke, to escape from the cylinder to a zone of relatively low pressure, said stroke limiting means comprising an element carried by one of the piston and the cylinder and urged towards a position in which it engages in a recess or groove in the other of the piston and the cylinder positively to prevent further movement of the piston at said end of said permitted stroke, said stroke limiting means, when so activated, also mechanically preventing removal of the piston from the cylinder, and means for selectively de-activating said stroke limiting means in order to allow said piston to be withdrawn from the cylinder, said de-activating means being a device operable to prevent said element moving into engagement with said recess or groove when the piston reaches said end of said permitted travel.

4,050,675

BATTERY WEDGE FOR SUBMARINES OR OTHER INSTALLATIONS

Adolph V. Mougillo, New Haven, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 6, 1976, Ser. No. 729,921
Int. Cl. B66f *11/00*
U.S. Cl. 254—104 **3 Claims**



1. In a wedge device for spacing apart or elevating or lowering objects wherein a central member is movable with respect to adjoining outer members and all components are required to be contained entirely within the envelope formed by the outer surfaces of said outer members the improvement comprising:

a linear succession of dual-faced oppositely-angled wedge sections in said central member,

the inner surfaces of said outer members mating with the adjoining surfaces of said central member when in the initial condition;

a bolt interconnecting said central and outer members and disposed in selectively extensive recesses therein,

a nut anchored in a recess in said central member and said bolt threaded through said nut and having its head received in recesses in said outer members,

a thrust plate anchored in said outer members and positioned in recesses therein immediately forward of the interior face of said bolt head,

said bolt extending from a position within the end of said device toward which said wedge sections taper substantially thereinto so as to power said central member from at least the next to the end wedge section thereof; and

spaced guide and restraining means secured two each symmetrically to said section containing said nut and a section remotely spaced therefrom and a like number of slots conforming to said guide and restraining members formed in said outer members,

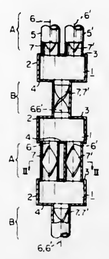
whereby all operative components are contained within the outer configuration of said device permitting unrestricted placement thereof and both expansion and contraction of said outer members by operation of said bolt.

4,050,676

MIXING DEVICE AND ELEMENT THEREFOR

Yasushi Morishima, 836, Aza Mori, Kokuba 1-chome, Otsu, and Yukifusa Miyazaki, 550, Aza Iwaden, Yabase-cho, Kusatsu, both of Japan

Continuation of Ser. No. 462,537, April 19, 1974, abandoned.
This application Dec. 2, 1975, Ser. No. 636,953
Int. Cl.² B01F *15/00*
U.S. Cl. 366—339 **8 Claims**



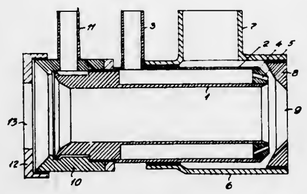
1. A device for mixing substances, such as fluids and finely divided particles, the device comprising: at least two mixing elements in a stacked, substantially axial, serially connected arrangement; each element including at least two parallel passages having substantially the same inner diameter and axes that are all in a common plane; with spiral vanes secured inside said passages, having straight entry edge lines, the entry edge line in one passage of each said at least two passages being substantially parallel to that of said vane in at least one other passage, and said entry edge lines intersecting the common plane at 70° to 110°; the common plane of one mixing element being out of phase by 60° to 120° with respect to that of a successively stacked mixing element; each element further including a collecting and dividing chamber provided on and connected to one end of said at least two passages; which chambers serially alternate with said passages; said chambers having portions with a transversal inner diameter somewhat larger than the sum of the inner diameters of the associated ones of said passages, the centers of said chambers being all substantially in the common plane; and a plane including a line extending between the centers of each of said at least two passages in one mixing element intersecting a plane including a corresponding line of the successive element; the substances being collected in said chambers, then divided into said at least two passages, further twisted therein by said vanes, again collected in a succeeding chamber, and still further divided in a direction different from a preceding divided direction into said at least two passages that are placed out of phase with respect to those of a preceding element, whereas the substances are alternatively twisted and multilayered, so that a complete mixing effect is attained.

4,050,677

MIXING DEVICE

Finn Benthin, Holbaek, Denmark, assignor to A/S Hotaco, Holbaek, Denmark

Filed Jan. 13, 1976, Ser. No. 648,806
Claims priority, application United Kingdom, Jan. 20, 1975, 2289/75; May 2, 1975, 18408/75
Int. Cl.² B01F *5/18;* B28C *5/06*
U.S. Cl. 366—11 **6 Claims**



1. In a device for the in situ formation of fibre-reinforced construction materials, such as mortars and plastics, such device being of the type including an elongate member, means to introduce fibres into a first end of said elongate member, and means for mixing construction material to be reinforced with said fibres at a second end of said elongate member, the improvement comprising:

said elongate member comprises a cylindrical inner tube having first and second ends, said fibres being introduced into said first end of said inner tube;

first gas connection means adjacent said first end of said inner tube for supplying gas into said inner tube to convey said fibres through said inner tube from said first end through said second end thereof;

a jacket surrounding said inner tube and having first and second ends, said first end of said jacket being connected to said inner tube, said second end of said jacket positioned adjacent but radially outwardly of said second end of said inner tube, said jacket and inner tube defining therebetween an annular first space;

an outer tube surrounding said jacket and having first and second ends, said first end of said outer tube being connected to said jacket, said second end of said outer tube extending axially beyond said second ends of said inner tube and said jacket, said outer tube and said jacket defining therebetween an annular second space;

connection means attached to said outer tube for introducing construction material to be reinforced into said second space and conveying said material through said second space in a direction toward said second end of said outer tube;

plug means positioned within said outer tube at said second end thereof for conveying said material from said second space toward said fibres passing through said second end of said inner tube, to thereby form a material-fibre mixture, said plug means having a central opening therethrough for passage of said mixture;

second gas connection means attached to said jacket for introducing gas into said first space and conveying said gas in a direction toward said second ends of said inner tube and said jacket; and

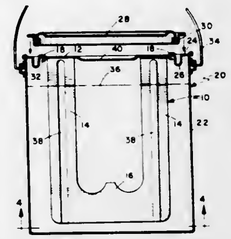
closure means positioned adjacent said second ends of said inner tube and said jacket for closing said first space, said closure means having extending therethrough inclined passage means surrounding said inner tube and extending from said first space toward said plug means and radially inwardly, for forming at least one gas jet surrounding said inner tube, said passage means being dimensioned to direct said at least one gas jet against said material being conveyed toward said fibres to disrupt said material into drops before mixture thereof with said fibres.

4,050,678

CONTAINERIZED LIQUID STIRRER

Charles S. Smith, 2842 Merton Ave., San Diego, Calif. 92111

Filed Dec. 3, 1975, Ser. No. 637,364
Int. Cl.² B01F *11/00*
U.S. Cl. 366—130 **3 Claims**



1. A liquid stirrer for a container having a body portion with a bottom and a rim having an annular shoulder and a removable lid mountable on said rim, said stirrer comprising:

a. a spanner bar removably extendable across a diameter of said annular shoulder and having a lip defined at each end thereof engageable between said annular shoulder and said lid such that said spanner is completely enclosed and firmly secured within a container when engaged by said lid and annular shoulder;

b. a spatula depending from said spanner bar and comprising a pair of generally parallel blades to extend into said container and including a transverse blade joining the distal ends of said parallel blades;

c. said spatula being semi-flexible to yield in use to swirling fluid in said container and extending into said container when said spanner bar is extended across said rim whereby said stirrer can be inserted into and completely enclosed within a container of liquid and captured by said lips between said rim and said lid to permit stirring of said liquid by reciprocal rotation of said can.

4,050,679

METHOD AND APPARATUS FOR CONTROLLING THE FURNACE TOP GAS PRESSURE OF BLAST FURNACES

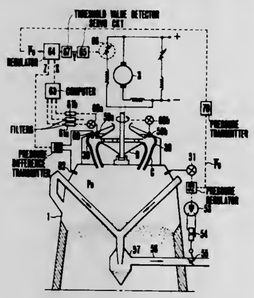
Kiyotoshi Sakai, 12-3-503, Tenjin 1-chome, Tobata, Kita-Kyushu, Fukuoka, Japan

Filed Oct. 27, 1976, Ser. No. 736,108
Claims priority, application Japan, Nov. 9, 1975, 50-134829
Int. Cl.² C21B *7/00*
U.S. Cl. 266—44 **5 Claims**

1. In a blast furnace installation comprising a blast furnace and a raw material charging apparatus including a hollow inverted frustum shaped rotary hopper mounted above said blast furnace, conveyor means for supplying the raw material

to said rotary hopper, a hollow disc shaped impeller located beneath said rotary hopper for receiving the raw material therefrom, stationary inclined chute means including an annular chamber member surrounding the periphery of said impeller for receiving the raw material discharged therefrom, and an electric motor mounted above said rotary hopper for driving said impeller, a method of controlling the gas pressure in the top of said blast furnace comprising the steps of detecting the gas pressure in said annular chamber member of said inclined chute means at a plurality of circumpherencially spaced points, comparing the mean value of said detected gas pressures with a preset furnace top gas pressure for producing a control signal proportional to the difference therebetween, and controlling the speed of said motor by said control signal thereby reducing substantially to zero the amount of the gas discharged to the atmosphere from said impeller.

3. In a blast furnace installation comprising a blast furnace and a raw material charging apparatus including a hollow inverted frustum shaped rotary hopper mounted above said blast furnace, conveyor means for supplying the raw material to said rotary hopper, a hollow disc shaped impeller located



beneath said rotary hopper for receiving the raw material therefrom, stationary inclined chute means including an annular chamber member surrounding the periphery of said impeller for receiving the raw material discharged therefrom, and an electric motor mounted above said rotary hopper for driving said impeller, apparatus for controlling the gas pressure in the top of said blast furnace comprising a main control system detecting the furnace top gas pressure to control, in accordance with a predetermined furnace top gas pressure, the amount of gas discharged through a gas exhaust conduit, a plurality of pressure detectors provided for said annular chamber member at equally spaced points around the periphery of said annular chamber member, a plurality of electric signal generators responsive to the outputs of said pressure detectors, respectively, a computer for producing the mean value of the electric signals produced by said electric signal generators, a regulator for producing an output proportional to the difference between said mean value and the predetermined furnace top gas pressure, and servo-means responsive to the output from said regulator for controlling the speed of said motor thereby reducing substantially to zero the amount of the gas discharged to the atmosphere from said impeller.

4,050,680

CUTTING TORCH ARRANGEMENT

Patrick E. Sweeney, Baltimore, Md., assignor to AAI Corporation, Cockeysville, Md.

Filed Nov. 3, 1975, Ser. No. 628,009
Int. Cl.² B23K 7/10
U.S. Cl. 266—48 **11 Claims**

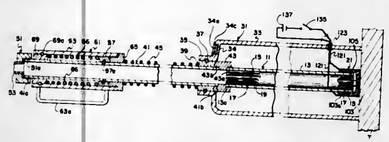
1. A cutting torch arrangement comprising

a plurality of longitudinally extending thermal bars each comprising a burner pipe having combustible rod-like elements extending along a length thereof, with longitudinal gas passageways formed therebetween for feeding of oxygen gas along the interior of said pipe and enabling igniting and burning of one end of said thermal pipe,

and composite support means compositely supporting said thermal bars at one end thereof remote from the opposite end thereof and having gas flow passageway means formed therein connecting with the interior of each of said thermal bars,

said composite support means comprising a common securing, supporting and gas feed manifold having a common gas feed opening therein and multiple thermal bar-supporting and gas feeding openings for secured supporting engagement with corresponding respective ones of a plurality of thermal bars,

and a common gas manifold chamber formed within said securing, supporting and gas feed manifold and connecting in gas flow connecting relation between said common gas feed opening and said multiple thermal bar-supporting and gas feeding openings is said manifold.

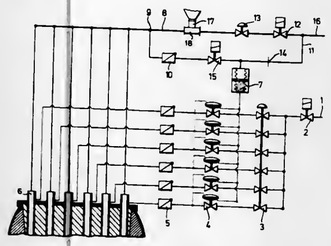


4,050,681

APPARATUS FOR THE CONTROLLED FEEDING OF A REFINING GAS AND OF A FLUID PROTECTIVE MEDIUM

Karl Brotzmann, and Hans Georg Fassbinder, both of Sulzbach-Rosenberg, Germany, assignors to Eisenwerk-Gesellschaft Maximilianshutte mbH, Sulzbach-Rosenberg, Germany

Filed May 10, 1974, Ser. No. 468,967
Claims priority, application Germany, May 25, 1973, 2326754
Int. Cl.² C21C 5/34
U.S. Cl. 266—82 **11 Claims**



1. In an apparatus for supplying a refining gas and for supplying a fluid protective medium individually to each of a plurality of tuyeres mounted in the refractory masonry of a refining vessel each of said tuyeres consisting of at least two concentric pipes with separate supply lines to supply said refining gas and to supply said protective medium, the refining gas passing through the center pipe and the protective medium passing through the annular spaces between said concentric pipes; and including a control valve (3) in the supply lines (1) through which said protective medium is supplied to each of said tuyeres, a pressure reducing valve (4) in each of said supply lines in series with said control valve (3), and a back pressure valve (5) between each of said tuyeres and each of said pressure reducing valves in each supply line of said protective medium, and

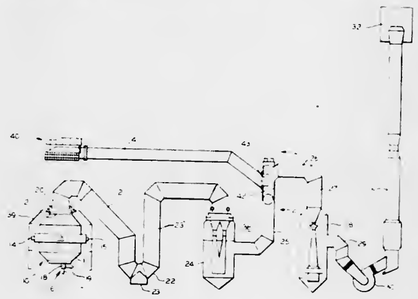
the improvements which comprise: means to control each of said pressure reducing valves (4) said means comprising a pressure transmitter (7) operatively connected to a by-pass line (11) of said main refining gas supply line (16) and said pressure transmitter (7) transmitting the pressure fluctuations of the refining gas line to each of the pressure reducing valves (4) mounted in each of said protective medium lines, whereby the pressure of said protective medium flowing to said tuyeres is individually controlled and changed by the pressure reducing valves (4) in relation to the refining gas pressure in such a way that the pressure in each of said protective medium lines cannot exceed the pressure in the refining gas line.

4,050,682

METHOD AND APPARATUS FOR HANDLING OFF-GASES FROM METAL REFINING VESSEL

Joerg Peter Baum, Essen-Sud, Germany, assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Mar. 31, 1975, Ser. No. 563,844
Int. Cl.² C21C 5/40
U.S. Cl. 266—158 **23 Claims**



1. Metallurgical apparatus including,

a metallurgical vessel having an open upper end and means for delivering process gases to a quantity of metal contained therein,

means for tilting said vessel between first and second positions, a gas cleaning system,

first gas collecting hood means for collecting off-gases from said vessel when the same is in its first position,

first conduit means for connecting said first gas collecting hood means to said gas cleaning system,

second gas collecting hood means for collecting off-gases from said vessel when said vessel is in its second position,

second conduit means for connecting said second gas collecting hood means to said gas cleaning system,

damper means for coupling and uncoupling said second conduit means and said gas cleaning system,

said damper means including means defining a passage and having an inlet coupled to said second conduit means and an outlet connected to said gas cleaning system, said passage defining means having a first portion lying between said inlet and said outlet to define a flow path and a second portion lying outside of said path,

and a damper element disposed in said passage defining means and being movable between a first position within the first portion thereof and between said inlet and said outlet for interrupting the flow path between said inlet and said outlet and a second position in the second portion of said passage defining means wherein a flow path between said inlet and outlet is open,

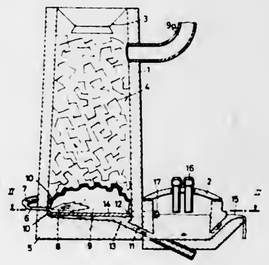
said second gas collecting hood includes an enclosure having a bottom opening and side walls, a portion of said side walls comprising a plurality of flexibly connected individual members to permit engagement thereof by vessel charging apparatus without damage thereto, said second conduit means opening the side of said enclosure and baffle means disposed in said second gas collecting hood for redirecting gases entering the same toward said second conduit means.

4,050,683

SMELTING PLANT AND METHOD

Hans Jürgen Langhammer, Platienwerbe, Germany, assignor to Klockner-Werke AG, Duisburg, Germany

Division of Ser. No. 689,859, May 25, 1976. This application Feb. 2, 1977, Ser. No. 764,918
Int. Cl.² C21C 7/00
U.S. Cl. 266—164 **5 Claims**



1. A smelting plant comprising: a shaft furnace having a floor and defining an upright elongated chamber; means for feeding metal-containing materials into the top of said chamber for forming therein an upright column of said materials; means including a burner above the floor of said furnace for forming a flame at the base of said column, whereby said materials at the base of said column are melted into a liquified-metal melt and a layer of slag on said melt and a deposit is formed in said furnace, said column being supported on said deposit; a slag drain in said furnace at the level of said deposit for withdrawal

17. Metallurgical apparatus including,

a metallurgical vessel having an open upper end and means

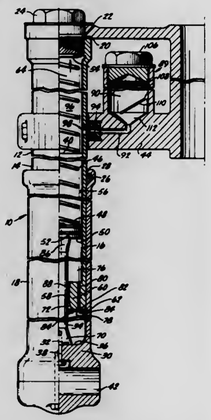
of said slag; a metal-drain conduit having an inlet end opening into said furnace below said layer and an outlet end substantially at said layer and formed as a trap preventing flow back into said furnace, whereby said metal passes out of said furnace through said conduit and remains at a level in said furnace determined by the level of said outlet end; and means for heating metal in said conduit between said ends.

4,050,684

VELOCITY SENSITIVE DUAL RATE SHOCK STRUT

Franklin C. Sanders, 13712 Prospect Ave., Santa Ana, Calif. 92705

Filed July 19, 1976, Ser. No. 706,798
Int. Cl.² F16F 9/48
U.S. Cl. 267—65 R **16 Claims**



15. A device for modifying the reaction of a shock strut to retraction and extension forces, the shock strut being of the kind containing fluid as a damping agent and gas as a spring agent, wherein the fluid and gas have an interface which moves to different levels in the strut in response to the extension and retraction forces applied to the strut, said device including:

a container defining a predetermined volume; and

a base member connected to said container having a semi-cylindrical surface for engagement with the strut, a passageway from said predetermined volume to said semi-cylindrical surface of a size to form an orifice, a seal formed about said passageway on said semi-cylindrical surface, and means to clamp said base member to the strut and to maintain a sealed condition therebetween, whereby said passageway can be held in sealed communication with an opening in the strut so that the passage of the interface thereby modifies the reaction of the shock strut.

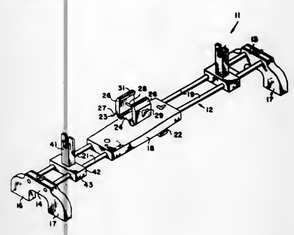
4,050,685

DISASSEMBLABLE SKI CLAMPING APPARATUS

Robert C. Cox, Eight Harold Court, Walnut Creek, Calif. 94598

Filed Oct. 6, 1976, Ser. No. 730,217
Int. Cl.² B25B 1/20
U.S. Cl. 269—296 **12 Claims**

1. Apparatus for firmly supporting a ski during work thereon, comprising a base including an elongated mounting structure from which said ski is to be supported; a clamp projecting from said mounting structure adapted to grip a ski to be supported generally at the midportion thereof; a pair of support standards projecting from said mounting structure in generally the same direction from which said clamp extends therefrom and on opposite sides of said clamp and spaced therefrom to engage said ski at locations spaced from said clamp; and legs at opposite ends of said mounting structure depending therefrom for supporting the same on a work surface; and means for reducing the distance of said clamp from said base relative to the distance therefrom at which said support standards engage said ski to urge said ski against said support standards for lateral support thereof at said locations;



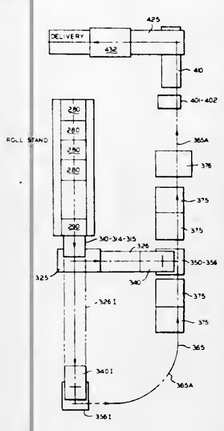
said clamp and said support standards each being selectively demountable from said base, said legs being selectively removable from said mounting structure, and said base including said mounting structure being disassemblable into shorter lengths to permit said apparatus to be disassembled for compact carrying and storage when not in use supporting a ski.

4,050,686

SHEET OR SIGNATURE FEEDING MACHINE AND METHOD

William B. McCain, Hinsdale; James F. Cosgrove, Western Springs, and Edward J. Zagorski, Chicago, all of Ill., assignors to McCain Manufacturing Co., Chicago, Ill.

Division of Ser. No. 441,056, Feb. 11, 1974, Pat. No. 3,966,185. This application Jan. 16, 1976, Ser. No. 649,639
Int. Cl.² B65H 39/02
U.S. Cl. 270—54 **4 Claims**



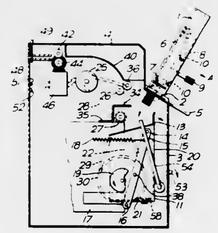
1. A machine for producing signatures and forming books therefrom comprising: a signature gathering conveyor, a roll stand having spaced spindles for supplying rolled webs of paginated printed material, means to withdraw web lengths from the rolls and means to register the withdrawn web lengths for proper pagination in justaposed head-to-foot relation, a knife and means to advance the registered webs to the knife along a first predetermined linear path where the webs are severed at a predetermined interval to produce a product of juxtaposed sheets, a first folder spaced laterally from said predetermined path for folding said product into a signature form of given dimension, transfer means including a transfer conveyor to transfer said product to the first folder, said transfer conveyor having a linear path diverging from said predetermined path, means to transfer the signature from the first folder to the gathering conveyor, a linear second transfer conveyor coaxial with said predetermined path and leading to a second folder for folding a signature to a different dimension, means to divert the juxtaposed sheet product emerging from said knife either to said first transfer conveyor or to said second transfer conveyor for delivery either to the first folder or to the second folder where the sheet product is folded into signature form, and signature delivery means to deliver the signature from the second folder to the gathering conveyor.

4,050,687

MICROFICHE HANDLING DEVICE

Harry Arthur Hele Spence-Bate, 1 Cheam Place, Morley, Australia (6062)

Filed Aug. 17, 1976, Ser. No. 715,180
Claims priority, application Australia, Aug. 20, 1975, 2858/75
Int. Cl.² B65H 5/22
U.S. Cl. 271—3.1 **6 Claims**



1. A device for handling microfiches comprising a light proof container, reception means for receiving a microfiche cassette on or in the container including a light proof reception opening, a microfiche receiving chamber capable of receiving a stack of microfiches from the reception means, said chamber being pivotally mounted towards one end adjacent the reception means on one end of a lever which is pivotally mounted at its other end to a static part of the device, wherein the lever is biassed by means of a resilient means to engage with a cam, and wherein a fixed clamping surface is provided onto which the resilient means biasses the chamber to form a clamping means, the cam on rotation urging the chamber away from the clamping surface;

an ejection opening in the container including a light proof seal, extraction means for removing the microfiches singly from the chamber and feeding the microfiches singly to the ejection opening for ejection into a developing unit, said clamping means arranged to clamp a stack of microfiches held in the receiving chamber so that after a single microfiche has been removed from the stack for feeding to the ejection opening, the remainder of the stack is held in the chamber.

4,050,688

ORTHOGONAL DOCUMENT HANDLING APPARATUS

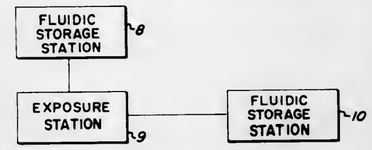
Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 15, 1976, Ser. No. 649,389
Int. Cl.² B65H 5/22
U.S. Cl. 271—5 **12 Claims**

1. Document handling apparatus, comprising:

a. an exposure station including orthogonally related surfaces;

b. first means for fluidically moving a document in a first direction and into orthogonal registration with said surfaces of the exposure station, a registered document being entirely within the exposure station; said first means including a rack having a plurality of superposed pockets for storing documents, means for aligning each of the pockets with the exposure station, and fluidic means for



moving documents in aligned pockets to the exposure station; and

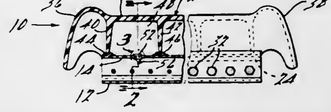
c. second means for fluidically moving said document in a second direction out of the exposure station; said first and second directions being transversely related.

4,050,689

PNEUMATIC FLEXIBLE BUMPER

David W. Barton, Birmingham, and George H. Muller, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 315,253, Dec. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 201,828, Nov. 24, 1971, Pat. No. 3,768,850, which is a continuation of Ser. No. 836,776, June 26, 1969, abandoned. This application Oct. 9, 1973, Ser. No. 404,580
Int. Cl.² B60R 19/10
U.S. Cl. 293—71 P **5 Claims**



1. A resiliently deformable bumper assembly for a vehicle or the like comprising:

a rigid elongate backing member secured to the vehicle body,

a resiliently deformable elongate outer shell,

means securing said outer shell to the backing member,

said outer shell and said backing member forming an elongate enclosure,

said backing member having a front surface forming an inner wall of said enclosure,

a plurality of independent, uninterconnected partitions extending generally transversely to said outer shell and dividing said enclosure into a plurality of consecutive compartments,

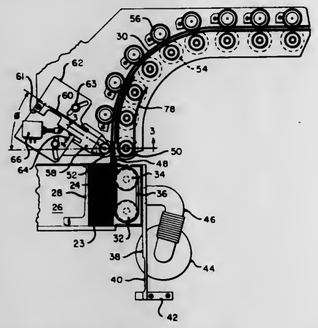
said partitions being integrally formed with said outer shell and being integrally joined exclusively to said outer shell,

each of said partitions having an edge unattached to said outer shell positioned adjacent the front surface of said backing member,

said unattached edge of said partition engaging the front surface of said backing member,

the portions of said partitions adjacent the unattached edges being resiliently deformed against said backing member to form seals therebetween and to place said partitions in compression between said outer shell and said front surfaces during normal unimpacted conditions.

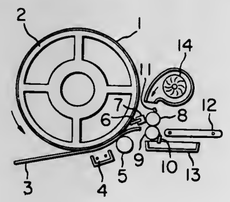
4,050,690
DOCUMENT SEPARATOR MECHANISM
Gunnar P. Michelson, Van Nuys, Calif., assignor to NCR Corporation, Dayton, Ohio
Filed Sept. 16, 1976, Ser. No. 723,693
Int. Cl.[2] B65H *3/46*
U.S. Cl. 271—125 **10 Claims**



6. In document sorting apparatus having a document hopper, feed mechanism at one end of said hopper for initiating movement of documents from said hopper, and means for separating the documents in single manner prior to transporting thereof, said separating means including drive means adjacent said feed mechanism for advancing the documents, and

retard means cooperating with said drive means and having a braked retard roller juxtaposed said drive means, said retard means including arm means carrying said roller and pivotally supported distal from said retard roller and swingable from said drive means when more than one document is present at the point of contact between said drive means and said retard roller, the presence of more than one document increasing the friction between the retard roller and the document adjacent thereto and slowing the rotation of said retard roller, and said retard means including disc means rotatable with said retard roller for timing the advancement of one document in relation to a predetermined time thereby permitting driving of one document past said drive means and restraining an adjacent document by said retard means until one document has been advanced beyond said drive means.

4,050,691
SEPARATOR DEVICE IN A COPYING MACHINE
Yoshio Ito, Yokohama; Masao Ariga, Koma, and Masashi Suda, Iruma, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 471,915, May 21, 1974, abandoned. This application Oct. 16, 1975, Ser. No. 622,857
Claims priority, application Japan, May 28, 1973, 48-62692
Int. Cl.[2] B65H *29/56*
U.S. Cl. 271—124 **4 Claims**



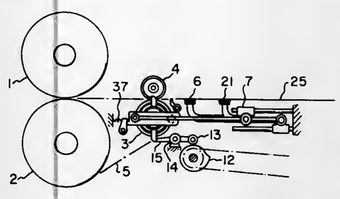
1. A separator device in a transfer type copying machine for separating a transfer material from a surface of a rotating drum type photosensitive member after a visualized image on the surface of the photosensitive member has been transferred to the transfer material at an image transfer station, said separator device comprising:

a single stripping pawl having a blunt end which is stationary and which contacts an end portion of the surface of the photosensitive member at a position immediately after the transfer station, wherein said pawl contacts a leading end of the transfer material to cause a portion of the transfer material adjacent said leading end to buckle and subsequently curl away from said stripping pawl, thereby stripping said portion of the transfer material away from the surface of the photosensitive member;

a pair of separating rollers disposed immediately downstream of said stripping pawl with respect to the direction of movement of the transfer material, for gripping the leading end of the transfer material after said curling movement thereof away from said pawl, said rollers rotating at the same peripheral speed as of the photosensitive member; and

means for cleaning peripheral surfaces of said rollers to remove unfixed toner deposited thereon.

4,050,692
SHEET FEEDING MACHINE
Josef Marass, Seehausen near Murnau, Germany, assignor to Georg Spless GmbH, Gersthofen, Germany
Continuation-in-part of Ser. No. 531,684, Dec. 11, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,685
Claims priority, application Germany, July 18, 1974, 2434625
Int. Cl.[2] B65H *5/10*
U.S. Cl. 271—267 **6 Claims**

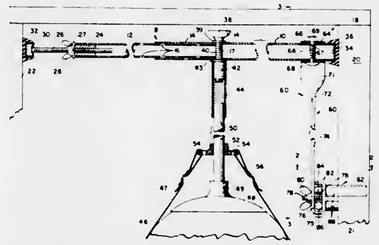


1. In a device for feeding sheets to a fed machine, said device having stationary conveying rollers that rotate continuously at the same peripheral speed as receiving rollers of the fed machine and gripper devices which reciprocate toward and away from the conveying rollers, the improvement comprising:

A. crank means for driving the gripper devices from the conveying rollers in a reciprocating motion such that the gripper devices accelerate said sheets to about the peripheral speed of the conveying rollers; and

B. clutch means connected between the continuously rotating conveying rollers and the crank means for the reciprocating gripper devices for engaging said crank means in time sequence with said fed machine, said clutch means being actuated in said time sequence by a rotating cam driven in timed relationship with said fed machine and a cam follower having an end for contacting the rotating cam and an actuating end for mechanically actuating the clutch means, said cam follower being pivoted between said ends.

4,050,693
PUNCHING BAG AND SUPPORT MEANS FOR SUPPORTING SAME IN A DOOR FRAME AND THE LIKE TO PREVENT TWISTING OR TURNING OF THE SUPPORT MEANS
Noah Lichterman, Chicago, Ill., assignor to Martin Yale Industries, Inc., Chicago, Ill.
Filed Mar. 22, 1976, Ser. No. 669,097
Int. Cl.[2] A63B *69/22*
U.S. Cl. 272—78 **7 Claims**



1. In combination, a punching bag and means for supporting same in a door frame having spaced apart vertical door jambs, said support means including a horizontally positioned and longitudinally adjustable means positioned between and supported by the door jambs, a punching bag supported on said support means, a rigid arm secured to said support means extending downwardly therefrom parallel to the adjacent door jamb, clamping means secured to said rigid arm substantially away from said support means and adapted to engage the opposite ends of the adjacent door jamb to prevent said support means from twisting or turning as said punching bag moves or vibrates back and forth, said clamping means being adjustable to adapt to door jambs of different dimensions between said opposite ends.

4,050,694
BATTING PRACTICE KIT
Raymond J. Domroski, 811 Spring St., Michigan City, Ind. 46350
Filed Mar. 10, 1976, Ser. No. 665,454
Int. Cl.[2] A63B *69/40*
U.S. Cl. 273—26 E **1 Claim**



1. A baseball batting practice kit for use by a batter comprising:

a. a simulated playing surface;

b. said simulated playing surface having a simulated baseball home plate generally centrally located thereon;

c. said simulated surface further having at least two batter's boxes thereon spaced on opposite sides of said simulated baseball home plate;

d. a hollow base adapted to containing stablizing filler material;

e. said hollow base having a substantially flat bottom and said flat bottom being adapted to being placed upon one of said batter's boxes;

f. a substantially vertical column supported by and projecting upward from said hollow base;

g. a substantially horizontal arm having one of its ends cooperatively engaging said vertical column and adapted to being displaced into a plurality of vertical positions thereon;

h. means for locking said horizontal arm in one of said vertical positions;

i. a reduced-diameter neck region on said horizontal arm adjacent to its other end thereof;

j. a hollow ball;

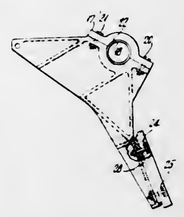
k. a tether attached to said hollow ball at one end and having a loop at its other end;

l. said loop being adapted to passing over said other end of said horizontal arm whereby said hollow ball hangs suspended therefrom;

m. a clip on said tether adapted to reducing the dimension of said loop whereby said loop is freely retained in said reduced-diameter neck region and said tether and ball are enabled to rotate about the longitudinal axis of said arm; and

n. said horizontal arm being cooperative with said simulated playing surface whereby said ball is suspended over said home plate when said hollow base is positioned on the batter's box opposite the batter's box occupied by said batter.

4,050,695
FLEXIBLE PLANK SUPPORT UNIT
Thomas M. Camilleri, 277 Avenue W., Brooklyn, N.Y. 11226
Filed Feb. 24, 1976, Ser. No. 660,878
Int. Cl.[2] A63D *5/00*
U.S. Cl. 273—53 **6 Claims**



1. In a flexible plank support unit for an automatic pinsetting machine comprising a horizontal shaft, a pair of supporting arms fulcrumed on the horizontal shaft and a backstop attached to the bottom part of the supporting arms, the improvement which comprises forming each supporting arm of separate upper and lower portions, each portion having a channel, the two channels forming an opening to receive the shaft, the upper and lower portions being detachably secured to one another around the horizontal shaft, and cushioning means positioned between the shaft and the upper and lower portions of each supporting arm.

4,050,696
ARCHERY ARROW
Fernando Troncoso, Jr., 1851 S. Orange Ave., Monterey Park, Calif. 91754
Filed Aug. 17, 1976, Ser. No. 715,188
Int. Cl.[2] F41B *5/02*
U.S. Cl. 273—106.5 B **8 Claims**

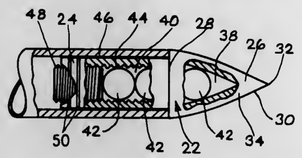
1. An improved archery arrow, said arrow comprising, in combination:

a. a hollow elongated arrow shaft bearing arrow vanes adjacent its rear end; and,

b. an arrow pile releasably secured to the front end of said arrow shaft, said pile comprising

i. an aerodynamically forwardly tapered down, dome-shaped hard point,

ii. a hollow pile tube connected to the rear end of said point and recessed inwardly thereof, said pile tube being releasably slideably disposed in said shaft front end so



that the leading edge of said shaft front end abuts the rear edge of said point to form a smooth, essentially continuous surface therewith, said pile tube being scored transversely and thus being readily breakable for shortening and lightening said tube, and

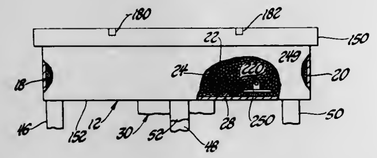
iii. control means for readily adjusting and positioning the weight of said pile to adjust the spine and balance of said arrow for fine tuning.

4,050,697

GAME AND GAME APPARATUS

John R. Purviance, 29530 Highmeadow Road, Farmington Hills, Mich. 48024

Filed Mar. 22, 1976, Ser. No. 669,203
Int. Cl.² A63F *3/00*
U.S. Cl. 273—139 **17 Claims**



16. A game comprising game board means, container means situated generally below and beneath said game board means, movable retrievable game article means situated within said container means, access aperture means formed through said game board means, generally dry and loose particle-like filler means within said container means obscuring the location of said retrievable game article means within said container means, said filler means being of a density different from the density of said retrievable game article means, and probe means employable by a player of said game for locating said obscured retrievable game article means and to attempt to retrieve said retrievable game article means through said access aperture means.

4,050,698

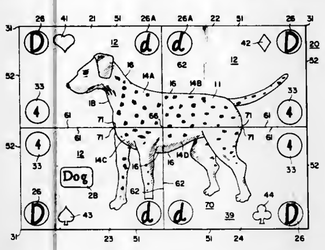
QUARTER CARD DECK

Albert Brown, Oakland, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 12, 1976, Ser. No. 675,722
Int. Cl.² A63F *1/00*
U.S. Cl. 273—152.41 **1 Claim**

1. A deck of playing cards for educational and play use, with each card of the deck formed of a uniform shape and marked on the face side of the card with a segment of a complete picture, with the cards marked as sets, in which each card of a set is marked with a different segment of a given complete picture, such that the complete picture is displayed when the cards of a set are aligned together to form a common pattern, in which each card is of a specific set of four cards, each card being of uniform rectangular shape, with each card marked on its face side with a quarter segment of a complete picture that is depicted when all four cards of a specific set are joined to form a common rectangle, with each set of four cards of the deck marked to display the figure of an animal, when assembled, with each specific set of four cards marked with a different picture, with

each card of a specific set being marked on its face side with a different suit symbol of a set of four suit symbols, with



each card of a specific set being marked with a common numerical sequential designation, said designation being individually different for each specific set of cards, such that

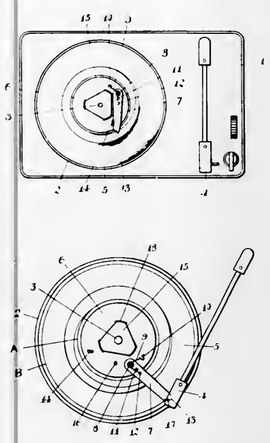
thirteen different specific sets of such cards may be employed to make up a deck of fifty-two cards that may be employed, in play, as a conventional deck of playing cards, for playing card games that involve four sets of individually sequentially identified cards with each set marked as a different suit, or alternately the cards may be employed for games that involve matching of the picture segments of four cards of similar or different specific sets.

4,050,699

QUICK REPLAY DEVICE

Keijiro Sawano, Ohanachaya 3-25-7, Katsushika, Tokyo, Japan

Filed June 7, 1976, Ser. No. 693,133
Int. Cl.² G11B *17/06*
U.S. Cl. 274—15 A **2 Claims**



1. A quick replay device comprising a relatively small disk

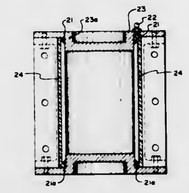
adapted to be situated on a turntable of a record player coaxially with a record which is situated beneath said disk, the latter having an outer periphery situated inwardly of the innermost groove of the record, said disk pivotally carrying a lever which is situated on top of said disk, and said disk having a stop while also carrying a spring which acts on said lever to urge the latter against said stop, and said lever when engaging said stop having a free hook end extending slightly beyond the outer periphery of said disk, the record player having a pickup arm which carries a stylus which when playing a record starts at an outer groove of the latter and progresses toward the innermost groove thereof, said pickup arm carrying a pin which engages said hook end of said lever when the stylus is at the innermost groove of the record, said disk being formed beneath said lever with a recess and said lever having a pointed projection extending into said recess of said disk when said spring holds said lever against said stop, the rotating turntable, when said pin of said pickup arm engages said hook end of said lever, causing the latter to be displaced away from said stop in opposition to said spring while said projection moves out of said recess and along an upper surface of said disk, so that said lever raises said pickup arm at said stylus thereof away from the record and while turning away from said stop displaces said pickup arm back toward said outer groove of the record, the length of said lever being such that when the stylus is again aligned with the outer groove of the record the hook end of said lever moves beyond said pin of said pickup arm so that the latter descends to again have its stylus situated in the outer groove of the record, while the separation of said lever from said pin of said pickup arm releases said lever to said spring to be returned thereby to a position engaging said stop, so that when the stylus again reaches the innermost groove of the record, the above operations will be automatically repeated whereby the record will be continuously replayed, the radial distance of the pivot axis of said lever from the axis of said disk and the distance from said pivot axis to said pointed projection being slightly greater than the radius of said disk, and said lever assuming a position when the stylus is situated over the outer groove of the record where said projection is situated slightly beyond said periphery of said disk, so that when the stylus is returned to the outer groove of the record not only does the hook end of the lever move beyond said pin of said pickup arm but also the projection becomes situated beyond the periphery of said disk so that the lever moves back down toward said disk to contribute also to the release of said lever by moving back down toward said disk when the stylus again engages the outer groove of the record.

4,050,700

SEAL HAVING FLUENT PACKING MATERIAL

Henry R. Lifferth, P.O. Box 57, Fortine, Mont. 59918

Filed Oct. 6, 1975, Ser. No. 619,698
Int. Cl.² F16J *15/10*
U.S. Cl. 277—72 FM **1 Claim**



1. A seal adapted to prevent flow between interconnected members, comprising .

a pair of abutting members in face to face relationship;

a third member extending transversely to the junction between the pair of members and abutting said members;

a first groove extending fully between the pair of abutting members and another groove formed by a chamfered edge of one of said abutting members, said other groove being in communication with the first groove and in communication with the third member;

a fitting adapted to receive a liquid sealant under pressure; means interconnecting the fitting and one of said grooves; and

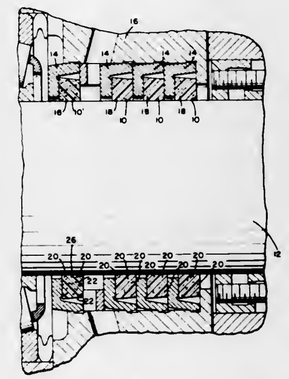
a liquid sealant injected through the fitting and filling said interconnected grooves.

4,050,701

FLUID SEAL

Paul Dale Webb, Tioga, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 26, 1976, Ser. No. 745,005
Int. Cl.² B65D *53/02*; C08F *28/00*
U.S. Cl. 277—125 **3 Claims**



1. A fluid seal, for fluid sealing a steel shaft having a given outside diameter, comprising:

a sealing element;

said element being formed of a moldable polymer material having a coefficient of expansion substantially equal to the coefficient of expansion of steel; and wherein

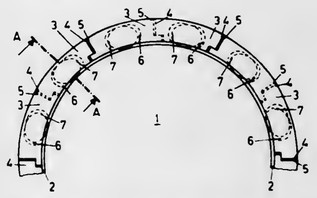
said element has carbon fibers and polytetrafluoroethylene particles dispersed therewithin.

4,050,702

SEGMENTED SEALING STRUCTURE

Antonio Del Matto, Brugg, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Apr. 13, 1976, Ser. No. 676,382
Claims priority, application Switzerland, Apr. 28, 1975, 5426/75
Int. Cl.² F16J *9/06*
U.S. Cl. 277—148 **5 Claims**



1. A packing ring structure for sealing two surfaces relative to each other comprising a pair of adjacently positioned ring components, each of said ring components being constituted by an assembly of ring segments provided with a projection at

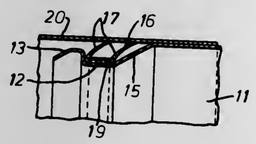
one end engaged with a complementarily configured recess at one end of an adjacent ring segment thereby providing a circumferentially extending interlocking of all the ring segments, said ring segments of the two ring components being staggered circumferentially relative to each other and each said ring segment being provided with at least one recess, the respective recesses in the segments of the two ring components being circumferentially aligned in face-to-face relation so as to form a circumferential array of slots, and pressure springs disposed in said slots.

4,050,703

TUBULAR CONNECTORS

Par-Ake Tuvesson, Bastad, and Carl-Gustaf Johansson, Angelholm, both of Sweden, assignors to Lindab, Lindhs Industri AB, Bastad, Sweden

Filed Dec. 2, 1975, Ser. No. 637,037
Claims priority, application Sweden, Dec. 12, 1974, 7415594
Int. Cl.² F16J *15/10*
U.S. Cl. 277—207 A **3 Claims**



1. A connector for joining to a hollow conduit, said connector comprising:

at least one end portion having an outer maximum dimension less than the inner dimension of said conduit to permit insertion into said conduit;

an anchoring portion of smaller dimension than said maximum dimension and spaced from the end of said connector;

an arched portion adjacent said anchoring portion on the side thereof facing the end of said connector, said arched portion being of greater dimension than said anchoring portion and of lesser dimension than said maximum dimension;

a connecting portion interconnecting and extending obliquely between said anchoring portion and said end portion; and

a lip seal mounted about the circumference of said anchoring portion and adapted to establish a seal between the outer side of said connector and the inner side of said conduit, said lip seal having a U-shaped cross section, the web of said U-shaped seal being held against said anchoring portion, the flanges of said U-shaped seal extending substantially parallel and radially outwardly from said anchoring portion beyond the maximum dimension of said connector;

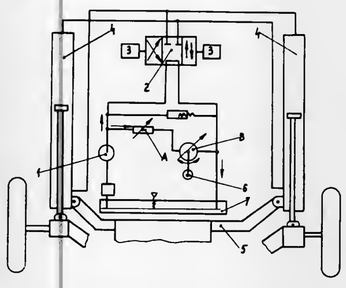
said connecting portion having a length greater than the height of said flanges of said U-shaped seal whereby upon axial insertion into said conduit, the flange closer to the end of said connector is bent over said web and the flange more distant from the end of said connector is bent over said connecting portion, and upon reversing the direction of relative movement between said connector and said conduit, the flange closer to the end of said connector is bent over said arched portion and the flange more distant from the end of said connector is bent over said web, said flanges remaining substantially parallel upon insertion, whereby an increase in pressure within said conduit makes more positive the seal between said connector and said conduit.

4,050,704

DEVICE FOR MAINTAINING AN UPRIGHT POSITION OF THE BODY OF A HARVESTER-THRESHER MACHINES

Mihail Duca; Dan Vasiliu; Teodor Demetrescu; Ion Cimpoias, all of Bucharest; Ion Linca, Bucharest-Otopeni; Stefan Breazu, Bucharest; Virgil Antonescu, Bucharest, and Iosif Cojocaru, Bucharest, all of Romania, assignors to Institutul de Cercetari si Proiectari de Masini Agricole-ICPMA, Bucharest, Romania

Filed Sept. 8, 1975, Ser. No. 611,256
Int. Cl.² B60S *9/10*
U.S. Cl. 280—6 R **10 Claims**



6. A device for maintaining the upright stance of the body of a harvester-thresher adapted to travel over irregular terrain, comprising:

a pendulum (6) swingably mounted on said body (5) for assuming different angular positions corresponding to two variations in the angular positions of the body (5) as the harvester-thresher travels over said terrain;

a flow controller (B) connected with said pendulum (6) and controlled thereby;

an adjustable valve (A) commanded by said flow controller (B);

an hydraulic fluid pump (1) connected hydraulically in circuit with said valve (A) and said flow controller (B), said flow controller (B) and said valve (A) bypassing a portion of the fluid delivered by said pump (1) in dependence upon the tilting angle of said body (5) of the harvester-thresher;

an electrically activated distributor (2) connected to said pump;

hydrostatic cylinders (4) connected to said body (5) of the harvester-thresher and hydraulically supplied through said distributor (2) with the remainder of the fluid delivered by said pump to displace said body (5) back into an upright position from a tilting position.

4,050,705

BRAKING DEVICE FOR SKI SCOOTERS

Philipp Kreis, Neumarkter Str. 34-36, 8000 Munich 80, Germany

Filed Mar. 1, 1976, Ser. No. 662,640
Claims priority, application Germany, Feb. 28, 1975, 2508814; Apr. 4, 1975, 2515838
Int. Cl.² A63C *17/14*
U.S. Cl. 280—11.1 BT **8 Claims**

1. In combination:

i. a ski scooter including:

a. a foot board having a front end and a rear end

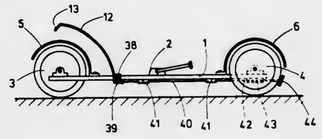
b. a binding means on said footboard for securing one foot of a rider

c. first wheel means mounted rotatably on said footboard adjacent said front end

d. second wheel means mounted rotatably on said footboard adjacent said rear end

e. a brake element movably mounted on said footboard adjacent said rear end and positioned for braking said second wheel means

f. an element pivotted on said footboard at a position forward of said binding means



g. linkage means connected to said pivotted element and to said brake element, to permit actuation of said brake element by upward pulling movement of said pivotted element

h. means on said pivotted element for releasable engagement by a ski stick

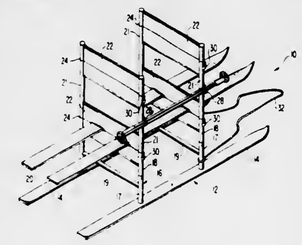
ii. a ski stick having thereon engaging means for selectively engaging said releasable means on the pivotted element.

4,050,706

SKI CARRY

Rachel Kronstadt, 8781 Pierce Way No. 102, Arvada, Colo. 80003

Filed Apr. 22, 1975, Ser. No. 570,379
Int. Cl.² B62B *13/00*
U.S. Cl. 280—12 R **6 Claims**



1. A modular tow device, adaptable to travel on snow, for the transportion of miscellaneous articles, comprising:

two parallel runner means for allowing the device to travel on snow;

a plurality of removable carrier means, each having depending posts; and

frame means attached to said runner means for receiving and holding each said removable carrier means in place, one at a time, said frame means comprising upstanding posts, each connected at one end thereof to one of said runner means and adapted to removably receive one of said depending posts of each said removable carrier means at the other end, said upstanding posts and said depending posts being in alignment and adapted to be removably secured together, and horizontal bars connecting upstanding posts on opposite runners, whereby the relative positions of said upstanding posts are assured,

wherein one of said removable carrier means is a rack means specifically adapted for carrying skis, said ski rack means comprising two supports each having said depending posts, and ski holders mounted between said depending posts of each of said supports, said ski holders on each of said supports being in alignment and adapted to hold skis to be transported by the tow device, and another of said removable carrier means is a container means for carrying packages, said package container means including a substantially horizontal floor portion on which the packages may be carried.

4,050,707

LIFTABLE BED TRUCK BODY CONFIGURATION FOR REMOVABLE STORAGE UNIT

Nick P. Glumac, Chesterton, Ind., assignor to Toter-Tee, Inc., Chesterton, Ind.

Filed Oct. 14, 1975, Ser. No. 622,104
Int. Cl.² B62D *21/18, 53/08*
U.S. Cl. 280—43.23 **2 Claims**



1. A variable height truck trailer adapted to be connected to and drawn by a truck tractor comprising a fixed bed and a liftable, load bearing bed in superposed relation to said fixed bed, means mounted between said beds adjacent to the rearward end thereof for elevating said liftable bed a predetermined distance above said fixed bed, a "fifth wheel" hitching mechanism at the forward end of said liftable bed, said hitching mechanism being adapted to be supported upon and attached to a generally circular and horizontally positioned "fifth wheel" mounting plate attached to said tractor body, said hitching mechanism including means extendible vertically between said plate and said liftable bed for initially matching the height of said "fifth wheel" for attachment of said hitching mechanism thereto and then for elevating the forward end of said liftable bed at the same time and to the same vertical extent as the rearward portion of the liftable bed is raised by the elevating means between the fixed and liftable beds, said vertically extendible means including inner and outer vertically telescoping extensible shells, one of which is connected to said "fifth wheel" plate and the other to said liftable bed, fluid actuation means to move said shells relative to each other, apertures defined respectively in the walls of said extensible shells adapted to be aligned horizontally when the forward end of said liftable bed is level with said rearward portion and the latter is resting upon said fixed bed and when the liftable bed is secured for the transport of loads in an elevated position above said fixed bed, a plurality of horizontally movable pins for insertion in said apertures when said apertures are in aligned relation to secure said shells in a predetermined vertically extended position, and means for actuating said pins when said apertures have come into aligned relation at a predetermined height position.

4,050,708

HAMPER AND CART

Momcilo M. Samardzija, and Cheryl Samardzija, both of Merrillville, Ind., assignors to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Apr. 12, 1976, Ser. No. 676,317
Int. Cl.² B62D *1/12*
U.S. Cl. 280—47.26 **2 Claims**

1. A cart on which a hamper may be mounted, formed of

a base plate bent at right angles to form a back section and a base section,

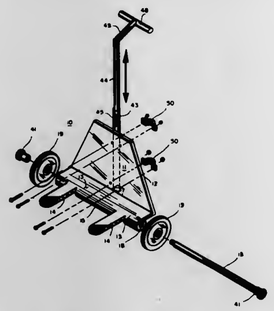
a telescopic handle asseembly mounted to the said back section of the base plate,

said base section formed from a substantially rectangular section of the base plate, with

a plurality of spaced flanges extending from the base plate, with each flange bent under the base plate about a com-

mon axis to form a closed circular tubular opening of the size to fit about an axle shaft,

said flanges separated by a plurality of spaced finger sections extending from the base section in the general plane of the base plate,



each said flange serving as a bearing support for a common axle shaft which shaft is fitted in the circular flange opeining, with

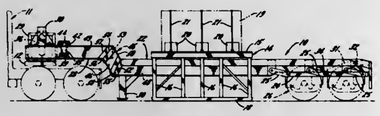
a wheel mounted to said axle shaft on each side of the base plate.

4,050,709

TRAILER DEFLECTOR RAMP

Eugene A. LeBoeuf, 9740 Mallery Drive, Noblesville, Ind. 46060

Filed Jan. 19, 1976, Ser. No. 650,355
Int. Cl.² B60P *1/02*
U.S. Cl. 280—106 T **6 Claims**



1. In a lift bed highway trailer adapted for coupling to a tractor by means of a fifth wheel connection, the combination comprising:

a. a liftable main frame having a lowered loading and unloading position and a raised transport position;

b. a subframe underlying said main frame;

c. a wheeled suspension underlying said subframe and adapted to serve as a ground support therefor;

d. a gooseneck fixed to the forward end of said main frame and adapted to connect same to the tractor;

e. a loaded pallet frame unit adapted to straddle said liftable main frame when the same is in lowered position and to rest freely upon said main frame when the latter is in raised transport position;

f. means for moving both the forward end portion and the rearward end portion of said main frame between the lowered loading and unloading position and the raised transport position; and

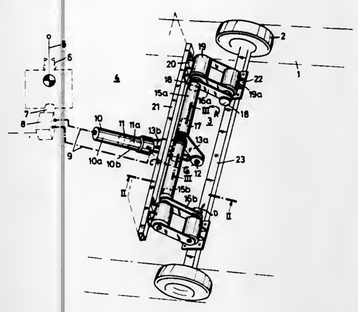
g. an inclined deflector ramp interposed between said gooseneck and the forward end of said main frame, said ramp being adapted to deflect the loaded pallet frame unit upwardly against the resistance of friction and gravity in event that the latter slides forwardly relative to the trailer under the impact of an emergency stop.

4,050,710

APPARATUS TO REDUCE THE EFFECT OF LATERAL FORCES DURING TURNS AND/OR ONE-SIDED LOADS ON PERSONS IN A VEHICLE

Heinz Flaig, Wetter, Germany, assignor to DEMAG Aktiengesellschaft, Duisburg, Germany

Filed Apr. 8, 1976, Ser. No. 674,838
Claims priority, application Germany, Apr. 10, 1975, 2515679
Int. Cl.² B60G *9/02*
U.S. Cl. 280—112 A **13 Claims**



1. Apparatus for reducing the tilting effect upon vehicles resulting from uneven loads and applied lateral forces in turning, comprising

a. a vehicle including a carriage and a chassis;

b. a dynamic feeler disposed on said vehicle, said feeler mounted to respond by swinging to tilting movements of said vehicle;

c. a regulator mounted between said chassis and said carriage and responsive to movements of said feeler for tilting said chassis in relation to said carriage around an axis parallel to the longitudinal axis of the vehicle; said regulator characterized by

d. a pair of rods on said vehicle rotatably mounted transversely of said longitudinal axis in coaxial alignment with each other;

e. said rods being rotatable with respect to each other;

f. a lever fixed on each of said rods at the ends thereof facing each other;

g. a reversible expanding and contracting device connected to said feeler;

h. one of said levers pivotally connected to one end of said expanding and contracting device and the other of said levers pivotally connected to the other end of said expanding and contracting device;

i. said levers being movable toward and away from each other in response to said expanding and contracting device for rotating said rods in opposite directions to each other;

j. a pair of lifting and lowering arms with one each fixed to one of said rods at the ends thereof opposite said levers; and

k. each of said pair of lifting and lowering arms pivotally connecting said chassis to said carriage for tilting one in relation to the other in response to said regulator.

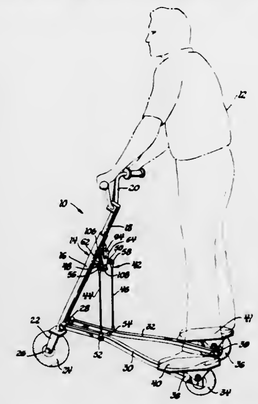
4,050,711

CAMBERING DEVICE FOR CAMBERING VEHICLE

Richard E. Denzer, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 28, 1976, Ser. No. 727,594
Int. Cl.² B60G *19/00*; B62K *15/00*
U.S. Cl. 280—278 **3 Claims**

1. In combination with a cambering vehicle having an upright steering frame provided with a pair of pivotally supported trailing arms, a mechanical cambering device for interconnecting the trailing arms so that they move in equal and opposite directions in parallel planes when the vehicle is leaned into a turn, said cambering device including a support member connected to said frame for pivotal movement about a first axis, a bell crank comprising a pair of members, pivot pin means mounting said members in said support member, each of said members supported by the associated pivot pin means for independent pivotal movement about an axis spaced from said first axis, a pair of links, means pivotally connecting one of said links between one of said members and one of said trailing



arms, means pivotally connecting the other of said links between the other of said members and the other of said trailing arms, each of said members having a plurality of openings formed therein located on a circle having its center at the center of said pivot pin means, a lock pin carried by the support member and adapted to be located in said openings formed in said members so as to selectively lock said members together in a first position wherein said trailing arms are located for normal operation of said vehicle and in a second position wherein said support member is prevented from pivoting about the first axis so as to allow said vehicle to be parked on a level surface.

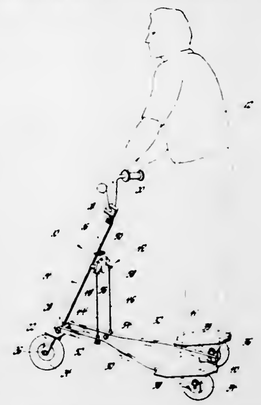
4,050,712

CAMBERING DEVICE FOR CAMBERING VEHICLE

Richard E. Denzer, Bloomfield Hills; Gerald J. Marsh, Warren, and Horacio Shakespear, West Bloomfield, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 28, 1976, Ser. No. 727,590
Int. Cl.² B60G *19/00*; B62K *15/00*
U.S. Cl. 280—278 **3 Claims**

1. In combination with a cambering vehicle having a steering frame provided with a pair of pivotally supported trailing arms, a mechanical cambering device for interconnecting the trailing arms so they move in equal and opposite directions when the vehicle is leaned into a turn, said cambering device including a support member connected to said frame for pivotal movement about a first axis, a bell crank comprising a pair of wing members carried by said support member for pivotal movement about a pair of laterally spaced axes which are parallel to said first axis, gear means interconnecting said wing members for coordinating pivotal movement thereof about said laterally spaced axes, a pair of links, means pivotally connecting one of said links between one of said wing members and one of said trailing arms, means pivotally connecting the other of said links between the other of said wing members and the other of said trailing arms, one of said wing members having three positioning means formed therein, a spring biased lock pin carried by the support member and adapted to cooperate with said positioning means formed in said one of said wing members so as to selectively lock said wing members together in a first position wherein said trailing arms are located for normal operation of said vehicle, and in a second positon wherein said trailing arms are located adjacent said frame for



stowing said vehicle in a minimum of space, and a third position wherein said support member is prevented from pivoting about the first axis so as to allow said vehicle to be parked on a level surface.

4,050,713

CAMBERING DEVICE FOR CAMBERING VEHICLE

Jerry K. Williams, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

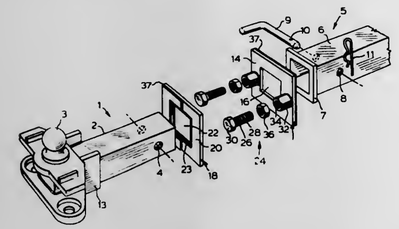
Filed Sept. 28, 1976, Ser. No. 727,592
Int. Cl.² B62K *15/00*; B60G *19/10*
U.S. Cl. 280—278 **3 Claims**



1. In combination with a cambering vehicle having a steering frame the lower portion of which is provided with a pair of pivotally supported trailing arms, a mechanical cambering device for interconnecting the trailing arms so they move in equal and opposite directions when the vehicle is leaned into a turn, said cambering device including a bell crank comprising a pair of members mounted on said steering frame for pivotal movement about a common axis, a pair of equalizer links, means pivotally connecting one of said links between one of said members and one of said trailing arms, means pivotally connecting the other of said links between the other of said

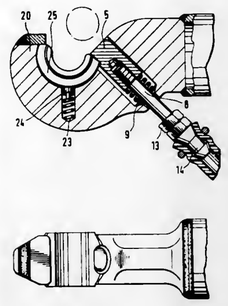
members and the other of said trailing arms, a first lock device carried by one of said members for securing said members together in a first position wherein said trailing arms are located for normal operation of said vehicle and in a second position wherein said trailing arms are located adjacent said frame so that the vehicle can be stowed in a minimum of space, and a second lock device carried by said frame for maintaining said bell crank in a fixed position relative to said frame when said members are in said first and second positions.

4,050,714
TRAILER HITCH ATTACHMENT
Walter H. Epp, 64 Highcourt Cres., St. Catharines, Ontario, Canada (L2M 3M6)
Filed Feb. 17, 1976, Ser. No. 658,479
Int. Cl.² G60D *1/00*
U.S. Cl. 280—495 **3 Claims**



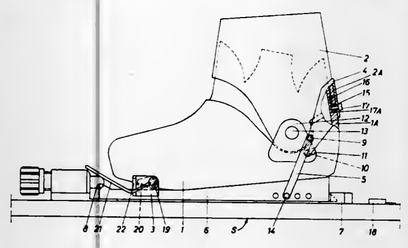
1. In combination a trailer hitch including a clevis pin, a trailer hitch head having a ball secured thereto and a shank extending therefrom, a trailer hitch drawbar having a hollow tubular member adapted to receive said shank and a clevis pin aperture adapted to receive said clevis pin locking said shank in said hollow tubular member such that said hitch head is removably coupled to said drawbar and a trailer hitch attachment for eliminating essentially all of the play in the coupling of said trailer hitch head to said trailer hitch drawbar; said attachment comprising a first plate provided with a first aperture of a shape and size to permit said shank to pass therethrough and a first skirt portion surrounding said first aperture, a second plate provided with a second aperture surrounded by a second skirt portion, said second aperture having a shape and size adapted to permit said shank to pass therethrough; a spacing means connecting said plates, said spacing means comprising first and second spacer members, each spacer member comprising a threaded bolt, a means for facilitating adjustment and a spacer member adjustor with a cooperating thread to threadably engage said bolt, each of said spacer members having a length which is adjustable by turning said bolt with respect to said spacer member adjustor; each of said spacer members having locking means for locking said bolt relative to said spacer member adjustor at a desired position so that a desired length of said spacer member is maintained; the arrangement being such that said first plate is secured on said drawbar such that said first plate cannot move with respect to said drawbar with said shank extending through said first aperture and said second plate is secured on said hitch head such that said second plate cannot move with respect to said hitch head with said shank extending through said second aperture and being removably secured in said hollow tubular member; said spacer members connecting said plates where said means for facilitating adjustment are exposed in a manner to allow adjustment of the spacer members by means of a tool; said spacer members being adjusted to space said plates such that said hitch head cannot move with respect to said drawbar while said shank is removably secured in said hollow tubular member by said clevis pin to eliminate essentially all the play in the coupling of said hitch head to said drawbar; said locking means adjusted to a position to maintain the desired adjusted length of said spacer members.

4,050,715
COUPLING HOOK FOR A GUIDE MEMBER OF A THREE-POINT ATTACHMENT OF A TRACTOR
Wilhelm von Allworden, Lohmar, Germany, assignor to Jean Walterscheid GmbH, Lohmar, Germany
Filed Oct. 8, 1976, Ser. No. 731,019
Claims priority, application Germany, Oct. 8, 1975, 2545040
Int. Cl.² B60D *1/10*
U.S. Cl. 280—508 **4 Claims**



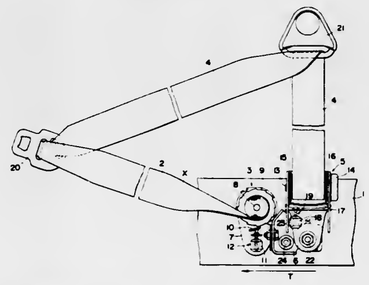
1. A coupling hook for a guide member of a three-point attachment of a tractor comprising a hook member having a hook opening, a partially spherical member having a slot to receive a coupling pin on an implement to be coupled and pivotally mounted within said hook opening, a latch displaceable into said hook opening to block a coupling pin in said partially spherical member slot in the locked position and displaceable into an open position, means on a portion of said hook opening opposed from said latch for defining a fulcrum for said partially spherical member, a first spring between said hook member and said partially spherical member and spaced from said fulcrum means urging said partially spherical member towards said latch, and means on said latch engageable with a portion of said partially spherical member for maintaining said latch in its open position.

4,050,716
SKI BINDING
Axel Kubelka, and Gottfried Schweizer, both of Vienna, Austria, assignors to TMC Corporation, Baar, Switzerland
Filed Mar. 19, 1976, Ser. No. 668,572
Claims priority, application Austria, Apr. 2, 1975, 2499/75
Int. Cl.² A63C *9/086*
U.S. Cl. 280—614 **13 Claims**



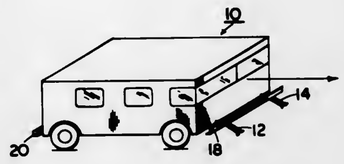
1. In a ski binding comprising a sole plate releasably secured to a ski and having a ski boot secured to said sole plate by a front support and a heel holding assembly, the improvement comprising a ski boot having a lower shell with a raised rear wall and an ankle cuff pivotally secured to said shell to allow pivotal movement of said ankle cuff in response to shifts in the weight of an individual using the boot, said cuff in part overlying said rear wall, said rear wall having an upper edge which is in the path of travel of the lower edge of the cuff so as to define a rearmost pivoted position on the cuff, said heel holding assembly, in the position of use, having first means engaging said lower shell to hold the boot heel to said sole plate, said heel holding assembly having second means including a stop member thereon positioned in said path of travel of said cuff to limit the degree of relative pivotal movement between said cuff and said lower shell.

4,050,717
SEAT BELT SYSTEM
Makoto Yamada, Seto; Shiro Sasaki; Shigenori Kanazawa, both of Toyota, and Yoshihiro Hayashi, Kasugai, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota; Nippon Denso Co., Ltd., Kariya and Tokai Rika Denki Seisakusho K.K., all of Japan
Filed Apr. 7, 1976, Ser. No. 674,491
Claims priority, application Japan, Apr. 25, 1975, 50-51147
Int. Cl.² B60R *21/10*
U.S. Cl. 280—744 **1 Claim**



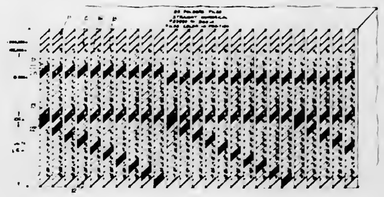
1. A seat belt system comprising:
a lap belt;
a lap belt take-up device, said device including a vehicular speed-sensing type emergency lock retractor having a belt winding shaft mounted on a car body frame member horizontally and substantially orthogonal to the traveling direction of the vehicle, one end of said lap belt being connected to said shaft;
a shoulder belt;
a shoulder belt take-up device, this device including a vehicular speed-sensing type emergency lock retractor having a belt winding shaft mounted on a car body frame member horizontally and substantially in parallel with the traveling direction of the vehicle, one end of said shoulder belt being connected to said shaft of said shoulder belt take-up device;
a guide ring, which is attached to a car body frame member in the vicinity of an outer shoulder of an occupant and through which said shoulder belt is inserted;
a tongue plate, to which the other end of said lap belt is connected and the other end of said shoulder belt is also connected through said guide ring and which is disengageably engaged with a buckle member anchored to a car body frame member on a side opposite to the retractors with respect to a seat; and
a retractor fixing bracket, which is substantially L-shaped, said lap belt and shoulder belt take-up devices being secured to respective arms of the L-shape and the bracket being secured to a car body frame member.

4,050,718
VEHICLE LEVELER SYSTEM
C. Lewis Newcomb, Jr., 520 11th Ave., Haddon Heights, N.J. 08035
Continuation of Ser. No. 316,472, Dec. 19, 1972, Pat. No. 3,881,746. This application May 5, 1975, Ser. No. 574,373
The portion of the term of this patent subsequent to May 6, 1992, has been disclaimed.
Int. Cl.² B60S *9/02*
U.S. Cl. 280—763 **7 Claims**



1. A leveler system for an over-the-road vehicle having a spring-suspended frame comprising in combination with said vehicle:
a plurality of jack devices each having an individually adjustable length, a lower ground-engaging portion on each said device,
and means for pivotally securing the upper portion of each said jack device to the spring-suspended frame of the vehicle adjacent a different corner thereof,
so that said vehicle can be partially elevated for leveling various individual amounts at each corner by driving the vehicle to move the jack devices in the direction of movement of said vehicle for rotation of the lengths thereof to a vertical condition supporting said vehicle frame and with a partial extension of the spring frame of said vehicle and the vehicle wheels resting on the ground, and so that said vehicle can be restored to normal over-the-road condition by driving the vehicle to rotate said jack devices for the lengths thereof to be inclined to the vertical with said vehicle frame fully spring suspended.

4,050,719
COLOR CODED INDEXING SYSTEM
Walter F. Cunningham, 183 W. Walnut Ave., Des Plaines, Ill. 60016
Filed Aug. 24, 1976, Ser. No. 717,164
Int. Cl.² B41F *21/00*
U.S. Cl. 283—36 **10 Claims**



1. A color coded indexing system to facilitate filing and retrieval of documents, comprising two ten-position digital bars spaced longitudinally from each other on and adjacent an edge of each document and each successively displaying in its 10 positions the numerals 0–9, 10 sets of color coded single digit tabs with each set displaying one of the numerals 0–9 and having a different color and each said tab having a transparent

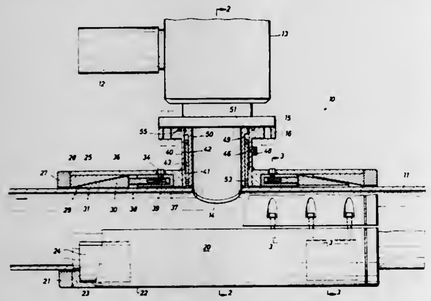
portion adjacent to and aligned with the said numeral thereon, and means for adhering selected said tabs to a document over said bars, whereby said transparent portion of a said tab adhered to a document over a said bar in any digital position thereof will overlie the digit in that position to transform said single digit tab into a double digit tab to provide a proper identification of the particular number of said document and proper filing of documents so identified will establish a color coded set position pattern for any desired filing system.

4,050,720

HOT TAP FOR PIPELINE

Bobby J. Reneau, P.O. Box 14, Bellaire, Tex. 77401

Filed Feb. 12, 1976, Ser. No. 657,356
Int. Cl.² F16L *35/00*
U.S. Cl. 285—18 **10 Claims**



8. The apparatus of claim 1 including

a cavity means in said laterally directed connective means, and wherein said piston is fluidly actuated within said cavity;

transverse head means closing said cavity at one end of said cavity; and

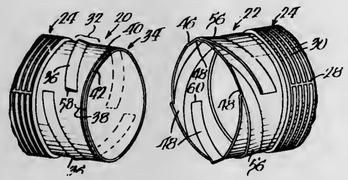
duplicate pipe gripping means in said housing, one arranged upstream and the other arranged downstream of said laterally directed connective means, each of which slidably engages the main pipeline and which are constructed nd arranged to work against one another in creating an axial load on gripping the pipe.

4,050,721

REINFORCED PLASTIC PIPE

Kenneth F. Streit, Mount Prospect, Ill., assignor to Phone-Ducs, Inc., North Chicago, Ill.

Filed June 9, 1976, Ser. No. 694,180
Int. Cl.² F16L *35/00*
U.S. Cl. 285—93 **32 Claims**



1. A length of plastic pipe comprising:

a first end portion, a middle portion, and a second end portion,

said middle portion having middle wall means for forming a passageway, a plurality of integral, exterior peripheral reinforcing flanges disposed at spaced intervals along the length of said middle wall means to provide stiffening, and a plurality of integral, longitudinal reinforcing ribs disposed at spaced intervals about the exterior of said middle wall means to provide stiffening, the height of said peripheral flanges being equal to the height of said longitudinal ribs,

said first end portion having a first end tubular wall of generally annular transverse cross-section and presenting a threaded male section having a plurality of protuberant helical thread rib segments on the exterior of said tubular wall, each rib segment having one side surface perpendicular to the exterior surface of said first end tubular wall for carrying the longitudinal threading bearing forces and one side surface disposed at an angle to, and merging with, the exterior surface of said first end tubular wall, each rib segment extending for a portion of the circumference of said wall thereon, said first end portion further having, between the distal end thereof and said threaded male section, a cylindrical end portion containing an annular groove in the exterior surface of said tubular wall and having a resilient gasket disposed within said annular groove,

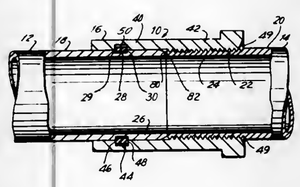
said second end portion having a second end wall means for forming an internal passageway of generally round transverse cross-section, a part of the exterior surface of said second end portion and the edges of parts of said circular flanges and longitudinal ribs lying along a line parallel to a longitudinal axis of said pipe thereby providing aligned longitudinal support points when said pipe is layed on a support surface, said second end portion presenting a threaded female section having a plurality of indented helical thread groove segments in the interior round surface of said second end wall means, each groove segment having one side surface perpendicular to the interior round surface of said second end wall means for carrying the longitudinal threading bearing forces and one side surface disposed at an angel to, and merging with, the interior round surface of said second wall means, each groove segment extending for a portion of the circumference of said wall thereon, whereby said second end portion is adapted to receive a first end portion of another length of similar pipe which is inserted therein and turned for causing threading engagement between the threaded male and female sections to establish a connection therebetween.

4,050,722

JOINT FOR CONDUIT

Sidney Berger, Great Neck; Salvatore Buda, East Hills, and Burton Weintraub, Old Bethpage, all of N.Y., assignors to Berger Industries, Inc., Maspeth, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,834
The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.
Int. Cl.² F16L *19/00*
U.S. Cl. 285—175 **8 Claims**



1. In combination:

a. a first two-ended conduit section having a length which equal to at least four times its outer diameter with a circular cylindrical outer wall surface of a constant diameter extending substantially the entire length of said conduit section and an axial passage of constant cross-sectional dimensions and configuration, one end of said first conduit section having external thread means thereon and a flat substantially perpendicular end face, the outside diameter of said thread means not exceeding said constant diameter, and said other end of said first conduit section being non-threaded and having a flat substantially perpendicular end face;

b. a second two-ended conduit section identical to said first conduit section having a length which is equal to at least four times its outer diameter, having a circular cylindrical outer wall surface of a constant diameter extending substantially the entire length of said conduit section, said outer wall surface equal in diameter to said outer wall surface of said first conduit section and an axial passage of constant cross-sectional dimensions and configuration equal to said axial passage through said first conduit section, one end of said second conduit section having external thread means thereon with a flat substantially perpendicular end face matching and abutting said adjacent flat substantially perpendicular end face of said other non-threaded end of said first conduit section, the outside diameter of said thread means not exceeding said constant diameter, and said other end of said second conduit section being non-threaded and having a flat substantially perpendicular end face;

c. a coupling sleeve having an end face and having first and second portions on opposite ends thereof, said first portion defining a central opening of a diameter slightly greater than the diameter of the entire length of said circular cylindrical outer wall surface so that said coupling sleeve may be slipped onto said first conduit section, said second portion defining a central opening of a diameter smaller than the diameter of said circular cylindrical outer wall surface and having female thread means formed therein extending from adjacent said end face and constructed and dimensioned to engage said external thread means on said one end of said second conduit section;

d. means providing an annular lock ring groove having an axially inward side and axially outward side in said outer wall surface of said first conduit section, near and spaced inwardly from said end face at said other, non-threaded end;

e. means providing an annular lock ring groove on the inner surface of said coupling sleeve in said first portion; and

f. at least one resilient lock ring of a variable diameter received partially within each of said annular lock ring grooves in its unbiased condition, a said annular lock ring groove having a depth at least equal to the cross-sectional height of said at least one lock ring;

g. at least one of said first portion of said coupling sleeve and said other end of said first conduit section provided with camming means to urge said lock ring fully into said annular lock ring groove when said coupling sleeve is first moved axially inwardly on said first conduit section, said lock ring in its unbiased condition spanning said annular lock ring grooves thereby captively holding said coupling sleeve on said first conduit section to form a coupling sleeve and conduit section unit and permitting rotation of said coupling sleeve on said first conduit section so that said coupling sleeve can be threaded onto said end of said second conduit section so as through said lock ring to force said end faces of said first and second conduit sections together;

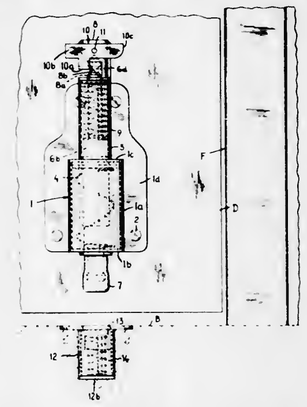
h. said central opening defined by said first portion being dimensioned to create a clearance between said first portion and said outer wall surface of said other non-threaded end of said first conduit section to thereby permit swivelling of said coupling sleeve on said non-threaded end of said first conduit section so that said female thread means on said coupling sleeve can mate with said external thread means on said other end of said second conduit section when said first and second conduit sections are not in exact axial alignment.

4,050,723

MECHANISM FOR SECURING A DOOR IN OPEN OR CLOSED POSITION

George Papadatos, 703 6th Ave., Asbury, Park, N.J.

Filed Dec. 3, 1976, Ser. No. 747,184
Claims priority, application Greece, May 17, 1976, 50740
Int. Cl.² E05C *1/02*
U.S. Cl. 292—164 **9 Claims**



1. Mechanism for securing a door in open or closed position comprising a casing having vertically aligned openings, means for securing the casing to a door near the floor, a hollow cylinder received in said openings of the casing and guided by said openings for vertical lengthwise movement relative to the casing, first spring means for biasing said cylinder upwardly relative to the casing, means for limiting upward movement of said cylinder relative to the casing to position said cylinder in an upper position, a plunger received in said cylinder and longitudinally movable therein, second spring means for biasing said plunger downwardly relative to said cylinder, detent means on the upper end of said plunger, latch means on the upper end of said cylinder engageable with said detent means on the upper end of said plunger to hold said plunger in an upper position, means for manually releasing said latch means whereupon said plunger is pressed downwardly into engagement with the floor by said second spring biasing means, said cylinder being manually movable downwardly relative to said casing and said plunger from said upper position to a position in which said latch means again engages said detent means whereupon said cylinder and plunger are raised by said first spring biasing means to said upper position.

4,050,724

SASH LOCK

Yoshitaka Nakanishi, 12-9, Yawata 5-chome, Ichikawa, Chiba, Japan

Filed Dec. 4, 1975, Ser. No. 637,656
Claims priority, application Japan, Dec. 27, 1974, 49-1248; Dec. 27, 1974, 49-1249
Int. Cl.² E05C *3/04*
U.S. Cl. 292—241 **11 Claims**

1. A sash lock, comprising:

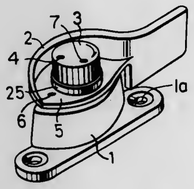
a base member;

a latch cam having a latch cam shaft for rotatably mounting the latch cam on the base member;

a locking member for unlockably locking the latch cam against rotation thereof on the base member, the locking

member having a cylindrical body portion which coaxially surrounds the cam shaft and is shiftable along the same in one direction for locking and in an opposite direction for unlocking the latch cam, the locking member also having a leg, which projects from one end of the cylindrical body portion, and having means defining a locking cam surface which projects from another end of the cylindrical body portion, the latch cam having a guide opening to guide the leg of the locking member in the locking and unlocking of the latch cam, and the base member having a recess which can be aligned with the guide opening by rotation of the latch cam on the base member to permit, when the guide opening is aligned with the recess, reversible insertion of the leg in the guide opening and recess to lock the latch cam to the base member;

a knob having a knob shaft which coaxially, rotatably pivots the knob to the cam shaft and to the cylindrical body portion of the locking member, the knob also having a

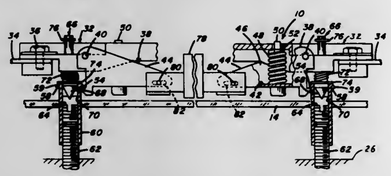


portion which defines a knob cam surface conformably matching the locking cam surface for the locking and unlocking of the latch cam, the knob cam surface and the locking cam surface each having a recessed flat cam portion, a projecting flat cam portion, and an inclined cam portion interconnecting the flat cam portions, and the flat cam portions being normal to the shaft; and

a spring on the base member and latch cam, urging the locking member against the knob cam surface;

whereby, when the recessed flat portion of the knob cam surface and the projecting flat portion of the locking cam surface are mutually engaged, the spring shifts the locking member in the direction for unlocking; and when the projecting flat portions of both surfaces are mutually engaged the spring is counteracted thereby, the locking member is shifted in the direction for locking, and the leg is inserted in the recess, locking the latch cam to the base member.

4,050,725
LATCH ASSEMBLY
William Crawford Wilson, and David Bowen Anderson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 29, 1976, Ser. No. 671,531
Int. Cl.² E05C *21/00*
U.S. Cl. 292—304 **5 Claims**



1. Latching assembly for selectively latching and accurately positioning a frame relative to a frame support, said frame and said frame support being biased from a latched position toward a separated position, said assembly comprising:

at least one pawl pivotably mounted on said frame, said pawl having a latching surface for latching said frame to said frame support; means to bias said pawl to a latched position; means connected to said pawl for selectively moving said pawl to an unlatched position; at least one guide pin mounted on said frame for extensible movement relative thereto, resilient means for urging said pin to a position extending from said frame, a positioning flange fixed to said guide pin; at least one latching post fixed to said frame support, said latching post having a recess sized for matingly receiving said one guide pin for laterally positioning said frame relative to said support when said members are moved toward their latched position and further having an adjustable shoulder, said shoulder having a first surface engageable by said positioning flange and a second surface engageable by said latching surface of said pawl when said frame is in its latched position relative to said frame support whereby said frame is securely latched and accurately spatially positioned relative to said frame support.

4,050,726
ENERGY ABSORBING BUMPER
Hermann Hablitzel, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Germany
Filed Apr. 30, 1976, Ser. No. 681,818
Claims priority, application Germany, May 9, 1975, 2520594
Int. Cl.² B60R *19/06*
U.S. Cl. 293—71 R **8 Claims**

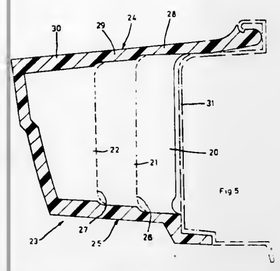
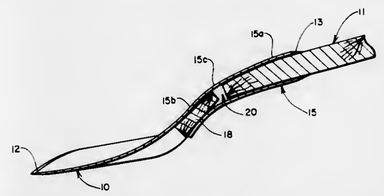


Fig 5

1. An energy absorbing bumper for protecting an object from damage from an impact, comprising a support mounted to said object, an elastic base member, arranged opposite said support, and at least two elastic sidewalls extending between said base member and said support, said sidewalls having a first cushion zone adjacent said support and a second cushion adjacent said base member, the wall thickness of said sidewalls being greater in said second cushion zone than in said first cushion zone, the material characteristics and wall thickness of said first and second cushion zones being selected so that a selected impact occuring at temperatures near or above room temperature will cause deformation of said first cushion zone with substantially no dissipation of impact energy and deformation of said second cushion zone with substantial impact energy dissapation, and said selected impact occuring at lower temperature will cause deformation of said first cushion zone with substantial impact energy dissapation and will cause substantially no deformation of said second cushion zone.

4,050,727
HAND-SHOVEL ASSEMBLY AND METHOD OF PRODUCING IT
David R. Bonnes, Columbus, Ohio, assignor to The Union Fork & Hoe Company, Columbus, Ohio
Filed Aug. 10, 1976, Ser. No. 713,113
Int. Cl.² A01B *1/22*; B25G *3/34*
U.S. Cl. 294—49 **12 Claims**

1. A hand implement comprising a head and an elongated handle; said head having a continuous socket formed thereon with an outwardly opening handle-receiving end and an opposite outwardly-opening plug-receiving end, a handle having a portion inserted into the handle-receiving end of the socket to fit tightly therein adjacent the socket outer end but to provide a space around the inserted handle portion within the socket, a plug having a portion inserted into the plug-receiving end of the socket to fit tightly therein adjacent the socket outer end but to provide a space around the inserted plug portion within the socket, said plug inserted portion and said handle inserted



portion having inner extremities spaced from each other to provide a chamber therebetween which communicates with the respective spaces around the inserted portions of the plug and handle, said chamber and said spaces being filled with a body of solid bonding material which is of substantially H-form in axial cross-section that bonds to the surrounding socket and the inserted plug and handle portions to substantially integrally connect the plug and handle portions together within the socket and cause them to tightly fit within the socket.

4,050,728
SECOND HANDLE FOR ATTACHING TO A SHOVEL OR THE LIKE
Glenn E. Davidson, 205 Franklin, Sublette, Kans. 67877
Filed Oct. 12, 1976, Ser. No. 731,465
Int. Cl.² B25G *3/00*
U.S. Cl. 294—58 **4 Claims**



1. A second handle for attaching to a shovel or the like, the second handle comprising:

an elongated tube having a first end portion and a second end portion;

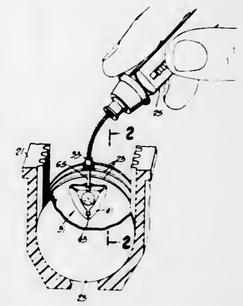
a hand grip attached to the second end portion of said tube for holding the second handle; and

a universal joint, attached to the second end portion of said tube and attached to the shovel for pivoting said tube on the shovel, said universal joint pivoting said tube in a plane parallel to the plane of the shovel, and pivoting said tube in a plane perpendicular to the plane of the shovel, said universal jont including:

a "J" shaped mounting strap, said mounting strap attached to the shovel by annular clamps; p1 a swivel rotatably mounted between the "J" shaped portion of said mounting strap; and

a pair of strap arms, one end of said strap arms pivotally attached to said swivel, the other end of said strap arms secured to the second end portion of said tube.

4,050,729
APPARATUS FOR HANDLING DELICATE ARTICLES SUCH AS SILICON WAFERS
Clifford L. Hutson, 1860 Idlewood Road, Glendale, Calif. 91202
Filed Apr. 20, 1976, Ser. No. 678,469
Int. Cl.² B66C *1/02*
U.S. Cl. 294—64 R **19 Claims**



1. Apparatus for picking up and handling silicon wafers and the like, comprising:

a rigid housing configured to be movable edgewise between closely adjacent wafers;

means in said housing defining an open vacuum chamber which terminates in a deflectable surface-contacting peripheral lip extending adjacently over a side face of the housing; and

means in said housing, connectable to a vacuum source and extending into said vacuum chamber in a plane substantially parallel to the plane including said lip, for generating a vacuum in said vacuum chamber.

4,050,730
HOOK LATCHING DEVICE
Akio Tada, 2-7, Mondohigashino-cho, Nishinomiya, Hyogo, and Hideyuki Torihata, 7-7, 1-Chome, Ohmiya, Asahi, Osaka, both of Japan
Filed May 19, 1976, Ser. No. 688,077
Int. Cl.² B66C *1/36*
U.S. Cl. 294—82 R **2 Claims**



1. In a hook assembly of the type including a hook having a hanger or shank portion, a curved portion with a tip end, and an opening through which a looped rope or wire is movable;

and a latching device for closing said opening; the improvement wherein said latching device comprises:

a bracket on said hanger portion of said hook adjacent said opening, said bracket having upper and lower surfaces with upper and lower recesses, respectively, therein;

a latching arm pivotally connected at a first end thereof to said bracket, said latching arm having adjacent a second end thereof a cap adapted to contact and receive said tip end of said hook;

said latching arm being pivotable from a closed position blocking said opening with said cap contacting said tip end to an open position opening said opening with said cap spaced from said tip end;

a locking lever pivoted to said latching arm interiorly thereof and at a position between said first and second ends thereof, said locking lever having at a first end thereof a pawl dimensioned to fit within said upper and lower recesses;

said locking lever being pivotable with respect to said latching arm from a first locking position wherein said pawl is within one of said recesses, thereby locking said latching arm against pivoting movement, to a second unlocking position wherein said pawl is in neither of said recesses, thereby allowing pivoting movement of said latching arm; and

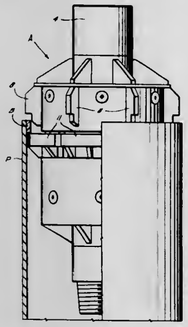
means acting on said locking lever for biasing said locking lever to said first locking position thereof;

whereby, when said latching arm is in said closed position thereof said pawl of said locking lever is in said lower recess, and when said latching arm is in said open position thereof said pawl is in said upper recess.

4,050,731
SHIFTING APPARATUS

Malcolm G. Coone; Billy C. Malone, and Marvin Lee Holbert, Jr., all of Houston, Tex., assignors to Lynes, Inc., Houston, Tex.

Filed Jan. 26, 1976, Ser. No. 652,175
Int. Cl.² B66C 1/42
U.S. Cl. 294—86.24 **8 Claims**

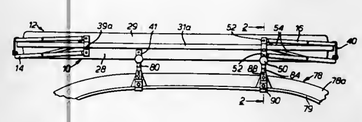


1. Apparatus for at least partial insertion within a longitudinally shiftable element, comprising: a longitudinally extending housing; an inflatable device within said housing; means communicable with said inflatable device for selective control of fluid pressure within and manipulation of said inflatable device; control elements within said housing selectively operational to expanded and retracted positions in response to said inflatable device; means on said housing for locking said control elements into expanded position, at least part of said elements when in the expanded position extending out of and away from said housing, said elements when in the expanded position engaging said shiftable element and governing longitudinal movement thereof, said elements when in the retracted position disengaging said shiftable element.

4,050,732
CAMPER ASSEMBLY

Gerard Connor MacIsaac, 17 McCubbin Street, Burwood, Victoria, Australia

Filed Feb. 2, 1976, Ser. No. 654,509
Claims priority, application Australia, Feb. 11, 1975, 554/75
Int. Cl.² B60P 3/34
U.S. Cl. 296—23 A **15 Claims**



15. A vehicle roof mount for supporting a camper assembly comprising:

a carry frame;

means to detachably mount the frame on the cabin roof of a vehicle;

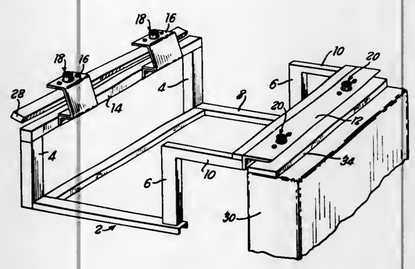
respective spaced sets of prongs for engaging the collapsed assembly along respective sides thereof and so retaining it on the carry frame, one set of which prongs being withdrawable to release the assembly; and

a pair of pads on which to rest the assembly during lifting of the latter onto or from the carry frame, which pads define respective pad surfaces for engaging an underside of the assembly and are so mounted that the pads are freely rotatable about each of two mutually perpendicular axes, rotation about one axis being effective to move the pad surfaces between an upwardly facing condition just above and to one side of the carry frame and a condition in which they face laterally outwardly of the frame.

4,050,733
VEHICLE CAB

James L. Borrill, Doncaster, England, assignor to International Harvester Company, Chicago, Ill.

Filed Jan. 23, 1976, Ser. No. 651,984
Int. Cl.² B62D 27/04
U.S. Cl. 296—28 C **10 Claims**

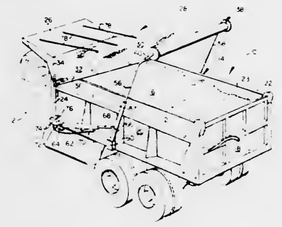


1. A cab sub-frame for a vehicle having a support structure, the sub-frame comprising first and second pairs of longitudinally and laterally spaced apart upright beam elements having upper and lower ends, a pair of lower longitudinally extending beam elements adapted to carry a floor, the lower beam elements having opposite ends connected to the lower ends of the first and second pairs of upright beam elements, a pair of upper longitudinally extending beam elements adapted to carry on operator's seat, the upper beam elements having a first end connected to the upper ends of the second pair of upright beam elements and a second end extending longitudinally therefrom, a first crossbar extending between and connected at the opposite ends thereof to the upper ends of the first pair of upright beam elements, a second crossbar parallel to the first crossbar and extending between and connected at the opposite ends thereof to the extending second ends of the upper beam elements, first and second crossbar supports longitudinally spaced and mounted to the support structure, first and second resilient mountings respectively carried by the first and second crossbars, and connecting means for connecting the first and second resilient mountings carried by the first and second crossbars respectively to the first and second crossbar supports mounted on the support structure of the vehicle, the connection insulating the mounted sub-frame from vibration in the support structure.

4,050,734
ROLL-UP TRUCK COVER ASSEMBLY

Douglas B. Richard, 17 Vine St., Ansonia, Conn. 06401

Continuation of Ser. No. 490,252, July 22, 1974, abandoned, and a continuation-in-part of Ser. No. 272,668, July 17, 1972, abandoned. This application Oct. 17, 1975, Ser. No. 623,446
Int. Cl.² B60P 7/04
U.S. Cl. 296—98 **19 Claims**

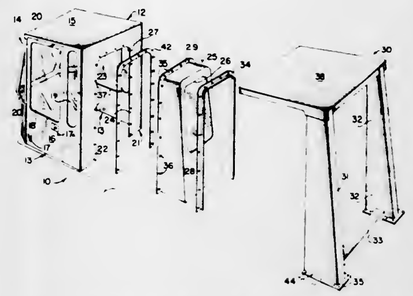


1. A roll-up truck cover assembly for dump trucks and the like having upstanding side and end walls defining an upwardly open body for receiving particulate material which may project upwardly beyond the sides of body; said cover assembly comprising a flexible top cover substantially co-existensive with the body cross section viewed from above, said cover extending across the top of a front end portion of said body and being attached thereto whereby completely to close said end portion of the body and to prevent air flow beneath the cover and billowing and particulate leakage, a take-up roll for said flexible cover having an opposite end portion of the cover attached thereto substantially across its width and having associated biasing means tending to rotate the roll in a take-up operation of the cover, a pair of similar arms pivotally mounted at lower end portions externally on opposite side walls of the truck body and having upper end portions connected with and rotatably supporting opposite end portions of said take-up roll, and operating means for swinging said arms rearwardly for an arcuate roll traverse of the truck body, the said rearward movement being a cover roll-out movement and being opposite to the direction which said biasing means tends to swing said arms while urging said cover in a take-up direction about said roll, said cover during both roll-out and take-up thus having substantially no horizontal component of movement with respect to said particulate material.

4,050,735
MULTI-PURPOSE CAB FOR CONSTRUCTION VEHICLES

John Molnar, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 22, 1975, Ser. No. 615,441
Int. Cl.² B62D 25/06
U.S. Cl. 296—102 **18 Claims**



1. A multi-purpose operator's cab adapted for use on a construction vehicle comprising;

a basic cab unit including a pair of laterally spaced side panels,

a front panel secured between forward ends of said side panels,

a top panel secured on said side and front panels,

a rear panel secured between rearward ends of said side and top panels, and

first mounting flange means formed on said rear panel, and

at least one rear member mounted on said rear panel and at least generally co-extensive therewith,

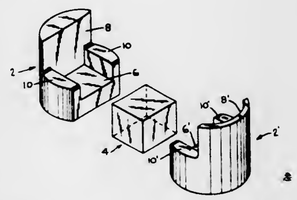
second mounting flange means formed on the periphery of said rear member, and

fastening means releasably securing said first and second mounting flange means together.

4,050,736
COMPACTABLE FURNITURE

Natan Karp, 9 Tel-Hai Str., Jerusalem, Israel

Filed Apr. 7, 1976, Ser. No. 674,401
Int. Cl.² A47B 39/00
U.S. Cl. 297—135 **5 Claims**



1. A compactable furnishing unit comprising two chairs and a shaped body wherein each chair is characterized by a seating surface, an upwardly extending backrest and two upwardly extending arm rests, said unit being characterized in that said shaped body is adapted to fit into the area defined by the seating surface, backrest and armrests of one of said chairs and to extend upwardly beyond the top of said armrests and that the second chair of said unit is adapted to be inverted and to rest with its armrests on the armrests of said first chair and with a portion of said shaped body extending into the area defined

by the seating surface, backrest and armrests of said second chair whereby the armrests of said second inverted chair are aligned with and maintained in position atop the armrests of said first chair by said shaped body and said unit of two chairs and a shaped body thereby form a compact unit, the combined height of the armrests of said first chair and the armrests of said second chair being substantially equal to the height of each of the backrests of said chairs whereby when said second chair is inverted onto said first chair the top surface of the backrest of each of said chairs is substantially continguous with the plane of the bottom of the other chair and further characterized in that the bottom of at least one of said chairs comprises a substantially flat surface adapted for use as a table when said chair is inverted atop the other chair, and the back of each chair is curved whereby the outer surfaces of the chairs of said unit in its compact state are substantially contiguous and define a substantially cylindrical shape and each of said chairs can be placed on its back on a floor surface and be adapted to serve as a sideway rocking chair.

4,050,737

SUPPORT HARNESS

Ruth Frances Jordan, 3095 Monticello Blvd., Cleveland Hts., Ohio 44118

Filed Aug. 30, 1976, Ser. No. 718,832
Int. Cl.² A47D *13/08*
U.S. Cl. 297—389 **8 Claims**



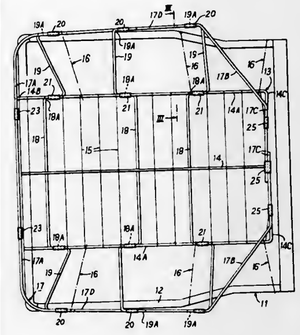
1. A support harness for firmly and comfortably supporting a child with cerebral palsy and the like against the back of a chair in normal sitting position comprising a back portion having means at shoulder and hip levels for detachably securing said back portion to the back of a chair; padded lateral flaps at opposite sides of said back portion of length and width for wrapping around a child's torso over the sides thereof and overlapping each other over the entire chest and abdomen, said lateral flaps and padding therein having cutouts to fit under the child's armpits for freedom of arm movement; releasable fastener means for securing said flaps in such overlapping relation; a longitudinal flap from the lower end of said back portion of progressively narrowing width to extend forwardly from the back of the chair under the child's hips and to extend upwardly through the child's crotch to overlie said overlapped lateral flaps substantially to the upper edges thereof; and shoulder straps including releasable fastener means to interconnect the upper end of said back portion to the end portion of said longitudinal flap, said lateral flaps and said longitudinal flap when wrapped around a child's trunk as aforesaid forming leg openings at the upper portions of the thighs for freedom of leg movement while the child is retained in normal erect sitting position; the padding in said lateral flaps beginning inwardly of said cutouts in the region of the back portion where the child's back curves away from the back of the chair thus to stiffen, without sacrifice of comfort, the portions of the harness which embrace the sides of the child's trunk.

4,050,738

SEAT FRAMES

David Thomas Griffiths, Pontardulais, Wales, assignor to Youngflex, S.A., Fribourg, Switzerland

Continuation-in-part of Ser. No. 440,782, Feb. 8, 1974, abandoned. This application Aug. 13, 1975, Ser. No. 604,177
Claims priority, application United Kingdom, Feb. 16, 1973, 7874/73
Int. Cl.² A47C *7/02*
U.S. Cl. 297—452 **3 Claims**



1. A seat frame comprising:
a base frame,
b. a cushion support including longitudinally extending side wire portions and a plurality of spaced, transversely extending cross wires anchored between said side wire portions,
c. a plurality of tension spring means anchored between said side wire portions and said base frame to suspend said cushion support in tension transversely with respect to said base frame,
d. a plurality of spaced spring elements each comprising a central portion extending transversely between said side wire portions, intermediate torsional portions extending parallel with and adjacent said side wire portions, and end portions extending transversely and outwardly from said torsional portions, in an upward direction from and at an obtuse angle to said cushion support,
e. means loosely connecting each of said torsional spring element portions to the adjacent side wire portion of said cushion support along a substantial portion of the length of the former,
f. an edge frame arranged above said cushion support and including resilient edge wire portions extending adjacent the free ends of the end portions of said spring elements at the respective sides of the seat, and
g. means connecting the free ends of the end portions of said spring elements to said edge frame.

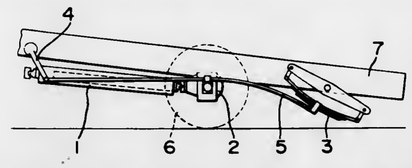
4,050,739

UNLOADING APPARATUS OF TRUCK

Terumasa Toyooka, 1-734, Sakae, Ikeda, Osaka, Japan

Continuation of Ser. No. 419,207, Nov. 26, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,387
Int. Cl.² B60P *1/04*
U.S. Cl. 298—19 V **4 Claims**

2. In a vehicle, a chassis, a drive shaft, a driving axle journaling ground-engaging wheels at its respective ends, a first resiliently flexible beam secured at its forward end to said chassis and extending rearwardly to and adjacent said axle, a first sliding connection between the axle and said first beam, to enable said axle to translate in the fore-and aft direction with respect to said chassis, spring support means attached to the rearward end of said first beam and to said chassis, for supporting the latter, said axle being translatable on and along said first beam, said drive shaft comprising forward and rearward aligned sections telescopically connected for conjoint rotation about common fore-and aft axis, and means carried by said axle and connected with the rearward end of the rearward section to rotate the ground-engaging wheels by and in response to rotation of said shaft.

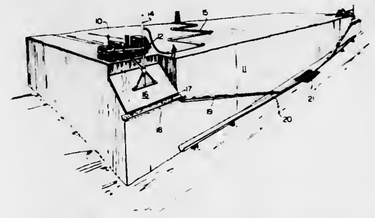


4,050,740

METHOD OF AND APPARATUS FOR MELTING BLOCK SULPHUR

Ernest Ralph Ellithorpe, 267-43rd Ave., North West, Calgary, Alberta, Canada (T2K 0H9), and Richard Calvin Ellithorpe, 336 Cedarbrae Crescent, South West, Calgary, Alberta, Canada (T2W 1Y4)

Filed Feb. 18, 1976, Ser. No. 659,159
Claims priority, application United Kingdom, Feb. 20, 1975, 7098/75; May 2, 1975, 18343/75
Int. Cl.² E21C *37/16, 41/14*; B01J *1/00, 6/00*
U.S. Cl. 299—6 **15 Claims**



1. A method of melting block sulfur, comprising the steps of:
positioning a heating element on a block of sulfur so the heating element is downwardly inclined towards and projects beyond an edge of the sulfur block;
supplying steam to said heating element to melt the sulfur beneath said heating element, whereby said melted sulfur flows downwardly at the underside of said heating element, to which it adheres by surface tension, and beyond said edge of the sulfur block; and
collecting said melted sulfur beyond said edge.

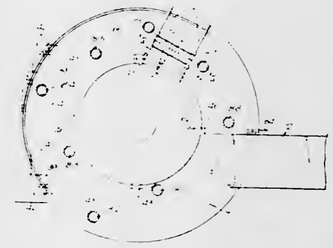
5. Apparatus for melting block sulphur, comprising:
a heating element;
said heating element defining a plurality of mutually spaced flow passages in a generally planar array;
steam inlet passage means communicating with said flow passages for supplying steam thereto;
outlet means communicating with said flow passages for discharging condensate therefrom;
means defining a flow surface at the underside of said heating element at and adjacent at least one edge thereof for flowing molten sulphur by surface tension along the underside of said flow surface;
overhead suspension means extending downwardly to said heating element for suspending said heating element at an inclination, with said heating element being downwardly inclined towards said edge thereof;
said suspension means including means for raising and lowering said heating element; and
trough means extending along and beneath said flow surface for collecting the melted sulphur beneath said flow surface defining means.

4,050,741

FEEDING CUT TOBACCO

William H. C. Dickinson, Winchester, England, assignor to W. H. Dickinson Engineering Limited, United Kingdom

Filed Nov. 28, 1975, Ser. No. 635,754
Claims priority, application United Kingdom, Nov. 28, 1974, 51679/74
Int. Cl.² B65G *53/24, 53/40*
U.S. Cl. 302—13 **16 Claims**



9. Apparatus for distributing tobacco, comprising an annular tray, means for delivering tobacco onto the annular tray as a carpet spread across a radius of the tray, means for driving the tray to convey the tobacco along a circular path around the tray, a number of fixed feed pipes extending downwards towards the tray and having tobacco inlet ends positioned near the tray at various distances from the axis of the tray, tobacco being sucked up from the tray through the feed pipe, and separator means for substantially separating the part of the tobacco carpet which passes beneath each inlet end from adjacent parts of the carpet for application to the respective feed pipe.

4,050,742

TRANSPORTING HEAVY FUEL OIL AS A SLURRY

Raymond H. Hughes, La Place, La., and Carl D. Clay, Casper, Wyo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Nov. 4, 1976, Ser. No. 738,799
Int. Cl.² B65G *53/30*
U.S. Cl. 302—66 **6 Claims**

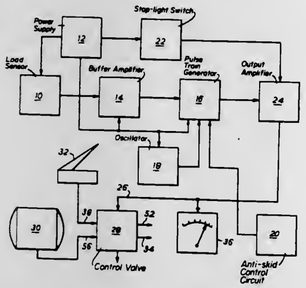
1. A process for transporting heavy fuel oil as a slurry in water, the process comprising:
a. separating the heavy fuel oil into a first portion and a second portion;
b. fractionating the first portion into a relatively low pour point fraction and a relatively high pour point fraction;
c. recombining the relatively low pour point fraction with the second portion;
d. substantially congealing at least a portion of the second portion of the heavy fuel to obtain congealed particles of the heavy fuel oil;
e. coating the congealed particles with the relatively high pour point fraction;
f. slurrying the coated, congealed particles in a carrier liquid; and
g. transporting the slurry in a transportation system.

4,050,743

LOAD DEPENDENT CONTROL ARRANGEMENTS

David John Knight, Bath, England, assignor to Bendix Westinghouse Limited, Bristol, England

Filed May 24, 1976, Ser. No. 689,213
Claims priority, application United Kingdom, June 3, 1975, 23941/75
Int. Cl.[2] B60T 8/18
U.S. Cl. 303—22 R 32 Claims



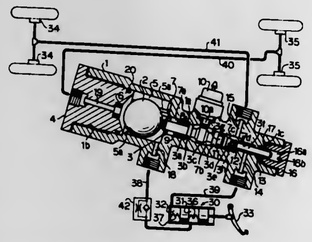
1. A load sensing arrangement comprising:
load sensor means for generating an analogue electric signal dependent on a load;
electric signal conversion means coupled to said load sensor means for converting said analogue signal to a binary signal having a mark-to-space ratio dependent on the magnitude of said analogue signal;
electrically operated fluid valve means coupled to said conversion means to alternately open and close a fluid valve in accordance with the marks and spaces in said binary signal;
a source of predetermined fluid pressure coupled to said fluid valve means to have said predetermined fluid pressure alternately passed and blocked by the opening and closing of said valve to produce an output of said fluid valve means which is dependent both on said predetermined pressure and on said load.

4,050,744

SAFETY DEVICE FOR USE IN A VEHICLE BRAKE

Tomoyuki Nogami, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Jan. 5, 1977, Ser. No. 756,976
Claims priority, application Japan, Sept. 18, 1976, 51-112098
Int. Cl.[2] B60T 8/14, 17/18
U.S. Cl. 303—24 A 10 Claims



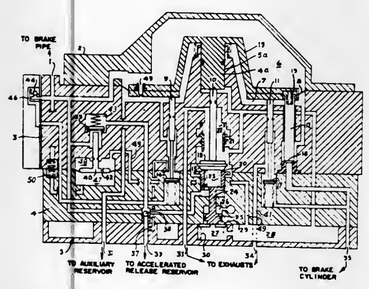
1. A safety device for use in a vehicle hydraulic brake comprising:
a. a valve casing installed in a hydraulic circuit interconnecting the tandem type master cylinder for the vehicle hydraulic brake and the front/rear wheel cylinders;
b. a ball-containing-chamber formed within said valve casing to serve as a part of the hydraulic circuit communicating to said rear wheel cylinders;
c. a ball accommodated in said ball-containing-chamber adapted to shut off the path of braking-fluid to the rear brake circuit, when the vehicle deceleration rate exceeds a predetermined value, by means of rolling up along a slope due to inertia to closely contact a valve seat;
d. a differential-piston-containing-chamber disposed in communication with said ball-containing-chamber; and
e. a differential piston axially movably fitted within said differential-piston-containing-chamber to receive on opposite ends thereof respectively the hydraulic pressure from the rear brake circuit and the front brake circuit, wherein when the rear brake circuit is damaged or broken down, said piston slides toward said ball to urge the same against said valve seat due to the difference of pressure in both circuits, and when the front brake circuit is broken down, said piston slides in the reverse direction similarly due to the difference of pressure to shut off the path of the braking-fluid to the front brake circuit.

4,050,745

BRAKE CONTROL VALVE APPARATUS

David John Wickham, London, England, assignor to Westinghouse Brake & Signal Company, Ltd., England

Filed Dec. 8, 1975, Ser. No. 638,463
Claims priority, application United Kingdom, Jan. 3, 1975, 208/75
Int. Cl.[2] B60T 15/52
U.S. Cl. 303—36 2 Claims



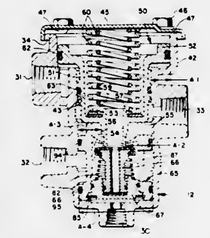
1. A fluid operable brake control valve apparatus having a brake cylinder valve means for controlling the supply of fluid pressure into and out of a brake cylinder, said valve means being operable by a main pressure responsive member movable in response to changes of pressure when applied to a brake pipe, a quick service valve operable in response to such a change tending to cause a brake application for connecting a quick service volume to the brake pipe to enhance the change at commencement of an application, accelerated release valve means operable in response to release of fluid pressure from the quick service volume to connect a charged accelerated release reservoir to the brake pipe to assist a change of pressure in the brake pipe causing such release, a further pressure responsive member for operating said accelerated release valve, one side of said member being subject to quick service volume pressure and communicating with the other side thereof through a choke, and means for normally biassing said further pressure responsive member towards a position in which the accelerated release valve is closed.

4,050,746

INVERSION BRAKE VALVE AND SYSTEM THEREFOR

Harold Durling, Elsie, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Division of Ser. No. 611,648, Sept. 9, 1975, Pat. No. 4,017,125.
This application Aug. 19, 1976, Ser. No. 716,027
Int. Cl.[2] B60T 15/12
U.S. Cl. 303—40 3 Claims



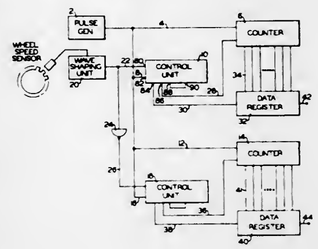
1. A valve for use with brake actuators in a fluid-actuated braking system where sources of pressure at varying levels exist at valve ports comprising:
a valve body having a generally closed cylindrical bore therein, said body having a first inlet port in fluid communication with one end of said bore, a vent port in fluid communication with the opposite end of said bore, second and third inlet ports and a delivery port in fluid communication with said bore;
a first cylindrically stepped single-piece piston within said bore generally adjacent said vent port, said first piston having a hollow stem in fluid communication at one end with said vent port and defining a first valve seat at its opposite end, said first piston including sealing means circumferentially disposed thereabout to define with said bore a first pressure responsive area in fluid communication with said second inlet port and to define with said bore and said first valve seat a second pressure responsive area said first pressure responsive area being at least as great as said second pressure responsive area but not greater than 1.5 time said second pressure responsive area;
biasing means contacting said first piston tending to move said first piston toward said first inlet port;
a second cylindrically stepped piston within said bore generally adjacent said first inlet port, said second piston including a second valve seat facing and generally concentric with said first valve seat, second sealing means circumferentially disposed about said second piston to define with said bore a third pressure responsive area in fluid communication with said first inlet port and to define with said bore and said second valve seat a fourth pressure responsive area in fluid communication with said third inlet port;
sealing means associated with one of said pistons effective to (i) seal said first and second valve seats to prevent fluid communication between said third inlet port, said vent port and said delivery port when said pressure at said outlet port acting over said second pressure responsive area equals the pressure exerted by said biasing means and said pressure developed at said first inlet port is typically zero to define a lapped position of said valve and (ii) sealing said first valve seat while opening said second valve seat to provide fluid communication between said delivery port and said vent port at a rate equal to the ratio of said first area and divided by said second area as pressure is supplied to said second inlet port to define a dump position of said valve; said valve moving from said dump position to said lapped position when the pressure at said delivery port acting over the second area is equal to the pressure at said first port times the ratio of the second area divided by the first area.

4,050,747

DIGITAL WHEEL SPEED CIRCUIT ARRANGED TO COMPENSATE FOR DIMENSIONAL IRREGULARITIES OF SENSOR ROTOR MEMBER

Gerhard Ruhnau; Wolfgang Gudat, both of Hannover; Peter Liermann, and Karl-Heinz Hesse, both of Gehrden, all of Germany, assignors to WABCO Westinghouse GmbH, Hannover, Germany

Filed Jan. 10, 1977, Ser. No. 757,830
Claims priority, application Germany, Apr. 17, 1976, 2616972
Int. Cl.[2] B60T 8/02
U.S. Cl. 303—95 7 Claims



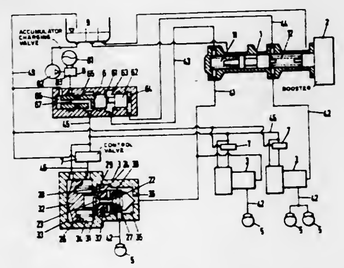
1. A circuit for providing a digital speed signal according to the angular velocity of a vehicle wheel comprising:
a. a wheel speed sensor device including a toothed rotor rotatable with the wheel, said sensor device generating a sinusoidal voltage having a fundamental frequency proportional to the rotational speed of the toothed rotor;
b. means for converting said sinusoidal voltage into a square wave signal; and
c. means for measuring the time duration between two positive polarity transitions of said square wave signal occurring at full cycle intervals and between two negative polarity transitions of said square wave signal occurring at full cycle intervals to provide said digital speed signal for each said full cycle interval thereof, said full cycle intervals defined by said positive and said negative polarity transitions having an overlapping relationship therebetween.

4,050,748

BRAKING SYSTEM HAVING ANTI-SKID CONTROL

Juan Belart, Walldorf, Germany, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed May 3, 1976, Ser. No. 682,867
Claims priority, application Germany, Aug. 23, 1976, 2519835
Int. Cl.[2] B60T 8/02
U.S. Cl. 303—114 10 Claims



1. A braking system having anti-skid control wherein a pressure control device is interposed in at least one line form-

ing a connection between a master cylinder and at least one wheel cylinder, said pressure control device including a housing carrying a piston having operating surfaces which are acted on by the wheel cylinder pressure and by an auxiliary pressure from a pressure medium source through a modulating valve, said modulating valve being able to block a connection between the pressure medium source and the pressure control device and to open a return connection, said pressure control device also including a valve member therein operable by said piston which is capable of blocking said connection between said master cylinder and said wheel cylinder, including:

a connecting line forming a connection between said pressure medium source and said modulating valve,

said modulating valve being positioned in said connection between said pressure medium source and said pressure control device and including means for controlling the output pressure of the auxiliary pressure which may be obtained from said pressure medium source so as to correspond to the pressure in said master cylinder;

said piston in said pressure control device being a stepped piston having first, second and third operating surfaces wherein said third operating surface is directly operated on by said auxiliary pressure from said modulating valve which is opposed by the master cylinder and wheel cylinder pressures acting respectively on said first and second operating surfaces, and having a valve passage formed in said piston capable of being opened by said valve member positioned in said piston after said connection to said master cylinder has been blocked, said valve passage forming a connecting passage leading from a chamber in said housing in front of said second operating surface.

4,050,749

CONTROL VALVE ASSEMBLIES FOR VEHICLE ANTI-SKID BRAKING SYSTEMS

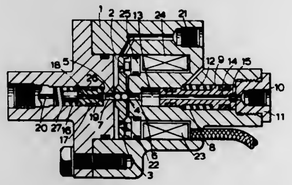
David Anthony Harries, and Ivan Mortimer, both of Solihull, England, assignors to Girling Limited, Birmingham, England

Filed Jan. 17, 1977, Ser. No. 759,897

Claims priority, application United Kingdom, Mar. 10, 1976, 09467/76

Int. Cl.² B60T 8/08

U.S. Cl. 303—119 **7 Claims**



1. A control valve assembly for a vehicle hydraulic braking system comprising a housing having an inlet port for connection to a supply of hydraulic fluid under pressure, an outlet port for connection to a wheel brake, and a pressure-relief port for connection to a reservoir for fluid, said housing having a first chamber, valve means in said first chamber movable between a first position in which said inlet port is in communication through said chamber with said outlet port and communication between said chamber and said pressure-relief port is closed, and a second position in which communication between said inlet port and said chamber is cut-off and said outlet port is in communication through said chamber with said pressure-relief port, and resilient means for urging said valve means into said first position, said housing having a stepped bore and a second chamber, communicating means between said second chamber and said first chamber open at least when said valve means is in said first position, a differential piston working in said stepped bore in said housing and having opposite ends of greater area and of smaller area, said end of greater area being exposed to said inlet port and said end of smaller area being exposed to said second chamber, said piston having a restricted passage through which said inlet port communicates at all times with said second chamber, said second chamber being located in said housing between said smaller diameter end of said piston and an adjacent inner end of said stepped bore.

4,050,750

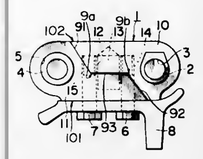
TWO-PIECE MASTER TRACK LINK

Akira Yoshihashi, Hirakata, and Hiraku Yamada, Kyoto, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed July 11, 1975, Ser. No. 595,032

Int. Cl.² B62D 55/28

U.S. Cl. 305—54 **10 Claims**



1. In a master track link for connecting an endless track which has an outer surface for receiving a track shoe and an opposite inner surface, while at one side thereof is formed a pin connection bore for receiving and retaining a track pin and at the other side thereof is formed a pin bushing connection bore for receiving the bushing of another track pin, said master track link being separable into two vertically overlapping and substantailly half link parts which are tightly coupled and interlocked with each other along an approximatley diagonal juncture defined by respective mating surfaces of said link parts by means of shoe bolts of which at least one of them extends from an outer surface of said track shoe to one link part while penetrating through the other link part adjacent to the track shoe so that both the link parts and the track shoe are fixedly secured simultaneously with each other, the improvement characterized in that each of said respective mating surfaces of said link parts comprises a first diagonal flat surface part located between one side end portion of said inner surface of said master track link and a vertically intermediate portion thereof, a second diagonal flat surface part located between a diagonally opposite side end portion of said outer surface of said master track link and a vertically intermediate portion thereof, an intermediate flat surface part extending between the first and the second diagonal surface parts in parallel to both said outer and inner surfaces of said master track link and at least one cavity which registers with another corresponding complementary cavity formed in the intermediate surface part of the associated link part so as to form a hollow space the longitudinal axis of which extends in a direction perpendicular to the outer and inner surfaces of said master track link between the link parts in which a traction and thrust bearing means corresponding to said hollow space is tightly fitted when said link parts are coupled and interlocked with each other together with said track shoe.

4,050,751

DOCUMENT CAROUSEL

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 11, 1976, Ser. No. 665,826

Int. Cl.² A47F 1/00; B65H 5/22

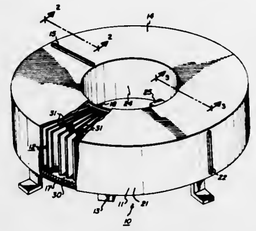
U.S. Cl. 312—197 **10 Claims**

1. Apparatus for storing documents, comprising:

a. a carousel having a number of pockets;

b. a structure for covering the pockets, said structure having an opening;

c. drive means for rotating the carousel with respect to the



structdre, whereby said pockets may be aligned with the opening; and

d. fluidic means for moving documents stored in said pockets through said opening.

4,050,752

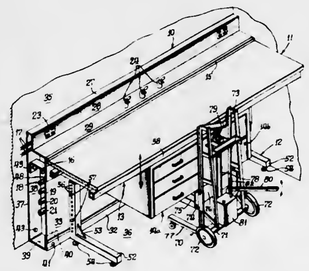
MODULAR LABORATORY CABINETS ADJUSTABLE IN ELEVATION

Donald P. Dykstra, Des Plaines, Ill., assignor to Portable Laboratories, Inc., Elk Grove Village, Ill.

Filed Apr. 12, 1976, Ser. No. 676,151

Int. Cl.² A47B 9/00; F16L 3/22

U.S. Cl. 312—243 **6 Claims**



1. For use in a room having a floor, the combination of a utility cabinet for holding utility conduits, a table top and means for supporting the table top in front of said utility cabinet, wherein

said means having an adjustment for permitting the table top to be set at a plurality of elevations within a selected range;

said utility cabinet having a front comprising an upper portion and a lower portion, said upper portion being solid throughout said range of elevations, said lower portion having an access opening to provide access to said utility conduits, and door means for said access opening.

4,050,753

BRACEABLE RAIL

Kurt Scherrer, Munsingen, Switzerland, assignor to U. Scharer Sohne AG, (USM), Munsingen, Switzerland

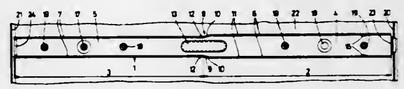
Filed Sept. 1, 1976, Ser. No. 719,374

Claims priority, application Switzerland, Sept. 5, 1975, 11535/75

Int. Cl.² E04C 3/30

U.S. Cl. 312—257 SK **2 Claims**

1. A rail intended to be braced between and form-lockingly connected at each end thereof to two support members, comprising two substantially U-shaped sectional bars each having two leg portions and being formed of first and second contiguous segments with a region of transition therebetween, said first segments being wider in cross-section than said second segments, said bars being mutually nested with the respective leg portions thereof directed toward each other, whereby said



leg portions in said first segment of each said bar embrace said leg portions in said second segment of the other said bar, each said region of transition including a latch surface, and said latch surfaces cooperating to exert an axially-directed force upon said bars for displacing said bars axially in opposite directions, wherein each said latch surface is plane and inclined with respect to the longitudinal axis of the respective said bar.

4,050,754

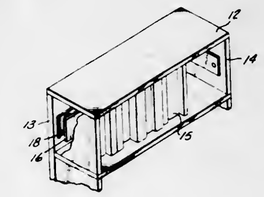
BOOK EJECTION APPARATUS

Charles L. Coley, 1303 Summertime Lane, Culver City, Calif. 90230

Filed Sept. 12, 1975, Ser. No. 612,944

Int. Cl.² A47B 23/00

U.S. Cl. 312—319 **9 Claims**



8. A book ejection system for use in a book case having at least one horizontal shelf, two vertical sides and at least one vertical back plate comprising a rectangular shaped back panel mounted on said vertical back plate substantially parallel thereto, compression resistant means having reactive characteristics mounted on said rectangular shaped back panel and a rectangular shaped front panel mounted on said compression resistant means substantially parallel to said back panel and maintained in a spaced relationship with respect to said back panel by at least one flexible bingee whereby when books positioned on said horizontal shelf susstantially against said front panel are pushed toward said vertical back panel and released, said book will be moved in a direction away from said back panel to a position spaced from said front panel by the reactive force of said compression resistance means.

4,050,755

ELECTRICAL CONNECTOR

Alexander William Hasircoglu, Lancaster, Pa., assignor to E. I Du Pont de Nemours and Company, Wilmington, Del.

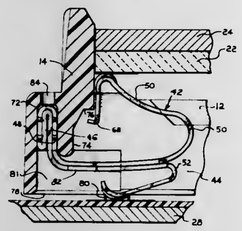
Filed Apr. 2, 1976, Ser. No. 672,885

Int. Cl.² H05K 1/12

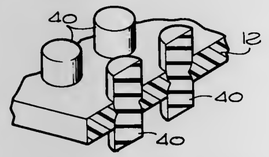
U.S. Cl. 339—17 CF **8 Claims**

6. As an article of manufacture, an electrical contact formed from a strip of conductive spring metal, said contact having a fold intermediate its ends and extending from the fold as opposed unbalanced compound cantilever springs, said springs having straight first legs extending in the same direction from said fold, the included angle between said first legs being about

10°, each spring having a second leg joined to its first leg by an arcuate bend, the included angles said first legs located between said second legs, having an arcuate contact segment adjacent its ends.



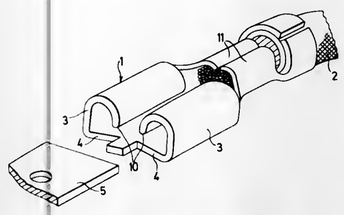
4,050,756
CONDUCTIVE ELASTOMER CONNECTOR AND METHOD OF MAKING SAME
John R. Moore, Santa Ana, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Dec. 22, 1975, Ser. No. 642,686
Int. Cl.² H01R *13/24*; H05K *1/04*
U.S. Cl. 339—59 M **2 Claims**



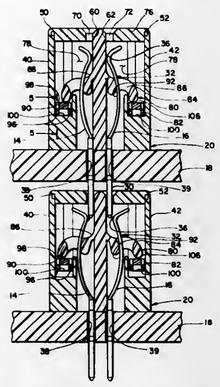
1. A conductive elastomer connector comprising:
a nonconductive planar substrate having generally parallel upper and lower surfaces;
a plurality of etched holes extending through said substrate from said upper surface to said lower surface;
a conductive elastomer rod retained in each of said holes, said rods extending above said upper surface and below said lower surface;
each said etched hole having an underetch pattern providing an inwardly extending annular ridge spaced from said upper and lower sufaces; and
each said rod having an annular recess in its outer surface spaced from said upper and lower surfaces and receiving said annular ridge therein whereby said rods are retained in said holes by said ridges.

4,050,757
INSULATING CASING FOR ELECTRICAL SPADE TERMINAL SOCKETS
Gottfried Glaesel, Minusio, Switzerland, assignor to Hego Electric GmbH, Glarus, Switzerland
Filed Feb. 25, 1976, Ser. No. 661,222
Int. Cl.² H01R *13/50*
U.S. Cl. 339—59 R **2 Claims**

1. An insulating casing for an electrical spade terminal socket of the kind having a web and inwardly bent lateral gripping portions laterally spaced from one another, said casing consisting of an integral body of insulating material adapted to be slid over a said socket from the front end of the latter, the casing being of substantially rectangular cross-section having two opposite narrow sides and two opposite broad sides, front end stop means for the socket at the front end of the casing formed solely by two protuberances which project symmetrically into the internal space of the casing from the narrow sides thereof, rear stop means spaced from said front end end formed by two symmetrically disposed ratchet teeth projecting into the internal space of the casing from respective broad sides thereof for engaging the rear ends of said gripping portions of an inserted spade terminal socket, a rib on the internal surface of each said broad side extending along the longitudinal center line of the said broad side for supporting the web portion of an inserted spade terminal socket, said ribs and said teeth projecting from each said broad side into the internal space of the casing for substantially equal distances, and symmetrically disposed noses on both broad sides in the casing at the front end thereof for guiding a spade terminal into the socket, whereby the casing can be slid over a spade terminal socket from the front of the latter in either one of two orientations which are offset by 180° with respect to each other.

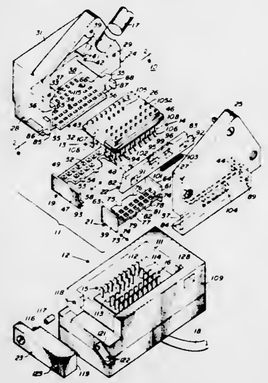


4,050,758
ZERO INSERTION FORCE CONNECTOR
James H. Curley, Costa Mesa, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Nov. 17, 1976, Ser. No. 742,700
Int. Cl.² H01R *13/62*
U.S. Cl. 339—74 R **10 Claims**



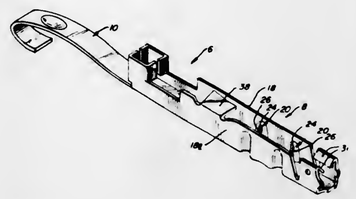
1. A zero insertion force electrical connector comprising:
an elongated insulative housing having a row of contacts therein, said housing being open to the top for receiving therein conductors on an electrical component;
said housing including walls on opposite sides of said row of contacts;
said contacts having spring contacting portions extending resiliently toward a vertical plane passing through one of said walls for engaging said conductors inserted into said housing;
means for retracting said contacting portions away from said vertical plane;
said retracting means comprising contact shifting means and cam actuator means, said contact shifting means having a hinged connection to said one wall and a free end adjacent to the other of said walls for vertical pivotal movement between a lower position and an upper position;
said contact shifting means embodying cam surface means for retracting said contacting portions of said contacts away from said vertical plane when moved from said lower position to said upper position; and
said cam actuator means being operable to move said contact shifting means from said lower position to said upper position, said cam actuator means comprising an elongated element underlying said free end of said cam shifting means and being mounted for longitudinal sliding movement in said housing.

4,050,759
ZERO-INSERTION-WITHDRAWAL FORCE CONNECTOR
Robert Andrew Jackson, III, Evanston, and Harry G. Willis, Plainfield, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed May 21, 1976, Ser. No. 689,431
Int. Cl.² H01R *13/54*
U.S. Cl. 339—75 M **7 Claims**



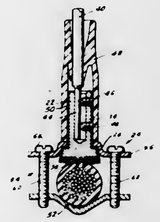
1. A zero-insertion-withdrawal force connector assembly comprising:
a first connector block having first and second contact fingers projecting therefrom, the planes of said first contact fingers being disposed at right angles to the planes of said second contact fingers,
a second connector block having third and fourth contact fingers projecting therefrom, the planes of said third contact fingers being disposed at right angles to the planes of said fourth contact fingers,
said second connector block being adapted to be disposed adjacent said first connector block with said third contact fingers lying alongside said first contact fingers but out of contact therewith and with said fourth contact fingers lying alongside said second contact fingers but out of contact therewith,
first means for moving said first and third contact fingers into engagement with each other in one direction,
second means for moving said second and fourth contact fingers into engagement with each other at right angles to the movement of said first means,
relative movement interengaging means between said first means and said second means for effecting movement of said first means at right angles to the movement of said second means and in response thereto when said second means is moved, and
third means for moving said second means.

4,050,760
SOLDERLESS ELECTRICAL CONTACT
Lawrence S. Cohen, Chicago, Ill., assignor to TRW Inc., Elk Grove Village, Ill.
Filed Feb. 10, 1976, Ser. No. 656,934
Int. Cl.² H01R *9/08*
U.S. Cl. 339—97 R **9 Claims**



1. An insulation rupturing wire termination contact element for establishing and maintaining electrical contact with the conductive core of an insulated wire as the insulated wire is forced into the contact element, comprising a wire termination channel portion having side panels and a base portion of thin conductive sheet metal, at least one of said side panels having an integral offset portion formed inwardly into said channel to engage the conductive core of a wire inserted therein, said offset portion having an end exposed toward the open side of said channel which end is formed by bending said sheet metal into a smoothly rounded blunt transitional configuration having sufficient rigidity for rupturing the insulation of a wire forced into said wire termination channel and for guiding the conductive core of such a wire into contact with the inwardly disposed surface of said offset portion.

4,050,761
CUP-SHAPED UNDERGROUND TAP CONNECTOR
Robert V. De France, Poughkeepsie, N.Y., assignor to Fargo Mfg. Company, Inc., Poughkeepsie, N.Y.
Filed July 16, 1976, Ser. No. 705,806
Int. Cl.² H01R *11/20*
U.S. Cl. 339—97 R **3 Claims**



1. A connector for joining a tap conductor to a run conductor of an underground cable system without removing the insulation from the run conductor comprising: respective insulated and uninsulated portions of said tap conductor, a body of conductive material adapted to be connected to said uninsulated portion, a piercing member of said body for passage through the insulation of said run conductor, clamping means for coupling said piercing member to said run conductor, adjustment means of said clamping means for bringing said piercing member into tight interengagement with said run conductor and supplying sufficient force to direct said piercing member through the insulation of said run conductor and into electrical communication with the interior thereof, said piercing member having a cup-shaped configuration to permit

piercing of the insulation and collection of a plug of insulation therein so as to minimize the stresses on the remainder of the insulated run conductor when the piercing member is electrically connected with the interior of the run conductor to complete an electrical connection between said run conductor and said tap conductor connected to said piercing member, said body being substantially tubular in configuration terminating in a lower flanged end, said piercing member extending from said flanged end and being of hollow cylindrical configuration whereby the rim thereof forms a cutting surface, a recess in the end of said piercing member opposite the flanged end to receive a tap wire therein, releasable lock means to hold the tap wire in electrical communication in the recess in said body, the exterior surface of said body and said flange being coated with a nylon material, the recess formed in said piercing member to receive the tap wire being large enough to receive a multiplicity of size wires and said locking means being in the form of at least one set screw adapted to be threaded laterally into and out of the recess so as to engage a wire extended therein and retain it in position in electrical contact with said body, and said body and said piercing member being of aluminum material.

4,050,762

TELESCOPING SPRING PROBE HAVING SEPARATE WIPER CONTACT MEMBER

Clyde Kenneth Hines, Arcadia; Everett James Long, Claremont, and Lawrence Eugene Wysocki, Covina, all of Calif., assignors to Everett/Charles, Inc., Pomona, Calif.

Filed Nov. 10, 1976, Ser. No. 740,396
Int. Cl.² H01R *13/00*
U.S. Cl. 339—108 TP **21 Claims**



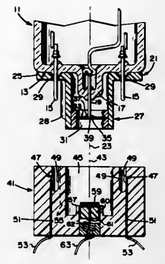
1. A miniature low resistance telescoping spring probe comprising:
- telescoping tubular housing and inner plunger both being elongated and of an electrically conductive material;
- said plunger comprising a probe head, external to said housing;
- engaged and concentric inner wall on said housing and outer wall of said plunger providing a sliding electrical connection and a bearing therebetween;
- a coil compression spring urging said housing and plunger in longitudinally opposite directions;
- a separate low electrical resistance wiper spring member affixed to said plunger;
- a substantially constant low electrical resistance connection between said wiper spring member and plunger;
- said wiper spring member comprising at least one longitudinally extending leg spring loaded outwardly into engagement with said inside wall; and
- a bearing surface on said leg in engagement with said inside wall and thereby providing a substantially constant low electrical resistance connection between said wiper spring member and inside wall during telescoping movement.

4,050,763

BASE AND SOCKET MEANS FOR AN ELECTRON TUBE

Harry E. Smithgall, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Aug. 16, 1976, Ser. No. 715,176
Int. Cl.² H01R *13/66*
U.S. Cl. 339—111 **11 Claims**



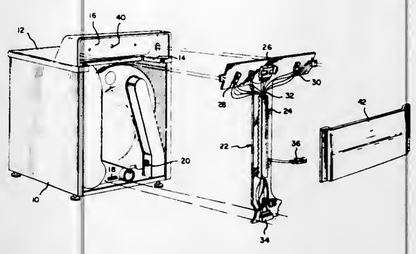
1. A protective and connective base for a multi-element electron tube having a closure portion incorporating an array of exteriorly projecting conductor pins spatially surrounding an axially oriented protrusion of a sealed exhaust tubulation having an axial conductive lead extending therefrom, said base comprising:
- an insulative member formed for seating on the surface of said closure, said base member having a longitudinal axis about which a rim-like portion surrounds an axially-oriented projecting substantially hollow stack portion formed to protectively encompass said sealed tubulation, said rim-like portion having a plurality of spatially related apertures therein substantially matching said array of conductor pins and dimensioned to promote adherence thereto, said hollow stack having a terminal opening and a metallic contact recessed therein, said contact formed to accommodate attachment of said axial conductive lead thereto.

4,050,764

INTRINSIC CERTIFICATION ASSEMBLY TECHNIQUE FOR WIRING COMPONENTS INTO AN ELECTRICAL APPARATUS

John Root Hopkins, Belleair, Fla.; Robert Maurice Renn, and Robert Keith Southard, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 649,009, Jan. 14, 1976, Pat. No. 4,006,959, which is a division of Ser. No. 520,399, Nov. 4, 1974, Pat. No. 3,970,354. This application Aug. 17, 1976, Ser. No. 715,095
Int. Cl.² H01R *3/00*
U.S. Cl. 339—103 M **1 Claim**



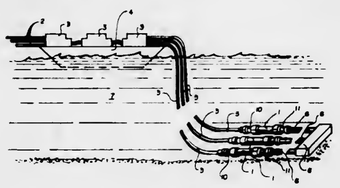
1. An improved electrical connector housing comprising:
an elongated, continuous base member having a plurality of parallel, substantially identical contact receiving passages transversely spaced therealong, each said passage including an open rear end portion defined by a pair of parallel spaced walls integrally upstanding from said base member, each said wall having a longitudinal ledge on both sides thereof, and a closed, substantially cylindrical front end portion and means in each passage engageable with latching means of a respective contact received therein,
- a strain relief cover having a plurality of spaced pairs of integral leg portions depending from an elongated continuous member, each said leg portion having a longitudinally extending step engageable with a corresponding ledge of said walls;
- said base member and said strain relief cover being made in great lengths and cut to a length containing the desired number of contact receiving passages.

4,050,765

UNDERWATER CABLE CONNECTOR ASSEMBLY

William C. Duesterhoeft, Austin, and James E. McClain, Greenville, both of Tex., assignors to Esco Manufacturing Company, Greenville, Tex.

Filed Aug. 30, 1976, Ser. No. 718,790
Int. Cl.² H01R *3/04*
U.S. Cl. 339—117 R **13 Claims**



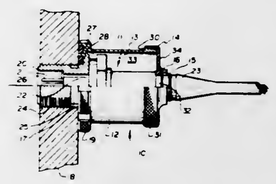
1. Electrical cable connector assembly, comprising:
- a. male connector means comprising an elongated body of insulating material with a conductive rod axially extending therethrough, one end of said conductive rod adapted to be joined with the conductive end of a first insulated power cable, the opposed end of said conductive rod terminating in a prong assembly,
- b. female connector means adapted for mateable coupling with said male connector means, said female connector means comprising a hollow insulating sleeve defining an elongated chamber therein and adapted to telescopically receive the elongated body of said male connector means at one open end thereof, means adapted to be joined with the conductive end of a second insulated power cable, and conductive socket means disposed within said hollow insulating sleeve at a location remote from said one open end adapted to receive said prong assembly in conductive coupling relationship, and
- c. means connected with said male connector means for establishing an indirect fluid path through said elongated chamber between said open end and the situs of conductive coupling of said prong assembly and said conductive socket means, whereby fluid exiting said chamber at said open end when said male and female connectors are mateably coupled is constrained to travel along said indirect fluid path.

4,050,766

CORROSION-PROOF ELECTRICAL CONNECTOR ASSEMBLY

Graeme N. Dennison, Saanichton, Canada, assignor to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence, Ottawa, Canada

Filed Aug. 23, 1976, Ser. No. 716,681
Claims priority, application Canada, Apr. 9, 1976, 249932
Int. Cl.² H01R *3/04*
U.S. Cl. 339—117 P **23 Claims**



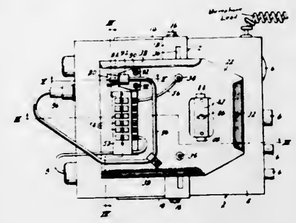
1. A housing for a corrosion-proof electrical connector having first and second mating members interconnecting electrical conductors in a pressurized environment, the housing comprising:
- container means having walls defining a substantially liquid-tight, rigid chamber adapted to receive the electrical connector, a closed end including a first passage therethrough for admitting a first conductor to the first mating member, and a cappable open end;
- a rigid cap closing the open end, the cap including a second passage therethrough for admitting a second conductor to the second mating member;
- locking means disposed on the cap and closed end for retaining said members in locked mating relation when the open end is capped;
- a dielectric liquid substantially inert to the environment and filling the rigid chamber to at least immerse the mating portions of said members; and
- a bleed hole disposed in the housing for directly communicating the environment to said liquid for pressure balancing the housing and pressure sealing the immersed portions of said members.

4,050,767

AUTOMOBILE MOUNT FOR CITIZENS BAND RADIOS

Keith E. Berning, R.R. No. 1, Cosby, Mo. 64436

Filed Aug. 5, 1976, Ser. No. 711,868
Int. Cl.² H01R *17/18*
U.S. Cl. 339—135 **7 Claims**



1. A radio mount for automobiles comprising:
- a. a first plate,
- b. means for mounting said first plate rigidly in an automobile,
- c. a second plate, said second plate being slidably engageable with and disengageable from said first plate,
- d. means rigidly affixing said second plate to the case of a radio, and

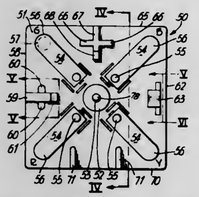
e. a series of pairs of electrical contacts, the contacts of each pair being mounted respectively on said first and second plates and being positioned to be brought into engagement by sliding engagement of said first and second plates, each of said pairs being operable when engaged to complete an electrical connection from said automobile to said radio, one of said connections being from an antenna mounted on said automobile to the antenna input connection of said radio case, and comprising a first connector mounted on said first plate and constituting a first central conductor surrounded by a first conducting shield separated from said first central conductor, a second connector mounted on said second plate and including a second central conductor surrounded by a second conducting shield separated from said second central connector, the central conductors of said first and second connectors being brought into engagement by sliding engagement of said first and second plates, and electrical connections grounding the shields of both said first and second connectors.

4,050,768

INTERCONNECTOR FOR ADAPTING EXISTING TELEPHONE OUTLETS TO PLUG-IN OUTLETS

Beverley William Gumb, London, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Aug. 16, 1976, Ser. No. 714,632
Int. Cl.² H01R *31/06*
U.S. Cl. 339—154 A **3 Claims**



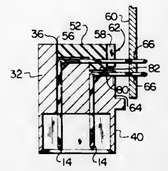
1. A common interconnector for adapting either of two forms of existing telephone outlets for telephone sets, the outlets each having screw terminals for attachment of conductors of the telephone system and the telephone sets connected to the outlets by plugs having a number of pins or by direct wiring to said terminals, said interconnector adapting said outlets to a form having a profiled aperture for accepting a profiled plug of a plug-in telephone unit and comprising:
a flat square main member having two opposed parallel surfaces;
a central boss extending from one of said parallel surfaces and a bore through said central boss;
four radially extending spring contact members on said one surface, said spring contact members extending from said central boss towards the corners of said main member, said contact members attached to said main member at their inner ends adjacent to said boss and including outer ends adjacent the corners of the main member and spaced from said one surface, said outer ends positioned to contact said screw terminals in said existing outlets when said main member is positioned on either of said two forms of existing outlet;
formations on said one surface, said formations comprising a formation at each edge of the main member, each formation of unique form and differing from the other of said formations, and adapted to interengage with existing formations at the periphery of the existing outlets, to provide a predetermined rotational relationship between the main member and the existing outlets independent of the particular one of said two existing outlets;
means for attaching said main member to an outlet;
a hollow snap-on cover fitting over said main member, said cover of rectangular form having four sides, three sides form a close fit over three sides of said main member, a transverse wall extending laterally across the interior of the cover, said transverse wall forms a close fit over the fourth side of said main member, said cover extending beyond said main member to form an extension bounded by a fourth side of said cover;
a jack positioned in said extension, said jack including contacts connected to said spring contacts on said main member; and
an aperture in said fourth side of said cover, said aperture having a predetermined profile for acceptance of a profiled plug therein, said aperture aligned with said jack to permit the spring contacts on said plug to engage said contacts in said jack.

4,050,769

ELECTRICAL CONNECTOR

J. Preston Ammon, Dallas, Tex., assignor to Elfab Corporation, Dallas, Tex.

Filed Mar. 18, 1976, Ser. No. 667,963
Int. Cl.² H01R *13/42, 13/46*
U.S. Cl. 339—196 M **2 Claims**



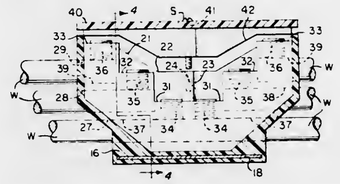
1. An electrical connector including an insulator, said insulator being adapted for housing a plurality of right angle contacts, press fitting said contacts into contact receiving apertures in a mounting substrate, and subsequent removal of one part of the insulator from the press fitted contacts, said connector comprising:
a first block of dielectric material having a plurality of linear sleeves comprising first passages formed therethrough with upper inside walls in spaced parallel relationship to the plane of said mounting substrate for receiving in slip-fit engagement a first linear portion of said right angle contacts, each of said linear sleeves also including second orthogonal passages having an inside face bounded on each side by upwardly projecting ribs which passages receive a second linear portion of said right angle contacts and which ribs support the second linear contact portions from transverse or twisting movement during subsequent contact press fitting;
a plurality of contact terminals having first and second linear portions formed into a generally right angle configuration with one another, said first linear terminal portions being received through said first passages and said second linear terminal portions lying upon the inside faces of said second passages and between adjacent ones of said upwardly projecting ribs;
a second block of dielectric material in mating engagement with said first block of dielectric material and having a plurality of linear passages formed therein and having second linear terminal portions protruding therethrough; and
said first and second blocks further adapted to hold said contacts in said passages and between said abutting blocks to effect press fitting said second linear terminal portions into the apertures in said substrate when a downward force from said insulator to said contacts through the engagement of abutting surfaces between said first linear passages and said first linear terminal portions.

4,050,770

JUNCTION BOX TERMINAL BLOCK

Larry E. Rigo, P.O. Box 805, Marietta, Ga. 30061

Filed Oct. 18, 1976, Ser. No. 732,843
Int. Cl.² H01R *9/10*
U.S. Cl. 339—198 G **6 Claims**



1. A terminal block for mounting across the width of a junction box trough for terminating wires extending into the trough, each terminal block comprising:
an insulated housing of width selected to fit within the width of the trough, the housing having lengthwise-extending partitions dividing it into side-by-side lug receiving recesses extending the full length of the housing and extending into the depth of the block toward its bottom from its exposed upper surface;
a conductive terminal lug in each recess, each lug extending the full length of a recess and being inwardly stepped along the length of the lug from a first level near the upper surface of the housing at each end to a recessed level at the central portion of the lug to provide multiple different levels of exposed surfaces located adjacent to each other;
the housing and each of the lugs having wire receiving bores opening through both sides of the housing toward said central portions and extending beneath different surface levels parallel to the length dimensions of the lugs, each uppermost bore ending beneath one of said first levels and each lowermost bore ending beneath said central portion;
a set screw extending into a tapped hole from each of said surface levels and intersecting a bore for clamping a wire in the bore, and all the set screws being accessible from the exposed surfaces of the lugs; and
the transverse ends of each recess and the transverse ends of each lug being shaped to converge toward said central portion from a level beneath said uppermost bore to the bottom of the lug and the recess of the housing, thereby to shorten the length of the lower portion of the lug and of the lowermost bores beneath said central portion.

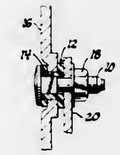
4,050,771

THREADED TERMINAL ASSEMBLY FOR DYNAMOELECTRIC MACHINE

Richard D. Watson, Chesterfield, and Thomas R. Sowash, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed July 1, 1976, Ser. No. 701,639
Int. Cl.² H01R *7/08*
U.S. Cl. 339—263 R **2 Claims**

1. A threaded terminal assembly for a dynamoelectric machine having a slotted frame member,
a unitary insulating grommet member having a pair of washer portions spaced by a distance greater than the thickness of the frame member and connected by a central sleeve portion of square cross section for a sliding non-rotatable fit into the slotted frame member with the washer portions loosely overlying opposed surfaces of the frame member, one of the washer portions being connected to the sleeve through a yieldable web member so that upon application of axial force to the grommet during assembly the web member will yield to conform the washer spacing to the frame thickness,
a square shanked bolt held securely within the grommet by an interference fit between the bolt shank and the interior of the sleeve portion whereby the bolt is non-rotatably mounted to the frame member and insulated therefrom



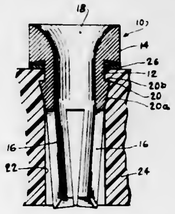
and is at least temporarily held firmly in such mounted position prior to attachment of a nut to the bolt for complete assembly.

4,050,772

UNITARY SOCKET TERMINAL FOR ELECTRONIC CIRCUITS

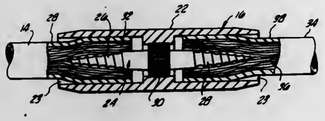
Jean Birnholz, and Pierre Couty, both of 1870 Monthey Valais, Monthey, Switzerland

Continuation-in-part of Ser. No. 638,939, Dec. 8, 1975. This application Jan. 26, 1976, Ser. No. 652,462
Claims priority, application Switzerland, May 21, 1975, 6499/75
Int. Cl.² H01R *9/12, 9/14; H05K 1/12*
U.S. Cl. 339—220 R **6 Claims**



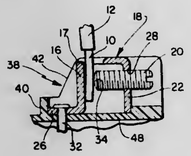
1. A unitary socket terminal for electronic circuits and connections, comprising:
a. a cylindrical tubular body having a circumferentially continuous inner wall which defines a cylindrical inner chamber,
b. a cylindrical tubular head, larger in diameter than the tubular body, formed at the upper end of said tubular body,
c. said tubular head having a circumferentially continuous inner wall which defines a funnel-shaped orifice whose smaller end communicates with said inner chamber,
d. said inner wall in said tubular head curving smoothly into said inner wall in the tubular body to form a continuous lead-guiding surface,
e. a downwardly facing annular shoulder formed on said tubular head,
f. said annular shoulder being adapted to engage a circuit or connecting element which encircles the tubular body, and
g. lead-gripping means formed at the lower end of the tubular body to engage a lead guided thereinto.

4,050,773
BATTERY TERMINAL CONNECTOR
Carl W. Newell, 940 Allen Ave., Glendale, Calif. 91201
Filed Mar. 24, 1976, Ser. No. 670,086
Int. Cl.[2] H01R *11/20, 11/26*
U.S. Cl. 339—224 **3 Claims**



1. A connector assembly for providing a non-corrosive coupler for a battery cable, said assembly comprising a coupling member constructed of a lead alloy and being adapted to be secured to a battery terminal, an electrical cable, one end of said battery cable being secured to said coupling member, and a connector assembly for securing and electrically communicating said electrical cable to said battery cable, said assembly being comprised of a threaded contact member constructed of an electrically conductive material and a rigid housing constructed of an insulating material and disposed about said threaded contact member, said contact member having a pair of threaded screw portions extending along a common longitudinal axis in opposite directions from a common head portion, one of said screw portions being in threaded engagement with the wires comprising said cable and the other of said portions being adapted for threaded engagement with the wires comprising said battery cable whereby said cable and said battery cable can be held in electrical communication by said screw portions of said contact member.

4,050,774
CAP AND CONNECTOR FOR FIVE-WIRE APPLICATIONS
Luther M. Sheldon, Cranston, R.I., assignor to General Electric Company, New York, N.Y.
Filed June 30, 1976, Ser. No. 701,062
Int. Cl.[2] H01R *7/12*
U.S. Cl. 339—264 R **1 Claim**

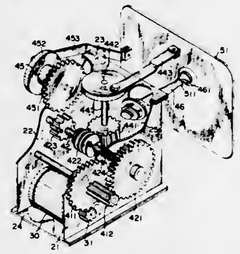


1. A wiring device for connection to a plurality of wires of an electric cable comprising
an insulating housing of generally cylindrical form,
electrical contacts at least partially within said housing,
said contacts being adapted to receive at an inner end portion thereof electrical conductors of a multiconductor cable,
said contacts being adapted to mate at the other end portion thereof with complimentary contacts of another wiring device,
one of said contacts being made up at its inner end of a strip portion and at its outer end of an elongated element of generally rod like configuration,
the elongated element extending along the axis of the cylindrical housing,
the strip portion of said contact being attached at the inner end of said elongated element and extending in a generally radial direction from said element,
the strip portion of said contact being in the form of an inverted "U" having a first and a second upright and a cross element and having a side arm extending from the end of the first upright of the "U",
the strip portion being attached at its side arm to the inner end of the elongated element,
the strip having a wire entry port located in the cross element of the U,
the strip having a threaded opening in the second upright of the U,
a screw element in the threaded opening adapted to urge a wire extending through said wire entry port against the inner surface of the first upright of the U,
and insulating walls extending up from and integral with the insulating housing and partically enclosing said strip at its sides and side arm and contacting the free ends of the strip to prevent separation of said first and second uprights.

4,050,775
CATOPTRIC LENS ARRANGEMENT
James R. Scholten, Wayland, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed July 26, 1976, Ser. No. 708,668
Int. Cl.[2] G02B *17/06, 5/10*
U.S. Cl. 350—200 **10 Claims**

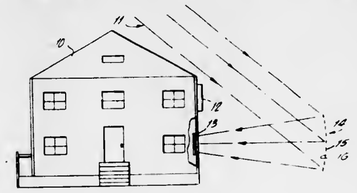
1. A catoptric lens system for focusing a maximum amount of light from an omnidirectional source into a parallel beam comprising:
a set of spherical reflectors disposed symmetrically in opposed reflective relationship along a common system axis, said surfaces having a common center and unequal radii;
a parabolic reflector symmetrically disposed in said system with said center as its focal point and having its reflective surface replaced in part by said spherical reflector having the greatest radius,
said spherical reflector having the lesser radius hemispherical in extent,
a collimating lens symmetrically disposed in said spherical reflector of lesser radius replacing in part its reflective surface; and
a substantially point source of light positioned at said center, whereby all light from said source is collimated and emanates from said system either directly through said lens, by reflection and re-reflection from said spherical and parabolic reflectors, or directly from said parabolic reflector.

4,050,776
ELECTRIC-POWERED ADJUSTABLE REAR-VIEW MIRROR FOR VEHICLES WITH DISENGAGEABLE WORM GEAR
Ming Ching Hsu, 97-2, Lane 39 Jen Hsing Street, San Chung Shih, Taiwan, China /Taiwan
Filed Aug. 25, 1975, Ser. No. 607,588
Int. Cl.[2] G02B *7/18*
U.S. Cl. 350—289 **2 Claims**



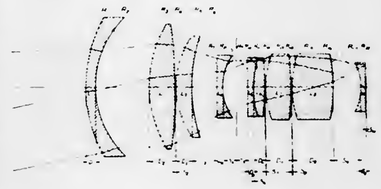
1. A universally adjustable mirror comprising a mirror, a support for mounting said mirror for universal movement with respect to a fixed member, a two directional D.C. motor, a shaft rotatable about its axis and movable longitudinally with respect to said axis, gear means for rotating said shaft in accordance with the direction of rotation of said two directional motor, a worm gear mounted on said shaft, a first transmission disc operatively connected to and rotatable by said worm gear when said motor rotates in one direction, a first linkage means connected to said first transmission disc for reciprocally turning said mirror about a first axis, a second transmission disc, a second linkage means connected to said second transmission disc for reciprocally turning said mirror about a second axis substantially perpendicular to the first axis, a driving gear mounted on said shaft for driving said second transmission disc said worm gear operating to move said shaft longitudinally upon rotation of said shaft by rotation of said motor in the opposite direction thereby causing disengagement of said worm gear from said first transmission disc, biasing means for normally urging said worm gear into engagement with said first transmission disc and means for controlling the direction of rotation of said two directional motor.

4,050,777
SOLAR ENERGY REFLECTING APPARATUS WITH YIELDABLY BIASED REFLECTORS
Melville F. Peters, Livingston, N.J., assignor to Walter Todd Peters; Margot Elizabeth Peters and Albert F. Kronman, all of East Dennis, Mass.
Filed Dec. 17, 1976, Ser. No. 751,844
Int. Cl.[2] G02B *5/08;* **F24J** *3/02*
U.S. Cl. 350—292 **11 Claims**



1. Solar energy reflecting apparatus comprising a frame, a plurality of elongated strips carried by said frame, at least one light reflecting major face on each strip, elongated margins on each strip disposed in side by side orientation with next adjacent strip margins, said light reflecting major faces oriented to form a light reflecting panel, at least one shaft secured to each strip and extending axially and outwardly thereof, bores in the frame to freely receive the free ends of the shafts therethrough, means to yieldably restrain the shafts from turning within the frame bores, means to return the strips to their reflecting orientation in the event of rotation and means to tilt and swing the frame to effect both diurnal and seasonal tracking of the sun.

4,050,778
ULTRA-VIOLET MICROGRAPHIC OBJECTIVE
Andor A. Fleischman, Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed Aug. 10, 1976, Ser. No. 713,320
Int. Cl.[2] G02B *13/14, 9/64*
U.S. Cl. 350—2 **1 Claim**



1. An economically manufacturable optical system of relatively large effective aperture for efficiently transmitting rays in the ultra-violet portion of the spectrum, the optical system having substantially the following specifications:

EFL = 1.1751 inches (29.85 mm)
Half Angle of Field = 12.15°

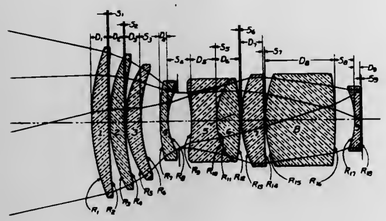
Lens		Radii(in.)	Thickness(in.)	spacing (in.)	N_D	V
L_1	R_1 =	1.7850	D_1 = .1400		1.691	54.7
	R_2 =	−1.1450		S_1 = .6410		
L_2	R_3 =	1.4440	D_2 = .3200		1.691	54.7
	R_4 =	7.2120		S_2 = .0050		
L_3	R_5 =	1.0360	D_3 = .1970		1.691	54.7
	R_6 =	−1.9500		S_3 = .2890		
L_4	R_7 =	−30.0003	D_4 = .0700		1.689	31.2
	R_8 =	−.6300		S_4 = .1760		
		— STOP —				
				S_5 = .1380		
L_5	R_9 =	120.0480	D_5 = .0700		1.717	29.5
	R_{10} =	−1.1450		S_6 = 0		
L_6	R_{11} =	1.1450	D_6 = .1400		1.734	51.7
	R_{12} =	15.0900		S_7 = .0050		
L_7	R_{13} =	1.1210	D_7 = .3150		1.691	54.7
	R_{14} =	27.1732		S_8 = .0050		
L_8	R_{15} =	1.2920	D_8 = .4990		1.691	54.7
	R_{16} =	2.6603		S_9 = .3240		
L_9	R_{17} =	−0.6160	D_9 = .0550	S_{10} = .0094 (BFL to FILM PLANE)	1.498	67.1
	R_{18} =	Inf.				

wherein the first column lists the lens elements numerically starting at the ray entrance side of the system; the second column lists the respective base radii R_1 to R_{18}; the third column lists the thicknesses of the respective elements; the fourth column lists the axial spacings S_1 to S_{10} between respective elements; and the fourth and fifth columns list respectively the refractive index and the dispersive index of the optical material.

4,050,779
ULTRA-VIOLET MICROGRAPHIC OBJECTIVE

Andor A. Fleischman, Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 10, 1976, Ser. No. 713,321
Int. Cl.² G02B 9/64, 13/14
U.S. Cl. 350—2 1 Claim



1. An economically manufacturable optical system of relatively large effective aperture for efficiently transmitting rays in the ultra-violet portion of the spectrum having substantially the following specifications:

TABLE 1

EFL = 1.3039 inches (33.11 mm)
Half Angle of Field = 12.55°

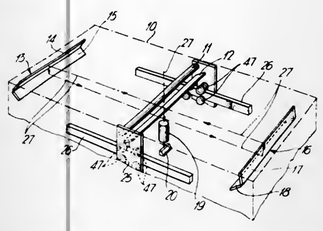
Lens	Radii(in.)	Thickness (in.)	Spacing (in.)	N_D	V
L_1	R_1=2.3320			1.697	55.4
	R_2=−9.9876	D_1=.1709			
			S_1=.005		
L_2	R_3=1.5523			1.697	55.4
	R_4=−3.2894	D_2=.1657			
			S_2=.005		
L_3	R_5=1.0150			1.697	55.4
	R_6=−1.4557	D_3=.1541			
			S_3=.2064		
L_4	R_7=2.0378			1.646	34.1
	R_8=−0.5897	D_4=.0720			
			S_4=.1212		
	---------- STOP ----------				
			S_5=.1436		
L_5	R_9=1.2414			1.650	39.2
	R_{10}=−0.6660	D_5=.2529			
L_6	R_{11}=0.6660			1.697	55.4
	R_{12}=1.8960	D_6=.2534			
			S_6=.006		
L_7	R_{13}=1.0624			1.651	55.9
	R_{14}=−10.9941	D_7=.2452			
			S_7=.005		
L_8	R_{15}=1.2749			1.651	55.9
	R_{16}=4.6676	D_8=.7357			
			S_8=.2085		
L_9	R_{17}=−0.6787			1.498	67.1
	R_{18}= Inf.	D_9=.0600			
			S_9=.0051 BFL		

wherein the first column lists the lens elements numerically starting at the ray entrance side of the system; the second column lists the respective base radii R_1 to R_{18}; the third column lists the thicknesses of the respective elements; the fourth column lists the axial spacings S_1 to S_9 between respective elements; and the fourth and fifth columns list respectively the refractive index and the dispersive index of the optical material.

4,050,780
OPTICAL SYSTEM FOR A SCANNING APPARATUS WITH REFLECTOR PAIRS AT EACH END

John Shi Sun Wei, and William Dickson Westwood, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 8, 1976, Ser. No. 740,067
Int. Cl.² G02B 27/17; G03B 27/70
U.S. Cl. 350—6 9 Claims

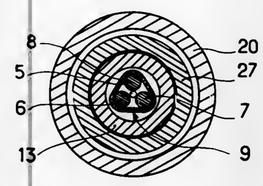


1. An optical system for a scanning apparatus, comprising;
an elongated housing;
a first mirror mounted in said housing for reciprocal movement therein for scanning of material positioned on said housing;
second and third mirrors mounted at one end of said housing, the second mirror optically aligned with said first mirror for reception of light rays therefrom and for reflection rays to said third mirror;
fourth and fifth mirrors mounted at the other end of said housing, the fourth mirror optically aligned with the third mirror for reception of said rays therefrom and for reflection of said rays to the fifth mirror;
a sixth mirror intermediate the ends of the housing and optically aligned with the fifth mirror for reception of said rays therefrom, the path of said rays from said sixth mirror extending to a lens system and then to an image receiver;
the sixth mirror mounted for reciprocal movement in said housing at a predetermined speed relationship with said lamp and first mirror, to maintain constant the total optical path length from said first mirror to said lens system.

4,050,781
CONNECTOR FOR OPTICAL FIBERS

Pierre Beauhaire, Meudon-la-Foret, France, assignor to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Nov. 10, 1975, Ser. No. 630,644
Claims priority, application France, Nov. 13, 1974, 74.37420
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 C 9 Claims

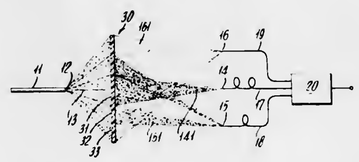


1. A connector for optical fibers comprising a pressing assembly including three rollers and a flexible sheath surrounding said rollers and applying perssure thereto for pressing said rollers against a pair of optical fibers placed end to end in the interior of the rollers, said rollers extending parallel to one another in equally spaced relation to define a bore with a central longitudinal axis in which the optical fibers can be aligned and held in alignment, said rollers having tapered ends to form flared openings at the respective ends of the assembly of rollers, first and second cones disposed at the respective ends of the assembly of rollers and engaged in said flared openings, each cone having a central bore for the passage of a respective fiber therethrough and into the bore of the assembly of rollers, and means for relatively moving one of said cones with respect to the other in a longitudinal direction to selectively cause (a) the cones to advance into the flared openings and displace the rollers radially against the opposition of said flexible sheath whereby to enlarge the bore in the roller assembly and permit free insertion and removal of said optical fibers and (b) the cones to retract in the flared openings and permit the rollers to be displaced inwardly under the action of the flexible sheath to clamp the rollers against the optical fibers in the bore of the roller assembly.

4,050,782
MODE SEPARATOR AND DELAY EQUALIZER FOR MULTIMODE OPTICAL FIBER TRANSMISSION SYSTEMS

Teiji Uchida, and Atsufumi Ueki, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Apr. 20, 1976, Ser. No. 678,636
Claims priority, application Japan, Apr. 21, 1975, 50-54324[U]
Int. Cl.² G02B 5/14, 3/08
U.S. Cl. 350—96 C 9 Claims

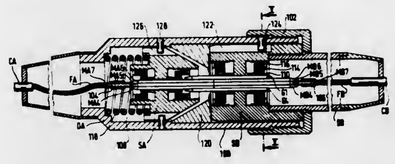


1. For use with an optical fiber transmission line, a light-mode separator located adjacent to said fiber end in a plane perpendicular to said fiber axis comprising: an array of concentric, circular, light-converging regions, each having a different optical axis and dimensioned to focus, within different ranges of angles, wave energy radiated at the end of said fiber, wherein each of the focusing points of the respective light-converging regions is located outside of other conical converging light rays formed by other converging regions.

4,050,783
CONNECTOR FOR AN OPTICAL FIBRE LINK

Andre Tardy, St. Germain les Arpajon, France, assignor to Compagnie Generale d'Electricite, Paris Cedex, France

Filed June 17, 1975, Ser. No. 587,785
Claims priority, application France, June 20, 1974, 74.21506
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 C 14 Claims

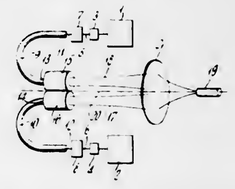


1. In a connector for axially connecting optical fibre elements, said connector comprising:
at least one optical fibre element and constituting a light guide;
and guide means for guiding an end section of that one fibre element axially to a position ensuring the connecting thereof to another axially aligned optical fibre element; the improvement comprising:
at least three holding rods which have the shape of cylinders of revolution;
clamping means for keeping these holding rods parallel to one another and in contact by their lateral surfaces and forming together, an optical fibre holding channel limited by adjacent portions of the lateral surfaces of these rods;
and wherein said end section of said one fibre element is arranged in that holding channel, whereby said clamping means provides contact of all rods with that one fibre element without substantially deforming the latter and wherein said guide means includes surface portions engaging said holding rods to guide said one fibre element accurately and without any danger of damage axially to the position ensuring axially aligned connection thereof to said other optical fibre element.

4,050,784
LIGHT BEAM COUPLER FOR AXIALLY DISCOINCIDENT OPTICAL FIBERS

Kohroh Kobayashi, Tokyo, Japan, assignor to Nippon Selfoc Company, Limited, Tokyo, Japan

Filed Apr. 29, 1976, Ser. No. 681,806
Claims priority, application Japan, Apr. 30, 1975, 50-59291[U]
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 C 10 Claims



1. A light-beam coupler for optical fibers comprising; a group of elongate light-transmission bodies each having a generally central axis about which the refractive index decreases approximately proportional to the square of the distance from said axis, and each of said bodies being adapted to magnify the diameter and to limit axial deviation of a light beam entering at one axial end, said bodies being installed adjacent to each other with their said axes in closely spaced relation; a plurality of optical fibers each of which is coupled to a different one of said light-transmission bodies at one of the ends of said group; a single optical fiber having one end installed in spaced relation to the other end of said group and on an optical axis parallel to the axes of said light-transmission bodies, and an optical lens interposed between said group of light-transmission bodies and said single optical fiber; said end of said single optical fiber being disposed near the focal plane of said optical lens.

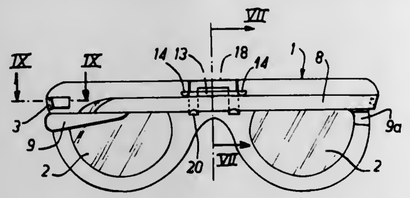
4,050,785
SPECTACLE FRAMES

Bernard Auge, 7, rue Poncelet, 75017 Paris, France

Filed Feb. 21, 1975, Ser. No. 551,550
Claims priority, application France, Feb. 27, 1974, 74.06618
Int. Cl.² G02C 5/14, 5/22
U.S. Cl. 351—120 8 Claims

1. In a frame for spectacles comprising a substantially flat front part in which two lenses are mounted, and two temples pivotally connected to said front part by means of hinges

located at opposite sides of the front part, said hinges lying between the planes containing the front and rear surfaces of the front part of the spectacles, said temples having a main part made of a thin material terminating in thicker free ends, and means for holding the thin parts of the temples against the rear surface of the front part of the spectacles when in folded position, the improvement according to which each hinge has a



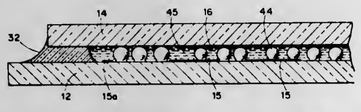
pivotal axis at a fixed acute angle to the axis of symmetry of said spectacles, with the upper end of said pivotal axis further from said axis of symmetry than its lower end, and the end of each temple is offset with respect to the rest of the temple in a direction parallel to the axis of the corresponding hinge by a distance substantially equal to the width of the main part of the temple adjacent said hinge.

4,050,786

LIQUID CRYSTAL DISPLAY DEVICE HAVING PARTICULATE SPACERS IN LIQUID CRYSTAL AREA AND METHOD OF FABRICATION

Bernard Feldman, Goleta, Calif., assignor to Transparent Conductors, Inc., Goleta, Calif.

Filed Aug. 31, 1971, Ser. No. 176,633
Int. Cl.² G02F *1/28*
U.S. Cl. 350—160 LC **11 Claims**



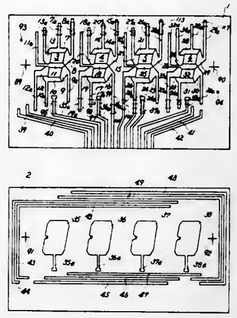
1. A display for containing electro-optic material in a layer of controlled thinness comprising:
first and second substrates;
a pattern of electrical conductors associated with each of said first and second substrates;
said first and second substrates being positioned to define a predetermined separation therebetween and having:
a plurality of support particles in the region between said first and second substrates;
said plurality of support particles being in generally isolated distribution throughout a substantial portion of the region between said first and second substrates including regions intermediate the peripheries of said first and second substrates;
said plurality of support particles being bonded to each of said substrates to provide a rigid physical interconnection between said first and second substrates;
said support particles thereby defining the predetermined separation between said substrates; and
an electro-optic material in the region between said first and second substrates.

4,050,787

ELECTROOPTIC DISPLAY DEVICE

Masanori Fujita, Matsudo, and Sukenori Suzuki, Narashino, both of Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Feb. 4, 1975, Ser. No. 546,899
Claims priority, application Japan, Feb. 4, 1974, 49-14274
Int. Cl.² G02F *1/16*
U.S. Cl. 350—160 LC **3 Claims**



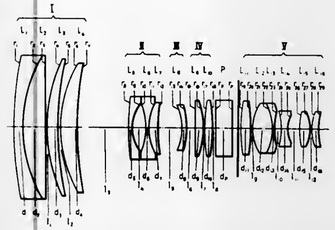
1. An electrooptic display device comprising:
two spaced-apart and opposing electrode substrates which define therebetween an interspace hermetically containing therein a substance having an electrooptic effect;
a plurality of segment electrodes disposed on one of said electrode substrates and having extending therefrom segmentlead electrodes;
lead electrodes disposed on said one electrode substrate;
common electrodes disposed on the other of said electrode substrates opposite respective ones of said segment electrodes and having extending therefrom common-lead electrodes electrically connected to predetermined ones of said lead electrodes; and
connecting electrodes disposed on said other electrode substrate and electrically connected to predetermined ones of said segment-lead electrodes and said lead electrodes thereby commonly connecting them together.

4,050,788

BASIC LENS FOR PANCRATIC SYSTEM

Irmgard Wendisch, Truman, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Nov. 18, 1975, Ser. No. 633,088
Claims priority, application Austria, Nov. 18, 1974, 9242/74
Int. Cl.² G02B *15/00*
U.S. Cl. 350—184 **3 Claims**



1. A basic lens for a pancratic camera lens having an afocal screen of variable enlargement wherein the basic lens comprises a plurality of lenses including a first biconvex lens nearest the object to be photographed, a second biconvex lens, a first biconcave lens cemented to said second biconvex lens, a second biconcave lens, a third biconvex lens and a positive meniscus all arranged in an aligned relationship as viewed in the direction of the incident light, wherein the positively refracting surfaces (Φ21, Φ28) of said second biconvex lens cemented to said first biconcave lens and the positive meniscus, said positively refracting surfaces (Φ21, Φ28) convex to the incident light, the positively refracting surface (Φ27) of the third biconvex lens, said positively refracting surface (Φ27) convex to the picture, as well as the negatively refracting surface (Φ25) of said second biconcave lens, said negatively refracting surface (Φ25) concave to the picture, have the following values:

$$\Phi 21 + \Phi 27 + \Phi 28 = 3.14, 2$$

and

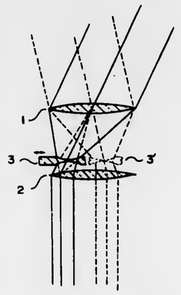
$$\Phi 25 = -1.62.$$

4,050,789

TRACKING LENS SYSTEM FOR SOLAR COLLECTORS AND SKYLIGHTS

Edward Herbert, Rte. 44, Canton, Conn. 06019

Filed Apr. 15, 1976, Ser. No. 677,153
Int. Cl.² G02B *9/16, 7/02;* F24J *3/02*
U.S. Cl. 350—226 **2 Claims**



1. A tracking lens system capable of tracking incident sunlight over any small angle, comprising
a condensing lens
a diverging lens, the diverging lens forming a compound lens with the condensing lens such that the focal point of the compound lens is virtual, and is located at the condensing lens,
position means to move the diverging lens so that the center of the diverging lens intercepts the axis of the incident sunlight beam, and
additional focusing means to concentrate the sunlight upon a focal point.

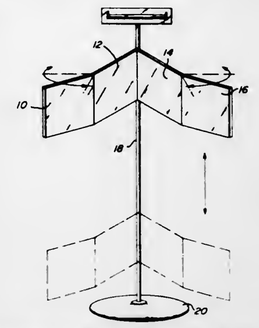
4,050,790

SELF-STYLING AND UTILITY MIRROR WITH FOUR SURFACES

Mildred M. Jorwa, 71 Lincoln Ave., Fair Lawn, N.J. 07410

Filed Nov. 14, 1975, Ser. No. 631,898
Int. Cl.² G02B *5/08*
U.S. Cl. 350—305 **3 Claims**

1. A self-styling utility mirror comprising:
four planar mirrored surfaces contiguous at the vertical edges thereof, said surfaces comprising two inner surfaces fixedly attached to each other at said vertical edges, said inner surfaces lying in vertical planes disposed at an angle ranging from 80 - 130° with respect to each other, and two outer surfaces located in rotatable hinged attachment to respective inner surfaces and adapted for horizontal rotation about the vertical axis defined by said hinged attachment;
a vertical support structure having a weighted base; and



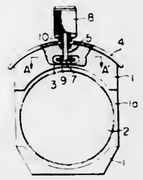
means for attachment of said mirror to said vertical support to enable the omni-directional movement of said mirror with respect to said support.

4,050,791

FILTER HOLDER INSERTABLE INTO THE LENS BARREL OF A CAMERA

Satoya Watanabe, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 19, 1975, Ser. No. 642,543
Claims priority, application Japan, Dec. 28, 1974, 50-1393
Int. Cl.² G02B *7/00;* G03B *17/00;* G02B *7/02*
U.S. Cl. 350—318 **9 Claims**



1. In combination, a lens barrel of a camera and a filter holder, the filter holder comprising a body for carrying a filter, the body having a slot; the lens barrel having a guide member comprising a pair of walls spaced apart a distance to slideably receive said body; an engaging member disposed in the slot and mounted on the body for rotation between first and second positions; and retaining means on the engaging member having a retracted position when the engaging member is in its first position to enable insertion of the holder between said walls, and having an extended position projecting beyond the body when the engaging member is in its second position, at least one of said walls having an aperture to receive said retaining means when the engaging member is in its second position.

4,050,792

OBSERVATION PORT ASSEMBLY

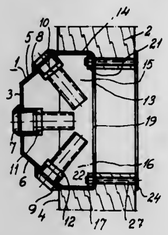
Ulf Svensson, Malmkoping, Sweden, assignor to Roger Rosny Jochen Svensson, Stockholm, Sweden

Filed Jan. 29, 1976, Ser. No. 653,609
Claims priority, application Sweden, Mar. 12, 1975, 7502788
Int. Cl.² G02B *5/00, 25/04*
U.S. Cl. 350—319 **5 Claims**

1. An observation port assembly in combination with a vertical panel, such as a door or the like and in which said vertical panel includes inner and outer vertical surfaces, said

vertical panel having a through-aperture in which said observation port assembly is mounted for permitting an observer, at the inner surface of the vertical panel, to unobtrusively observe the area at the outer surface of the vertical panel, the improvement characterized in that said observation port assembly comprises:

a box-shaped housing part including means for fixed attachment to the outer surface of said vertical panel and in said through aperture, said box-shaped housing part including a plurality of separate optical viewing elements each having viewing-oculars adjacent each other and accessible for viewing from the inner surface of said vertical panel, the



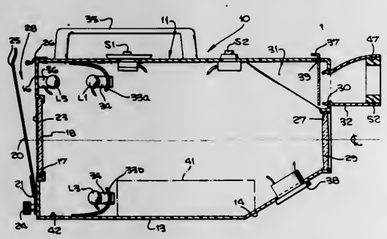
separate optical viewing elements having a linear optical axis at a predetermined angular relationship to the linear optical axis of an adjacent optical viewing element, the box-shaped housing part including a portion projecting beyond the outer surface of said vertical panel and comprising diverse surface portions in which said viewing elements are fixedly mounted, said housing part having an inner wall, and fastening means extending from said inner wall of said housing part and the inner surface of said vertical panel, said housing part enclosing said fastening means and preventing access to said fastening means from the outer surface of said vertical panel.

4,050,793

PORTABLE SLATING DEVICE

Howard W. Hoadley, 9413 Petit Ave., Sepulveda, Calif. 91343

Filed Feb. 17, 1976, Ser. No. 658,340
Int. Cl.² G03B *21/32*
U.S. Cl. 352—5 **8 Claims**



1. A portable slating device for use with a movie camera having a lens, a film, and a separate sound recorder, said device comprising:

a light-tight housing having a lens on the front end and a copyholder on the back end thereof for holding an opaque record medium having information on the face thereof of a size as provided by a conventional typewriter,

a source of electrical energy,

light bulbs in said housing connected to said source of electrical energy and positioned for illuminating the face of the record medium so that the information thereon can be photographed,

a synchronizing light bulb located in said housing,

an audio signal means mounted on the wall of said housing, and

circuit means connected to said source of electrical energy and including a switch attached to the wall of said housing which when closed provides for momentarily simultaneously energizing said synchronizing light bulb and said audio signal means,

whereby when the front end of said housing is positioned adjacent the lens of the camera operating at sound speed for the housing lens functions as a supplementary close-up lens which cooperates with the camera lens to sharply focus the information on the opaque record medium onto the film, and

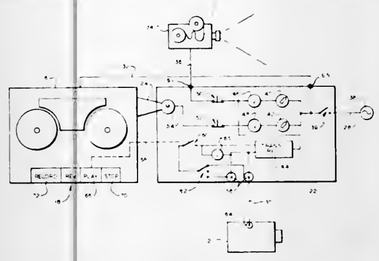
whereby when said switch is closed said synchronizing light bulb flashes on a frame of the film and said audio signal means emits an audio signal which is recorded by the sound recorder for use in thereafter synchronizing the visual action on the film with the audio on the sound recorder.

4,050,794

FILM-SOUND SYNCHRONIZATION SYSTEM

James R. Shields, Jr., R.D. 4, Canastota, N.Y. 13032

Continuation-in-part of Ser. No. 420,627, Nov. 30, 1973, abandoned. This application Feb. 13, 1975, Ser. No. 549,770
Int. Cl.² G03B *31/00*
U.S. Cl. 352—12 **18 Claims**



1. A system for synchronizing projection of a motion picture with playback of sound recorded on a medium separate from the film, said system comprising, in combination:

a. a moving picture projector;

b. a first line providing electrical power from a source to operate said projector;

c. a playback unit including an electric motor for driving the record medium past a stationary pickup means and an electrical sound system for producing audible sound from the movement of said medium past said pickup means;

d. a second line providing electrical power from a source to operate said sound system;

e. a third line connected between said motor and a source other than through said sound system for providing electrical power to operate said motor;

f. manually operable first switch means in said first line for interrupting power to said projector to allow said playback unit to operate at a faster rate than said projector for a selected time interval until synchronism between the motion picture and the sound is restored; and

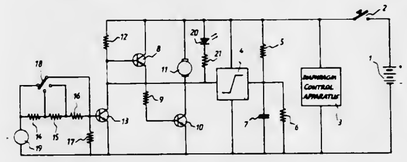
g. manually operable second switch means in said third line for interrupting power to said motor to allow said projector to operate at a faster rate than said playback unit, without interruption of the electrical power operating said sound system, for a selected time interval until synchronism between the motion picture and the sound is restored.

4,050,795

MOTION PICTURE CAMERA OPERABLE BY A SINGLE OPERATING SWITCH

Eduard Wagensonner, Aschheim; Theodor Huber, Munich, and Bernhard von Fischern, Ottobrunn, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 4, 1976, Ser. No. 663,814
Claims priority, application Germany, Mar. 8, 1975, 2510142
Int. Cl.² G03B *7/08*
U.S. Cl. 352—141 **11 Claims**



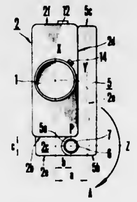
1. In a motion picture camera having film, a battery, film transport means for transporting said film, a diaphragm having an aperture, and electronically energized diaphragm control means for adjusting said aperture in accordance with light available for exposure, apparatus for automatically energizing said film transport means following the operation of said diaphragm control means in response to external activation of a single operating switch, comprising, in combination, connecting means for directly connecting said film transport means and said diaphragm control means to said battery upon external operation of said single operating switch; control switch means connected to said film transport means for blocking the energization of said film transport means until receipt of a control signal; and delay circuit means for furnishing said control signal to said control switch means only after completion of the operation of said diaphragm control means.

4,050,796

MOTION PICTURE CAMERA PRESENTING A FOLDABLE GRIP

Yoshio Komine, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1976, Ser. No. 658,163
Claims priority, application Japan, Feb. 20, 1975, 50-21334
Int. Cl.² G03B *17/00*
U.S. Cl. 352—243 **17 Claims**



1. A motion picture camera comprising:

A. a camera body including a bottom wall and a side wall;

B. a grip adapted for holding a camera, said grip being constructed independently of said camera body;

C. link means for pivoting said grip rotatably on said camera body, said link means being provided with a mounting orifice, said grip being pivoted rotatably on said camera body by said link means between a first position protruding outwardly from said camera body generally outstanding from said bottom wall thereof and a second position where said grip is folded along said side wall of said camera body; and

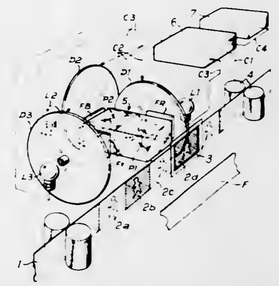
D. actuating means adapted to actuate said camera, said actuating means being attached to said link means through said mounting orifice thereof to be slidable along said mounting orifice in response to manual operation for actuating said camera.

4,050,797

METHOD AND APPARATUS FOR OBTAINING IMAGES OF DIFFERENT COLOR INTENSITIES COMBINATIONS AND RELATIONSHIPS

Jean M. Weiss, 50, rue Sebastien Mercier, 75015 Paris, France

Filed Dec. 18, 1974, Ser. No. 534,065
Claims priority, application France, Dec. 27, 1973, 73.46640; Dec. 12, 1974, 74.37326
Int. Cl.² G03B *21/00*
U.S. Cl. 353—30 **4 Claims**



1. A method of obtaining a plurality of resultant images reproducing the same pattern with different color intensities, combinations and relationships using at least two different information images each having the same pattern produced from the same master pattern image showing said pattern, said method comprising the steps of

a. producing at least first and second predetermined information images obtained from said master pattern image

b. recording said at least first and second information images on respective at least first and second single image storing elements;

c. successively and repetitively positioning said respective image storing elements at a predetermined position so that said first and second image storing elements are successively and repetitively positioned at said predetermined position;

d. cyclically performing the steps of snychronously and successively illuminating each of said image storing elements bearing said information images, when the respective storing elements are at said predetermined position, with flashed light of one color selected from at least two primary colors, and superimposing the successive effects resulting from the successive illuminations of the respective image storing elements in order to obtain a resultant image;

e. said step of positioning said at least first and second storing elements comprising positioning said image storing elements successively in said predetermined position at a rate selected such that the storing element at said position is changed at least six times per second for superimposing said successive effects when seen by the eye, and

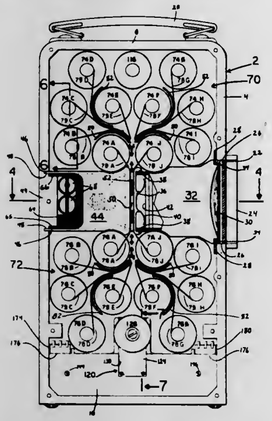
f. varying, during the performance of said cyclically performed steps, at least one of the following parameters; the number of at least one information image, and the color of illumination of at least one information image.

4,050,798

VISUALIZER

William O. Bogga, 1333 N. Robberson, Springfield, Mo. 65802

Filed Dec. 18, 1975, Ser. No. 642,019
Int. Cl.² G03B *21/26*
U.S. Cl. 353—35 26 Claims



1. A visualizer apparatus comprising: a housing; means defining a film gate in the housing; means for illuminating one side of the film gate; a plurality of spools in the housing beyond the film gate; a plurality of film strips in the housing and superimposed on each other with the film gate to form a composite illustration when properly aligned, each film strip being connected to a different spool so that when any spool is rotated in the proper direction the film strip connected to it will wind around the spool; a rotatable drive element associated with each spool in the housing and normally being disengaged from its spool so that it will rotate independently of its spool; an electric motor in the housing; means coupling the electric motor with the drive elements for all of the spools so that when the electric motor is energized all the drive elements will rotate; clutch means associated with each spool for coupling the spool with its respective drive element when the clutch means is actuated; and separate switch means associated with each clutch means for electrically connecting the motor with a source of electrical energy when the clutch means associated with the switch means is actuated, whereby when a specific clutch means is actuated, the electric motor will be energized, causing all the drive elements to rotate, and the spool associated with the actuated clutch means will rotate so that its film strip will wind around it.

4,050,799

MICROFORM READER

Roger A. Gross, Hartford; Marvin D. Radloff, Woodland, and Donald D. Gault, Neosho, all of Wis., assignors to Bell & Howell Company, Chicago, Ill.

Filed Mar. 31, 1975, Ser. No. 563,949
Int. Cl.² G03B *21/22;* G02B *7/02;* G03B *3/00*
U.S. Cl. 353—74 9 Claims

1. In a microform reader apparatus of the type which projects a magnified image of a film frame onto a viewing screen and which includes a light source, a condensing lens, a film holder and a projection assembly including a projecting lens and a plurality of mirrors for projecting the magnified image onto the viewing screen, the improvement of an adjustable mirror assembly for maximizing the light delivered to the projection lens to optimize the brightness of the displayed image comprising:

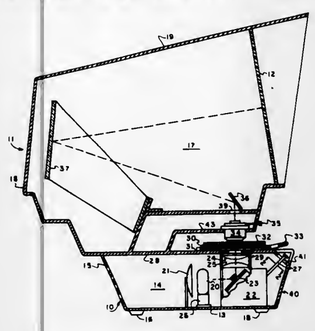
a mirror having a major reflecting surface positioned in between the light source and the condensing lens for receiving the light emitted by the light source on said major reflecting surface;

a universal mount for holding said mirror and for providing said mirror freedom of arcuate positional movement about first and second axes, said first and second axes being perpendicular to each other;

first urging means abutting said universal mount for adjusting the position of said mirror about said first axis;

second urging means abutting said universal mount for adjusting the position of said mirror about said second axis;

said first and second urging means each comprising an eccentric cam having a cam surface abutting said universal mount, the rotation of said cams causing said mirror to move about said first and second axes;



a pair of side walls, said universal mount including a first member extending across said side walls and pivotably mounted to said side walls;

a second member having first and second ends, said first end including a mirror holder for holding said mirror, said second member being pivotably mounted to said first member at an intermediate point between said first and second ends;

an end wall adjacent said second end of said second member; and;

resilient force means connecting said second end to said end wall to thereby maintain said cam surfaces in constant abutment relation to said universal mount.

4,050,800

DEVICE FOR SUCCESSIVE REPRODUCTION OF INFORMATION

Hiroshi Ogawa, and Masao Ariga, both of Kawasaki, Japan, assignors to Canan Kabushiki Kaisha, Tokyo, Japan

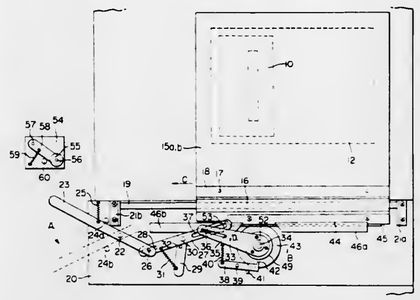
Filed Jan. 19, 1976, Ser. No. 650,042
Claims priority, application Japan, Jan. 30, 1975, 50-12863; July 16, 1975, 50-87027
Int. Cl.² G03B *27/62*
U.S. Cl. 355—75 8 Claims

1. A device for forming successive reproductions, wherein said device includes a reciprocating original carrying table, and comprises in combination:

an information support table disposed for reciprocal movement for being positioned over said original carrying table to permit reproductions to be made of said information;

means for moving said movable table to change the said information to be reproduced by successively shifting said movable table over said original carrying table, wherein said moving means comprises a plurality of at least three interconnected links, one of said links being coupled to said original carrying table to transmit a driving force of said carrying table to move said movable table; and

means including another of said links engaged with said one link for varying the distance of said shifting movement of the movable table, wherein said distance is varied by



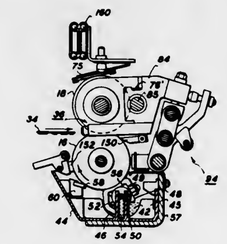
changing the point of engagement between said engaging links.

4,050,801

RELEASE AGENT APPLICATION SYSTEM FOR A HEATED FUSER ROLL

Alan F. McCarroll, Rochester, and Douglas P. Connolly, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 28, 1974, Ser. No. 473,846
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R 8 Claims



1. Roll fuser apparatus comprising:

a heated fuser roll structure;

a backup roll cooperating with said fuser roll structure for forming a nip through which copy sheets pass with toner images thereon contacting said heated fuser roll structure;

a sump containing liquid release agent to be applied to said fuser roll structure;

means for wicking said release agent to the surface of said fuser roll structure and simultaneously removing toner material therefrom;

means adapted to effect engagement of different portions of said wicking means with said fuser roll structure in order to permit periodically the engagement of a new wick portion with said fuser roll structure, said engagement effecting means comprising an elongated support member having a plurality of concave surfaces thereon, said support member being rotatably supported adjacent said fuser roll structure with different portions of said wicking means disposed therebetween in accordance with the positioning of said concave surfaces relative to said fuser roll structure; and

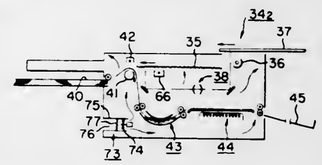
means for doctoring the release agent applied to said fuser roll structure to a substantially uniform thickness and to remove toner therefrom.

4,050,802

ELECTROPHOTOGRAPHIC COPYING MACHINE

Keiji Tanaka, Kawasaki; Yujiro Ando, Yokohama, and Katsunobu Ohara, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 471,916, May 21, 1974, Pat. No. 3,936,184.
This application Jan. 27, 1976, Ser. No. 652,871
Claims priority, application Japan, May 25, 1973, 48-58903; July 9, 1973, 48-77272; Nov. 9, 1973, 48-126039
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R 14 Claims



1. A dust protection method for an electrophotographic apparatus wherein an electrostatic latent image is formed with the utilization of at least illuminating means and means for applying voltage by corona discharge, which comprises:

directing, by blower means, air which has passed through dust removing means into a housing of said electrophotographic apparatus which accommodates means for forming an image; and

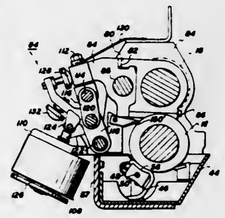
maintaining the air pressure inside the housing at a higher value than the pressure of the ambient air to cause an air flow from the inside of the housing to the outside of the housing, thereby filling the inside of the housing with dust-free air and preventing dusty air from entering into the housing, wherein the electrophotographic apparatus is protected from dust.

4,050,803

QUICK RELEASE MECHANISM FOR A BACKUP ROLL FUSER EMPLOYED IN A COPIER APPARATUS

Alan F. McCarroll, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 28, 1974, Ser. No. 473,845
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R 13 Claims



1. A roll fuser assembly for use in a copier apparatus for fixing toner images to sheets of copy paper, said assembly comprising:

a heated fuser roll structure;

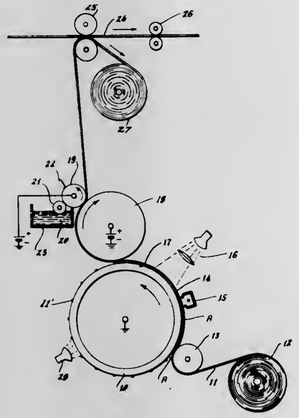
means for supporting said fuser roll structure for rotational movement in said fuser assembly;

a backup roll;

means for securing said backup roll above said fuser roll structure whereby said roll and roll structure form a nip therebetween through which sheets of copy paper having toner images thereon pass with the toner images contacting said heated fuser roll structure; and

means for supporting said backup roll above said fuser roll structure with said securing means removed to thereby render it unnecessary to handle said backup roll prior to removal of said securing means.

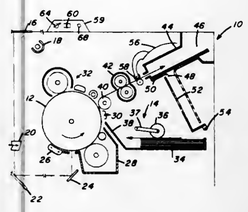
4,050,804
LIQUID INK IMAGING SYSTEM
Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed June 4, 1976, Ser. No. 692,838
Int. Cl.² G03G *15/10*
U.S. Cl. 355—10 **4 Claims**



1. An electrostatic imaging apparatus comprising: a photoconductor assembly; means for positioning the inner surface of a dielectric web against said photoconductor whereby an air gap is formed between said photoconductor and said web; charging means for applying a charge to the outer surface of said web; means for exposing a light pattern through said web, whereby the air gap is ionized and forms a latent image on the inner surface of the web; means for guiding the latent image bearing web away from the photoconductor, including a conductive roller, said roller being biased at a potential sufficient to prevent charge transfer from said assembly to said web; a liquid developing system for developing the latent image on said web; and means for transferring said developed image from said web to an image copy member.

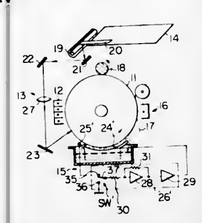
4,050,805
ELECTROPHOTOGRAPHIC COPYING APPARATUS FOR TWO-SIDED COPYING
Charles Thomas Hage, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 18, 1975, Ser. No. 633,149
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 **8 Claims**

1. In a document copier having processing stations for forming copies of documents on discrete sheets which are fed seriatim in a given travel path from a supply hopper through the processing stations to a receiving hopper, means for selectively operating the copier in a two-sided copy mode in which a first-side copy is formed on one side of a discrete sheet during a first-side copy cycle and a second-side copy is formed on the opposite side of the discrete sheet during a second-side copy cycle, comprising: an auxiliary tray selectively movable to a first position adjacent to said receiving hopper for receiving sheets therefrom and to a second position overlying said supply hopper, a deflector selectively movable to a first position intercepting said travel path into said receiving hopper to direct sheets toward said auxiliary tray and to a second position out of said travel path, and control means for positioning said deflector and said auxiliary tray in said first positions during the first-side copy cycle of said two-sided copy mode whereby sheets receiving the first-side copy will be directed into said auxiliary tray, and for positioning said deflector and



said auxiliary tray in said second positions during the second-side copy cycle of said two-sided copy mode whereby sheets may be fed from said auxiliary tray along said travel path to have the second side copy made thereon, the sheets thence being delivered to said receiver hopper.

4,050,806
METHOD AND APPARATUS FOR ELECTRICALLY BIASING DEVELOPING ELECTRODE OF ELECTROPHOTOGRAPHIC DEVICE
Seiichi Miyakawa, and Tadahiro Eda, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan
Filed May 7, 1975, Ser. No. 575,328
Claims priority, application Japan, May 10, 1974, 49-52010; June 14, 1974, 49-67714
Int. Cl.² G03G *15/00, 15/10*
U.S. Cl. 355—14 **22 Claims**

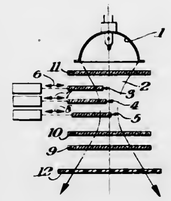


6. In an electrophotographic device having a photoconductive member, charging means for charging the photoconductive member, imaging means for radiating a light image of an original document onto the photoconductive member and a developing electrode disposed closely adjacent to the photoconductive member after the photoconductive member has been charged by the charging means and radiated with the light image by the imaging means, apparatus for electrically biasing the developing electrode comprising:

sensing means comprising a plurality of sensors for automatically sensing the potential remaining at a plurality of respective portions of the photoconductive member; and

computing means comprising a comparator for automatically selecting the output of the sensor having the lowest value of the sensed potential, automatically computing the viasing voltage to be applied to the developing electrode in accordance with the lowest value of the sensed potential and applying said biasing voltage to the developing electrode.

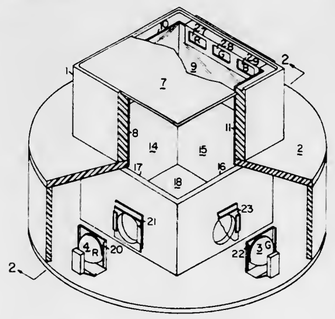
4,050,807
PROCESS AND DEVICE FOR COPYING PHOTOGRAPHIC COLOR IMAGES
Siegfried Barbieri, Brixen, Italy, assignor to Durst AG. Fabrik Fototechnischer Apparate Bozen, Bolzano-Bozen, Italy
Filed Feb. 11, 1976, Ser. No. 657,075
Claims priority, application Italy, Mar. 6, 1975, 4812/75
Int. Cl.² G03B *27/32, 27/52*
U.S. Cl. 355—32 **12 Claims**



1. A process for copying or enlarging of photographic images in accordance with the substractive method in which substractive color filters are selectively interposed at variable depths in the path of the printing light, the process being characterized by substantially removing wave lengths from the copying light in the overlapping wave length range of the spectral sensitivity curves of photographic copying paper whereby disruptions caused by the reciprocal effect of filters in the overlapping wave lenths is minimized.

7. A device for filtering undesirable wave lengths from light used for copying photographic color images by the substractive method in which substractive color filter are selectively interposed at variable depths in the path of the printing light, comprising filter means, and the filter means being characterized by substantially filtering out wave lengths corresponding to the overlapping wave lengths of the spectral sensitivity curves of photographic copying paper.

4,050,808
ADDITIVE COLOR PRINTING METHOD AND APPARATUS
Robert Paul Gyori, Studio City, and Thomas Tullio, Burbank, both of Calif., assignors to De luxe General, Incorporated, Hollywood, Calif.
Filed July 9, 1976, Ser. No. 703,735
Int. Cl.² G03B *27/78, 27/32*
U.S. Cl. 355—38 **12 Claims**



2. Light-emissive apparatus, comprising:

a. a hollow housing (1) having a translucent transparency-receiving surface (7) and plural light sources (3, 4, 5, 6) of different spectral characteristics spaced from said surface,

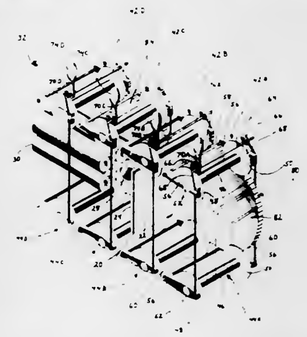
b. a specularly reflective surface (8, 9, 10, 11) within said housing adjacent to said translucent surface,

c. a non-specularly reflective surface (14, 15, 16, 17, 18) within said housing adjacent to said light sources,

d. plural light-responsive means (27, 28, 29) positioned adjacent to said translucent transparency-receiving surface, and

e. control means (33) connected to said plural light-responsive means and to said plural light source for the respective individual control of the output of said plural light sources of different spectral characteristics.

4,050,809
COMPACT VISUALIZER
William O. Bogga, 1333 N. Robberson, Springfield, Mo. 65802
Filed July 26, 1976, Ser. No. 708,888
Int. Cl.² G03B *21/26*
U.S. Cl. 353—35 **11 Claims**

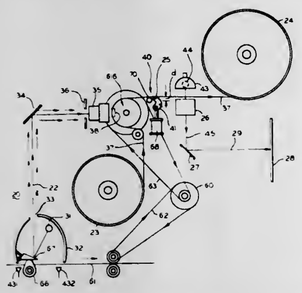


1. A visualizer for composing composite illustrations, said visualizer comprising; a case; means defining a gate within the case; a first spool located beyond one end of the gate; a second spool located beyond the other end of the gate; a film strip connected to and wound around the first and second spools, the film strip passing through the gate intermediate the first and second spools; a rotatable drive member in the case; and actuating means for moving one or the other of the spools into engagement with the periphery of the drive member to rotate the spools, thereby causing the film strip to pass through the gate, the actuating means moving the first and second spools in unison such that when the first spool is moved into engagement with the periphery of the drive member, the second spool is moved away from the periphery of the drive member and vice-versa, the actuating means including first and second swing arms which pivot relative to the case and carry the first and second spools respectively, tie rods connecting the first and second swing arms to enable them to pivot in unison, and an actuating element for moving the swing arms.

4,050,810
INSTANTANEOUS IMAGING MICROFILM RECORDING CAMERA WITH BLIP CONTROL
Milan A. Broderick, Riverwoods, and Eugene V. Mateja, Norridge, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.
Filed Aug. 15, 1975, Ser. No. 605,122
Int. Cl.² G03B *27/32, 27/52, 27/70*
U.S. Cl. 355—40 **16 Claims**

1. A microfilm camera comprising a supply of instant imaging film threaded through said camera and onto a take-up means, at least one instant developing station means disposed adjacent the path of said film, means for feeding successive documents into a copy station in said camera, means compris-

ing an image optical system for reflecting onto the film an image of a document fed into said camera as said film travels away from said supply and to said developing station, means responsive to the document feed for copying each image and for projecting a signal image onto the film at a point having a predetermined relationship to the image being copied when the signal is being projected, whereby an automatic searching device may count any selected number of said signals to find



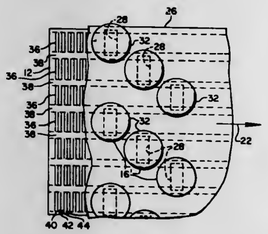
the image which was being copied when the signal was projected and fixing means for thereafter exposing said film to ambient ultraviolet light to release gas from image areas which did not receive the light of either said image or said signal, and means for thereafter transporting said film from said developing station past said fixing means to said take-up means without exposing said film to a heat sufficient to set an image on said film, whereby all gas released by said fixing means evaporates from said film without any permanent effect thereon.

4,050,811

OPTICAL DATA RECORD COPIER HAVING ARRAY OF LENSES WITH FIELD GAPS ALIGNED WITH DATA GAPS

James T. Russell, Richland, Wash., assignor to Eli S. Jacobs, New York, N.Y.

Filed Apr. 21, 1976, Ser. No. 679,005
Int. Cl.² G03B *27/44, 27/50, 33/10;* G01D *9/42*
U.S. Cl. 355—46 **14 Claims**



1. Copying apparatus for making photocopies of optical data records, comprising:

first means for supporting a master record in a copying position, said master record having optical data tracks recorded thereon which include a plurality of spaced data groups separated by data gaps on said master record;

light means for directing light at said master record to produce light images of said data groups;

second means for supporting a photocopy record adjacent to said master record in said copying position;

a plurality of lenses supported between said master record and said photocopy record in an array of lenses extending across the master record, said lenses being positioned in spaced relationship so that the light images of different data groups are each transmitted through a different lens of said array to said photocopy record; and

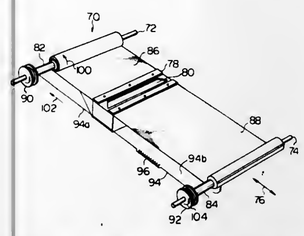
field separation means for limiting the viewing fields of said lenses simultaneously and for causing the fields of view of the array lenses when viewing the master record to be separate and spaced apart by field gaps at said master record which are aligned with said data gaps.

4,050,812

LIGHT SHIELD CURTAIN ASSEMBLY FOR RECIPROCATING OPTICAL SCANNING HEAD

Yutaka Koizumi, and Yoshiharu Iwanaga, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1976, Ser. No. 674,351
Claims priority, application Japan, Apr. 15, 1975, 50-50843[U]
Int. Cl.² G03G *15/04*
U.S. Cl. 355—66 **6 Claims**



1. A curtain assembly for a reciprocating optical scanning head, comprising;

first and second rollers extending perpendicular to a direction of reciprocation of the scanning head and disposed on opposite sides of the scanning head in said direction respectively;

a first curtain fixed at opposite ends to the first roller and the scanning head respectively, the first curtain being rolled around the first roller;

a second curtain fixed at opposite ends to the second roller and the scanning head respectively, the second curtain being rolled around the second roller;

first and second pulleys fixed for rotation with the first and second rollers respectively;

a wire fixed at opposite ends to the first and second pulleys and being rolled around the first and second pulleys in directions opposite to directions in which the first and second curtains are rolled around the first and second rollers respectively; and

biasing means for tensioning the wire.

4,050,813

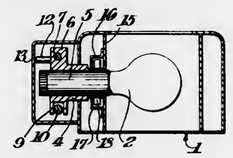
LAMP-ADJUSTING MECHANISM, PARTICULARLY FOR PHOTOGRAPHIC ENLARGING APPARATUS

Wilmuth Pramstraller, Brixen, Italy, assignor to Durst AG. Fabrik Fototechnischer Apparate Bozen, Bizano-Bozen, Italy

Filed Jan. 2, 1975, Ser. No. 645,939
Claims priority, application Italy, Jan. 10, 1975, 6701/75
Int. Cl.² G03B *27/54;* F21V *19/02*
U.S. Cl. 355—67 **7 Claims**

1. An adjustable light source for a photograhic projector apparatus having a condenser illuminating system, comprising a condenser having an optical axis, a lamp having a characteristic profile, a holder within which the lamp is mounted, a housing, a longitudinal separating wall disposed within the housing whereby the housing is separated into longitudinal traversing mechanism and lamp-containing compartments, longitudinal traversing means being mounted in the longitudinal traversing compartment, the longitudinal traversing means comprising

substantially parallel lead screw and guide rod mounted longitudinally parallel to each other in the longitudinal traversing compartment, a nut is connected to the holder and operatively engaged with the lead screw for longitudinally traversing the holder and light source towards and away from the condenser when the lead screw is rotated, a tilting control rotatably mounted on the housing, eccentric connecting means coupling the guide rod to the tilting control whereby rotation of the tilting control imparts an arcuate movement to the guide rod relative to the lead screw whereby the holder is adjustably



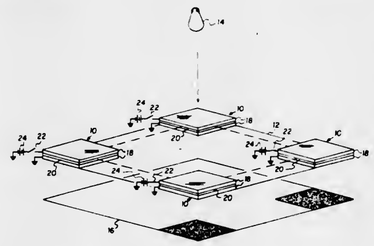
angularly tilted relative to the lead screw, a slot in the separating wall, the lamp holder being disposed through the slot with one end thereof connected to the lead screw and guide rod and the other end thereof being disposed in communication with the lamp-containing compartment, resilient light sealing means mounted on the separating wall alongside the slot whereby light from the lamp is prevented from passing through the slot into the longitudinal traversing compartment and whereby the tilting movement of the holder is accommodated to permit the position of the lamp relative to the condenser to be precisely adjusted.

4,050,814

PROGRAMMABLE LIGHT CONTROL MATRIX DEVICE

Thomas A. McFadden, Mountain View, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 24, 1974, Ser. No. 536,136
Int. Cl.² G03B *27/72*
U.S. Cl. 355—71 **12 Claims**



1. A programmable light control matrix device comprising a planar surface matrix array of cells, each cell being formed with a pair of transparent parallel electrodes separated by a film of electrooptic material having two states, one for passing and the other for blocking light, one state occurring when said cell is electrically energized and the other when it is deenergized wherein said array is formed with a pair of transparent parallel plates having inner and outer surfaces and said material is a continuous sheet disposed therebetween, one of said plates bearing on its inner surface adjacent said sheet a continuous conductive sheet constituting a common electrode of each of said cells and the other plate bearing on its inner surface adjacent said film a plurality of individual electrodes, each constituting the other electrode of said cells and being associated with an individual one thereof, whereby a cell is energized by applying an electric potential across its associated individual electrode and said conductive sheet, and said other plate has individual apertures passing between its inner and outer surfaces, there being one for each of said individual electrodes collinear with its associated electrode, having thin metallized walls which do not obstruct the passage of light so that it may pass therethrough from one of said plates to the other and that function as leads which connect to said individual electrodes for applying an electric potential thereto.

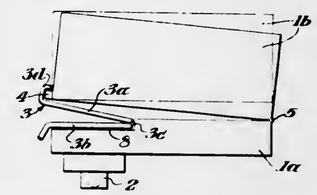
11. A programmable light control matrix device comprising a planar surface matrix array of cells, each cell being formed with a pair of transparent parallel electrodes separated by a film of electrooptic material having two states, one for passing light when deenergized and the other for blocking light when energized, wherein said array has adjoining rows and columns of cells and is formed with four planar surface subarrays in adjoining planar juxtaposition which are simultaneously energizable, each of said subarrays being formed with a pair of transparent parallel plates having inner and outer surfaces and said material is a continuous sheet disposed therebetween, with one of the plates of each subarray bearing on its inner surface adjacent its associated sheet alternate rows, with respect to the rows of the array, of a plurality of individual electrodes in alternate columns, with respect to the columns of the array, each individual electrode constituting one of the electrodes for the cells associated with its subarray and including conductive leads to said individual electrodes which are borne on the inner surface of the associated plate in the spaces between said alternate rows and the other plate of each subarray bears on its inner surface adjacent its associated film conductive strips coincident with said alternate rows constituting the other electrodes of each of the associated cells, so that a cell is energized by applying an electric potential across the conductive strip and the individual electrode corresponding thereto, said array being arranged so that none of the cells in one subarray overlap the cells in any other subarray.

4,050,815

PHOTOGRAPHIC ENLARGING APPARATUS WITH HINGED IMAGE HOLDER

Wilmuth Pramstriller, Brixen near Bozen, Italy, assignor to Durst S.p.A. Fabbrica Macchine ed Apparecchi Fototechnici, Balzano-Bozen, Italy

Filed Nov. 11, 1976, Ser. No. 740,975
Claims priority, application Italy, Nov. 13, 1975, 6721/75
Int. Cl.² G03B *27/62, 27/52*
U.S. Cl. 355—75 **6 Claims**



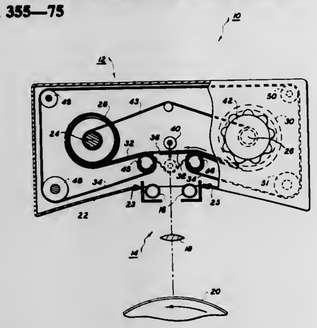
1. An image holding arrangement for a photographic enlarger having a lamp housing and a lens compartment separate from each other, movable means connecting the lamp housing to the lens holding compartment for movement of the lamp housing away from and towards the lens holding compartment, a hinged image holder disposed between adjacent portions of the lamp housing and lens holding compartment, the image holder having substantially flat upper and lower portions hinged to each other, and loose coupling means connecting the upper portion of the image holder to the lamp housing whereby movement of the lamp housing away from the lens holder automatically opens the image holder for insertion and removal of image material.

4,050,816

DOCUMENT HANDLING SYSTEM

Denis J. Stemmle, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 30, 1976, Ser. No. 701,371
Int. Cl.² G03B *27/62*; B65H *5/02, 5/04*
U.S. Cl. 355—75 **10 Claims**



1. In an automatic document handling system of a copying apparatus for making pre-collated copy sheet sets by repeated collated imaging of a set of original document sheets, the improvement comprising:

an elongated windable document holding first web;

means for forming a spaced pair of wound scrolls of said first web for winding up a set of otherwise unattached documents on said first web therein and retaining said documents between turns of said first web on both said web scrolls;

said first web having a minor intermediate unwound segment extending between said web scrolls for transporting exposed documents between said web scrolls and onto which documents are insertable and removable;

means for recirculatingly winding and unwinding said first web between one said web scroll and the other said web scroll to recirculating expose individual documents on said intermediate segment of said first web between said web scrolls in a pre-collated order;

a second web commonly wound with said first web on at least one of said scrolls for retaining documents thereon wound between said first and second webs;

optical imaging means for imaging documents on said intermediate segment of only said first web between said web scrolls for copying said documents; and

separating means for separating said second web from said first web and guiding it away from said intermediate segment after said first and second webs have unwound from said scroll and before said first web passes through said intermediate segment so that said second web is not interposed between said optical imaging means and said intermediate segment of said first web.

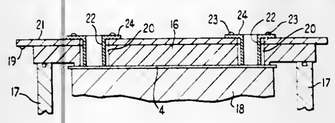
4,050,817

MANUFACTURE OF MULTI-LAYER STRUCTURES

Ian Derek Bromfield, Leicester, and Peter Seddon, Wigan, both of England, assignors to Nippon Kogaku K.K., Tokyo, Japan

Division of Ser. No. 466,914, May 3, 1974, Pat. No. 4,007,988.
This application Aug. 28, 1975, Ser. No. 608,683
Claims priority, application United Kingdom, May 3, 1973, 21073/73
Int. Cl.² G03B *27/00*
U.S. Cl. 355—133 **2 Claims**

1. In the manufacture of a multi-layer structure, a method of aligning a succession of masks relative to a photo-sensitive substrate, comprising: subjecting the substrate to a series of photographic exposures of selected areas of the substrate through a succession of masks, each mask being brought into a desired spatial relationship to the substrate, wherein each successive mask is correctly positioned relative to the substrate using fiducial marks on each successive mask which are each brought successively into a predetermined relationship with corresponding fiducial marks on the substrate without the superimposition on the latter of any photographic images of



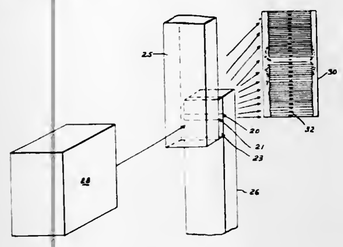
the fiducial marks on the masks, the substrate being subjected to a succession of main exposures through a succession of masks, and the same two fiducial marks on the substrate and respective uniform background regions surrounding said masks being exposed separately from said main exposure of the remainder of the substrate.

4,050,818

METHOD FOR DETERMINING CHANGES IN SPACING BETWEEN TWO POSITIONS OF INTEREST

William N. Sharpe, Jr., East Lansing, Mich., and Glenn W. Hollenberg, Kennewick, Wash., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 612,070, Sept. 10, 1975, Pat. No. 4,014,613.
This application May 21, 1976, Ser. No. 713,481
Int. Cl.² G01B *11/16*
U.S. Cl. 356—32 **1 Claim**



1. The method of determining the change in spacing between two positions of interest; comprising: positioning two linear ½ mil wire light scatterers on opposite sides of an adhesive within a lap joint; directing a beam of coherent monochromatic light past the two linear scatterers; providing a screen at a predetermined distance from said scatterers for displaying the interference pattern; providing markings on said screen for measuring the changes in the interference pattern.

4,050,819

UNDERSEA RANGING-COMMUNICATIONS FROM ALTITUDE VIA LASER

Samuel W. Lichtman, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

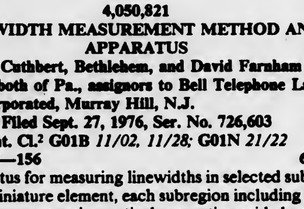
Filed July 2, 1976, Ser. No. 702,267
Int. Cl.² H04B *9/00*; G01C *3/08*
U.S. Cl. 356—51 **10 Claims**

1. A system for detecting an object in water comprising:

a. a first source of light energy waves being propagated on to the water surface for sensitizing an area of the water surface;

b. a second source of light energy waves collimated with said first source being propagated to the sensitized area of the water and being reflected by said water surface;

c. a third source of light energy waves collimated with said first and second light sources being propagated to the



sensitized area for penetrating the water and upon reflection from a submerged body modulates said second light source that is reflected from the water surface;

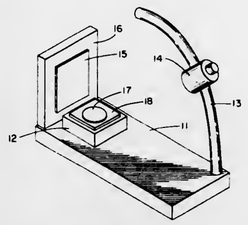
d. detector means for receiving the reflected modulated light source for detecting the presence of the submerged body.

4,050,820

LIGHT-REFLECTING ANALYTICAL DEVICE

John Franklin Hanny, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 17, 1976, Ser. No. 658,562
Int. Cl.² G01N *21/00*
U.S. Cl. 356—103 **10 Claims**



1. A cholesteric liquid crystal testing device comprising a light absorbing mounting surface for receiving a film comprising cholesteric liquid crystal material, a light source directed to the mounting surface and adjustable to vary the angle of light incident on the mounting surface between about 20° and about 70°, and a light reflecting surface located substantially perpendicular to the mounting surface to intercept light directed from the light source and scattered in a spectral hue from a film comprising cholesteric liquid crystals located on said mounting surface.

4,050,821

LINEWIDTH MEASUREMENT METHOD AND APPARATUS

John David Cuthbert, Bethlehem, and David Farnham Munro, Alburtis, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

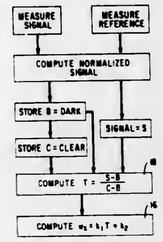
Filed Sept. 27, 1976, Ser. No. 726,603
Int. Cl.² G01B *11/02, 11/28*; G01N *21/22*
U.S. Cl. 356—156 **6 Claims**

4. Apparatus for measuring linewidths in selected subregions of a microminiature element, each subregion including features exhibiting two contrasting optical properties, said element also including at least two reference subregions each exhibiting uniformly a different one of said two optical properties, said apparatus comprising

means including a source for directing light at each of said reference subregions and at a selected subregion to be measured,

means responsive to light obtained directly from said source and from light that impinged upon said reference and selected subregions for generating normalized reference and subregions signals,

means for processing said normalized signals to generate a signal representative of one of said optical properties of said selected subregion,



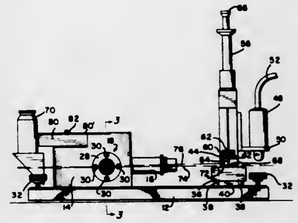
and means for processing said last-mentioned signal in accordance with a predetermined relationship to generate a signal directly representative of a specified linewidth in said selected subregion.

4,050,822

DROP MEASURING APPARATUS, AND A METHOD OF EVALUATING MATERIALS WETTABILITY

Felix R. Grat, Lake Hiawatha, N.J., assignor to Rame-Hart, Inc., Mountain Lakes, N.J.

Filed Mar. 10, 1976, Ser. No. 665,792
Int. Cl.² G01N *13/02*
U.S. Cl. 356—171 **17 Claims**



1. Liquid-drop measuring apparatus, for use as a materials-wettability evaluating device, comprising:

first means for accepting a liquid-drop deposition and supporting such a liquid drop thereon; and

second means coupled to said first means for measuring the height of a liquid drop which has been deposited and is supported on said first means; wherein

said first means comprises a platform having a planar surface on which to support a liquid drop, in order that said surface and the chord of a drop supported thereon will define a contacting interface therebetween:

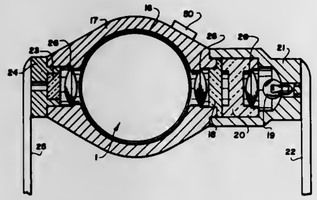
said second means comprises means for gauging the elevation of an uppermost surface of such a drop from said surface of said first means; and

said gauging means comprises viewing means for visually fixing on a drop supported on said surface of said platform, and means for moving said viewing means in order visually to fix on the chord of such drop and to scan to the uppermost surface of such drop.

4,050,823
APPARATUS FOR CONTINUOUSLY MEASURING THE CO_2 CONTENT IN BREATHING GASES

Horst Frankenberger, Bad Schwartau, Germany, assignor to Dragerwerk Aktiengesellschaft, Labeck, Germany

Division of Ser. No. 609,564, Sept. 2, 1975, Pat. No. 4,011,859. This application July 22, 1976, Ser. No. 707,503
Claims priority, application Germany, Sept. 5, 1974, 2442589
Int. Cl.² G01J *3/50*
U.S. Cl. 356—186 3 Claims

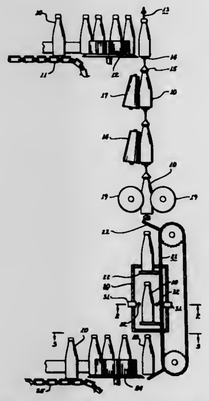


1. A gas measuring device comprising an annular mounting device having an opening therethrough, a respiratory gas tube extending through the opening and being held in said mounting device, a luminous source in said mounting device arranged on one side of said tube, an interference filter mounted on said mounting device and arranged in the path of rays from said luminous source and in the path of said tube, lens means on said mounting device for directing the rays through the tube and the gases therein, and a photodetector mounted on said mounting device on the other side of said tube from said luminous source.

4,050,824
METHOD AND APPARATUS FOR INSPECTING BOTTLED GOODS

Arthur F. Woodrow, and Jorge E. Simmons, both of Tucson, Ariz., assignors to TSN Company, Inc., Tucson, Ariz.

Continuation-in-part of Ser. No. 534,168, Dec. 19, 1974, abandoned. This application June 25, 1976, Ser. No. 700,013
Int. Cl.² G01N *21/24*
U.S. Cl. 356—197 13 Claims



1. A method for inspecting the contents of filled bottled goods and detecting the presence of foreign matter therein without affecting the translational speed of the bottled goods along a conveyer, said method comprising the steps of:

a. translating a plurality of filled bottles along a conveyer;
b. rotating each translating bottle and the contents thereof;
c. stopping the rotation of each bottle abruptly enough to inspire relative rotation between the contents and the bottle while continuing the translational movement of the bottle along the conveyer;
d. transmitting radiant energy from a stationary source through each bottle and the rotating contents thereof as the bottle continues its translational movement along the conveyer;
e. producing a plurality of detection signals from stationary detector means in response to the radiant energy transmitted through each bottle and the contents thereof during translational movement of the bottle and its contents past the stationary detector means;
f. generating a plurality of output signals responsive to the plurality of detection signals and indicative of the transmitted radiant energy intercepted by the bottle and the contents thereof;
g. comparing the plurality of output signals with one another to provide a compared signal reflective of the coincidence of the detection signals; and
h. determining the presence of foreign matter in each bottle from the compared signal.

4,050,825
CAKE OF SOAP, ESPECIALLY FOR WASHING HANDS

Walter Stein, 18 Hauptstrasse, D-7707 Engen, Germany

Filed Dec. 3, 1973, Ser. No. 420,972
Int. Cl.² A46B *15/00;* C11D *17/04*
U.S. Cl. 401—19 13 Claims



1. An article for cleansing comprising a cake of soap, said cake of soap being defined in part by a top surface and opposite end surfaces, a recess in said cake of soap opening upwardly through said top surface and endwise through said end surfaces, said opening being defined by a bottom surface and opposing spaced inner peripheral surfaces between said top and bottom surfaces and extending between said end surfaces, an imperforate plate in said recess completely covering said bottom surface, means securing said plate to said cake of soap, bristle means carried by said plate and being at least partially disposed within said opening, said plate having means for preventing water from erroding said peripheral surfaces thereby precluding disintegration of said cake of soap, and said errosion preventing means being defined by an upper surface of said plate opening concavely outwardly in a direction toward said top surface.

4,050,826
LIQUID APPLICATOR

Walter G. Berghahn, Scotch Plains, and Jack Weinstein, Old Bridge, both of N.J., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 11, 1976, Ser. No. 657,345
Int. Cl.² B05C *21/00;* B43K *5/00, 8/02*
U.S. Cl. 401—196 6 Claims

1. A liquid applicator suitable for use in the application of liquids to a surface of the human body comprising a container having a container body adapted for storing a quantity of said liquid, said container having an opening at one end thereof which is provided with an upper margin, step means spaced below said upper margin of said opening and extending inwardly from the walls of said opening, said step means being adapted to support a shaped applicator means; shaped applicator means positioned in said opening and resting on said step means; said applicator means being releasibly secured in said opening of said container; said shaped applicator means comprising a non-flexible, non-deformable, sintered, porous synthetic plastic resin structure having a controlled porosity and having omni-directional interconnecting pores, said applicator

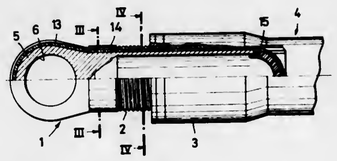


also including a collecting channel disposed adjacent said shaped applicator means adapted to collect overflow liquid coming through the pores of said shaped applicator and directing it back into said container, passage of the fluid collecting in said collecting channel and draining back into said container being possible only through the pores of said applicator.

4,050,827
FORCE TRANSMITTING STRUCTURAL MEMBER

Wolfgang Jonda, Oberpframmern, Germany, assignor to Messerschmitt-Bolkow-Blohm G.m.b.H., Munich, Germany

Filed Sept. 10, 1975, Ser. No. 612,102
Claims priority, application Germany, Sept. 14, 1974, 2444084
Int. Cl.² B25G *3/00;* A44B *21/00*
U.S. Cl. 403—11 11 Claims

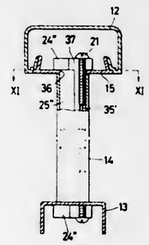


1. A structural member capable of transmitting both tensile and compressive stresses and of transmitting a predetermined load, comprising an elongated part, said part comprising at least one end section and a separate intermediate section with said at least one end section and intermediate section coupled together as a unit, said at least one end section projecting outwardly from said intermediate section and each capable of transmitting the predetermined load of the structural member, wherein the improvement comprises that said at least one end section includes a first subsection and a second subsection spaced apart in the elongated direction of said elongated part and integrally joined together, said first subsection forming the end of said end section spaced from said intermediate section and having attaching structure adjacent the end of said end sections spaced from said intermediate section, said second subsection having a connecting structure on the exterior thereof for connecting said end section to said intermediate section, the attaching structure in said first subsection arranged for attaching said end section to a different member for transmitting the predetermined load between said elongated part and the different member, said second subsection having grooves formed in the exterior surface on opposite sides thereof with the grooves extending in the elongated direction of said part, the grooves penetrating inwardly from the exterior surface through the connecting structure in the exterior surface of said second subsection so that the base of the grooves are spaced inwardly from the connecting structure, said end section being capable of transmitting the predetermined load in the elongated direction of said elongated part between said first and second subsections, said end section including a fiber-reinforced synthetic plastic material wound in a continuous manner in the elongated direction of said elongated part around both the first and second subsections with the fiber-reinforced synthetic plastic material being located in the grooves in said second subsection and extending transversely of the attaching structure in said first subsection of said at least one end section, and the integrally joined said first and second subsections and said fiber-reinforced synthetic plastic material each having a different E-modulus and said integrally joined first and second subsections and said fiber-reinforced synthetic plastic material wound thereon each being capable of transmitting the predetermined load so that if a failure of said integrally joined first and second subsections occurs said plastic material can transmit the predetermined load.

4,050,828
METHOD OF INTERLOCKING A LATERAL MEMBER AND THE END OF A HOLLOW POST AND THE JOINT CONSTRUCTION USED THEREIN

Tadaomi Noro, 19-3 Tsurukawa 4 chome, Machida, Tokyo, Japan

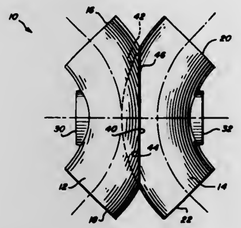
Division of Ser. No. 559,812, March 19, 1975, Pat. No. 3,962,774. This application May 3, 1976, Ser. No. 682,472
Int. Cl.² E04H *17/14, 17/16*
U.S. Cl. 403—201 7 Claims



1. A construction for jointing a lateral member and one end of a hollow post, which comprises

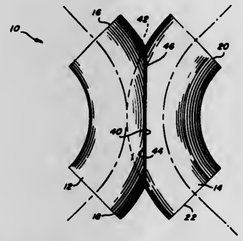
a. a stud composed of a stud body adapted to fit substantially snugly against the inner wall of the hollow post and a stud head for holding the lateral member in a desired position,
1. the inner wall of the hollow post having at least one self-tapping screw guide groove formed by a pair of parallel protrusions in the hollow post, the pair of parallel protrusions fitting in a longitudinal groove in the stud body, and
b. at least one self-tapping screw to be driven into a gap between the inner wall of the hollow post and the stud body along the axial direction of the hollow post, the screw threads of the self-tapping screw biting into the stud body and the inner wall of the hollow post for rigid connection of the stud body and the inner wall of the hollow post.

4,050,829
DOUBLE-SIGMOID CONNECTOR
Ronald Paul Glanz, New Albany, Ind., assignor to Chemetron Corporation, Chicago, Ill.
Filed Apr. 22, 1976, Ser. No. 679,338
Int. Cl.[2] F16B 1/00
U.S. Cl. 403—205 3 Claims



1. A double sigmoid connector comprising: a pair of arcuate pipe elbows having coplanar, arcuate centerlines, one of said pair having an elongated opening in its outer periphery and the other of said pair having a portion of its outer periphery extending into said opening and substantially closing same, said one elbow being rigidly joined to said other elbow around said opening, wherein the improvement comprises: each of said pair of elbows having an outlet formed in its inner periphery and extending inwardly of said inner periphery.

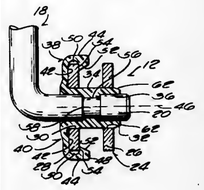
4,050,830
DOUBLE-SIGMOID CONNECTOR
Robert Charles Paulin, Clarksville, Ind., and Ronald Joseph Billings, Fern Creek, Ky., assignors to Chemetron Corporation, Chicago, Ill.
Filed Apr. 22, 1976, Ser. No. 679,335
Int. Cl.[2] F16B 1/00
U.S. Cl. 403—205 6 Claims



1. A double sigmoid structural connector comprising: a pair of arcuate pipe elbows having coplanar, arcuate centerlines, one of said pair having an elongated opening in its outer periphery and the other of said pair having a portion of its outer periphery extending into said opening and substantially closing same, said one elbow being rigidly joined to said other elbow around said opening.

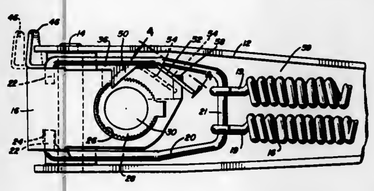
4,050,831
UNITARY BUSHING AND RETAINER ASSEMBLY
Edmund H. DuBois, Zion, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Sept. 15, 1976, Ser. No. 723,487
Int. Cl.[2] B25G 3/00; F16B 9/00, 13/06
U.S. Cl. 403—243 7 Claims

1. A unitary bushing and retainer assembly comprising a first work piece including a shank portion which has a recess, a second work piece including a main body and an ear which is integrally connected to said main body in generally spaced parallel relation to said main body, said main body and ear having therein respective coaxial apertures, and a unitary bushing and retainer comprising a sleeve portion extending through both of said second work piece apertures and including a bore extending coaxially with said apertures and pivotally



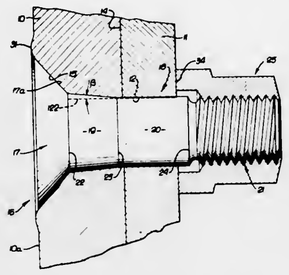
receiving said shank portion of said first work piece, retainer means located between said apertures of said second work piece, on said sleeve portion bore and engaging said recess in said shank portion of said first work piece, thereby positively resisting withdrawal of said shank portion from said bore, and means for preventing movement of said second work piece axially of said shank portion of said unitary bushing and retainer.

4,050,832
WINDSHIELD WIPER PIVOT ARM CONNECTION
Donald W. Stratton, St. John, Ind., and John P. Moorhead, Palos Verdes, Calif., assignors to The Anderson Company, Gary, Ind.
Filed Nov. 10, 1976, Ser. No. 740,398
Int. Cl.[2] F16B 21/10
U.S. Cl. 403—321 15 Claims



1. A wiper arm assembly comprising a mounting head having a socket and an arm pivotally connected to the mounting head and projecting longitudinally outwardly from the mounting head, spring means connected between said mounting head and said arm for pivoting said arm relative to said mounting head, and a latch slidably mounted on said mounting head, said latch comprising a body portion mounted on said mounting head for sliding movement in a direction parallel to the longitudinal axis of said arm, blocking means carried by said body portion, retaining means carried by said body portion and spaced from said blocking means, and actuator means carried by said body portion, said latch in one position will engage the blocking means with said arm to block said arm relative to said mounting head and will clear the retaining means from interference with the socket, and said latch means in a second position will clear the blocking means from interference with said arm and will overlap said retaining means over said socket.

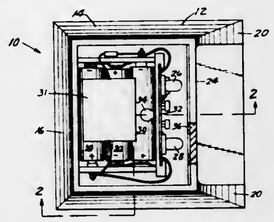
4,050,833
TAPER HEADED FASTENER TO INCREASE WORK FATIGUE LIFE
Franklin S. Briles, 1301 Dolphin, Corona del Mar, Calif. 92625
Filed July 30, 1975, Ser. No. 600,388
Int. Cl.[2] F16B 5/02
U.S. Cl. 403—405 7 Claims



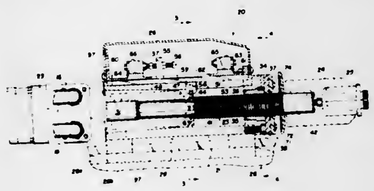
1. In a fastening assembly capable of displacing work material between first and second locations, the first location being proximate the junction between a workbore and a conical countersink surface in the work, the second location being at the work surface adjacent and closely bounding the countersink surface, the combination that comprises:
a. a fastener head and shank, the head being conical to closely interfit the work countersink surface, the conical head defining an included conical angle of at least about 100°,
b. the shank defining first, second and third sections in a lengthwise axially forward sequence away from the head, the third section being threaded to receive a tightening nut, the second section being cylndrical and having an outer diameter to closely fit the workbore diameter,
c. the first shank section being conically tapered forwardly away from the head and toward the second section and being sufficiently oversized in relation to the workbore that interference force will develop in response to forward displacement and seating of the fastener into the work, thereby to effect said displacement of work material between said locations, said first section taper being less than about 4° and greater than about ¼°, the work to include first and second panels, the combined axial extents of said conical head and said shank first section being less than the thickness of said first panel, whereby said first section will be located entirely within the first panel,
d. the work to have a rear side face into which said countersink is sunk, whereby when said fastener is seated in said work said work rear side face will form a rearward bulge extending annularly about the rearward facing side of the head at said second location, the entirety of the bulge being immediately proximate to the radially outermost periphery of the head.

4,050,834
INTERNALLY POWERED TRAFFIC CONTROL DEVICE
John H. Lee, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 4, 1976, Ser. No. 655,091
Int. Cl.[2] E01F 11/00, 9/08
U.S. Cl. 404—16 14 Claims

10. A traffic lane delineator device comprising
a housing adapted to be secured to a roadway surface and subjected to vehicle traffic thereon comprising a base, a rigid top and sloped sides supporting the top facilitating the passage of vehicles thereover without damage to the housing, wherein one of said sides is adapted to allow light to pass therethrough,
a light emitting diode positioned within the housing such that light produced thereby emerges through said one side,
a power supply including a rechargeable battery pack and a solar cell for recharging the battery pack during periods of high ambient light intensity positioned with the housing,
a network positioned within said housing for controlling the energization of the light emitting diode, including oscillator means which when activated periodically energizes the light emitting diode and light sensing means for activating the oscillator means when the intensity of the ambient light is below a predetermined level, and
a retroreflective material disposed adjacent said one side for enhancing the visibility of the delineator device during periods when the network is de-energized,
whereby the use of the periodically energized light emitting diode enables the delineator device to be small, compact and rugged, usable directly on traffic surfaces while yet having appreciable intensity and practical battery life enabling acceptable maintenance intervals.



4,050,835
HYDRAULIC TAPPING APPARATUS
Robert C. Womack, Dallas, Tex., assignor to AAA Products International Inc., Dallas, Tex.
Filed Feb. 2, 1976, Ser. No. 654,179
Int. Cl.[2] B23G 1/00; B23B 47/00
U.S. Cl. 408—11 10 Claims



1. Hydraulic tapping apparatus comprising
an elongated housing, including an elongated body having a motor end and a spindle end; said housing body having external means for indexing said housing relative to a supporting fixture; and a reversible hydraulic motor mounted at said body motor end, with its drive shaft extending axially into said body; a lead nut nonrotatably mounted at said body spindle end;
a spindle having a lead screw intermediate its ends for coaction with said lead nut, having means for mounting a tap at its outer end, and having spline means at its inner end; said motor shaft including drive spline means for coupling with said spindle spline means;
said lead nut and said motor shaft supporting said spindle for

rotation and for longitudinal movement relative to said housing;

said housing having means defining an elongated guideway extending parallel to the rotational axis of said spindle;

a control carriage supported in said guideway for rectilinear movement therealong; means coupling said control carriage to said spindle for simultaneous longitudinal movement;

a reversing control device and stop control device mounted in longitudinally spaced relation on said housing; and adjustable actuators mounted on said control carriage for engaging and actuating said reversing and stop control devices;

said drive spline being axially and rotationally fixed to said motor shaft;

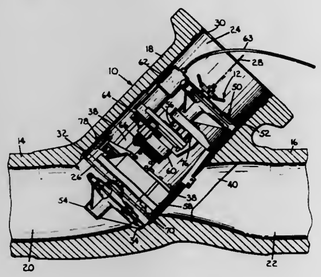
said housing guideway, said lead nut, said control carriage, and said spindle-to-carriage coupling means, all being disposed relative to each other to allow limited additional longitudinal movement of said spindle and carriage in a direction toward the spindle end of said housing, following engagement of an adjustable actuator with said reversing control device; said drive spline and said spindle spline having relative dimensions that said spindle spline will disengage from said drive spline before said spindle and carriage exceed said additional longitudinal movement toward the housing spindle end, thereby preventing damage to said apparatus in the event of failure of said reversing control device.

4,050,836

PORTABLE FIELD MACHINE FOR CUTTING, GRINDING AND LAPPING VALVE SEATS

Ronald J. Anders, Raleigh, N.C., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed July 1, 1976, Ser. No. 701,958
Int. Cl.² B23B *3/26, 41/00*
U.S. Cl. 408—20 **13 Claims**



1. A body mounted valve seat finishing machine operatively disposed substantially totally internally of the cylindrical valving chamber of a valve body, said valving chamber having axially spaced surfaces coaxially disposed with respect to a control axis, said surfaces being on opposite sides of an annular valve seat having a profile adapted for sealing engagement by a valving member which is translatable along the control axis between a valve closed position engaging the seat and an open position spaced from the seat, said body mounted valve seat finishing machine comprising:

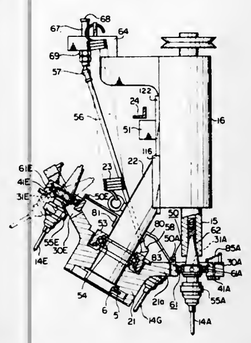
a stationary housing having axially spaced sections interconnected by a shaft member; means carried by the housing engageable with said surfaces for coaxially positioning the shaft with respect to the control axis; tool holder means including valve seat profile forming means; means rotatably and reciprocably supporting the tool holder means on the shaft member for axial movement along the control axis and rotation thereabout; carrier means rotatably supported on the tool holder support means; means preventing relative rotation between the carrier means and the housing; drive means operatively connected between the tool holder support means and the carrier means for rotating the tool holder means about the shaft member; first feed means operatively connected between the housing and the tool holder means for axially moving the latter, the carrier means and the drive means as a unit along the shaft; and second feed means for moving said profile forming means radially with respect to the tool holder means and shaft member whereby the profile forming means can be positioned axially and radially with respect to the axis for performing finishing operations on the valve seat.

4,050,837

DRILLING MACHINE WITH AUTOMATIC TOOL CHANGER

Hiromichi Shichida, Hino; Hideo Katsube; Shigeaki Oyama, both of Hachioji; Kenichi Toyoda, Hino, and Mitsuo Saito, Tokyo, all of Japan, assignors to Fujitsu Fanuc Limited, Hino, Japan

Filed July 8, 1976, Ser. No. 703,368
Claims priority, application Japan, July 15, 1975, 50-85865
Int. Cl.² B23B *39/20*
U.S. Cl. 408—35 **7 Claims**



1. A drilling machine with an automatic tool changer comprising longitudinally traversable spindle head including driving means therefore; a spindle rotatable held by said spindle head; a bar one end of which is slidably supported by said spindle head; a tool magazine which is intermittent-rotatably supported by the other end of said bar; a plurality of tool arbors for holding tools, rotatably held by said tool magazine, each of said tool arbors being detachable from said spindle and driven to rotate by said spindle; wherein the improvement comprises a cam plate fixed to said bar, and a plurality of support rings for rotatably supporting said tool arbors, each of said support rings being swingably attached to said magazine and having means engaging said cam plate and being supported for swing movement in the tool magazine between a working position in which the tool arbor is aligned with the axis of said spindle and a non-working position in which the tool arbor is retracted responsive to relative rotation between said magazine and said cam.

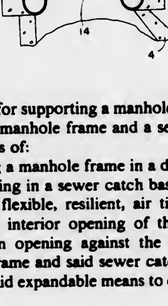
4,050,838

ARRANGEMENT FOR DRILLING HOLES TO APPLY BUILDERS' HARDWARE ON WINDOWS

Jakob Kneip, Haus near 32, 5401 Mermuth, Germany

Filed Oct. 30, 1975, Ser. No. 627,044
Int. Cl.² B23B *39/18*
U.S. Cl. 408—46 **10 Claims**

1. An arrangement for drilling holes to apply builders' hardware to windows comprising, in combination, a framework with two sides members; an upper mounting rail between said side members for receiving a blind or sash frame of a window; a stop rail attached to said mounting rail; fixed drilling means having two drilling units and a plurality of lowerable spindles above said mounting rail and at the center thereof; two tubular members above and parallel to said mounting rail; two auxiliary drilling units with a plurality of lowerable spindles on said tubular members and movable synchronously in opposite directions; cable connecting means connecting said two auxiliary drilling units so that movement of one of said auxiliary drilling units displaces the other auxiliary unit synchronously in the



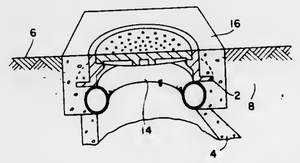
opposite direction, displacements of said auxiliary drilling units being relative to said fixed drilling means; linear displacement of one auxiliary drilling unit being transmitted directly through said cable connecting means to the other auxiliary unit for displacing said other auxiliary unit synchronously in the opposite direction, said cable connecting means comprising two runs of cable, each run being movable in opposite direction, each drill unit being attached to a separate run; first stop means abutted by said auxiliary drilling unit when drilling holes for a blind frame; and second stop means abutted by said auxiliary drilling unit when drilling for a sash and casement window frame, said second stop means being tiltable upward.

4,050,839

PROCESS FOR RAISING MANHOLES

Ronald D. Vollmar, 1809 Clark St., Muncie, Ind. 47301

Filed Aug. 27, 1976, Ser. No. 718,125
Int. Cl.² E03F *1/00;* E02D *29/14*
U.S. Cl. 404—72 **1 Claim**



1. A process for supporting a manhole frame and obtaining a seal between a manhole frame and a sewer catch basin, comprising the steps of:

a. positioning a manhole frame in a desired position relative to an opening in a sewer catch basin;

b. placing a flexible, resilient, air tight expandable means within the interior opening of the manhole frame and catch basin opening against the inner surfaces of said manhole frame and said sewer catch basin opening;

c. inflating said expandable means to expand said expandable means into contact with the inner surfaces of said manhole frame and said sewer catch basin opening

d. placing sealing and supporting material around the exterior of said expandable means in sealing and supporting contact with said manhole frame and said sewer catch basin; and,

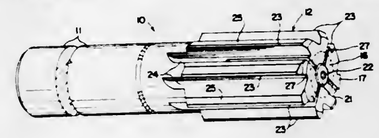
e. removing said expandable means from the interior of said sealing and supporting material, said manhole frame, and said sewer catch basin.

4,050,840

RADIALLY ADJUSTABLE ROTARY CUTTING TOOL

Thomas Jerome Skingle, Parma, Ohio, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed Apr. 1, 1975, Ser. No. 564,065
Int. Cl.² B23B *27/14, 51/00*
U.S. Cl. 408—144 **4 Claims**



1. In a rotary cutting tool with a cutting head having a generally cylindrical body with a threaded axial bore and a plurality of longitudinally extending radial slots extending through to the bore to accommodate radial expansion of the cutting head, and an expansion element threaded into said bore and adapted when turned into said bore to radially expand the cutting head, the improvement wherein said cutting head comprises an inner core portion consisting of low to medium alloy carbon steel and an annular outer portion consisting of a tool steel and metallurgically bonded to said core portion at an annular interface region, said annular outer portion being shaped to define a plurality of integral, circumferentially shaped longitudinally extending cutting surfaces.

4,050,841

POWER BORING BITS

William J. Hildebrandt, West Simsbury, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Mar. 15, 1976, Ser. No. 666,783
Int. Cl.² B23B *51/00*
U.S. Cl. 408—213 **20 Claims**



1. A power boring bit comprising:

a. a shaft member having an elongated shank portion and a pointed tip portion at one end thereof configured to provide cutting surfaces along a segment of its axial length extending from the point of said tip portion, said cutting surfaces circumscribing a circle of rotation of maximum radius at a location along the length of said tip portion spaced from said point thereof, said tip portion having a generally axially extending planar shoulder portion

spaced from said point with the radial distance to said shoulder portion being less than said maximum radius, said shoulder portion having a length dimension extending axially of said shaft member and a width dimension extending perpendicularly to said length dimension;

b. a cutter disc having a planar body portion and a centrally disposed aperture therethrough receiving and extending about said tip portion at said axial shoulder portion, said cutter disc having a channel therein extending from the circumference thereof to said centrally disposed aperture therethrough, one edge portion bounding said channel extending at an angle from said plane of said body portion of the disc toward said point of said tip portion to provide a cutting lip portion with a root end adjacent said body portion of said disc and a free end spaced therefrom towards said point, said free end of said cutting lip portion having a cutting edge extending from the periphery of said disc to closely adjacent said axial shoulder portion of said tip portion intermediate the width of said axial shoulder portion and inwardly of the circle of rotation of maximum radius; and

c. means bonding said disc to said tip portion.

4,050,842

ROTARY CUTTING TOOL

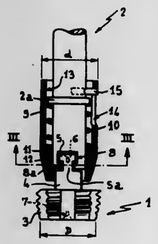
André Jania, 33, Boulevard Gambetta, Belleville-sur-Saone, France (69220)

Filed May 26, 1976, Ser. No. 690,346

Claims priority, application France, June 4, 1975, 75.18156

Int. Cl.² B23B *31/08;* B23G *51/00*

U.S. Cl. 408—226 **5 Claims**



1. A rotary cutting tool and quick-change tool holder operative to support the tool in a floating engagement permitting the tool to shift transversely of the holder through a limited distance, comprising:

a. a rotary cutting tool having an annular active cutting element and having a cylindrical shank extending therefrom, the shank terminating in a T-shaped tongue portion which is undercut at a location spaced from the end of the shank to leave a head at the end of the shank;

b. a tool support comprising a cylindrical holder having a transverse T-slot cut therethrough and shaped to recieve the head of the tongue portion as a clearance fit in the inner portion of the T-slot and the undercut portion of the tongue portion as a clearance fit in the outer portion of the T-slot, the cylindrical shank being adjacent to the cylindrical holder when the tongue portion is in the T-slot;

c. a sleeve member having a bore which is a snug sliding fit on said cylindrical holder and a clearance fit on said shank;

d. yieldable means normally maintaining the sleeve with its bore surrounding the cylindrical holder and surrounding a portion of the length of the shank between the tongue portion and the cutting element; and

e. the clearance between the sleeve bore and the portion of the shank which it overlies limiting said transverse shifting of the tool in the holder.

4,050,843

GAS TURBINE ENGINES

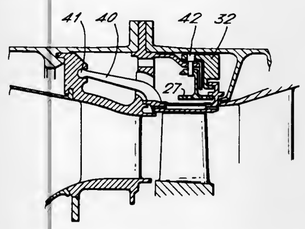
Peter Richard Needham, Bristol, and Kenneth Richard Langley, Wotton-under-Edge, both of England, assignors to Rolls-Royce (1971) Limited, England

Filed Nov. 24, 1975, Ser. No. 634,849

Claims priority, application United Kingdom, Dec. 7, 1974, 52995/74

Int. Cl.² F01D *25/26*

U.S. Cl. 415—116 **15 Claims**



1. A gas turbine engine including a rotor having a relatively slow thermal growth response rate disposed adjacent non-rotating structure for operation over a range of speeds and temperatures, comprising:

an annular sealing ring surrounding a portion of the rotor to define a clearance therewith and being capable of radial expansion and contraction,

means defining first and second radially inwardly facing surfaces on the ring,

a first annular control member having a relatively high thermal growth response rate and having means for engaging and supporting at least a portion of the first surface of the ring,

a second annular control member having a relatively low thermal growth response rate and having means for engaging and supporting at least a portion of said second surface of the ring, the surfaces of the ring and the engagement means on the control members being so juxtaposed that during any rapid increase in the operating temperature of the engine the ring is supported and expanded by the first control member and during any rapid decrease in the engine operating temperature, the ring is supported by the second control member and is constrained to contract at the same rate of contraction as said second control member.

4,050,844

CONNECTION BETWEEN VANE ARM AND UNISON RING IN VARIABLE AREA STATOR RING

Guy W. Miller, Vernon, and James R. Norris, Bolton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 1, 1976, Ser. No. 691,920

Int. Cl.² F04D *29/52*

U.S. Cl. 415—147 **8 Claims**

1. In a variable vane stator structure,

a row of vanes arranged in a ring,

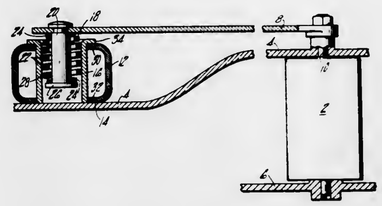
a shroud in which each of said vanes is pivoted for rotation about substantially a radial axis,

a crank arm on each vane,

an actuating ring for the row of vanes, said ring being connected to the ends of the crank arms remote from the vane, and

connecting means between the ring and arm including a pin on said arm,

a cooperating sleeve on the actuating ring surrounding and spaced from the pin, and



an elliptical shaped resilient member in the form of a coil spring secured at its ends to the pin and engaging with and slidable in the sleeve on the ring.

4,050,845

DEVICE FOR STABILIZING THE POSITION OF ROTORS OF LARGE STEAM TURBINES

Rudolf Gemein, Duisburg, and Franz Wotschofsky, Mulheim, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

Filed Sept. 22, 1976, Ser. No. 725,526

Claims priority, application Germany, Sept. 30, 1975, 2543689

Int. Cl.² F01D *5/20;* F04D *29/66*

U.S. Cl. 415—172 A **8 Claims**

1. In a steam turbine having a rotor and a stator, the rotor having rotor blade rings at the outer periphery thereof and the stator having a carrier for vanes interposed between the rotor blade rings respectively in axial direction of the rotor, the rotor blade rings having respective shroud bands at the radially outer periphery thereof, the shroud bands and the stator carrier defining gaps therebetween, a device for stabilizing the position of the rotor comprising means for enlarging at least a part of the radial gaps, respectively, said means comprising channels of substantially circular cross section each extending in the form of a crescent in peripheral direction of the turbine over at least an upper half of the turbine.

4,050,846

FLUID CIRCULATING APPARATUS

Wolfgang Metzinger, Grossniedesheim; Bernd Böll, Frankenthal, and Peter Hergt, Ludwigshafen, all of Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Germany

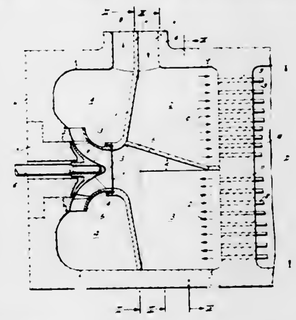
Filed June 22, 1976, Ser. No. 698,747

Claims priority, application Germany, June 25, 1975, 2528210

Int. Cl.² F04D *29/44, 29/40*

U.S. Cl. 415—182 **6 Claims**

1. In a fluid circulating apparatus, a combination comprising a hollow housing having an inlet port and an outlet port arranged adjacent each other in a common tubular socket provided in one wall of said housing, and including internal partitions subdividing the interior of the housing into a first chamber communicating with the outlet port, and a second chamber including a first compartment communicating with said inlet port and a second compartment, said partition including a funnel-shaped member and extending transversely through said housing and having a central opening providing communication between said second compartment and said first chamber, and an inclined wall separating said first compartment from said second compartment, said funnel-shaped member extending with peripheral portion thereof through said socket



and separating said ports from each other, said housing further having at least one first aperture through which fluid which enters said first compartment via said inlet port can leave said first compartment and at least one second aperture through which fluid leaving said first compartment via said first aperture can enter said second compartment; and a circulating pump installed in said first chamber and arranged to draw fluid through said central opening in said funnel-shaped member from said second compartment and to discharge pressurized fluid into said first chamber and from the latter through said outlet port.

4,050,847

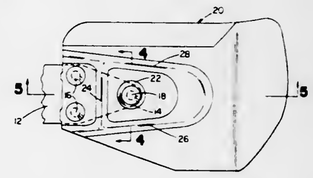
LIGHTWEIGHT FAN

Gordon R. A. New, and William G. Carry, both of Chatham, Canada, assignors to Fram Corporation, East Providence, R.I.

Filed Aug. 30, 1976, Ser. No. 718,789

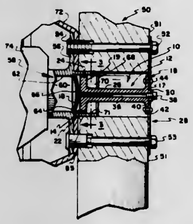
Int. Cl.² F04D *29/34*

U.S. Cl. 416—132 A **9 Claims**



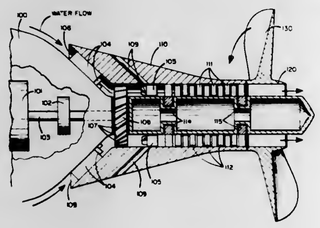
1. In a fan comprising a hub having a plurality of arms extending radially therefrom and a fan blade connected by rivets to each said arm and extending radially outwardly therefrom, said rivets located at positions radially spaced along each said arm and blade and the radially outermost of said rivets bearing directly against said blade, the improvement in which said fan blade has a circular rib formed therein extending about said radially outermost rivet and closely adjacent the head of the radially outermost rivet securing said blade to a said arm.

4,050,848
HYDRO SEAL RETAINER
Paul J. White, 809 Olive St., Vista, Calif. 92083
Filed Mar. 29, 1976, Ser. No. 671,349
Int. Cl.[2] B64C *11/08*
U.S. Cl. 416—146 A **4 Claims**



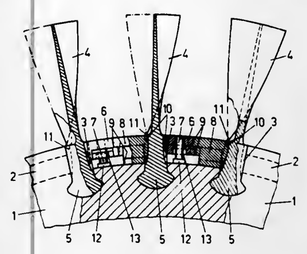
1. In an aircraft engine that normally supplies oil under pressure to a chamber formed by the front portion of a crankshaft, said oil under pressure being utilized to manipulate the blade angle pitch of a constant speed, controllable pitch propeller, said chamber being subsequently sealed off at its exit end by an expansion plug that is engaged with the interior wall portion of said crankshaft forming said chamber when a fixed pitch propeller is substituted for said controllable pitch propeller, the improvement which comprises:
a backup seal apparatus positioned downstream and adjacent to said expansion plug, said apparatus having outer peripheral walls that conform concentrically with and are sealingly engaged with said interior wall portion formed by said crankshaft to prevent escape of said oil under pressure if said expansion plug should fail, said backup seal apparatus having a first oil seal end and a second seal retaining end, said second seal retaining end positioned downstream of said first end and connected to said first seal end by a shaft means therebetween, said second retaining end having at least a pair of flanges extending outwardly therefrom 180 degrees apart adapted to accept at least two of the fixed pitch propeller retaining bolts through holes formed in said flanges to retain said backup seal apparatus within said chamber.

4,050,849
HYDRODYNAMIC TRANSMISSION FOR SHIP PROPULSION
Herman E. Sheets, 87 Neptune Drive, Groton, Conn. 06340
Filed Apr. 19, 1976, Ser. No. 678,392
Int. Cl.[2] B63H *11/04, 23/26*
U.S. Cl. 416—171 **11 Claims**



1. Apparatus for propelling a ship through a body of water by means of the combined thrust of a water jet and a propeller driven by a hydrodynamic transmission, said apparatus comprising in combination:
a. power means within the ship;
b. an axial flow pump rotated by said power means;
c. an axial flow turbine having at least one rotatable portion, said turbine being mechanically free of said power means and disposed outside said ship adjacent its stern;
d. at least one propeller affixed to said rotatable portion of said turbine for rotation therewith; and,
e. primary channel means for directing water from said body to said pump and from said pump to said turbine, the inlet end of said channel being disposed adjacent the stern portion of the ship to reduce drage;
said turbine discharging water from said pump centrally of said propeller.

4,050,850
ARRANGEMENT FOR LOCKING PARTS INTO THE ROTOR OF A TURBOMACHINE
Wolfgang Beckershoff, Fislisbach, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland
Filed Jan. 19, 1976, Ser. No. 650,061
Claims priority, application Switzerland, Jan. 30, 1975, 1105/75
Int. Cl.[2] F01D *5/32*
U.S. Cl. 416—221 **22 Claims**

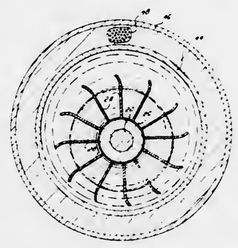


1. An arrangement for locking parts in the rotor of a turbomachine comprising a rotor having first slots extending circumferentially around said rotor and second slots extending transversely across said first slots and spaced apart in the circumferential direction around said rotor so that said second slots extend generally in the axial direction of said rotor, rotor parts having roots thereon with each said rotor part having its roots fitted into one of said second slots so that the roots of said rotor part are spaced apart in the circumferential direction by the said first slots, and locking means positioned within said first slots and displaceable only in a plane transverse to said second slots and passing through said first slots for movement therein between a release position and a locking position, said locking means having outer end faces disposed in locking engagement with the surface of the roots of said rotor parts when in the locking position, said outer end faces of said locking means being displaced from locking engagement with said rotor parts when in the release position, and said locking means being incompressible along the direction of said first slots when in the locking position.

4,050,851
LIQUID RING PUMPS AND COMPRESSORS USING A FERROFLUIDIC RING LIQUID
Harold K. Haavik, South Norwalk, Conn., assignor to The Nash Engineering Company, Norwalk, Conn.
Filed Nov. 10, 1975, Ser. No. 630,845
Int. Cl.[2] F04C *19/00*
U.S. Cl. 417—68 **10 Claims**

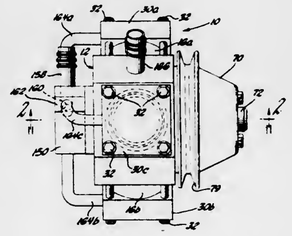
1. A liquid ring pump or compressor comprising a casing, a rotor mounted for rotation within said casing and defining, at least in part, a plurality of working chambers, port means through which a pumped medium is admitted to and discharged from said chambers, said casing including at least a

portion eccentric to said rotor, a quantity of ferromagnetic liquid within said chamber whereby, upon rotation of said rotor, said chambers are caused alternately to expand and contract, electrical coil means disposed to induce a field within



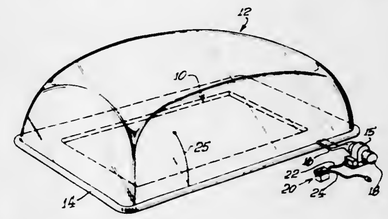
said casing to cause said ferromagnetic liquid to form a rotating ring, impingement of said ring on said rotor causing the rotor to turn, said coil means and liquid together constituting electrical motor means of which said liquid constitutes a rotor.

4,050,852
VARIABLE DISPLACEMENT RADIAL PISTON COMPRESSOR
Byron L. Brucken, Miamisburg, and Roy E. Watt, Brookville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Sept. 13, 1976, Ser. No. 722,643
Int. Cl.[2] F04B *1/24, 49/00*
U.S. Cl. 417—273 **3 Claims**



1. A radial compressor comprising a housing having a plurality of symmetrical bores therein radiating from a common chamber in said housing, a drive shaft journalled in said housing with its axis intersecting all the axes of the bores, said shaft having a wobble plate supported thereon at some predeterminated angle thereto so as to be rotatable therewith, said wobble plate encircled by an outer ring member journalled on the periphery thereof such that said wobble plate is free to rotate relative to said ring member, piston means operating within all of said bores, rod members drivingly connecting each of the piston means to said ring memer, said rod members in the form of circumferentially spaced connecting rods extending from said ring member into each bore, each said rod universally connected to the piston means in its associated bore, means hingedly connecting one of said rods to said ring member for pivotal movement solely about an axis substantially normal to the axis of said shaft, the remaining rods having their ring ends universally connected to said ring member, whereby said one rod hinge connecting means is operable to prevent said ring member from rotating with said wobble plate during the rotational movement of said shaft, and whereby said wobble plate imparts a single working stroke toggle action to each rod for driving each of the piston means through one working stroke reciprocation in its associated bore during each 180° rotation of said shaft, whereby each of the piston means will travel through two working stroke reciprocations in its associated bore for each 360° rotation of said shaft.

4,050,853
RAIN-RESPONSIVE CONTROL
Armand J. Pereyra, 104 W. C St., Ontario, Calif. 91761
Filed Nov. 14, 1975, Ser. No. 632,091
Int. Cl.[2] F04B *49/00*; E04H *3/16*; H01H *29/00*
U.S. Cl. 417—44 **8 Claims**



8. The combination of: a control circuit,
means in the control circuit to inflate a cover for a swimming pool,
means for sensing falling rain and energizing said inflating means in response to falling rain,
a selector switch having a first position and a second position,
said selector switch at its first position permitting the responsive switch to energize inflating means in the event of falling rain,
said selector switch at its second position energizing the inflating means independently of the responsive switch,
whereby with the selector switch at its first position a person desiring to use the swimming pool in the absence of rain may turn the selector switch to its second position to inflate the swimming pool cover and may later return the selector switch to its first position to deflate the swimming pool cover and to reset the control circuit for operating the inflating means in response to falling rain.

4,050,854
FLUID LIFTING APPARATUS
Judson A. Hereford, 5827 Vesa Drive, Houston, Tex. 77087, and Franklin Beard, 14906 Cladywood, Houston, Tex. 77079
Filed Oct. 4, 1976, Ser. No. 729,857
Int. Cl.[2] F04F *1/08, 1/12*
U.S. Cl. 417—121 **13 Claims**

1. Apparatus for lifting fluid from the bottom of a well in stages to the earth's surface, comprising:
a plurality of vertically spaced lifting cylinders, each of said cylinders having a fluid inlet and a fluid outlet,
a plurality of flow tubes, one each being connected between the inlet and outlet of adjacent cylinders, said flow tubes and cylinders providing a closed conduit for the flow of fluid from the well bottom to the earth's surface,
a plurality of check valves, one of said check valves being in series with each of said fluid inlets,
a plurality of vertical barrels, one barrel positioned within each of said cylinders of external diameter less than the internal diameter of said cylinder, each barrel communicating at its upper end to the cylinder fluid outlet and at its lower end with a bottom chamber communicating with the cylinder fluid inlet,
a first air line extending from the earth's surface and ported into the bottom cylinder and each alternate cylinder thereabove,
a second air line extending from the earth's surface and ported into the next-to-bottom cylinder and each alternate cylinder thereabove,

means for alternatively applying air pressure to said first and second air lines, each of said air lines being vented while the other of said air lines is being pressured, and

a plurality of valve means for determining the fluid flow from said cylinders, one of said fluid flow valve means being in each of said cylinders communicating with said bottom chamber therein, each of said fluid flow valve means having a float therein for closing said valve when the fluid in the cylinder is below a predetermined level,



whereby fluid in each of said cylinders ported to the one of said air lines being pressured is pressured downwardly through its fluid flow valve means into the bottom chamber to close the check valve in series with the fluid inlet and to flow upwards through said chamber and said barrel to the next adjacent cylinder thereabove, to positively open the check valve to said next adjacent cylinder and said fluid flow valve means therein to permit filling said next adjacent cylinder with fluid.

4,050,855

DRY AIR ROTARY PUMP OR COMPRESSOR

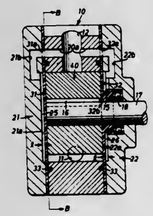
Hiroshi Sakamaki, Utsunomiya, and Toshiyuki Maeda, Ageo, both of Japan, assignors to Nippon Piston Ring Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

Filed Jan. 30, 1976, Ser. No. 653,953

Claims priority, application Japan, Feb. 26, 1975, 50-23583; Feb. 26, 1975, 50-26136[U]

Int. Cl.² F04C *15/00*

U.S. Cl. 418—131 **6 Claims**



1. A dry air rotary pump or compressor comprising:

a stator housing having a cylindrical inner wall;

a pair of end heads mounted on the opposite ends of said stator housing to form a cylindrical pump cavity;

a drive shaft eccentrically journalled on one of said end heads, and extending in the interior of the pump cavity;

a rotor mounted on said drive shaft within said pump cavity and co-operating with the cylindrical inner wall of said stator housing and with the inner end walls of said end heads to form suction and compression or delivery chambers;

a pair of flexible diaphragm type sealing plates clamped on the opposite ends of said stator housing by said end heads to be pressedly contacted with the opposite end faces of said rotor, each of said sealing plates being made of a composite consisting essentially, by weight, of 10.0 – 75.0% carbon and/or graphite, 0.1 – 60.0% molybdenum disulfide, 1.0 – 20.0% fluorine resin, and the remainder, which is greater than 25.0% of the total composition by weight, being heat resistant synthetic resin without fluorine resin to have a coefficient of elasticity greater than 200 Kg/cm^2; and

a pair of recesses provided on the inner end walls of said end heads to form a pair of pressure chambers behind each of said sealing plates.

4,050,856

DASH POT ARRANGEMENT FOR DISTRIBUTION-TYPE FUEL INJECTION PUMP CUT OFF BARREL

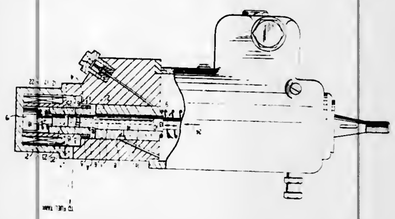
Masayoshi Kobayashi, Kawagoe, and Yasutaka Yuzawa, Kunagaya, both of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Division of Ser. No. 561,530, March 24, 1975, Pat. No. 3,989,021. This application Mar. 10, 1976, Ser. No. 665,482

Claims priority, application Japan, Mar. 22, 1974, 49-31699[U]; Mar. 22, 1974, 49-31700[U]; Mar. 22, 1974, 49-31701[U]

Int. Cl.² F04B *49/00, 7/04, 39/10*

U.S. Cl. 417—289 **3 Claims**



1. In a distribution type fuel injection pump having a casing, a bore within said casing, inlet and outlet fuel channels in said casing and bore, a cylindrical plunger barrel fixedly mounted within said bore, an axially slidable and rotatable plunger mounted within said plunger barrel, a cut off sleeve slidably mounted on said slidable and rotatable plunger for relative movement with respect to said plunger and said casing, an end plug slidably and sealably mounted within said sleeve and forming with the end of said plunger a fuel compression chamber, a fixed magnetic core carried by said casing in contact with said end plug and limiting axial movement of said end plug in a direction out of said sleeve, an electromagnetic coil fixed to said sleeve and concentrically surrounding said core and axially movable thereon in a direction away from said plunger barrel in response to energization thereof, means spring biasing said coil and said sleeve in a direction towards said cylinder plunger barrel, a axial channel running from said compression chamber axially through a portion of said plunger, first, second and third radial channels within said plunger intersecting said axial channel and positioned for communicating with said inlet and outlet fuel chambers and for opening up to the periphery of said plunger, respectively, a radial cut off channel within said cut off sleeve and movable to a position and alignable with the third radial channel of said plunger to relieve fuel within said compression chamber at cut off, the improvement comprising: means defining a dash pot chamber between said casing, said plunger barrel and said cut off sleeve for dampening movement of said cut off sleeve towards said plunger barrel.

4,050,857

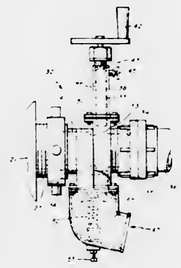
INCOMING GATED RELIEF VALVE

Paul A. Leach, Jaffrey, N.H., assignor to Jaffrey Fire Protection Company, Inc., Jaffrey, N.H.

Filed May 14, 1976, Ser. No. 686,385

Int. Cl.² F04B *49/00;* **A62C** *27/20*

U.S. Cl. 417—309 **2 Claims**



1. In combination:

a fire engine pump having at least one pressure outlet for connection to a fire hose for fighting a fire and having at least two suction inlets for connection to a source of fire fighting liquid;

a water supply conduit connected to one said inlet;

an incoming, gated, valve threadedly mounted on another of said suction inlets, said valve having a thin body with a horizontally extending main valve chamber and a vertically extending valve gate chamber; a normally-closed, manually-operable gate reciprocable in a plane normal to the direction of flow through said main valve chamber, in said gate chamber

an air bleeder valve in the upper portion of said body

and a coil spring-biased, normally closed, automatic pressure-relief valve incorporated in said valve in the lower portion of said body and on the suction side of the gate thereof; said valve body including a discharge vent for said pressure relief valve

the location of said relief valve and said air bleeder valve inside said reciprocable gate enabling said valves to relieve undue air and water pressure in said pump despite said gate being closed.

4,050,858

WELL PUMPING APPARATUS

Phillip K. Ewbank; Charles R. Ewbank, and Garen N. Ewbank, all of 513 N. Main, Fairview, Okla. 73737

Filed Apr. 5, 1976, Ser. No. 674,012

Int. Cl.² F04B *17/00;* **F04D** *13/04*

U.S. Cl. 417—234 **1 Claim**

1. In combination with a water well pumping apparatus having an engine driving a reel mounted on a base disposed adjacent a well to be pumped, a plurality of hoses including a well fluid discharge hose connected at one end with said reel and windable thereon, a hydraulic pump driven by said engine and connected with a pair of hoses of said plurality of hoses and having a generally cylindrical pump assembly adapted to be connected at one end with the other end of said plurality of hoses and lowered vertically into the well to be pumped, the pump assembly having an impeller equipped pump contained by a pump housing at its depending end portion, at least one fluid elevating staging means coaxially connected with the upper end of the pump housing and including a coaxial pump drive shaft connected with the impeller at the depending end portion of the pump drive shaft and having a hydraulic motor drivably connected with the upper end of the pump drive shaft, the improvement comprising:

pump drive shaft support means including a centrally bored thrust body coaxially surrounding the depending end portion of said pump drive shaft and connected with said pump housing, said thrust body having a counterbore in its depending end;

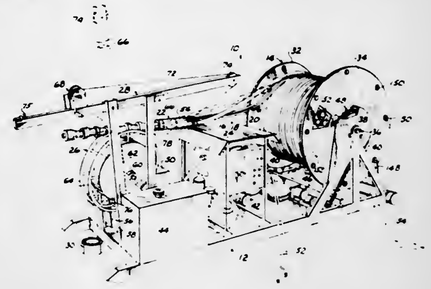
thrust bearing means secured within the thrust body counterbore

said thrust bearing means including a thrust plate having a socket nesting and supporting the depending end portion of said pump drive shaft,

a thrust plate cap secured to the depending end of said thrust body, and,

a thrust bearing interposed between said thrust plate and said thrust cap;

hydraulic motor mounting means including an apertured hydraulic motor mounting plate having a depending annular wall coaxially connected with said staging means and surrounding the upper end portion of said pump drive shaft;



a bushing receiving sleeve coaxially disposed within said annular wall;

a bushing surrounding the upper end portion of said pump drive shaft including a stem portion coaxially received by said staging means and having an upstandng head portion at least partially disposed within said bushing sleeve;

sealing means comprising waterproof sealing rings interposed between said bushing head and said bushing sleeve and between said bushing stem and said pump drive shaft, respectively,

said bushing head having an annular groove in its wall surface surrounding said pump drive shaft and having a lateral port communicating with the groove,

said motor mounting plate annular wall having a lateral port coaxially aligned with the bushing head port;

a drain tube interconnecting the lateral ports;

a hydraulic motor surrounding sleeve coaxially secured to said motor mounting plate; and,

a motor mounting and hose connecting cap overlying the end of said motor mounting sleeve opposite said motor mounting plate.

4,050,859

DIAPHRAGM PUMP HAVING A REED VALVE BARRIER TO HYDRAULIC SHOCK IN THE PRESSURIZING FLUID

William Duncan York, Edina, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed July 1, 1976, Ser. No. 701,807

Int. Cl.² F04B *9/08, 35/02*

U.S. Cl. 417—386 **13 Claims**

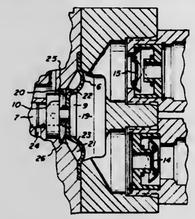
1. An improvement in diaphragm pumps of the type having a mechanically reciprocating member for pressurizing hydraulic oil for reciprocating a diaphragm member to transfer fluid

through inlet and outlet valves into and out of a pumping chamber adjacent a first side of the diaphragm, comprising:

a. a hydraulic chamber of containing hydraulic oil in fluid contact with said mechanically reciprocating member;

b. a diaphragm chamber adjacent a second side of said diaphragm and having a narrowed aperture opening into said hydraulic chamber;

c. a mechanical stop member connected to said diaphragm and sized to fit into said narrowed aperture opening; and



d. a flexible reed valve member secured between said diaphragm and said mechanical stop member, said flexible reed valve member being sized to contact said diaphragm chamber in fluid flow sealing relationship between said diaphragm chamber and said narrowed aperture when said mechanical stop member is in said narrowed aperture opening, and to deflect pressurized hydraulic fluid from direct impingement on said diaphragm when said mechanical stop member moves away from said narrowed aperture opening.

4,050,860

SPRAY PUMP ASSEMBLY

Steve W. Beres, Bridgeport, Conn., assignor to VCA Corporation, Baton Rouge, La.

Filed June 1, 1976, Ser. No. 691,220

Int. Cl.[2] F04B *21/04*

U.S. Cl. 417—444 **1 Claim**



1. A finger-operated spray pump assembly comprising:

a. compression chamber means, said compression chamber means having vent hole means in the wall thereof, and closure means rigidly connectable thereto, the lower end of said compression chamber means having a series of guide means connected to the inside wall thereof;

b. piston means slidably fitted in said compression chamber means;

c. grommet means rigidly connectable to said compression chamber means for connecting closure means to said compression chamber means;

d. hollow stem means having an upper end and a lower end, said upper end of said stem means being slidably fitted inside said grommet means, said stem means having actuator button means connectable to the upper end thereof, said stem means having shoulder means for contacting and forcing said piston means toward said check valve means, and said lower end of said stem means being slidably fitted in said piston means;

e. seal means slidably fitted in said lower end of said stem means, said seal means having base means, said base means having post means connected thereto, said post means being adapted for slidable receipt in said lower end of said stem means, said lower end of said stem means being adapted to urge said seal means away from sealing contact with said pistion means prior to said shoulder means contacting said piston means;

f. spring means fitted inside said compression chamber means to urge said seal means against said piston means;

g. check valve means located in the lower end of said compression chamber means, said check valve means having arm means thereon which are slidably received between said guide means; and,

h. dip tube means connectable to said compression chamber means.

4,050,861

DIAPHRAGM PUMP

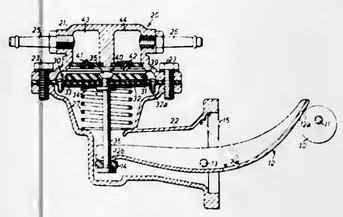
Toshimitsu Sakai; Tadashi Saitou, both of Toyota, and Isamu Suzuki, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Kogyo Kabushiki Kaisha, Obu, both of Japan

Filed May 6, 1975, Ser. No. 574,876

Claims priority, application Japan, May 30, 1974, 49-62376[U]

Int. Cl.[2] F04B *43/02*; F01B *19/00*

U.S. Cl. 417—471 **2 Claims**



1. In an air diaphragm pump comprising a lower housing mounted on a stationary structure for forming a lubrication oil chamber therein; an upper housing coupled with said lower housing for forming an air pumping chamber therein and provided thereon with an inlet port and an outlet port; a spring-loaded diaphragm piston assembly including a flexible diaphragm interposed and hermetically clamped at the outer periphery thereof between said housings to define said air pumping chamber and an operation rod for reciprocating said diaphragm assembly within said oil chamber; valve means assembled within said upper housing and including a first check valve to suck the air into said air pumping chamber through said inlet port and a second check valve to discharge the sucked air though said outlet port; and a driving mechanism assembled within said lower housing for operating said operation rod;

the improvement comprising:

upper and lower protector plates located respectively within said air chamber and said lubrication oil chamber for fluid-tightly connecting said flexible diaphragm at the center thereof to said operation rod, said plates having substantially planar portions;

a flexible disc sealing member integral with said flexible diaphragm on the side thereof facing said lubrication oil chamber and clamped between said diaphragm and said lower protector plate;

the outer periphery of said flexible disc sealing member being interposed and fluid-tightly clamped with the outer periphery of said diaphragm between said housings;

said flexible disc sealing member being interposed and fluid-tightly clamped between said lower protector plate and said diaphragm throughout the entire planar portion of said lower protector plate; and

a buffer member secured to said upper protector plate to protect said valve means.

4,050,862

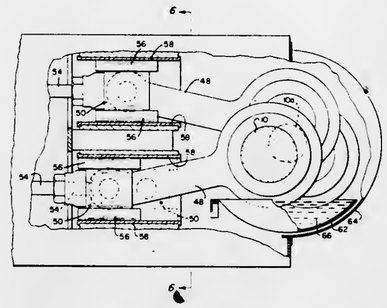
MULTI-PLUNGER RECIPROCATING PUMP

Frederic W. Buse, Allentown, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 7, 1975, Ser. No. 629,781

Int. Cl.[2] F04B *21/02, 21/04*

U.S. Cl. 417—539 **21 Claims**



1. A multi-plunger reciprocating pump comprising a generally horizontally extending crankshaft, a plurality of generally horizontally extending cylinders alternatively disposed at least generally above and below the centerline of said crankshaft, conduit means operatively associated with each of said cylinders for supplying fluid to, and discharging pumped fluid from, said cylinders, valve means for controlling fluid flow through said conduit means to-and-from said cylinders, a piston movably disposed in each of said cylinders for reciprocation therein, and connecting means connecting said crankshaft to said pistons such that rotation of said crankshaft causes driven reciprocation of said pistons in said cylinders, wherein said connecting means for each said piston comprises a connecting rod connected to said crankshaft to be driven thereby, a piston rod connected to the piston, and a crosshead connecting said connecting rod to said piston rod, and further comprising arcuate way means disposed adjacent two opposite sides of each said crosshead, arcuate bearing shoe means mounted to such two opposite sides of each said crosshead slidably supporting the crosshead on its said way means, and other arcuate shoe means mounted to each said crosshead intermediate its said acruate bearing shoe means, whereby 90° rotation of said crossheads causes said other shoe means to support said crosshead on said arcuate way means.

4,050,863

APPARATUS FOR THE HOT-PRESSING OF COMPOSITE BOARDS MADE FROM LIGNOCELLULOSIC MATERIAL

Nils Evert Erling Book, Motala, Sweden, assignor to Aktiebolaget Motala Verkstad, Motala, Sweden

Filed Dec. 1, 1975, Ser. No. 636,671

Claims priority, application Sweden, Dec. 4, 1974, 7415215; Mar. 5, 1975, 7502463

Int. Cl.[2] B29C *3/00*

U.S. Cl. 425—84 **5 Claims**

1. Apparatus for heat-pressing sheets of lignocellulosic material in a stationary press for forming lignocellulosic materials into boards during which time provision is made to allow draining of liquid, gas or steam from the sheets when being pressed and heated in the press, said apparatus comprising: a pair of vertically spaced heated press plate assemblies having flat, opposed, horizontally parallel surfaces of finite length; means in the upper surface of said lower press plate assembly defining drain passages for receiving gas, liquid or steam material compressed from said sheet and for conducting it horizontally; plate means for conveying a sheet of lignocellulosic material into the press between the opposed press plate assemblies which plate means defines interspersed rigid sheet support portions and slot portions therethrough adapted to communicate with said drain passages to permit draining from the sheets being pressed, said plate means being constructed and arranged to permit draining of any liquid, gas or steam being pressed out of the sheet while resisting plastic deformation of the sheet during the pressing action.



4,050,864

APPARATUS FOR MANUFACTURING CONCRETE PANELS WITH SURFACE PATTERN DECORATIONS

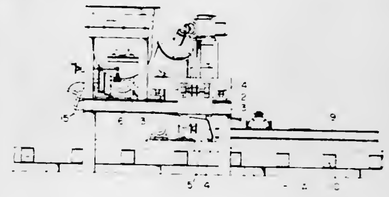
Saiji Komaki, No. 1, Nagayoshi-cho, Kagoshima, Kagoshima, Japan

Filed Nov. 26, 1975, Ser. No. 635,335

Claims priority, application Japan, Sept. 3, 1975, 50-106055

Int. Cl.[2] B28B *13/02*

U.S. Cl. 425—134 **7 Claims**



1. In an apparatus for manufacturing concrete panels with surface decoration patterns thereon, said surface decoration patterns being formed by finishing material containing color cement or pigments or other coloring material, said apparatus comprising a mortar hopper, having a mortar outlet opening, a mortar shoot extending downward from beneath the outlet opening of said hopper; a molding surface positioned below said mortar shoot, said mortar shoot extending toward said molding surface; color mortar containers disposed above the mortar shoot to discharge color mortar materials contained therein; a mixing means operatively associated with said mortar shoot for incompletely mixing the mortar with the color mortar materials on said mortar shoot; a mixed mortar inverting descent guide plate connected to the lower end of the mortar shoot; and a vibrator attached to the mortar shoot, wherein the mortar layer which is obtained with color patterns produced through the incomplete mixing carried out by said mixing means is laid on said molding surface by relative movement between said mixed mortar inverting descent guide plate and said molding surface.

4,050,865

BRICK PRESS AND ASSOCIATED EQUIPMENT FOR MAKING BRICKS

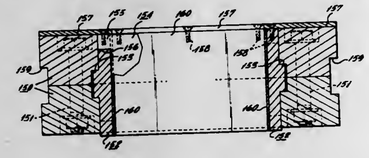
Frede Hilmar Drostholm, Vedbaek; Harry Jensen, Gentofte, and Per Willadsen, Melby, all of Denmark, assignors to Frede Hilmar Drostholm, Denmark

Continuation-in-part of Ser. No. 510,145, Sept. 30, 1974. This application Sept. 9, 1976, Ser. No. 721,867

Claims priority, application Australia, Sept. 25, 1975, 85165/75

Int. Cl.² B29C *3/00*; B29B *11/04, 11/08*

U.S. Cl. 425—183 8 Claims



1. A press for forming bricks comprising an open ended mold, means for introducing a charge of particulate material into one end of the mold, a pair of press elements adapted to enter the opposite ends of the mold, means for applying pressure through the press elements against the charge of material in the mold and for concurrently shifting the position of the press elements toward one end of the mold and thereby shift the mean position of the charge with respect to the side walls of the mold during application of pressure by the press elements and replaceable wear plates covering and adhesively secured to the side walls of the mold by an adhesive which is decomposable at elevated temperature.

4,050,866

APPARATUS FOR MELT-SPINNING

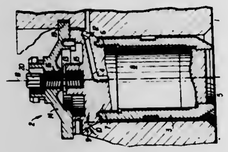
Harley Kilsdonk, Zevenaar, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed June 18, 1976, Ser. No. 697,481

Claims priority, application Netherlands, June 23, 1975, 7507443

Int. Cl.² D01D *3/00*

U.S. Cl. 425—192 S 17 Claims



1. An apparatus for the manufacture of synthetic threads by the melt-spinning method comprising a heating jacket, a spinning assembly disposed in the jacket, said spinning assembly having a housing having two open ends and surrounding a compartment for polymer to be spun, a spinnerette plate having spinning orifices across a first of said ends, a closure member having a first portion which fits in the second of said ends and a second portion which has a sloping face which extends radially outwardly from the first portion outside the housing, said jacket having a sloping surface which bears against the sloping face of the closure member, and means for producing polymer to be spun into the compartment including a bore through the sloping surface of said jacket which communicates with a bore through the sloping face of said closure member.

4,050,867

EXTRUSION HEAD FOR EXTRUDING PLASTOMERIC OR ELASTOMERIC MATERIAL ON FILAMENTS

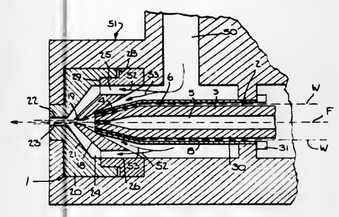
Antonio Ferrentino, Monza (Milan); Antonio Brovedan, Milan, and Angelo Sala, Merate, all of Italy, assignors to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed Dec. 18, 1975, Ser. No. 641,980

Claims priority, application Italy, Dec. 20, 1974, 30785/74

Int. Cl.² B29F *3/10*

U.S. Cl. 425—114 9 Claims



1. An extrusion head for extruding plastomeric or elastomeric material on at least two filaments of relatively high modulus of elasticity comprising a mandrel having a surface provided with a plurality of guiding means, one for each filament for engaging each of said filaments and maintaining them in spaced relation while they are drawn across said mandrel and having material directing means intermediate said guiding means for receiving said material and directing it between said guiding means, said mandrel having a forward end at one end of said guiding means and a rearward end at the other end of said guiding means and said surface of said mandrel has a first cylindrical portion extending from said rearward end toward said forward end and a second portion intermediate said first portion and said forward end, said second portion tapering and decreasing from said first portion to said forward end and from the transverse dimensions of said first portion to smaller transverse dimensions, said guiding means following said surface and thereby guiding each of said filaments along a first path parallel to said first portion of said surface and then along a second path parallel to said second portion of said surface, said extrusion head further comprising a die at said forward end of said mandrel, said die having a central duct and an opening extending from said duct to said second portion of said mandrel, said opening being defined by a conical wall co-axial with said second portion and spaced, at least in part, from said second portion to define a space between sid conical wall and said second portion for the passage of said material between said conical wall and said second portion into said central duct, said central duct being in communication with said guiding means.

4,050,868

CASTING MACHINE FOR CASTING CONCRETE ELEMENTS

Esko Patamaa, 03100 Nummela, Finland

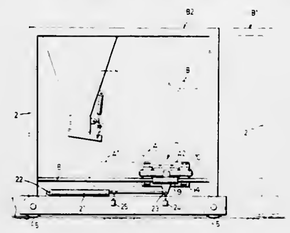
Filed May 11, 1976, Ser. No. 685,218

Claims priority, application Finland, May 13, 1975, 751397

Int. Cl.² B28B *1/08, 13/02*

U.S. Cl. 425—135 6 Claims

1. A casting machine for casting concrete elements, said casting machine comprising a support frame (2) situated for movement above a cast mould (3), said support frame including means (4) for feeding the concrete into the mould, a vibrating device (7) for vibrating the mould and a mechanism (6) for moving the support frame along the mould during feeding of the concrete, characterized in that said vibrating device (7) is mounted on said support frame so as to be glideable in the direction of movement (B) of the support frame (2), locking units (12, 14) being located on said vibrating device whereby the vibrating device is adapted to be momentarily fastened, without play, to the casting mould (3) for the time of vibration irrespective of the continual movement of the support frame, a carriage (9) for supporting said vibrating device, a guide (8)



supporting said carriage for movement therealong an in parallel with the direction of movement of said support frame, said guide being supported by the support frame, and shifting means (21) being connected to said carriage for moving the carriage along the guide.

4,050,869

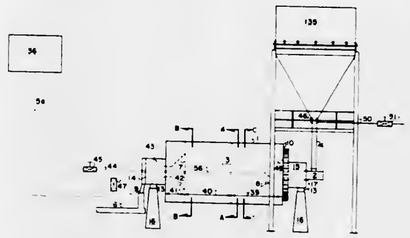
APPARATUS FOR AGGLOMERATING POWDERS

Robert B. Takewell, Borger, Tex.; Paul W. Brandon, Havre de Grace, Md., and Paul R. Odom, Macon, Ga., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 450,037, March 11, 1974, abandoned, which is a division of Ser. No. 186,113, Oct. 4, 1971, Pat. No. 3,803,283. This application Mar. 18, 1976, Ser. No. 668,120

Int. Cl.² B29B *1/02*

U.S. Cl. 425—222 1 Claim



1. Apparatus for agglomerating finely divided materials such as clay, silica, or silicate pigments into a range of pellet sizes providing optimum density, packing efficiency, and attrition resistance, comprising:

a. a rotatable drum for receiving finely divided material and tumbling it until it is agglomerated;

b. pellet initiation means located within said rotatable drum for spraying liquid wetting agent, in a flat wide spray, on the finely divided material for encouraging it to agglomerate;

c. input conveying means passing into said rotatable drum for introducing finely divided material into said drum, said input conveying means including a screw conveyor comprising a non-rotatable shell and a rotatable shaft, and being connected to said rotatable drum by lubricated bushings;

d. inlet means opening into one end of said drum and attached to said conveying means for receiving said finely divided material to be agglomerated;

e. outlet means opening into the opposite end of said rotatable drum for receiving the agglomerated material from said drum;

f. pellet conveying means located at said outlet means for conveying the discharged agglomerated material away from said drum;

g. pre-wetting means attached to said input conveying means for adding from 0 to 5 percent wetting liquid to said finely divided material;

h. first motor means attached to said rotatable drum for providing rotary motion to said drum;

i. second motor means attached to said input conveyor means for providing conveyor drive power to said input conveyor means.

j. a first baffle within said drum for dividing said drum into compartments;

k. a second baffle within said drum between said first baffle and said outlet means for further dividing said drum into compartments; and,

l. a plurality of lifter trays located radially in said drum between said second baffle and said outlet means for lifting the pelleted material and funneling it out of said drum.

4,050,870

MOLDING PRESS HAVING A DEVICE FOR GRIPPING AND DELIVERING ELEMENTS TO BE MOLDED

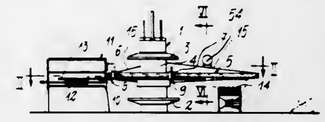
Vito Frigo, Cervignano del Friuli (Udine), Italy, assignor to Ausatuft S.p.A., Italy

Filed Sept. 3, 1975, Ser. No. 609,977

Claims priority, application Italy, Sept. 17, 1974, 27359/74

Int. Cl.² B29C *3/04*

U.S. Cl. 425—317 6 Claims



1. In a molding press, molding means situated at a molding station for molding an article to a given configuration, a delivery station to which molded articles are to be delivered, a supply station from which articles are supplied to be molded at said molding station, a pair of gripping means one of which is provided for gripping an article at said supply station and transferring the latter to said molding station and the other of which is provided for gripping an article molded at said molding station and transferring the latter to said delivery station, and moving means operatively connected to both of said gripping means for moving said one gripping means from said supply station to said molding station and for simultaneously moving the other gripping means from said molding station to said delivery station, said one gripping means gripping the article at said supply station and carrying the latter to said molding station and releasing the article at the latter station while said other gripping means simultaneously grips a molded article at said molding station and carries the latter to said delivery station for releasing the latter at said delivery station, a guide means extending across said molding station to one side thereof toward said supply station and to an opposite side thereof toward said delivery station, said moving means including a carriage movable along said guide means, a pair of arms carried by said carriage, and said pair of gripping means being respectively carried by said arms, each of said arms carrying at an end thereof a slide means, and said pair of gripping means being respectively slidable on the pair of slide means respectively situated at the ends of said arms.

4,050,871
APPARATUS FOR MAKING PELLETS USABLE AS AGGREGATE OR FILLER

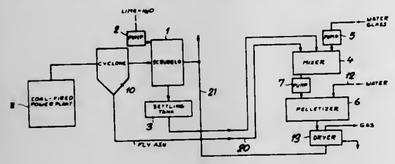
Ulrich Kleeberg, Mühlheim (Ruhr); Jürgen Leimkühler, Essen; Jürgen Knoepe, Herbern, and Manfred Stöhr, Essen, all of Germany, assignors to Gottfried Bischoff Bau kompl. Gasreinigungs-und Wasserrueckkuhlanlagen Kommanditgesellschaft and STEAG Aktiengesellschaft, both of Essen, Germany

Division of Ser. No. 593,670, July 7, 1975. This application May 17, 1976, Ser. No. 687,391

Claims priority, application Germany, July 6, 1974, 2432572

Int. Cl.² B29J *1/00*

U.S. Cl. 425—317 **3 Claims**



1. A plant for making hard and water-stable pellets usable as aggregate or filler, said plant comprising:

means including a scrubbing tower for treating a waste gas containing pollutants with water and lime to form a sludge containing said pollutants;

means connected to said tower for partially dewatering said sludge;

means connected to the dewatering means for mixing the dewatered sludge with a binder;

means connected to the mixing means for pelletizing said sludge; and

means for removing particulate material from said gas prior to treatment thereof and for introducing said particulate material into the dewatered sludge at said mixing means.

4,050,872
ROLLER CHAIN GUIDE ARRANGEMENT

Karl-Heinz Ahrweiler, Krefeld, Germany, assignor to Eduard Kusters, Krefeld, Germany

Filed June 28, 1976, Ser. No. 700,346

Claims priority, application United Kingdom, Oct. 11, 1975, 2545624

Int. Cl.² B29C *15/00*; B27D *3/04*

U.S. Cl. 425—371 **5 Claims**



1. In apparatus in which a group of roller chains are disposed, packed closely together, side by side, and in such a manner that they can advance independently of each other, the group being disposed to advance in one area parallel to each other in a common plane, with at least some of the roller chains leaving the common plane at one point and re-entering the plane again, the improvement comprising guide means disposed so as to separate any chain which has left the common plane by a predetermined spacing from chains adjacent thereto before re-entering the common plane, and convergence means following said guide means for urging the chains transversely together until said roller chains reach close proximity at the point where said chains reenter said common plane.

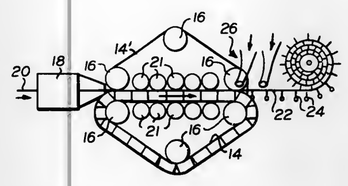
4,050,873
TRAIN MOLDING APPARATUS

George C. Brumlik, 154 Upper Mountain Ave., Montclair, N.J. 07042, and Bernard I. Bartner, 229-07 58th Ave., Bayside, Queens, N.Y. 11364

Continuation of Ser. No. 559,284, March 17, 1975, abandoned, which is a continuation of Ser. No. 317,034, Dec. 20, 1972, abandoned. This application Dec. 23, 1976, Ser. No. 754,085

Int. Cl.² B29C *7/00, 15/00*

U.S. Cl. 425—371 **13 Claims**



1. Continuous molding apparatus for molding a plurality of three dimensional articles comprising

a. carrier means adapted to travel in a first path followed by a arcuate path

b. a plurality of contiguous mold means, said mold means having transverse and mutually adjacent pairs of faces which are transverse with respect to the carrier means, mounted on said carrier means adjacent ones of said mold means forming undercut mold cavities in said transverse and mutually adjacent pairs of faces of said mold means when said carrier means travels in the said first path, said mold faces containing said undercut mold cavities separating from each other and opening said mold cavities when said carrier means travel in said arcuate path

c. means for feeding and forcing a material capable of flow into the said mold cavities.

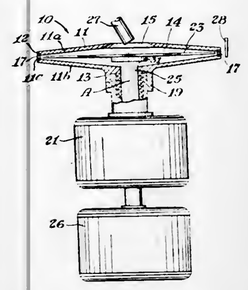
4,050,874
CENTRIFUGAL EXTRUSION APPARATUS WHICH HEAT PLASTIFIES MATERIAL BY MECHANICAL SHEARING ACTION

Douglas S. Chisholm, Kent, Conn., and David H. Dawson, Green River, Wyo., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 536,493, Dec. 26, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 661,195

Int. Cl.² B29F *3/06*

U.S. Cl. 425—382 R **6 Claims**



1. A centrifugal extruder adapted to receive particulate heat plastifiable material, heat plastify and discharge the material in heat plastified form, the centrifugal extruder comprising

a generally hollow discoidal rotor, the hollow discoidal rotor defining

a material receiving opening in communication with

a generally discoidal material receiving cavity,

a plurality of peripherally disposed extrusion openings, the extrusion openings being in full communication with the material receiving cavity, the material receiving cavity having a generally double tapered cross-sectional configuration when the cross-section is taken in a plane containing the axis of rotation, the cavity having a maximum dimension adjacent the axis of rotation in a direction normal to the plane of rotation of the rotor and a minimum dimension in a direction normal to the plane of rotation of the rotor at a location remote from the axis of rotation,

a shear means disposed within the material receiving cavity, the shear means being a generally planar shearing element defining spaces to permit particles of heat plastifiable material to distribute themselves on either side of the shearing element, the shearing element being adapted to rotate coaxially relative to the housing and having peripheral portions which approximate the diameter of the material receiving cavity, the shearing element being in spaced relationship to a surface of the housing defining the cavity and the extrusion orifices,

means operatively associated with the rotor to rotate the rotor and

means operatively associated with the shearing element to rotate the shearing element in a like direction, the rotor and the shearing element being rotatable relative to one another to thereby apply shear to a particulate heat plastifiable material within the rotor, the shear causing the particulate material to become heat plastified and centrifugal force causing the heat plastified material to be discharged from the extrusion openings.

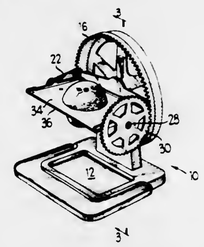
4,050,875
ARTS AND CRAFTS MOLDING DEVICE

Allison W. Katzman, and Albert G. Keller, both of Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 4, 1975, Ser. No. 637,729

Int. Cl.² B29C *5/04*

U.S. Cl. 425—429 **8 Claims**



1. An arts and crafts device for molding hollow objects or the like from molten thermoplastic material to provide a hollow molded end product, which device comprises a frame having a base portion and a vertical carriage support, a carriage mounted on said carriage support for rotation about a first axis, a crank having a drive shaft mounted on said frame for rotation relative thereto and secured to said carriage for rotating said carriage, said carriage being in the form of a yoke having two opposing arms, a mold receiver including two generally planar sheets for holding a split mold, each half of said mold being secured to one of said sheets, means including a second frame and a second shaft mounting said mold receiver to and between said yoke arms for rotation relative thereto about a second axis generally perpendicular to said first axis, a crown gear on said frame concentric with said first axis, and a second gear mounted on said second shaft and enmeshed with said crown gear for tracking said crown gear while said carriage is rotated by said crank, thereby also rotating said mold on said second, perpendicular axis.

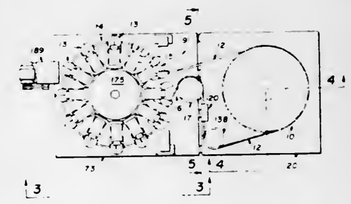
4,050,876
ROTARY STRETCH BLOW MOLDING APPARATUS

Ivan L. Kauffman, Commerce, and Robert C. Kellogg, Hartland, both of Mich., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 415,851, Nov. 14, 1973. This application May 5, 1976, Ser. No. 683,254

Int. Cl.² B29D *23/03*

U.S. Cl. 425—529 **11 Claims**



1. In a continuous motion stretch blow molding apparatus, for blow molding hollow articles from tubular parisons, the combination comprising:

A. a continuous motion transfer means;

B. a plurality of upwardly disposed stretch pin means operatively carried on said transfer means, each stretch pin means including:

a. a stretch pin body and a stretch pin provided with:

i. first passage means for conveying blow air into a parison carried on a stretch pin means to blow such parison into the shape of a final article;

ii. second air ejection passage means for conveying transfer air into said final article carried on such stretch pin means; and

b. valve means operatively associated with the air ejection passage means and responsive to the pressure of the blow air to prevent blow air from exiting through the air ejection passage means during forming of said final article;

C. a continuous motion rotary parison loading turret for receiving parisons and for sequentially loading them onto said stretch pin means;

D. a continuous motion rotary molding turret having a plurality of molding stations;

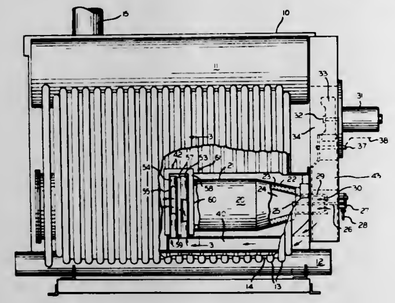
E. said transfer means being operative to locate each of said stretch pin means with a parison loaded thereon in an individual one of said molding stations for a stretching, blowing and cooling operation on each parison on each stretch pin means to form an article from each parison; and

F. pressurized fluid ejection means successively cooperable with the second air ejection passage means of each stretch pin means to eject each article upwardly from each stretch pin means.

4,050,877
REDUCTION OF GASEOUS POLLUTANTS IN COMBUSTION FLUE GAS

Glenn D. Craig, Menomonee Falls; David T. Feuling, Milwaukee, both of Wis., and Paul G. LaHaye, Cape Elizabeth, Maine, assignors to Aqua-Chem, Inc., Milwaukee, Wis.

Division of Ser. No. 488,057, July 12, 1974, Pat. No. 3,955,909, which is a division of Ser. No. 295,249, Oct. 5, 1972, Pat. No. 3,837,788. This application Oct. 9, 1975, Ser. No. 620,953
Int. Cl.² F23N *5/08*
U.S. Cl. 431—76 **10 Claims**



1. Fuel burning apparatus adapted for reducing nitrogen oxides in its exhaust gas, comprising:

a. means defining a primary combustion zone having an inlet for combustion supporting gas and an outlet for gaseous combustion products and having means for introducing fuel therein,

b. a secondary combustion device disposed in a secondary combustion zone through which the gaseous combustion products flow from the primary zone,

c. a source of combustion supporting gas,

d. first flow control means constructed and arranged to conduct said gas to said primary combustion zone,

e. second flow control means constructed and arranged to conduct said combustion supporting gas to said secondary combustion zone by way of said device, and

f. means for sensing the level of carbon monoxide in the gaseous combustion products downstream of said secondary combustion device, said sensing means being operatively coupled to said second flow control means, said sensing means being responsive to the sensed level of carbon monoxide for operating said second flow control means to adjust the flow of said combustion supporting gas provided to said secondary zone in direct relation to the level of said sensed carbon monoxide.

4,050,878
ELECTRONIC CARBURETION SYSTEM FOR LOW EXHAUST EMISSIONS OF INTERNAL COMBUSTION ENGINES

Jack C. Priegel, El Paso, Tex., assignor to Autotronic Controls Corporation, El Paso, Tex.

Continuation of Ser. No. 470,566, May 16, 1974, abandoned, which is a division of Ser. No. 122,933, March 10, 1971, Pat. No. 3,817,225. This application Sept. 17, 1976, Ser. No. 724,073
Int. Cl.² F02B *3/00*
U.S. Cl. 431—90 **13 Claims**

1. A method of controlling the air/fuel ratio in a combustion apparatus having a chamber into which flows of air and fuel are conducted so that the resulting mixture can be combusted to provide a source of energy, said method comprising the following steps:

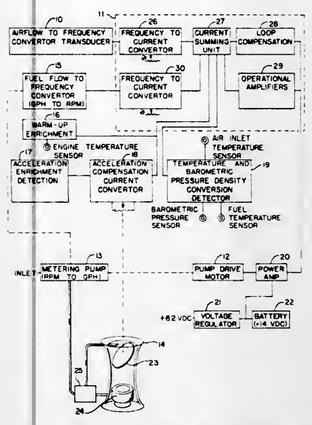
establishing a rate of air flow with valve means according to a desired output of the combustion apparatus;

measuring said air flow rate and producing a first signal systematically related to said air flow rate;

pumping fuel into said chamber with a positive displacement fuel pump driven by a motor;

measuring the speed of said fuel pump and producing a second signal systematically related to said speed;

providing a ratio control signal corresponding to a selected air/fuel ratio;



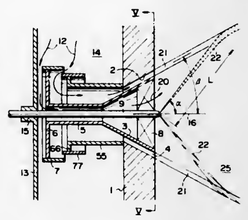
combining said first, second, and ratio control signals to produce a fuel feed control signal systematically related to the deviation of the ratio of said air and fuel flow rates from said selected air/fuel ratio; and

utilizing said fuel feed control signal to control the speed of said motor to supply fuel to said chamber at a rate minimizing said deviation, thereby providing a flow of fuel which results in the delivery of air and fuel to said chamber in said selected air/fuel ratio.

4,050,879
FUEL COMBUSTION APPARATUS

Yasuro Takahashi; Yukihisa Fujima; Masaharu Oguri, and Akito Komori, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1975, Ser. No. 628,427
Claims priority, application Japan, Nov. 18, 1974, 49-132501; Nov. 18, 1974, 49-138610
Int. Cl.² F23D *15/00*
U.S. Cl. 431—174 **5 Claims**

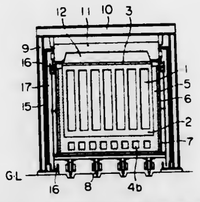


1. A fuel combustion apparatus for burning a premix of air and fuel, comprising a conical air nozzle positioned in spaced relation within a conical opening in a furnace wall to define an air passageway therebetween to form a conical film of air and fuel atomizing means for injecting fuel into the conical film of air in amounts varying circumferentially of said film of air so that a premix is formed uniformly mixed with air and having a varied air-fuel ratio which is greater than 1 and less than 1 at predetermined circumferential locations of said film of air.

4,050,880
METHOD AND APPARATUS OF BAKING CARBONACEOUS MOLDING

Kiyoshi Naito, Urawa, and Akio Shukuya, Kawagoe, both of Japan, assignors to Shinagawa Refractories Co. Ltd., Tokyo, Japan

Filed Mar. 18, 1976, Ser. No. 667,851
Claims priority, application Japan, Apr. 16, 1975, 50-45180
Int. Cl.² F27D *5/00*; F27B *9/00*
U.S. Cl. 432—5 **15 Claims**

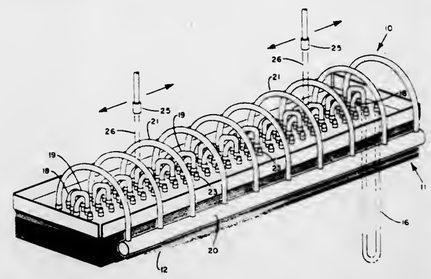


1. A method for the continuous baking of preheating, burning and cooling of carbonaceous moldings, which comprises charging, with carbonaceous moldings to be baked and breeze, a mobile baking chamber provided with a combustion chamber and a gas flue through which combustion gas, heating gas or cooling air passes, sealing from the atmospheric air the space between a fixed ceiling having a combustion means and a gas recirculation means and said mobile baking chamber, and the upper contact surface of intermobile baking chamber, and connecting a number of said mobile baking chamber in a row for movement beneath the fixed ceiling.

4,050,881
REMOTE HEATING PROCESS

James J. Watson, Jr., McMinnville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,199
Int. Cl.² F27D *13/00*; F27B *3/22*
U.S. Cl. 432—5 **8 Claims**



1. In the fabrication of a heat exchanger wherein tubular components are bonded together to form flow circuits through the heat exchanger coil, the process of heating the tubular joints of the exchanger during the bonding operation, including the steps of

assembling the tubular components with their joints being located in a region adjacent to at least one tube sheet of the heat exchanger coil,

directing a high speed jet of flammable gas at the tube sheet adjacent to the joint region whereby, upon striking the tube sheet, the gas forms a blanket of flammable gas about the tubular joints,

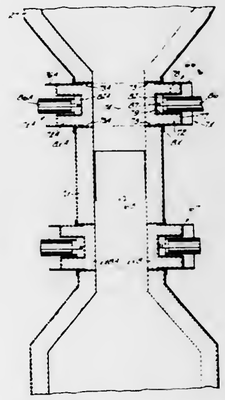
maintaining the velocity of the jet traveling between the jet source and the tube sheet at a speed sufficiently high enough to prevent the gas in the jet stream from mixing with ambient air and thus being ignited, and

igniting the gas within the blanket to create a burning zone encompassing the tube joint region whereby the joints are heated to a predetermined temperature.

4,050,882
DUAL VARIABLE ORIFICE FOR REINFORCED PREHEATER

Robert F. Kohl, Tucson, Ariz.; Lyle A. Karis, West Allis, and James L. Shy, East Troy, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 4, 1976, Ser. No. 738,847
Int. Cl.² F27B *7/02*
U.S. Cl. 432—14 **9 Claims**



1. In a method of processing cement materials for making Portland cement in a system utilizing kiln and an associated cooler and having a flue connection to a suspension preheater provided with a calciner and a mixing chamber, wherein the material to be processed is suspended in a gas stream, comprising the steps of:

A. Regulating the amount of kiln off-gases that is permitted to pass into the mixing chamber;

B. Bypassing the kiln off-gases not passed to the mixing chamber through a bypass system;

C. Supplying gas from a source to replace a portion of the kiln off-gases not passed to the mixing chamber;

D. Regulating the flow of the gas supplied from the source and off-gases from the kiln and the flow area to the mixing chamber to control the flow velocity of the gases into the mixing chamber thereby preventing materials in the mixing chamber from short circuiting and preheater system by falling out into the kiln.

9. An apparatus for processing cement materials for making Portland cement which utilizes a kiln having an inlet end enclosed in a hood and an outlet end connected to an associated cooler and having a reinforced preheater system provided with a calciner and a mixing chamber which receives calcined material from the calciner to mix with gas supplied to the mixing chamber, the improvement including;

a gas flow flue connected between the kiln hood and the entrance to the mixing chamber;

a kiln off-gas bypass means connected into the kiln hood and operable to provide a bypass flow path for kiln off-gases;

a first selectively adjustable flue restricting means operably

disposed in said flue to restrict the flow of kiln off-gases into said flue;

a duct operatively connected between a source of recoup cool gas and said flue to direct recoup gas into said flue; and,

a second selectively adjustable flue restricting means operably disposed in said flue in a position above the entrance of said recoup cooler gas duct into said flue;

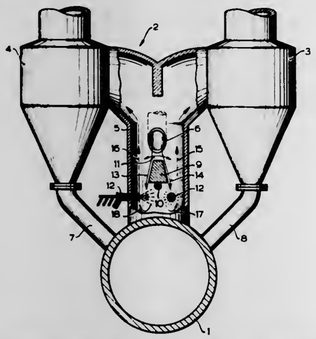
whereby the first adjustable flue restricting means may be selectively operated to restrict the flow of a predetermined amount of kiln off-gases into said flue thereby forcing the kiln off-gases to flow into the bypass path, and said recoup cooler gas branch duct operates to provide a volume of recoup gas to supplement the kiln gas that is bypassed, and the second adjustable restricting means is selectively operable to restrict the flue opening therethrough to effect an increase in the velocity of the gas flowing into the mixing chamber thereby preventing materials from falling out of the mixing chamber.

4,050,883

APPARATUS AND METHODS FOR THE HEAT TREATMENT OF FINE-GRAINED MATERIALS

Wolf Goldmann; Georg Schepers; Otto Heinemann, all of Ensigerloh; Heinz-Herbert Schmits, Rheda-Wiedenbruck, and Horst Ritzmann, Ensiger, all of Germany, assignors to Polysius AG, Neubeckum, Germany

Filed Apr. 8, 1976, Ser. No. 674,951
Claims priority, application Germany, May 6, 1975, 2520102
Int. Cl.² F27B *15/00*
U.S. Cl. 432—14 **13 Claims**



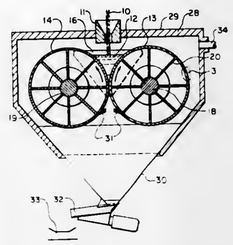
1. In apparatus for the heat treatment of fine-grained material prior to firing said material in a furnace and wherein said apparatus includes a gas conduit having a substantially vertical portion, inlet means for introducing a fine-grained material to said conduit at a first level such that said material may fall downwardly through said vertical portion, means for combusting fuel in said conduit at a second level lower than said first level to provide at said second level a heating zone through which said material may fall, means in said conduit between said first and second levels for distributing said material over the cross-sectional area of said conduit as it falls downwardly, and means for delivering furnace exhaust gas to said conduit at a level below said heating zone and at such velocity with respect to the grain size of said material that at least part of the material which falls through said heating zone is entrained by said gas and passed again through said heating zone; the improvement comprising means adjustably mounting said distributing means for movement within said conduit between a plurality of positions, adjustment of said distributing means enabling the concentration of material in different cross-sectional areas of said conduit below said distributing means to be varied.

4,050,884

SLAG WASTE HEAT BOILER

Richard Jablin, 1438 Manor Lane, Blue Bell, Pa. 19422

Filed Mar. 4, 1976, Ser. No. 663,844
Int. Cl.² F24H *1/00*; F27B *17/00*
U.S. Cl. 432—29 **18 Claims**



1. A process for cooling and solidifying molten slag and converting heat removed from the slag into a useful form of energy comprising:

a. forming a pool of molten slag maintained in contact with a heat-transfer surface moving relative to said pool;

b. pouring fresh molten slag into said pool of molten slag;

c. cooling and solidifying slag from said pool on said heat-transfer surface while transferring heat from said cooled and solidified slag to said heat-transfer surface;

d. scraping said solidified slag from said heat transfer surface; and

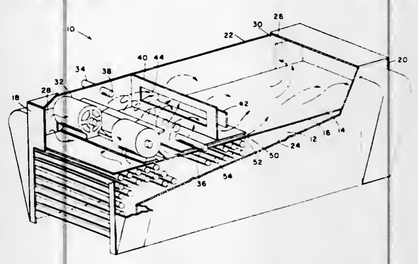
e. absorbing said heat from said heat-transfer surface into a heat absorber for making further use of said heat.

4,050,885

METHOD OF DRYING GYPSUM WALLBOARD AND APPARATUS THEREFOR

Chester R. Nowick, Williamsville, and Alfred DeFranza, Buffalo, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Mar. 18, 1976, Ser. No. 668,085
Int. Cl.² F26D *7/04*; F27B *9/00*
U.S. Cl. 432—31 **10 Claims**



1. The method of drying gypsum wallboard in a wallboard dryer having

1. a drying section with means for conveying wallboard therethrough at a plurality of spaced apart levels, and

2. an elongate gas reheating plenum section having elongate exterior walls separating the interior of said plenum from the exterior thereof, having means for moving gases from said dryer section into and on through said plenum and back to said dryer section, and having combustion means in said walls for propelling heated products of combustion, said method comprising the steps of

a. continuously conveying a plurality of undried gypsum wallboards into and through said drying section at said plurality of levels,

b. drying said wallboards at an equal rate at all said levels by passing heated gases through said drying section, which said gases are at a uniform temperature throughout as said gases enter said drying section,

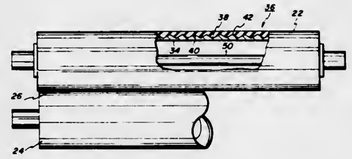
c. providing said uniform temperature heated gases by moving gases from said dryer section through said means for moving gases and from said moving means on through said plenum whereat said means for propelling heated products of combustion directs heated products of combustion crosswise of said plenum at an angle of from about 45° to about 135° to the direction of flow of said gases from said moving means, and mixing said heated products of combustion thoroughly with substantially all of said gases by the turbulence caused by the combination of said combustion and said crossed directions of flow of said products of combustion and substantially all of said gases to be heated, lowering the temperature of said products of combustion to about 550° F upon being mixed with said gases which intersect with said flow of products of combustion.

4,050,886

ROLL FUSER

Rabin Moser, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 24, 1976, Ser. No. 726,328
Int. Cl.² F27B *9/28*; B60B *5/00*
U.S. Cl. 432—60 **7 Claims**



1. In a fuser apparatus for fixing toner images to copy substrates including a heated roll structure and a backup roll structure forming a nip through which said substrates move with said toner images contacting said heated roll structure, the improvement comprising:

one of said roll structures having an outer resilient layer affixed to a rigid core wherein the inner surface of said outer resilient layer is irregularly shaped and the outer surface of said core has a shape complementary thereto, the irregularly shaped inner surface providing said resilient layer with alternate thick and thin portions along the longitudinal axis of said one of said roll structures whereby a structure is provided which strips said substrates therefrom as the substrates pass through said nip; said irregularly shaped inner surface comprising a plurality of similarly shaped areas the distance between corresponding parts of which is greater than the thickness of said resilient layer.

4,050,887

METHOD AND APPARATUS FOR TEMPERATURE CONDITIONING PARTS

L. John Berggren, Simsbury; Charles L. D. Chin, Avon, and Joseph R. Reilly, Naugatuck, all of Conn., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 418,075, Nov. 21, 1973, Pat. No. 3,894,835.
This application Nov. 4, 1974, Ser. No. 520,620
Int. Cl.² F27B *9/14*; F02M *17/28*
U.S. Cl. 432—122 **20 Claims**

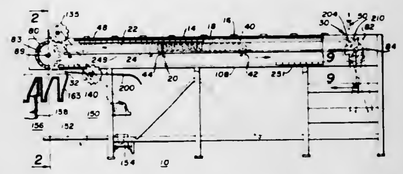
1. A process for temperature-conditioning elongated molded parts which comprises:

a. loading a plurality of said parts in side-by-side relationship into consecutively presented part-supporting assemblies at a charging station;

b. passing the parts while supported in the assemblies in one direction along a series of generally parallel paths between adjacent heat transfer assemblies;

c. rotating the parts about their vertical axes during movement along said paths;

d. transferring heat between said parts and heat transfer assemblies as the parts traverse said paths;



e. discharging said parts from said assemblies after traversing said paths without any blow molding of said parts after heat transfer and before said discharge; and

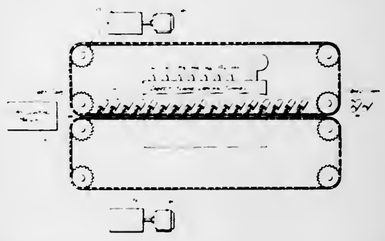
f. recylcing said assemblies after discharge of said parts in the opposite direction substantially parallel to said one direction back to the charging station without passage through an intermediate processing station to receive additional parts.

4,050,888

CONVEYOR SYSTEM FOR PASSING COATED CANS THROUGH CHAMBER

Lewis Pfister, White Plains, and Edward Ehas, Floral Park, both of N.Y., assignors to Flynn Burner Corporation, New York, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,510
Int. Cl.² F27B *9/14*; F26B *25/02*
U.S. Cl. 432—124 **3 Claims**



1. A conveyor system for conducting objects which are cans having a fresh coating thereon through a chamber for treating said can coatings and for concurrently rotating these objects to optimize said treatment, said system comprising:

A. an endless belt for conducting said objects through said chamber and having rotatable pins mounted thereon, the pins extending laterally from the belt, one end of the pins having means thereon for supporting said objects, the other end of each pin having a sprocket wheel secured thereto;

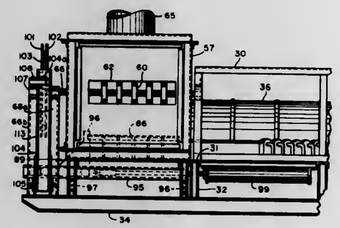
B. an endless sprocket chain disposed in parallel relation to said belt, said chain being engaged by the sprocket wheels mounted on said pins;

C. first variable speed drive means operatively coupled to said belt to cause movement thereof in a predetermined direction to advance said objects through said chamber at a desired speed; and

D. second variable speed drive means independent of said

first means and operatively coupled to said chain to cause movement thereof in a selectable direction to cause the pin-borne objects to rotate at a rate determined by the relative speeds of said belt and said chain and in a direction determined by the selected direction.

4,050,889
ROTARY OVEN
Thomas F. Kohn, Belding, Mich., assignor to Belco Industries, Incorporated, Belding, Mich.
Filed Mar. 1, 1976, Ser. No. 662,822
Int. Cl.² F27B *9/02*
U.S. Cl. 432—130 **13 Claims**

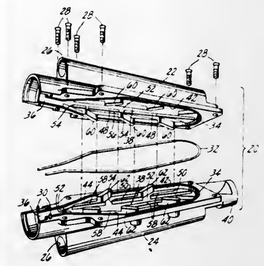


1. An oven having a primary heating chamber including heat-generating means and means for inducing movement of gases through said primary heating chamber, means for inducing movement of objects along a path through said primary heating chamber, and a secondary heating chamber communicating with said primary heating chamber and traversed by said path and by said gases, wherein the improvement comprises:

an object carrier rotatably mounted in said secondary heating chamber, said carrier having a plurality of receptacles angularly spaced about the axis of rotation thereof; and

indexing means adapted to rotate said carrier to positions successively placing said receptacles for engagement of said movement-inducing means with objects carried by said receptacles.

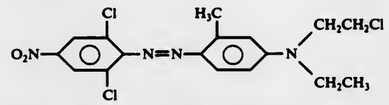
4,050,890
HOT MELT DISPENSER BODY
Richard Montgomery Elliott, and Albert Eugene Newton, both of Beverly, Mass., assignors to USM Corporation, Boston, Mass.
Filed Apr. 12, 1976, Ser. No. 676,220
Int. Cl.² F27B *5/00, 17/00*
U.S. Cl. 432—210 **7 Claims**



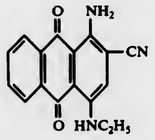
1. A hot melt body for an applicator of thermoplastic material to be advanced from an inlet to an outlet end and progressively reduced from solid to fluid as the material is thus fed, the body comprising elongated complemental portions defining a longitudinal main melt chamber extending between the inlet and outlet end and having progressively diminishing cross sections toward the outlet end shaped to constrain the material while at least partly solid to rectilinear movement and characterized by opposite side walls and at least one continuous flatted wall engageable throughout its length with the thermoplastic, complemental outer manifold passageways formed in the the respective body portions and leading to said outlet end, and a series of complemental bypass passageways formed in the respective body portions and interconnecting the main melt chamber at localities spaced therealong with the manifold passageways, said localities being disposed where solid thermoplastic material in said chamber is being rendered molten and semi-fluid, means in the body coextensive with said passageways for heating the walls of the main melt chamber and of the manifold and bypass passageways, said bypass passageways being generally angularly biased divergently relative to the side walls of said chamber in the direction of the feeding of said material in the main melt chamber.

4,050,891
HEAT TRANSFER BLACK DYESTUFF A
Jacques R. Magill, Milton, N.J., assignor to Crompton & Knowles Corporation, New York, N.Y.
Filed Dec. 17, 1976, Ser. No. 751,748
Int. Cl.² D06P *1/20*; C09D *11/00*
U.S. Cl. 8—2.5 R **19 Claims**

1. A dyestuff composition composed of 20 to 80 parts of a brown dye of the formula



and 80 to 20 parts of a blue dye of the formula



4,050,892
COLORING POLYESTER MATERIALS WITH ACID DYES
Dara Ardeshir Jilla, Collinsville, Va., assignor to Martin Processing Co., Inc., Martinsville, Va.
Filed Sept. 13, 1973, Ser. No. 396,805
Int. Cl.² D06P *3/00*
U.S. Cl. 8—4 **14 Claims**

1. A process for pretreating a material consisting essentially of polyester to impart thereto affinity for acid dyes, which comprises pretreating the polyester material for a brief time less than about one minute at a temperature between 90° C and 250° C and at ordinary atmospheric pressure with a mixture of (a) an organic nitrogen compound selected from the group consisting of diethylenetriamine, triethylenetetramine, tetraethylenepentamine, hexamethylenediamine, hexamethylenetetramine, mono-, di- and triethanolamine, triethylamine, di- and tripropylamine, and di- and tributylamine, and (b) a glycol selected from the group consisting of ethylene glycol, di-, tri- and tetraethylene glycol, and polypropylene glycol, and then subjecting the polyester material to contact with cold water or a mixture of cold water and a carboxylic acid selected from the group consisting of oxalic acid, sebacic acid, citric acid, and adipic acid sufficient to chill the polyester material, thereby imparting to the thus-pretreated polyester material an affinity for acid dyes.

4,050,893
ARRANGEMENT FOR PREPARING NATURAL TISSUE FOR IMPLANTATION
Warren D. Hancock, Santa Ana, and Frederick P. Sattler, Fullerton, both of Calif., assignors to Hancock Laboratories, Inc., Anaheim, Calif.
Continuation of Ser. No. 490,686, July 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 324,217, Jan. 16, 1973, abandoned, which is a continuation of Ser. No. 28,630, April 15, 1970, abandoned. This application Mar. 10, 1976, Ser. No. 665,520
Int. Cl.² C14C *3/16*; A61F *1/22*
U.S. Cl. 8—94.11 **46 Claims**

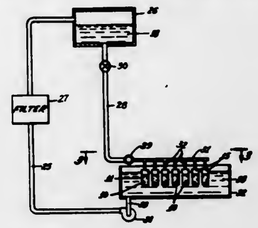
1. The method of preparing natural heart valve for implantation comprising the steps of

applying a tanning fluid under pressure in the physiologic range to the downstream end of a natural heart valve so as to cause said valve to assume substantially its natural configuration,

and simultaneously applying a tanning fluid to the upstream end of said valve at a pressure less than that at said downstream end,

thereby to cause said valve substantially to maintain said configuration during fixation of the tissue thereof.

10. The method of preparing for implantation natural tissues in a form in which a portion thereof is subjected to pressure within the physiologic range when implanted and which assumes a predetermined configuration as a result of such pressure comprising the steps of



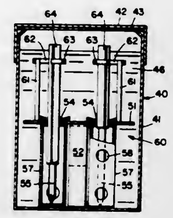
applying a tanning fluid to said portion of said tissues,

said tanning fluid so applied being under pressure in the physiologic range so as to cause said tissues to assume substantially said predetermined configuration,

and simultaneously applying a tanning fluid to remaining parts of said tissues at a pressure less than that of said portion of said tissues,

thereby to cause said tissues to assume said configuration during fixation of said tissues.

4,050,894
STERILIZING AND STERILITY MAINTAINING APPARATUS FOR DENTAL AND SURGICAL TOOLS AND THE LIKE
Mariano Rodriguez Genis, 7a. Calle 3-37 Zona 1, Guatemala, Guatemala
Filed Feb. 25, 1975, Ser. No. 552,955
Int. Cl.² A61L *3/00, 3/02*; B65D *81/24*
U.S. Cl. 21—86 **6 Claims**



1. Sterilizing and sterility-maintaining apparatus for dental and surgical tools and the like, including in combination

a main sterilizing container having a cover, heating means, and capsule-supporting means,

a plurality of imperforate tool-holding capsules removably mounted in capsule-supporting means, said capsules having removably and hermetically sealable closures, and

a normally solid petroleum product that is liquid at sterilizing temperatures, retained in each said capsule and surrounding and covering at least the operative portions of the tools in said capsules and serving in solidified state to

aid in retaining the sterility of each said tool after completion of the sterilization and after said capsule is opened,
at least one of said capsules including tool support means therewithin, each said tool support means comprising
a disc covered by said petroleum product and having a perforation therethrough for each tool to be supported,
a perforate tube for housing each said tool, attached to said disc below each said perforation through said disc,
retention means secured to said disc for holding said disc relative to said capsule, and
upstanding post means secured to said disc and having support means extending out therefrom for supporting the upper end of a said tool and defining a support ring-like structure overlying each said perforation.

4,050,895

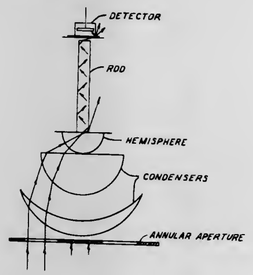
OPTICAL ANALYTICAL DEVICE, WAVEGUIDE AND METHOD

Edgar E. Hardy, Kettering, and Donald J. David, Centerville, both of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 617,120, Sept. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 522,558, Nov. 11, 1974, abandoned. This application Sept. 17, 1976, Ser. No. 724,035

Int. Cl.² G01N *21/22, 33/16*

U.S. Cl. 23—230 R **34 Claims**



1. A device for detecting a first material comprising
a. an elongated waveguide having on a longitudinal peripheral surface of said waveguide a second material providing for multiple internal reflections of light through said material, which second material on contacting said first material selectively combines with said first material to measurably change the light transmitting capabilities of said waveguide,
b. a light source positioned to transmit light into said waveguide, and
c. means for measuring the light exiting from said waveguide.

4,050,896

METHOD AND APPARATUS FOR THE PRODUCTION OF REACTION MIXTURES FROM LIQUID REACTION COMPONENTS

Reiner Raffel, Siegburg; Wilfried Ebeling, Cologne; Klaus Nadolski, and Klaus Schulte, both of Leverkusen, all of Germany, assignors to Maschinenfabrik Hennecke GmbH and Bayer Aktiengesellschaft, both of Leverkusen, Germany

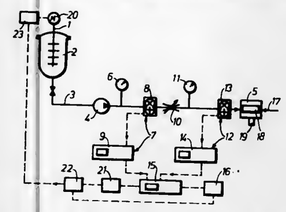
Filed Sept. 13, 1976, Ser. No. 722,900

Claims priority, application Germany, Sept. 27, 1975, 2543302

Int. Cl.² G01F *1/86, 1/88*; G01N *9/26*

U.S. Cl. 23—230 A **12 Claims**

1. A method for the production of reaction mixtures from two or more liquid reaction components comprising charging at least one of the reaction components with a gas, measuring the volumetric flowrate of the gas-charged reaction component at a first pressure level, bringing the gas charged reaction component to a second pressure level, measuring the volumetric flowrate at said second pressure level whereby the differential value of the measured volumetric flowrate is a measurement for the gas charge and mixing the gas charged component with the remaining reaction components.



4,050,897

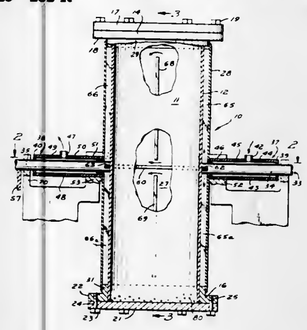
REACTOR APPARATUS

Max Klein, Tinton Falls, N.J., assignor to Normac, Inc., Tinton Falls, N.J.

Division of Ser. No. 266,469, June 26, 1972, which is a continuation-in-part of Ser. No. 814,879, March 19, 1969, abandoned, which is a continuation-in-part of Ser. No. 601,148, Dec. 12, 1966, abandoned, which is a continuation-in-part of Ser. No. 460,187, June 1, 1965, abandoned. This application July 27, 1976, Ser. No. 709,249

Int. Cl.² B01J *1/00*; B08B *13/00*; C08F *2/00*

U.S. Cl. 23—252 R **13 Claims**



1. An apparatus effective for treating materials under selected temperature conditions and with agitation, which comprises:
a. a liquid-tightly closeable tubular materials-treating chamber,
b. a temperature-control fluid jacket spaced away from and enclosing at least substantially its overall body portion thereby to provide a temperature-control fluid chamber enclosing said body portion,
c. divider means within said control fluid chamber and extending in at least substantially liquid-tight engagement with its wall and that of said treating chamber and dividing said control fluid chamber into a plurality of substantially equal control fluid compartments, said divider means comprising an annular divider member in like liquid-tight engagement and lying in a plane substantially normally transverse to the central axis of said chamber;
d. means to enable rotating the tubular jacketed treating chamber end over end about an axis lying substantially in said plane and also substantially normally transverse to said central axis;
e. temperature-control fluid ingress means to enable feeding said fluid to about the correspondingly same inlet location of each said compartment and while the treating chamber is being thus rotated;
f. control fluid egress means at about the correspondingly same outlet location of each said compartment to enable discharging heat-control fluid from said compartments while said chamber is being rotated; and
g. flowing fluid diverter means in each said compartment intermediate its fluid ingress and egress ends to affect the flow course of fluids through it to enable providing substantially overall uniform heat transfer through the wall separating said two chambers.

4,050,898

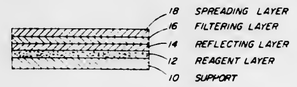
INTEGRAL ANALYTICAL ELEMENT

Charles A. Goffe, deceased, late of Brockport, N.Y., by Patricia A. Goffe, executrix; Royden N. Rand, and Tai W. Wu, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,619

Int. Cl.² G01N *31/22*

U.S. Cl. 23—253 TP **23 Claims**



1. An element for detection of analyte dissolved in proteinaceous, aqueous liquids, the element comprising an isotropically porous spreading layer and a reagent layer, wherein the spreading layer comprises a non-fibrous, water-resistant material and an non-ionic surfactant, the surfactant being present in an amount within the range of from about 1 to about 15 percent and effective to normalize liquid transport in the spreading layer.

4,050,899

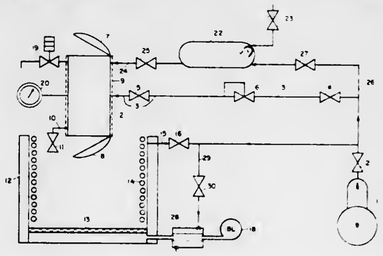
METHOD AND APPARATUS FOR FRAGMENTING CERTAIN SOLID WASTES

Kenneth E. Grube, 150 Anchorage Circle; Vincent E. Harrington, and James V. Harrington, both of 19 Dolphin Road, all of Groton, Conn. 06340

Continuation-in-part of Ser. No. 429,733, Jan. 2, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 620,068

Int. Cl.² C05F *9/02*

U.S. Cl. 23—259.1 **4 Claims**



1. Apparatus for processing waste material of the type collected from municipalities to facilitate decomposition of organic components thereof, comprising:
a pressure vessel;
means for hydrating the waste material within the pressure vessel under pressure at tempertures sufficient to boil the moisture at atmospheric pressure;
means for dehydrating, comminuting and expelling the waste material by sudden decompression of the vessel; and
an open ended composting pit underlying the pressure vessel and receiving the comminuted dehydrated material expelled from the pressure vessel, the open ended composting pit having a pair of concentric spaced apart wall members surrounding the material, and a heating coil in the space between said wall members for regulating the temperature of the interior of the pit, thereby controlling the action of aerobic decomposition of the material therein.

4,050,900

INCINERATION APPARATUS
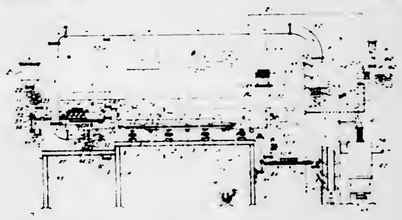
Jim F. Hobbs, Richardson, and Craig Smyser, Dallas, both of Tex., assignors to Shirco, Ltd., Dallas, Tex.

Continuation of Ser. No. 423,398, Dec. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 38,936, May 20, 1970, Pat. No. 3,648,630. This application Oct. 31, 1975, Ser. No. 627,651

The portion of the term of this patent subsequent to Mar. 13, 1989, has been disclaimed.

Int. Cl.² F23G *5/10*

U.S. Cl. 23—277 R **7 Claims**



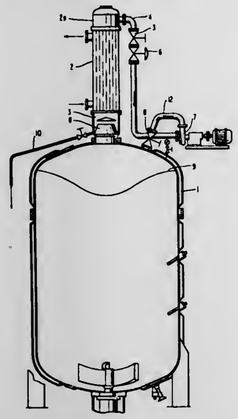
1. An incinerator for processing materials having volatile components comprising:
a housing defining an elongated combustion chamber having an inlet end and a discharge end;
a conveyor belt supported on rollers for movement in said combustion chamber and having an upper belt portion for moving materials being processed in said incinerator along said combustion chamber from said inlet end to said discharge end and further having a return belt portion below said upper belt portion;
infrared heat means supported on said housing and adapted to direct infrared rays on said materials on said conveyor belt as said belt moves said materials along said combustion chamber, said materials releasing combustion gases as a result of heating from said infrared rays;
charging means connected with said housing at said inlet end of said combustion chamber for receiving materials from a source and discharging said materials on said conveyor belt in said chamber;
means for removing processed materials from said combustion chamber at the discharge end of said chamber;
means connected to said housing for forcing ambient air into said housing in the region of said discharge end;
means for inducing a draft at said inlet end in order to create a backflowing mixture of air and combustion gases, said backflowing mixture flowing over and generally parallel to said materials from the region of said discharge end to said inlet end in order to provide a portion of the heat required for drying and combustion of said material; and
heat sensing means located within said housing above said conveyor belt and connected to control means for varying the temperature of said backflowing mixture by controlling the intensity of said heat means.

4,050,901

COOLING UNIT FOR LARGE POLYMERIZATION VESSELS

Kurt Pfeiffer; Johannes Dietrich; Günter Beckmann, and Karl-Heinz Herkt, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Germany

Division of Ser. No. 167,568, July 3, 1971, Pat. No. 3,785,430. This application June 4, 1973, Ser. No. 366,520
Claims priority, application Germany, Aug. 1, 1970, 2038363
Int. Cl.² B01J *1/00*
U.S. Cl. 23—285 **9 Claims**



1. An apparatus for cooling of polymerization charges in a polymerization vessel having a liquid level and a gas space above said liquid level, comprising a reflux cooler means including a reflux cooler head mounted on the polymerization vessel above said liquid level and in direct open communication with the gas space of the polymerization vessel, a gas conduit means operatively connecting the reflux cooler head with the polymerization vessel and being in communication with the gas space of the polymerization vessel, and means in said gas conduit means for providing a force-feeding of the gas through said gas conduit means, said reflux cooler means and said gas space.

4,050,902

SPENT CATALYST REGENERATION WITH INTERNAL AND EXTERNAL REGENERATED-CATALYST RECYCLE MEANS

Richard P. Pulak, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 533,052, Dec. 16, 1974, which is a continuation-in-part of Ser. No. 429,422, Dec. 28, 1973, Pat. No. 3,953,175. This application Nov. 1, 1976, Ser. No. 737,357
The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.
Int. Cl.² B01J *8/08, 8/18, 37/14*
U.S. Cl. 23—288 B **5 Claims**

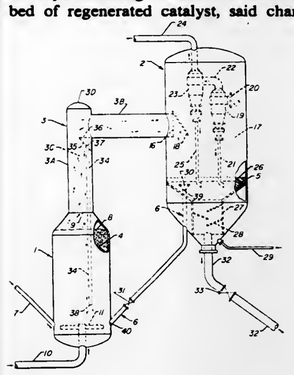
1. An apparatus for oxidizing coke on spent catalyst which comprises in combination:

a. a spent-catalyst receiving chamber for containing a dense-phase fluidized bed of catalyst having a spent-catalyst inlet means and a fresh-regeneration-gas inlet means connected thereto to allow passage of spent catalyst and fresh regeneration gas respectively into said chamber and having a regenerated-catalyst/regeneration-gas outlet means connected thereto to allow passage of regenerated catalyst and regeneration gas from said chamber;

b. a transfer conduit having a substantially vertical portion and a substantially horizontal portion, said vertical portion having an inlet connected to the regenerated-catalyst/regeneration-gas outlet means and said horizontal portion extending into the side of a hereinafter described regenerated-catalyst receiving chamber and having an outlet within said chamber whereby regenerated catalyst and regeneration gas are carried from said spent-catalyst receiving chamber in admixture to said regenerated-catalyst receiving chamber;

c. an internal regenerated-catalyst recycle means, having an inlet means in the transfer conduit and an outlet means in the spent-catalyst receiving chamber, to allow passage of a portion of regenerated catalyst from the transfer conduit to the spent-catalyst receiving chamber;

d. a regenerated-catalyst receiving chamber for containing a dense-phase bed of regenerated catalyst, said chamber



having a regenerated-catalyst outlet means and a spent-regeneration-gas outlet means connected thereto to allow passage of regenerated catalyst and spent regeneration gas from said chamber and said chamber being positioned adjacent to and at an elevation with respect to said spent-catalyst receiving chamber to maintain at least a portion of said dense-phase bed of regenerated catalyst above said dense-phase fluidized bed of catalyst in said spent-catalyst receiving chamber; and,

e. an external regenerated-catalyst recycle means, having an inlet means in the regenerated-catalyst receiving chamber and an outlet means in the spent-catalyst receiving chamber, to allow passage of a portion of regenerated catalyst from the regenerated-catalyst receiving chamber to the spent-catalyst receiving chamber.

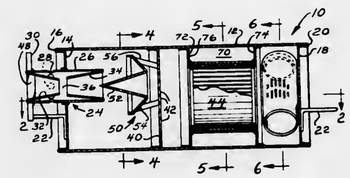
4,050,903

COMBINATION MUFFLER AND CATALYTIC CONVERTER

Charles H. Bailey, Mount Prospect, and James E. Dillon, Elgin, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 29, 1976, Ser. No. 737,129
Int. Cl.² F01N *3/15*
U.S. Cl. 23—288 FC **4 Claims**

1. A combination muffler and catalytic converter assembly comprising an outer housing having inlet and outlet tubes therein for receiving and exhausting exhaust gases from an internal combustion engine to which the assembly is adapted to be attached; an axial flow monolithic catalytic converter element positioned within said housing and radially spaced from the walls thereof in the path of said exhaust gases; aspirator means including a plurality of openings and a venturi portion in said inlet tube for sucking secondary air through said plurality of openings and into an exhaust gas stream passing through said venturi portion of said inlet tube; a perforated distributor plate having a plurality of spaced openings defining an open area equal to 20 – 40% of the open face inlet area of the catalytic converter element, said distributor plate being positioned in said housing intermediate said aspirator means and said catalytic converter element, said perforated distributor plate containing at least 5 openings per square inch and being spaced upstream from the inlet end of said monolithic catalytic converter element by at least about 5.5 times the diameter of the openings in the distributor plate, the openings in said perforated distributor plate defining a pattern whose outer periph-



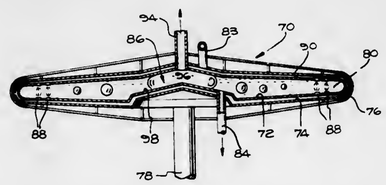
ery generally corresponds to the outer periphery of the open inlet face area of the catalytic converter element, and turbulence inducing means positioned between said distributor plate and the inlet end of said inlet tube, said turbulence inducing means including a stationary vane member in the exhaust inlet upstream of the venturi for swirling the exhaust gases and a deflector member downstream of the venturi for reversing their flow.

4,050,904

SOLUBILIZATION AND REACTION OF COAL AND LIKE CARBONACEOUS FEEDSTOCKS TO HYDROCARBONS AND APPARATUS THEREFOR

Frank B. Cramer, Mission Hills, Calif., assignor to Clean Energy Corporation, Los Angeles, Calif.

Division of Ser. No. 512,538, Oct. 7, 1974, Pat. No. 3,966,582. This application Dec. 29, 1975, Ser. No. 644,953
Int. Cl.² B01J *1/00*
U.S. Cl. 23—288 E **4 Claims**



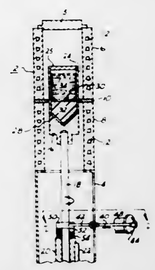
1. Apparatus for the conversion of coal and like high molecular weight feedstocks at least partially to hydrocarbon vapor which comprises a reaction chamber having a central portion, an outer periphery, and a generally circular horizontal cross-section therebetween, means introducing a molten salt solution of said feedstock tangentially into said chamber at its outer periphery, said chamber being shaped to guide said feedstock solution circularly then inwardly progressively as a spirally moving mass from said chamber outer periphery toward the chamber central portion, a circularly distributed series of jet means outward of the chamber central portion, said jet means mixing steam continually distributively into fresh portions of said salt solution to form said moving mass of feedstock solution in molten salt into a reaction stream and under hydrogenating conditions within the chamber, whereby hydrocarbon vapors are evolved in the reaction stream in spirally moving reaction stream-entrained relation, vapor recovery means recovering evolved hydrocarbon vapors from said molten salt comprisng a central domed portion in the reactor and a vapor outlet in said portion at a relative pressure to radially inwardly bias movement of said evolved hydrocarbon vapor toward said outlet through the spirally moving reaction stream, and molten salt recovery means including a reaction chamber salt outlet in the chamber central portion.

4,050,905

GROWTH OF DOPED CRYSTALS

Carl F. Swinehart, University Heights, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Filed May 27, 1975, Ser. No. 581,233
Int. Cl.² B01D *9/00*; B01J *17/08, 17/36*; C01D *3/00*
U.S. Cl. 23—301 **6 Claims**



1. In the Stockbarger method of growing inorganic alkali metal or alkaline earth metal salt crystal ingots of at least two inches in diameter and containing a plurality of crystal domains or macrocrystal components, from a stratified melt of the same containing up to 1.5% of a dissolved dopant, the improvement comprising slowly moving, with variable velocity, the solidified crystal with respect to the melt about a vertical axis at a rate that is adequate to maintain an even distribution of the dopant in the melt at the interface, but that is not sufficient to disturb the temperature gradient in the melt.

4,050,906

THERMOSTATIC METAL

Jacob L. Orastein, Norton, and Seth R. Thomas, Middleboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 30, 1968, Ser. No. 771,824
Int. Cl. B22b *15/00*
U.S. Cl. 428—617 **1 Claim**

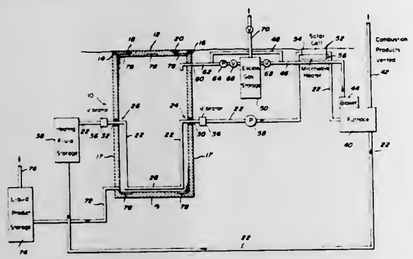
1. A multilayer composite thermostatic metal material comprising a first metal layer composed of an alloy consisting of approximately 72% manganese, 18% copper and 10% nickel, a second layer of metal selected from the group consisting of an alloy composed of approximately 36% nickel and 64% iron, an alloy composed of approximately 42% nickel and the balance iron, and an alloy composed of from 0.9 to 1.4% silicon, a maximum of 0.2% iron, from 0.1 to 2.5% manganese, a maximum of 0.05% lead, a maximum of 0.5% impurities, and the balance copper, a third layer of metal of relatively higher electrical conductivity than said metals of said first and second layers, said first and second metal layers being metallurgically bonded in the solid-phase to opposite sides of said third metal layer and having relatively high and low coefficients of thermal expansion respectively for cooperating with said third metal layer in substantially determining the electrical conductivity and flexivity characteristics of said thermostatic material, and an additional layer of metal selected from the group consisting of copper, nickel and cupronickle alloys having one face thereof metallurgically bonded in the solid-phase to one face of said first metal layer oppositely of said third metal layer protecting said first metal layer from oxidation and corrosion.

4,050,907

ORGANIC WASTE TREATING AND CONVERSION SYSTEM

George H. Brimhall, 435 Mirada Road, Half Moon Bay, Calif. 94109

Filed July 9, 1976, Ser. No. 703,771
Int. Cl.² C10J 3/00
U.S. Cl. 48—111 33 Claims



1. An apparatus for organic waste treatment comprising:
a. a waste treatment tank,
b. a heating fluid conduit circuit, a portion of which passes through the tank,
c. vibratory means connected to the conduit circuit adjacent the portion of the conduit circuit which passes through the tank for vibrating the portion of the conduit circuit which passes through the tank,
d. a pump positioned in the conduit circuit for circulating the heating fluid in the conduit circuit,
e. a furnace positioned in the portion of the conduit circuit which is external to the tank for heating the heating fluid in the conduit circuit,
f. feeding means interconnecting the tank and the furnace for feeding the gas generated in the tank to the furnace for combustion, and
g. supplemental heating means positioned in the portion of the conduit circuit which is external to the tank for supplementing the heat output of the furnace.

33. An apparatus for organic waste treatment comprising:
a. a vertical well for the waste to be treated having a depth substantially greater than its cross-sectional area,
b. a wire loop, a portion of which passes through the well,
c. vibratory means connected to the loop adjacent the portion of the loop which passes through the well,
d. gas recovery means connected to the well for recovering the gas generated in the well, and
e. radiation diffusers positioned in the top of the well.

4,050,908

PROCESS FOR THE PRODUCTION OF FUEL VALUES FROM COAL

Gerald P. McNamee, Santa Ana; Theodore R. Roszkowski, Malibu; David W. Stanbridge, Pacific Palisades, and Gerald A. White, Los Angeles, all of Calif., assignors to The Ralph M. Parsons Company, Pasadena, Calif.

Filed July 20, 1976, Ser. No. 707,004
Int. Cl.² C10J 3/16; C10K 3/04
U.S. Cl. 48—210 23 Claims

1. A process for the production of methane which comprises in combination the steps of:
a. forming a slurry of particulate coal in a liquid hydrocarbon solvent comprising hydrocarbons boiling up to about 750° F and generated from the liquefaction of coal in the presence of hydrogen;
b. combining the slurry and a hydrogen containing gas in a liquefaction zone maintained at a temperature from about 700° to about 1000° F and at a pressure up to about 2500 psi for a time sufficient to convert a substantial portion of coal to fluid hydrocarbons and a solid residue of liquefaction;
c. combining the effluent, fluid hydrocarbons and the solid residue of liquefaction from the liquefaction zone with a synthesis gas in a stripping zone and forming a liquid-solids fraction comprising liquid hydrocarbons boiling above the boiling point of the liquid hydrocarbon solvent and the solid residue of liquefaction and a vapor fraction comprising hydrocarbons, carbon monoxide, carbon dioxide, hydrogen sulfide and hydrogen;
d. combining, in a gasification zone, the liquid-solids fraction from the stripping zone with steam and oxygen in an amount sufficient to gasify substantially all of the carbon contained in the liquid-solids fraction to generate a synthesis gas comprising hydrogen and the oxides of carbon;
e. passing a major portion of the synthesis gas to the stripping zone to form the vapor fraction;
f. separating the vapor fraction by cooling and condensation into a liquid hydrocarbon solvent fraction, a light liquid hydrocarbon fraction and a residual vapor fraction comprising hydrocarbons containing up to about 5 carbon atoms, hydrogen sulfide, carbon dioxide, carbon monoxide and hydrogen;
g. returning at least a portion of the liquid hydrocarbon solvent fraction to form additional slurry;
h. converting a minor portion of the synthesis gas from the gasification zone into a hydrogen rich gas stream;
i. hydrotreating the light liquid hydrocarbon fraction with at least a portion of the hydrogen rich gas stream to convert bound sulfur to hydrogen sulfide and separating the formed hydrogen sulfide from the hydrogen sulfide lean light liquid hydrocarbon;
j. passing another portion of the hydrogen rich gas stream as at least part of the hydrogen containing gas to the liquefaction zone;
k. separating at least a portion of the contained carbon dioxide and hydrogen sulfide from the residual vapor fraction to form a carbon dioxide-hydrogen sulfide lean vapor stream;
l. methanating a portion of the carbon dioxide-hydrogen sulfide lean vapor stream in the presence of steam and a supported catalyst containing from about 5 to about 35% by weight of at least one metal of the third period of Group VII of the Periodic Table on a temperature stabilized, ceramic alumina support in a first methanation zone having an inlet temperature of at least about 900° F and exit temperature up to about 1500° F;
m. combining, with steam, the effluent of the methanation zone, the balance of the carbon dioxide-hydrogen sulfide lean vapor stream and the hydrogen sulfide lean light liquid hydrocarbon in a catalytic reforming stage where, at a temperature from about 1200° to about 1500° F maintained by the effluent of the methanation stage, hydrocarbons are reformed to yield an effluent gas stream comprising steam, hydrogen, carbon monoxide, carbon dioxide and methane; and
n. passing the effluent gas stream from the reforming stage to at least one additional methanation stage where the hydrogen and carbon monoxide react to form additional methane.

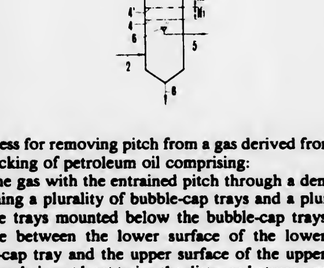
4,050,909

PROCESS AND APPARATUS FOR THE PRODUCTION OF HYDROGEN AND CARBON DIOXIDE

Gerhard Raake, Poecking, Germany, assignor to Linde Aktiengesellschaft, Hoellriegelskreuth, Germany

Filed Nov. 25, 1975, Ser. No. 635,041
Claims priority, application Germany, Oct. 30, 1975, 2548700
Int. Cl.² B01D 53/00
U.S. Cl. 55—68 27 Claims

1. In a process for the separation of substantially pure carbon dioxide and a gas enriched in hydrogen from a raw gas consisting essentially of carbon dioxide, hydrogen and hydrogen sulfide, the steps of:
a. scrubbing said raw gas in a first scrubbing stage with a first fraction of partially loaded physical scrubbing agent to obtain a partially scrubbed raw gas and a more loaded scrubbing agent;
b. scrubbing said partially scrubbed raw gas in a second stage with physical scrubbing agent to obtain a further scrubbed raw gas enriched in hydrogen and said partially loaded physical scrubbing agent;



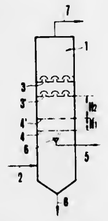
c. subjecting said more loaded scrubbing agent to at least one pressure reducing stage to obtain a gaseous phase therefrom;
d. subjecting a second fraction of said partially loaded scrubbing agent to at least one pressure-reducing stage to obtain reduced pressure liquid phase substantially free of hydrogen sulfide; and
e. scrubbing said gaseous phase of step (c) with at least a fraction of liquid phase of step (d) to obtain a scrubbed substantially pure carbon dioxide stream and a scrubbing solution containing carbon dioxide and hydrogen sulfide.

4,050,910

APPARATUS AND METHOD FOR REMOVING PITCH FROM THERMALLY CRACKED GAS

Takao Ishihara; Kiyoji Sanpei; Hiroshi Nabatame, and Shoichi Motokawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,298
Claims priority, application Japan, Oct. 14, 1975, 50-122854
Int. Cl.² B01D 46/04
U.S. Cl. 55—96 2 Claims



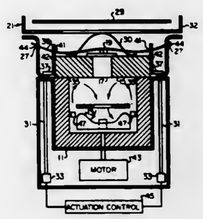
1. A process for removing pitch from a gas derived from the thermal cracking of petroleum oil comprising:
passing the gas with the entrained pitch through a demister containing a plurality of bubble-cap trays and a plurality of sieve trays mounted below the bubble-cap trays, the distance between the lower surface of the lowermost bubble-cap tray and the upper surface of the uppermost sieve tray being at least twice the distance between adjoining sieve trays; and
spraying a cleaning oil against the lower surface of the lowermost sieve tray at a rate of 0.1 to 1.0 m^3/hr. per unit area of the bottom surface of the lowermost sieve tray to prevent deposition of pitch.

4,050,911

GAS CHROMATOGRAPH OVEN

Paul Bryce Welsh, Wilmington, Del., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 499,894, Aug. 23, 1974, abandoned.
This application May 29, 1975, Ser. No. 582,053
Int. Cl.² B01D 15/08
U.S. Cl. 55—197 9 Claims



1. A gas chromatograph oven comprising:
a thermally insulated housing having an oven door assembly closing one side thereof, one side of said housing defining a first air passage;
rotating stirring fan means for producing a high pressure region and a low pressure region within said housing;
said oven door assembly including:
a frame;
a hatch;
said hatch being movable into spaced-apart relation with said housing to define a second air passage;
spring biasing means disposed between said hatch and said door frame to maintain closure of the housing open side by said hatch;
cover means coupled with said hatch for selectively opening and closing said first air passage in response to the establishment and closure respectively, of said second air passage by movement of said hatch;
actuation means for moving said hatch in opposition to said hatch spring biasing means, thereby to establish said second air passage and to open said first air passage;
one of said first and second air passages being disposed adjacent said low pressure region to duct ambient room temperature air into said housing; and
the other of said first and second air passages being disposed adjacent to said high pressure region to exhaust air from said housing.

4,050,912

APPARATUS FOR COOLING HOT GASES

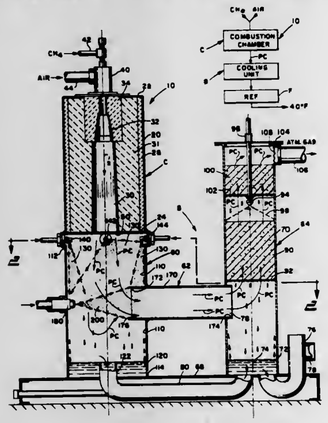
Klaus H. Hemseth, and Arvind C. Thekdi, both of Sylvania, Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed May 19, 1976, Ser. No. 687,816
Int. Cl.² B01D 47/14
U.S. Cl. 55—223 4 Claims

1. Apparatus for scrubbing, quenching, cooling hot gases comprising:
a generally U-shaped configuration having first, second and third steel plate, tubular members;
said first tubular member extending generally in a first plane and having an open upper end and a closed lower end, said first tubular member adapted to receive said hot gases through said upper end; liquid boundary forming means spaced about the peripheral interior of said first tubular member for forming a liquid boundary circumscribing the

interior of said first tubular member to prevent hot spots from occurring in said first tubular member;

said second tubular member positioned generally transverse to said first tubular member in a second plane and having an inlet end extending into said first member and defining the outlet of said first member and an outlet at its opposite end, jet pump cooling means in said first tubular member directing a high speed, finely divided liquid spray into said



second tubular member for entraining and aspirating said hot gases in said spray and substantially cooling said hot gases as said gases travel the length of said second tubular member; and

said third tubular member extending generally transverse to said second member, said third member having an outlet at its upper end, a closed lower end and an inlet defining said outlet of said second member, and means for scrubbing said cooled gases between its outlet and its inlet.

4,050,913

VORTEX AIR CLEANER ASSEMBLY WITH ACOUSTIC ATTENUATOR

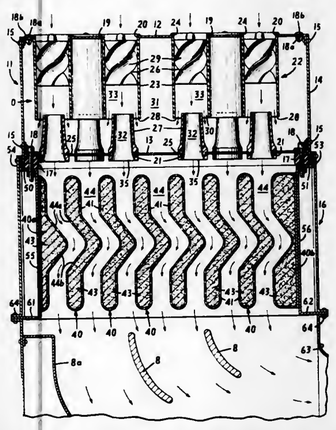
Charles J. Roach, Brooklyn, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Continuation-in-part of Ser. No. 484,001, June 28, 1974, abandoned, which is a continuation of Ser. No. 316,326, Dec. 18, 1972, abandoned. This application Apr. 23, 1975, Ser. No. 571,032

Int. Cl.² B01D *45/14*

U.S. Cl. 55—276 **18 Claims**

1. A vortex air cleaner-acoustic attenuator comprising, in combination, a housing having an inlet and an outlet arranged for air flow therethrough; and, disposed in the housing across the line of air flow from the inlet to the outlet, in sequence, a first array comprising a plurality of vortex air cleaners, in which the vortex air cleaners comprise a straight tubular air cleaner body having a cylindrical central passage with an inlet and an outlet at opposite ends, and a deflector adjacent the inlet for creating a vortex stream in the influent air to concentrate any contaminant particles in the air at the periphery of the passage, and clean the air at the center of the passage, and an outlet member having a central clean air passage communicating with the cylindrical central passage of the tubular body and disposed within the passage at the outlet, the exterior wall of the outlet member defining a generally annular contaminant scavenge passage within the cylindrical central passage of the tubular body through which pass contaminant particles, while relatively clean air at the center of the passage passes through the central clean air passage of the outlet member; and a second array comprising a plurality of spaced acoustic sheets defining passages therebetween arranged in flow communication with the clean air passages of the outlet members of the vortex air cleaners in the first array, the acoustic sheet passages having a diameter that is approximately the same as the diameter at the narrowest point of the clean air passages of the outlet members of the vortex air cleaners in the air cleaner array, so that the total of acoustic sheet thickness plus acoustic sheet passage diameter approximates the total of clean air passage inside diameter at the narrowest point plus the distance between the inside walls of the clean air passages, taken at the narrowest point of the clean air passages, of the outlet members of the air cleaners in one row, and the inside walls of the clean air passages, taken at the narrowest point of the clean air passages, of the outlet members of the air cleaners in the next adjacent row in the air cleaner array feeding air into the acoustic sheet passages, the inlet end openings of the acoustic sheet passages being substantially in alignment with the air cleaner passages for direct flow thereinto from the vortex air cleaner array in a straightthrough course, the acoustic sheets being arranged to deflect such air at least once from the acoustic surface of the sheets in the course of travel through the passages, the total pressure drop across the combination of vortex air cleaner array and array of intercepting spaced acoustic sheets being less than the additive pressure drop across either the vortex air cleaner array or the array of intercepting acoustic sheets, taken separately.



4,050,914

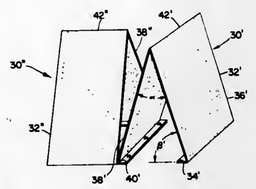
ACCELERATOR FOR CHARGED PARTICLES

David R. Murphy, Falls Church, Va., assignor to S.A.E.S. Getters S.p.A., Milan, Italy

Filed July 26, 1976, Ser. No. 708,645

Int. Cl.² B01D *53/04*; F04B *37/02*; H01J *43/28*

U.S. Cl. 55—387 **3 Claims**



1. An accelerator for charged subatomic particles said accelerator comprising:

A. A vacuum chamber defined by gas-tight walls,

B. A means within said chamber for producing a beam of charged particles, and

C. A means for inhibiting secondary emissions said means comprising outwardly extending wedge-shaped members covering the inner surface of the walls of the vacuum chamber, each said member comprising:

1. a sheet metal strip, said sheet metal strip comprising:
   a. a first wing parallel to and attached to the inner surface of the wall,
   b. a first sheet metal segment attached to the wing and extending outwardly from the wall,
   c. a second sheet metal segment attached to the edge of the first segment furthest from the wall, said second segment being equal in length to and forming a dihedral angle of less than 90° with the first segment, and
   d. a second wing attached to the second segment, said second wing being parallel to and attached to the inner surface of the wall, and
2. a coating on both sides of the sheet metal strip, said coating consisting of particles of a nonevaporable getter metal embedded in the sheet metal strip without substantial reduction of the surface area of said particles, and
3. a means for attaching the sheet metal strip to the inner surface of the wall of the vacuum chamber, said means comprising spot welds attaching the first and second wings to the inner surface of the wall wherein the first and second wings of the sheet metal strip extend toward each other, the first wing forming a dihedral angle of less than 90° with the first segment and the second wing forming a dihedral angle of less than 90° with the second segment.

4,050,915

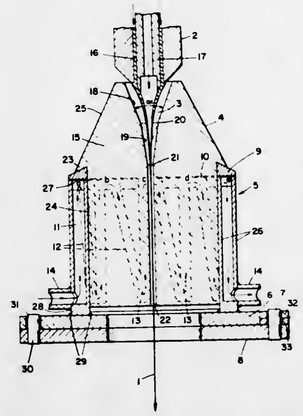
FERRULE AND USE THEREOF FOR COOLING A MELT SPUN HOLLOW GLASS FIBER AS IT EMERGES FROM A SPINNERETTE

William E. Brown, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 4, 1976, Ser. No. 729,440

Int. Cl.² C03B *37/02*

U.S. Cl. 65—1 **13 Claims**



1. A ferrule having utility for uniformly cooling an individual, melt-spun, hollow glass fiber, without making substantial contact with the fiber, as it issues from a spinnerette and passes downwardly through the ferrule,

said ferrule having a rigid, heat-conductive body member, an interior wall of which defines a vertical, rectilinear passageway extending completely through said member and having the general shape of a long-stemmed, conical funnel, every cross-section of said passageway along its axis being generally circular in shape,

said ferrule being adapted, by generally vertical cuts which form a slot therein or divide the ferrule into mating segments, so that it can be emplaced adjacent to a spinnerette and closely fitted around a moving fiber is issuing therefrom, in a position such that the axes of the fiber and passageway will coincide and the fiber will enter the funnel-shaped portion of said passageway as it leaves the spinnerette and exit from the lower terminus of the stem-shaped section,

the width of said slot or the widths of the spaces between the mated segments being such that not more than 25 percent of any circumference of said passageway is interrupted by said slot or spaces,

said ferrule, or each of said segments, being so composed as to have an average heat conductivity at least equal to that of graphite and being adapted to be brought into heat-transfer-effective contact with a heat sink.

4,050,916

METHOD AND APPARATUS FOR FORMING KINKY FIBERS FROM GLASS

Robert G. Russell, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 608,420, Aug. 28, 1975, abandoned, which is a continuation of Ser. No. 469,729, May 13, 1974, abandoned. This application Nov. 26, 1976, Ser. No. 745,028

Int. Cl.² C03B *37/02*

U.S. Cl. 65—2 **11 Claims**



1. The method of forming fibers of heat-softened glass including flowing streams of the glass in a row from a feeder, the regions of the streams adjacent the feeder being cone-shaped, attenuating the streams of glass to fibers, impinging a coherent stream of liquid against the tips of the cones of the glass streams to effect successive distortions of the tips of the cones of glass, and reducing the temperature of the glass streams at the distortions by the stream of liquid at a rate sufficient to form successive permanent bends in the attenuated fibers.

4,050,917

PROCESS OF CONVERSION OF SOLID WASTE INTO WORKABLE MATERIAL WITH PREDETERMINED CHARACTERISTICS AND/OR INTO FERTILIZERS OR SOIL IMPROVING AGENTS

Stephen Varro, 425 E. 51st St., New York, N.Y. 10022

Filed Sept. 2, 1975, Ser. No. 609,697

Claims priority, application Germany, Aug. 30, 1974, 2441716

Int. Cl.² C05F *11/08*

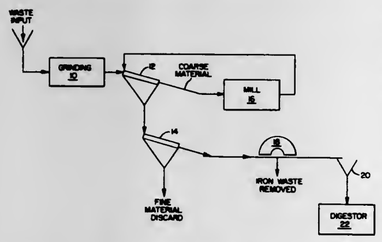
U.S. Cl. 71—9 **3 Claims**

1. A process for composting waste material including the following steps:

supplying raw waste material;

grinding said supplied waste material into particles;

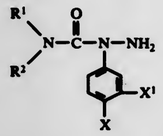
extracting said ground particles within a predetermined size range;
extracting iron containing particles from said particles within said predetermined size range;
digesting said particles within said predetermined size range having said iron particles extracted therefrom;
said step of digesting includes the steps of:
exposing said digesting particles to oxygen by raking said digesting particles;
controlling said exposure by controlling the rate of raking;
continually controlling the pH value of said digesting particles by selectively adding a water diluted nitrogen-phosphorous buffer solution having a pH value within the range of 6.2 to 6.8% in order to produce a digested material having a stable pH value of approximately 7.3;



continually controlling the moisture content of said digesting particles according to a linear value of moisture content with respect to time by selectively adding relatively hot water to produce a digested material having a moisture content in the range of from 10–30% by weight;
continually controlling the temperature of said digesting particles within a predetermined temperature range;
advancing said digesting particles over a series of stacked horizontal decks by said step of raking and performing said steps of continually controlling the pH value and continually controlling the moisture content in response to steps of monitoring the pH value and moisture content at a plurality of predetermined locations along said horizontal decks.

4,050,918
HERBICIDAL SEMICARBAZIDES
Kurt H. G. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.
Division of Ser. No. 471,380, May 20, 1974, Pat. No. 3,984,463, which is a continuation-in-part of Ser. No. 445,396, Feb. 25, 1974, abandoned, which is a continuation of Ser. No. 283,687, Aug. 25, 1972, abandoned. This application May 19, 1976, Ser. No. 687,721
Int. Cl.² A01N *9/36, 9/14, 9/20*
U.S. Cl. 71—86 **7 Claims**

1. A method for controlling undesirable plant growth which comprises applying to the locus to be protected, in amount sufficient to exert herbicidal action, a compound of the formula



wherein R^1 and R^2 are each independently alkyl of 1 to 4 carbon atoms; X and X^1 each is halogen of atomic number 9 to 35, inclusive, or an acid addition salt thereof selected from the group of hydrochloric, hydrobromic, sulfuric, phosphoric, nitric, maleic, fumaric, citric tartaric, methanesulfonic, ethanesulfonic, acetic or benzoic acids.

4,050,919
PROCESS FOR DEVELOPING SEEDLESS FLESHY BERRY OF GRAPES
Yoshie Motomura, Sendai, and Jiro Ishiyama, Noda, both of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Japan
Filed Apr. 6, 1976, Ser. No. 674,078
Claims priority, application Japan, Apr. 8, 1975, 50-41876
Int. Cl.² A01N *9/36, 9/12*
U.S. Cl. 71—86 **11 Claims**

1. A process for developing seedless, fleshy berry of grapes which comprises contacting the flower bunches of grapes with an effective amount of an aqueous solution containing gibberellin and at least one cyclic 3′, 5′-adenylic acid compound selected from the group consisting of cyclic 3′, 5′-adenylic acid, alkali metal and alkaline earth metal salts of cyclic 3′, 5′-adenylic acid, and derivatives of cyclic 3′, 5′-adenylic acid, said gibberellin and cyclic 3′, 5′-adenylic acid being present in the concentration of 10 to 300 p.p.m. and 1 to 10,000 p.p.m., respectively, and said derivatives of cyclic 3′, 5′-adenylic acid being selected from the group consisting of 6-benzyl-cyclic 3′, 5′-adenylic acid, 6-allyl-cyclic 3′, 5′-adenylic acid, 8-bromo-cyclic 3′, 5′-adenylic acid, 8-iodine-cyclic 3′, 5′-adenylic acid, 9-methyl-cyclic 3′, 5′-adenylic acid, N^6, $O^{2'}$-(dibutyl ester)-cyclic 3′, 5′-adenylic acid and N^6-(butyl ester)-cyclic 3′, 5′-adenylic acid.

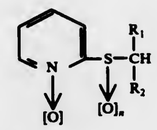
4,050,920
HERBICIDAL COMPOSITION FOR PADDY FIELD USE
Tetsuo Takematsu; Makoto Kounai, both of Utsunomiya; Takayuki Isogawa, Tokyo, and Koshiro Kodama, Noshiro, all of Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan
Filed Sept. 26, 1975, Ser. No. 617,246
Claims priority, application Japan, May 8, 1975, 50-55636; Sept. 26, 1974, 49-110897
Int. Cl.² A01N *9/22*
U.S. Cl. 71—88 **4 Claims**

1. A method for controlling the growth of weeds in a paddy field which comprises adding a herbicidal composition which comprises 200 – 300 g of 3,4-dichloropropionanilide, 150–250 g of S-ethylhexahydro-1H-azepine-1-carbothioate and 10–17 g of -βnaphthyl-N-methyl carbamate per 10 ares to the water of a flooded paddy field after the growth of weeds has ensued.

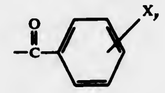
2. A method for controlling the growth of weeds in a paddy field which comprises applying a herbicidal composition which comprises 200–300 g of 3,4-dichloropropionanilide, 150–250 g of S-ethyl-hexahydro-1H-azepine-1-carbothioate and 0.5–1.0 g of β-naphthyl-N-methyl carbamate per 10 ares to a flooded paddy field by direct application.

4,050,921
REGULATION OF THE NATURAL GROWTH OR DEVELOPMENT OF PLANTS WITH 2-SULFINYL OR 2-SULFONYL PYRIDINE N-OXIDE COMPOUNDS
Howard L. Plant, Milford; John W. Zakel, Hamden, and Ronald B. Ames, Naugatuck, all of Conn., assignors to Uniroyal Inc., New York, N.Y.
Filed Apr. 16, 1976, Ser. No. 677,660
Int. Cl.² A01N *9/22*
U.S. Cl. 71—94 **22 Claims**

1. A method of regulating the natural growth or development of plants which comprises applying to said plants an effective non-herbicidal plant-regulating amount of a 2-sulfinyl-, or 2-sulfonyl-pyridine N-oxide compound of the formula



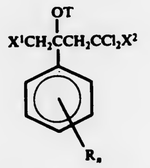
wherein:
n is 1 or 2;
R_1 is hydrogen, C_1 to C_{15} alkyl, phenyl or benzyl;
R_2 is hydrogen,
C_1 to C_{12} alkyl,
C_1 to C_4 alkenyl,
C_2 or C_3 alkoxycarbonyl,
C_5 or C_6 alicyclic,
phenyl provided R_1 is not phenyl,
phenyl substituted with from 1 to 3 substituents which may be the same or different and are selected from the group consisting of C_1 to C_3 alkyl, halogen, cyano, nitro, C_1 or C_2 alkoxy, phenoxy, dioxymethylene and 2,2-dichlorocyclopropyl; and phenyl substituted with 4 to 5 substituents which may be the same or different and are selected from methyl and chlorine;
1-methyl-2,2-dichlorocyclopropyl,
2,2-dichlorocyclopropyl,
naphthyl, 9-anthryl, 5-indanyl,
4-biphenylyl,
2-benzothiazolyl, 2-thienyl or benzyl;
R_1 and R_2 may be joined together in the form of a polymethylene chain $-(CH_2)_m-$ where *m* is 3,4 or 5 to form a carbocyclic ring;
and when R_1 is hydrogen or methyl R_2 can be the radical



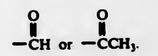
where *y* is 0, 1 or 2 and the X's are the same or different and are selected from C_1 to C_3 alkyl, halogen, and 2,2-dichlorocyclopropyl.

4,050,922
SUBSTITUTED BENZENE-METHANOL COMPOUNDS
Lowell D. Markley, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 466,569, May 3, 1974, Pat. No. 3,972,913. This application Mar. 17, 1976, Ser. No. 667,780
Int. Cl.² A01N *9/24*
U.S. Cl. 71—106 **37 Claims**

1. A composition comprising an inert carrier and a herbicidally-effective amount of a compound of the formula:

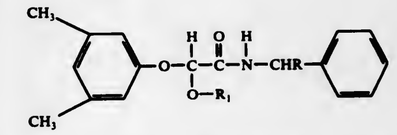


wherein x^1 represents bromo, chloro or iodo, X^2 represents hydrogen, chloro or methyl; *n* represents an integer of 0 to 3, inclusive; R is ring-substituted in the 3-, 4- or 5-positions and each R independently represents hydrogen, trifluoromethyl, alkyl of from 1 to about 3 carbon atoms, alkoxy of from 1 to about 3 carbon atoms, bromo, chloro, fluoro or nitro, and T represents hydrogen,



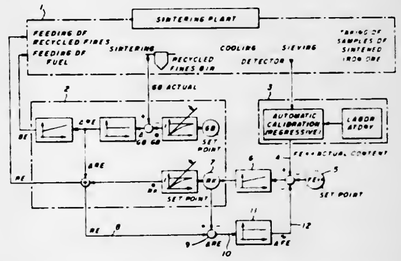
4,050,923
N-BENZYL-2-(3,5-DIMETHYL PHENOXY)-2-ALKOXY AMIDE HERBICIDES
Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.
Filed June 30, 1975, Ser. No. 591,686
Int. Cl.² A01D *9/20*
U.S. Cl. 71—118 **3 Claims**

1. The method of controlling undesirable vegetation which comprises applying to the area where control of said vegetative growth is desired, an herbicidal amount of a compound having the formula



in which R is hydrogen or alkyl having 1 to 4 carbon atoms and R^1 is alkyl having 1 to 4 carbon atoms.

4,050,924
PROCESS OF CONTROLLING FE^{++} CONTENT OF SINTERED IRON ORE
Fred Cappel, Sprendlingen; Walter Hastik, Frankfurt am Main, both of Germany; Georg Fleming, and Pierre Hofmann, both of Esch, Alzette, Luxembourg, assignors to Dravo Corporation, Pittsburgh, Pa.
Filed Dec. 3, 1975, Ser. No. 637,395
Claims priority, application Germany, June 3, 1975, 2524444
Int. Cl.² C22B *1/16*
U.S. Cl. 75—5 **5 Claims**



1. In a process for controlling the quality of sintered iron ore produced in a belt-type continuous sintering operation wherein a recycled-fines balance controller regulates the fuel rate and the recycled-fines feed rate to maintain a recycled-fines balance, the improvement comprising: determining the actual Fe^{++} content of the sintered iron ore, selecting a preset Fe^{++} content, applying the difference between the actual Fe^{++} content preset Fe^{++} content to an Fe^{++} content controller to produce a desired fines withdrawal rate, and modifying the

recycled-fines feed rate as a function of the desired fines withdrawal rate to correct the Fe^{++} content to the preset value.

4,050,925

PROCESS FOR THE PRODUCTION AND USE OF ACTIVATED ALUMINA IN REFINING STEEL

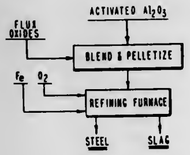
Arthur F. Johnson, Franklin Lakes, N.J., assignor to R.C.M. Corporation, Fontana, Calif.

Division of Ser. No. 483,129, June 26, 1974, Pat. No. 3,955,969. This application Jan. 28, 1976, Ser. No. 653,263

The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.

Int. Cl.² C21B *3/02, 5/04*

U.S. Cl. 75—30 **4 Claims**



1. The process for the production and use of activated alumina from dross containing aluminum particles, alumina and impurities comprising:

a. changing said dross onto a layer of molten halide salts underlain by a layer of molten aluminum in a holding furnace, whereby a portion of the aluminum entrained within the dross enters the aluminum layer and the alumina and impurities are entrained in the halide flux layer;

b. separating said dross from said molten aluminum; digesting said dross with hot water to at least partially dissolve halide salts and other soluble impurities and decompose insoluble impurities;

c. separating remaining aluminum particles and the purified alumina from said water as separate fractions;

d. calcining said alumina under conditions controlled to produce an activated alumina;

e. blending said calcined alumina with binders and slag-formers;

f. pelletizing the mixture so formed; and

g. using the pellets in the refining of steel, whereby a more fluid slag is formed.

4,050,926

CONTINUOUS SULPHUR DROSSING PROCESS

Frank Lawson; Glen Waverley, both of Victoria; Deaby Harcourt Ward, and Robert George Kelly, both of Port Pirie, all of Australia, assignors to The Broken Hill Associated Smelters Proprietary Limited and Monash University, both of Melbourne, Australia

Filed July 14, 1976, Ser. No. 705,356

Claims priority, application Australia, Sept. 8, 1975, 3079/75

Int. Cl.² C22B *13/06*

U.S. Cl. 75—78 **17 Claims**

1. A continuous sulphur drossing process for the decoppering of lead which comprises:

continuously flowing lead bullion into the first of a series of at least two reaction vessels;

continuously agitating the lead bullion in the first reaction vessel;

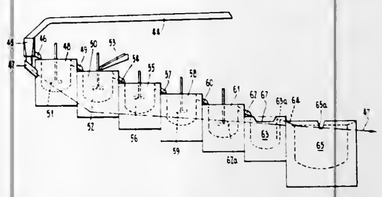
continuously adding sulphur to the lead bullion in the first reaction vessel during the continuing agitation;

continuously and concurrently transferring the lead bullion, dross arising from copper reacted with the sulphur, and any unreacted sulphur from each reaction vessel to the next in the series, without backmixing;

continuously agitating the contents of each reaction vessel;

maintaining the average total residence time of the materials in the reaction vessels below that within which a significant amount of reversion to elemental copper would occur, thereby substantially preventing re-solution of copper in the bullion;

continuously and concurrently transferring decoppered



bullion and dross from the final reaction vessel in the series to an unagitated dross separation vessel;

removing the dross from the surface of the decoppered bullion in the dross separation vessel; and

continuously withdrawing decoppered bullion from the dross separation vessel.

4,050,927

ALLOYED STEEL

Shinichi Murakami, Osaka; Katsutaro Akamatsu, Hirakata, and Hisashi Hiraishi, Kyoto, all of Japan, assignors to Kubota, Ltd., Japan

Filed Dec. 1, 1975, Ser. No. 636,643

Int. Cl.² C22C *30/00*

U.S. Cl. 75—122 **13 Claims**

1. An alloy having high heat and wear resistance, which consists essentially of carbon in an amount of 0.30 to 0.50%, silicon in an amount of 1.0 to 1.8%, manganese in an amount of 1.0 to 1.8%, chromium in an amount of 26 to 30%, nickel in an amount of 18 to 22%, tungsten in an amount of 0.5 to 6%, nobium in an amount of 0.5 to 4%, cobalt in an amount of 18 to 22%, and iron and other impurities as a remainder, said percentage being based on the total weight of the composition.

4,050,928

CORROSION-RESISTANT MATRIX-STRENGTHENED ALLOY

James Roy Crum, Ona, W. Va., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,227

Int. Cl.² C22C *30/02, 38/06, 38/42*

U.S. Cl. 75—124 **11 Claims**

1. An alloy consisting essentially of 18% to 30% nickel and 20% to 30% chromium with the nickel-to-chromium ratio of up to 1.0, 1.7% to about 3% aluminum, 1% to about 5% copper, 0.03% to 0.08% carbon, up to 0.6% silicon, up to about 1.5% manganese, up to 0.06% calcium and balance essentially iron in an amount at least 44% of the alloy.

4,050,929

HEAT RESISTING ALLOYED STEEL

Shinichi Murakami, Osaka; Katsutaro Akamatsu; Toshiaki Morichika, both of Hirakata, and Hisashi Hiraishi, Kyoto, all of Japan, assignors to Kubota, Ltd., Japan

Filed Dec. 1, 1975, Ser. No. 636,644

Int. Cl.² C22C *30/00*

U.S. Cl. 75—171 **2 Claims**

1. A heat resisting alloy having a high compressive strength at elevated temperature which consists essentially of carbon in an amount of not more than 0.15%, silicon in an amount of 1 to 2%, chromium in an amount of 25 to 32%, manganese in an amount of 1 to 2, nickel in an amount of 10 to 25%, cobalt in an amount of 25 to 45%, molybdenum in an amount of 0.3 to 10%, phosphorus in an amount of not more than 0.04%, sulfur in an amount of not more than 0.04%, niobium in an amount of 0 to 3%, and iron as the remainder, said percentage being based on the total weight of the composition.

4,050,930

ELECTRICAL CONTACT MATERIAL

Kenya Motoyoshi; Masahiro Kume, and Yoshisari Amano, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 16, 1976, Ser. No. 667,373

Claims priority, application Japan, June 24, 1975, 50-78785

Int. Cl.² C22C *5/06*

U.S. Cl. 75—173 A **3 Claims**

1. An electrical contact material produced by internal oxidation of an alloy consisting of 1–15% by weight of metal indium, 0.5–12% by weight of metal tin, 0.01–5% by weight of one metal selected from the group consisting of manganese and molybdenum, and the balance silver, wherein oxides are formed by said internal oxidation which are spherical in shape and finely and uniformly dispersed.

4,050,931

AMORPHOUS METAL ALLOYS IN THE BERYLLIUM-TITANIUM-ZIRCONIUM SYSTEM

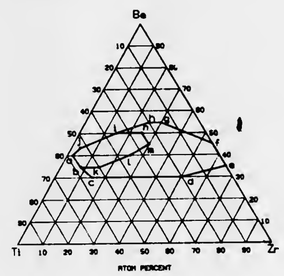
Lee Elliot Tanner, Summit; Ranjan Ray, Morristown, both of N.J., and Carl F. Cline, Walnut Creek, Calif., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 604,510, Aug. 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 572,563, April 28, 1975, Pat. No. 3,987,517, which is a continuation-in-part of Ser. No. 519,394, Oct. 30, 1974, abandoned. This application July 27, 1976, Ser. No. 709,028

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.² C22C *14/00, 16/00*

U.S. Cl. 75—175.5 **5 Claims**



1. A high strength, low density metal alloy that is substantially amorphous, characterized in that the alloy consists essentially of a composition being defined within an area on a ternary diagram having as its coordinates in atom percent Be, atom percent Ti, and atom percent Zr, said area being defined by a polygon having at its corners the 10 points defined by

a. 40% Be, 58% Ti, 2% Zr

b. 35% Be, 57% Ti, 8% Zr

c. 30% Be, 55% Ti, 15% Zr

d. 30% Be, 20% Ti, 50% Zr

e. 35% Be, 0% Ti, 65% Zr

f. 45% Be, 0% Ti, 55% Zr

g. 55% Be, 15% Ti, 30% Zr

h. 55% Be, 20% Ti, 25% Zr

i. 50% Be, 35% Ti, 15% Zr

j. 43% Be, 53% Ti, 4% Zr.

4,050,932

COLLOIDAL GRAPHITE FORGING LUBRICANT AND METHOD

Harold G. Lemmer, New Baltimore, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 565,873, April 7, 1975. This application Aug. 5, 1976, Ser. No. 711,784

Int. Cl.² B22F *3/14, 3/24*

U.S. Cl. 75—211 **2 Claims**

1. A method for hot forming highest quality ferrous powdered metal articles without a prior separate presintering operation, said method comprising the steps of:

coating an unsintered powdered steel preform with a colloidal graphite forging lubricant containing at least about 2%, by weight, powdered copper for suppressing an adverse lubricant-preform interaction above a temperature of about 2050° F., said powdered copper having an average particle size less than about 50 microns,

induction heating said lubricant-coated preform to a temperature of about 2100°–2500° F. to sinter said preform without incurring an attendant adverse lubricant-preform interaction,

cooling said preform to a hot forming temperature below about 2000° F., and

hot forming said lubricant-coated preform into a predetermined shape and thereby form a powdered metal article having high ductility, high impact strength, and a metal density exceeding 99%.

2. A method of hot forming a ferrous powdered metal article that includes concurrent presintering of a ferrous powdered metal preform during the same heating operation and with the same induction heating equipment used to heat presintered ferrous powdered metal preforms to hot forming temperatures,

heating an unsintered ferrous powdered metal preform to a temperature of about 250°–600° F.,

dipping said heated preform into a colloidal graphite hot forming lubricant containing about 2%–4%, by weight, powdered copper, said powdered copper having a particle size no greater than about 15 microns,

induction heating said preform to a temperature of about 2300°–2400° F. for about 1 minute to sinter said preform without incurring an attendant adverse lubricant-preform interaction,

cooling said preform to a temperature of about 1400°–1800° F., and

hot forming said lubricant-coated preform into a predetermined shape and thereby form a powdered metal article having high ductility, high impact strength, and a metal density exceeding 99%.

4,050,933

IMPERVIOUS METAL OBJECT AND METHOD OF MAKING THE SAME

Howard I. Sanderow, Cherry Hill, N.J., and Kenneth M. Merz, Malvern, Pa., assignors to Stanadyne, Inc., Hartford, Conn.

Continuation of Ser. No. 334,242, Feb. 21, 1973, Pat. No. 3,838,982. This application July 3, 1974, Ser. No. 485,450

The portion of the term of this patent subsequent to Oct. 1, 1991, has been disclaimed.

Int. Cl.² C22C *1/04*

U.S. Cl. 75—246 **14 Claims**

1. A method of making an impervious metal body comprising the steps of

completely coating iron powder particles with a layer of copper which is about 12% to about 30% by weight of the body,

compressing said coated particles together, and heating the compressed particles to a temperature at which the copper layer melts and the melted copper flows and fills the voids between the particles.

7. An impervious metal body produced by completely coating iron powder particles with a layer of copper which is about 12% to about 30% by weight of the body, compressing the

coated particles together, and heating the compressed particles to a temperature at which the copper layer melts and the melted copper flows and fills the voids between the particles.

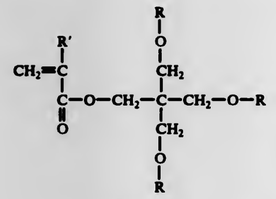
4,050,934

ELECTRON ACCEPTOR MONOMERS AND POLYMERS

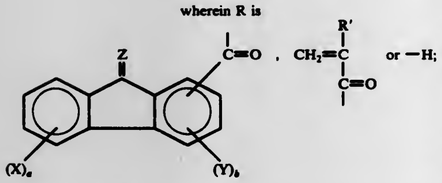
Sam R. Turner, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 22, 1975, Ser. No. 615,664
Int. Cl.² G03G *13/00, 5/04*
U.S. Cl. 96—1 R **4 Claims**

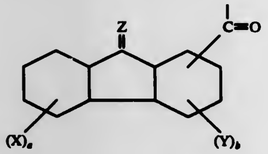
1. An electrophotographic imaging member having a photoconductive insulating layer comprising a monomer of the formula



wherein R is



R′ is hydrogen or methyl;
X and Y are independently selected from the group consisting of —NO_2, halogen, cyano and —CF_3;
Z is oxygen or dicyanomethylene; and
a and *b* can range from 0 to 3; with the proviso that at least one of R is



4,050,935

TRIGONAL SE LAYER OVERCOATED BY BIS(4-DIETHYLAMINO-2-METHYLPHENYL)-PHENYLMETHANE CONTAINING POLYCARBONATE

William W. Limburg, Penfield; John P. Yanus, Webster, and Damodar M. Pai, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 2, 1976, Ser. No. 673,235
Int. Cl.² G03G *5/04, 5/08*
U.S. Cl. 96—1 PC **28 Claims**

1. An imaging member comprising a layer of trigonal selenium and a contigous layer of electrically active material consisting essentially of an electrically inactive polycarbonate resin having dispersed therein from about 15 to about 75 percent by weight of bis(4-diethylamino-2-methylphenyl)-phenylmethane said trigonal selenium exhibiting the capability of photogeneration of holes and injection of said holes and said electrically active material being substantially non-absorbing in the spectral region at which the trigonal selenium generates and photo-generated holes but being capable of supporting the injection of photo-generated holes from said trigonal selenium and transporting said holes through said electrically active material.

4,050,936

IMAGE FORMING PROCESS WITH PHOTOPOLYMER LAYERS BETWEEN A SUPPORT AND A SUBSTRATE

Keiji Takeda; Masataka Murata, and Teppei Ikeda, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 29, 1975, Ser. No. 645,148
Claims priority, application Japan, Dec. 28, 1974, 50-300
Int. Cl.² G03C *11/12, 5/00*
U.S. Cl. 96—28 **25 Claims**

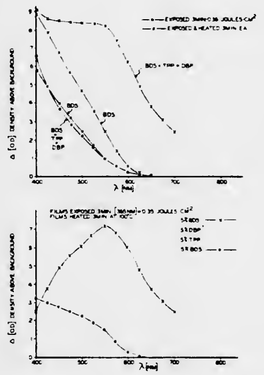
1. An image forming process which comprises image-wise exposing a photosensitive material to light, the photosensitive material comprising a support and a substrate with a photopolymerizable material therebetween, where either or both of the support or substrate is transparent and image-wise exposing is through the transparent support and/or substrate, and stripping off the support to leave either exposed areas or non-exposed areas of the photopolymerizable material on the substrate, in which the photopolymerizable material is characterized by comprising at least two different photopolymerizable layers which each comprise one or more addition polymerizable monomers, one or more photopolymerization initiators and one or more binders, which photopolymerizable layers are placed adjacent the transparent support and the substrate, wherein at least one of the ingredients or the ratio of the ingredients of the photopolymerizable layers is different in at least the two different photopolymerizable layers, and the photopolymerizable layers have the relationship of C>A>B and C′>B′>A′ or C>B>A and C′>A′>B′, wherein:
A is the adhesive strength between the support and the photopolymerizable layer adjacent thereto;
B is the adhesive strength between the substrate and the photopolymerizable layer adjacent thereto;
C is the lowest adhesive strength of all the adhesive strengths between any two photopolymerizable layers among the layers, A′ is the adhesive strength between the support and the photopolymerizable layer adjacent thereto after exposure to light, B′ is the adhesive strength between the substrate and the photopolymerizable layer adjacent thereto after exposure to light, and C′ is the lowest adhesive strength of all the adhesive strengths between any two photopolymerizable layers among the photopolymerizable layers after exposure to light, whereby following image-wise exposure and delamination cohesive failure occurs either (i) at the interface of the support and the photopolymerizable layer adjacent thereto or (ii) at the interface of the substrate and the photopolymerizable layer adjacent thereto, thereby providing negative and positive images in complimentary relationship in accordance with the following:
1. In the case of cohesive failure as described at (i), the substrate carrying the layer of the photopolymerizable composition adjacent thereto and areas of the photopolymerizable composition originally on the support in correspondence to the image-wise exposure, with the support carrying a complementary image of the photopolymerizable composition originally on the support; or
2. In the case of cohesive failure as described at (ii), the support carrying the layer of the photopolymerizable composition adjacent thereto and areas of the photopolymerizable composition originally on the substrate in correspondence to the image-wise exposure, with the substrate carrying a complementary image of the photopolymerizable composition originally on the substrate.

4,050,937

IMAGEWISE EXPOSING AND HEATING A MICROIMAGING FILM CONTAINING AN ORGANO DISELENIDE, A TERTIARY PHOSPHINE OR PHOSPHITE AND AN ORGANIC PEROXIDE

Dana G. Marsh, Rochester, and Joseph Y. C. Chu, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

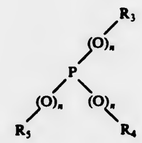
Filed Dec. 13, 1976, Ser. No. 749,636
Int. Cl.² G03C *5/24*
U.S. Cl. 96—48 R **10 Claims**



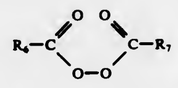
1. An imaging method comprising the steps of:
a. providing a film of an organic polymer as matrix material having uniformly dispersed therein:
i. a photochemically reactive organo diselenide characterized by the formula:

R_1—Se—Se—R_2

wherein R_1 and R_2 are aralkyl or alkyl hydrocarbon moieties;
ii. a tertiary phosphine or phosphite characterized by the formula:



wherein each *n* is 0 in the case of a phosphine and 1 in the case of a phosphite and R_3, R_4 and R_5 are independently substituted or unsubstituted aryl hydrocarbon moieties; and
iii. an organic peroxide characterized by the formula:



wherein R_6 and R_7 are aryl or substituted aryl;
b. exposing the film in an imagewise manner to ultraviolet radiation to form an image therein; and
c. heating the exposed film to a temperature of at least about 100° C for a time sufficient to enhance the image contrast.

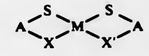
4,050,938

PHOTOGRAPHIC ELEMENTS INCORPORATING CHELATED-METAL QUENCHING COMPOUNDS

Wendell F. Smith, Jr, Fairport, and George A. Reynolds, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

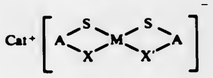
Continuation-in-part of Ser. No. 420,179, Nov. 29, 1973, abandoned. This application July 1, 1975, Ser. No. 592,300
Int. Cl.² G03C *1/84, 1/76*
U.S. Cl. 96—84 R **20 Claims**

1. A photographic element comprised of a support and containing one or more hydrophilic coatings thereon, at least one of which is radiation-sensitive, and at least one of said hydrophilic coatings including an organic dye selected from azine dyes, oxazine dyes, thiazine dyes, anthraquinone dyes, azo dyes, azomethine dyes, cyanine dyes, diphenylmethane dyes, triphenylmethane dyes, formazan dyes, induline dyes, indigoid dyes, phthalein dyes and pyronine dyes or a precursor of such a dye, dispersed in a water-immiscible solvent therefor, wherein the improvement comprises a stabilizing amount of a chelated-metal quenching compound incorporated within said water-immiscible solvent for said organic dye or dye precursor; said quenching compound having its longest wavelength absorption peak bathochromic to the longest wavelength absorption peak of said organic dye and having a structure selected from the group consisting of



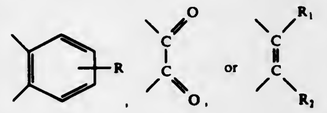
I.

and



II.

wherein:
M is nickel, cobalt, copper, palladium or platinum; X and X′ are independently selected from the group consisting of sulfur and oxygen; Cat^+ is a cation; and A is



wherein:
R is hydrogen or alkyl, and R_1 and R_2 are independently selected from the group consisting of hydrogen, phenyl, substituted phenyl, nitrile and alkyl.

4,050,939

MICROIMAGING FILM CONTAINING AN ORGANO DISELENIDE, A TERTIARY PHOSPHINE OR PHOSPHITE AND AN ORGANIC PEROXIDE

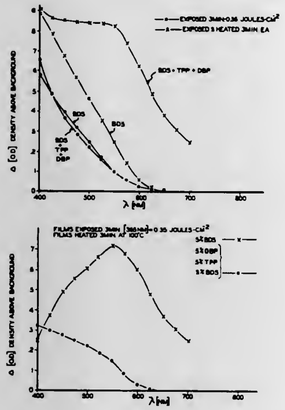
Dana G. Marsh, Rochester, and Joseph Y. C. Chu, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 13, 1976, Ser. No. 749,635
Int. Cl.² G03C *1/84*
U.S. Cl. 96—88 **10 Claims**

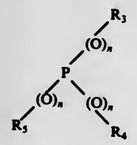
1. A microimaging composition comprising a film of an organic polymer as matrix material having uniformly dispersed therein:
i. a photochemically reactive organo diselenide characterized by the formula:

R_1—Se—Se—R_2

wherein R_1 and R_2 are aralkyl or alkyl hydrocarbon moieties; and

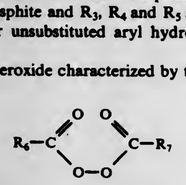


ii. a tertiary phosphine or phosphite characterized by the formula:



wherein each n is 0 in the case of a phosphine and 1 in the case of a phosphite and R_3, R_4 and R_5 are independently substituted or unsubstituted aryl hydrocarbon moieties; and

iii. an organic peroxide characterized by the formula:



wherein R_6 and R_7 are aryl or substituted aryl.

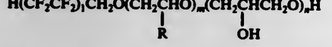
4,050,940

PROCESS FOR THE PREPARATION OF A PHOTOGRAPHIC MATERIAL

Teiji Habu; Masao Ishihara; Eiichi Sakamoto; Hiroshi Yamada, and Masaaki Kaneshige, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1976, Ser. No. 665,438
Claims priority, application Japan, Mar. 15, 1975, 50-31391
Int. Cl.² G03C *1/38, 1/02, 1/76, 1/78*
U.S. Cl. 96—114.5 **4 Claims**

1. A process for the preparaton of a gelatin-silver halide photographic layer thereon which comprises forming the layer by coating with a coating solution which contains a compound represented by the following formula:



wherein R is hydrogen or methyl, *l* is an integer of 2 to 10 inclusive, *m* is an integer of 0 to 50 inclusive, and *n* is an integer of 0 to 50 inclusive, provided that when *n* is 1, R is methyl, and further provided that both *m* and *n* are not 0 simultaneously.

4,050,941

HIGH RESOLUTION PHOTOHARDENABLE COATING COMPOSITIONS CONTAINING TETRACYANOETHANE COMPOUNDS

José Francisco Pazos, Claymont, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 20, 1976, Ser. No. 752,618
Int. Cl.² G03C *1/68, 5/00;* C08F *8/18*
U.S. Cl. 96—115 P **17 Claims**

1. A photohardenable coating composition which comprises

a. a substantially solid, organic composition comprising an addition polymerizable, nongaseous, ethylenically unsaturated compound capable of forming a high polymer by free-radical initiated chainpropagating addition polymerization, and a macromolecular, organic, polymeric binder.

b. 1.0–10% by weight, based on the total solvent-free coating, of an organic, radiation-sensitive free-radical generating system activatable by actinic radiation which initiates polymerization of the unsaturated compound, and

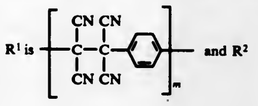
c. 0.04–3% by weight, based on the total solvent-free coating, of a tetracyanoethane compound of the formula

$$R^1C(CN)_2C(CN)_2R^2$$

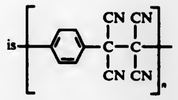
where R^1 and R^2 are both p-chlorophenyl or p-biphenyl, or R^1 is p-biphenyl and R^2 is



, or



and R^2



where m and n represent the number of repeat units, or R^1 and R^2 are joined together to form the $-CH(OC_2H_5)CH_2-$ radical, or

R^1 and R^2 are joined together to form the



radical.

4,050,942

NITROSO-DIMER-CONTAINING COMPOSITIONS AND PHOTOIMAGING PROCESS

George Raymond Nacci, Wilmington, Del.; assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 560,711, March 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 452,338, March 18, 1974, abandoned. This application May 21, 1976, Ser. No. 688,931
Int. Cl.² G03C *1/70, 1/727*
U.S. Cl. 96—115 R **17 Claims**

1. A photopolymerizable coating composition which comprises

1. at least one, nongaseous, ethylenically unsaturated compound capable of forming a high polymer by free-radical initiated chain addition propagation,
2. 3–95% by weight, based on the total composition, of an organic polymeric binder having a molecular weight of at least 4000,
3. 0.1–5% by weight, based on the total composition, of a nitroso dimer which is a noninhibitor of free-radical polymerization but thermally dissociates to nitroso monomer which is an inhibitor of free-radical polymerization, and is characterized by
   a. a dissociation constant of 10^{-2} – 10^{-10} in solution at 25° C, and
   b. a rate of dissociation having a half-life of at least 30 seconds in solution at 25° C; and
4. 0.1 – 0.9% by weight, based on total composition, of an organic, radiation-sensitive free-radical generating system.

12. A method for producing an image on a substrate by the process which comprises

a. applying to the substrate a layer of a photopolymerizable coating composition which comprises
   1. at least one, nongaseous, ethylenically unsaturated compound capable of forming a high polymer by free-radical initiated chain addition propagation,
   2. 3–95% by weight, based on the total composition, of an organic polymeric binder having a molecular weight of at least 4000,
   3. 0.1–5% by weight, based on the total composition, of a nitroso dimer which is a noninhibitor of free-radical polymerization but thermally dissociates to nitroso monomer which is an inhibitor of free-radical polymerization, and is characterized by
      a. a dissociation constant of 10^{-2} – 10^{-10} in solution at 25° C, and
      b. a rate of dissociation having a half-life of at least 30 seconds in solution at 25° C, and
   4. 0.1 – 2% by weight, based on total composition, of an organic radiation-sensitive free-radical generating system, with the proviso that when the amount of free-radical generating system is 1–2%, the weight ratio of nitroso dimer to free-radical generating system is greater than 2 to 1,

b. imagewise exposing the photopolymerizable layer through an image-bearing transparency at a temperature of 20°–65° C to radiation which activates the free-radical generating system to generate free-radicals, whereby the free-radicals are consumed by reaction with the nitroso monomer,

c. essentially completely deactivating the nitroso dimer inhibitor system,

d. reexposing at least the previously unexposed portion of the photopolymerizable layer to radiation which activates the free-radical generating system to generate free-radicals while continuing to maintain the nitroso dimer inhibitor system in the essentially completely deactivated state, whereby photopolymerization takes place, and

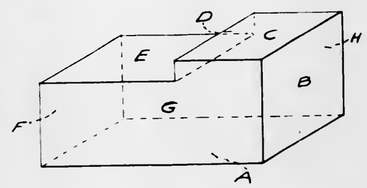
e. developing the resulting image.

4,050,943

TREATMENT MATERIAL AND METHOD FOR EXPOSED AGGREGATE CONCRETE CASTING

Ratanjit S. Sondhe, c/o H.S.H. Enterprises, Inc. 10643-B Kinsman Road, Newbury, Ohio 44065

Continuation-in-part of Ser. No. 322,065, Jan. 8, 1973, abandoned. This application Mar. 5, 1975, Ser. No. 555,353
Int. Cl.² C08L *1/28*
U.S. Cl. 106—12 **9 Claims**



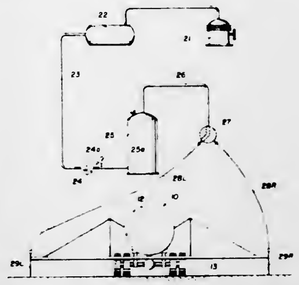
1. A composition for preventing the setting of concrete comprising by weight from 3% to 10% of a film former dissolved in from 84.5% to 95% of an aliphatic alcohol having 1 to 3 carbon atoms, and from 2% to 5.5% of a chelating compound; wherein said film former is a cellulose ether of the type which is soluble in both water and said aliphatic alcohol; and wherein said chelating compound is selected from the group consisting of citric, tartaric, and gluconic acids, the sodium and calcium salts of these acids, and mixtures thereof.

4,050,944

GROUND MARKING FOAM

Dwayne L. Cartwright, Dallas, Tex., assignor to Holloway Farm Supply, Inc., Whitewright, Tex.

Filed Feb. 23, 1976, Ser. No. 660,765
Int. Cl.² B01J *13/00*
U.S. Cl. 106—19 **7 Claims**



1. A composition effective for producing an agricultural ground marking foam by passing air therethrough, comprising a concentrate to be further extended with water in the ratio of about 1 part concentrate to 80 parts water, by volume; said concentrate consisting essentially of:

sodium lauryl sulfate functioning as a foam producing ingredient; said foam producing ingredient comprising of 5 to 12 percent of the concentrate by weight;

n-lauryl betaine functioning as a foam stabilizer; said foam stabilizer comprising 1 to 10 percent of said concentrate by weight;

and water functioning as a diluent; said diluent comprising 70 to 90 percent of said concentrate by weight.

4,050,945
HEAT-SENSITIVE COLOR-PRODUCING COMPOSITIONS AND ARTICLES USING SAME

Yoshio Suzuki, 2-1438 Owada-cho, Omiya, Saitama, Japan

Filed July 8, 1974, Ser. No. 486,299
Int. Cl.² C09D *11/02, 11/12*
U.S. Cl. 106—21 9 Claims

1. A heat sensitive recording member comprising:
a uniform mixture of a first metallic compound reactant, a second chelating compound reactant and a binder, said first and second reactants being adapted to react with one another to produce a colored chelated compound, said first and second reactants being physically separated by a heat-fusible material having a melting point of from about 60° to 150° C, at least one of said first and second reactants being encapsulated in said heat-fusible material, said heat-fusible material being of a different composition from said binder.

4,050,946
GLASSES, THERMALLY STABLE HIGH (BETA)-CRISTOBALITE GLASS-CERAMICS AND METHOD

Chi-Tang Li, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 320,788, Jan. 3, 1973, abandoned. This application Oct. 22, 1976, Ser. No. 734,911
Int. Cl.² C03C *3/22, 3/04*
U.S. Cl. 106—39.6 13 Claims

1. A glass-ceramic having stabilized high-cristobalite solid solution crystal phase formed by thermal in situ crystallization of a glass consisting essentially of the composition $MO.Al_2O_3.nSiO_2$ wherein the Al_2O_3/MO molar ratio is 1 and MO is a member of the group consisting of CaO and a mixture of CaO and a metal oxide wherein the metal is a cation selected from iron and the first, second and fourth groups of the Periodic Table and the molar ratio of CaO to said metal oxide is from 4:1 to 1:3 and n is a positive number of from 8 to 37.

4,050,947
PROCESS FOR OPALIZING GLASS

Raymond E. Ahlgren; Daniel W. Schwoerer, and Boyce H. Lundstrom, all of Portland, Oreg., assignors to Bullseye Glass Co., Portland, Oreg.

Filed Mar. 17, 1976, Ser. No. 667,494
Int. Cl.² C03C *3/04, 3/08*
U.S. Cl. 106—52 6 Claims

1. A glass making batch for the production of a spontaneous opal glass containing essentially, in weight percent, of:
40–85% of a cullett which, in weight percent, contains about 72% SiO_2, 13% Na_2O, 12% CaO, and 3% metal oxide selected from the group consisting of aluminum oxides, iron oxides and mixtures thereof;
3–19% SiO_2; and
an amount of AlF_3 which is 10–30% of the weight of the cullett.

4,050,948
METHOD OF MAKING LIGHTWEIGHT CEMENT SLURRIES AND THEIR USES

Richard G. Gandy, Grand Prairie, and Vincent Cobee White, Arlington, both of Tex., assignors to BJ-Hughes Inc., Long Beach, Calif.

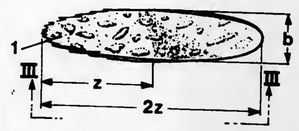
Filed Mar. 23, 1976, Ser. No. 669,587
Int. Cl.² C04B *7/35*
U.S. Cl. 106—76 7 Claims

1. A method of making lightweight cement slurry capable of setting to provide a lightweight set cementitious composition, the method consisting essentially of
forming a solution of sodium metasilicate and an activator in mix water and, thereafter, mixing Portland cement and said solution to provide a cement slurry, the proportions of said solution and said Portland cement being selected to provide a slurry having a density of about 11 to 14 pounds per gallon of slurry, and wherein the amount of said sodium metasilicate is from about 1% to 3% by weight of the weight of said Portland cement, and the amount of said activator is from about 1% to 3% by weight of the weight of said Portland cement.

4,050,949
REINFORCING MATERIAL FOR CONCRETE

Bengt G. S. Lundgren, Ulricehamn, and Sture B. G. Outling, Partille, both of Sweden, assignors to SKF Nova AB, Gothenburg, Sweden

Filed Nov. 24, 1975, Ser. No. 634,319
Claims priority, application Sweden, Nov. 26, 1974, 7414809
Int. Cl.² B22D *23/08;* C04B *31/18*
U.S. Cl. 106—97 12 Claims



1. A reinforcing material for concrete said material being a multitude of short and substantially straight steel reinforcing elements of substantially rectangular cross section and small thickness in relation to their length and width, intended to be uniformly distributed and randomly orientated in the concrete, characterized in that the elements are relatively difficult to crush steel flakes with a shape tapering towards the ends of the flakes, said flakes having a thickness of from about 0.1 mm to about 0.5 mm and a length of at least about 100 times the thickness.

4,050,950
CONTROLLED DENSITY FILL MATERIAL CONTAINING FLY ASH

William E. Brewer, Toledo, Ohio, and Franklin V. Zimmer, Southfield, Mich., assignors to K-Krete, Inc., Toledo, Ohio

Division of Ser. No. 475,579, June 3, 1974. This application Dec. 3, 1975, Ser. No. 637,463
Int. Cl.² C04B *13/22*
U.S. Cl. 106—97 11 Claims

1. A controlled density fill material consisting essentially of 2% to 6% by weight of Portland cement, 2% to 10% by weight of fly ash, 70% to 90% by weight of aggregate and 5% to 15% by weight of water, the fill material being sufficiently placeable and flowable that tamping or vibrating is unnecessary and having a concrete-comparison 28-day compressive strength of less than 1400 psi, whereby the material may be easily re-excavated.

4,050,951
PROCESS FOR THE POST-TREATMENT OF TITANIUM DIOXIDE PIGMENTS

Luigi Piccolo; Benedetto Calcagno, both of Milan, and Emilio Bossi, Fagnano Olona (Varese), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 5, 1975, Ser. No. 638,161
Claims priority, application Italy, Dec. 20, 1974, 30816/74
Int. Cl.² C09C *1/36*
U.S. Cl. 106—300 14 Claims

1. A method for the post-treatment of titanium dioxide pigments, which comprises flowing in an elongated tubular reaction zone a suspension of subdivided particles of titanium dioxide of a size from about 0.1 to 1 micron in a stream of carrier gas in which particle concentration is from 5 to 50 Kg per m^3 of carrier gas at a temperature of from 100° to 250° C, injecting into said stream at one or more points along said tubular reaction zone a gaseous flow of one or more halides selected from the group consisting of the halides of aluminum, silicon and titanium in an overall amount corresponding to from 1 to 20% by weight, calculated as oxides, with respect to the feed in titanium dioxide, and injecting, downstream of each point of injection of said gaseous flow at a distance from the latter sufficient to allow the homogenization of the resulting mixture therein, a flow of steam in said mixture in an amount of from the stoichiometric value required for the transformation into hydroxides of said halides injected at said point to 50% in excess with respect to said stoichiometric value.

4,050,952
METHOD OF PRESERVING HONEY

David Edmund Liebl, 1136 Drake St., Madison, Wis. 53715

Filed Nov. 19, 1976, Ser. No. 743,527
Int. Cl.² A23L *1/08*
U.S. Cl. 127—46 R 1 Claim

1. A method for (preserving) treating honey which comprises exposing the honey to (ultrasonic sound, 18,000–20,000 Hertz or higher, to inhibit crystallization and fermentation of the honey) ultrasound radiation of at least 18,000 Hertz in a temperature range of 50° to 100° Fahrenheit for less than 5 minutes whereby crystallization and fermentation of the honey are inhibited.

4,050,953
PROCESS FOR CONTINUOUSLY PRODUCING SUGAR

Norio Nakazato; Kosai Hiratsuka, and Tokinobu Furukawa, all of Kudamatsu, Japan, assignors to Hitachi, Ltd., Japan

Filed June 21, 1976, Ser. No. 698,080
Claims priority, application Japan, June 24, 1975, 50-76903
Int. Cl.² C13F *1/02;* C13G *1/00*
U.S. Cl. 127—60 7 Claims



1. In a process for continuously producing sugar from an aqueous sugar solution in a continuous sugar evaporator-crystallizer having a plurality of evaporating-crystallizing vessels, each evaporating-crystallizing vessel being a stage, each stage communicated one to another in series and provided with a means for feeding an aqueous sugar solution, a heating means and a means for withdrawing generated steam, by feeding the aqueous sugar solution to each evaporating-crystallizing stage, heating the aqueous sugar solution in each evaporating-crystallizing stage, thereby evaporating water from the solution and crystallizing sugar crystals, and withdrawing the generated steam from each of the stages, while feeding sugar crystals to the first evaporating-crystallizing stage and withdrawing the resulting sugar crystal slurry from the last evaporating-crystallizing stage, the improvement which comprises providing a sugar crystal distance of 0.26 to 0.59 mm in the solution in the first evaporating-crystallizing stage.

4,050,954
SURFACE TREATMENT OF SEMICONDUCTOR SUBSTRATES

Jagtar S. Basi, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

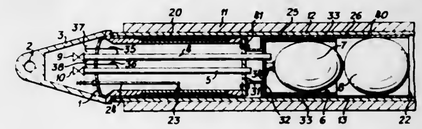
Filed Mar. 25, 1976, Ser. No. 670,508
Int. Cl.² C03C *23/00*
U.S. Cl. 134—2 13 Claims

1. In a method of cleaning a silicon wafer polished with a metal oxide polishing medium, the improvement comprising: establishing hydrophilic surfaces on said wafer by oxidation thereof with an oxidizing agent selected from the group consisting of alkali metal hypohalites, and dichromates and permanganate salts of alkali metals in sulfuric acid, and including the step of treating the hydrophilic formed surfaces with an NH_4OH solution.

4,050,955
METHOD AND APPARATUS FOR LAUNCHING PIPELINE CLEARING SPHERES

Donald Alan Southgate, London, England, assignor to The British Petroleum Company Limited, London, England

Filed Apr. 1, 1975, Ser. No. 564,129
Claims priority, application United Kingdom, Apr. 10, 1974, 15912/74
The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.
Int. Cl.² B08B *9/04*
U.S. Cl. 134—8 3 Claims



1. An underwater pipeline apparatus for closing an open end of a pipeline and for carrying and launching at least one pipeline clearing sphere for clearing the pipeline, said apparatus comprising in combination:
i. a tubular member having a given diameter for holding a pipeline clearing sphere and having an open end for inserting in the open end of a pipeline and a transverse closure opposite said open end, said closure being spaced from the open end a distance sufficient to permit the clearing sphere to be positioned therebetween;
ii. an outwardly radially expanisble gripping and sealing means associated with the tubular member and actuatable by a fluid under pressure to grip the inside of a pipeline and seal thereagainst;
iii. means for supplying said fluid to actuate said gripping and sealing means; and
iv. means for introducing compressed gas to the interior of the tubular member to displace the pipeline clearing sphere from the interior of the tubular member into the interior of the pipeline wherein the tubular member has an aperture in the wall thereof at a position so that gas can be released therethrough from the space between the location in the tubular member to be occupied by a spere and the transverse closure of the tubular member and the walls thereof, and means for admitting water to the interior of the space, whereby the water in said space acts to overcome sphere distortion when the apparatus is submerged.

3. A method of clearing a pipeline using a pipeline clearing apparatus which method comprises:
i. sucking a pipeline clearing sphere into a tubular member having a closed and open end by partly evacuating the member, said sphere and closed end defining a space therebetween;
ii. admitting water to, and releasing air from, the space

between the sphere and the closed end of the tubular member whereby the admitted water in said space acts to overcome sphere distortion when the apparatus is submerged;

iii. inserting the open end of the tubular member in the open end of a submerged pipeline;

iv. sealingly engaging the open end of the tubular member to the pipeline; and

v. supplying compressed gas to the space between the sphere and the closed end to displace the sphere into the pipeline and along the inside thereof to thereby clear the pipeline.

4,050,956

CHEMICAL BONDING OF METALS TO CERAMIC MATERIALS

Henderikus Johannes de Bruin, Bellvue Heights, and Charles Edward Warble, Glen Waverley, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell and The Flinders University of South Australia, Bedford Park, both of Australia

Continuation-in-part of Ser. No. 360,848, May 16, 1973, abandoned, which is a continuation of Ser. No. 117,511, Feb. 22, 1971, abandoned. This application June 18, 1975, Ser. No. 588,171

Claims priority, application Australia, Feb. 20, 1970, 0390/70

Int. Cl.² C23F *7/00*

U.S. Cl. 148—6 **26 Claims**

1. A method for chemically bonding a body of a refractory oxide ceramic selected from the group consisting of oxides of metals of groups II, III, IV and VIII of the Periodic Classification of the Elements and mixtures of such oxides, in chemical combination and physical admixture to the body of a metal selected from the group consisting of metals having atomic numbers between 21 and 29 inclusive in the first transition series between 39 and 47 inclusive in the second transition series and between 57 and 79 inclusive in the third transition series; the method comprising disposing selected surfaces of the bodies to be bonded in abutting relationship and heating at least the abutting surfaces in an atmosphere consisting of air to a temperature below the melting point of the lowest melting component of the system, the temperature sufficient to bring about a chemical reaction between the ceramic oxide and the metal thereby forming a bond between the said surfaces.

4,050,957

PROCESS FOR THE PASSIVATION OF FERROSILICON

Maurice Sales, Ville Longue, France, assignor to Societe Pyreneenne du Silico-Manganese, Paris, France

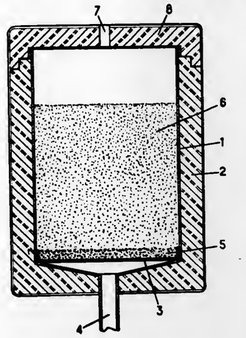
Continuation of Ser. No. 348,468, March 27, 1973, abandoned, which is a continuation of Ser. No. 52,879, July 7, 1970, abandoned. This application Oct. 8, 1975, Ser. No. 620,742

Claims priority, application France, July 10, 1969, 69.23581

Int. Cl.² C23C *11/00*

U.S. Cl. 148—6.3 **5 Claims**

1. A process for the passivation of discrete particles of ferrosilicon containing 30 to 90% by weight silicon comprising contacting said ferrosilicon particles with a gaseous oxidizing agent containing a gaseous inorganic acid, said gaseous oxidizing agent being selected from the group consisting of air, oxygen, steam or carbon dioxide, at a temperature between



about 800° and 1150° C for a period of time ranging between about one and twelve hours.

4,050,958

METHOD OF REMOVING SURFACE DEFECTS OF A STEEL PRODUCT

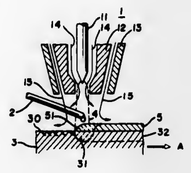
Wataru Shimada, and Seigo Hiramoto, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1976, Ser. No. 657,941

Claims priority, application Japan, Feb. 28, 1975, 50-25278

Int. Cl.² B23K *9/16*

U.S. Cl. 148—9.5 **4 Claims**



1. In a method of removing surface defects of a steel product by melting the defects of the surface with an arc, the improvement characterized by

using an arc generator which comprises a non-consumable electrode protected with an inert gas and means for shielding a molten pool formed on the surface of the steel product from air with a shield gas, comprising mainly carbon dioxide gas, and

applying a deoxidizer to the molten pool to deoxidize it and cover the surface of the molten pool with a slag formed therewith by the deoxidizer which is oxidized.

4,050,959

PROCESS OF MAKING A HIGH STRENGTH COLD REDUCED STEEL SHEET HAVING HIGH BAKE-HARDENABILITY AND EXCELLENT NON-AGING PROPERTY

Kazuhide Nakaoka; Kenji Araki, both of Yokohama; Koji Iwase, Machida; Yasuo Koike, Yokohama, and Shiro Fukunaka, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 14, 1975, Ser. No. 631,929

Claims priority, application Japan, Nov. 18, 1974, 49-132006

Int. Cl.² C21D *9/46*

U.S. Cl. 148—12.3 **7 Claims**

1. A process of making a high strength cold reduced steel having both high bake-hardenability and excellent non-aging property consisting essentially of controlling the chemical composition of the steel within the following range in the steel making stage:

C	0.02 to 0.12%
Mn	10 × [S] to 2.00%
[N] [N]	0.003 to 0.02%
Al	$<5 \times 10^{-4}/[N]$ %
[S] [S]	0.005 to 0.023%,

the steel is hot rolled, pickled and cold reduced, and the cold-reduced steel strip so obtained is subjected to the following full continuous annealing process:

heating-up step	Ac_1 to 900° C.
holding time	5 to 180 seconds at a temperature of from Ac_1 to 900° C.
rapid cooling step	quenching to room temperature from Ac_1 to 900° C. in a water jet stream
reheating step	from the room temperature to a temperature of from 150 to 450° C.
tempering step	holding at a temperature of from 150 to 450° C. for from 5 to 300 seconds, and
final step	cooling from 150 to 450° C. to room temperature and coiling.

4,050,960

METHOD FOR DECREASING THE AMOUNT OF CARBON AND NITROGEN CONTAINED IN THE FERROCHROME ALLOY

Yasushi Nakamura; Michihisa Itou, both of Tokyo, and Mitsuo Uchimura, Yokohama, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 531,218, Dec. 10, 1974, abandoned. This application June 7, 1976, Ser. No. 693,621

Claims priority, application Japan, Dec. 11, 1973, 48-137372

Int. Cl.² C21D *1/74;* C22F *1/02*

U.S. Cl. 148—16 **4 Claims**

1. A method for decreasing the carbon and nitrogen content of pulverized ferrochrome alloy which comprises pulverizing a molten bath of the ferrochrome alloy having a carbon content of 0.1% or less in an atomizing operation by the use of a jet of a cooling water to produce ferrochrome alloy particles of a size of 1 mm to 0.05 mm and further under such condition as to generate an oxide film of 1 μ or less on the surface of said particles, said water containing oxygen dissolved therein of 1.5 ml or less per 1 l of the water at 20° C, the atmosphere in which the atomizing operation is effected being maintained at 5% or less oxygen, and thereafter heating the particles in a hydrogen stream at a temperature between 1000° C and 1300° C for about 3 to 20 hours to cause carbon in the alloy to react with the oxide film on the surface of said particles whereby the carbon is removed from said particles, nitrogen being removed by said hydrogen stream.

4,050,961

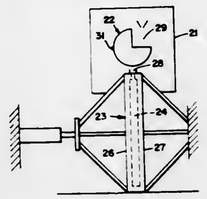
METHOD FOR CASTING ANODES

Bill J. Knight, 7315 S. Settler Ave., Tucson, Ariz. 85706

Filed Nov. 22, 1974, Ser. No. 526,161

Int. Cl.² B22D *25/04, 35/04*

U.S. Cl. 148—32 **23 Claims**



1. In a method of casting an insoluble anode including the steps of heating a lead alloy to a molten condition and pouring the molten lead alloy into a suitable mold, the improvement comprising the additional steps of

arranging the mold in a vertical configuration and providing an opening along the entire length of the mold for introducing molten lead alloy thereinto,

selecting the temperature of the molten lead alloy at a predetermined differential above its melting point,

maintaining the temperature of the mold at a predetermined temperature substantially below the melting point, and

thereafter continuously streaming the molten lead alloy into various distinct portions of the opening; proportionately along substantially its entire length in order to achieve intimate and complete filling of the mold with minimum flow of the molten lead alloy thereby being necessary.

4,050,962

MANUFACTURE OF FERROMAGNETIC, ACICULAR METALLIC IRON PARTICLES BY HYDROGEN REDUCTION

Eberhard Koester, Frankenthal; Gerd Wunsch, Speyer; Eduard Schoenafinger, Ludwigshafen, and Henning Schaechage, Musterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed July 14, 1975, Ser. No. 595,562

Claims priority, application Germany, July 16, 1974, 2434096

Int. Cl.² H01F *1/02*

U.S. Cl. 148—105 **8 Claims**

1. A process for the manufacture of acicular ferromagnetic iron metal particles which comprises the steps of:

a. dispersing acicular iron oxide in a solution of an alkaline earth metal salt in a solvent wherein the alkaline earth metal cation of said metal salt is selected from the group consisting of calcium, barium and strontium, and the acid anion of said metal salt is selected from the group consisting of aliphatic monobasic, dibasic and tribasic carboxylic acid anions of from 2 to 6 carbon atoms;

b. removing the solvent by evaporation, said alkaline earth metal salt being applied to said acicular iron oxide in an amount of from 0.2 to 10% by weight based on the iron oxide employed; and

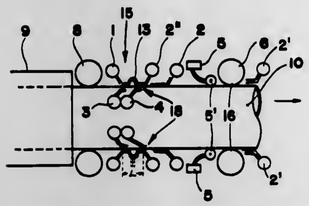
c. reducing the so-treated pulverulent acicular iron oxide by passing gaseous hydrogen at a temperature of from 230 to 350° C over said treated iron oxide to form acicular iron metal particles retaining the acicular shape of the acicular iron oxide starting material and being from 0.1 to 0.6 μm in length with a length-to-thickness ratio of from 10 to 25:1.

4,050,963

METHOD OF QUENCHING LARGE-DIAMETER THIN-WALL METAL PIPE

Kazuo Kunioka, Yokohama; Yutaka Mihara, Tokyo, and Takao Noguchi, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1976, Ser. No. 652,576
Claims priority, application Japan, Jan. 31, 1975, 50-12380
Int. Cl.² C21D *9/08*
U.S. Cl. 148—128 **8 Claims**



1. A method of quenching a large-diameter thin-walled metal pipe comprising the steps of:
moving the metal pipe through a heating zone;
passing the pipe through a cooling zone following passage of the pipe through the heating zone, the cooling zone including a plurality of nozzles;
spraying a cooling liquid onto the pipe from the nozzles so as to quench the pipe at a velocity in the range of from 0.5 m/sec to 7 m/sec;
detecting the amount of strain on the outer periphery of the quenched pipe in a radical direction at a plurality of positions at the rear end of the cooling zone, as seen in the direction of movement of the pipe, to obtain a deviation of a detected value from a preset value; and
adjusting the amount of cooling liquid sprayed on the pipe from the nozzles in accordance with the amount of deviation from the preset value, whereby the adjusted cooling water spray controls the deviation of the pipe emerging from the cooling zone.

4,050,964

GROWING SMOOTH EPITAXIAL LAYERS ON MISORIENTED SUBSTRATES

Daniel Leon Rode, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 636,564, Dec. 1, 1975, abandoned. This application Feb. 23, 1976, Ser. No. 660,472
Int. Cl.² H01L *21/208, 21/205*
U.S. Cl. 148—171 **8 Claims**

1. A process of epitaxially depositing semiconductor material on a semiconductor substrate comprising the step of misorienting the growth surface from a crystallographic plane of the substrate by an angle approximately equal to the angle between the treads and risers of terraces which would be formed at the growth temperature if the epitaxial layer were deposited on a surface nominally parallel to said plane

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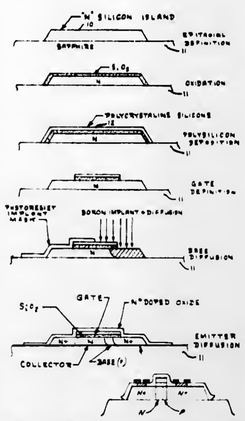
4,050,965

SIMULTANEOUS FABRICATION OF CMOS TRANSISTORS AND BIPOLAR DEVICES

Alfred C. Ipri, Princeton, N.J., and John C. Sarace, Mission Viejo, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 21, 1975, Ser. No. 624,515
Int. Cl.² H01L *21/84, 21/265*
U.S. Cl. 148—175 **1 Claim**

1. A process for the fabrication of a bipolar device being comprised of forming a dielectric substrate of sapphire, depositing an epitaxial layer of semiconducting material thereupon in a single crystal fashion, forming semiconductor islands by an etching technique leaving regions of material where the bipolar device is to be formed, oxidizing the formed semiconductor islands, depositing poly-crystalline silicon thereupon, defining the deposited poly-crystalline silicon, base doping the bipolar device on one side of the device, diffusing the base doping, N+ doping for the emitter of the bipolar device with the edge



of the formed poly-silicon gate being the diffusion edge for both the base and emitter diffusion, the N+ doping also making better contact to the collector region, as well as for source-drain n-channel device doping, P+ doping for "p" channel source drain, base contacting, driving in diffusion sources N+ and P+, opening contacts, and forming metal interconnects to complete the circuit.

4,050,966

METHOD FOR THE PREPARATION OF DIFFUSED SILICON SEMICONDUCTOR COMPONENTS

Rudolf Wolfle, Gilching; Dieter Rucker, Hohenschaftlarn, and Uta Lanerer, Neugermering, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Continuation of Ser. No. 884,616, Dec. 12, 1969, abandoned. This application June 19, 1975, Ser. No. 588,516
Claims priority, application Germany, Dec. 20, 1968, 1816082
Int. Cl.² H01L *21/228*
U.S. Cl. 148—188 **3 Claims**

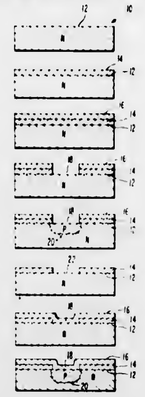
1. In a method of preparing semiconductor components of silicon having at least two zones of different conduction type produced by diffusion from dopant-containing solid substance applied to the surface of a semiconductor crystal, the solid substance being at least one layer of nickel substantially 0.2 μ thick and containing a concentration of from 3 to 10 percent of respective dopant, the nickel layer including the dopant contained therein being deposited chemically upon selected zones of the semiconductor crystal surface, and the dopant at the selected zones being diffused into the respective zones from a respective layer of nickel containing the dopant to form zones of different conduction type, the improvement therein which comprises carrying out the diffusion of the dopant into the semiconductor crystal in two steps which consist of diffusing a series of disks formed of semiconductor crystal and separated by respective spacers until a liquid phase is no longer present at the respective surface of the crystal disks, and thereafter removing the spacers and packing the crystal disks tightly against one another and completing the diffusion thereof.

4,050,967

METHOD OF SELECTIVE ALUMINUM DIFFUSION

Wojciech Rosnowski, Summit, and Samuel Ponczak, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 9, 1976, Ser. No. 749,179
Int. Cl.² H01L *21/223, 21/225*
U.S. Cl. 148—189 **10 Claims**



1. A method of selectively diffusing aluminum into a wafer including a silicon body having a surface comprising:
forming a masking layer comprising a layer of silicon dioxide and a layer of polycrystalline silicon on a surface of said body;
forming an opening in at least one of said layers thereby defining a masked portion and an unmasked portion of said surface;
subjecting said wafer, including both the unmasked portion of said surface and said masked portion to a source of aluminum impurities; and
diffusing said aluminum through said opening and into said body.

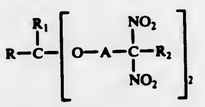
4,050,968

EXPLOSIVE COMPOSITION CONTAINING A HYDROXYALKYL ACRYLATE COPOLYMER BINDER

Samuel Goldhagen, Sacramento, Calif.; Harry Heller, Silver Spring, Md., and Julius Rothenstein, Citrus Heights, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1970, Ser. No. 29,623
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.4 **16 Claims**

1. A cured explosive composition comprising (1) an explosive, (2) a readily curable elastomeric polymer which is derived from 2,2-dinitropropyl acrylate and at least one hydroxy alkyl acrylate; (3) a diluent or plasticizer selected from the group consisting of diluents or plasticizers represented by the formula



wherein R is hydrogen or alkyl; R_1 is hydrogen or alkyl; R_2 is hydrogen, alkyl, halogen, nitroalkyl, aryl, cycloalkyl, haloalkyl or nitrazaalkyl; and A is alkylene; and (4) a polyisocyanate curing agent.

4,050,969

CATALYTIC SYSTEM AND POLYURETHANE PROPELLANTS

Adolf E. Oberth, Fair Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 29, 1976, Ser. No. 727,723
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.4 **4 Claims**

1. In a propellant composition comprising:
a. an oxidizer component;
b. a polyurethane fuel component; and
c. the improvement comprising as a curing catalyst a ferric compound selected from the group consisting of ferric bis(acetylacetonato) chloride, ferric bis (acetylacetonato) perchlorate, ferric bis (acetylacetonato) mandalate, and ferric bis (acetylacetonato) p-toluenesulfonate.

4,050,970

STABILIZED NITRATO-ALKANOL EXPLOSIVE COMPOSITION

George Heary Barnett, Kew, Australia, assignor to ICI Australia Limited, Melbourne, Australia

Filed Nov. 21, 1975, Ser. No. 634,179
Claims priority, application Australia, Dec. 9, 1974, 9949/74
Int. Cl.² C06B *25/00*
U.S. Cl. 149—88 **19 Claims**

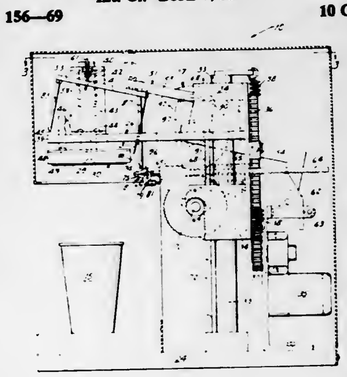
1. An aqueous composition of matter comprising at least one nitrato-alkanol and a stabilizingly effective amount of one or more derivatives of carbamic acid sufficient to maintain the pH of said aqueous composition between about 4 and about 8.

4,050,971

DEVICE FOR FUSING LENGTHS OF FILM OVER THE OPEN ENDS OF CUPS

Wayne R. Verkins, St. Anthony; Richard T. Podvin, Fridley, and Karl Frederick Rist, III, Oakdale, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 19, 1976, Ser. No. 659,234
Int. Cl.² B65B *7/00*
U.S. Cl. 156—69 **10 Claims**



1. A device for applying predetermined lengths of a heat sealable film over the open end of a cup from a supply length of the film, said device comprising:
clamp means comprising jaws having projecting terminal ends adapted for engagement with a said film, means mounting said jaws for relative movement between a closed position affording engagement of the terminal ends of the jaws on opposite sides of a said film and an open position at which the terminal ends of the jaws are spaced

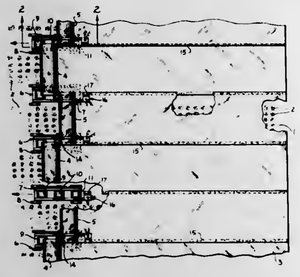
to afford movement of a said film therebetween, and
means for releasably retaining said jaws at either their open or closed positions;
means for advancing said clamp means from a first position to a second position, said positions being spaced a distance equal to said predetermined length;
means at said first position for moving said jaws from said open position to said closed position to afford engagement of said jaws with an end portion of a said film;
means at said second position for moving said jaws from said closed position to said open position to afford release of a said predetermined length of film upon application thereof to a said cup;
means adapted for supporting a said cup in said device;
means for providing relative movement between said means adapted for supporting and a said predetermined length of the film extending between said first and second positions, said means for providing relative movement being adapted to bring the lip of the cup into full circle engagement with one surface of the predetermined length of film;
means for applying heat and pressure to fuse said predetermined length of film to the lip of said cup when the predetermined length of film is in engagement with the cup; and
means for severing the applied predetermined length of film from the supply length of film.

4,050,972

LAYING DOWN OF LARGE SHEETS OF FILM

Daniel E. Cardinal, Jr., 1352 Estate Lane, Lake Forest, Ill. 60045

Filed Feb. 25, 1977, Ser. No. 772,305
Int. Cl.² B32B *31/08*
U.S. Cl. 156—71 **8 Claims**



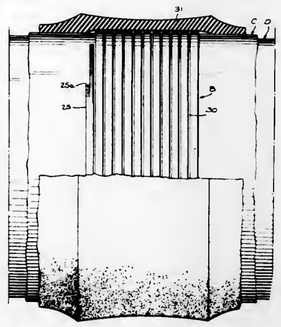
6. A method of protecting a large field with a removable film sheet, said method comprising:
a. externally supporting on a transport assembly a plurality of short rolls of film in generally end-to-end but staggered relationship so that the ends of said rolls overlap,
b. driving said assembly in one direction down the field,
c. simultaneously rotating said rolls in one direction to thereby unwind said film in edge-to-edge overlapping relationship and lay it onto the field,
d. and joining the overlapping edges of said film as it is unwound so that it is laid down in a unitary sheet.

4,050,973

METHODS OF BUILDING ZERO DEGREE BELTED TIRES, USING HIGH SOFT STRETCH BELT-FORMING TAPES

James J. Neville, Kinnelon; Wesley Ferrell, Wayne, and Daniel Schichman, Cedar Grove, all of N.J., assignors to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 160,675, July 8, 1971, Pat. No. 3,774,662.
This application May 10, 1973, Ser. No. 359,191
Int. Cl.² B29H *17/14, 17/20*
U.S. Cl. 156—123 R **13 Claims**



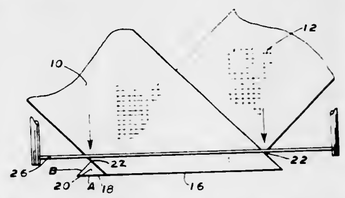
1. The method of single-stage building a raw 0° belted tire; said method comprising the steps of:
A. building on a tire building drum a tire carcass having at least in the medial region thereof a building diameter substantially less than the ultimate diameter of the corresponding crown region of the toroidally shaped carcass; and
B. building on said medial region of said as built carcass while the latter is maintained substantially at said building diameter a circumferentially extending reinforcing cord-constituted 0° belt-forming structure having
1. a high radial expansibility and
2. no circumferentially adjacent laterally directed cut cord ends along either side edge;
C. the building of said 0° belt-forming structure comprising the steps of
1. providing high "soft stretch" reinforcing cord tape constituted of
a. a plurality of reinforcing cords disposed in side by side relation and
i. each having a respective multiplicity of undulations therein
ii. which in any given straight length of said tape are substantially planar, with the plane of each undulation in each cord being substantially parallel to the plane of the corresponding undulation in each next adjacent cord, and with said undulations in each cord being out of lateral alignment with said undulations of each next adjacent cord,
iii. and which undulations enable said tape to be elongated, without any stretching of said cords, by straightening of the latter to remove said undulations therefrom, and
b. relatively weak tying means acting on said cords at the regions of intersection of said undulations and releasably holding said cords in the undulating state thereof, said tying means being constructed
i. to hold said cords against straightening under moderate forces such as are applied to said tape during normal handling thereof and the building of said belt-forming structure,
ii. but to yield and permit said cords to straighten out under appreciably higher forces such as are applied to said tape when said belt-forming structure composed thereof and said as built carcass undergo a radial expansion during shaping,
c. the magnitude of said undulations of said cords being predetermined to provide a tape stretch ratio, defined as the ratio of the length of said cords when fully straight to the length of said tape when said cords are undulated, which is no greater than substantially equal to the expansion ratio of the tire, defined as the ratio of said ultimate diameter to said building diameter; and
2. helically winding said tape
a. circumferentially of said as built carcass in said medial region thereof
b. for at least a plurality of full turns
c. at an angle of substantially 90° to a plane including the axis of said as built carcass
d. until the desired width of said belt-forming structure is attained.

4,050,974

METHOD OF REDUCING INTERLINER REMNANT

Jules Borrin, 299 Sherman Ave., Teaneck, N.J. 07666

Filed Jan. 24, 1977, Ser. No. 761,979
Int. Cl.² B31F *5/00;* B32B *31/00*
U.S. Cl. 156—159 **7 Claims**



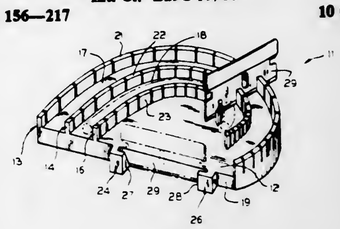
1. A method of reducing remnant upon the cutting of interliner blanks from a plurality of bias-cut strips of square-woven interlining material, which comprises:
providing first and second strips of a thermoplastic interlining material, bias-cut from a square-woven sheet, said strips having upper and lower planar surfaces bounded by parallel bias-cut side edges, parallel butt end edges and substantially the same widths;
superposing a portion of the lower surface of the first strip over a portion of the upper surface of the second strip with a portion of a butt end edge of said first strip superposed over a portion of a butt end edge of said second strip, said superposed butt end edges being aligned with each other and each aligned butt end edge of each strip extending distally beyond one bias-cut side edge of the opposite strip a given distance;
fusing the first and second strips together along a thin line traversing the width of said strips along a line parallel to said aligned butt end edges, a distance from said aligned butt end edges equal to the distance from the point where said bias-cut edge of one strip intersects with said bias cut edge of the other strip (point 22 in the drawings);
severing to remove the portion of said strips between said thin line and the aligned butt end edges; and
using the fused strips as a source of interliner blanks.

4,050,975

O-RING SPLICING FIXTURE

A. Peter Draffone, Lombard, Ill., assignor to B.W. Darrah, Inc., Chicago, Ill.

Filed Sept. 22, 1976, Ser. No. 725,419
Int. Cl.² B29C *19/00*
U.S. Cl. 156—217 **10 Claims**



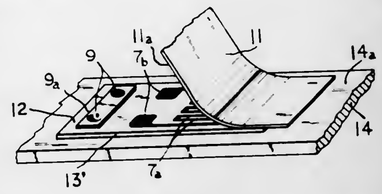
10. The method of fabricating O-rings from flexible cord material comprising steps of:
cutting the desired cord material to a length slightly larger than the circumference of the O-ring required;
forming a spiral of the cut cord material;
keeping the spiral formed cut cord material in a single plane thereby conforming the cord material at the ends to the arcuate shape determined by the desired finished O-ring;
cutting the spiral formed cord material along the diametral plane at a point on the spiral where its arcuate shape conforms to the arcuate shape determined by the desired finished O-ring to form one end;
repositioning the cut cord materials into the spiral with the other end at the point in the spiral so that its arcuate shape conforms to the shape of the finished O-ring;
trimming the other end along the diametral plane at the same point on the spiral; and
bonding the one end and the other end together to complete the O-ring forming a perfect circle with uniform cross-sectional stress.

4,050,976

STRAIN GAGE APPLICATION

Ludvigs O. Reiters, Natick, Mass., assignor to Bofors America, Inc., Edison, N.J.

Filed Jan. 27, 1976, Ser. No. 652,894
Int. Cl.² B32B *31/00, 15/08*
U.S. Cl. 156—233 **7 Claims**



1. In the preparation of a strain-gage, a method for application of fine electrically-conductive metallic foil grids in uncemented attachment to a specimen surface, comprising the steps of supporting a metallic foil grid upon a flexible backing, adhering the thus-supported grid to a tacky surface of a pressure-sensitive flexible tape, removing the backing, replacing the backing with a flexible layer less than about 0.001 inch thick and consisting essentially of a partly-cured fiber-reinforced thermosetting resin, placing and pressing the outer surfaces of the resin layer against a desired surface to which the grid is to be bonded while the tape and grid adhere, effecting a final curing of the resin layer which hardens the same while bond-

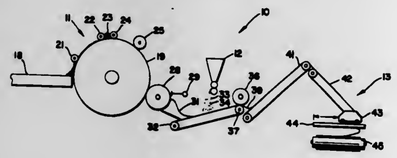
ing it both to the desired surface on one side and to the grid on the other, and stripping the tape to expose the grid after the resin layer is sufficiently hardened by curing to bond securely with the grid.

4,050,977

COMPOSITE BATT AND METHOD FOR PRODUCING SAME

George Sumner Buck, Jr.; Robert George Weyker, both of Memphis, and Arthur Gerard Ward, Arlington, all of Tenn., assignors to Fiberlok, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 507,485, Sept. 19, 1974, Pat. No. 3,993,518. This application Sept. 12, 1975, Ser. No. 612,858
Int. Cl.² B32B *31/00*
U.S. Cl. 156—283 3 Claims



1. A process for producing a layered composite batt comprising the steps of:

A. Producing a plurality of open webs of fibers,

B. Dispensing a particulate copolymer onto each open web of fibers;

C. Reciprocatively layering each web and the particulate copolymer carried therein to form a layer having an upper and a lower face,

D. Arranging the layers thus formed such that each layer produced is in face to face contact with at least one other layer, thereby forming a plurality of layers,

E. Heating the plurality of layers to a temperature above the melting point of the copolymer but below the scorching point of the fibers, thereby bonding the layers into a composite, and

F. Allowing the composite to cool to room temperature.

wherein Steps A, B, and C are used to produce a layer of cotton fibers having dispensed therein a particulate copolymer of vinyl chloride and vinylidene chloride and Steps A, B, and C are used to produce a layer of polyester fibers having dispensed therein a second particulate copolymer of vinyl chloride and vinylidene chloride and the layers thus produced are arranged according to Step D.

4,050,978

METHOD FOR PRODUCING LIGHT-WEIGHT CONSTRUCTION MEMBER

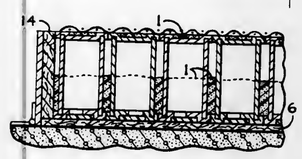
Alvin Edward Moore, Muskal Way, Diamondhead, Rte. 1, Bay St. Louis, Miss. 39520

Continuation-in-part of Ser. No. 399,800, May 14, 1973, Pat. No. 3,870,581, which is a continuation of Ser. No. 102,317, Dec. 29, 1970, abandoned. This application Apr. 21, 1974, Ser. No. 462,922

and an upper can-end plate that has an upwardly open recess;

C. placing on said upper can-end plates strength-providing network, having mesh sufficiently large for passage of moldable material thru it; and providing means holding at least portions of said network in contact with upper can-end plates;

D. inserting into the mold, thru said mesh, moldable material in fluent form, capable of setting into can-bracing material



and adhering to said cans and said can supporting element, sidewall-bracing portions of said material going around and bracing said sidewalls, and extending above said lower can-end elements and not being above said upper can-end plates other portions of its lodging in said upwardly facing recesses, only that part of said material lodging in said upper can-end recesses extending above said upper can-end plates;

E. allowing said fluent material to set; and taking from the mold the completed construction member.

4,050,979

PROCESS FOR THINNING SILICON WITH SPECIAL APPLICATION TO PRODUCING SILICON ON INSULATOR

Ronald K. Smeltzer, Dallas, and Kenneth E. Bean, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 429,228, Dec. 28, 1973, abandoned. This application Jan. 14, 1976, Ser. No. 649,130
Int. Cl.² H01L *21/306*
U.S. Cl. 156—647 9 Claims



1. A method of forming thin layers of silicon on an insulating substrate which comprises the steps of

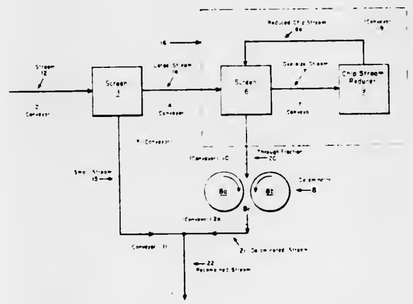
a. providing a silicon member having a first layer of one conductivity type and a second layer of opposite conductivity type and having a resistivity of at least an order of magnitude greater than said first layer and a concentration

4,050,980

SELECTIVE DELAMINATION OF WOOD CHIPS

Fred L. Schmidt, and Frank J. Steffes, both of Camas, Wash., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 527,772, Nov. 27, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 666,823
Int. Cl.² D21C *1/10*
U.S. Cl. 162—24 10 Claims



1. A selective delamination process for producing a high yield, uniform pulp having reduced pulp screen rejects, which comprises:

a. conveying a mill-wood chip stream to a primary means for separating by size the chip stream into respective first and second fractions on the basis of a chip thickness of about one-fourth inch, said first fraction consisting of wood chips having a thickness equal to or greater than about one-fourth inch and being retained by said primary separation means, and said second fraction consisting of wood chips having a thickness of less than about one-fourth inch;

b. conveying said first chip fraction to a means for reducing the size of said first chip fraction without imparting substantial compressive forces thereto and without substantial reduction in the fiber length of the chips in said first wood chip fraction;

c. conveying said reduced chip fraction to a secondary means for separating by size said reduced chip fraction into respective oversized and through-put chip fractions, the oversized chip fraction consisting of wood chips having a thickness equal to or greater than about one-fourth inch and being retained by said secondary separation means and said through-put fraction consisting of wood chips having a thickness of less than about one-fourth inch, said through-put fraction being more susceptible to

4,050,981

PROCESS FOR THE DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL BY MAINTAINING A CONCENTRATION OF CARBON MONOXIDE IN THE PRESENCE OF OXYGEN AND ALKALI

Allan Geoffrey Jamieson, Ornskoldsvik; Hans Olof Samuelsson, Goteborg; Leif Åke Smedman, Domsjo, and Kent Ivar Sundell, Ornskoldsvik, all of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed June 11, 1975, Ser. No. 586,114
Claims priority, application Sweden, June 14, 1974, 7407885; Jan. 22, 1975, 7500686
Int. Cl.² D21C *3/02, 9/02, 9/14, 11/06*
U.S. Cl. 162—37 37 Claims

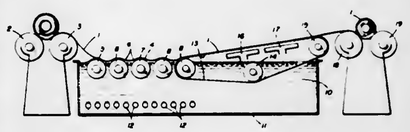
1. A process for the delignification of lignocellulosic material which comprises carrying out the delignification with oxygen gas and alkali in the presence of a gas phase comprising oxygen gas and carbon monoxide wherein the carbon monoxide is in a concentration within the range from about 1% to about 12% by volume of the gas phase while maintaining the carbon monoxide concentration within said range by withdrawing carbon monoxide and oxygen gas from the delignification, and separating and recycling withdrawn oxygen gas.

4,050,982

PROCESS AND APPARATUS FOR CONTINUOUSLY SHRINKING A NON-WOVEN SHEET

Robert Bolliand, Lyon, and Claude Saligny, Ecully, both of France, assignors to Rhone-Poulenc-Textile, France

Filed Apr. 16, 1974, Ser. No. 461,341
Claims priority, application France, May 18, 1973, 73.18439
Int. Cl.² D21D *3/00*
U.S. Cl. 162—100 5 Claims



1. A process for the continuous shrinking of a sheet of fibers containing heat-shrinkable fibers by means of a hot liquid, which comprises passing the sheet loosely over at least one cylinder partially immersed in a liquid maintained at a temperature which will cause shrinkage of the shrinkable fibers, said cylinder having a surface exposed above the liquid which is coated with a stable liquid film which prevents the sheet from touching the surface of the cylinder, said cylinder being rotated in the direction the sheet travels, and removing absorbed liquid from the sheet.

2. An apparatus for shrinking a sheet which contains heat-

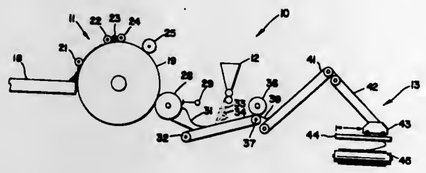
ing it both to the desired surface on one side and to the grid on the other, and stripping the tape to expose the grid after the resin layer is sufficiently hardened by curing to bond securely with the grid.

4,050,977

COMPOSITE BATT AND METHOD FOR PRODUCING SAME

George Sumner Buck, Jr.; Robert George Weyker, both of Memphis, and Arthur Gerard Ward, Arlington, all of Tenn., assignors to Fiberlok, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 507,485, Sept. 19, 1974, Pat. No. 3,993,518. This application Sept. 12, 1975, Ser. No. 612,858
Int. Cl.² B32B *31/00*
U.S. Cl. 156—283 3 Claims



1. A process for producing a layered composite batt comprising the steps of:
   A. Producing a plurality of open webs of fibers,
   B. Dispensing a particulate copolymer onto each open web of fibers;
   C. Reciprocatively layering each web and the particulate copolymer carried therein to form a layer having an upper and a lower face,
   D. Arranging the layers thus formed such that each layer produced is in face to face contact with at least one other layer, thereby forming a plurality of layers,
   E. Heating the plurality of layers to a temperature above the melting point of the copolymer but below the scorching point of the fibers, thereby bonding the layers into a composite, and
   F. Allowing the composite to cool to room temperature.
   wherein Steps A, B, and C are used to produce a layer of cotton fibers having dispensed therein a particulate copolymer of vinyl chloride and vinylidene chloride and Steps A, B, and C are used to produce a layer of polyester fibers having dispensed therein a second particulate copolymer of vinyl chloride and vinylidene chloride and the layers thus produced are arranged according to Step D.

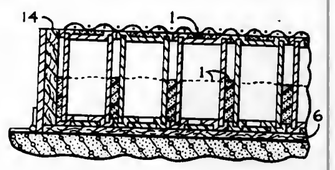
4,050,978

METHOD FOR PRODUCING LIGHT-WEIGHT CONSTRUCTION MEMBER

Alvin Edward Moore, Manini Way, Diamondhead, Rte. 1, Bay St. Louis, Miss. 39520

Continuation-in-part of Ser. No. 359,800, May 14, 1973, Pat. No. 3,878,661, which is a continuation of Ser. No. 102,317, Dec. 29, 1970, abandoned. This application Apr. 21, 1974, Ser. No. 569,922
Int. Cl.² B32B *5/18;* B29D *27/00;* B28B *23/00*
U.S. Cl. 156—300 6 Claims

1. A method of making a light-weight, transportable construction member, including the following steps:
   A. placing in the bottom of a mold that is later separable from said member a can-supporting, substantially planar, preformed can-supporting element;
   B. placing on said can-supporting element a plurality of strength-providing cans, each of these cans having: a sidewall; a lower can-end element, fixed to the bottom of said sidewall and resting on the can-supporting element; and an upper can-end plate that has an upwardly open recess;
   C. placing on said upper can-end plates strength-providing network, having mesh sufficiently large for passage of moldable material thru it; and providing means holding at least portions of said network in contact with upper can-end plates;
   D. inserting into the mold, thru said mesh, moldable material in fluent form, capable of setting into can-bracing material



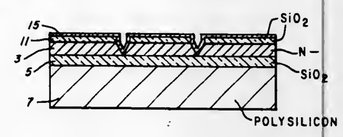
and adhering to said cans and said can supporting element, sidewall-bracing portions of said material going around and bracing said sidewalls, and extending above said lower can-end elements and not being above said upper can-end plates other portions of its lodging in said upwardly facing recesses, only that part of said material lodging in said upper can-end recesses extending above said upper can-end plates;
   E. allowing said fluent material to set; and taking from the mold the completed construction member.

4,050,979

PROCESS FOR THINNING SILICON WITH SPECIAL APPLICATION TO PRODUCING SILICON ON INSULATOR

Ronald K. Smeltzer, Dallas, and Kenneth E. Bean, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 429,228, Dec. 28, 1973, abandoned. This application Jan. 14, 1976, Ser. No. 649,130
Int. Cl.² H01L *21/306*
U.S. Cl. 156—647 9 Claims



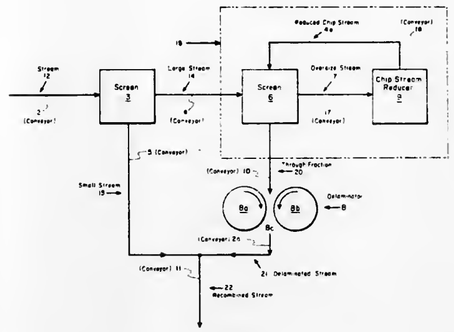
1. A method of forming thin layers of silicon on an insulating substrate which comprises the steps of
   a. providing a silicon member having a first layer of one conductivity type and a second layer of opposite conductivity type and having a resistivity of at least an order of magnitude greater than said first layer and a concentration of less than about 1.5×10^{19} atoms/cc, and
   b. forming a first oxide layer on said second layer,
   c. forming a layer of polycrystalline silicon on said first oxide layer,
   d. etching said first layer with an etching solution consisting of, by weight, 1 part HF, 3 parts NHO_3 and from about 8 to about 12 parts CH_3COOH to provide etching away of said first layer, said etching automatically stopping at the junction of said first and second layer, and
   e. forming semiconductor devices in the exposed surface of said second layer.

4,050,980

SELECTIVE DELAMINATION OF WOOD CHIPS

Fred L. Schmidt, and Frank J. Steffes, both of Camas, Wash., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation-in-part of Ser. No. 527,772, Nov. 27, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 666,823
Int. Cl.² D21C *1/10*
U.S. Cl. 162—24 10 Claims



1. A selective delamination process for producing a high yield, uniform pulp having reduced pulp screen rejects, which comprises:
   a. conveying a mill-wood chip stream to a primary means for separating by size the chip stream into respective first and second fractions on the basis of a chip thickness of about one-fourth inch, said first fraction consisting of wood chips having a thickness equal to or greater than about one-fourth inch and being retained by said primary separation means, and said second fraction consisting of wood chips having a thickness of less than about one-fourth inch;
   b. conveying said first chip fraction to a means for reducing the size of said first chip fraction without imparting substantial compressive forces thereto and without substantial reduction in the fiber length of the chips in said first wood chip fraction;
   c. conveying said reduced chip fraction to a secondary means for separating by size said reduced chip fraction into respective oversized and through-put chip fractions, the oversized chip fraction consisting of wood chips having a thickness equal to or greater than about one-fourth inch and being retained by said secondary separation means and said through-put fraction consisting of wood chips having a thickness of less than about one-fourth inch, said through-put fraction being more susceptible to liquor penetration during pulping than chips having a larger thickness;
   d. reconveying said oversized chip fraction to said reducing means for further reduction of said oversized chips and reconveying said reduced chips produced thereby to said secondary separation means;
   e. selectively delaminating said through-put fraction, at a substantially high through-put rate, by feeding same to a compression means; and
   f. pulping said second chip fraction and said selectively delaminated fraction, respectively to produce wood pulp.

4,050,981

PROCESS FOR THE DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL BY MAINTAINING A CONCENTRATION OF CARBON MONOXIDE IN THE PRESENCE OF OXYGEN AND ALKALI

Allan Geoffrey Jamieson, Ornskoldsvik; Hans Olof Samuelson, Goteborg; Leif Åke Smedman, Domsjo, and Kent Ivar Sondell, Ornskoldsvik, all of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed June 11, 1975, Ser. No. 586,114
Claims priority, application Sweden, June 14, 1974, 7407885; Jan. 22, 1975, 7500686
Int. Cl.² D21C *3/02, 9/02, 9/14, 11/06*
U.S. Cl. 162—37 37 Claims

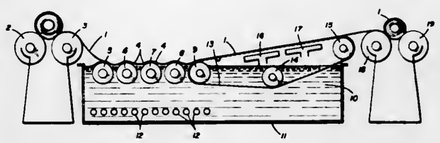
1. A process for the delignification of lignocellulosic material which comprises carrying out the delignification with oxygen gas and alkali in the presence of a gas phase comprising oxygen gas and carbon monoxide wherein the carbon monoxide is in a concentration within the range from about 1% to about 12% by volume of the gas phase while maintaining the carbon monoxide concentration within said range by withdrawing carbon monoxide and oxygen gas from the delignification, and separating and recycling withdrawn oxygen gas.

4,050,982

PROCESS AND APPARATUS FOR CONTINUOUSLY SHRINKING A NON-WOVEN SHEET

Robert Bolliand, Lyon, and Claude Saligny, Ecully, both of France, assignors to Rhone-Poulenc-Textile, France

Filed Apr. 16, 1974, Ser. No. 461,341
Claims priority, application France, May 18, 1973, 73.18439
Int. Cl.² D21D *3/00*
U.S. Cl. 162—100 5 Claims



1. A process for the continuous shrinking of a sheet of fibers containing heat-shrinkable fibers by means of a hot liquid, which comprises passing the sheet loosely over at least one cylinder partially immersed in a liquid maintained at a temperature which will cause shrinkage of the shrinkable fibers, said cylinder having a surface exposed above the liquid which is coated with a stable liquid film which prevents the sheet from touching the surface of the cylinder, said cylinder being rotated in the direction the sheet travels, and removing absorbed liquid from the sheet.

2. An apparatus for shrinking a sheet which contains heat-shrinkable fibers which comprises a tank containing a liquid heated at a temperature which will cause shrinkage of the shrinkable fibers at a constant level, at least one cylinder rotatably disposed in the tank with a surface exposed above the level of the liquid, means for rotating the cylinder at a speed whereby a continuous, stable liquid film is carried on the exposed surface thereof, said film covering the sheet without it touching the surface of the cylinder, means for putting the sheet loosely into contact with the film carried by the cylinder in the same direction as the cylinder is rotated, and means for removing liquid from the sheet.

4,050,983

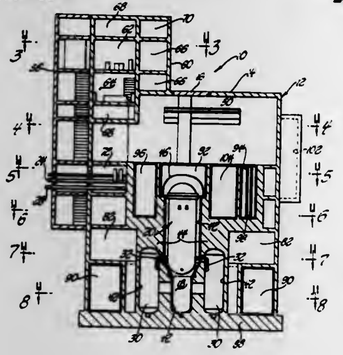
PASSIVE CONTAINMENT SYSTEM

Frank W. Kleimola, Jackson, Mich., assignor to Nucledyne Engineering Corporation, Reed City, Mich.

Continuation-in-part of Ser. No. 383,485, July 30, 1973, Pat. No. 3,904,282, which is a continuation of Ser. No. 61,063, Aug. 5, 1970, abandoned. This application Feb. 10, 1975, Ser. No. 548,744

Int. Cl.² G21C 9/00

U.S. Cl. 176—38 **20 Claims**



1. In a boiling water type nuclear reactor power plant comprising a reactor assembly wherein said reactor assembly serves as steam generating means for driving associated turbine means, reactor assembly coolant system means comprising reactor coolant conduit means, reactor coolant circulated within at least a portion of said reactor assembly coolant system means, and a containment structure sealingly enclosing at least said reactor assembly and at least a portion of said reactor assembly coolant system means, the method of affecting containment of said reactor power plant during a failure of said reactor assembly coolant system means within said containment structure and an attendant vaporized loss of said reactor coolant therefrom, said method comprising the steps of providing at least one first fluid body of normally kinematically inert first fluid coolant liquid, normally preventing any direct communication of said first coolant liquid with said reactor assembly coolant system means, providing at least one second fluid body of normally kinematically inert relatively cold second fluid coolant liquid, normally preventing any direct communication of said second coolant liquid with said reactor assembly coolant system means, providing at least one third fluid body of normally kinematically inert relatively hot third fluid coolant liquid, normally preventing any direct communication of said third coolant liquid with said reactor assembly coolant system means, permitting said reactor coolant as is accidentally lost from said failure to enter into a void space defined by said containment structure and vaporize within said void space to thereby increase the pressure within said void space, permitting sufficient quantities of such accidentally lost reactor coolant to enter and vaporize within said void space as to cause said pressure within said void space to increase to a first predetermined magnitude, when said pressure of said vaporized reactor coolant attains said first predetermined magnitude permitting at least a portion of said second coolant liquid and said third coolant liquid to be communicated to said reactor assembly coolant system means as to thereby at least in part replace the volume of said reactor coolant lost therefrom due to said failure, permitting at least a portion of said vaporized reactor coolant in said void space to flow through said first coolant liquid to thereby cause said first coolant liquid through heat transference to absorb some of the energy of said vaporized reactor coolant flowing therethrough, and permitting said vaporized reactor coolant to continue to flow into said first coolant liquid to thereby result in at least substantial displacement of said first coolant liquid and an attendant flow of said first coolant liquid into said void space whereby a back pressure of sufficient magnitude is developed within said void space sufficient to prevent further depletion of said reactor coolant from said reactor assembly coolant system means through said failure.

4,050,984

CLOSED CYCLE GAS COOLANT NUCLEAR POWER PLANT

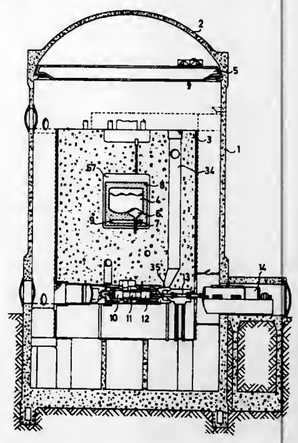
Erhard Arndt, Viernheim; Nikolaus Brodmann, Unterflockenbach, and Horst R. Roser, Hemsbach-Entenweide, all of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Germany

Continuation-in-part of Ser. No. 391,018, Aug. 23, 1973, abandoned. This application Jan. 27, 1976, Ser. No. 652,844

Claims priority, application Germany, Sept. 28, 1973, 2241426

Int. Cl.² G21C 19/28

U.S. Cl. 176—60 **10 Claims**



1. Nuclear power plant having a gas coolant flowing in a closed cycle comprising a prestressed concrete pressure tank, a high-temperature reactor located within said tank, a gas turboset including a turbine located within said tank, heat exchange apparatus including recuperators, pre-coolers and intermediate coolers located within said pressure tank, conduit means connecting said reactor, turboset and heat exchange apparatus and forming a flow path for said gas coolant therebetween, wherein the improvement comprises that said tank has a vertically extending axis, said tank forming a horizontally extending tunnel spaced below said nuclear reactor, said turboset being positioned horizontally in the horizontally extending tunnel so that said turboset is spaced and shielded from said reactor by the portion of said concrete pressure tank disposed between said reactor and said turboset, said tank forming a plurality of vertically extending first shafts disposed in an annular arrangement about the vertical axis of said tank with said first shafts located uniformly radially outwardly from said reactor and extending from below to above said reactor, one said recuperator and one said pre-cooler located within each of said first shafts with said pre-cooler arranged to receive the flow of the gas coolant from said recuperator located in the same said first shaft, said conduit means arranged downstream in the path of said gas coolant from said turbine in said turboset is divided into at least two equal partial gas flow systems with each said system including a horizontally arranged first ring segment conduit separate from another horizontally arranged first ring segment conduit of the other said system, said recuperators in said first shafts divided into at least two separate groups with said recuperators in the same group positioned adjacent to one another, the same group of said recuperators each connected to the same said first ring segment conduit, a tie line interconnecting said turbine and the same group of said recuperators so that flow between said recuperators in the same group takes place through said first ring segment conduit, said conduit means including a horizontally arranged second ring segment conduit corresponding to each said first ring segment conduit and connected to said pre-coolers arranged in the same group with said recuperators interconnected by the corresponding said second ring segment conduit and arranged to receive the flow of said gas coolant from said recuperators connected to the corresponding said first ring segment conduit, a collecting conduit in communication with said second ring segment conduit for returning the flow of gas coolant to said turboset, each said recuperator comprises a nest of tubes, a horizontally arranged third ring segment conduit interconnecting said nests of tubes in each said recuperator within one said group of recuperators, and a tie line connecting said third ring segment to the high pressure stage of said compressor for distributing the gas proportionally to said nests of tubes in said recuperators within one said group of recuperators.

4,050,985

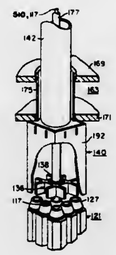
NUCLEAR REACTOR

Howard W. Yant, Greensburg; Karl W. Stinebiser, New Stanton, and Gregory C. Anzur, Herminie, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 13, 1974, Ser. No. 505,891

Int. Cl.² G21C 15/26

U.S. Cl. 176—61 **7 Claims**



1. A nuclear reactor including a vessel having therein a nuclear core, said core having a plurality of fuel-component assemblies, and an inlet plenum below said core and an outlet plenum above said core, said reactor also including means for supplying a coolant between said inlet plenum and said outlet plenum, said coolant being conducted separately through said assemblies from the inlet plenum to the outlet plenum and exiting said assemblies at a temperature at or in excess of 800° F, the coolant emitted from adjacent assemblies being at substantially different temperatures, the said reactor also including upper internals including supporting means for the upper components of said reactor, the said upper internals also including a plurality of passive outlet modules for conducting said coolant from said adjacent assemblies emitting coolant at substantially different temperatures to said outlet plenum, said plurality of modules substantially forming a continuum above a selected plurality of the fuel component assemblies, each said module being disposed to conduct, mix, and substantially confine the coolant emitted from a subplurality of said assemblies so as to equalize the temperature of the coolant emitted from said subplurality prior to discharge to said outlet plenum, each said module including a grid disposed within said module having a plurality of openings therein each disposed to receive the coolant from an assembly of said last-named subplurality, each opening sized so as to provide peripheral engagement to each respective one of said assemblies, there being one said opening for each respective assembly of said subplurality said grid spaced a predetermined distance from said last-named assembly so as to provide a backup hold-down for said last-named assembly, the said last-named module also including means, interposed between said grid and said outlet plenum for substantially confining the coolant from said last-named subplurality in the region between the outlet of said core and said outlet plenum to a generally vertical path, said modules thereby reducing the effect of thermal stripping on the remainder of the upper internals.

4,050,986

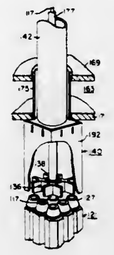
NUCLEAR REACTOR I

Edward W. Ference, Central City; John L. Houtman, Acme, and Robert N. Waldby, New Stanton, all of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 13, 1974, Ser. No. 505,890

Int. Cl.² G21C 19/28, 1/02

U.S. Cl. 176—61 **5 Claims**



1. A liquid metal cooled nuclear reactor including a vessel, a head plate for said vessel, said vessel supporting a nuclear core therein including a plurality of vertically disposed core assemblies emitting coolant at different temperatures, said vessel also having inlet means below said core and outlet means above said core, and a low thermal inertia upper internals structure suspended above said core for channeling substantially all of said coolant from the top of said core to said outlet means, said suspended structure allowing said assemblies to rise vertically a preselected distance before interfering with said vertical rising, said upper internals structure comprising:

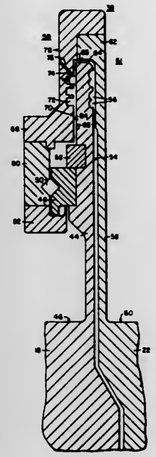
a. a stainless steel weldment including:
   i. a plurality of vertically disposed elongated load bearing columns each affixed at its upper end to said head plate;
   ii. an upper pair of horizontally disposed parallel plates;
   iii. a plurality of upper stub tubes circumferentially welded to said upper plates;
   iv. a lower pair of horizontally disposed parallel plates;
   v. a plurality of lower stub tubes circumferentially welded to said lower plates, and
   vi. means for affixing the lower portion of each said column to said upper and lower plates;
b. a plurality of outlet modules of a refractory corrosion resistant alloy, each said module having a flow collector disposed between said core and said weldment for collecting coolant emitted from a plurality of said assemblies, a cylindrical chimney, said chimney extending upwardly through a concentrically aligned lower stub tube and upper stub tube,
c. means for mechanically affixing said chimney to said weldment, and
d. a peripheral seal affixed to said weldment and extending about the outer periphery of said core for directing the bulk of said coolant from said assemblies into said collectors, said seal formed of a plurality of horizontally abutting blocks having a horizontal section and a plurality of vertical protrusions extending downwardly therefrom, said protrusions circumferentially surrounding the top of some of said assemblies so as to act as a core bundling device.

4,050,987

ROTATING PLUG BEARING AND SEAL

Elmon E. Wade, Ruffs Dale, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1974, Ser. No. 537,474
Int. Cl.[2] G21C *13/06*
U.S. Cl. 176—87 19 Claims



1. A nuclear reactor including an elongated pressure vessel, a pressure vessel closure head secured to said pressure vessel, said pressure vessel closure head having rotatable members above said pressure vessel, and a structure for supporting said members which permits lubrication of seals and bearings, said structure for supporting said members comprising:

a generally planar, rotatable, cylindrical first plug;

a generally planar cylindrical first member having an opening therein, said first member receiving said first plug in said opening;

an annular first support structure secured to the periphery of and extending vertically above said first plug, said first support structure having an extension horizontally outward from the outer side of said first support structure and extending vertically downward, said extension and said first support structure forming a generally U-shaped first annular space;

an annular second support structure having an inner side and an outer side secured to said first member, said first annular space receiving said second support structure therein, said extension of said first support structure and said outer side of said second support structure forming a second annular space;

a bearing having an inner race and an outer race, said outer race being secured to said extension of said first support structure and said inner race being secured to said outer side of said second support structure;

means for sealing said second annular space;

means for lubricating said bearing; and

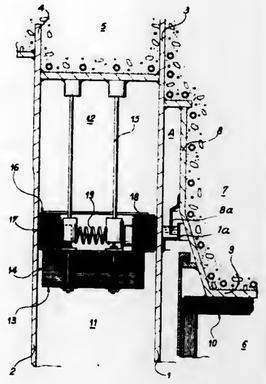
means for lubricating said means for sealing said second annular space.

4,050,988

HEAT-INSULATED DEVICE, FOR INSULATING THE TOP PART OF THE ANNULAR SPACE BETWEEN THE MAIN VESSEL AND THE SAFETY VESSEL OF A FAST-NEUTRON REACTOR

Guy Lemercier, Le Puy Ste-Reparade, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 29, 1975, Ser. No. 609,168
Claims priority, application France, Aug. 30, 1974, 74.29649
Int. Cl.[2] G21C *13/04;* E04C *3/10;* B65D *25/18*
U.S. Cl. 176—87 8 Claims



1. A heat-insulating device, for insulating the top part of the annular space separating the main vessel from the safety vessel of a fast-neutron nuclear reactor, the two vessels having a common vertical axis and being open at their top part and covered by a horizontal slab of concrete, in which the ends are suspended by the slab, the device comprising a cylindrical bottom heat-insulating ring mounted under the slab and adjacent the facing walls of the vessels to bound the regions to be insulated, the ring extending through the annular space in a horizontal plane and connected to the slab by tie-rods, and a top heat-insulating ring divided into two coaxial elements resting on the bottom ring and pressed and sealed against the walls of the two vessels respectively by an assembly of spacing springs disposed radially and bearing against the two elements.

4,050,989

PROCESS OF PREPARING DESACYL-PEPSIDINE WITH *BACILLUS PUMILUS*

Noriaki Kuwana, Inuyama; Yoshikazu Hasegawa, Kounan, and Yukio Nozu, Gifu, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 638,093, Dec. 5, 1975. This application Apr. 5, 1976, Ser. No. 673,883
Claims priority, application Japan, Dec. 5, 1974, 49-138862
Int. Cl.[2] C12D *13/06*
U.S. Cl. 195—29 9 Claims

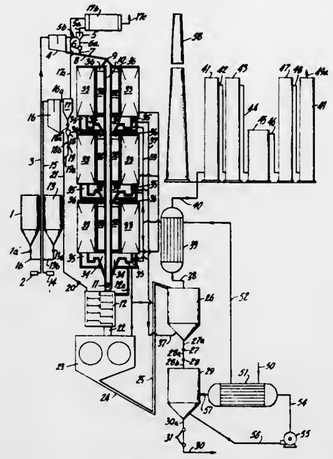
1. A process for the preparation of desacyl-pepsidine which comprises contacting an N-acyl-pentapeptide with a bacterium belonging to *Bacillus pumilus.*

4,050,990

METHOD AND APPARATUS FOR PRODUCING FORM COKE

Kurt Lorenz, Hattingen, Germany, assignor to Firma Carl Still, Germany

Continuation of Ser. No. 604,360, Aug. 13, 1975, abandoned.
This application Sept. 30, 1976, Ser. No. 728,289
Claims priority, application Germany, Aug. 14, 1974, 2439014
Int. Cl.[2] C10B *53/04;* C10L *5/02*
U.S. Cl. 201—5 1 Claim



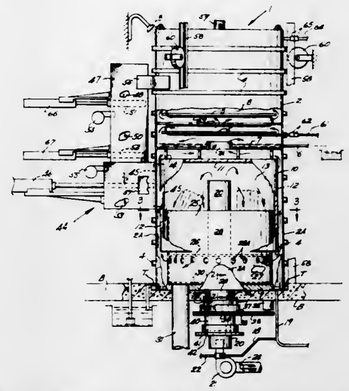
1. A method of producing form coke pieces having uniformly mutually identical shape, comprising directing a non-compressed stream of fine coal into the top of a shaft furnace and permitting it to fall downwardly therein so as to permit the hot walls of the furnace to radiate heat to the fine coal and at a rate and temperature such that the fine coal is heated within 1 or 2 seconds up to from 800° to 900° C, permitting the fine coal to fall through a height within the shaft furnace to cause the coal particles to become degassed as completely as possible, permitting the fine coal which is formed to accumulate at the bottom of the shaft furnace and regularly withdrawing the accumulated quantities of coal particles and mixing it with caking coal in a mixer in proportions of about two parts of fine coke to one part of caking coal while the fine coke is still hot so that the caking coal becomes partly degassed and forms a mixture with the fine coke, drawing off the carbonization gases at various elevations throughout the shaft furnace and separating the gases drawn at the upper levels which are rich in hydrocarbons from the gases drawn at the lower levels which are richer in hydrogen, collecting the carbonization gases and subjecting them to an after heating in the presence of water and steam so as to convert the hydrocarbons and carbon substantially to carbon monoxide and hydrogen and at the same time to decompose the ammonia gases which are formed to nitrogen and hydrogen with the aid of the water and steam, adding a catalyst such as a nickel carrier catalyst to the carbonization gases, directing the withdrawn carbonization gases through connecting ducts which widen in an obliquely upwardly extending direction so that only a minimum quantity of coal and coke dust is entrained by the carbonization gases withdrawn, and directing the carbonization gases into heatable retorts into which steam and water is supplied, pressing the mixture into a coke briquette, exposing the finished briquette to temperatures of up to 400° for 180 minutes so as to harden the briquettes and increase the mechanical resistance of the coke briquettes, and thereafter exposing the coke briquettes to temperatures of up to 900° C for from 60 to 120 minutes for an after hardening of the coke briquettes during which degasification gases are still produced, and thereafter permitting the coke briquettes to cool, recirculating the decarbonization gases back into the shaft furnace, and cooling the briquettes by circulating inert gases over the briquettes and circulating the inert gases which have been heated by the briquettes in heat exchange relationship with water for heating the water.

4,050,991

PYROLYTIC REDUCER AND CONDENSER APPARATUS

Walter C. Kautz, Jr., 21707 NW. 51st Ave., Ridgefield, Wash. 98646

Filed Apr. 23, 1976, Ser. No. 679,704
Int. Cl.[2] C10B *1/04, 53/00*
U.S. Cl. 202—99 11 Claims



1. A pyrolytic reducer and condenser apparatus for the reduction of waste material and condensation of resulting volatiles, said apparatus comprising in combination,

a reduction bin for the reception of waste articles to be reduced, said bin having a side wall with outlet ports and a floor,

an insulative member having a top wall and a side wall and circumposed in a spaced apart manner about at least a portion of the side wall of said bin,

a regulatable reduction heat source including a duct having a discharge end providing a controlled upward heat flow into said insulative member against the top wall thereof, said reduction bin being disposed below the discharge end of said duct and receiving a redirected downward heat flow,

condenser means receiving the heat flow passing downwardly intermediate the reduction bin and insulative member side wall along with the heat flow and waste material volatiles suspended therein discharged through said reduction bin ports for the recovery of condensibles from the reduction flow.

4,050,992

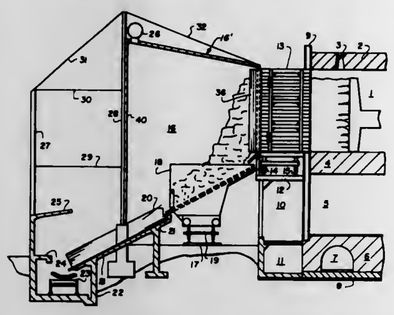
HOUSING CONSTRUCTION EXTENDING OVER THE COKE DISCHARGE AREA OF A HORIZONTAL COKE OVEN BATTERY

Carl Otto Still, Recklinghausen, Germany, and Walter Dean Aust, Pittsburgh, Pa., assignors to Firma Carl Still, Germany

Filed Sept. 30, 1975, Ser. No. 618,006
Claims priority, application Germany, Oct. 2, 1974, 2446987
Int. Cl.[2] C10B *33/00, 39/08*
U.S. Cl. 202—227 5 Claims

1. A structure for use with a coke oven battery having a plurality of horizontally arranged ovens each of which has an opening through which glowing coke may be pushed and which is associated with a quenching station for quenching the glowing coke and which has a housing associated with the station for the offtake of coke gases, comprising a master gangway extending horizontally alongside the battery of ovens, a

guide car trackway along which a coke guide car is movable extending along said gangway, a coke cake guide car movable along said guide car trackway and having an opening on one side alignable with each oven opening in succession for receiving the flowing coke therefrom and having an opposite side with a discharge opening, a quench car trackway for the coke extending alongside and below the guide car trackway, a quench car movable along said quench car trackway to and from the quenching station, said housing extending over the length of said oven battery and having an inner wall adjacent said gangway and positioned between said gangway and said quench car trackway extending over the length of said oven battery, said inner wall facing the discharge opening of said coke cake guide car and the coke ovens with a plurality of



horizontally spaced openings corresponding in number, size and arrangement to the openings of said coke ovens and the discharge opening of said guide car, said housing having a roof extending from said inner wall over the quench car trackway and enclosing said trackway overall of said oven up to said quenching station with the height of the roof being above the guide car, and means associated with said housing for the offtake of gases, said housing including an outer wall spaced from and parallel to said wall adjacent said gangway, said outer wall having a chute extending therethrough alignable with one side of said coke quench car at least along one position of its travel along said quench car trackway, and a coke conveyor for conveying quenched coke located alongside the discharge of said chute in a position to receive the quenched coke and to transport it away.

4,050,993

DISTILLATION OF READILY POLYMERIZABLE ETHYLENICALLY UNSATURATED COMPOUNDS

Calvin L. Daniels, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

Filed Sept. 11, 1972, Ser. No. 288,138
Int. Cl.² B01D *3/34*; C07C *7/18*
U.S. Cl. 203—9 **7 Claims**

1. A process for the distillation of a readily polymerizable aromatic hydrocarbon having ethylenically unsaturated substituents which comprises subjecting such compound to distillation conditions in the presence of N,N-nitroso-methylaniline as a polymerization inhibitor in a system from which oxygen and sulfur have been excluded.

4,050,994

RECOVERY OF 2-PYRROLIDONE FROM DILUTE ALKALINE SOLUTIONS

Byron E. Anshus, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 26, 1976, Ser. No. 745,501
Int. Cl.² B01D *3/34*; C07D *207/12*
U.S. Cl. 203—35 **4 Claims**

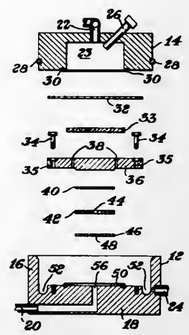
1. A process for the recovery of 2-pyrrolidone from alkaline aqueous solution, which comprises the steps of adding sulfuric acid to said solution in amounts sufficient to provide a neutralized or acidified solution of 3–7 pH, removing by a first evaporation a major amount of the water from said neutralized or acidified solution to provide a slurry comprising sulfate salt and 2-pyrrolidone, and recovering 2-pyrrolidone from said slurry by a second evaporation under reduced pressure.

4,050,995

METHOD FOR DETERMINING WATER VAPOR TRANSMISSION RATE OR WATER CONTENT

Roger L. Bredeweg, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 11,557, Feb. 1, 1971, Pat. No. 3,886,057.
This application May 9, 1973, Ser. No. 358,576
Int. Cl.² G01N *27/46*
U.S. Cl. 204—1 T **4 Claims**



1. A method for determining water vapor transmission rate through a plastic film sample or like sample structure comprising:

a. placing the sample in a sealed cell;
b. evacuating substantially all water vapor from the sample and cell;
c. introducing a measured quantity of water into the cell on one side of the sample;
d. drawing the water vapor of such water through the sample and into a fibrous body having an electrically conductive water absorption material therein;
e. electrolyzing the water vapor in the fibrous body into hydrogen and oxygen;
f. transporting said hydrogen and oxygen from said cell to a mass spectrometer;
g. measuring the quantity of said hydrogen and oxygen transported from said cell in said mass spectrometer; and
h. determining the water vapor transmission rate of said test sample from the quantity of said hydrogen and oxygen transported.

4,050,996

ELECTOCHEMICALLY EXCHANGING A STEEL SURFACE WITH A PURE IRON SURFACE

Otto J. Klingesmaier, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

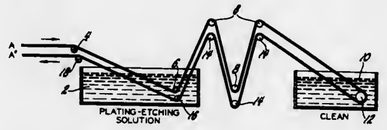
Filed Nov. 3, 1976, Ser. No. 738,450
Int. Cl.² C25D *5/04, 7/06*
U.S. Cl. 204—28 **4 Claims**

1. A process for exchanging a surface layer of a moving steel strip for an iron layer of different composition comprising the steps of:

anodically polarizing a first portion of a moving steel electrode-strip while passing it in one direction through an iron-ion-containing electrolyte in spaced relation to an oppositely moving and polarized counter-electrode-strip of substantially the same composition as said electrode-strip to concurrently electrolytically erode the surface of said electrode-strip, supply iron ions to said electrolyte therefrom, and electrodeposit iron onto said counterelectrode strip at substantially the same rate as the electrode strip is eroded;

cleansing said eroded surface of any impurities left thereon; and

cathodically polarizing a second portion of said electrode-



strip while passing it through and iron-ion-containing electrolyte is spaced relation to an oppositely moving and polarized counterelectrode strip of substantially the same composition as said electrode-strip to simultaneously electrolytically deposit iron on said second portion, remove iron ions from said electrolyte and electrolytically erode said counterelectrode strip at substantially the same rate as said second portion is plated.

4,050,997

METHOD OF MANUFACTURING A FIBER REINFORCED COMPOSITE MATERIAL

Herbert Heissler, Munich, Germany; Eckart Hitsch, Salzburg, Austria, and Wolfgang Scheer, Munich, Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 315,986, Dec. 18, 1972, abandoned. This application May 16, 1975, Ser. No. 578,187
Int. Cl.² C25D *7/06*
U.S. Cl. 204—28 **10 Claims**

1. A process for producing reinforcing carbon fiber for the manufacture of carbon fiber reinforced materials, said carbon reinforcing fiber being composed of carbon fiber substrate having a light metal or metalloid coating thereon exhibiting improved adhesion for the carbon fiber substrate, said process comprising:

forming on the surfaces of said carbon fiber substrate chemical groups capable of forming bonds with respect to the light metal or metalloid of said coating, said chemical groups being formed on the surfaces of said fiber substrate by passing said fiber substrate through an electrically conductive liquid and applying a voltage to said fiber substrate, said voltage being applied to said fiber substrate by spaced voltage applying means in said liquid, each of said voltage applying means being spaced from said fiber substrate so that activated current is applied to said fiber substrate by way of said conductive liquid and without mechanical contact of said fiber substrate with said applying means, and thereafter

depositing said light metal or metalloid on the surfaces of the fiber substrate by (a) contacting said fiber substrate with a composition comprising a compound capable of decomposing to yield said light metal or metalloid in atomic form and a solvent for said compound and (b) causing said compound to decompose to thereby yield said light metal or metalloid in atomic form whereby said light metal or metalloid deposits on the surfaces of said fiber substrate and combines with the chemical groups.

4,050,998

ELECTROLYTIC REDUCTION OF AROMATIC STEROIDS

Klaus Junghans, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Continuation-in-part of Ser. No. 489,160, July 17, 1974, abandoned. This application June 8, 1976, Ser. No. 693,849
Claims priority, application Germany, July 18, 1973, 2337155
Int. Cl.² C25B *3/04*
U.S. Cl. 204—59 R **12 Claims**

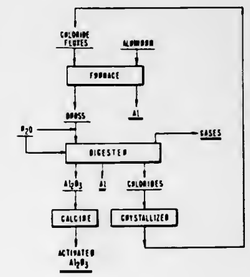
1. A process for the electrolytic reduction of $\Delta^{1,3,5(10)}$ steroids to $\Delta^{2,5(10)}$ steroids which comprises subjecting a $\Delta^{1,3,5(10)}$ steroid to electrochemical reduction wherein the solvent consists of liquid ammonia and wherein the electrolyte consists of an alkali metal salt of a strong acid, when the electrolysis is conducted in a divided cell, and consists of an alkali metal hydroxide or alkali metal salt of a weak acid, or of a mixture of an alkali metal hydroxide or alkali metal salt of a weak acid and an alkali salt of a strong acid, when the electrolysis is conducted in an undivided cell.

4,050,999

PROCESS FOR THE PRODUCTION AND USE OF ACTIVATED ALUMINA TO PRODUCE ALUMINUM

Arthur F. Johnson, Franklin Lakes, N.J., assignor to R.C.M. Corporation, Fontana, Calif.

Division of Ser. No. 483,129, June 26, 1974, Pat. No. 3,955,969.
This application Jan. 28, 1976, Ser. No. 653,265
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.² C25C *3/06*
U.S. Cl. 204—67 **1 Claim**



1. The process for the production and use of activated alumina from dross containing aluminum particles, alumina and impurities comprising:

a. charging said dross onto a layer of molten halide salts underlain by a layer of molten aluminum in a holding furnace, whereby a portion of the aluminum entrained within the dross enters the aluminum layer and the alumina and impurities are entrained in the halide flux layer;
b. separating said dross from said molten aluminum; digesting said dross with hot water to at least partially dissolve halide salts and other soluble impurities and decompose insoluble impurities;
c. separating remaining aluminum particles and the purified alumina from said water as separate fractions;
d. washing said digested alumina with hot water to remove any residual, soluble impurities;
e. drying said alumina to produce an activated alumina;
f. crystallizing and drying said halide salts from said water, and returning to said holding furnace;
g. contacting said calcined alumina with fluoride gases generated in an operating aluminum reduction cell; and
h. thereafter using said alumina for reduction in said cell.

4,051,000
NON-CONTAMINATING ANODE SUITABLE FOR ELECTROWINNING APPLICATIONS

Aubrey Stewart Gendron, Lively; Shinichiro Abe, Toronto; Victor Alexander Ettel, and Charles Edward O'Neill, both of Mississauga, all of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Oct. 28, 1975, Ser. No. 625,899
Claims priority, application Canada, Nov. 4, 1974, 212965
Int. Cl.² C25C 1/12, 1/16, 1/22, 7/02
U.S. Cl. 204—106 14 Claims

11. A method for electrowinning a metal from the group consisting of nickel, copper, cobalt and zinc from an electrolyte containing one of said metals using an insoluble anode and cathode while inhibiting contamination of said metal deposited on said cathode which comprises.

establishing an electrowinning cell comprising an insoluble non-contaminating anode and an insoluble cathode in said electrolyte,

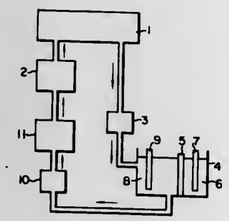
said non-contaminating anode comprising a metal substrate formed of a metal selected from the group consisting of titanium, zirconium, tantalum and alloys thereof, said metal substrate having a flash-coating of a platinum-group metal, and coating being in turn covered by a duplex metal oxide coating comprising essentially an intermediate of lead dioxide having a thickness of about 50 to about 2000 microns adhering to said platinum-group metal coating and an overlayer of manganese dioxide having a thickness of about 10 to about 1000 microns adhering to said lead dioxide layer,

and then passing a current from said insoluble anode to said cathode, whereby said metal is deposited on said cathode and whereby contamination of metal deposited on said cathode is greatly inhibited.

4,051,001
PROCESS FOR REGENERATING ETCHING SOLUTION

Hajime Inoue, Kamakura; Fumio Harada, Yokohama; Kazunobu Kato, Yokohama, and Syoji Oikawa, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 22, 1975, Ser. No. 607,037
Claims priority, application Japan, Aug. 26, 1974, 49-97098
Int. Cl.² C25F 7/02
U.S. Cl. 204—151 7 Claims



1. A process for the regeneration of an acidic etching solution containing cupric chloride used in etching of copper comprising the steps of

a. electrolyzing a used acidic etching solution containing cupric chloride and cuprous chloride in an electrolytic cell having a cathode compartment separated by a diaphragm from an anode compartment, said used acidic etching solution being contained in said cathode compartment wherein a copper ion concentration of said used acidic etching solution is reduced by deposition of metallic copper on a cathode, a caustic soda solution being contained in said anode compartment wherein chlorine is absorbed by said caustic soda solution, and

b. treating an etching solution resulting from an electrolysis according to step (a) with hydrogen peroxide to increase a cupric ion concentration by oxidizing cuprous ions to cupric ions and with hydrochloric acid to increase a chloride ion concentration, said treatment producing a regenerated acidic etching solution containing cupric chloride.

4,051,002
ELECTRODIALYSIS FOR AQUEOUS SOLUTION OF BASE

Tomoki Ganjima, Yokohama, and Toshio Ichiki, Kawasaki, both of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed May 13, 1976, Ser. No. 685,984
Claims priority, application Japan, July 25, 1975, 50-90188
Int. Cl.² B01D 13/02
U.S. Cl. 204—180 P 12 Claims

1. In an electrodialysis process for aqueous base-containing solutions the improvement which comprises using a sulfonic acid group-free cation-exchange membrane which is a copolymer of ethylene and an unsaturated carboxylic acid or a salt thereof having an ion-exchange capacity of 0.7 to 3 m equivalent/g (dry resin).

4,051,003
CURABLE COMPOSITIONS DIALLYL ESTERS OF DICARBOXYLIC ACIDS AND FLUOROPOLYMERS

Elihu J. Aronoff, Framingham, and Kewal Singh Dhami, Shrewsbury, both of Mass., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 489,697, July 18, 1974, abandoned, which is a division of Ser. No. 401,973, Oct. 1, 1973, abandoned.
This application Mar. 26, 1976, Ser. No. 670,693
Int. Cl.² C08F 8/00
U.S. Cl. 204—159.17 4 Claims

1. A high temperature processing fluorocarbon homopolymer or copolymer selected from the group consisting of polymers and copolymers of ethylene-tetrafluoroethylene, ethylene-chlorotrifluoroethylene, vinylidene fluoride, tetrafluoroethylene-vinylidene fluoride, tetrafluoroethylene-hexafluoropropylene, vinylidene fluoride-hexafluoropropylene, vinylidene fluoride-hexafluoropropylene-tetrafluoroethylene and mixtures thereof having incorporated therein a crosslinking coreactant compound comprising a diallyl ester having the structural formula:



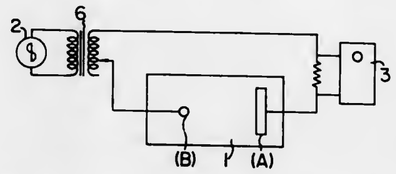
wherein R is an organic radical containing from 4 to 20 carbon atoms and is selected from the group consisting of alkyl radicals, cycloalkyl radicals and mixed alkyl-cycloalkyl radicals; R' and R'' are independently selected from hydrogen, alkyl, cycloalkyl, aralkyl and aryl radicals and mixtures thereof; and the total carbon atoms in R, R' and R'' is from 10 to 34.

4,051,004
ELECTRODEPOSITION COATING METHOD USING ALTERNATING CURRENT

Takashi Sunamori, and Sachio Obana, both of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed June 19, 1975, Ser. No. 588,654
Claims priority, application Japan, June 26, 1974, 49-73582; July 1, 1974, 49-75628; July 24, 1974, 49-84112; July 24, 1974, 49-84113; July 24, 1974, 49-84114; Aug. 1, 1974, 49-88413
Int. Cl.² C25D 13/18
U.S. Cl. 204—181 40 Claims

1. A method for producing a coated article which comprises filling an electrodeposition coating vessel with an aqueous solution or dispersion of an electrodeposition coating composition containing as the paint binder the below-mentioned salt of a purified resin, immersing in said vessel an article to be coated (A) having an electrode area of S_1 and an opposite electrode (B) having an electrode area of S_2 in such proportions that the electrode area ratio S_1/S_2 becomes 1.5 to 300, connecting the article to be coated (A) and the opposite electrode (B) to an alternating current electric source, and impressing an alternating current to the electrodes to deposit the aforesaid electrodeposition coating composition onto the article to be coated (A), wherein the salt of purified resin is:



i. a salt of a polycarboxylic acid resin having an acid value of 5 to 50 which has a $pK_a(r)$ value, as defined by the formula (I) shown below, of 8.0 or more, an n value of 0.5 to 1.5 and a degree of neutralization of 0.3 to 1.5, and which contains 5 wt% or less of low molecular weight acidic impurities having a $pK_a(e)$ value, as defined by the formula (II) shown below, of at least 0.5 smaller than the $pK_a(r)$ value of the main component of the resin,

$$pH = pK_a(r) + n \log \frac{\alpha}{1-\alpha} \quad (I)$$

wherein pH is the pH value of an aqueous solution of the salt of the polycarboxylic acid resin; $pK_a(r)$ is the constant $-\log K_a(r)$; $K_a(r)$ is the dissociation constant in water of the polycarboxylic acid resin; n is a parameter showing the degree of spreading of the polycarboxylic acid resin when the resin is dissolved or dispersed in an aqueous medium; and α is the degree of neutralization of the polycarboxylic acid resin with a base,

$$pH = pK_a(e) + \log \frac{\alpha}{1-\alpha} \quad (II)$$

wherein pH is the pH value of an aqueous solution of the acidic impurities; $pK_a(e)$ is the constant $-\log K_a(e)$; $K_a(e)$ is the dissociation constant in water of said impurities; and α is the degree of neutralization of said impurities with a base, or

ii. a salt of a nitrogen-containing basic resin high in hydrophobic property which has a $pK_b(r)$ value, as defined by the formula (III) shown below, of 6.0 or more, an n' value of 0.5 to 1.5, and a degree of neutralization α' of 0.3 to 1.5, and which contains 5 wt% or less of low molecular weight basic impurities having a $pK_b(e)$ value, as defined by the formula (IV) shown below, of at least 0.5 smaller than the $pK_b(r)$ value of the main component of the nitrogen-containing basic resin,

$$pOH = pK_b(r) + n' \log \frac{\alpha'}{1-\alpha'} \quad (III)$$

wherein pOH is the pOH value of an aqueous solution of the salt of the nitrogen-containing basic resin; $pK_b(r)$ is the constant $-\log K_b(r)$; $K_b(r)$ is the dissociation constant in water of the nitrogen-containing basic resin; n' is a parameter showing the degree of initial spreading of the nitrogen-containing basic resin when the resin is dissolved or dispersed in an aqueous medium; and α' is the degree of neutralization of the nitrogen-containing basic resin with an acid,

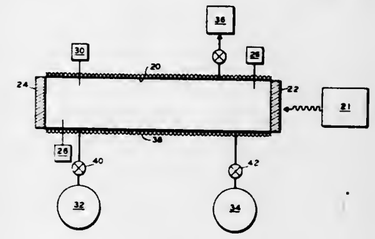
$$pOH = pK_b(e) + \log \frac{\alpha'}{1-\alpha'} \quad (IV)$$

wherein pOH is the pOH value of an aqueous solution of the basic impurities; $pK_b(e)$ is the constant $-\log K_b(e)$; $K_b(e)$ is the dissociation constant in an aqueous medium of said impurities; and α' is the degree of neutralization of said impurities with an acid.

4,051,005
PHOTOLYTIC PRODUCTION OF HYDROGEN

Nicholas Leo Krascella, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 21, 1976, Ser. No. 725,303
Int. Cl.² B01J 1/10
U.S. Cl. 204—157.1 R 10 Claims



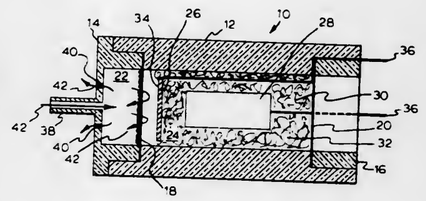
1. In the production of hydrogen from water the improvement which comprises:

as an essential step thereof forming a water-halogen gas mixture and irradiating the mixture with radiation energy in the visible spectrum to form the corresponding hydrogen halide and processing the hydrogen halide to effect the release of hydrogen therefrom.

4,051,006
PORTABLE ELECTROCHEMICAL CELL STRUCTURE

Radhakrishna Murty Neti, Brea, and Ray Lawrence Roggenkamp, Fountain Valley, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 22, 1976, Ser. No. 669,072
Int. Cl.² G01N 27/46
U.S. Cl. 204—195 P 6 Claims



1. An electrochemical cell comprising:

a. a body having a space therein and two openings into said space, said body being of an electrochemically inert material;

b. a first membrane disposed to cover one of said two openings in said body, said first membrane being of a highly porous electrochemically inert material;

c. a second membrane disposed to cover the other of said two openings in said body, said second membrane being of highly porous electrochemically inert material;

d. a first electrode disposed within said space in said body closely adjacent and in non-contacting relationship with said first membrane, said first electrode having a non-sintered layer of platinum black and polytetrafluoroethylene disposed thereon;

e. a second electrode disposed within said space in said body in non-contacting relationship with said first electrode;

f. an electrochemically inert hydrophilic filler material dis-

posed within said space in said body and in contact with said first and second electrodes;

g. an electrolytic material disposed throughout a portion of said filler material and being in contact with said first and second electrodes whereby an electrical path between said first and second electrodes is established through said electrolytic material;

h. means adapted for providing an electrical connection operably connected to said first and second electrodes; and,

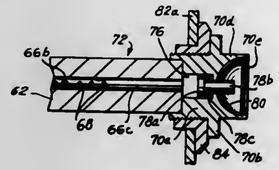
i. means disposed adjacent said first membrane for causing an electrochemical reaction producing fluid to permeate said first membrane and contact said first electrode.

4,051,007

SACRIFICIAL ANODES FOR CATHODIC PROTECTION

Ludwig Hessle, Burgipfad 4, 1 Berlin 45, Germany

Filed Oct. 6, 1975, Ser. No. 620,104
Int. Cl.² C23F 13/00
U.S. Cl. 204—197 **1 Claim**



1. A sacrificial anode for cathodic protection of inner portions of a tank and the like, at least partly filled with a liquid, which portions are exposed to a corrosive inner environment, to be protected against corrosion by the provision of the sacrificial anode that is consumed while its material gradually migrates through the liquid to and is deposited on the inner tank portions, in the absence of an external voltage being applied, and wherein the inner tank environment also promotes detrition of the sacrificial anode;

the latter comprising a generally cylindrical body of anodic material, the outer surface of which is exposed to the tank environment;

said body being provided with a metal core including a metal bar having a first end flush with one end face of said body and a metal tube having a portion embedded in said body and connected with said bar;

the embedded portion having an at least partially perforated wall;

a remaining portion thereof projecting from the other end face of said body, and said projecting portion of the tube having an imperforated wall;

said body normally constituting a barrier between the interior of said tube and the tank environment;

whereby the latter reaches communication with an external test location by way of at least one of the perforations in said tube wall when that perforation becomes communicative as a result of progressed detrition of at least an adjacent portion of said body, at which point the sacrificial anode should be replaced for continued effective cathodic protection;

a closure cap connected to said body and to said tube;

said closure cap having a first portion defining a first chamber that communicates with said tube interior;

a plunger, at least partly slidable in said chamber and sealingly engaging an inner wal of said first chamber with a portion thereof;

the movement of said plunger being responsive to the detrition of said body and as a result of a pressure difference being relayed thereto through said tube;

spring means in said first chamber and between a portion of said plunger and said inner wall of the first chamber for normally biasing said plunger into a rearwardly, non-indicating rest position toward said tube, while the pressure difference will move said plunger against said spring means into a forwardly indicating position;

a second portion of said cap defining an indicating second chamber having an at least partly light-reflecting concave inner wall;

said plunger including a forward index pin portion protruding from said first chamber;

said forward index pin portion being normally disposed substantially flush with said concave inner wall when in a non-indicating position;

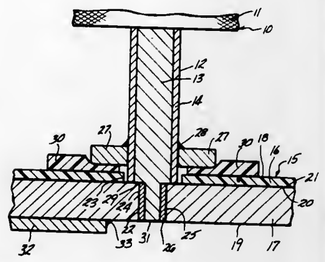
at least the envelope of said forward index pin portion having a conspicuous color that becomes visible to an observer of said indicating chamber when said plunger has been moved to the forwardly indicating position beyond the reflecting surface of said concave wall, denoting the detrition of said body.

4,051,008

FLANGED CONNECTION MEANS FOR ANODE POSTS IN ELECTROLYTIC DIAPHRAGM CELLS

James M. Ford, Cleveland, Tenn.; Morton S. Kircher, Oakville, Canada, and Hugh A. Mosher, Paget East, Bermuda, assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 31, 1976, Ser. No. 672,370
Int. Cl.² C25B 1/16, 1/26, 9/02
U.S. Cl. 204—266 **9 Claims**



1. In an electrolytic cell including:

a. a cell base having:

i. an interior layer which provides an interior surface, having a plurality of separate first openings therethrough, and

ii. a conducting layer secured to said interior layer which provides an exterior surface, having a plurality of separate second openings therein,

iii. said first and second openings being aligned to provide a plurality of separate openings in said cell base for a plurality of anode posts,

b. a cell body secured to said cell base,

c. a plurality of diaphragm-coated cathodes secured to said cell body,

d. a plurality of anodes, each anode having

1. an anode post secured to said cell base, and

2. a metallic conductive surface secured to said anode post,

3. each metallic conductive surface being positioned adjacent to and parallel to at least one of said cathodes,

e. and current conducting means secured to said exterior surface,

the improved securing means for securing said anode posts to said cell base, comprising;

f. separate soldered connections, between each of said anode posts and said cell base, in said separate openings for securing each anode post in indirect contact with the conducting layer in said cell base, and

g. flange means, positioned on each of said anode posts above said soldered connection, for providing an upward seating surface and

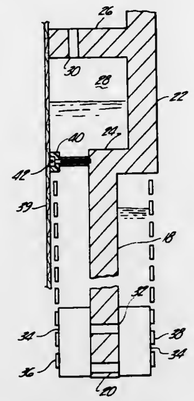
h. liquid-tight seal means, between said seating surface of said flange and said interior layer of each of said anode posts, for isolating said soldered connections from an interior space of said cell.

4,051,009

BIPOLAR ELECTROLYTIC FILTER PRESS CELL FRAME

Albert John Schweickart, Southgate; Stephen Michael Collins, Riverview, and John Joseph Bortak, Plymouth, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed May 19, 1975, Ser. No. 578,406
Int. Cl.² C25B 9/02
U.S. Cl. 204—279 **15 Claims**



1. A cell frame for a bipolar electrolytic filter press cell, comprising:

a. a peripheral rim,

b. a first linear section defining a central web recessedly disposed within the rim, one side of the web defining a catholyte side and the other an anolyte side,

c. a U-shaped section integrally formed with the linear section and cooperating therewith to define a recessed area communicating with the anolyte side above the first linear section, the recessed area extending away from the anolyte side of the central web,

d. the portion of the frame extending from the top of the central web downwardly defining a lower zone at which electrolysis is carried out,

e. the portion of the frame extending upwardly from the top of the central web defining an upper zone for disengagement the electrolysis-generated gases, and

f. means for preventing distortion of the central web and facilitating disengagement of the gases disposed between the upper zone and the lower zone on the anolyte side of the frame.

4,051,010

SPUTTERING APPARATUS

Marvin E. Roth, and Donald J. Vallere, both of Reading, Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 642,043, Dec. 18, 1975, Pat. No. 4,022,939.
This application Jan. 10, 1977, Ser. No. 758,300
Int. Cl.² C23C 15/00
U.S. Cl. 204—298 **2 Claims**

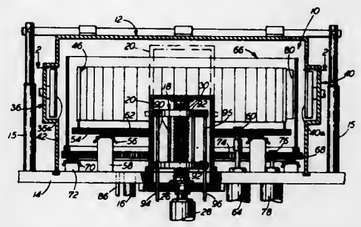
1. A sputtering apparatus comprising:

a cylindrical vacuum chamber having therewithin;

a. a vacuum pump disposed along the longitudinal axis of said chamber,

b. a cylindrical workholder assembly concentric with and disposed around said pump,

c. a cylindrical shutter concentric with and disposed around said workholder assembly, said shutter having at least one longitudinally extending opening through a wall thereof, and



d. at least one longitudinally extending sputtering target mounted on a wall of said chamber;

means for rotating said workholder assembly about said axis for disposing successive portions of said workholder assembly into radial alignment with said at least one target; and

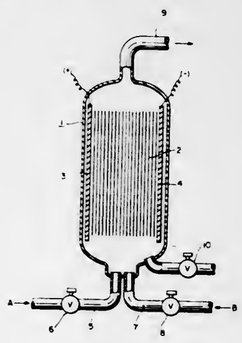
means for selectively disposing said at least one opening into alignment with said at least one target.

4,051,011

CONTINUOUS ENZYMATIC REACTOR

Terukatsu Miyauchi, Yokohama, and Shintaro Furusaki, Zushi, both of Japan, assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Oct. 22, 1975, Ser. No. 624,901
Claims priority, application Japan, Oct. 26, 1974, 49-123699
Int. Cl.² C25B 7/00, 9/00; C12B 1/00
U.S. Cl. 204—299 R **16 Claims**



1. A device for performing catalytic enzymatic reactions comprising:

a. a reaction vessel equipped with a valved inlet port for supplying electrically charged colloidal enzyme solution, a valved inlet port for supplying reactant substrate solution, a valved drain port, and an outlet port for discharge of reacted product; and

b. at least one carrier with enzyme entrapped thereon located inside said reaction vessel; and

c. means for inducing a continuous electrical field across said reaction vessel such that, in operation, colloidal enzyme introduced into said reaction vessel migrates to and is held by said carrier under the potential of said electric field, which enzyme is held fixed by electrical forces during

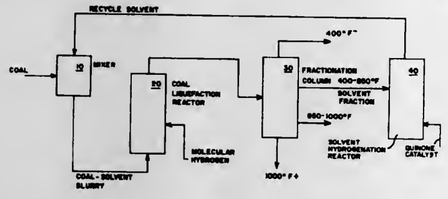
continuous enzymatic reaction of said reactant to reacted product with no substantial loss of enzyme.

4,051,012

COAL LIQUEFACTION PROCESS

Karl W. Plumlee, and Lonnie W. Vernon, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed May 17, 1976, Ser. No. 686,827
Int. Cl.² C10G 1/04
U.S. Cl. 208—8 10 Claims



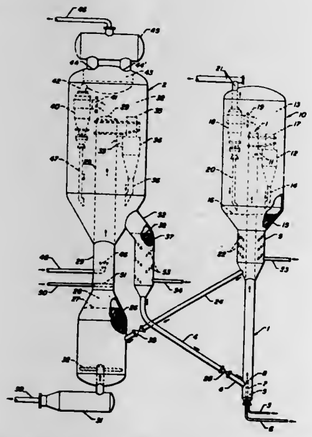
1. A process for liquefying a particulate coal feed to produce useful petroluem-like liquid products, which comprises: (a) contacting, in a liquefaction zone, said coal feed with a hydrogen donor solvent at temperature and pressure sufficient to hydroconvert and liquefy the coal, (b) separating the product from the liquefaction zone into fractions inclusive of a liquid solvent fraction which contains at least 30 weight percent hydrogen donor compounds, (c) hydrogenating said liquid solvent fraction in a hydrogenation zone in the presence of an added quinone, compound and (d) recycling the hydrogenated liquid solvent mixture to said coal liquefaction zone.

4,051,013

FLUID CATALYTIC CRACKING PROCESS FOR UPGRADING A GASOLINE-RANGE FEED

Charles W. Strother, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation of Ser. No. 361,911, May 21, 1973, Pat. No. 3,948,757. This application Dec. 3, 1975, Ser. No. 637,446
The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.
Int. Cl.² C10G 37/02
U.S. Cl. 208—78 5 Claims



1. A fluid catalytic cracking process for simultaneously cracking a gas oil feed and upgrading gasoline-range hydrocarbon feed which process comprises the steps of:

a. contacting the gasoline-range feed with freshly regenerated catalyst in a relatively upstream portion of a short-time dilute-phase riser reaction zone which portion is maintained at first catalytic cracking conditions including a gasoline-range-feed residence time of less than about 0.5 seconds in the presence of said catalyst, a temperature within the range of about 1,250° F. to about 1,500° F. and a catalyst-to-gasoline-range-feed weight ratio of at least about 75 to 1;

b. contacting the gas oil feed with used catalyst in a relatively downstream portion of the short-time dilute-phase riser reaction zone which portion is maintained at second catalytic cracking conditions including a gas-oil residence time of less than about 10 seconds in the presence of used catalyst, a temperature in the range of from about 900° F. to about 1,100° F. and a catalyst-to-gas-oil-feed weight ratio of from about 4 to about 25 to 1;

c. passing catalyst and feed streams in admixture through the riser reaction zone to produce spent catalyst, containing coke, and product components including gasoline;

d. discharging the mixture from said reaction zone into cyclone separators to effect the separation of spent catalyst from product components and any unreacted feed;

e. recovering product components and any unreacted feed;

f. passing spent catalyst to a regeneration zone maintained at oxidizing conditions including the presence of fresh regeneration gas, a temperature within the range of from about 1,250° F. to about 1,500° F., a pressure from about atmospheric to about 50 psig. and a catalyst residence time of from about 2 to about 5 minutes and therein oxidizing at said oxidizing conditions coke from spent catalyst and CO, resulting from coke oxidation, to produce freshly regenerated catalyst and spent regeneration gas, said oxidizing conditions being sufficient to substantially completely oxidize said CO to CO_2 and said CO oxidation being effected in contact with said freshly regenerated catalyst;

g. transferring at least a portion of the heat of CO combustion to regenerated catalyst thereby heating said catalyst to a temperature of from about 1,250° F. to about 1,500° F.; and,

h. returning heated regenerated catalyst to said reaction zone of step (a) above.

4,051,014

PROCESS FOR TREATING SULFUR-CONTAINING HYDROCARBON FEEDSTOCKS TO PRODUCE HIGH YIELD COKE

George P. Masologites, Olympia Fields, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 318,250, Dec. 26, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,439
Int. Cl.² C10G 34/00
U.S. Cl. 208—88 11 Claims

1. A process for producing coke which comprises:

1. contacting a sulfur containing hydrocarbon feedstock containing at least 1% by weight Conradson Carbon Residue with at least one peroxy oxidant in the presence of a catalyst comprising a metal in an amount effective to promote the oxidation of sulfur to preferentially oxidize at least a portion of the sulfur contained in said hydrocarbon feedstock, said metal being selected from the group consisting of Group IVB, Group V, Group VI and mixtures thereof;

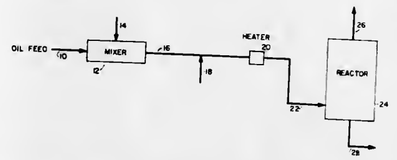
2. subjecting said oxidized sulfur-containing hydrocarbon feedstock to coking conditions at temperatures in the range from about 800° F. to about 1100° F. to produce a coke product from said coking having a sulfur content reduced by at least 40% by weight relative to the sulfur content of a coke product produced by subjecting the feedstock to the coking conditions of step 2 without the oxidation of step 1.

4,051,015

HYDROCONVERSION OF HEAVY HYDROCARBONS USING COPPER CHLORIDE CATALYST

Roby Bearden, Jr., and William C. Baird, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed June 11, 1976, Ser. No. 695,072
Int. Cl.² C10G 23/02
U.S. Cl. 208—108 9 Claims



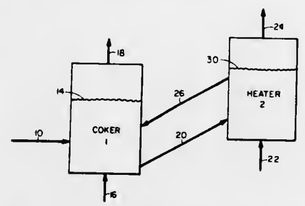
2. A process for the hydroconversion of a heavy hydrocarbonaceous oil, which comprises contacting said oil in liquid continuous phase with hydrogen and a particulate catalyst consisting essentially of a chloride of copper selected from the group consisting of cuprous chloride, cupric chloride and mixtures thereof, said catalyst being present in said oil in an amount ranging from about 1 to about 50 weight percent, at a temperature of at least 750° F. and under hydrogen partial pressure of at least about 500 psig.

4,051,016

FLUID COKING WITH H_2S ADDITION

William J. Metrailer, Baton Rouge, La.; Charles Rebick, Mountainside, and Richard K. Lyon, Fanwood, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Jan. 27, 1976, Ser. No. 652,761
Int. Cl.² C10G 9/32
U.S. Cl. 208—127 9 Claims



1. In a fluid coking process comprising the steps of contacting a carbonaceous material having a Conradson carbon content of at least 5 weight percent with hot fluidized solids in a fluidized coking bed contained in a coking zone maintained in a fluidized state by the introduction of a fluidizing gas and operated at coking conditions, including a pressure ranging from about 0 to about 150 psig, to produce a vapor phase product and a solid carbonaceous material which deposits on said fluidized solids, the improvement which comprises introducing into said coking zone a fluidizing gas comprising from about 5 to about 40 mole percent of hydrogen sulfide, based on the total gas introduced into said coking zone.

4,051,017

CATALYTIC HYDROCARBON REFORMING PROCESS AND CATALYST

William Ralph Beaty, Jr., Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 540,915, Jan. 14, 1975, Pat. No. 3,966,588, which is a division of Ser. No. 360,274, May 14, 1973, Pat. No. 3,900,430. This application Feb. 27, 1976, Ser. No. 662,184
Int. Cl.² C10G 35/06, 35/08
U.S. Cl. 208—135 13 Claims

1. A catalyst for hydrocarbon reforming consisting essentially of from about 0.01 to about 10 weight percent based on the catalyst weight of at least 1 catalytic metal selected from the group consisting of palladium, vanadium, platinum, rhenium and iridium, supported on a gamma alumina produced by a process consisting essentially of

a. hydrolyzing aluminum alkoxides to produce an aqueous alumina portion containing up to about 32 weight percent Al_2O_3 and an organic reaction product;

b. contacting said aqueous alumina slurry with an organic solvent selected from the group consisting of ethanol, propanol, isopropanol, butanol, hexanol, isobutanol and tertiary butanol in an amount sufficient to produce alumina having a cumulative pore volume (0–10,000A) from about 1.0 to about 2.75 cc/g, a surface area from about 225 to about 400 m^2/g and a loose bulk density from about 7.5 to about 25 lb/ft^3 upon drying to an Al_2O_3 content from about 80 to about 100 weight percent to form a solvent-aqueous alumina mixture;

c. drying said solvent-aqueous alumina mixture to produce alumina; and

d. forming said alumina of (c) into particles and calcining to produce said gamma alumina.

4,051,018

HYDROCARBON CONVERSION WITH A SELECTIVELY SULFIDED ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

H. Peter G. Knapik, Brookfield, and Frank H. Adams, La Grange Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 638,798, Dec. 8, 1975. This application Mar. 4, 1977, Ser. No. 774,284
Int. Cl.² C10G 35/08
U.S. Cl. 208—139 19 Claims

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon in a reaction zone maintained at hydrocarbon conversion conditions with a selectively sulfided acidic catalytic composite comprising a halogenated porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, and tin are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in the form of tin oxide; and wherein substantially all of the catalytically available cobalt is present in a sulfided state.

4,051,019

METHOD FOR LOADING FINELY DIVIDED PARTICULATE MATTER INTO A VESSEL

James A. Johnson, Clarendon Hills, Ill., assignor to UOP Inc., Des Plaines, Ill.

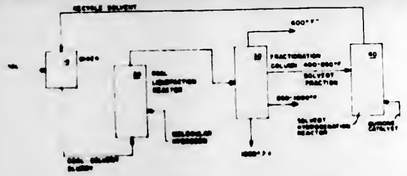
Continuation-in-part of Ser. No. 463,074, April 22, 1974, abandoned. This application Sept. 25, 1975, Ser. No. 616,798
Int. Cl.² B65B 37/02; B65G 3/04; C10G 11/01
U.S. Cl. 208—146 4 Claims

1. A method for forming a fixed-bed of catalyst particles which is subsequently contacted by a reactant feedstock comprising in the absence of a reactant feedstock,

a. loading finely divided catalyst particulate matter having a diameter from about one sixty-fourth to about one-half inch into a reactor vessel having said fixed-bed for the purpose of increasing the packing density of said fixed-bed and without fluidizing said particulate matter which comprises the following steps:

b. introducing said finely divided particulate matter into the upper portion of said vessel uniformly across said vessel's cross-section at a particle flux of from about 300 to about 1,000 $lb/hr\text{-}ft^2$;

c. introducing an inert, non-reactant fluid medium uniformly



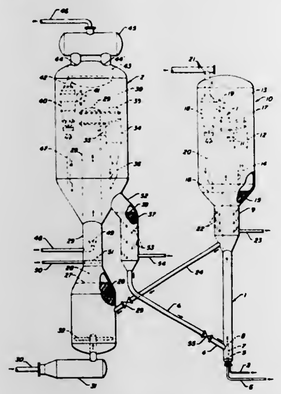
1. A process for liquefying a particulate coal feed to produce useful petroleum-like liquid products, which comprises: (a) contacting, in a liquefaction zone, said coal feed with a hydrogen donor solvent at temperature and pressure sufficient to hydrocouvert and liquefy the coal, (b) separating the product from the liquefaction zone into fractions inclusive of a liquid solvent fraction which contains at least 30 weight percent hydrogen donor compounds, (c) hydrogenating said liquid solvent fraction in a hydrogenation zone in the presence of an added quinone, compound and (d) recycling the hydrogenated liquid solvent mixture to said coal liquefaction zone.

4,051,013

FLUID CATALYTIC CRACKING PROCESS FOR UPGRADING A GASOLINE-RANGE FEED

Charles W. Strother, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation of Ser. No. 361,911, May 21, 1973, Pat. No. 3,948,757. This application Dec. 3, 1975, Ser. No. 637,446
The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.
Int. Cl.² C10G *37/02*
U.S. Cl. 208—78 **5 Claims**



1. A fluid catalytic cracking process for simultaneously cracking a gas oil feed and upgrading gasoline-range hydrocarbon feed which process comprises the steps of:
a. contacting the gasoline-range feed with freshly regenerated catalyst in a relatively upstream portion of a short-time of less than about 10 seconds in the presence of said catalyst, a temperature in the range of from about 900° F. to about 1,100° F. and a catalyst-to-gas-oil-feed weight ratio of from about 4 to about 25 to 1;
c. passing catalyst and feed streams in admixture through the riser reaction zone to produce spent catalyst, containing coke, and product components including gasoline;
d. discharging the mixture from said reaction zone into cyclone separators to effect the separation of spent catalyst from product components and any unreacted feed;
e. recovering product components and any unreacted feed;
f. passing spent catalyst to a regeneration zone maintained at oxidizing conditions including the presence of fresh regeneration gas, a temperature within the range of from about 1,250° F. to about 1,500° F., a pressure from about atmospheric to about 50 psig. and a catalyst residence time of from about 2 to about 5 minutes and therein oxidizing at said oxidizing conditions coke from spent catalyst and CO, resulting from coke oxidation, to produce freshly regenerated catalyst and spent regeneration gas, said oxidizing conditions being sufficient to substantially completely oxidize said CO to CO_2 and said CO oxidation being effected in contact with said freshly regenerated catalyst;
g. transferring at least a portion of the heat of CO combustion to regenerated catalyst thereby heating said catalyst to a temperature of from about 1,250° F. to about 1,500° F.; and,
h. returning heated regenerated catalyst to said reaction zone of step (a) above.

4,051,014

PROCESS FOR TREATING SULFUR-CONTAINING HYDROCARBON FEEDSTOCKS TO PRODUCE HIGH YIELD COKE

George P. Masologites, Olympia Fields, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 318,250, Dec. 26, 1972, abandoned. This application Aug. 26, 1974, Ser. No. 500,439
Int. Cl.² C10G *34/00*
U.S. Cl. 208—88 **11 Claims**

1. A process for producing coke which comprises:
1. contacting a sulfur containing hydrocarbon feedstock containing at least 1% by weight Conradson Carbon Residue with at least one peroxy oxidant in the presence of a catalyst comprising a metal in an amount effective to promote the oxidation of sulfur to preferentially oxidize at least a portion of the sulfur contained in said hydrocarbon feedstock, said metal being selected from the group consisting of Group IVB, Group V, Group VI and mixtures thereof;
2. subjecting said oxidized sulfur-containing hydrocarbon feedstock to coking conditions at temperatures in the range from about 800° F. to about 1100° F. to produce a coke product from said coking having a sulfur content reduced by at least 40% by weight relative to the sulfur content of a coke product produced by subjecting the feedstock to the coking conditions of step 2 without the oxidation of step 1.



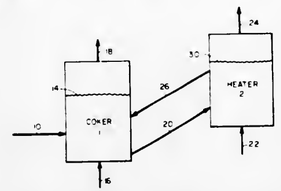
2. A process for the hydroconversion of a heavy hydrocarbonaceous oil, which comprises contacting said oil in liquid continuous phase with hydrogen and a particulate catalyst consisting essentially of a chloride of copper selected from the group consisting of cuprous chloride, cupric chloride and mixtures thereof, said catalyst being present in said oil in an amount ranging from about 1 to about 50 weight percent, at a temperature of at least 750° F. and under hydrogen partial pressure of at least about 500 psig.

4,051,016

FLUID COKING WITH H_2S ADDITION

William J. Metraller, Baton Rouge, La.; Charles Rebick, Mountainside, and Richard K. Lyon, Fanwood, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Jan. 27, 1976, Ser. No. 652,761
Int. Cl.² C10G *9/32*
U.S. Cl. 208—127 **9 Claims**



1. In a fluid coking process comprising the steps of contacting a carbonaceous material having a Conradson carbon content of at least 5 weight percent with hot fluidized solids in a fluidized coking bed contained in a coking zone maintained in a fluidized state by the introduction of a fluidizing gas and operated at coking conditions, including a pressure ranging from about 0 to about 150 psig, to produce a vapor phase product and a solid carbonaceous material which deposits on said fluidized solids, the improvement which comprises introducing into said coking zone a fluidizing gas comprising from about 5 to about 40 mole percent of hydrogen sulfide, based on the total gas introduced into said coking zone.

4,051,017

CATALYTIC HYDROCARBON REFORMING PROCESS AND CATALYST

William Ralph Beaty, Jr., Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 540,915, Jan. 14, 1975, Pat. No. 3,966,588, which is a division of Ser. No. 360,274, May 14, 1973, Pat. No. 3,900,430. This application Feb. 27, 1976, Ser. No. 662,184
Int. Cl.² C10G *35/06, 35/08*
U.S. Cl. 208—135 **13 Claims**

1. A catalyst for hydrocarbon reforming consisting essen-*mina having a cumulative pore volume (0–10,000A) from about 1.0 to about 2.75 cc/g. a surface area from about 225* to about 400 m^2/g and a loose bulk density from about 7.5 to about 25 lb/ft^3 upon drying to an Al_2O_3 content from about 80 to about 100 weight percent to form a solvent-aqueous alumina mixture;
c. drying said solvent-aqueous alumina mixture to produce alumina; and
d. forming said alumina of (c) into particles and calcining to produce said gamma alumina.

4,051,018

HYDROCARBON CONVERSION WITH A SELECTIVELY SULFIDED ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

H. Peter G. Knapik, Brookfield, and Frank H. Adams, La Grange Park, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 638,798, Dec. 8, 1975. This application Mar. 4, 1977, Ser. No. 774,284
Int. Cl.² C10G *35/08*
U.S. Cl. 208—139 **19 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon in a reaction zone maintained at hydrocarbon conversion conditions with a selectively sulfided acidic catalytic composite comprising a halogenated porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, and tin are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in the form of tin oxide; and wherein substantially all of the catalytically available cobalt is present in a sulfided state.

4,051,019

METHOD FOR LOADING FINELY DIVIDED PARTICULATE MATTER INTO A VESSEL

James A. Johnson, Clarendon Hills, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 463,074, April 22, 1974, abandoned. This application Sept. 25, 1975, Ser. No. 616,798
Int. Cl.² B65B *37/02*; B65G *3/04*; C10G *11/01*
U.S. Cl. 208—146 **4 Claims**

1. A method for forming a fixed-bed of catalyst particles which is subsequently contacted by a reactant feedstock comprising in the absence of a reactant feedstock,
a. loading finely divided catalyst particulate matter having a diameter from about one sixty-fourth to about one-half inch into a reactor vessel having said fixed-bed for the purpose of increasing the packing density of said fixed-bed and without fluidizing said particulate matter which comprises the following steps:
b. introducing said finely divided particulate matter into the upper portion of said vessel uniformly across said vessel's cross-section at a particle flux of from about 300 to about 1,000 $lb/hr\text{-}ft^2$;
c. introducing an inert, non-reactant fluid medium uniformly

across said vessel's cross-section and counter-current to the flow of said finely divided particulate matter and at a rate insufficient to fluidize said particulate matter;

d. adjusting the flow of said fluid medium to continuously maintain a constant velocity differential between said fluid medium and the falling finely divided particulate matter which velocity differential is at least as great as the free-fall terminal velocity of said finely divided particulate matter.

4,051,020

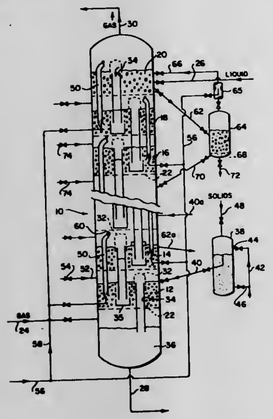
HYDROCARBON CONVERSION PROCESS FOR REMOVING SULFUR AND NITROGEN WITH PASSAGE OF CATALYST PARTICLES IN A SERIES OF SPACED BEDS

Gerald W. G. McDonald, Summit, N.J., assignor to Commonwealth Oil Refining Co. Inc.

Division of Ser. No. 627,127, Oct. 30, 1975. This application June 14, 1976, Ser. No. 695,398

Int. Cl.² C10G *23/00*

U.S. Cl. 208—213 **7 Claims**



1. A hydrocarbon conversion process for removing sulfur and nitrogen from hydrocarbon oil; comprising introducing into a mulit-stage reactor a liquid hydrocarbon oil adjacent the top of said reactor and withdrawing liquid product from the bottom of said reactor, introducing a hydrogen-rich gas adjacent to the bottom of said reactor and withdrawing gaseous reaction and unreacted hydrogen from the top of said reactor, maintaining a series of spaced beds of suspended catalyst particles within said reactor, maintaining desired liquid levels of oil within each of said beds to provide suspension of catalyst particles in said oil, passing said liquid oil from one bed to the next lower bed, and separately passing said catalyst particles from one bed to the next adjacent bed.

4,051,021

HYDRODESULFURIZATION OF HYDROCARBON FEED UTILIZING A SILICA STABILIZED ALUMINA COMPOSITE CATALYST

Glen P. Hamner, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

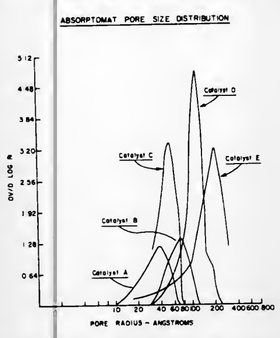
Filed May 12, 1976, Ser. No. 685,500

Int. Cl.² C10G *23/02*

U.S. Cl. 208—216 **6 Claims**

1. A process for the hydrodesulfurization of a hydrocarbon feed which comprises

contacting said feed with hydrogen and a catalyst characterized as comprising a composite of an alumina support stabilized with up to 6% silica and from about 5 to about 30 percent by weight of a Group VIB metal, metal oxide or metal sulfide thereof and from about 1 to about 12 percent by weight of a Group VIII metal, metal oxide or



metal sulfide thereof, the percents by weight being calculated on said composite, said catalyst being further characterized as follows:

Distribution of Pore Diameter measured by nitrogen adsorption isotherm	
0 - 50A	<1
50 - 70A	<24
70 - 160A	>70
160 + 200A	<5
200A+	
Pore Volume, cc/g	0.4 - 0.9
Surface Area, m^2/g	200 - 400

4,051,022

SYNTHETIC OIL TREATMENT

Gary A. Myers, Plano, and Donald K. Wunderlich, Richardson, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 421,139, Dec. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 314,015, Dec. 11, 1972, abandoned. This application July 18, 1975, Ser. No. 597,297

Int. Cl.² C10G *29/04, 25/00*

U.S. Cl. 208—253 **3 Claims**

1. A method for removing at least one non-metallic impurity selected from the group consisting of arsenic and selenium from a synthetic hydrocarbonaceous liquid obtained from normally solid coal, oil shale, or tar comprising contacting said liquid with a solid co-precipitated material consisting essentially of aluminum, oxygen, and a metal selected from the group consisting of iron and cobalt; said co-precipitated material being in subdivided form; and carrying out said contacting of said liquid and said co-precipitated material in a hydrogen atmosphere at a temperature of at 300° F and in the substantial absence of water, said substantial absence of water being less than 1.0 percent by weight of water in said liquid, and effecting deposition of said at least one non-metallic impurity on said co-precipitated material.

4,051,023

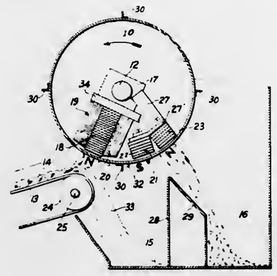
COMBINATION ELECTROMAGNET AND PERMANENT MAGNET SEPARATOR

Robert E. Fogle, and James Floros, both of Erie, Pa., assignors to Eriez Magnetics, Erie, Pa.

Filed Apr. 11, 1975, Ser. No. 567,420

Int. Cl.² B07C *9/00*; B03C *1/22*

U.S. Cl. 209—223 A **8 Claims**



1. A magnetic separator comprising a generally cylindrical drum made of a non-magnetic material,

means to rotate said drum around its longitudinal axis,

conveyor means for moving material past said drum,

a first chute for receiving non-magnetic material discharged from said conveyor means,

a second chute for magnetic material,

said first chute being disposed between said second chute and said conveyor means, a chute partition disposed between said first and second chutes,

said drum having a support means on its central axis disposed on the inside of said drum fixed against rotation,

an electromagnet supported on said support means,

said electromagnet extending radially from said support means and terminates adjacent the inner periphery of said drum,

said electromagnet having a pole at a position between a vertical line passing through an upper end of said conveyor and a vertical line passing through said chute partition, and a permanent magnet supported on said support means and disposed adjacent said second chute,

said conveyor comprising a belt means supporting said belt for movement around a closed path,

said path having an upper part and a lower part,

said upper part passing through the field generated by said electromagnet,

said permanent magnet comprises a back bar and a ceramic magnet fixed to said back bar.

4,051,024

OIL RECOVERY APPARATUS AND METHOD

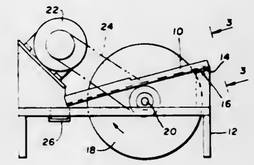
John G. Lowe, Pequannock, and Roy I. Butler, Kinnelon, both of N.J., assignors to Lowe Engineering Company, Lincoln Park, N.J.

Filed Jan. 29, 1976, Ser. No. 653,501

Int. Cl.² B01D *15/02, 15/06*

U.S. Cl. 210—30 A **16 Claims**

1. An oil recovery apparatus which removes oil, petroleum and like contaminating products as they float on or near the surface of a contaminated fluid, the apparatus including: (a) a support frame; (b) a multiplicity of substantially like-sized disks rotatably carried on and by said frame and when the frame is in operative use and position these disks are supported and rotated so as to be partially immersed in the contaminated fluid with the oil in the contaminated fluid contacting the side surfaces of the immersed disk, these side surfaces of the disks having an affinity for retaining oil and oil products and as the disks are rotated the floating oil in the contaminated fluid is attracted to the sides of the disk sufficiently for the oil to be lifted from the contaminated fluid; (c) a scraper assembly including at least one flexible ribbon associated with each disk, said scraper assembly providing a support for the flexible ribbon which during a portion of the supported length is bent so as to extend in a plane which is slightly upward from a plane parallel to the axis of the disk when the scraper assembly is in mounted scraping condition, the ribbon portion is arranged to provide at least one extending portion of ribbon which when in engaged condition with the disk is bent to provide a bias causing the edge of the extending portion of this ribbon to snugly engage the side of a disk to scrape the side of said rotating disk to remove the collected oil prior to the re-entry of the disk into the contaminated fluid, said scraper assembly including at least one tubular conductor which provides at least a portion of the



scraper support, said scraper assembly being readily removable from the support frame and in mounted condition the tubular conductor is sloped so that the discharge exit is below that portion having the scraper ribbons, this scraper assembly arranged so that one end rests on the support frame and is positively positioned at and in a selected orientation, this scraper assembly in mounted condition presenting the extending portion of the ribbon to the side of the rotating disk after the disk has reached its zenith and is on its downward movement prior to its re-entering the contaminated fluid, the conductor which is associated with each blade is adapted to receive the scraped oil from the disk and conduct the oil to a discharge end; (d) an accumulator adapted to receive the oil from the conductors and collect the accumulation for further disposition, and (e) power means associated with the disks and adapted to turn these disks in a prescribed direction and at a selected speed.

4,051,025

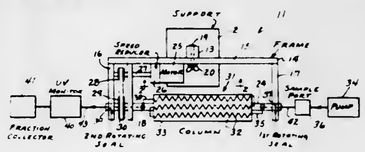
PREPARATIVE COUNTERCURRENT CHROMATOGRAPHY WITH A SLOWLY ROTATING HELICAL TUBE ARRAY

Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 29, 1976, Ser. No. 727,864

Int. Cl.² B01D *15/08*

U.S. Cl. 210—31 C **12 Claims**



1. An apparatus for continuous countercurrent chromatography comprising a support, frame means pivoted to said support for rotary adjustment around a transverse horizontal axis, a separation column comprising a helical tube array and journalled on said frame means for rotation around an axis perpendicular to said horizontal pivotal axis, drive means on said frame means drivingly connected to said separation column for rotating the column, feed conduit means for introducing fluids to one end of said separation column, fluid monitoring means,

and delivery conduit means connecting the other end of said separation column to said fluid monitoring means.

4,051,026

RECOVERY OF SILVER FROM SILVER-CONTAINING SOLUTIONS

Adrien Edgard Henri Julien Cremers, Winksele; André Petrus Adolf Maes, Kessel-LO, and Jozef Leonia Pleysier, Rijkevorsel, all of Belgium, assignors to Leuven Research & Development VZW, Leuven, Belgium

Filed Oct. 28, 1975, Ser. No. 626,052

Claims priority, application Netherlands, Oct. 29, 1974, 7414149

Int. Cl.² C02B *1/42*

U.S. Cl. 210—38 B **13 Claims**

10. The process of recovering silver from silver-containing solutions, which comprises the steps of:

a. forming silver-thiourea complexes in said solution by adding thiourea material thereto; and

b. adsorbing said silver-thiourea complexes on a cation exchanger.

4,051,027

SETTLING CLAY-CONTAINING SLIMES

Othmer F. Batzer, and John A. Stewart, both of Libertyville, Ill., assignors to International Minerals & Chemical Corporation, Libertyville, Ill.

Filed Dec. 22, 1975, Ser. No. 643,446

Int. Cl.² C02B *1/20*

U.S. Cl. 210—42 R **5 Claims**

1. A process for settling waste slime solids, from a phosphate are processing operation, including suspended attapulgite, montmorillonite, and fine sand from an aqueous suspension thereof, wherein said suspension contains from about 0.01% to about 35% by weight of solids, which comprises the steps of adding hydrogen peroxide to said suspension in an amount to enhance the settling of said solids, said amount being at least about 2 pounds per ton of suspended solids, and settling said solids from said suspension.

4,051,028

PROCESS FOR PURIFYING WATER

Francois Marie Fleesinger, Paris, France, assignor to Degremont, Rueil-Malmaison, France

Filed Apr. 26, 1976, Ser. No. 680,842

Claims priority, application France, Apr. 25, 1975, 75.12975

Int. Cl.² C02B *1/20*

U.S. Cl. 210—47 **7 Claims**

1. A process for purifying water containing material dissolved and/or suspended therein, which comprises mixing the water with an effective amount of a solution of a polymeric aluminum hydroxide prepared by treating a solution containing up to 2.5 moles/liter of aluminum chloride with a solution consisting essentially of water and an alkaline or alkaline-earth hydroxide, under vigorous agitation, the resulting solution of the polymeric aluminum hydroxide having a pH of 4.5–5.5, a molar ratio of OH to aluminum of from 2.3 to 2.7 and a concentration of aluminum of from 0.025 to 0.40 mole/liter, and separating floc from the thus treated water.

4,051,029

PROCESS OF INHIBITING SCALE FORMATION WITH MIXTURES OF THIO-, OXYGEN OR THIO-OXYGEN PHOSPHATES AND PYROPHOSPHATES

Derek Redmore, Ballwin, and Alfred E. Woodson, Festus, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 272,676, July 17, 1972, Pat. No. 3,909,447. This application June 26, 1975, Ser. No. 590,448

Int. Cl.² C02B *5/06*

U.S. Cl. 210—58 **14 Claims**

1. A process of inhibiting scale formation in a system which comprises treating said system with a composition comprising a mixture of thiophosphate, pyrophosphate containing both oxygen and sulfur, and oxygen phosphate esters of alcohols selected from the group consisting of alkanols having at least seven carbon atoms and alcohols of the formula $R'(OA)_nOH$ where R′ is alkyl, cycloalkyl, alkenyl, aryl, aralkyl, alkaryl, or heterocyclic, A is an alkylene moiety and n is from 1 to 100, said pyrophosphate esters being the major part of the combined thiophosphate and pyrophosphate esters and the weight ratio of said combined esters to the oxygen phosphate esters being from about 10:1 to 1:10.

4,051,030

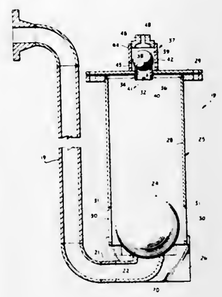
LIQUIDS SEPARATING SYSTEM

George E. Hulet, Jr., 3664 Rockbridge Road, Stone Mountain, Ga. 30083

Filed May 18, 1976, Ser. No. 687,550

Int. Cl.² B01D *21/24*

U.S. Cl. 210—114 **5 Claims**



1. Apparatus for draining heavy liquid from a tank which contains both heavy and light liquids comprising a flow passage communicating between outside the tank and inside the tank and valve means in open communication with the liquids in the tank, said valve means comprising a valve seat and a valve element arranged to engage said valve seat to open and close said flow passage, said valve element comprising a float valve with a specific gravity less than the heavy liquid and greater than the light liquid, and said valve means further including a valve housing positioned over said valve seat for confining said float valve to substantially vertical movement toward and away from said valve seat, said valve housing defining openings at its lower portion and being closed in its upper portion, an upper flow passage defined in the upper portion of said valve housing and an upper valve seat and an upper valve element arranged to engage said upper valve seat to open and close said upper flow passage, whereby when the level of the heavy liquid rises in the tank the heavier liquid displaces the lighter liquid up through the upper valve element and fills the valve housing and when the level of the heavy liquid recedes in the tank below the upper valve element the upper valve element closes and traps the heavier liquid in the valve housing and maintains the float valve high in the valve housing away from the valve seat as the heavy liquid continues to recede in the tank until the light liquid flows through the openings in the lower portion of the valve housing and displaces the heavy liquid in the valve housing and allows the float valve to move down against the valve seat.

4,051,031

FILTER APPARATUS

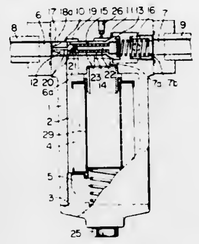
Eiji Suzuki, Tokyo, Japan, assignor to Taisei Kogyo Co., Ltd., Japan

Filed June 25, 1975, Ser. No. 590,122

Claims priority, application Japan, Nov. 20, 1974, 49-140270[U]; Mar. 24, 1975, 50-39285[U]

Int. Cl.² B01D *27/10*

U.S. Cl. 210—133 **4 Claims**



1. A filter device comprising, a filter casing, having a filter element chamber for removably housing a filter element therein, said housing having an inlet with a valve seat and an inlet passageway communicating with said inlet and said chamber, means defining a second passageway outwardly of said chamber for passage of fluid from a filter element therein outwardly of said housing, means defining a second set circumferentially of said second passage upstream of an outlet of said second passageway from said casing, an elongated valve element slidable axially in said second passageway in response to fluid under pressure in said second passageway having a portion biased to seat on said second seat and close said second passageway, biasing means biasing said valve element in a direction for seating on said seat and closing said second passageway, and said valve element comprising a second portion axially of the first portion thereof and integral therewith for seating on the first-mentioned seat for closing said inlet passageway.

4,051,032

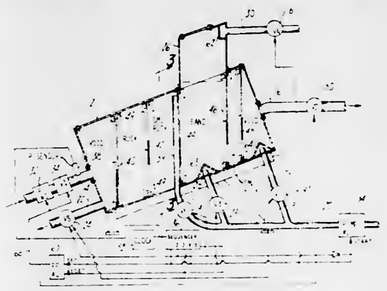
WATER TREATMENT SYSTEM

Jack A. Borchardt, Ann Arbor, Mich., assignor to Environmental Filtration Products, Inc., Orlando, Fla.

Filed May 21, 1976, Ser. No. 688,558

Int. Cl.² B01D *23/24*

U.S. Cl. 210—142 **16 Claims**



12. A waste effluent treatment system comprising: a closed tank having an effluent inlet at one end and an effluent outlet at an opposite end to provide an effluent flow path substantially horizontally through the tank; a plurality of septa disposed in spaced relation within the tank to subdivide the tank into subchambers serially along the effluent flow path; a fine particulate medium in at least one of the subchambers to filter the effluent; a coarse particulate medium in another subchamber and upstream in the effluent flow from said one subchamber; first means for horizontally backwashing at least the coarse medium; and second means for vertically backwashing and expanding the fine medium in said one subchamber.

4,051,033

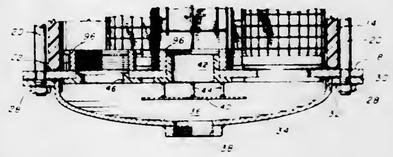
FILTER DEVICE

Roy J. Blace, Wallingford, Conn., assignor to Blace Filtronics, Inc., Derby, Conn.

Filed Dec. 22, 1975, Ser. No. 643,594

Int. Cl.² B01D *23/04*

U.S. Cl. 210—193 **11 Claims**



1. Filter apparatus for internal precoat of filter bags, and for fluid flow respectively in an upward and downward direction for filtering fluid and providing backwash cleaning of said apparatus, said apparatus comprising an upright housing having sidewalls, a top cover with an outlet for filtered fluid located therein, a bottom cover with an inlet for fluid to be filtered located therein, a horizontally arranged bottom wall located in a lower portion of said housing and spaced above said bottom cover, circular openings located in said bottom wall with short tubular flange sections located at said openings and extending upwardly therefrom, vertically extending rod members constructed and arranged to define a vertical skeleton tube surrounding each of said tubular flange sections, a flexible tubular filter bag with a closed top, sidewalls, and an open bottom surrounding each of said skeleton tubes, the lower edge of the sidwall of each bag sealingly connected to the tubular flange section which it surrounds, perforate frame means surrounding the exterior surface of each of said filter bags with clamp means arranged at the lower edge thereof as fastening means connecting said exterior frame, said filter bag, and said skeleton tube to the exterior surface of its corresponding tubular flange, filter aid media supply means connected to said bottom cover inlet whereby it may be introduced to the interior of each of said filter bags by a pressurized source of fluid to be filtered, backwash means in fluid communication with said top cover outlet whereby backwash of said filter bags occurs in a direction from the exterior to the interior through their sidewalls with discharge of washed material through said bottom cover inlet opening.

4,051,034

SYSTEM FOR WATER DISINFECTION

Anton Amon, and Jason K. Sedam, both of Dunwoody, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

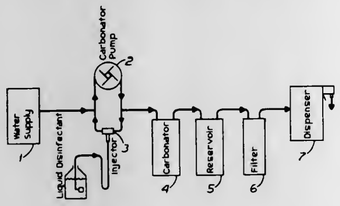
Division of Ser. No. 398,373, Sept. 18, 1973, abandoned. This application May 28, 1975, Ser. No. 581,510

Int. Cl.² C02B *1/36*

U.S. Cl. 210—206 **8 Claims**

1. A carbonated beverage system of the type including a water supply means, a closed system carbonator means, and a beverage dispenser means fluidly and operatively connected together in said system, wherein said water supply means sequentially supplies water initially to the carbonator means and thereafter to the dispenser means, and further wherein, the

improvement comprises liquid halogen-based disinfectant injection means connected to said carbonator means for, at substantially the same time of operation of said carbonator means, injecting a sufficient amount of liquid halogen-based disinfectant into the water being carbonated in a closed system, and thus, produce rapid disinfection of any pathogenic micro-



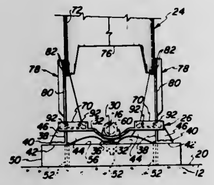
organisms in the water, and further wherein filter means are connected in the system between the carbonator means and dispenser means in order to provide a safety factor in the system and assure water disinfection of any large organisms in the water by entrapping the large organisms for an extended time in a low concentration disinfectant level.

4,051,035

APPARATUS FOR THE AEROBIC TREATMENT OF LIQUID WASTE

William O. Boschen, Cliffside Park; Angelo V. Annichiarico, East Hanover, and Arthur L. Johnson, Lodi, all of N.J., assignors to Ralph B. Carter Company, Hackensack, N.J.

Filed Aug. 16, 1976, Ser. No. 714,849
Int. Cl.² C02C *1/12*; B01F *3/04*
U.S. Cl. 210—220 **24 Claims**



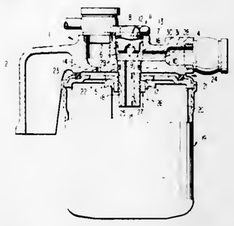
1. In a system for the aerobic treatment of waste materials in a liquid basin, the system including gas distribution lines in an array of continuous lines having a plurality of orifices placed therein for releasing gas, such as air, to the liquid in the basin during operation of the system, and a mixer-aerator device for placement in position over any one of the orifices for enhancing the mixing and aerating of the liquid in the region adjacent that position, the improvement comprising:
   - a plurality of brackets capable of being placed within the basin in a pattern corresponding to the array of continuous lines;
   - means for attaching the continuous lines to the brackets at spaced locations along the continuous lines without interrupting the continuity of the continuous lines, at least some of the locations corresponding to the placement of the orifices;
   - selective means integral with each bracket and the mixer-aerator device for securing the mixer-aerator device upon a selected bracket in a rigid, self-supporting manner, over a line and the orifice placed at the location of the selected bracket, the selective means being capable of ready operation for selectively securing the mixer-aerator device to the selected bracket and selectively removing the mixer-aerator device from the selected bracket, said selective means including:
   - at least two rigid legs extending between the mixer-aerator device and the selected bracket, the legs each having opposite ends;
   - a foot adjacent at least one of the opposite ends of each leg;
   - receptor means for each foot, the location of the receptor means corresponding to the location of each foot when the mixer-aerator device is in place upon the selected bracket; and
   - fastening means for selectively securing each foot with the corresponding receptor means in such manner as to preclude relative movement between the foot and the receptor means, said fastening means being capable of manual operation to release each foot from the corresponding receptor means without disturbing the attachment of the line to the selected bracket and the continuity of the array whereby selective securement and removal of the mixer-aerator device is accomplished readily without disturbing the operation of the system.

4,051,036

FILTER FOR LIQUIDS

Ulrich Conrad, Ludwigsburg, and Gerd Niemeier, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Feb. 3, 1976, Ser. No. 654,909
Claims priority, application Germany, Feb. 7, 1975, 2505091; June 7, 1975, 2525526
Int. Cl.² B01D *27/08*
U.S. Cl. 210—232 **10 Claims**



1. A filter for liquids comprising:
   - a filter head including an inlet channel, a discharge channel, and a bore extending downwardly through said filter head, said bore having a first diameter tapering downwardly to a second smaller diameter providing a conically shaped bore portion;
   - a filter body located below said filter head;
   - a bolt member inserted through said bore and threadedly connected to said filter body for connecting said filter body to said filter head, said bolt member having a first shank portion with a diameter corresponding to said first diameter and a second shank portion with a diameter corresponding to said second smaller diameter, and said bolt member communicating said filter body with said discharge channel by means of a dead-end bore and a full cross-bore through said bolt member, said cross-bore and said discharge channel communicating through an annular chamber surrounding said bolt member at the conically shaped portion of said bore in said filter head; and
   - sealing ring means constructed and arranged in a groove in said second smaller diameter shank portion of said bolt member for sealing said downwardly extending bore in said filter head, whereby said sealing ring means is inwardly compressed in said groove by the conically shaped portion of said bolt member upon insertion of said bolt member into said bore.

4,051,037

DEVICE FOR ASSEMBLING STACKED ANNULAR FILTERING ELEMENTS, UNDER CONSTANT PRESSURE

Michel Billault, Limoges, France, assignor to Sofrance S.A., Limoges, France

Filed Oct. 7, 1976, Ser. No. 730,177
Claims priority, application France, Oct. 16, 1975, 75.31678
Int. Cl.² B01D *25/04*
U.S. Cl. 210—236 **11 Claims**



1. A device for the assembly of stacked annular filtering elements under constant pressure for filtering a fluid flowing through the stack of elements from the outside thereof to the inside thereof, the device comprising a support which provides an abutment for one end of the stack of elements, a presser member which provides an abutment for the other end of the stack of elements, and a calibrated spring acting to bias the presser member towards the support such that said abutments are pushed one towards the other thus trapping the stack of elements therebetween, said spring being housed inside a tube located inside the stack of elements, one end of the tube being connected to the presser member and the other end of the tube being mounted to slide in a sealed manner on a securing member connected to the support, whereby the spring cannot contact the filtered fluid leaving the inside of the stack of elements.

4,051,038

FLOW CONTROL VANE FOR A SKIMMER-TYPE OIL BOOM

Cornelis in't Veld, Vlaardingen, Netherlands, assignor to National Marine Service, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 527,293, Nov. 26, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 643,170
Claims priority, application Netherlands, Nov. 26, 1973, 7316165
The portion of the term of this patent subsequent to Sept. 7, 1993, has been disclaimed.
Int. Cl.² E02B *15/04*
U.S. Cl. 210—242 S **4 Claims**



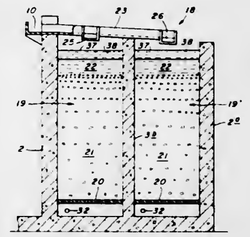
1. In an oil boom including a pair of longitudinally extending and generally parallel surface barriers constituting a forward and rear barrier and a longitudinally extending surface space therebetween, the forward barrier being shorter than the rear barrier at one end, and an end closure for the said space at said one end being connected to the rear barrier and extending forwardly so as to define a surface bypass area between said end closure and the adjacent end of said forward barrier, the improvement comprising a fixed flow control vane extending generally longitudinally of said forward barrier and between said forward barrier and said end closure, said vane including an upright, relatively narrow and elongated central web section extending longitudinally of the vane, the web section being forwardly inclined and disposed so as to lie beneath the surface of a body of water in which the boom is afloat by a predetermined distance.

4,051,039

ACTIVATED SEWAGE PLANT AND PROCESS

Donald F. Heaney, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 301,262, Oct. 27, 1972, abandoned, which is a division of Ser. No. 2,103, Jan. 12, 1970, Pat. No. 3,713,543, which is a continuation-in-part of Ser. No. 761,616, Sept. 23, 1968, abandoned. This application Apr. 26, 1976, Ser. No. 680,421
Int. Cl.² B01D *23/16*
U.S. Cl. 210—274 **3 Claims**



1. A filter especially designed for use in filtering the effluent flowing from the settling tank of an activated sewage plant to a clearwell and chlorinating vessel having an effluent discharge comprising:
   - a. a vessel having a bottom and side walls and having a perforate false bottom spaced above the bottom,
   - b. a filter bed not less than 6 feet in depth supported on said false bottom and comprised of hard gravel-like quartz sand, the particles of which are rounded and non-angular and in the general size ranging between 1 mm and 3 mm in the greatest dimension and with the particles in the bed predominantly varying from one another but not substantially more than 1 mm, said filter having a valved discharge outlet from the space below the false bottom for the collection of filtered water, said filter having means for forcing air under pressure into the space under the false bottom when said valved outlet is closed, said filter having means for forcing backwash water into the space under the false bottom when air is also being forced into said space, said filter having a head space above the filter bed for receiving water to be filtered and having an overflow weir into which water flows when the water is being backwashed.

4,051,040

ANTITHROMBOGENIC HEMO DIALYSIS MEMBRANES

James J. Hazdra, Downers Grove; David J. Rausch, Naperville, both of Ill., and Karl O. Munninger, North Las Vegas, Nev., assignors to John L. Hutchinson, Wheaton, Ill., a part interest

Filed Mar. 17, 1976, Ser. No. 667,539
Int. Cl.² B01D *13/00*
U.S. Cl. 210—321 B **4 Claims**

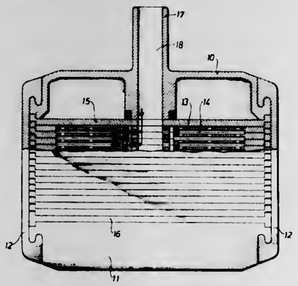
1. An artificial kidney machine having a hemo dialysis cellulosic membrane containing alkali carboxymethylation to the

extent of about 5 - 12 percent of that alkali carboxymethylation which may be theoretically incorporated in said membrane.

4,051,041
DEVICE FOR DIFFUSION OF SUBSTANCES BETWEEN TWO FLUIDS THROUGH SEMIPERMEABLE MEMBRANES

Gerhard Riede, Ealov, Sweden, assignor to Gambro AG, Switzerland

Continuation of Ser. No. 446,265, Feb. 27, 1974, abandoned. This application July 2, 1975, Ser. No. 592,666
Claims priority, application Sweden, Mar. 21, 1973, 7339489
Int. Cl.² B01D *31/00*
U.S. Cl. 210—321 B **7 Claims**

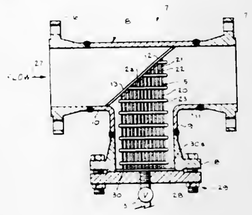


1. A device for diffusion of substances between two liquids through semipermeable membranes comprising a plurality of spacer elements each having inlet and outlet openings at opposed ends thereof, said inlet and outlet openings being aligned when said spacer elements are arranged in stacked relation, said spacer elements having recessed portions on opposite sides thereof spaced from the inlet and outlet openings and extending between said openings, pairs of membranes disposed between each of said spacer elements and provided only with inlet and outlet openings at opposed ends thereof coinciding with the inlet and outlet openings in said spacer elements when arranged in stacked relation, a first liquid being passed between the membranes of each pair and a second liquid being passed over the outer surfaces of each membrane and through the recessed portions of adjacent spacer elements, each spacer element having at least one first recessed groove on one side thereof extending away from an opening, a first transverse passage extending between the outer end of said at least one first recessed groove on the one side and the opposed side of said spacer element, a second recessed groove on the opposed side of said spacer element extending from the first transverse passage to the recessed portion on the opposed side of said spacer element and a second transverse passage extending between the outer end of the second recessed groove and the one side of said spacer element for communicating with the recessed portion on the one side of said spacer element, the surface of each spacer element adjacent to and surrounding said at least one first recessd groove, the opening and said first transverse passage forming a continuous seal with the adjacent surface of the superposed spacer element with a pair of membranes therebetween when said spacer elements and pairs of membranes are clamped together in alternate stacked relation to prevent leakage of the second liquid from the at least one first recessed groove into the first liquid passing between the membranes of each pair.

4,051,042
FLUID FLOW FILTERING ARRANGEMENT

Leo D. Tullier, 4727 Bayou Vista, Houston, Tex. 77018, and John F. Vignone, 8282 61 Drive, Flushing, N.Y. 11379

Filed Dec. 15, 1975, Ser. No. 641,099
Int. Cl.² B01D *21/02*
U.S. Cl. 210—409 **18 Claims**

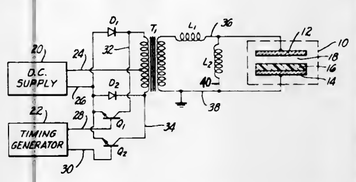


1. An arrangement for filtering fluid flow in a conduit comprising:
a. a T connection having a hollow body including a hollow projection which is connected with and intersects a pair of aligned hollow lateral extensions for forming a flow passage through the connection;
b. flange means formed on said hollow projection;
c. a plate secured in said T connection to intersect the flow passage, said plate having an opening therein;
d. a hollow, annular filter member positioned in said hollow projection and extending into the flow passage, said filter member including:
1. a core formed of spaced strips;
2. said strips having a surface for receiving the flow of fluid;
3. said strips having converging side surfaces extending from said fluid receiving surface whereby the space between said spaced strips is smallest adjacent the fluid receiving surface; and
4. a plurality of spaced reinforcing ribs engaging said spaced strips;
e. said filter member having an end positioned to communicate with the opening in said plate for receiving fluid flow in said filter member;
f. closing means for closing the other end of said filter member; and
g. retaining means secured to said flange means to retain said filter member in position in said hollow projection.

4,051,043
APPARATUS FOR FLUID TREATMENT BY ELECTRON EMISSION

Joseph William Harter, Los Angeles, and Stuart Wallace Beltzel, Santa Monica, both of Calif., assignors to O-3 Company, Los Angeles, Calif.

Filed Jan. 26, 1976, Ser. No. 652,633
Int. Cl.² C01B *13/11*
U.S. Cl. 250—531 **13 Claims**

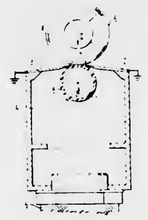


1. An apparatus for treating a fluid by electron emission, said apparatus including a cell for fluid treatment by electron emission and a circuit means for supplying an alternating current to said cell in which the improvement comprises:
said circuit means including power supply means for supplying electric power to the terminals of said cell,
said circuit means also including means for interrupting power flow from said power supply means to said cell for an interval during each cycle of said alternating current, energy storage means shunted across the terminals of said cell for storing energy when power is supplied to said cell said energy storage means being capable of supplying the energy stored therein to said cell upon the reversal of the polarity of said cell.

4,051,044
ELECTRIC DISCHARGE SURFACE TREATING APPARATUS

Bent Sörensen, Lunderskov, Denmark, assignor to Softal Elektronik Erik Blumenfeld KG, Hamburg, Germany

Filed Dec. 29, 1975, Ser. No. 644,411
Claims priority, application Germany, Dec. 30, 1974, 2461865
Int. Cl.² B01K *1/00*; H01T *19/04*
U.S. Cl. 250—531 **5 Claims**



1. Apparatus for the treatment of the surface of an object of conductive or non-conductive material by raising the surface energy thereof, comprising:
means defining a first rotatable cylindrical electrode with a surface adapted to lie along the surface of the object, a second knife-like electrode with the edge thereof lying along said surface of said cylindrical electrode in closely spaced relation to define a discharge gap between the electrodes, the knife-like electrode lying substantially tangentially to the cylindrical electrode,
object-supporting means adapted to maintain such an object in contact with said surface of said first cylindrical electrode, and
means for providing a flow of gas through the discharge gap between the electrodes.

4,051,045
OZONE GENERATING APPARATUS

Yoshihiko Yamamoto; Masahiro Shigenobu, and Hideo Kuwabara, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1975, Ser. No. 577,455
Claims priority, application Japan, June 10, 1974, 49-66222
Int. Cl.² C01B *13/11*
U.S. Cl. 250—536 **8 Claims**

1. An ozone generating apparatus comprising:
an ozone generator having a discharge tube with discharge electrodes;
a power source means for feeding a rectangular waveform alternating current between the discharge electrodes of the ozone generator;
a forward converter;
a reverse converter for converting the direct current of the forward converter to alternating current;
an ozone generating rate detector for detecting the ozone generating rate of the ozone generator to generate a signal proportional to the ozone generating rate;
an adder for comparing the output of the detector with a reference value;
first and second function generators to receive the output of the adder with each output having predetermined characteristics;
a direct current detecting circuit for detecting DC output



current fed from the forward converter to the reverse converter;
a forward converter control circuit for controlling the output current of the forward converter depending upon a comparison of the output of the first function generator with the output of the direct current detecting circuit; and
a reverse converter control circuit for controlling the output frequency of the reverse converter depending upon the output of the second function generator.

4,051,046
DETERGENT COMPOSITIONS CONTAINING INSOLUBLE PARTICULATE MATERIALS HAVING FABRIC CONDITIONING PROPERTIES

Francis Louvaine Diehl, Wyoming, and James Byrd Edwards, Roselawn, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 357,128, May 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 333,103, Feb. 16, 1973, Pat. No. 3,892,681. This application July 10, 1975, Ser. No. 594,909
Int. Cl.² C11D *3/12, 3/14*; D06M *11/12*
U.S. Cl. 252—8.6 **1 Claim**

1. A detergent composition in particulate form having fabric conditioning properties, consisting essentially of:
a. from about 2% to about 99.5% by weight of an organic surface-active agent selected from the group consisting of anionic, nonionic, zwitterionic and ampholytic detergents and mixtures thereof; and
b. from about 0.05% to about 10% by weight of a substantially water-insoluble particulate material having:
i. an average particle size in the range from about 5 to about 30 micrometers;
ii. a shape having an anisotropy of about 5:1 to 1:1;
iii. a hardness of less than about 5.5 on the Moh scale;
iv. a melting point above about 150° C; and
v. substantial freedom from exchangeable calcium and magnesium ions,
said water-insoluble particulate material being selected from the group consisting of glass beads, glass beads, glass microballoons, ceramic beads, and mixtures thereof.

4,051,047

GROUP II METAL MIXED SALTS OF TWO DIFFERENT ORGANIC ACIDS IN LUBRICANT

Thomas V. Liston, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 24, 1976, Ser. No. 670,515
Int. Cl.² C10M *1/40, 3/34, 5/22, 7/38*
U.S. Cl. 252—33 **17 Claims**

1. A Group II metal salt of:

A. an oil-soluble hydrocarbyl sulfonic acid; and

B. a polyoxyalkylenated sulfuric acid having a molecular weight in the range of about 500 to about 5000.

4,051,048

OIL-SOLUBLE HYDROLYZED ANIONIC-GRAFT POLYMER OF ETHYLENE-PROPYLENE COPOLYMER AND ANIONICALLY POLYMERIZABLE NITRILE MONOMER AND DERIVATIVES THEREOF HAVING UTILITY AS MULTIFUNCTIONAL V. I. IMPROVER FOR LUBRICATING OILS

Robert L. Elliott, Scotch Plains, and J. Brooke Gardiner, Mountainside, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 680,077, April 26, 1976. This application Oct. 13, 1976, Ser. No. 732,143
Int. Cl.² C10M *1/32, 1/18*
U.S. Cl. 252—51.5 R **21 Claims**

1. An oil soluble hydrolyzed anionic-graft polymer having a number average molecular weight in the range of about 1,000 to 500,000 while containing in the range of about 0.005 to 2 wt. % nitrogen and being useful as an oil additive having dispersancy properties, said anionic-graft polymer being a graft polymer of:

1. an anionically polymerizable monomer containing in the range of about 3 to 24 carbon atoms and at least one electron withdrawing group in such proximity to an olefinic bond that said bond is activated, said monomer being a nitrile monomer of the formula:

wherein R^{ν} is hydrogen or lower alkyl up to about 12 carbons, X is selected from the group consisting of hydrogen, halogen, cyano and lower alkyl up to 6 carbons; and,

2. an anion of an oxidized ethylene copolymer comprising about 20 to 80 mole % ethylene and about 20 to 80 mole % propylene; said anionic graft polymer being either acid or base hydrolyzed.

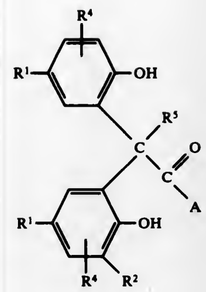
4,051,049

LUBRICATING OIL CONTAINING ALKANOIC AMIDE OR ESTER-BRIDGED HYDROCARBYL SUBSTITUTED PHENOLS

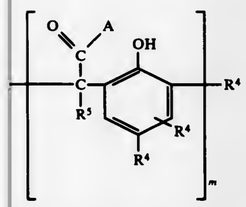
John Scotchford Elliott, Beaconsfield; Bryan Terence Davis, and Richard Martin Howlett, both of Wokingham, all of England, assignors to Edwin Cooper and Company Limited, Bracknell, England

Division of Ser. No. 462,092, April 18, 1974, Pat. No. 3,966,807. This application Mar. 15, 1976, Ser. No. 666,912
Claims priority, application United Kingdom, Apr. 19, 1973, 19173/73
Int. Cl.² C10M *1/32*
U.S. Cl. 252—51.5 A **10 Claims**

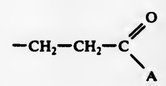
1. A lubricating composition comprising a major amount of a lubricating oil selected from synthetic ester oils, mineral oils and mixtures thereof and containing a minor dispersant amount of an additive having the formula:



wherein each R^1 is the same or different and is a hydrogen atom or an alkyl group, provided that at least one R^1 is an alkyl group containing at least 30 up to about 200 atoms; R^2 is hydrogen or is a group of the formula:



in which m is zero or an integer; each R^4 is the same or different and is hydrogen or a group of the formula —Z—R^6 in which Z is a sulfur atom, a chain of at least two sulfur atoms or is absent and R^6 is an alkyl group, a hydroxy-substituted aralkyl group when Z is absent, a hydroxy-substituted aryl group or a hydroxy-substituted alkaryl group when Z is present; each R^5 is the same or different and is a hydrogen atom, a methyl group or the group:



and each



is the same or different and is selected from the group consisting of an amide group or is an ester group wherein said amide group has at least one hydroxyalkyl or aminoalkyl substituent attached to the nitrogen atom and said ester group is derived from an hydroxyethyl substituted amine.

4,051,050

OIL-SOLUBLE ANIONIC-GRAFT POLYMER OF ETHYLENE-PROPYLENE COPOLYMER AND ANIONICALLY POLYMERIZABLE MONOMER HAVING UTILITY AS MULTIFUNCTIONAL V. I. IMPROVER FOR LUBRICATING OILS

Robert L. Elliott, Scotch Plains, and John Brooke Gardiner, Mountainside, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

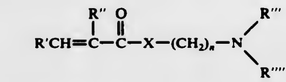
Filed Apr. 26, 1976, Ser. No. 680,077
Int. Cl.² C10M *1/36, 1/18*
U.S. Cl. 252—51.5 R **24 Claims**

1. An oil soluble anionic-graft polymer having a number average molecular weight in the range of about 1,000 to 500,000 while containing in the range of about 0.005 to 2 wt. % nitrogen and being useful as an oil additive having dispersancy properties, said oil soluble polymer being a graft polymer of:

1. an anionically polymerizable monomer containing in the range of about 3 to 50 carbon atoms and at least one electron withdrawing group in such proximity to an olefinic bond that said bond is activated, said monomer being selected from the group consisting of:

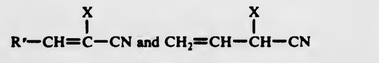
a. N,N (di $C_{1\text{-}10}$ hydrocarbyl) carbodiimides;

b. monomers of the formula:



wherein X is oxygen or an NR″ group; n is 2 to 5; R′ and R″ are hydrogen or a C_1 to C_4 alkyl group; and R‴ and R⁗ are C_1 to C_{12} hydrocarbyl groups; and

c. nitrile monomers of the formulae:



wherein R^{ν} is hydrogen or lower alkyl and X is selected from the group consisting of hydrogen, halogen, cyano and lower alkyl;

and, (2) an anion of an oxidized ethylene copolymer comprising about 20 to 80 mole % ethylene and about 20 to 80 mole % propylene.

4,051,051

LUBRICATING OIL COMPOSITIONS CONTAINING AN ACYCLIC POLYMER OF CYCLOPENTENE

Frederik L. Binsbergen, and Dick J. Van Namen, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed June 21, 1976, Ser. No. 698,611
Claims priority, application United Kingdom, June 24, 1975, 26721/75
Int. Cl.² C10M *1/18*
U.S. Cl. 252—59 **3 Claims**

1. An oil composition comprising a lubricating oil and from 0.025 to 10%w of substantially linear polymer selected from the group consisting of an acyclic polymer of cyclopentene, acyclic polymers of cyclopentene which have been partially hydrogenated to remove less than 70% of the initial unsaturation of the acyclic polymer, and mixtures thereof, said linear polymer having a molcular weight of between 1.0×10^4 and 3.0×10^5.

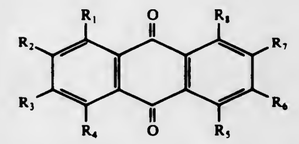
4,051,052

LIQUID DEVELOPER

Yasuo Ueda, Kobe; Yasutoki Kamezawa; Tatsuo Aizawa, both of Osaka, and Toshimitu Ikeda, Himeji, all of Japan, assignors to Mita Industrial Company Ltd., Osaka, Japan

Division of Ser. No. 32,733, April 28, 1970, Pat. No. 3,781,208. This application Oct. 25, 1973, Ser. No. 409,737
Int. Cl.² G03G *9/00*
U.S. Cl. 252—62.1 L **16 Claims**

1. A liquid developer for electrophotography which consists essentially of a dispersion of an anthraquinone dye or pigment finely dispersed in an electrically insulating hydrocarbon liquid consisting essentially of isoparaffinic hydrocarbon selected from the group consisting of a mixture consisting substantially of isoparaffins containing from 9 to 11 carbon atoms and having a boiling point range of from about 320° F to about 350° F, a mixture consisting substantially of isoparaffins containing 8 to 12 carbon atoms and having a boiling point range of from about 345° F to about 375° F and a mixture consisting substantially of isoparaffins containing 9 to 14 carbon atoms and having a boiling point range of from about 354° F to about 386° F, and from 0 to 30% by volume of an aromatic hydrocarbon in which the anthraquinone dye or pigment is substantially insoluble said anthraquinone dye or pigment have the formula:



wherein R_1 to R_8 are selected from hydrogen, halogen, hydroxyl, amino, —SO_3M, in which M is hydrogen, an alkali metal or an alkaline earth metal, and a substituent of the group consisting of

a. an alkyl group,
b. an alkoxy group,
c. an alkylthio group,
d. an alkylamino group,
e. an alkylcarbonyl group,
f. an N-alkylcarbonamide group,
g. an N-alkylsulfonamide group,
h. an alkarylamino group,
i. an N-alkarylcarbonamide group,
j. an N-alkarylsulfonamide group,
k. an alkylbenzenesulfonamide group,
l. an alkylarylamino group,
m. an alkylamino-triazinylamino group, and
n. an alkaryloxy group,

each of the above groups (a) to (n) having 8 to 24 carbon atoms in the alkyl portion, and wherein 1 to 4 of R_1 to R_8 are substituents selected from the said groups (a) to (n);

and from 0 to 30% by volume of an aromatic hydrocarbon, the liquid developer containing 0.05 to 5 grams of said dye or pigment per liter of said liquid developer.

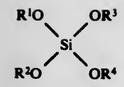
4,051,053

HYDRAULIC FLUIDS COMPRISING ORTHOSILICATE ESTERS

John Scotchford Elliott; Gerald John Joseph Jayne; Herbert Frank Askew, and Colin John Harrington, all of Swindon, England, assignors to Castrol Limited, England

Continuation of Ser. No. 431,889, Jan. 9, 1974, abandoned. This application Apr. 22, 1976, Ser. No. 679,440
Claims priority, application United Kingdom, Jan. 10, 1973, 01409/73
Int. Cl.² C07F *7/04*; C09K *3/00*
U.S. Cl. 252—78.3 **13 Claims**

1. An orthosilicate ester having the general formula:



wherein R^1 is selected from the group consisting of propylene glycol monoalkyl ether residues containing from 1 to 2 carbon atoms in the terminal alkyl group and tertiary alkyl groups; each of R^2, R^3 and R^4 is the same or different and is selected from the group consisting of ethylene and propylene glycol monoalkyl ether residues containing from 1 to 2 carbon atoms in the terminal alkyl group and tertiary alkyl groups, provided that when R^1 is a propylene glycol monoalkyl ether residue each of R^2, R^3 and R^4 are also propylene glycol monoalkyl ether residues; the total number of carbon atoms in R^1, R^2, R^3 and R^4 being at least 15 and at least one of R^1, R^2, R^3, and R^4 being a glycol monoalkyl ether residue.

11. A hydraulic fluid containing at least one compound as defined in claim 1.

4,051,054

DETERGENT COMPOSITIONS

Charles Bloor Davies, Wallasey, and James Francis Davies, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 510,664, Sept. 30, 1974, abandoned. This application May 12, 1976, Ser. No. 685,597

Claims priority, application United Kingdom, Oct. 1, 1973, 45688/73

Int. Cl.² C11D *1/66, 3/10*

U.S. Cl. 252—89 R **12 Claims**

1. A solid detergent additive consisting essentially of from about 5% to about 55% by weight of a nonionic detergent compound absorbed onto finely divided calcium carbonate having a surface area of at least about 5 m^2/g.

9. A process for forming a detergent additive according to claim 1 comprising dissolving a nonionic detergent compound in a volatile solvent of water, diethyl ether or lower aliphatic alcohols, mixing the solution with finely divided calcium carbonate having a surface area of at least 5 m^2/g, and then evaporating the solvent from the mixture.

4,051,055

CLEANSING COMPOSITIONS

Toan Trinh, Sharonville, and Bruce Albert Yeazell, Springfield Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 21, 1976, Ser. No. 753,070

Int. Cl.² C11D *3/04, 3/14, 3/395, 7/10*

U.S. Cl. 252—95 **11 Claims**

1. An aqueous, hard surface cleansing composition comprising:

a. from about 0.1% to about 50% of a compound which releases hypochlorite ions in aqueous solution;

b. from about 0.1% to about 30% of a mineral clay having a cation exchange capacity of at least 3 milliequivalents of cation per 100 grams of clay;

c. from 0% to about 25% of a surfactant which is compatible with hypochlorite;

d. from 0% to about 65% of a particulate abrasive having a paticle size of from about 1 to about 250 microns and a specific gravity of from about 0.2 to about 2.2;

e. from 0% to about 50% of a water-soluble, inorganic alkaline salt or mixture of such salts;

f. an amount of a source of soluble fluoride ions which provides at least 0.01% of fluoride ions to said composition; and

g. the balance of said composition comprising water.

4,051,056

ABRASIVE SCOURING COMPOSITIONS

William Law Hartman, Cheviot, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 504,217, Sept. 9, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,220

The portion of the term of this patent subsequent to Oct. 12, 1993, has been disclaimed.

Int. Cl.² C11D *7/56*

U.S. Cl. 252—99 **8 Claims**

1. A liquid, abrasive, hard surface cleansing composition which leaves little or no abrasive residue on hard surfaces after use, said composition consisting essentially of:

a. from about 0.1% to 7% by weight of a surfactant selected from the group consisting of water soluble alkyl sulfates containing from about 8 to about 18 carbon atoms in the alkyl group;

b. from about 2% to 25% by weight of a particulate expanded perlite abrasive material, substantially all of said material ranging in particle size from 1 micron to 190 microns, said material having an average specific gravity ranging from about 0.2 to 2.2;

c. from about 0.1% to 10% by weight of a bleaching agent which yields hypochlorite species in aqueous solution;

d. from about 1% to 30% by weight of a suspending agent which serves to maintain said expanded perlite abrasive material dispersed throughout said liquid composition wherein said suspending agent is an inorganic colloid-forming clay selected from the group consisting of smectites, attapulgites and mixtures thereof; and

e. the balance of said liquid composition consisting essentially of a filler selected from the group consisting of water and mixtures of water and inorganic salts, the concentration of water ranging from about 10% to 90% by weight of the composition.

4,051,057

SOLUTIONS FOR CLEANING SURFACES OF COPPER AND ITS ALLOYS

Harry Ericson, Grevebergsgatan 13, Vastra Frolunda, Sweden (421 56), and Carl Otto Fredriksson, Bogatan 37 B, Goteborg, Sweden (412 72)

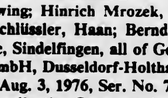
Filed Dec. 8, 1975, Ser. No. 638,697

Claims priority, application Sweden, Dec. 13, 1974, 74156480

Int. Cl.² C11D *7/08, 7/18, 7/32*

U.S. Cl. 252—100 **8 Claims**

1. A solution for pickling copper and its alloys which contains 5 - 125 g/l of one or more mineral acids selected from the group consisting of sulphuric acid and phosphoric acid, 2 - 50 g/l hydrogen peroxide, 5 - 100 g/l hydroxy acid selected from the group consisting of citric acid and gluconic acid, and 0.01 - 5 g/l of one or more of the group consisting of benzotriazole and a tertiary amine of the general formula



in which R is an aliphatic carbon chain containing less than 24 carbon atoms and the sum of n_1 and n_2 is less than 30.

4,051,058

STABLE PEROXY-CONTAINING MICROBICIDES

Walter Grosse Bowing; Hinrich Mrozek, both of Dusseldorf; Hans-Joachim Schlussler, Haan; Bernd Tinnefeld, Velbert, and Peter Vogele, Sindelfingen, all of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed Aug. 3, 1976, Ser. No. 711,205

Claims priority, application Germany, Aug. 16, 1975, 2536618; Apr. 12, 1976, 2616049

Int. Cl.² A61K *33/40, 7/135;* **C11D** *7/18, 7/38*

U.S. Cl. 252—186 **9 Claims**

1. A stable peroxy-containing concentrate useful for the production of microbicidal agents consisting essentially of

1. from 0.5% to 20% by weight of an acid selected from the group consisting of peracetic acid, acetic acid, mixtures of peracetic acid and acetic acid, perpropionic acid, propionic acid and mixtures of perpropionic acid and propionic acid,

2. from 25% to 40% by weight of H_2O_2,

3. from 0.25% to 10% by weight of a sequestering compound selected from the group consisting of an organic phosphonic acid capable of sequestering bivalent metal cations and its water-soluble acid salt,

4. from 0 to 5% by weight of an anionic surface-active compound selected from the group consisting of sulfonates and sulfates, and

5. the remainder to 100% by weight, water.

4,051,059

PEROXY-CONTAINING MICROBICIDES STABLE IN STORAGE

Walter Grosse Bowing; Hinrich Mrozek, both of Dusseldorf; Hans-Joachim Schlussler, Haan; Bernd Tinnefeld, Velbert, and Peter Vögele, Sindelfingen, all of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed Aug. 3, 1976, Ser. No. 711,206

Claims priority, application Germany, Aug. 16, 1975, 2536617; Apr. 12, 1976, 2616049

Int. Cl.² A61K *33/40, 7/135;* **C11D** *7/18, 7/38*

U.S. Cl. 252—186 **7 Claims**

1. A peroxy-containing concentrate, stable in storage, consisting essentially of

1. from 0.5% to 20% by weight of an acid selected from the group consisting of peracetic acid, acetic acid, perpropionic acid, propionic acid, mixtures of peracetic acid and acetic acid, and mixtures of perpropionic acid and propionic acid,

2. from 25% to 40% by weight of H_2O_2,

3. from 0 to 5% by weight of an anionic surface-active compound selected from the group consisting of sulfonates and sulfates, and

4. the remainder to 100% by weight, water.

4,051,060

METHOD FOR THE PREPARATION OF CONCENTRATED NITRATE-DEFICIENT SALT SOLUTIONS

Johannes B. W. Kanij, Zevenaar; Arend J. Noothout, Oosterbeek, and Marie E. A. Hermans, Arnhem, all of Netherlands, assignors to Reactor Centrum Nederland (Stichting), The Hague, Netherlands

Continuation of Ser. No. 358,388, May 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 106,922, Jan. 15, 1971, abandoned. This application Nov. 28, 1975, Ser. No. 636,294

Claims priority, application Netherlands, Jan. 16, 1970, 7000674; Australia, Jan. 15, 1971, 24159/71

Int. Cl.² C01B *43/00*

U.S. Cl. 252—301.1 R **14 Claims**

1. A process for the preparation of an aqueous concentrated nitrate-deficient uranyl nitrate solution of a molar nitrate to uranium ratio of about 1.5 or greater, comprising the step of dissolving uranium oxide in a volume of liquid wherein said uranium oxide comprises a mixture having a composition lower than UO_3 and at least equal to or higher than UO_2 and is dissolved in a volume of liquid selected from the group consisting of:

(a) a solution of HNO_3, wherein the amount of said HNO_3 in solution is less than the molar amount of said uranium oxide, so that the uranium concentration in said resulting solution is higher than that of the stoichiometric uranyl nitrate in solution,

(b) an aqueous solution of uranyl nitrate, and

(c) a mixtue of (a) and (b),

such that the resulting solution has a uranium concentration of at least 2 molar, and the ratio of nitrate ions concentration to uranium concentration is between about 1 and 2 moles, thereby obviating the step of concentrating the solution of nitrate-deficient uranyl nitrate solution.

4,051,061

GALLIUM PHOSPHIDE LIGHT EMITTING SEMICONDUCTIVE MATERIALS

Rameshwar Nath Bhargaza, Ossinning, and Gertrude F. Neumark, Hartsdale, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 165,043, July 23, 1971, abandoned. This application Aug. 10, 1973, Ser. No. 387,519

Int. Cl.² C09K *11/42*

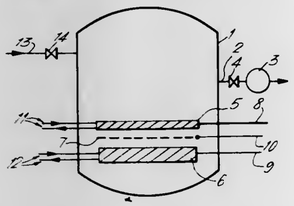
U.S. Cl. 252—301.4 P **1 Claim**

1. Yellow luminescing single crystals of gallium phosphide containing magnesium filled Ga vacancy-O_p nearest-neighbor complexes in a concentration producing under excitation with a light having a wave-length of 4880 A. a spectral output at 105° K. which peaks at about 5800 A., said magnesium being present in a concentration of about 10^{16}-10^{18} per cubic centimeter, and O_p symbolizes an oxygen atom at a phosphorus site in the crystal.

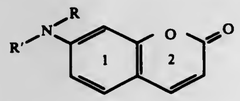
4,051,062
7-AMINO COUMARIN DYES FOR FLASHLAMP-PUMPED DYE LASERS

Peter R. Hammond, Livermore; Erhard J. Schimitschek, San Diego, and John A. Trias, La Mesa, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 3, 1976, Ser. No. 720,175
Int. Cl.² H01S 3/20; F21K 2/00
U.S. Cl. 252—301.17 **4 Claims**



1. A laser dye solution comprising a compound of the type



wherein R and R' are the same or different, being selected from the group consisting of hydrogen, methyl, ethyl, and a 3 carbon chain fused to ring 1 to form a heterocyclic ring.

4,051,063
STORAGE OF MATERIAL

Richard Stuart Nelson, Goring-on-Thames; Stanley Frederick Pugh, Abingdon, and Michael John Stapley Smith, Boars Hill, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 18, 1974, Ser. No. 524,996
Claims priority, application United Kingdom, Nov. 20, 1973, 53893/73
Int. Cl.² G21F 9/02
U.S. Cl. 252—301.1 W **17 Claims**

1. A method for the storage of a material within a solid comprising the steps of:

locating a solid in a chamber containing an atmosphere comprising a material to be stored within the solid;

bombarding a surface of the solid with ions of the material of said atmosphere at an energy sufficient such that the material is implanted beneath the surface of the solid and such that erosion of the solid, due to sputtering, does not prevent the implanted material from being retained in said solid, said bombarding forming a concentration of said material within the solid;

depositing on the implanted surface of said solid, by sputtering, additional solid material such that there is a net gain in the thickness of said solid, said sputtering being carried out in said chamber with ions of said atmosphere including ions of said material to be stored; and

bombarding said additional solid material with ions of the material of said atmosphere to implant ions of the material therein such that there is a build up of stored material in the solid.

4,051,064
PROCESS FOR MAKING COLLOIDAL SOLS OF ANTIMONY PENTOXIDE IN POLYHYDROXY ALCOHOLS

Charles E. Crompton, Arlington Heights, Ill., and Abdulla M. Z. Kazi, Euclid, Ohio, assignors to Chemetron Corporation, Chicago, Ill.

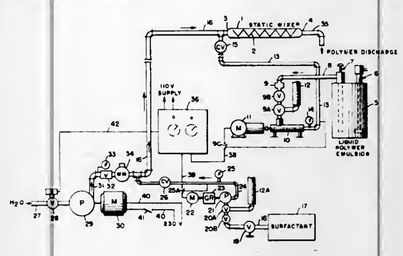
Continuation-in-part of Ser. No. 605,287, Aug. 18, 1975, Pat. No. 3,994,825. This application Aug. 10, 1976, Ser. No. 713,152
The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.
Int. Cl.² B01J 13/00
U.S. Cl. 252—309 **9 Claims**

1. A process for making a colloidal dispersion of hydrous antimony pentoxide particles comprising introducing particles of an oxidizable antimony oxide into an aliphatic polyhydroxy alcohol having vicinal hydroxyl groups and contacting said particles with aqueous hydrogen peroxide at a temperature of from about 0° C to about the decomposition temperature of the reaction mixture for a length of time sufficient to convert at least a portion of said particles to colloidal particles of hydrous antimony pentoxide.

4,051,065
APPARATUS FOR DISSOLVING WATER SOLUBLE POLYMERS AND GUMS IN WATER

Gerard J. Venema, Oak Park, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 502,722, Sept. 3, 1974, abandoned. This application May 18, 1976, Ser. No. 687,551
Int. Cl.² B01F 7/08
U.S. Cl. 252—359 A **2 Claims**



1. A continuous polymer solution preparation system comprising:

a. a static mixer containing stationary helical elements in a tubular chamber having an inlet end and an outlet end,

b. a water supply,

c. a water supply line connecting said water supply of (b) to the inlet end of said mixer of (a),

d. means for continuously forcing water under pressure through said water supply line of (c),

e. a surfactant supply,

f. a surfactant supply line,

g. means for continuously forcing surfactant under pressure from said surfactant supply of (e) through said surfactant supply line of (f),

h. means interconnecting said surfactant line of (f) and said water supply line of (c),

i. a supply of a water-in-oil polymer emulsion of a water soluble vinyl addition polymer in water,

j. a polymer emulsion supply line connected to said supply of (i),

k. means interconnecting said polymer emulsion supply line of (j) and said water line of (c) at a point between the inlet end of said mixer of (a) and the interconnection of said surfactant line of (f) and said water line of (c),

l. means for continuously forcing said polymer emulsion through said polymer emulsion supply line of (j) under pressure, and

m. a polymer discharge line connected to the outlet end of said mixer of (a), the number of said helical elements and the means for forcing the resulting composition of water, surfactant and polymer emulsion under pressure through said tubular chamber of said static mixer of (a) containing said stationary helical elements being effective to give a Reynolds number of at least 50,000.

4,051,066
CORROSION-INHIBITING RUBBER AND METHODS OF PREPARATION

Boris A. Miksic, Oakdale, and Donovan P. Stern, Staples, both of Minn., assignors to Northern Instruments Corporation, Lino Lakes, Minn.

Filed Jan. 13, 1975, Ser. No. 540,565
Int. Cl.² C23F 11/14, 11/18
U.S. Cl. 252—389 R **20 Claims**

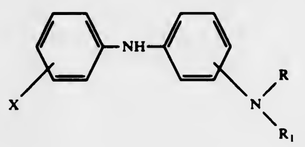
1. A solid, corrosion-inhibiting elastomer containing a noncellular or intercellular elastomeric matrix, said elastomeric matrix containing a corrosion-inhibiting amount of the corrosion-inhibiting compound cyclohexamethyleneimine dinitrobenzoate distributed through said elastomeric matrix.

4,051,067
STABILIZATION OF UNSATURATED CARBOXYLIC ACID ESTERS WITH MIXTURES OF POLYALKYLENEAMINES AND ARYLENEDIAMINES

Gene Ray Wilder, Medina, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 436,438, Jan. 25, 1974, abandoned. This application Dec. 29, 1975, Ser. No. 644,613
Int. Cl.² C09K 15/16
U.S. Cl. 252—401 **14 Claims**

1. An inhibitor composition comprising polyalkyleneamine which is an acyclic aliphatic compound having amino groups attached through alkylene of 1–10 carbon atoms and arylenediamine of the formula

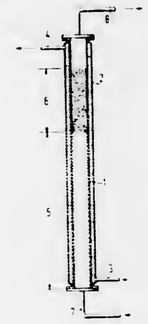


in which X is hydrogen, chloro, trichloromethyl, trifluoromethyl, nitro, lower alkyl, lower alkoxy, or phenoxy, R is hydrogen or alkyl, R_1 is alkyl or phenyl, or R and R_1 together with the nitrogen atom is a heterocyclic radical selected from the group consisting of pyrrolidinyl, 2,5-dimethylpyrrolidinyl, piperidino and hexahydro-1H-azepin-1-yl in which the polyalkyleneamine is 10–90 parts by weight and the arylenediamine is 10–90 parts by weight per 100 parts by weight of the inhibitor composition.

4,051,068
PROCESS FOR REACTIVATING SILVER CATALYSTS USED IN THE MANUFACTURE OF ETHYLENE OXIDE BY DIRECT OXIDATION

Siegfried Rebsdat, Winhoring, Burg; Sigmund Mayer, Burgkirchen-Holzen, and Josef Alfranseder, Hofschallern, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Apr. 27, 1976, Ser. No. 680,778
Claims priority, application Germany, May 2, 1975, 2519599; Mar. 20, 1976, 2611856
Int. Cl.² B01J 23/96; C07D 301/10, 303/04
U.S. Cl. 252—412 **9 Claims**



1. Process for reactivating used silver carrier catalysts for the manufacture of ethylene oxide by reacting ethylene with molecular oxygen or air, which comprises adjusting on the catalyst a concentration of cesium, rubidium or of both of from 1 to 1,000 ppm by impregnating the said catalyst with a solution of cesium, rubidium or of both compounds selected from the group consisting of salts and hydroxides in an aliphatic alcohol having from 1 to 6 carbon atoms and containing at most 10% by weight of water and evaporating the alcohol and any water present.

4,051,069
FLUIDIZED CATALYTIC CRACKING REGENERATION PROCESS

Dorrance P. Bunn, Jr.; Dale Williams; Henry B. Jones, all of Houston, and John P. MacLean, Stafford, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed May 7, 1976, Ser. No. 684,505
Int. Cl.² B01J 29/38, 21/20; C10G 11/18
U.S. Cl. 252—417 **9 Claims**

1. In a fluidized catalyst cracking process wherein a coke-contaminated, spent cracking catalyst is regenerated, in a single regenerator vessel, by burning coke therefrom at an elevated temperature with a molecular oxygen containing regeneration gas for producing a regenerated catalyst and a flue gas comprising oxides of carbon, the improvement which comprises:

a. flowing hot, spent catalayst substantially vertically downward into the radial center of a first cylindrical regeneration zone having a closed bottom and open top;

b. flowing oxygen containing primary regeneration gas radially into said first regeneration zone under conditions of turbulent flow, for intimately mixing said spent catalyst and primary regeneration gas within said first regeneration zone;

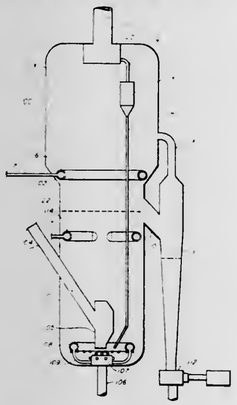
c. flowing said mixture of primary regeneration gas and spent catalyst upwardly from the open top of said first

regeneration zone into the bottom of a second cylindrical regeneration zone, having an open bottom and open top, forming a dense phase bed of catalyst undergoing regeneration fluidized by the flow of regeneration gas therethrough, said fluidized dense phase catalyst bed having a top surface, a temperture in the range of about 1050–1450° F, a catalyst residence timein the range of about 3–20 minutes, a specific coke burning rate in the range of about 0.5 to 1.0 lb coke/hour/lb catalyst, and a regeneration gas superificial vapor velocity in the range of about 2.5 to 6.0 ft/sec;

d, withdrawing, via a regenerated catalyst ductway, hot regenerated catalyst from the upper portion of said fluidized dense phase catalyst bed for contact with a hydrocarbon charge stock in a reaction zone;

e, flowing a trim gas containing molecular oxygen radially in a downwrd direction of about 30° to about 60° from horizontal into said fluidized dense phase catalyst bed at a vertical elevation below said regenerated catalyst duct, at a rate to provide the equivalent of 1–10% of the oxygen supplied in said primary regeneration gas;

f, flowing spent regeneration gas, substantially depleted in oxygen and containing entrained catalyst, from the top surface of said fluidized dense phase catalyst bed through the open top of said second regeneation zone into the



bottom of a frustoconic transition zone, having an open bottom and an open top, wherein said regeneration gas superificial vapor velocity is reduced to about 1.0 to 2.2 ft/sec, such that a major portion of catalyst entrained therein returns to said dense phase bed under the influence of gravity and such that a dilute phase of catalyst entrained in spent regeneration gas is formed;

g. flowing a secondary regeneration gas containing molecular oxygen radially in a direction in the range from about horizontal to about 45° downward from horizontal into said transition zone at a rate to provide an amount of oxygen equivalent to about 1–10% of the oxygen supplied in said primary regeneration gas, for cumbusting substantially all carbon monoxide in said spent regeneration gas to carbon dioxide in said transition zone;

h. flowing said dilute phase of catalyst entrained in spent regeneration gas upwardly through the open top of said transition zone into the bottom of a cylindrical third regeneration zone, having an open bottom and a closed top, wherein said dilute phase is maintained at a temperature in the range of 1150°–1450° F, a pressure in the range of 6–50 psig, a density in the range of 0.1 to 1.0 lb/cu ft., and having a spent regeneration gas superifical vapor velocity in the range of 0.1 to 2.2 ft/sec;

i. flowing said dilute phase from said third regeneration zone into a solid-gas separation zone for separation into a flue gas essentially free of entrained catalyst and separated catalyst;

j. venting said flue gas from said separation zone; and

k. flowing said separated catalyst, via a catalyst dipleg, from said separation zone to said first regeneration zone for admixture with additional spent catalyst and primary regeneration gas.

4,051,070

CATALYST PREPARATION UTILIZING METAL NITRATES AND NITROGEN OXIDE SCAVENGER

Wesley B. Argo, St. Louis; James W. Edwards, Creve Coeur; Albert P. Little, and William M. Lumb, both of Chesterfield, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 2, 1974, Ser. No. 430,017

Int. Cl.[2] B01J *23/26, 37/00*

U.S. Cl. 252—428 **13 Claims**

1. In a method of preparing a catalyst by forming a mixture of a metal nitrate and catalyst support and heating the mixture to decompose the metal nitrate, the improvement of adding a nitrogen oxide scavenger to the mixture, before heating, in an amount sufficient to scavenge the nitrogen oxide produced upon decomposition of the metal nitrate, the said scavenger being selected from the group consisting of lower carboxylic acid amides containing no more than six carbon atoms and urea-formaldehyde resin.

4,051,071

DEHYDROGENATION METHOD AND SULFIDED NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE FOR USE THEREIN

John C. Hayes, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 518,700, Oct. 29, 1974, Pat. No. 3,939,060, which is a continuation-in-part of Ser. No. 288,864, Sept. 13, 1972, Pat. No. 3,846,282. This application Jan. 19, 1976, Ser. No. 650,574

Int. Cl.[2] B01J *27/04*

U.S. Cl. 252—439 **14 Claims**

1. A sulfided catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % iridium, about 0.01 to about 5 wt. % nickel and about 0.01 to about 1 wt. % sulfur; wherein the platinum or palladium, iridium, and nickel are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium, iridium and nickel are present therein in the elemental metallic state or in a sulfided state; and wherein the composite is sulfided, prior to contact with the dehydrogenatable hydrocarbon and after substantially all of the platinum or palladium, iridium and nickel contained therein have been reduced to the corresponding elemental metallic state, by treatment with a sulfiding gas at conditions selected to incorporate about 0.01 to about 1 wt. % sulfur.

7. A sulfided nonacidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % iridium, about 0.1 to about 5 wt. % alkali metal or alkaline earth metal, about 0.01 to about 5 wt. % nickel, and about 0.01 to about 1 wt. % sulfur; wherein the platinum or palladium, iridium, alkali metal or alkaline earth metal and nickel are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium, nicke and iridium are present in the elemental metallic state or in a sulfided state; wherein substantially all of the alkali metal or alkaline earth metal is present in an oxidation state above that of the elemental metal; and wherein the composite is sulfided, prior to contact with any hydrocarbon and after substantially all of the platinum or palladium, iridium and nickel contained therein have been reduced to the corresponding elemental metallic state, by treatment with a sulfiding gas at conditions selected to incorporate about 0.01 to about 1 wt. % sulfur.

4,051,072

METHOD FOR MAKING PELLET TYPE CATALYST

Raymond E. Bedford, Burton, and Morris Berg, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1976, Ser. No. 673,711

Int. Cl.[2] B01J *21/04, 23/20, 23/24, 23/72, 23/40, 23/74*

U.S. Cl. 252—464 **10 Claims**

1. In a method for making pellet-type catalysts the improvement comprising the steps of grinding to the desired size refractory ceramic support materials having a high free alkali metal content of at least about 0.15% based on the weight of said support material, forming the resulting support materials into pellets of the desired shape and size, calcining the pellets to obtain the desired surface area and pore structure, soaking the pellets in a dilute inorganic acid solution having a concentration of from about 0.04 to about 0.15 weight % acid or in a solution of the salt of the acid having an equivalent concentration of acid anion, said soaking being continued for a short period of time of at least about one minute such as to avoid removal of any constitutents forming the support crystallites and to enable penetration of the acid anions into said pellets to the depth to which it is desired to impregnate the pellets with catalytically active metallic material, draining said solution from said pellets, and impregnating said pellets with a solution of a salt or acid of the catalytically active material to the depth of acid or acid salt treatment, said catalytically active material being at least one of the metals selected from the Groups V-B, VI-B and VIII of the Periodic Table of Elements, and copper, the use of said high alkali metal content refractory ceramic support material resulting in substantial cost savings in support material and enabling control of the depth of catalyst impregnation and pellet surface area.

4,051,073

PELLET-TYPE OXIDATION CATALYST

Louis Hegedus, St. Clair Shores, and Jack C. Summers, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 13, 1976, Ser. No. 658,031

Int. Cl.[2] B01J *21/04, 23/42, 23/44*

U.S. Cl. 252—466 PT **5 Claims**

1. A noble metal pellet-type oxidation catalyst comprising a porous alumina support member having a surface area of at least 100 m^2/g. up to about 250 m^2/g. and a pore structure characterized by a macropore volume of at least 0.020 cm^3/g. up to about 0.200 cm^3/g. and a macropore radius greater than about 10,000 A, and a catalyst material selected from the group consisting of platinum and platinum/palladium deposited on said support to a depth of at least 90 microns up to about 250 microns, said pore structure serving to increase the diffusivity of the reactants into the interior of the catalyst, the surface area serving to compensate for the otherwise accelerated rate of poisoning caused by the increase in diffusivity, and the depth of deposit being such that the catalyst poisons do not break through the zone of deposit prior to the desired lifetime of the catalyst.

4,051,074

RESISTOR COMPOSITION AND METHOD FOR ITS MANUFACTURE

Eiichi Asada, Tokyo, Japan, assignor to Shoei Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1975, Ser. No. 626,773

Int. Cl.[2] H01B *1/02*

U.S. Cl. 252—503 **9 Claims**

1. A process for varying the resistance value of a resistor composition containing 10–60 parts by weight of a conductive material selected from the group consisting of gold, silver, platinum, rhodium, ruthenium, osmium, iridium, vanadium, tin, tungsten, carbon and alloys, mixtures and oxides thereof, said conductive material having a known specific surface area, 90–40 parts by weight of a glass frit having a known specific surface area, and a vehicle therefor which comprises increasing or decreasing the total surface area of said conductive material and glass frit while maintaining the weight ratio of said conductive material to said glass frit constant without changing the temperature coefficient of resistance of said composition.

4,051,075

COATED PARTICLES AND CONDUCTIVE COMPOSITIONS THEREFROM

Robert Smith-Johannsen, Portola Valley, and Wendell W. Moyer, Jr., Atherton, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 468,668, May 10, 1974, Pat. No. 3,992,558. This application Feb. 3, 1976, Ser. No. 654,990

Int. Cl.[2] H01B *1/00*

U.S. Cl. 252—511 **4 Claims**



1. A process for coating discrete electrically conductive particles of less than 20 microns with a high polymer coating comprising:

injecting the polymer and particles into a chamber;

injecting a fluid stream into the chamber under pressure and at an elevated temperature, said fluid propelling the polymer and particles at high velocities along an arcuate path having both a recycle and separation outlet, wherein said polymer and said particles undergo repeated high velocity impacts with each other thereby coating said particles with said polymer and wherein discrete articles of less than approximately 20 microns having the polymer coating thereon are separated out of the chamber, but agglomerated particles of greater than 20 microns are recycled around the arcuate path, said separated particles being free-flowing and non-agglomerative and electrically conductive; and

dispersing the separated conductive particle in a suitable binder to produce a conductive coating.

4,051,076

AROMA CHEMICALS

Jordan J. Bloomfield, and Dennis C. Owsley, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

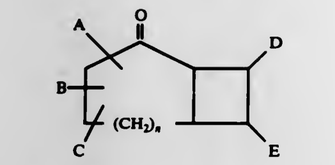
Filed Dec. 29, 1975, Ser. No. 645,188

Int. Cl.[2] C11B *9/00;* **C07C** *13/28, 45/00, 49/00*

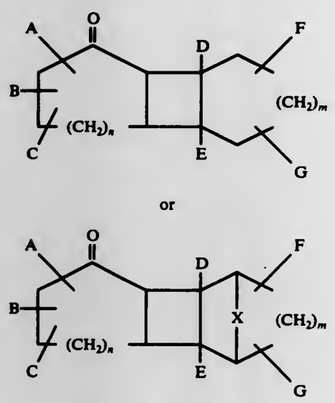
U.S. Cl. 252—522 **30 Claims**

1. A fragrance composition having incorporated therein an

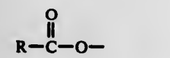
odoriferous amount of a compound represented by the structural formulae:



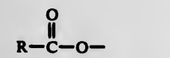
or



wherein *n* is an integer 0 or 1; A, B and C each independently represent hydrogen or alkyl having from 1 to 3 carbon atoms, provided that when *n* is 0 at least one of A, B or C cannot be hydrogen; D and E each independently represent hydrogen, alkyl having from 1 to 6 carbon atoms, provided that the sum of the carbon atoms in D and E does not exceed 6, alkoxy having from 1 to 5 carbon atoms or



wherein R represents alkyl having from 1 to 6 carbon atoms or aryl, provided that if either D or E is alkoxy or



then the other substituent D or E must be hydrogen; *m* is an integer 1 through 8; F and G represent hydrogen or alkyl having from 1 to 3 carbon atoms; X represents



wherein *p* is an integer 0 through 2 and I and J each independently represent hydrogen or methyl, provided that if *p* is 0 then *m* must be greater than 2; provided that the sum of the carbon and oxygen atoms in the compound is no greater than 23 and at least one carrier commonly used in fragrance compositions.

4,051,077

NON-FILMING DUAL ADDITIVE DEVELOPER

Donald J. Fisher, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 445,389, Feb. 25, 1974, Pat. No. 3,900,588. This application Jan. 27, 1975, Ser. No. 544,095

Int. Cl.² G03G *9/00*

U.S. Cl. 252—62.1 P **13 Claims**

1. An electrostatographic developing composition comprising particles; said particles including (1) finely divided electroscopic toner material, (2) a minor portion, based upon the weight of said toner material of a stable, tough, substantially smearless, polymeric additive having an average particle size less than about the average particle size of said finely divided toner material, and (3) a minor portion, based on the weight of said toner material, of a finely divided nonsmearable abrasive material of a hardness greater than said polymeric additive and said toner material.

4,051,078

CHLORINATED ELASTOMER COMPOSITIONS

Hirosi Kato, Nishinomiya, and Hideo Fujita, Takarazuka, both of Japan, assignors to Dainichi-Nippon Cables, Ltd., Amagasaki, Japan

Filed Oct. 14, 1975, Ser. No. 622,449

Claims priority, application Japan, Apr. 15, 1975, 50-46260; July 31, 1975, 50-93896

Int. Cl.² C08F *8/26;* C08G *65/24*

U.S. Cl. 260—2 A **7 Claims**

1. A chlorinated elastomer composition comprising

a. a chlorinated elastomer selected from the group consisting of polychloroprene, chlorinated polyethylene and polyepichlorohydrin,

b. 3 to 30 parts of at least one metal oxide of Groups II, IV, V, VI, and VIII of the Periodic Table, wherein the metal has an oxidation state of 2 to 5 valences as a curing agent, and

c. 0.1 to 10 parts of at least one accelerator having the general formula:

$$A—(S)_n—A'$$

wherein S is sulfur atom, A and A' are polyhydroxy aryl groups having 6 to 18 ring carbon atoms and n is zero or an integer of 1 to 4, said parts of (b) and (c) being parts by weight per 100 parts of (a).

4,051,079

REGENERATION OF ACIDIC CATION EXCHANGE RESIN USING ACIDIFIED PHENOL-WATER MIXTURE

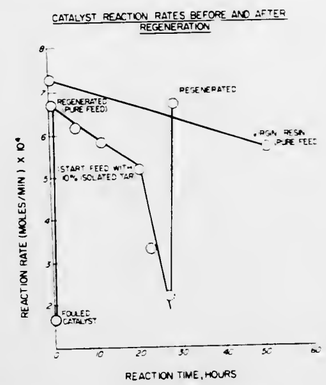
Earl George Melby, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 22, 1976, Ser. No. 698,764

Int. Cl.² B01D *15/06;* B01J *1/09*

U.S. Cl. 260—2.2 R **8 Claims**

1. Process for regenerating sulfonated acidic cation exchange resin that has been deactivated with phenol-derived organic tars or by contamination with metallic ions, or both, which process comprises passing a phenol-water mixture con-



taining an acid having a pKa of less than about 3 through said resin, wherein the major component of said mixture is phenol.

4,051,080

METHOD FOR RECLAIMING CURED RUBBER SCRAPS

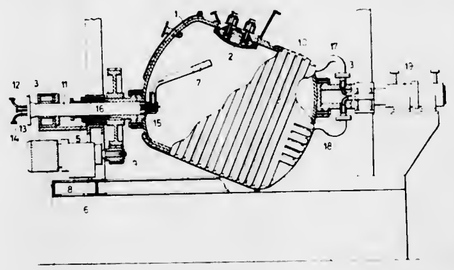
Temistocle Boccoli, Broni, Pavia, Italy, assignor to Piovanelli Macchinari e Impianti S.p.A., S. Ilario D'Enza, Italy

Filed May 6, 1975, Ser. No. 575,064

Claims priority, application Italy, May 14, 1974, 22685/74

Int. Cl.² C08J *11/04*

U.S. Cl. 260—2.3 **6 Claims**



1. A method of reclaiming rubber, consisting essentially of the combination of steps of heating scraps of cured rubber which have been freed of non-rubbery components, the compositions of the scraps being identical or compatible and the size of the scraps being substantially uniform, at a temperature below the curing temperature of said scraps in an autoclave which is heated externally while subjecting said scraps to agitation to effect even mixing and constant movement of said scraps, said heating and agitating of the scraps being undertaken in the presence of water in the form of steam equal to a percentage by weight of the scraps which percentage may vary from 5 to 10% wherein the exact amount of water relative to said scraps is controlled to determine the extent to which the scraps become plastic and in the presence of air, the volume of which is sufficient to effect a pressure within the autoclave of between 10 and 30 atmospheres, for a period of time sufficient to cause the contents of the autoclave to reach a temperature of about 110° C and continuing said treatment for a period of time of at least 15 minutes which is a period of time sufficient to plasticize said scraps.

4,051,081

PROCESS FOR MAKING HYDROPHILIC POLYURETHANE FOAMS

Gert Jabs, Schildgen, and Gunther Loew, Leichlingen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 449,296, March 8, 1974, abandoned. This application July 15, 1976, Ser. No. 705,648

Claims priority, application Germany, Mar. 14, 1973, 2312678

The portion of the term of this patent subsequent to Mar. 25, 1992, has been disclaimed.

Int. Cl.² C08G *18/14*

U.S. Cl. 260—2.5 AD **6 Claims**

1. In a process for producing a hydrophilic polyurethane foam which comprises reacting an organic polyisocyanate, an organic compound which contains at least two active hydrogen atoms in a mixture containing a blowing agent, the improved process of producing a hydrophilic polyurethane which comprises including in the reaction mixture from about 2 to about 10% by weight based on the weight of said organic compound of an alkyl aryl sulphonic acid which is soluble in said organic compound wherein said alkyl aryl sulphonic acid has the formula

$$R_n—Ar—[—SO_3H]_m$$

wherein

Ar represents a C_6–C_{14} arylene group,

R represents an alkyl group of 2–20 carbon atoms with the proviso that the total number of carbon atoms of all alkyl groups is from 4 to 40 carbon atoms,

n in an integer of 1 to 4, and

m is an integer from 1 to 3

4,051,082

CARBODIIMIDE-ISOCYANURATE FOAMS MODIFIED WITH ETHOXYLATED POLYOLS

Moses Cenker, Trenton, Mich., and Peter Tai-Yuen Kan, Plymouth, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Feb. 2, 1976, Ser. No. 654,445

Int. Cl.² C08G *18/50*

U.S. Cl. 260—2.5 AR **10 Claims**

1. A cellular foam characterized by carbodiimide, isocyanurate and urethane linkages prepared by catalytically condensing an organic polyisocyanate in the presence of (a) a carbodiimide-promoting catalyst; (b) a trimerization catalyst; (c) a urethane catalyst, and (d) from 10 parts to 40 parts by weight per 100 parts by weight of polyisocyanate of a polyol mixture comprising (1) from 5 parts to 30 parts of a polyoxyethylated polyhydric alcohol and (2) from 5 parts to 25 parts of an ethoxylated acid of phosphorus, said acid having a P_2O_5 equivalency of from about 72% to about 95% by weight.

4,051,083

ELASTOMER BLENDS FOR TIRE COMPONENTS

Neil F. Newman, Edison, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 444,313, Feb. 21, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 601,076

Int. Cl.² C08L *7/00, 9/06*

U.S. Cl. 260—5 **9 Claims**

1. A method for improving the weather resistance, flex and ozone resistance of tire flexing components prepared from blends of highly unsaturated rubbers, said blends comprising 25 to 75% by weight of natural rubber, the balance of said blends being styrene-butadiene rubber or polybutadiene rubber, which comprises incorporating into the tire flexing composition about 25 to about 40 parts per hundred based on the highly unsaturated rubber blend of a chlorinated EPDM containing 0.1 to 0.9 weight % chlorine.

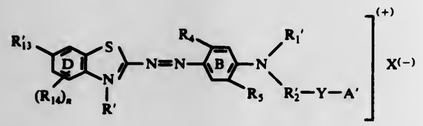
4,051,084

CATIONIC DYESTUFFS

Hans-Peter Kuhlthau, Leverkusen, and Hermann Beecken, Schildgen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

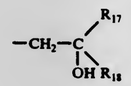
Filed Jan. 9, 1975, Ser. No. 539,778
Claims priority, application Germany, Jan. 11, 1974, 2401246
Int. Cl.[2] C09B *29/36, 29/22;* D06P *3/76*
U.S. Cl. 260—158 **7 Claims**

1. Dyestuff of the formula:



wherein

R′ represents C_1-C_6-alkyl, halo-C_1-C_6-alkyl, hydroxy-C_1-C_6-alkyl, cyano-C_1-C_6-alkyl, acetoxy-C_1-C_6-alkyl, C_1-C_4-alkoxycarbonyl-C_1-C_6-alkyl, carbonyl-C_1-C_6-alkyl, aminocarbonyl-C_1-C_6-alkyl, C_2-C_7-alkenyl, benzyl, phenylethyl, or



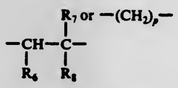
wherein

R_{17} denotes hydrogen or methyl and

R_{18} denotes methyl, ethyl, chloromethyl, methoxymethyl, ethoxymethyl, propoxymethyl, butoxymethyl, allyloxymethyl, phenoxymethyl, or phenyl;

R_1′ represents C_1-C_6-alkyl, C_2-C_7-alkenyl, cyclopentyl, cyclohexyl, benzyl, β-phenylethyl, C_1-C_6-alkylcyclopentyl, C_1-C_6-alkylcyclohexyl, C_1-C_6-alkylbenzyl, C_1-C_6-alkyl-β-phenylethyl or C_1-C_6-alkyl substituted by halogen, hydroxyl, C_1-C_4-alkoxy, phenoxy, cyano, acetoxy, hydroxycarbonyl, C_1-C_4-alkoxycarbonyl, C_1-C_4-alkoxycarbonyloxy, aminocarbonyl, C_1-C_4-alkylsulphonylamino, or C_1-C_4-alkylsulphonyl-C_1-C_4-alkylamino;

R_2 represents



R_6 denotes hydrogen, methyl, ethyl, methoxymethyl, ethoxymethyl, propoxymethyl, butoxymethyl, allyloxymethyl, phenyl, or phenoxymethyl;

R_7 denotes hydrogen, methyl, ethyl, butoxymethyl, methoxymethyl, ethoxymethyl, propoxymethyl, allyloxymethyl, phenyl, phenoxymethyl, or —Y—A′;

R_8 denotes hydrogen or methyl;

p denotes the numbers 1 - 6;

Y represents oxygen or sulphur;

R_4 represents hydrogen, halogen, C_1-C_6-alkyl, halo-C_1-C_6-alkyl, C_1-C_4-alkoxy, C_1-C_6-alkylcarbonylamino, C_1-C_4-alkylsulphonylamino, phenylcarbonylamino, phenylsulphonylamino, C_1-C_4-alkylcarbonyloxy, phenylcarbonyloxy, benzyloxy, β-phenylethyloxy, or either of the last two mentioned radicals substituted in the phenyl ring by C_1-C_6-alkyl, cyano, phenyloxy, naphthyloxy, C_1-C_6-alkylphenyloxy, C_1-C_6-alkylnaphthyloxy, halophenoxy, or halonaphthyloxy;

R_4, in addition, when joined together with B represents a fused naphthalene ring or a fused tetralin ring;

R_5 represents hydrogen, C_1-C_6-alkyl, C_1-C_4-alkoxy, C_1-C_4-alkylcarbonylamino or C_1-C_4-alkylsulphonylamino, phenylcarbonylamino, phenylsulphonylamino, C_1-C_4-alkylcarbonyloxy, phenylcarbonyloxy, benzyloxy, β-phenylethyloxy, or either of the last two mentioned radicals substituted in the phenyl ring by C_1-C_6-alkyl, phenyloxy, naphthyloxy, C_1-C_6-alkylphenyloxy, C_1-C_6-alkylnaphthyloxy, halophenoxy, or halonaphthyloxy;

R_5, in addition, when joined together with B represent a fused naphthalene ring or a fused tetralin ring;

R_{13}′ represents hydrogen, C_1-C_6-alkyl, C_1-C_4-alkoxy, cyclopentyl, cyclohexyl, benzyl, β-phenylethyl, C_1-C_6-alkylcyclopentyl, C_1-C_6-alkylcyclohexyl, C_1-C_6-alkylbenzyl, C_1-C_6-alkyl-β-phenylethyl, phenyloxy, naphthyloxy, C_1-C_6-alkylphenyloxy, C_1-C_6-alkylnaphthyloxy, halophenyloxy, halonapthyloxy, benzyloxy, β-phenylethyl, C_1-C_4-alkylcarbonylamino, C_1-C_4-alkylsulphonylamino, phenylcarbonylamino, phenylsulphonylamino, a fused benzene ring, or a fused tetrahydrobenzene ring, either of which is fused in the 4,5-position or 5,6-position of D;

R_{14} represents C_1-C_6-alkyl, C_1-C_4-alkoxy, phenoxy, benzyloxy, benzyl, trifluoromethyl, halogen, C_1-C_4-alkylcarbonylamino, C_1-C_4-alkylsulphonylamino, phenylcarbonylamino, phenylsulphonylamino, a fused benzene ring or a fused tetrahydrobenzene ring either of which is fused in the 6,7-position of D;

A′ is a member of a group consisting of cyclohexyl, naphthyl, phenyl, or phenyl substituted by chloro, methyl, ethyl, isopropyl, sec. butyl, tert. butyl, tetramethylbutyl, nonyl, dodecyl, phenyl, benzyl, cyclohexyl, phenyl-isopropyl, methoxy, ethoxy, isopropoxy, phenylsulfonyl or methylthio;

n represents the numbers 0, 1, 2, or 3; and

$X^{(-)}$ represents an anion.

4,051,085

HARDENABLE MOULDING COMPOSITIONS CONTAINING A THERMOPLASTIC POLYMER A COPOLYMERIZABLE VINYL COMPOUND AND A POLYESTERURETHANE

Bernhard Hess, Moers, and Karl Raichle, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Oct. 9, 1975, Ser. No. 621,220
Claims priority, application Germany, Oct. 15, 1974, 2448929
Int. Cl.[2] C08L *1/14*
U.S. Cl. 260—16 **6 Claims**

1. A heat hardenable moulding composition which is a blend of preformed ingredients comprising

a. from 3 to 30 parts by weight of a thermoplastic polymer having a molecular weight of 500 to 10,000,000,

b. from 20 to 70 parts by weight of a copolymerizable vinyl compound,

c. from 20 to 70 parts by weight of a polyesterurethane having α, β-ethylenically unsaturated dicarboxylic acid residues and a urethane group equivalent of at least 0.05 equivalents per 100 g. of polyesterurethane and

d. a viscosity-increasing amount of a member selected from the group consisting of oxides and hydroxides of the metals of Group IIa of the Periodic Table.

4,051,086

ABSORPTION RATE OF ABSORBENT POLYMERS BY TREATING WITH GLYOXAL

Albert Richard Reid, Hockessin, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 25, 1976, Ser. No. 670,484
Int. Cl.[2] C08L *1/02*
U.S. Cl. 260—17.4 GC **11 Claims**

1. A method of increasing the water or saline solution absorption rate of a water-insoluble, crosslinked polymer selected from the class consisting of acrylamide homopolymer, copolymers of acrylamide and a second vinyl monomer copolymerizable therewith, homopolymers of sodium acrylate, homopolymers of sodium methacrylate, and polysaccharides grafted with copolymers of acrylamide and a second vinyl monomer copolymerizable therewith, which method comprises applying to the surface of particles of said polymer about 0.2 to 5% by weight of glyoxal.

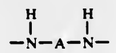
4,051,087

COPOLYAMIDE

Lacey E. Scoggins, and Robert W. Campbell, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

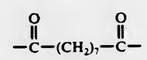
Filed May 20, 1976, Ser. No. 687,973
Int. Cl.[2] C08G *69/26*
U.S. Cl. 260—18 N **24 Claims**

1. A normally solid, moldable copolyamide having: diamine-derived primary structural units of the formula

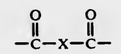


wherein each A is individually selected from the group consisting of 5-methylnonamethylene, 2,4-dimethyloctamethylene, 2,4,6-trimethylheptamethylene, and 4-isopropylheptamethylene;

first diacid-derived primary structural units of the formula



and second diacid-derived primary structural units of the formula



wherein X is divalent aliphatic hydrocarbon radical containing from 14 to 46 carbon atoms;

the nitrogen atoms provided by said diamine-derived primary structural units constituting at least 70 percent, by number, of the total nitrogen atoms in said copolyamide; the carbonyl groups provided by said first and second diacid-derived structural units constituting at least 70 percent, by number, of the total carbonyl groups in said copolyamide;

the molar ratio of the total diamine-derived structural units to the total diacid-derived structural units being in the range of 105:100 to 100:105.

4,051,088

LIQUID THERMOSETTING COATING COMPOSITIONS

David Vincent Gibson, North Bayswater, Australia, assignor to Dulux Australia Ltd., Australia

Filed Aug. 11, 1975, Ser. No. 603,284
Claims priority, application Australia, Aug. 26, 1974, 8662/74
Int. Cl.[2] C09D *3/52, 3/56, 3/66*
U.S. Cl. 260—20 **5 Claims**

1. A liquid thermosetting coating composition having a weight solids content of 70% minimum characterised in that the film-forming component thereof is a blend of the following constituents;

1. from 60–95% by weight of an acid half-ester of a carboxylic acid anhydride and a polyol, the polyol being a diester of a diepoxide, an autoxidative monocarboxylic fatty acid and a monocarboxylic hydroxy-acid, further characterised in that the diepoxide has an epoxide equivalent of 300 maximum, the acid half-ester is epoxide-free and comprises on average 1.5-2.5 hydroxy groups, 1-2 carboxyl groups and 1-2 autoxidative residues of monocarboxyolic fatty acids per molecule; and

2. from 5–40% by weight of a crosslinking agent reactable with hydroxyl groups of the acid half-ester to form a crosslinked molecular net work.

4,051,089

WATER REDUCIBLE SHORT OIL ALKYD RESINS AND PROCESS OF MAKING SAME

Michael A. Tobias, Somerville, and Carlos J. Martinez, Edison, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 21, 1975, Ser. No. 570,340
Int. Cl.[2] C09D *3/64, 3/66*
U.S. Cl. 260—22 R **12 Claims**

1. A water reducible short oil alkyd resin consisting essentially of the reaction product of from about 10–15 wt. % based on the total weight of the reactants of a polyethylene glycol having a molecular weight between about 200–2000; from about 20–25 wt. % based on the total weight of the reactants of a triglyceride having from about 30–60 carbon atoms; from about 18–23 wt. % based on the total weight of the reactants of a polyol having from about 2 to about 6 hydroxy groups; and from about 43–48 wt. % based on the total weight of the reactants of an aromatic dicarboxylic acid or anhydride having from about 8–12 carbon atoms; said resin having an alcoholic acid number between about 45 and about 65.

4,051,090

ADHESIVE BONDING

Carl Horowitz; Michael Dichter, both of Brooklyn, N.Y., and Navinchandra Bhogilal Shah, Jersey City, N.J., assignors to Polygulf Associates, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,515
Int. Cl.[2] C08L *61/06*
U.S. Cl. 260—23.7 M **3 Claims**

1. An adhesive, for bonding a first elastomeric substrate to a second elastomeric substrate, comprising:

i. elastomer

ii. prepolymer

iii. graft initiator, having the following constituents in parts by weight:

Styrene butadiene rubber	70.00
Butadiene propolymer having pendant vinyl groups	3.00
Carbon black	4.50
Benzene	22.50
Sulfur	0.25
Benzothiazyldisulfide	0.15
Zinc oxide	0.50
Stearic acid	0.10
Antioxidant	0.15
Accelerator	3.00
Toluene	40.85
Divinyl benzene	2.00
Cumyl peroxide	0.10
Silver perchlorate	0.40
Methyl ethyl ketone	2.50

4,051,091

WATER-DISPERSION VARNISH FOR ELECTRODEPOSITION AND PROCESS FOR MAKING SAID WATER DISPERSION VARNISH

Kyoichi Shibayama; Hiroshi Ono; Eiki Jidai, and Akira Fujii, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1974, Ser. No. 525,065
Int. Cl.[2] C08J *3/10;* C08L *79/08;* C25D *13/06, 13/20*
U.S. Cl. 260—29.2 TN **10 Claims**

1. A process for preparing a water-dispersion varnish suitable for electrodeposition which comprises reacting

the reaction product of

A. a polyesterimide having a carboxyl group in its chain or at the terminus of the chain and having an ester

group and an imide group in its repeating unit or a polyesteramideimide having a carboxyl group in its chain or at the terminus of the chain and having an ester group, an imide group and an amide group in its repeating unit and

B. an organic compound having at least two hydroxyl groups with

C. a polybasic acid or its anhydride in the presence or absence of a solvent yielding a modified polyesterimide or polyesteramideimide having a molecular weight of from 5,000–100,000 and an acid value of 10–100;

dissolving said modified polyesterimide or polyesteramideimide in an organic solvent;

dispersing said modified polyesterimide or polyesteramideimide solution in an aqueous solution containing a surfactant and a volatile base; and forming a water dispersion of said modified polyesterimide or polyester amideimide by passing or bubbling an inert gas through the dispersion of said modified polyesterimide or polyester amideimide solution and said aqueous solution to remove all or part of said solvent and volatile base.

7. A water-dispersion varnish which is suitable for use in electrodeposition which is formed by reacting

the reaction product of

A. a polyesterimide having a carboxyl group in its chain or at the terminus of the chain and having an ester group and an imide group in its repeating unit or a polyesteramideimide having a carboxyl group in its chain or at the terminus of the chain and having an ester goup, an imide group and an amide group in its repeating unit, and

B. an organic compound having at least two hydroxyl groups with

C. a polybasic acid or its anhydride in the presence or absence of a solvent yielding a modified polyesterimide or polyesteramideimide having a molecular weight of from 5,000–100,000 and an acid value of 10–100;

dissolving said modified polyesterimide or polyesteramideimide in an organic solvent;

dispersing said modified polyesterimide or polyesteramideimide solution in an aqueous solution containing a surfactant and a volatile base; and

forming a water dispersion of said modified polyesterimide or polyester amideimide by passing or bubbling an inert gas through the dispersion of said modified polyesterimide or polyesteramideimide solution and said aqueous solution to remove at least part of said solvent and volatile base.

4,051,092

FOUNDRY CORE COMPOSITION OF AGGREGATE AND A BINDER THEREFOR

Melville J. Holik, Franklin Park, and John F. Kraemer, Chicago, both of Ill., assignors to International Minerals & Chemical Corporation, Libertyville, Ill.

Continuation-in-part of Ser. No. 631,583, Nov. 15, 1975, abandoned. This application Oct. 26, 1976, Ser. No. 733,721

Int. Cl.² C08L *61/10*

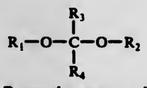
U.S. Cl. 260—29.3 **8 Claims**

1. A foundry core mix adapted to being cured by a catalyst comprising a foundry aggregate and about 1% to 5% by weight of the aggregate of a binder comprising in admixture:

a. a curable resin base of the group consisting of epoxy resins, polyester resins, and aqueous phenol-formaldehyde resins,

b. a reactive liquid polyisocyanate in the amount of 80% to 125% by weight of the resin base, and;

c. a solvent of the formula



in which R_1 and R_2 are the same or different hydrocarbon radicals of three to six carbon atoms and R_3 and R_4 are the same or different hydrogen, methyl, ethyl or phenyl radicals.

4,051,093

MANUFACTURE OF SHEAR-RESISTANT AQUEOUS COPOLYMER EMULSIONS

Kurt Wendel, Ludwigshafen; Fritz Reichel, Eppelheim, and Christof Taubitz, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 29, 1975, Ser. No. 626,749

Claims priority, application Germany, Nov. 6, 1974, 2452585

Int. Cl.² C08L *25/04, 33/02*

U.S. Cl. 260—29.6 TA **3 Claims**

1. In a process for the manufacture of shear-resistant, aqueous copolymer emulsions by copolymerizing the monomers in an aqueous emulsion containing conventional polymerization initiators which form free radicals, the improvement which comprises initially copolymerizing in a reaction vessel (the amounts being based on total monomers)

A. from 0.5 to 15 percent by weight of monoolefinic monomers containing a functional group selected from the groups consisting of the carboxyl group, the sulfonic acid group and the phosphate group, and

B. from 5 to 30 percent by weight of monoolefinic monomers containing a functional group selected from the group consisting of a tertiary amino group, a quaternary amino group and a heterocyclic group containing nitrogen and thereafter, while continuing the copolymerization, adding to said vessel

C. from 0 to 94.5 percent by weight of a monomer from the group consisting of styrene and acrylonitrile and

D. from 0 to 94.5 percent by weight of acrylic or methacrylic acid esters of alkanols of 1 to 8 carbon atoms, as well as

E. from 0 to 30 percent by weight of further olefinic monomers and thereafter completing the polymerization, the pH during the polymerization being less than 7 and the amount of monomers (C) and (D) together being at least 25 percent by weight.

4,051,094

ELECTRICAL CONDUCTIVE LACQUER

Franz Gottfried Reuter, and Tankred Menzel, both of Lemforde, Germany, assignors to Reuter Maschinen et al, Lemforde, Germany

Continuation of Ser. No. 504,192, Sept. 9, 1974, which is a division of Ser. No. 292,321, Sept. 26, 1972, abandoned. This application Oct. 9, 1975, Ser. No. 621,767

Claims priority, application Germany, Sept. 27, 1971, 2148191; Oct. 16, 1971, 2151626; July 12, 1972, 2234216

Int. Cl.² C08L *31/04*

U.S. Cl. 260—29.6 M **2 Claims**

1. An electrically conductive lacquer consisting essentially of silver-plated copper particles, acetylene soot particles, and a binder, the binder being an aqueous dispersion of a copolymer of butyl acrylate, vinyl acetate, and acrylic acid in an aqueous silicate solution.

4,051,095

HYDROLYZED POLYURETHANE PLASTICIZER

Yale Karmell, Chicago, Ill., assignor to Samuel Bingham Co., Franklin Park, Ill.

Filed Jan. 26, 1976, Ser. No. 652,418

Int. Cl.² C08K *5/11, 5/12, 5/16*

U.S. Cl. 260—31.8 DR **4 Claims**

1. A method for modifying the hardness of an acrylonitrile-butadiene rubber which comprises mixing with the rubber and curing agents a proportion of plasticizer sufficient to modify the hardness of the cured rubber to the desired degree and curing the rubber-plasticizer mix, said plasticizer comprising a mixture, by weight of from 25% to 75% of an ester plasticizer and from 75% to 25% of a hydrolyzed polyester-based polyurethane elastomer produced by autoclaving said elastomer with steam at an elevated temperature and pressure until it becomes liquid, said ester plasticizer having the general miscibility characteristics, with respect to said rubber and said hydrolyzed elastomer, of dioctyl phthalate, dibutyl phthalate, dioctyl adipate, and dioctyl sebacate.

4,051,096

RESIN COMPOSITION

Toshinori Koseki; Kunio Maeda; Michihiro Aboshi, and Haruo Kinoshita, all of Kawasaki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 436,631, Jan. 25, 1974, abandoned. This application June 15, 1976, Ser. No. 696,395

Int. Cl.² C08K *5/01, 5/12*

U.S. Cl. 260—31.8 M **25 Claims**

1. A stable resin composition which comprises 0.1 to 25 percent by weight of an oil retainer, 99.8 to 50 percent by weight of a base resin and 0.1 to 25 percent by weight of an oil, with the weight ratio of oil to oil retainer being from 2 to 1 to 15 to 1 the said oil being absorbed and remaining absorbed by the oil retainer;

said oil retainer being a thermoplastic resin which has a lower flowing temperature than the base resin, and at normal room temperatures remains undissolved in the oil and absorbs not more than 0.03 times its own weight of oil, and which, at a temperature 10° C higher than the flowing temperature of the base resin, dissolves in the oil or absorbs not less than 0.3 times its own weight of oil;

said base resin being a thermoplastic resin which remains undissolved in the oil and absorbs not more than 0.03 times its own weight of oil, and, at a temperature 10° C higher than the flowing temperature of the base resin, it absorbs not more than one half of the weight of the oil absorbed by the oil retainer and is different from the oil retainer;

and said oil being a lubricating oil which is liquid at normal room temperatures or which, though solid at normal room temperatures, becomes fluidized at a temperature lower than the flowing temperature of the base resin.

4,051,097

CARBON METALLIC FRICTION COMPOSITION

Francis William Aldrich, Troy, N.Y., assignor to The Bendix Corporation, South Bend, Ind.

Continuation of Ser. No. 322,820, Jan. 11, 1973, abandoned, which is a continuation-in-part of Ser. No. 222,342, Jan. 31, 1972, abandoned. This application Apr. 12, 1976, Ser. No. 676,076

Int. Cl.² C08K *3/04*

U.S. Cl. 260—38 **4 Claims**

1. A composition for an automobile brake lining having a substantially uniform coefficient of friction upon frictional engagement with another member up to 740° F., said composition consisting of metal or metal oxide particles from 15–55 volume percent of the total composition, non-graphitic amorphous carbon particles from 10–75 volume percent of the total composition, an elastomer from 0–10 volume percent of the total composition and an organic resin from 15–35 volume percent of the total composition, said organic resin holding the metal or metal oxides, the non-graphic amorphous carbon particles and the elastomer together, said elastomer attenuating noise created by frictional engagement of the brake lining, said amorphous carbon and metal or metal oxide together forming the friction producing material to create said uniform coefficient of friction.

4,051,098

METHOD OF PREPARING SHAPED ACTIVE CARBON

Takeshi Takemura; Yoshihisa Katoh, both of Hamamatsu; Shigeyuki Kurita, Fukuroi; Susumu Sasaki, Fujieda; Kyohei Funabiki, Fujieda, and Keizo Hatano, Fujieda, all of Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo and Daiichi Tanso Kogyo KK, Fukuroi, both of Japan

Continuation-in-part of Ser. No. 491,188, July 24, 1974, abandoned, which is a continuation of Ser. No. 335,608, Feb. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 129,137, March 29, 1971, abandoned. This application July 30, 1976, Ser. No. 709,985

Claims priority, application Japan, Apr. 2, 1970, 45-27632

Int. Cl.² C08K *3/04*

U.S. Cl. 260—38 **10 Claims**

1. A composition comprising active carbon particles and as a binder therefor a cured resin selected from the group consisting of a one-step phenolic resin and a furfural-modified phenolic resin wherein said resin is characterized by being soluble in water at 25° C prior to curing and is combined with said active carbon in a weight ratio from 1 part of said binder to 10 parts of said active carbon to 1 part of said binder to 2 parts of said active carbon.

4,051,099

PROCESS FOR THE DYEING OF THERMOPLASTICS IN THE MELT

Jost von der Crone, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

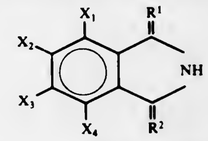
Filed Mar. 30, 1976, Ser. No. 671,804

Claims priority, application Switzerland, Apr. 11, 1975, 4648/75

Int. Cl.² C08K *5/24*

U.S. Cl. 260—40 P **9 Claims**

1. Process for the dyeing of thermoplastics in the melt, which process comprises the use of dyestuffs of the formula



wherein X_1 – X_4 represents H-atoms or halogen atoms, or one or two of the radicals X_1 – X_4 represent alkyl, alkoxy, phenyl or phenoxy groups, and those remaining represent H-atoms, R^1 and R^2 represent radicals of methylene-active compounds, or radicals of the formula =N—A wherein A stands for the radical of an aliphatic, cycloaliphatic, araliphatic, aromatic or heterocyclic amine or hydrazine, whereby, provided that R^1 and R^2 represent radicals of the formula =N—A, one A represents a heterocyclic radical containing N-atoms, optionally together with O- or S-atoms.

4,051,100

FLUOROELASTOMER-BASED COMPOSITE MATERIAL

Roger O. Bjerk, Edelstein; William D. Brandon; Frederick S. Engelking, both of Peoria, and John Parker Jero, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 366,967, June 4, 1973, Pat. No. 3,898,361. This application July 14, 1975, Ser. No. 595,822

The portion of the term of this patent subsequent to Aug. 5, 1992, has been disclaimed.

Int. Cl.² C08K *3/04, 7/14*

U.S. Cl. 260—42.18 **3 Claims**

1. As an article of manufacture a friction material formed of an elastomeric matrix comprising from about 20 to about 50% by weight of an elastomeric copolymer of hexafluoropropylene and vinylidene fluoride, and from about 12 to about 40%

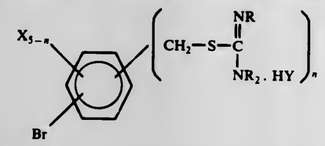
by weight of carbon black; and said friction material further containing from about 20 to about 60% by weight of glassy or ceramic asperite particles of from about 0.0001 to about 0.005 inch in effective diameter intermixed with and dispersed throughout said friction material in mechanically held non-bonded relation to provide a friction surface of said article of manufacture including the said matrix and said asperite particles.

4,051,101
HALOGENATED ISOTHIURONIUM SALTS AS FLAME RETARDANTS

Michael W. Lindvay, Ann Arbor, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed July 12, 1976, Ser. No. 704,335
Int. Cl.[2] C08K 5/29; C07C 123/00
U.S. Cl. 260—45.85 R **22 Claims**

1. Bromophenyl isothiuronium salts of the formula:



wherein:

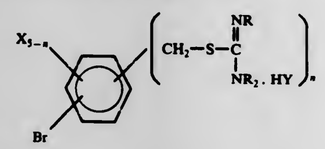
each X substituent is independently selected from a group consisting of hydrogen, chlorine, bromine, alkyl, and haloalkyl, said alkyl containing 1 to 6 carbon atoms and said haloalkyl of 1 to 6 carbon atoms containing 1 to 3 halogen atoms, said halogen being independently selected from chlorine and bromine;

each Y substituent is independently selected from a group consisting of halogen, hydrogen phosphate, hydrogen sulfate, nitrate, acetate, alkali-metal phosphate, and alkali-metal sulfate;

each R substituent is independently selected from the group consisting of hydrogen, alkyl and haloalkyl, said alkyl containing 1 to 3 carbon atoms and said haloalkyl of 1 to 3 carbon atoms containing 1 to 3 halogen atoms, said halogen being selected from chlorine and bromine; and

n is an integer from 2 to 4.

9. A flame retardant polymeric composition comprising a polymer selected from the group comprised of polyurethane, polyester, styrenic polymers, polyamides, cellulosic polymers, and epoxy polymers and a flame retarding amount of bromophenyl isothiuronium salts of the formula:



wherein:

each X substituent is independently selected from a group consisting of hydrogen, chlorine, bromine, alkyl, and haloalkyl, said alkyl containing 1 to 6 carbon atoms and said haloalkyl of 1 to 6 carbon atoms containing 1 to 3 halogen atoms, said halogen being independently selected from chlorine and bromine;

each Y substituent is independently selected from a group consisting of halogen, hydrogen phosphate, hydrogen sulfate, nitrate, acetate, alkali-metal phosphate, and alkali-metal sulfate;

each R substituent is independently selected from the group consisting of hydrogen, alkyl and haloalkyl, said alkyl containing 1 to 3 carbon atoms and said haloalkyl of 1 to 3 carbon atoms containing 1 to 3 halogen atoms, said halogen being selected from chlorine and bromine; and

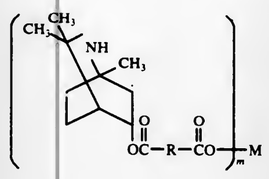
n is an integer from 1 to 5.

4,051,102
BICYCLIC HINDERED AMINO ACIDS, METAL SALTS THEREOF AND STABILIZED COMPOSITIONS

Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 429,236, Dec. 28, 1973, Pat. No. 3,879,396.
This application Jan. 29, 1975, Ser. No. 545,259
Int. Cl.[2] C07D 221/22; C08K 5/34; C09K 15/30
U.S. Cl. 260—45.8 N **14 Claims**

1. A composition of matter stabilized against ultraviolet deterioration which comprises a synthetic organic polymer normally subject to ultraviolet deterioration containing from 0.005 to 5% of a stabilizing compound of the formula



wherein

R is straight- or branched-chain alkylene having 1 to 20 carbon atoms,

M is hydrogen or a metal selected from the group consisting of barium, nickel, manganese, calcium, zinc, iron, sodium, cobalt, tin, and dialkyl tin, and

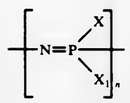
m has a value of from 1 to 4, the value of m being the same as the available valence of M.

4,051,103
STABILIZATION OF POLYFLUOROPHOSPHAZENES WITH ZINC HIPPURATE

Delmar Frederick Lohr, Jr., Akron, and Jung Wong Kang, Clinton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Feb. 23, 1977, Ser. No. 771,231
Int. Cl.[2] C08K 5/09
U.S. Cl. 260—45.75 W **11 Claims**

1. A polyphosphazene composition stabilized against thermal aging comprising (1) a polyphosphazene represented by the general formula:



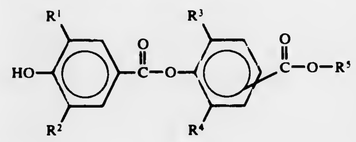
wherein *n* represents an integer from 20 up to about 50,000 and X and X_1 each represent a monovalent substituent selected from the groups consisting of alkoxy, substituted alkoxy, aryloxy, substituted aryloxy, hydroxy, and amino, and X and X_1 are randomly distributed along the —P=N— backbone and the polyphosphazene includes one or two or more randomly distributed groups, and (2) a stabilizer consisting of an organic compound compatible with said polyphosphazene and present in an amount sufficient to stabilize said polyphosphazene against thermal degradation, said organic compound being zinc bis hippurate.

4,051,104
BENZOYLOXYBENZOATES AND COMPOSITIONS STABILIZED THEREWITH

John D. Spivack, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 318,324, Dec. 26, 1972, abandoned.
This application Mar. 28, 1975, Ser. No. 563,251
Int. Cl.[2] C07C 69/76
U.S. Cl. 260—45.85 B **15 Claims**

1. A benzoyloxybenzoate having the structure



wherein

R^1, R^2, R^3, and R^4 are tert-butyl groups,

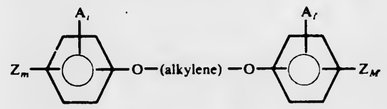
R^5 is alkyl group having up tp 30 carbon atoms, phenyl or alkyl substituted phenyl having up to 24 carbon atoms.

4,051,105
PLASTIC COMPOSITIONS

Arnold L. Anderson, and Robert J. Nulph, both of Alma, Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 260,240, June 6, 1972, abandoned. This application Feb. 8, 1973, Ser. No. 330,837
Int. Cl.[2] C08L 25/10, 25/12
U.S. Cl. 260—45.95 G **14 Claims**

1. A Plastic composition comprising acrylonitrile-butadiene-styrene polymer and a flame retardant, said flame retardant consisting of a compound having the formula



wherein Z is bromine; *m* is an integer having a value of 1–5 and *m'* is an integer having a value of 0–4; *i* is an integer having a value of 0–2 and *i'* is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

4,051,106
HIGH MOLECULAR WEIGHT COPOLYESTER RESINS HAVING A HIGH DEGREE OF ALTERNATING STRUCTURE

Edward V. Gouinlock, Jr., Warsaw, and Jerold C. Rosenfeld, Tonawanda, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,637
Int. Cl.[2] C08G 63/18, 63/42
U.S. Cl. 260—47 C **11 Claims**

1. A process for the production of high molecular weight, linear aromatic polyesters having an alternation index above 1.6 by reacting an organic diacid halide with a hydroxyl-containing component comprising a combination of a bisphenol and 5 to 95 mol percent of a glycol, said process comprising:

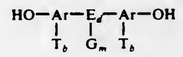
a. adding one member of the combination of a hydroxyl-containing component to the diacid halide employing at least 3 mols of diacid halide per mol of hydroxyl-containing component,

b. reacting the resulting mixture so as to form a bis-adduct,

c. removing all of the unreacted diacid halide from the bis-adduct, and

d. thereafter reacting the bis-adduct with a different member of the combination of hydroxyl-containing component so as to form the desired high molecular weight linear polyester,

and wherein the diacid halide is terephthaloyl chloride, isophthaloyl chloride or a mixture thereof, the glycol has 2-20 carbon atoms, and the bisphenol has the formula



in which Ar is aromatic, each T is independently selected from the group consisting of halogen, G or OG, each G is independently selected from the group consisting of alkyl, aryl, haloaryl, haloalkylaryl, alklaryl, cycloalkyl, halocycloalkyl, and haloalkyl, E is a bivalent alkylene, haloalkylene, cycloalkylene, halocycloalkylene, arylene, haloarylene, —O—, —S—, —SO—, $-SO_2-$, $-SO_3-$, —CO—,



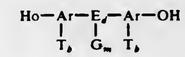
or GN <, *m* is 0 to the number of replaceable hydrogen atoms on Ar, and *d* d is 0 or 1.

4,051,107
MICROSTRUCTURED HIGH MOLECULAR WEIGHT-LOW VISCOSITY POLYESTER POLYMERS

Joseph A. Pawlak, Cheektowaga; Anthony L. Lemper, Amherst, and Victor A. Pattison, Clarence Center, all of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,636
Int. Cl.[2] C08G 63/40
U.S. Cl. 260—47 C **13 Claims**

1. In the solution polymerization process for the production of linear aromatic polyesters by reacting an organic diacid halide with a hydroxyl-containing component in the presence of a base catalyst, the improvement which comprises adding a hydroxyl-containing component comprising a combination of a bisphenol and 5 to about 95 mol percent of a glycol, to the diacid halide, wherein one member of the combination is added to and reacted with the diacid halide and thereafter a different member of the combination is added and reacted with the diacid halide, and the reaction is conducted at a temperature in the range of 0° C. to 40° C. to produce a polyester having an intrinsic viscosity of at least 0.6 dl/g in sym-tetrachloroethane at 30° C and an alternation index of about 1.1 to 1.6; wherein the diacid halide is terephthaloyl chloride, isophthaloyl chloride or a mixture thereof, the glycol has 2-20 carbon atoms, and the bisphenol has the formula



in which Ar is aromatic, each T is independently selected from the group consisting of halogen, G and OG, each G is independently selected from the group consisting of alkyl, aryl, haloaryl, haloalkylaryl, alkylaryl, cycloalkyl, halocycloalkyl, and haloalkyl, E is a bivalent alkylene, haloalkylene, cycloalkylene, halocycloalkylene, arylene, haloarylene, —O—, —S—, —SO—, $-SO_2-$, $-SO_3-$, —CO—,

or GN<, *m* is 0 to the number of replaceable hydrogen atoms on E, each *b* is 0 to the number of replaceable hydrogen atoms on Ar, and *d* is 0 or 1.

4,051,108

PREPARATION OF FILMS AND COATINGS OF PARA ORDERED AROMATIC HETEROCYCLIC POLYMERS

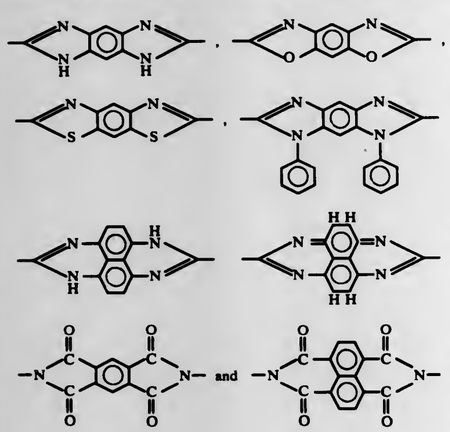
Thaddeus E. Helminiak, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 5, 1975, Ser. No. 638,211
Int. Cl.[2] C08G *73/10, 73/18, 73/22*
U.S. Cl. 260—47 CP **10 Claims**

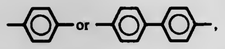
1. A method of fabricating a composite film consisting of a para ordered aromatic heterocyclic polymer having the following formula:

$$+Z\text{-}Ar\frac{}{n}$$

where Z is a heterocyclic selected from the group consisting of



where Ar is



and *n* is an integer having a value such that the polymer has an inherent viscosity of at least 2, said method comprising the following steps:

a. mixing a solution consisting of the polymer in a solvent therefor wth a non-solvent for the polymer having a boiling point up to about 100° C and being selected from the group consisting of a hydrocarbon and an alcohol, the amount of non-solvent mixed with the solution being sufficient to precipitate the polymer from solution, thereby precipitating the polymer in the form of two dimensional, microscopic sheets;

b. separating the microscopic sheets from the resulting mixture while maintaining the sheets wetted with the non-solvent;

c. mixing the wetted microscopic sheets with the non-solvent so as to provide a dispersion containing about 0.1 to 5 grams of the sheets per 100 milliliters of non-solvent;

d. collecting from the dispersion at least one layer of the microscopic sheets; and

e. evaporating non-solvent from the sheets so that they coalesce and form a composite film.

4,051,109

AROMATIC POLYMERS

Dennis Arthur Barr, Welwyn, and John Brewster Rose, St. Albans, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 79,358, Oct. 8, 1970, abandoned, which is a division of Ser. No. 714,899, March 21, 1968, Pat. No. 3,634,355, which is a continuation-in-part of Ser. No. 580,290, Sept. 19, 1966, abandoned. This application Feb. 26, 1973, Ser. No. 335,902
Int. Cl.[2] C08G *65/40, 75/20*
U.S. Cl. 260—49 **5 Claims**

1. A solid alkali metal salt of a member of the group consisting of 4-(4-halogenophenylsulfonyl) phenol and 4-(4-halogenobenzoyl) phenol, said salt being polymerizable by condensation polymerization.

4,051,110

METHYLENE PHOSPHONATES OF POLYMERIZED POLYALKYLENEPOLYAMINES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 160,106, July 6, 1971, abandoned. This application Apr. 22, 1976, Ser. No. 679,389
Int. Cl.[2] C08G *12/06*
U.S. Cl. 260—72 R **8 Claims**

1. Methylene phosphonates of polymers selected from the group consisting of polyalkylenepolyamine-epihalohydrin polymers and polyalkylenepolyamine-dihalide compound polymers, said dihalide compounds being an alkylene ether dihalide compound, or an unsaturated dihalide compound, said methylene phosphonate polymers having nitrogen-bonded methylene phosphonate units of the formula

$$-CH_2PO(OM)_2$$

where M is alkali metal, alkaline earth metal, hydrogen, alkyl ammonium or ammonium, the terminal nitrogen atoms of said methylene phosphonate polymers having no more than one methylene phosphonate group attached thereto, the remaining valence of the terminal nitrogen atom having attached thereto the group

$$-CH_2CH(OH)-CH_2-,$$

a divalent aliphatic ether radical or a divalent unsaturated aliphatic radical, said polymers being those having controlled crosslinking so that they are soluble in, dispersible in or soluble and dispersible in an aqueous medium.

4,051,111

INJECTION MOLDABLE POLYURETHANES

John Ambrose Holloway, Sheffield Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 20, 1976, Ser. No. 716,195
Int. Cl.[2] C08G *18/28, 18/00*
U.S. Cl. 260—75 NP **4 Claims**

1. Polyurethanes having low temperature impact and elevated heat distortion resistance with a Vicat value greater than 115° C., stiffness at 160° F. of greater than 4,000 psi and a 250° oven sag of less than 50 mm, prepared by reacting a hydroxyl-terminated polyester or polylactone macroglycol having a molecular weight greater than 2800 to about 8000, an aliphatic diol containing 2 to 6 carbon atoms present in amount so that the average hydroxyl molecular weight of a mixture of the hydroxyl-terminated macroglycol and butanediol is about 450 to less than about 650, and more than a molar equivalent of a cyclic diisocyanate, reacted together at a temperature below 160° C. in two stages, first at a temperature of greater than 50° C. to less than 100° C. and then at less than 160° C. to substantially complete the polyurethane reaction.

4,051,112

POLYESTER GRANULE FOR MELT-SHAPING AND PROCESS FOR THE PREPARATION THEREOF

Takatoshi Kuratsuji; Hiroo Inata, and Shoji Kawase, all of Iwakuni, Japan, assignors to Teijin Limited, Japan

Filed July 1, 1975, Ser. No. 592,312
Claims priority, application Japan, July 5, 1974, 49-76416
Int. Cl.[2] C08G *63/70*
U.S. Cl. 260—75 T **5 Claims**

1. Polyester granule for melt-shaping which is composed of a difficultly crystallizable copolyester having a minimum time for half-crystallization of at least 1 minute, and having surfaces resulting from cutting by a cutter,
wherein:

i. said polyester granule has an intrinsic viscosity of at least 0.55 (as measured in o-chlorophenol at 35° C),

ii. said polyester granule has on its surface an oriented portion having an N-value of at least 0.04, the N-value being calculated by equation (1):

$$N = n\lambda/d \quad (1)$$

in which *n* is the number of interference fringes caused by double refraction counted upon the observation through a polarizing microscope using a light source of the wavelength λ (microns), and
d is the thickness (microns) of a sample prepared by slicing the granule to a predetermined thickness including a part of the cut surface of the granule and

iii. the inside of the polyester granule other than the said surface portion has an N-value of not higher than 0.02,

said cutting being performed under conditions which will control the surface temperature *t* (° C) of the extrudate to satisfy equation (2):

$$Tg + 30° C \geqq t > Tg - 15° C \quad (2)$$

in which Tg is the second order transition temperature (° C) of the extrudate.

4,051,113

EXTRACTION OF POLYLACTAMS

Ernst Kissel; Eckart Neumann; Ernst Guenther, all of Ludwigshafen; Guenter Valentin, Ruchheim, and Werner Hoerauf, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Aug. 28, 1973, Ser. No. 392,243
Claims priority, application Germany, Aug. 30, 1972, 2242641
Int. Cl.[2] C08G *69/46*
U.S. Cl. 260—78 L **7 Claims**

1. A process for the extraction of monomer-containing and/or oligomer-containing polylactam granules which comprises continuously extracting polylactam granules with a countercurrent of water at temperatures above 80° C, under the following conditions:

a. the water flows upwardly through a substantially vertical extraction zone at a mean of from 0.5 to 20 cm/min and the polylactam granules pass downwardly through said extraction zone at a rate of from 0.2 to 5 cm/min,

b. the temperature at the upper end of the extraction zone is higher than at its lower end,

c. the extraction zone is divided into subzones by at least one heating zone so that the density of the water containing extractables in an upper subzone is lower than that of the water contained in the subzone immediately below by at least 0.0002, and

d. the uppermost heating zone divides the entire extraction zone into lengths bearing a ratio to each other of from 50:50 to 85:15, the shorter section being at the upper end of the extraction zone and said heating zone or the total of said heating zones constitutes 1/7 to 1/20 of the length of the vertical exraction zone.

4,051,114

VEGETABLE PROTEIN ISOLATE AND METHOD OF PRODUCING SAME

William D. Goodwin, Atlanta, Ga., assignor to Introtech, Washington, D.C.

Filed May 13, 1975, Ser. No. 576,974
Int. Cl.[2] A23J *1/14*
U.S. Cl. 260—123.5 **7 Claims**

1. A process for producing a protein composition from rapeseed which is crushed and admixed with water, subjecting the mixture of rapeseed substance admixed with water to high intensity agitation, refluxing the resultant mixture with N,N, dimethylformamide (DMF) for a sufficient time to solubilize and extract the protein from the mixture, and thereafter recovering the protein therefrom.

4,051,115

PROCESS FOR THE PRODUCTION OF LIGNIN SILICATE AND LIGNIN SILICOFORMATE

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 598,999, July 25, 1975, abandoned. This application Aug. 18, 1976, Ser. No. 715,410
Int. Cl.[2] C07G *1/00*
U.S. Cl. 260—124 R **8 Claims**

1. The process for the production of sulfate lignin silicoformate and sulfate lignin silicate by the following steps:

a. dry granular alkali metal metasilicate is slowly added to concentrated mineral acid in the ratio of 1 to 1 mols over a period fo 15 to 45 minutes, while agitating and keeping the temperature between 25° to 85° C; the chemical reaction is completed in 4 to 12 hours, thereby

b. producing a white granular mixture of silicoformic acid, metasilicic acid and salt; then by

c. washing with water and filtering, the salt is removed, thereby

d. recovering silicoformic acid and metasilicic acid; then

e. a residue of alkali metal carbonate is added to the silicoformic acid and metasilicic acid by adding an aqueous solution containing 10% to 25% alkali metal carbonate until the pH is 9 to 11, then filtering and air drying at 25° to 85° C; then

f. mixing about 1 to 2 parts by weight of the mixture of silicoformic acid and metasilicic acid with about 3 parts by weight of a lignin compound, then heating the mixture to 50° to 100° C while agitating for 20 to 60 minutes, thereby

g. producing sulfate lignin silicoformate and sulfate lignin silicate.

4,051,116

ASSYMMETRICAL 1:2 COBALT COMPLEXES OF METALLIZABLE MONOAZO COMPOUNDS HAVING ONE SULFO GROUP PER COMPLEX

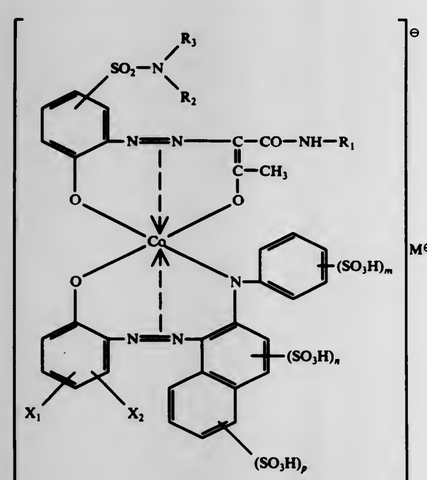
Jacky Dore, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 189,768, Oct. 15, 1971, abandoned. This application Dec. 17, 1974, Ser. No. 533,521

Int. Cl.[2] **C09B** *45/10, 45/20, 45/30;* **D06P** *1/10*

U.S. Cl. 260—145 A **20 Claims**

1. A complex of the formula



wherein

R_1 is alkyl of 1 to 12 carbon atoms, substituted alkyl wherein the alkyl chain has 1 to 12 carbon atoms and each substituent is independently halo, cyano or lower alkoxy, cyclohexyl, phenyl or substituted phenyl wherein each substituent is independently halo, lower alkyl, lower alkoxy, cyano, carboxy or lower alkoxy carbonyl,

each of R_2 and R_3 is independently hydrogen, lower alkyl or substituted lower alkyl wherein each substituent is independently halo, hydroxy or lower alkoxy,

each of X_1 and X_2 is independently halo, nitro, trifluoromethyl, alkyl of 1 to 6 carbon atoms, substituted alkyl, alkoxy of 1 to 6 carbon atoms or substituted alkoxy, wherein each alkyl chain of substituted alkyl and alkoxy chain of substituted alkoxy independently has 1 to 6 carbon atoms and each substituent is independently halo, trifluoromethyl or cyano,

$M^{\oplus}$ is lithium, sodium, potassium or ammonium,

m is 0 or 1,

n is 0 or 1, and

p is 0 or 1,

with the proviso that the sum of *m*, *n* and *p* is 1, wherein each halo is independently chloro or bromo.

4,051,117

TRIAZOLE-AZO-PHENYL CATIONIC DYESTUFFS

Hans-Peter Kuhlthau, Leverkusen, and Hermann Beecken, Bergisch-Gladbach, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

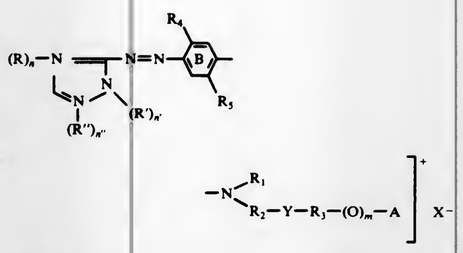
Filed Nov. 1, 1974, Ser. No. 520,211

Claims priority, application Germany, Nov. 3, 1973, 2355076

Int. Cl.[2] **C09B** *29/08, 29/26;* **D06P** *1/08, 1/10*

U.S. Cl. 260—146 R **22 Claims**

1. Cationic dyestuff of the formula



wherein

R, R', R'', and R_1 independently of one another are C_1–C_6 alkyl unsubstituted or substituted with carboxyl, halogen, hydroxyl, C_1–C_4 alkoxy, cyano, C_1–C_4 alkoxy carbonyl, or carbonamide; cyclopentyl unsubstituted or substituted with halogen or C_1–C_6 alkyl; cyclohexyl, unsubstituted or substituted with halogen or C_1–C_6 alkyl; benzyl unsubstituted or substituted with halogen or C_1–C_4 alkyl; 2-phenyl ethyl unsubstituted or substituted in the phenyl nucleus with halogen or C_1–C_4 alkyl; β-phenyl-β-hydroxyethyl unsubstituted or substituted in the phenyl nucleus with halogen or C_1–C_4 alkyl; 2-phenylpropyl-(2) unsubstituted or substituted in the phenyl nucleus with halogen or C_1–C_4 alkyl; or R_1 is cyclised onto ring B to form pyrroline or tetrahydropyridine, each of which is unsubstituted or substituted with one or more C_1–C_4-alkyl radicals;

R_2 is



R_6 is hydrogen, methyl, ethyl, methoxymethyl, ethoxymethyl, propoxymethyl, butoxymethyl, allyloxymethyl, phenyl, or phenoxymethyl;

R_7 is hydrogen, methyl, ethyl, methoxymethyl, ethoxymethyl, propoxymethyl, butoxymethyl, allyloxymethyl, phenyl, phenoxymethyl, —Y—A, [—O—$(CH_2)_q$—$(O)_m$—A] or chloromethyl, with the proviso that R_7 is [—Y—A] only when [—Y—R_3—$(O)_m$—A] is [—Y—A];

that R_7 is [—Y—A] only when [—Y—R_3—$(O)_m$—A] is [—Y—A];

that R_7 is [—O—$(CH_2)_q$—$(O)_m$—A], only when [—Y—R_3—$(O)_m$—A] is [—O—$(CH_2)_q$—$(O)_m$—A];

q is a number from 1 to 4;

R_8 is hydrogen or methyl;

p is a number from 1 to 6;

Y is oxygen or sulfur;

R_3 is a direct bond or C_1–C_6 alkylene, —CO—, or —CONH—;

R_4 is hydrogen, halogen, C_1–C_6-alkyl, C_1–C_6 alkoxy, cyano, trifluoromethyl, phenoxy, benzyloxy, acetylamino, propionylamino, benzoylamino, methylsulfonylamino, ethylsulfonylamino, phenylsulfonylamino, C_1–C_4 alkylcarbonyloxy, benzoyloxy, or C_1–C_4 alkylsulfonyl;

R_5 is hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, phenoxy, benzyloxy, acetylamino, propionylamino, benzoylamino, methylsulfonylamino, ethylsulfonylamino, phenyl sulfonylamino, C_1–C_4 alkyl carbonyloxy, benzoyloxy, or C_1–C_4 alkylsulfonyl;

A is cyclohexyl, methyl, borneyl, tetrahydronaphthyl, decahydronaphthyl, phenyl, naphthyl, 1,2,4-triazolyl-(3), benzthiazolyl-(2) or benzoxazolyl-(2), each of which are unsubstituted or substituted with C_1–C_{12} alkyl, C_1–C_6 alkoxy, halogen, C_1–C_4 alkoxycarbonyl, phenyl, benzyl, 2-phenylethyl, 2-phenylpropyl, C_1–C_4-alkylsulfonyl, or phenylsulphonyl;

X^- is an anion;

n, *n'*, and *n''* independently of one another are 0 or 1;

m is 0 or 1, with the proviso that the sum $n+n'+n''=2$ and that *m* is 1 only if R_3 is alkylene.

4,051,118

WATER-SOLUBLE DISAZO DYESTUFFS CONTAINING A 3- OR 4-[PYRAZOLYLENE-(1)-BENZOYLAMINO]-6-SULPHOPHENYL MOIETY

Hans Ackermann, Riehen, and Fabio Beffa, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 429,773, Jan. 2, 1974, abandoned, which is a continuation of Ser. No. 186,761, Oct. 5, 1971, abandoned, which is a division of Ser. No. 753,876, Aug. 20, 1968, Pat. No. 3,697,500. This application Apr. 8, 1975, Ser. No. 566,520

Claims priority, application Switzerland, Aug. 21, 1967, 11738/67

Int. Cl.[2] **C09B** *62/08, 62/24, 62/74, 62/82*

U.S. Cl. 260—153 **8 Claims**

1. A dyestuff of the formula



wherein

A represents phenyl, naphthyl or phenyl or naphthyl substituted by lower alkyl or sulphamoyl,

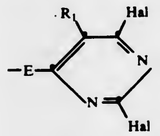
B represents phenyl, lower alkyl-phenyl, naphthyl, phenol, lower alkylphenol, naphthol, benzoylaminonaphthol, N-methyl-N'-m-chloro-phenyl barbituric acid, or di-(phenylamino) malonic acid,

Q represents 1,3- or 1,4-phenylene or 1,3- or 1,4-phenylene substituted by lower alkyl, chloro or bromo,

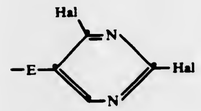
R represents lower alkyl or COO^-M^+,

X represents hydroxy or NH_2,

Y represents a group directly linked to a ring carbon atom of A or B and has the formula

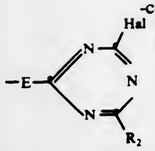


(I)

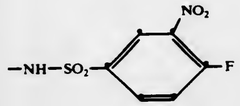


(II)

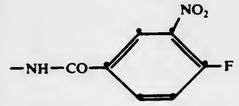
-continued



(III)

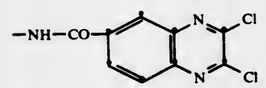


(IV)

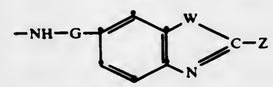


(V)

(VI)

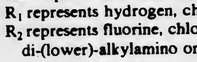


(VII)

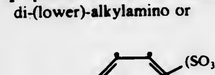


(VIII)

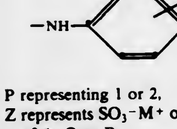
in which G is CO or SO_2, W is O or S, and Z is Cl, Br, $SO_3^-H^+$,



(IX)

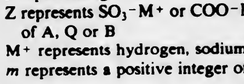


(X)



(XI)

wherein E represents —NH—,



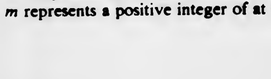
* the bond being linked to the remainder of Y,

Hal represents fluorine, chlorine or bromine,

Hal' represents chlorine or bromine,

R_1 represents hydrogen, chlorine, bromine or cyano,

R_2 represents fluorine, chlorine, bromine, lower alkylamino, di-(lower)-alkylamino or



P representing 1 or 2,

Z represents $SO_3^-M^+$ or COO^-M^+ linked to a ring carbon of A, Q or B

M^+ represents hydrogen, sodium or potassium,

m represents a positive integer of at most 3, and

n represents a positive integer of at most 5,
and wherein which when *m* is 3, one Y is linked to A and the other to B.

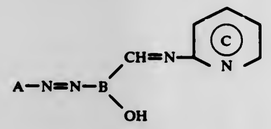
4,051,119

AZOMETHINE DYES DERIVED FROM AN O-HYDROXY AROMATIC ALDEHYDE AND A 2-AMINOPYRIDINE

Raouf Botros, Beech Creek, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Filed Sept. 2, 1975, Ser. No. 609,683
Int. Cl.[2] C09B *29/14, 29/36;* **D06P** *1/02, 3/79*
U.S. Cl. 260—156 **7 Claims**

1. An azomethine dye of the formula:



wherein:

A is phenyl, naphthyl, phenyl substituted by up to 3 substituents or naphthyl substituted by up to 2 substituents, said substituents being independently selected from lower alkyl of 1–4 carbons; lower alkoxyl of 1–4 carbons; nitro; cyano; fluorine; chlorine; bromine; trifluoromethyl; hydroxyl; RCOO—, where R is alkyl of 1–4 carbons; carboxyl; ROOC—, where R is alkyl of 1–4 carbons; RCO—, where R is alkyl of 1–4 carbons; benzoyl; RCONH—, where R is alkyl of 1–4 carbons; ArCONH—, where Ar is phenyl; or carbamyl, the nitrogen of which is unsubstituted or singly or doubly substituted by alkyl of 1–4 carbons;

B is salicylaldehyde, o-hydroxy-naphthaldehyde, or salicylaldehyde or o-hydroxy-naphthaldehyde substituted by up to 2 substituents independently selected from lower alkyl of 1–4 carbons; lower alkoxyl of 1–4 carbons; cyano; fluorine; chlorine or bromine;

and

C is 2-aminopyridyl or 2-aminopyridyl substituted by up to 2 substituents independently selected from lower alkyl of 1–4 carbons; lower alkoxyl of 1–4 carbons; nitro; chlorine or bromine.

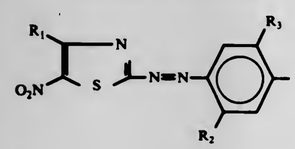
4,051,120

MONOAZO COMPOUNDS HAVING A 5-NITROTHIAZOLYL-2 DIAZO COMPONENT RADICAL AND A 1,4-PHENYLENE COUPLING COMPONENT RADICAL HAVING AN N-(ALKYL OR ALLYL)-N-(ALKOXYL- OR ALKOXYETHOXY-ETHOXYCARBONYLOXYALKYL)-AMINO GROUP IN ITS PARA POSITION

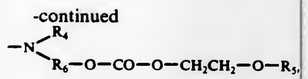
Ruedi Altermatt, Bucktea, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Sept. 15, 1975, Ser. No. 613,216
Claims priority, application Switzerland, Sept. 19, 1974, 12726/74
Int. Cl.[2] C09B *29/08, 29/26;* **D06P** *1/18, 2/42*
U.S. Cl. 260—158 **9 Claims**

1. A compound of the formula



-continued



wherein

R_1 is hydrogen, C_{1-4}alkyl, phenyl or substituted phenyl having 1 to 3 substituents each of which is independently chloro, bromo or cyano, with the proviso that the maximum number of cyano groups is one,

R_2 is C_{1-4}alkyl or C_{1-4}alkoxy,

R_3 is hydrogen, C_{1-4}alkyl or C_{1-4}alkoxy,

R_4 is C_{1-4}alkyl or allyl,

R_5 is C_{1-4}alkyl or β-(C_{1-4}alkoxy) ethyl, and

R_6 is C_{2-4}alkylene, with the proviso that the nitrogen atom and the oxygen atom to which R_6 is attached are not attached to the same carbon atom thereof.

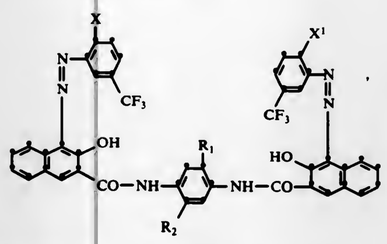
4,051,121

AZO PIGMENTS HAVING TWO 2-HALO-5-TRIFLUOROMETHYLPHENYL DIAZO COMPONENT RADICALS AND A BIS-(2-HYDROXYNAPHTHOYL-3-AMINO)-2,5-DIHALO-BENZENE COUPLING COMPONENT RADICAL

Boris Tcherkinsky, and Hans Wasem, both of Basel, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 404,341, Oct. 9, 1973, abandoned. This application Nov. 11, 1975, Ser. No. 630,810
Claims priority, application Switzerland, Oct. 13, 1973, 15036/73
Int. Cl.[2] C09B *33/14, 43/12*
U.S. Cl. 260—174 **13 Claims**

1. A compound of the formula



wherein each of X, X', R_1 and R_2 is independently fluoro, chloro or bromo.

4,051,122

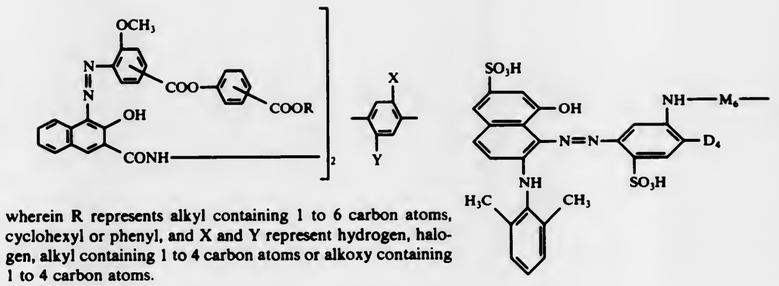
DISAZO PIGMENTS CONTAINING TETRACARBOXYLIC ACID ESTER GROUPS

Karl Ronco, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 466,357, May 2, 1974, abandoned. This application Sept. 23, 1975, Ser. No. 615,851
Claims priority, application Switzerland, May 16, 1973, 6966/73
Int. Cl.[2] C09B *33/14, 43/12*
U.S. Cl. 260—174 **7 Claims**

1. Disazo pigment of the formula

(XI)



wherein R represents alkyl containing 1 to 6 carbon atoms, cyclohexyl or phenyl, and X and Y represent hydrogen, halogen, alkyl containing 1 to 4 carbon atoms or alkoxy containing 1 to 4 carbon atoms.

4,051,123

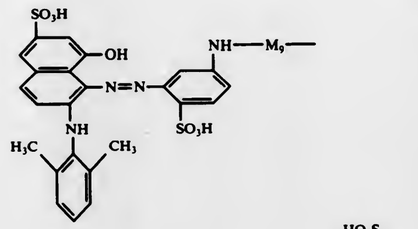
SULFONIC-ACID-GROUP CONTAINING DISAZO DYESTUFFS

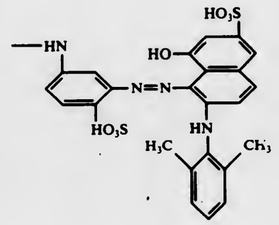
Bernhard Piller; John Lenoir, both of Marly-le-Petit; Alfred Froehlich; Thomas Stauner, both of Marly-le-Grand, and Paul Tschopp, Marly, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 238,944, March 28, 1972, abandoned. This application Aug. 21, 1975, Ser. No. 606,395
Int. Cl.[2] C09B *35/22, 35/24, 35/30, 35/34*
U.S. Cl. 260—178 **12 Claims**

1. Azo dyestuff of the formula

(XI)

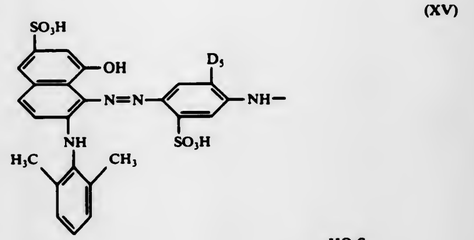


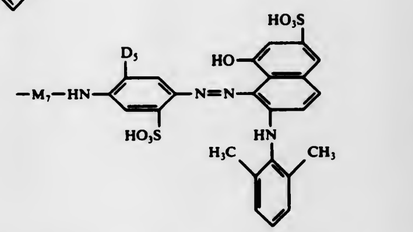


wherein M_9 denotes benzophenone-4,4'-dicarbonyl, diphenylsulphone-4,4'-dicarbonyl, naphthalene-2,6-dicarbonyl, N-benzoylaniline-3,4'-dicarbonyl, N-benzoyl-2-chloroaniline-5,4'-dicarbonyl, 1,2-diphenoxyethane- 3',3''- or -4',4''-dicarbonyl or N,N'-dibenzoylethylenediamine- 4,4'-dicarbonyl.

5. Azo dyestuff of the formula

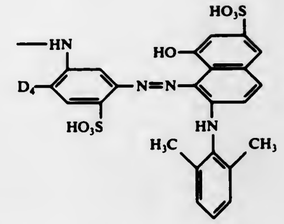
(XV)





wherein D_5 denotes chlorine or methyl, methoxy or trifluoromethyl and M_7 denotes isophthaloyl, terephthaloyl, benzophenone-4,4'-dicarbonyl, naphthalene-2,6-dicarbonyl, diphenylsulphone-4,4'-dicarbonyl, N-benzoylaniline-3,4'-dicarbonyl, N-benzoyl-2-chloroaniline-5,4'-dicarbonyl or 1,2-diphenoxyethane-3',3''- or -4',4''-dicarbonyl or N,N'-dibenzoylethylenediamine-4,4'-dicarbonyl.

9. Azo dyestuff of the formula



wherein D_4 denotes methyl or methoxy and M_6 denotes terephthaloyl, benzophenone-4,4'-dicarbonyl, diphenylsulphone-4,4'-dicarbonyl, naphthalene-2,6-dicarbonyl, N-benzoylaniline-3,4'-dicarbonyl, N-benzoyl-2-chloroaniline-5,4'-dicarbonyl, 1,2-diphenoxyethane-3',3''- or -4',4''-dicarbonyl or N,N'-dibenzoylethylenediamine-4,4'-dicarbonyl.

4,051,124
PROCESS FOR PRODUCING AN AZONITRILE WITH IMPROVED COLOR FROM AN AMINONITRILE IN AN AQUEOUS SYSTEM COMPRISING MIXED SURFACE ACTIVE COMPOUNDS

Earl Phillip Moore, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 14, 1976, Ser. No. 686,508
Int. Cl.² C07C *107/02*
U.S. Cl. 260—192 **13 Claims**

1. A process for the preparation of 2,2'-azobis(isobutyronitrile) of improved color comprising

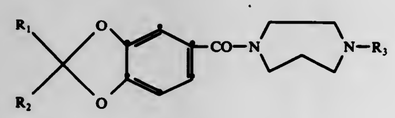
reacting 2-amino-2-methylpropionitrile with a metal hypochlorite, $M(OCl)_x$ where M is selected from sodium, potassium or calcium and x is the valence of M, in an aqueous medium having an initial concentration of 5 to 15% by weight metal hypochlorite in the presence of 0.25 to 10% by weight, based on the weight of said aminonitrile, of a mixture of a quaternary ammonium surface active compound with a compound selected from a nonionic and amphoteric surface active compound said mixture having and HLB of about 8 to about 35 at a temperature of about −10° C to about 30° C said metal hypochlorite and aminonitrile being present in an equivalent ratio of from 1:1 to 2:1 of hypochlorite to aminonitrile and recovering the self-precipitated 2,2'azobis(isobutyronitrile) from the reaction mixture without the use of a precipitating agent.

4,051,125
1,3-BENZODIOXOL DERIVATIVES

Satoru Tanaka, Higashikurume, and Hideaki Watanabe, Ushiku, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 609,145, Aug. 29, 1975, which is a division of Ser. No. 503,515, Sept. 5, 1974, Pat. No. 3,981,864. This application May 10, 1976, Ser. No. 684,735
Claims priority, application Japan, Sept. 8, 1973, 48-100761; Sept. 8, 1973, 48-100762
Int. Cl.² C07D *243/08*
U.S. Cl. 260—239 BC **3 Claims**

1. A member selected from the group consisting of a compound of the formula:



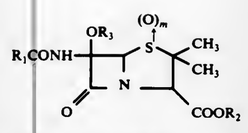
wherein R_1 and R_2 are respectively lower alkyl of 1 to 2 carbon atoms or both R_1 and R_2 together form divalent alkylene of 4 or 5 carbon atoms as a part of a cyclic structural moiety; and R_3 is lower alkyl, phenyl, halogen-substituted phenyl or benzhydryl, and a pharmacologically acceptable acid-addition salt thereof.

4,051,126
PROCESS FOR THE PREPARATION OF 6-ALKOXY-SUBSTITUTED PENICILLINS

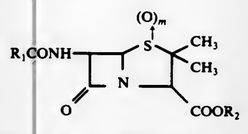
Masuo Murakami, Tokyo; Ichiro Isaka, Hoya, and Teruya Kashiwagi, Ageo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 533,124, Dec. 16, 1974, abandoned. This application July 13, 1976, Ser. No. 704,770
Claims priority, application Japan, Dec. 26, 1973, 48-3259; Nov. 12, 1974, 49-130145
Int. Cl.² C07D *499/44, 499/58*
U.S. Cl. 260—239.1 **14 Claims**

1. A process of preparing a 6-substituted penicillin compound of the formula:



wherein R_1CO is phenyl lower alkanoyl, phenoxy lower alkanoyl, benzoyl, or benzoyl substituted by nitro, lower alkyl or lower alkoxy in the benzene ring; R_2 is lower alkyl, lower alkyl substituted by phenyl, nitro-phenyl, halo-phenyl or lower alkoxy phenyl; benzoyl, or benzoyl substituted by nitro, halo, or lower alkoxy; R_3 is lower alkyl; and m is 1 or 0 which consists essentially of the steps of (a) first adding a halogenating agent to an inert organic solvent solution of a penicillin compound of the formula:



where R_1, R_2 and m have the same meaning as defined above, under cooling at a temperature of about 0° C. to about −30° C. and then (b) adding to the reaction mixture about one equivalent of an alkali metal alcoholate of the formula

$$MOR_3$$

wherein R_3 has the same meaning as in the above formula and M represents an alkali metal in the presence of an alcohol corresponding to said alcoholate.

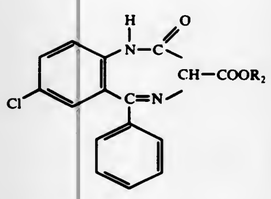
4,051,127
PREPARATION OF BENZODIAZEPINE DERIVATIVES

François Krausz, Montpellier, France, assignor to C M Industries, Paris, France

Filed Jan. 5, 1976, Ser. No. 646,515
Claims priority, application United Kingdom, Jan. 6, 1975, 485/75
Int. Cl.² C07D *291/08*
U.S. Cl. 260—239.3 D **10 Claims**

1. A process for the manufacture of benzodiazepines of formula (IV)

(IV)

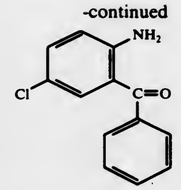


which process comprises:

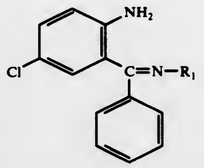
i. condensing 2-amino-5-chloro-benzophenone (I) with a

(I)

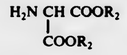
-continued



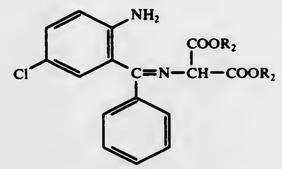
primary amine $R_1—NH_2$ to give an imine (II)



ii. reacting the imine (II) with an amino ester



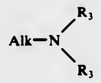
to give a ketimine (III),



and

iii. converting the ketimine (III) to the benzodiazepine (IV) by cyclization,

and in which R_1 represents an $Alk—NH_2$ group, an



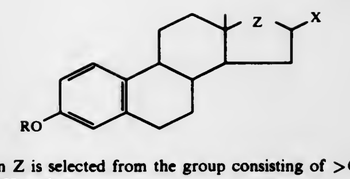
group or an $Alk—OR_4$ group in which Alk denotes a straight or branched alkylene group with 2 to 6 carbon atoms and R_3 and R_4 each represent a C_1-C_4 alkyl group and R_2 represents a C_1-C_4 alkyl group.

4,051,128
STEROID ETHERS

Mohammed T. Shipchandler, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

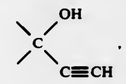
Filed July 29, 1976, Ser. No. 709,693
Int. Cl.² C07J *71/00*
U.S. Cl. 260—239.57 **11 Claims**

1. A compound of the formula

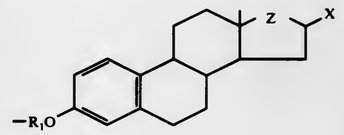


wherein Z is selected from the group consisting of >C=O, >CHOH, and

(II)

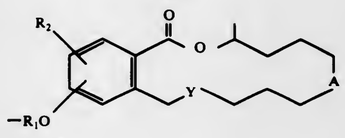


X is selected from the group consisting of —H and —OH, and R is selected from the group consisting of



and

(III)



wherein R_1 is a straight or branched chain hydrocarbon of from 1 to about 16 carbon atoms; A is selected from the group consisting of $—CH_2—$, >C=O, and $>CHOR_3$; Y may be a single bond or a double bond; R_2 and $—R_1O—$ represent substituents on the aromatic ring of the group of the second formula, in either the 2 or 4 positions, and R_2 is selected from the group consisting of H and OR_3; R_3 is selected from the group consisting of lower alkyl of from 1 to about 6 carbon atoms; lower acyl of from 1 to about 6 carbon atoms; moncyclic aryl of about 6 to 8 carbon atoms; and monocyclic aralkyl, that is, an alkyl group having an aryl substituent thereon, wherein the alkyl group has 1 to about 5 carbon atoms and the aryl group has about 6 to 8 carbon atoms.

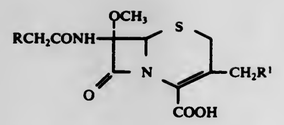
4,051,129
PROCESS FOR PREPARING 7-METHOXYCEPHALOSPORIN COMPOUNDS

Bunji Shimizu; Akio Saito; Masakatsu Kaneko; Hiroaki Yanagisawa, and Hideo Nakao, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Nov. 11, 1975, Ser. No. 630,816
Claims priority, application Japan, Nov. 30, 1974, 49-138799
Int. Cl.² C07D *501/04, 501/36, 501/28, 501/22*
U.S. Cl. 544—21 **7 Claims**

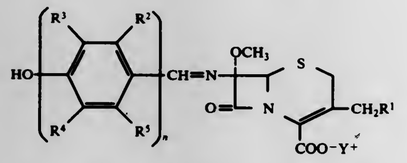
1. A process for preparing a 7α-methoxy-3-cephem-4-carboxylic acid having the formula

(I)



wherein R represents cyanomethylthio, 1-cyanoethylthio, azidomethylthio, propargylthio, 2-hydroxyethylthio, 2,3-dihydroxypropylthio, methylsulfonyl, ethylsulfonyl, cyanoethylsulfonyl, 3-isoxazolyloxy, 3-isoxazolylthio, 2-(1,3,4-thiadiazolyl)thio, 2-imidazolythio or sydnon-3-yl nd R^1 is acetoxy, carbamoyloxy or 1-methyl-1H-tetrazol-5-ylthio or a salt with the carboxyl group thereof which comprises the steps of contacting a 7β-benzylidenemino-7α-methoxy-3-cephem-4-carboxylic acid having the formula

(II)

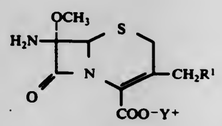


wherein R^1 is the same as defined above, R^2, R^3, R^4 and R^5 may be the same or different and each represents hydrogen atom, an alkyl having 1–4 carbon atoms, an alkoxy having 1–4 carbon atoms, or a halogen atom, or R^2 and R^3 or R^4 and R^5 may be linked together to form a saturated, unsaturated or aromatic ring, n is an integer of 1 or 2 and Y^+ is a cation selected from the group consisting of an alkali metal ion and an ammonium ion having the formula



wherein R_a, R_b, R_c and R_d can be the same or different, and each is selected from the group consisting of hydrogen alkyl having from 1 to 8 carbon atoms, cyclopentyl, cyclohexyl, cycloheptyl, phenyl, phenylalkyl wherein the alkyl has from 1 to 4 carbon atoms, R_a and R_b can be linked together with said N to form a saturated heterocyclic ring, and R_a, R_b and R_c can be linked together with said N to form a heterocyclic ring, with a hyrazine to give a 7-amino-7-methoxy-3-cephem-4-carboxylic acid having the formula

(III)



wherein R^1 and Y^+ are the same as defined above, and reacting the latter compound with a compound selected from the group consisting of a carboxylic acid having the formula

RCH_2COOH (IV)

wherein R is the same as defined above, an acid halide of (IV), an azide of (IV), an acid anhydride of (IV), a p-nitrophenyl ester of (IV), cyanomethyl ester of (IV) and a phthalimide ester of (IV).

4,051,130

4(3H)-OXOBENZO-2,1,3-THIADIAZINE-2,2-DIOXIDES AND DERIVATIVES THEREOF

Lennon H. McKendry, Midland, Mich., and Walter P. Bland, Takoma Park, Md., assignors to The Dow Chemical Company, Midland, Mich.

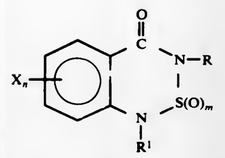
Continuation-in-part of Ser. No. 497,583, Aug. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 398,355, Sept. 17, 1973, abandoned. This application Mar. 12, 1976, Ser. No. 660,577

Int. Cl.[2] C07D *285/16*

U.S. Cl. 544—11 **27 Claims**

1. A compound corresponding to the formula:

(I)



wherein:

each X independently represents loweralkyl, halologeralkyl, cycloalkyl having from 3 to about 8 carbon atoms, phenyl, loweralkylphenyl, halophenyl, —SCN, —COOR[5],



$-YR^2$, $-SO_2R^5$, $-SO_2NR^3R^4$, $-CF_3$,



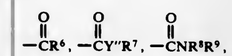
or $-Y'CF_2C(Z)_3$;

n represents an integer of 1 to 4, inclusive;

m represents an integer of 1 or 2;

R represents loweralkyl, halologeralkyl; alkenyl, haloalkenyl, alkynyl and haloalkynyl, each of about 3 to about 6 carbon atoms; cycloalkyl of 3 to about 8 carbon atoms; phenyl, loweralkylphenyl, halophenyl, benzyl, loweralkylbenzyl, halobenzyl, loweralkoxyloweralkyl, diloweralkylaminoloweralkyl; loweralkylthioloweralkyl, or cyanoloweralkyl;

R^1 represents hydrogen,



$-SO_2R^{10}$ or $-SO_2NR^8R^9$;

R^2 and R^5 each represent alkyl of 1 to 2 carbon atoms;

R^3 represents loweralkyl;

R^4 represents hydrogen or loweralkyl;

R^6 represents loweralkyl and hololoweralkyl each having from 1 to 5 carbon atoms, alkenyl and haloalkenyl of 2 to 5 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, loweralkoxyloweralkyl and loweralkylthioloweralkyl, each of 2 to 6 carbon atoms, alkoxycarbonylalkyl of 4 to 8 carbon atoms, phenyl, loweralkylphenyl or halophenyl;

R^7 represents alkyl of 1 to 7 carbon atoms, haloalkyl of 1 to 4 carbon atoms, alkenyl and haloalkenyl of 3 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, loweralkylphenyl or halophenyl;

R^8 represents loweralkyl of 1 to 4 carbon atoms and cycloalkyl of 3 to 6 carbon atoms;

R^9 represents R^8 and alkoxy, and when taken together with R^8 and the nitrogen from which each depends, a heterocyclic ring of 4 to 8 carbon atoms;

R^{10} represents alkyl and haloalkyl, each of 1 to 7 carbon atoms;

each Y, Y' and Y'' independently represents a chalcogen group having an atomic number of from 8 to 16 inclusive;

each Z independently represents hydrogen, bromo, chloro or fluoro; and

where R^1 is hydrogen, the salts thereof with organic or inorganic bases.

4,051,131

INTERMEDIATES FOR PREPARING CEPHALOSPORINS

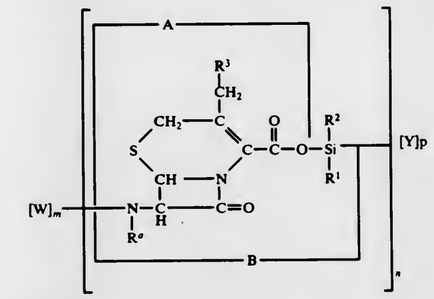
Charles A. Robinson, West Chester, Pa., assignor to American Home Products Corporation (Del.), New York, N.Y.

Division of Ser. No. 310,511, Nov. 29, 1972, Pat. No. 3,965,098. This application Mar. 22, 1976, Ser. No. 669,135

Int. Cl.[2] C07D *501/18*

U.S. Cl. 544—28 **7 Claims**

1. A compound of the group consisting of those having the following formula:



wherein:

R^1 is of the group consisting of hydrogen, lower alkyl, phenyl, loweralkylphenyl and benzyl

R^2 is of the group consisting of lower alkyl, phenyl, loweralkylphenyl and benzyl

R^3 is hydrogen or



R^a is of the group consisting of tetrazolylacetyl and sydnonylacetyl; W is of the group consisting of hydrogen and

II



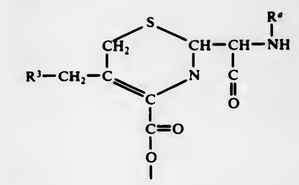
wherein R^1 and R^2 have the same meaning as before, and X is halogen;

m and p are integers from 0 to 1 and are always equal

n is an integer from 1 to about 25;

Y is of the group consisting of halogen, and groups of the following formula:

III



wherein R^a has the same meaning as before; with the provisos that, in Formula I,

1. when m is o and p is 0, n is more than 1;
2. when n is more than 1, the moieties A of the additional groups B recur in random head-toward-head, head-toward-tail and tail-toward-tail disposition;
3. when W is hydrogen, n is 1, and Y in Formula III, then R^a is hydrogen,
4. when W is hydrogen or



4,051,132

PROCESS FOR EPIMERIZING BETA-LACTAM ANTIBIOTIC COMPOUNDS BY MEANS OF AN ACID QUENCH

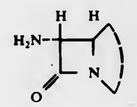
Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 436,014, Jan. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 350,543, April 16, 1973, abandoned, Ser. No. 303,906, Nov. 6, 1972, abandoned, Ser. No. 306,066, Nov. 13, 1972, abandoned, Ser. No. 314,484, Dec. 12, 1972, abandoned, Ser. No. 319,945, Dec. 29, 1972, abandoned, and Ser. No. 340,804, March 13, 1973, abandoned, said Ser. No. 350,543, is a continuation-in-part of Ser. No. 267,858, June 30, 1972, abandoned. This application Dec. 24, 1975, Ser. No. 644,250

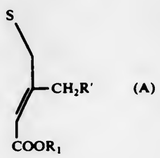
Int. Cl.[2] C07D *501/04*

U.S. Cl. 544—20 **22 Claims**

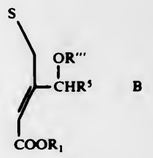
1. The process of epimerizing a compound having the formula



wherein the symbol indicated as a curved broken line represents the following:

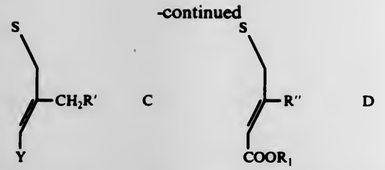


(A)



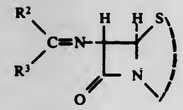
B

-continued



wherein R_1 is an easily removable ester blockingg group; R′ is hydrogen, halo, loweralkanoyloxy, carbamoyloxy, furyl, thiazolyl, thiazolyl, thiadiazolyl, pyrrolyl, or tetrazolyl; each of which can be substituted with a lower alkyl substituent of 1-6 carbon atoms; R″ is phenyl, furyl, thienyl, thiazolyl, thiadiazolyl, pyridyl, pyrazolyl, or tetrazolyl; R‴ is loweralkanoyl; R^5 is loweralkyl; and Y is $PO(OH)_2$ (OR^4), $SO_2(OH)$ or SO_2NH_2 in which R^4 is loweralkyl;

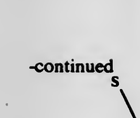
a. which comprises reacting the compound above with an aromatic or aliphatic aldehyde or ketone to yield an intermediate of the formula



wherein the broken curved line is as defined, and R^2 is loweralkyl or phenyl and R^3 is hydrogen, loweralkyl or phenyl;

b. and treating the latter intermediate with a base sufficiently strong to convert the aldimino compound to its anionic form said treatment conducted in the presence of an aprotic solvent and the optional presence of a dipolar aprotic co-solvent, followed by addition of a molecular excess of acid, a carboxylic acid having from 1-5 carbon atoms;

c. and reacting the compound thereby produced with acid in the optional presence of an amine, and recovering the product,



wherein the curved broken line is as defined above.

4,051,133

PROCESS FOR CONVERTING PENICILLIN SULFOXIDES TO THE CORRESPONDING 3-DESACETOXYCEPHALOSPORINS

Poul Borrevang, Rodovre, and Henning Borge Petersen, Lyngby, both of Denmark, assignors to Novo Industri A/S, Bagsvaerd, Denmark

Filed Jan. 2, 1976, Ser. No. 646,321

Claims priority, application United Kingdom, Jan. 3, 1975, 307/75

Int. Cl.² C07D *501/10*

U.S. Cl. 544—18 **8 Claims**

1. The process for converting a penicillin G or V sulfoxide ester to the corresponding 3-desacetoxycephalosporin ester which comprises heating a solution of the penicillin G or V sulfoxide ester in an inert solvent in the presence of a catalyst, said catalyst being the complex formed by a phosphite or phosphine amide selected from the group consisting of:

2-piperidino-1,3,2-dioxaphospholane,

Piperidino-diphenylphosphine,

2-piperidino-4,5-benzo-1,3,2-dioxaphospholane,

2-(2′,6′-dimethylpiperidino-4,5-benzo-1,3,2-dioxaphospholane

2-(1′-imidazolyl)-4,5-benzo-1,3,2-dioxaphospholane, tris-(dimethylamino)-phosphine.

and the salt of a strong acid with a nitrogeneous base selected from the group consisting of:

alfa-picoline hydrobromide

alfa-picolinium methanesulfonate

pyridinium 2-trichloroethylphosphate

N,N-dimethylaniline hydrobromide

4,051,134

REACTIVE DYESTUFFS

Adolf Friedrich, Leverkusen; Horst Harnisch, Cologne, and Roderich Raue, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

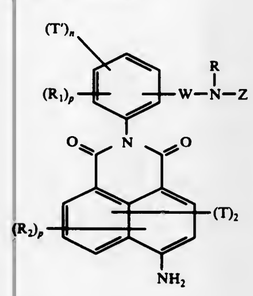
Filed Nov. 20, 1975, Ser. No. 633,781

Claims priority, application Germany, Nov. 23, 1974, 2455615

Int. Cl.² C07D *401/10*

U.S. Cl. 544—217 **2 Claims**

1. Compound of the formula:



wherein

W is a direct bond, C_1-C_4-alkylene; cyclopentylene; cyclohexylene; cyclopentylene or cyclohexylene substituted with methyl, ethyl, or propyl but each containing no more than 8 carbon atoms; or phenylene;

T and T′ are sulphonic acid, sulphonic acid alkali metal salt, or sulphonic acid ammonium salt, and *n* is 0 or 1;

R is hydrogen; C_1-C_4-alkyl; C_1-C_4-alkyl substituted with hydroxyl, methoxy or ethoxy; benzyl; phenethyl; benzyl or phenethyl substituted with methyl, ethyl, methoxy, ethoxy or chlorine; phenyl; tolyl; xylyl; phenyl substituted with hydroxy, methoxy or ethoxy; cyclopentyl; cyclohexyl; or cyclopenty! or cyclohexyl substituted with methyl or ethyl if *n* is 1; or sulfo-C_1-C_4-alkyl; sulphophenyl; sulphotolyl; sulphobenzyl; sulphophenethyl; or sulfocycloalkyl if *n* is 0;

R_1 and R_2 are hydrogen, F, Cl, Br, C_1-C_6-alkyl, C_1-C_6-alkoxy, nitro, cyano, carbo-C_1-C_5-alkoxy, phenyl, or benzyl;

p is 1, 2 or 3; and

Z is a polyamide- or cellulose-fiber reactive group comprising at least one reactive substituent bonded to a 5-membered or 6-membered heterocyclic ring containing at least one nitrogen atom.

4,051,135

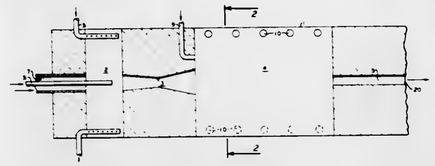
CARBON BLACK REACTOR

John W. Vanderveen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 524,832, Nov. 18, 1974, Pat. No. 3,989,804, which is a continuation of Ser. No. 286,893, Sept. 7, 1972, abandoned. This application June 2, 1976, Ser. No. 692,072

Int. Cl.² C09C *1/50*

U.S. Cl. 23—259.5 **7 Claims**



1. A carbon reactor comprising:

a. a first section with conduit means for the introduction of a plurality of reactants thereinto, said conduit means restricted to axial and radial flow with means to introduce at least one reactant with axial flow and means to introduce at least one reactant with radial flow;

b. a means in open communication with said first section for producing a mixed reactant mass in axial, non-rotating flow;

c. a second section in open communication with said means for producing said reactant mass, said second section having along its length a plurality of means spaced tangentially to said second section for introducing combustion gases;

d. a pyrolytic carbon black forming section in open communication with said second section; and

e. conduit means for the recovery of carbon black from said carbon black forming section.

4,051,136

PIPERAZINYL CYCLOBUTENONES

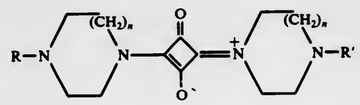
Carl Peter Krimmel, Wauconda, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Apr. 7, 1976, Ser. No. 674,519

Int. Cl.² C07D *295/02, 243/08*

U.S. Cl. 260—268 R **5 Claims**

1. A compound of the formula



wherein R and R′ are alkyl having from 2 to 6 carbon atoms and *n* is 1 or 2.

4,051,137

SUBSTITUTED PIPERAZINE DIONES AND POLYMERIC COMPOSITIONS STABILIZED THEREBY

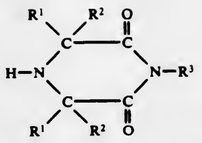
Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 391,200, Aug. 24, 1973, Pat. No. 3,928,357, which is a continuation-in-part of Ser. No. 237,982, March 24, 1972, abandoned. This application Nov. 19, 1975, Ser. No. 633,202

Int. Cl.² C07D *241/08*

U.S. Cl. 260—268 TR **1 Claim**

1. A compound of the formula



wherein

R^1 and R^2 are together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group, and

R^3 is benzyl.

4,051,138

WATER-SOLUBLE AMINE-LINKED POLYMERIC COLORANTS

Patricia C. Wang, and Robert E. Wingard, both of Palo Alto, Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Dec. 8, 1975, Ser. No. 638,730

Int. Cl.² C09B *5/14*

U.S. Cl. 260—278 **21 Claims**

1. A water-soluble polymeric coloring composition consisting essentially of *n* units of an organic optically chromophoric group, A, and *m* units of a sulfur oxide water-solubilizing groups selected from the group consisting of sulfonate group and 2 to 4 carbon alkyl sulfonate groups attached through amine linkages selected from the group consisting of the secondary amine linkage and 1 to 4 carbon alkyl-substituted tertiary amine linkages directly to separate carbon atoms of a saturated aliphatic hydrocarbon backbone, wherein *n* is from 0.2 to 4 times *m*, the sum of *n* plus *m* is a value from 20 to 3000 and the coloring composition has a molecular weight of from 2000 to 2,000,000.

4,051,139

PYRIDINE GRIGNARD DERIVATIVES

Adrian Charles Ward Curran, Newcastle-upon-Tyne, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

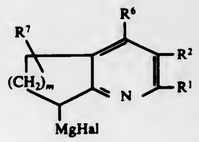
Division of Ser. No. 526,353, Nov. 22, 1974, Pat. No. 3,963,722. This application Dec. 8, 1975, Ser. No. 638,384

Claims priority, application United Kingdom, Nov. 26, 1973, 54728/73; Mar. 27, 1974, 13516/74

Int. Cl.² C07D *221/16, 215/14, 215/06, 215/12*

U.S. Cl. 260—290 HL **10 Claims**

1. A compound of formula (II)



wherein

R^1, R^2 and R^6 are independently hydrogen, alkyl of 1 to 6 carbon atoms, phenylalkyl of 7 to 12 carbon atoms, phenyl, alkylphenyl of 7 to 12 carbon atoms, alkoxyphenyl of 7 to 12 carbon atoms, or halophenyl, or R^1 and R^2 taken together, are trimethylene, tetramethylene or pentamethylene or an R^7 substituted derivative thereof;

R^7 is hydrogen, alkyl of 1 to 6 carbon atoms, gem-dimethyl, phenylalkyl of 7 to 12 carbon atoms, phenyl, alkylphenyl of 7 to 12 carbon atoms, alkoxyphenyl of 7 to 12 carbon atoms, or halophenyl;

m is 1 or 3; and

Hal represents chlorine, bromine or iodine, with the proviso

that when R^1 and R^2 or R^2 and R^6 are both alkyl, they are selected from normal and secondary alkyl groups.

4,051,140

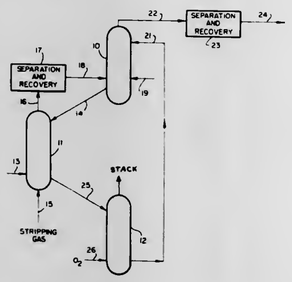
PREPARATION OF PYRIDINES AND NICOTINONITRILE FROM PIPERIDINES

Abraham P. Gelbein, Plainfield, N.J.; Paul Janssen, deceased, late of Beasberg-Refrath, Germany, by Almuth Janssen, heir; Hermann Richtzenhain, Much-Schwellenbach, Germany, assignors to The Lummus Company, Bloomfield, N.J.

Filed July 1, 1976, Ser. No. 701,693

Int. Cl.² C07D *213/24, 213/57*

U.S. Cl. 260—290 P **11 Claims**



1. A process for producing nicotinonitrile, comprising:

a. converting in a first reaction zone a member selected from the group consisting of 3-alkyl piperidines, 2,3-dialkyl piperidines, and 2,5-dialkyl piperidines to the corresponding pyridine by contacting said member with supported vanadia as a catalyst, at a temperature of from 500° F to 1000° F, said supported vanadia containing from about 25 to about 75 percent, by weight, of the vanadia, said vanadia having been placed in molten form substantially entirely within the pores of the support, the support having a surface area greater than about 50 m^2/gm and a porosity greater than about 0.4 cc/gm, said support being selected from the group consisting of gamma-alumina and silica-alumina; and

b. contacting said corresponding pyridine in a second reaction zone with ammonia at a temperature of from 575° F to 930° F in the presence of oxidized vanadia supported on a porous support to produce nicotinonitrile, said support containing from about 25 to about 75 percent, by weight, of the vanadia having been placed in molten form substantially entirely within the pores of the support, the support having a surface area greater than about 50 m^2/gm and a porosity greater than about 0.4 cc/gm, said support being selected from the group consisting of gamma-alumina and silica-alumina.

4,051,141

THIENO[3,2-C]PYRIDINE DERIVATIVES

Albert Rene Joseph Castaigne, Toulouse, France, assignor to Centre d'Etudes pour l'Industrie pharmaceutique, Toulouse, France

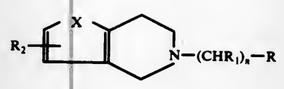
Division of Ser. No. 435,036, Jan. 21, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 660,248

Claims priority, application France, Feb. 1, 1973, 73.03503

Int. Cl.² C07D *513/04*

U.S. Cl. 260—294.8 C **6 Claims**

1. A compound selected from the derivatives of the formula:



in which X is sulfur; R is selected from the group consisting of phenyl, phenyl substituted with 1 or 2 halogen atoms or alkyl having 1–6 carbon atoms or alkoxy having 1–6 carbon atoms or hydroxy or nitro, benzoyl, and benzoyl substituted with chloro or fluoro or alkyl having 1–6 carbon atoms or alkoxy having 1–6 carbon atoms or 1 or 2 hydroxy groups or nitro; R_1 is selected from the group consisting of hydrogen, halogen, hydroxy and alkyl having 1–6 carbon atoms; R_2 is selected from hydrogen and halogen and *n* is 1 or 2, and in which the symbols R_1 may have different meanings in each radical $-(CHR_1)-$ when *n* is 2; and the pharmaceutically acceptable acid addition salts thereof.

4,051,142

1-ARYL-4-PYRIDONES

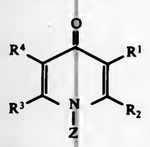
Glenn R. Carlson, North Wales, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 24, 1976, Ser. No. 689,219

Int. Cl.² C07D *213/57, 213/56, 213/55*

U.S. Cl. 260—294.9 **11 Claims**

1. A compound of the formula



wherein

R^1 is a carboxy group or an agronomically-acceptable salt thereof, a carb(C_1-C_4)alkoxy group, a carbamoyl group, a (C_1-C_4)alkyl or di(C_1-C_4)-alkyl carbamoyl group, or a cyano group,

R^2 is a (C_1-C_4)alkyl group,

R^3 is a hydrogen atomm or a (C_1-c_4)alkyl group,

R^4 is a hydrogen atom, a (C_1-C_4)alkyl group, or a halogen atom, and

Z is a substituted phenyl group having up to three substituents selected from halogen atoms, (C_1-C_4)alkyl groups, (C_1-C_4)alkoxy groups, trifluoromethyl groups, and nitro groups, or, when R^3 is a hydrogen atom, additionally an unsubstituted phenyl group.

4,051,143

PROCESS FOR THE PRODUCTION OF α-[2-(p-CHLOROPHENOXY)-ISOBUTYRYL]-β-NICOTINOYL GLYCOL ESTER

Arthur Scherm, Bad Homburg, and Dezsö Peteri, Hammersbach, Marköbel, both of Germany, assignors to Merz & Co., Germany

Continuation of Ser. No. 610,185, Sept. 4, 1975, abandoned. This application Dec. 15, 1976, Ser. No. 750,594

Claims priority, application United Kingdom, Sept. 5, 1974, 38778/74

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 R **7 Claims**

1. A process for the production of α-[2-(p-chlorophenoxy)-isobutyryl]-β-nicotinoyl glycol ester in high yields which consists essentially of reacting [2-(p-chlorophenoxy)-isobutyryl]-β-chloroethyl ester with an alkali metal salt of nicotinic acid in a polar or dipolar aprotic solvent having a boiling point between about 100° C. and 200° C.

4,051,144

SINISTER-3,5-DISUBSTITUTED OXOZOLIDINES THEIR PREPARATION AND USE

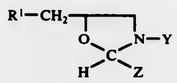
Leonard M. Weinstock, Belle Mead; Roger J. Tull, Metuchen, and Dennis M. Mulvey, Whitehouse, all of N.J., assignors to Charles E. Frosst & Co., Kirkland, Canada

Continuation of Ser. No. 283,875, Aug. 25, 1972, abandoned, which is a division of Ser. No. 172,234, Aug. 16, 1972, Pat. No. 3,718,647, which is a division of Ser. No. 818,474, April 21, 1969, Pat. No. 3,657,237. This application Dec. 4, 1974, Ser. No. 529,314

Int. Cl.² C07D *263/04*

U.S. Cl. 260—307 FA **17 Claims**

1. An optically active oxazolidine in the sinister configuration having the structure:



wherein R^1 is hydroxy or R^3O— wherein R^3 is $C_{1\text{-}16}$ alkylsulfonyl, benzenesulfonyl optionally having substituents selected from the group consisting of

a. an amino group,
b. 1–3 bromo groups,
c. 1–3 chloro groups,
d. a chloro and a nitro group,
e. a fluoro group,
f. a methoxy group,
g. 1–3 methyl groups and
h. a nitro group;

Z is hydrogen, benzyl, C_1-C_3 alkyl, phenyl optionally having substituents selected from the group consisting of

a. 1–3- bromo groups,
b. 1–3 chloro groups,
c. 1–3 methyl groups,
d. a methoxy group and
e. 1–3 hydroxy groups,

or Z can be furfuryl; and Y is a straight or branched chain C_1-C_5 alkyl or hydroxy substituted straight or branched chain C_1-C_5 alkyl.

4,051,145

FLUORINATED INDAZOLE DERIVATIVES AND A PROCESS FOR THEIR PREPARATION

Victor Marie Dupré, Louvres; Jacques Pierre Edmond Pechméze, Paris, and Robert Frédéric Michel Sureau, Enghien les Bains, France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Mar. 26, 1975, Ser. No. 562,062

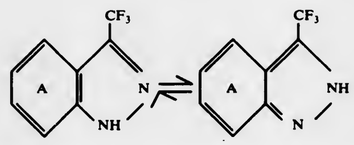
Claims priority, application France, Mar. 29, 1974, a74.11262

Int. Cl.² C07D *231/56*

U.S. Cl. 548—372 **6 Claims**

1. Compound of the formula:

(I)



in which the nucleus A is unsubstituted or substituted by one or two nitro, amino, alkyl, alkoxy, chlorine or bromine and the alkyl and alkoxy each contain up to two carbon atoms.

4,051,146

CONDITIONING OF PERHALOGENO-COPPER PHTHALOCYANINES

Diether Wessling, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 14, 1975, Ser. No. 621,801

Claims priority, application Germany, Oct. 16, 1974, 2449231

Int. Cl.² C09B *47/04*

U.S. Cl. 260—314.5 **2 Claims**

1. Process for conditioning perhalogeno-copper phthalocyanines, characterized in that the melts obtained on halogenation of copper phthalocyanine in the presence of aluminum chloride are poured into cold water, an organic solvent selected from the group consisting of liquid benzene derivatives unsubstituted or substituted by halogen atoms, lower alkyl groups or nitro groups is added to the mixture, the whole is heated without intermediate isolation for 3 to 8 hours to temperatures between 90 and 150° C, the organic solvent is driven off in steam, the residue is filtered and the material on the filter is washed until free from salt, dried and ground.

4,051,147

1-(ARYLAMINO)-AND 1-(ARYLIMINO)-PYRROLES

Robert E. Johnson, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

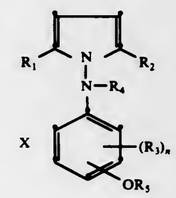
Continuation-in-part of Ser. No. 372,324, June 21, 1973, abandoned. This application June 9, 1975, Ser. No. 585,448

Claims priority, application United Kingdom, June 10, 1974, 25599/74

Int. Cl.² C07D *207/50*

U.S. Cl. 260—326.47 **12 Claims**

1. A compound having the formula:



where R_1 and R_2 are each hydrogen or each lower-alkyl, or R_1 is hydrogen and R_2 is carboxyl; R_3 is hydrogen, hydroxy, benzyloxy, halo, azido, amino, di-lower-alkylamino or lower-alkyl; R_4 is hydrogen, lower-alkanoyl, benzoyl or lower-alkyl; X represents either a benzenoid nucleus fused to the phenyl ring at the positions indicated, or it represents two hydrogen atoms or one hydrogen atom and one of the groups R_3, or two of the groups R_3; R_5 is hydrogen, lower-alkyl, lower-alkanoyl, benzoyl or benzyl; and *n* is one of the integers 1 and 2, and where the phenyl ring of the groups R_4 and R_5 when benzoyl can be substituted by lower-alkyl, lower-alkoxy or from one to two halogens, and where halo or halogen, all occurrences, represents fluorine, chlorine or bromine, and lower-alkyl, lower-alkoxy and lower-alkanoyl, all occurrences, have from one to four carbon atoms.

4,051,148

6,11-DIHYDRODIBENZO-[b.e.]-THIEPIN-11-ONE-3-CARBOXALDEHYDE

Anthony Prince, Mountain View; Otto Halpern, and Jack Ackrell, both of Palo Alto, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed June 18, 1976, Ser. No. 697,648

Int. Cl.² C07D *337/12*

U.S. Cl. 260—327 B **1 Claim**

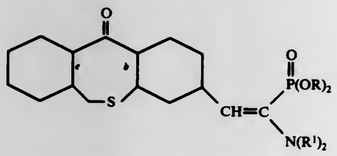
1. 6,11-dihydrodibenzo-[b.e.]-thiepin-11-one-3-carboxaldehyde.

4,051,149
6,11-DIHYDRODIBENZO-[b.e.]-THIEPIN-11-ONE-3-ACETONITRILE
Jack Ackrell, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed June 18, 1976, Ser. No. 697,651
Int. Cl.[2] C07D *337/12*
U.S. Cl. 260—327 B **1 Claim**

1. 6,11-Dihydrodibenzo-[b.e.]-thiepin-11-one-3-acetonitrile.

4,051,150
3-(2-DIALKYLAMINO-2-DIALKYLPHOSPHONYL-VINYL)-6,11-DIHYDRODIBENZO-[b.e.]-THIEPIN-11-ONE
Arthur F. Kluge, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed June 18, 1976, Ser. No. 697,652
Int. Cl.[2] C07D *337/12*
U.S. Cl. 260—327 B **2 Claims**

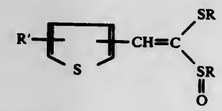
1. A compound of the formula:



wherein R and R^1 represent an alkyl radical containing from 1 to 4 carbon atoms.

4,051,151
THIOPHENE DERIVATIVES AND PROCESS FOR PREPARATION THEREOF
Genichi Tsuchihashi, Tama, and Katsuyuki Ogura, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan
Filed Jan. 21, 1976, Ser. No. 651,112
Claims priority, application Japan, Jan. 23, 1975, 50-9297; Jan. 27, 1975, 50-10520; Feb. 3, 1975, 50-13388; Nov. 25, 1975, 50-140249
Int. Cl.[2] C07D *333/00, 333/12;* A61K *31/43;* A01N *9/00*
U.S. Cl. 260—329 S **7 Claims**

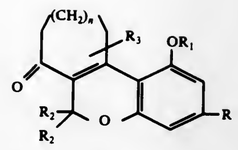
1. A compound of the formula



wherein R' represents a member selected from the group of hydrogen and alkyl and R represents a member selected from the group of (1) alkyl, (2) substituted alkyl wherein the substituent is halogen, hydroxy or alkoxy, (3) phenyl, and (4) substituted phenyl wherein the substituent is alkyl, alkoxy, aryl, nitro or halogen.

4,051,152
OXO C-RING BENZOPYRANS
Raj Kumar Razdan, Belmont; Haldean Cloyce Dalzell, Weston, both of Mass., and Patricia Herlihy, Dover, N.H., assignors to Sharps Associates, Cambridge, Mass.
Filed Jan. 7, 1976, Ser. No. 647,050
Int. Cl.[2] C07D *307/83, 311/80*
U.S. Cl. 260—345.3 **15 Claims**

1. A compound of the formula



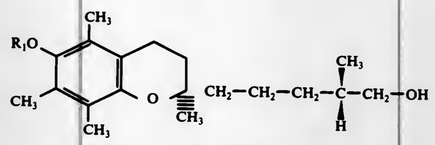
wherein *n* represents 0 or 1, R is an alkyl group having 1 to 20 carbon atoms, an aryl-lower group or a cycloalkyl-lower alkyl group, R_1 is hydrogen or



wherein R_4 is lower alkyl, phenyl, cycloalkyl-lower or aryl-lower alkyl, R_2 is a lower alkyl and R_3 is hydrogen or one or two lower alkyl groups.

4,051,153
INTERMEDIATES IN THE SYNTHESIS OF VITAMIN E
Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Continuation-in-part of Ser. No. 544,163, Jan. 27, 1975, abandoned. This application Dec. 9, 1975, Ser. No. 639,011
Int. Cl.[2] C07D *311/72*
U.S. Cl. 260—345.5 **2 Claims**

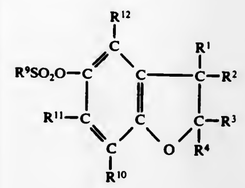
1. An optically active antipode of the formula:



wherein R_1 is benzyl, tetrahydropyranyl or t-butyl or its optically active antipode, said antipode being free of its other optically active antipode.

4,051,154
CERTAIN 2-SUBSTITUTED-2,3-DIHYDRO-5-BENZOFURANOL ESTERS OF CERTAIN SULFONIC ACIDS
Peter Stuart Gates, Cambridge; John Gillon, Great Shelford, and David Thomas Saggers, Saffron Walden, all of England, assignors to Fisons Limited, London, England
Continuation of Ser. No. 279,262, Aug. 9, 1972, Pat. No. 3,937,702, which is a continuation of Ser. No. 826,274, May 20, 1968, Pat. No. 3,689,507. This application May 6, 1975, Ser. No. 575,361
Claims priority, application United Kingdom, May 24, 1968, 24858/68; Feb. 8, 1969, 6951/69; Apr. 8, 1969, 17985/69
Int. Cl.[2] C07D *307/83*
U.S. Cl. 260—346.22 **12 Claims**

1. A compound of the formula



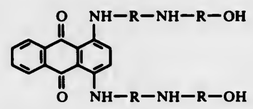
wherein

R^1, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen and alkyl of 1 to 6 carbon atoms,

R^4 represents a member selected from the group consisting of hydroxy, alkylthio of 1 to 4 carbon atoms, phenoxy, nitrophenoxy, halophenoxy, —OSO_2R^{14}, —$OCOR^{13}$, and —O—O—R^{15} wherein R^{13} is selected from the group consisting of alkyl of 1 - 4 carbon atoms, alkenyl of 2 - 4 carbon atoms, alkynyl of 2 - 4 carbon atoms, phenyl, chlorophenyl, tolyl, alkylamino of 1 - 4 carbon atoms, dialkylamino of 2 - 8 carbon atoms, alkoxy of 1 - 6 carbon atoms, phenoxy, phenylamino, chlorophenylamino, haloalkoxy of 1- 6 carbon atoms, methoxyethoxy, chlorophenoxy, alkenyloxy of 2 - 4 carbon atoms, chloroallyloxy, alkynyloxy of 2 - 4 carbon atoms and chlorobutynyloxy, R^{14} is selected from the group consisting of alkyl of 1 - 4 carbon atoms, haloalkyl of 1 - 4 carbon atoms, phenyl, chlorophenyl, nitrophenyl, and tolyl, and R^{15} is selected from the group consisting of alkyl of 1 - 4 carbon atoms, alkenyl of 2 - 4 carbon atoms and alkynyl of 2 - 4 carbon atoms, R^9 is selected from the group consisting of alkyl of 1 - 4 carbon atoms, chloromethyl, methoxypropyl, bromoethyl, phenyl, chlorophenyl and tolyl; and R^{10}, R^{11} and R^{12} are the same or different and are selected from the group consisting of hydrogen, alkyl of 1 - 4 carbon atoms, halogen, cyano, acetyl and alkoxy of 1 - 4 carbon atoms.

4,051,155
ANTHRAQUINONE DYES
Robert C. Hoare, Rabat, Morocco, assignor to Allied Chemical Corporation, Morris Township, N.J.
Filed Dec. 15, 1975, Ser. No. 640,677
Int. Cl.[2] C09B *1/50;* C07C *97/24*
U.S. Cl. 260—379 **2 Claims**

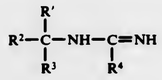
1. A compound having the formula



wherein R is alkylene of 1 to 4 carbon atoms.

4,051,156
N-(TRIARYL-METHYL)-AMIDINES, PROCESS FOR THE PREPARATION THEREOF AND COMPOSITIONS CONTAINING THE SAME
Lajos Guczoghy; Todor Pfliegel; Maria Puklics; Laszlo Institoris, and Jeno Seres, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt, Budapest, Hungary
Filed July 5, 1973, Ser. No. 376,445
Claims priority, application Hungary, July 5, 1972, 1250
Int. Cl.[2] C09B *11/10*
U.S. Cl. 260—393 **8 Claims**

1. An amidine derivative of the formula:



wherein

R', R^2, and R^3 are identical or different aryl groups; and

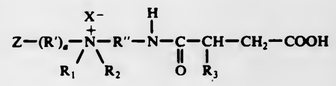
R^4 is alkyl, aralkyl or aryl.

4,051,157
CATALYTIC ALLYLIC ALKYLATION
Barry M. Trost, and Thomas R. Verhoeven, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.
Filed Jan. 5, 1976, Ser. No. 646,640
Int. Cl.[2] C07J *9/00*
U.S. Cl. 260—397.1 **15 Claims**

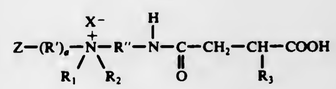
1. The method in which an organic substrate having an OR group attached through the oxygen group to a carbon alpha to a double bond carbon in which OR is hydroxy, ether or ester group, comprising the displacement of the carbon-oxygen bond which is alpha to the double bond carbon and which connects to the oxygen group, with stereochemical control for retention of configuration by reacting the substrate with a nucleophile in the presence of a palladium (Pd^o) catalyst, in which the nucleophile is selected from the group consisting of a carbon nucleophile in the form of carbanions stabilized with at least two stabilizing groups and a nitrogen nucleophile in which the carbanion is replaced with corresponding nitrogen compounds.

4,051,158
MONOMERIC EMULSION STABILIZERS DERIVED FROM ALKYL/ALKENYL SUCCINIC ANHYDRIDE
Carlos M. Samour, Wellesley, and Mildred C. Richards, Wakefield, both of Mass., assignors to The Kendall Company, Boston, Mass.
Division of Ser. No. 476,950, June 6, 1974, Pat. No. 3,959,355, which is a division of Ser. No. 309,038, Nov. 24, 1972, Pat. No. 3,839,419, which is a division of Ser. No. 40,718, May 26, 1970, Pat. No. 3,751,451, which is a continuation-in-part of Ser. No. 867,900, Oct. 20, 1969, abandoned. This application Dec. 11, 1975, Ser. No. 640,110
Int. Cl.[2] C07C *101/24*
U.S. Cl. 260—404.5 **7 Claims**

1. A compound having the formula



or



wherein

Z is an ethylenically unsaturated radical selected from the group consisting of acryloyloxy, methacryloyloxy, acrylamido, methacrylamido, vinyloxy, allyloxy, methallyloxy, vinylacetoxy, allylacetoxy, methallylacetoxy, 4-hydroxymaleoyloxy, 4-hydroxyfumaroyloxy, 4-hydroxymaleoylamino, 4-hydroxyfumaroylamino, 4-hydroxycitraconyloxy, 4-hydroxycitraconylamino, 4-hydroxyitaconyloxy or 4-hydroxyitaconylamino;

R' and R'' are independently selected from the group of ethylene, propylene, isopropylene, 2-hydroxypropylene, acetoxypropylene or —O—CH_2—CHR_4(O—CH_2—CHR_4)$_a$ where *n* is zero to 4; *a* = 0 or 1, and R_4 is hydrogen or methyl with the proviso that *a* is zero where Z is vinylacetoxy, allylacetoxy, or methallylacetoxy and *a* is 1 otherwise;

R_1 and R_2 are independently selected from the group consisting of alkyl having 1 to 7 carbon atoms, hydroxyalkyl having 1 to 7 carbon atoms, benzyl, R_3—O—CO—CH_2— and R_5—NH—CO—CH_2— where R_5 is hydrogen or alkyl having 1 to 4 carbon atoms;

R_3 is lipophilic aliphatic hydrocarbon group having from about 7 to about 28 carbon atoms; and

X⁻ is halide, alkyl sulfate wherein the alkyl moiety has 1 to 4 carbon atoms, or toluene sulfonate.

4,051,159
TRANSPARENT FRAGRANCE RELEASING COMPOSITION AND METHOD OF MAKING SAME

Michael Tsoucalas, Bergenfield; Kenneth W. Barclay, Mahwah, and Jack M. Rogers, Fairlawn, all of N.J., assignors to Avon Products, Inc., New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,204
Int. Cl.² C09F 5/00; A24F 25/00; A61K 7/46
U.S. Cl. 260—404.5 **16 Claims**

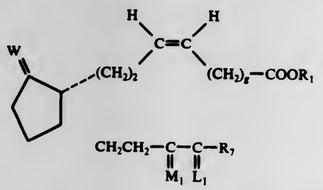
1. A shaped, self-supporting transparent article capable of emitting a fragrance over a sustained period comprising a substantially homogeneous mixture of from about 40 to 60% by weight of a polyamide resin formed from a polymerized fatty carboxylic acid and a polyamine, from about 35 to 55 percent by weight of a C_{14}–C_{22} straight or branch chain alkyl alcohol and from about 5 to 20 percent by weight of a fragrance material.

4,051,160
CIS-4,5-DIDEHYDRO-11-DEOXY-13,14-DIHYDRO-PG COMPOUNDS

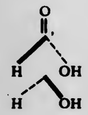
Gordon L. Bundy, Kalamazoo, and Norman A. Nelson, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 548,586, Feb. 10, 1975, Pat. No. 3,987,072. This application Jan. 12, 1976, Ser. No. 648,268
Int. Cl.² C07C 177/00
U.S. Cl. 260—413 **40 Claims**

1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof;
wherein W is



wherein g is 2 to 4, inclusive;
wherein L_1 is



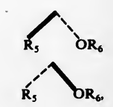
or



or a mixture of

and

wherein R_3 and R_4 are hydrogen or methyl, being the same or different,
wherein M_1 is



or

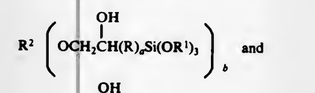
wherein R_5 and R_6 are hydrogen or methyl, with the proviso that R_5 is methyl only when R_6 is hydrogen and R_6 is methyl only when R_5 is hydrogen;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable cation; and
wherein R_7 is $—(CH_2)_m—CH_3$, wherein m is one to 5, inclusive.

4,051,161
ULTRAVIOLET SCREENING AGENTS AND COATING MATERIALS CONTAINING ORGANOSILANE ESTER GROUPS

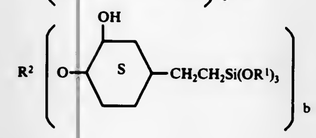
Stephen Proskow, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 289,459, Sept. 15, 1972, abandoned. This application May 8, 1975, Ser. No. 575,795
Int. Cl.² C07F 7/08, 7/18
U.S. Cl. 260—448.8 R **11 Claims**

1. A compound of one of the formulas



and

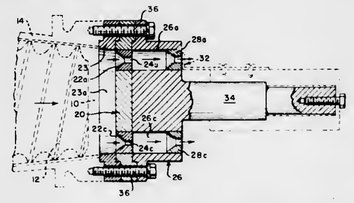


wherein
R is a divalent hydrocarbon or hydrocarbon ether radial of up to 10 carbons;
R^1 is an aliphatic hydrocarbon radical of less than 5 carbon atoms, an acyl radical of less than 5 carbon atoms, or a radical of the formula $(CH_2CH_2O)_nZ$ in which n is an integer of 1 to 8 and Z is an aliphatic hydrocarbon radical of less than 5 carbon atoms;
R^2 is a stable, monovalent or divalent carbocyclic hydroxy-aromatic radical, containing up to 4 aromatic rings joined to oxygen through an aromatic carbon, of the type which absorbs light in the region of 2500–4000 A in an amount effective for stabilizing polymers against ultraviolet light;
a is 0 or 1; and
b is 1 or 2.

4,051,162
METHOD OF MAKING PUFFED DOUGH PIECES OF VARYING CONFIGURATION

Larry Edward Rose, Battle Creek, and Norman Francis Lawrence, Hickory Corners, both of Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 429,305, Dec. 28, 1973, abandoned. This application June 30, 1975, Ser. No. 591,575
Int. Cl.² A23L 1/18
U.S. Cl. 426—448 **3 Claims**



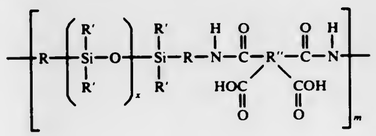
1. A method of making puffed dough pieces of varying configuration from one cooker-expander extrusion operation which produces gelantinized cereal dough comprising forcing cereal dough through a series of confined zones under high pressure and heat to an unconfined zone of lower pressure, said confined zones including a final extrusion zone and modulating backup zones, said extrusion zone having a plurality of restricted openings of varying cross-section and shape, said backup zones having a plurality of holding areas of varying size and configuration wherein the flow characteristics of said holding areas are correlated to the flow characteristics of the corresponding restricted openings in order to modulate the linear flow of the dough past the various restricted openings to the same rate, extruding said dough through said extrusion zone and modulating backup zones into said unconfined zone wherein the dough undergoes puffing, and subdividing the extruded dough into pieces.

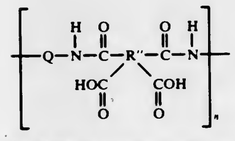
4,051,163
POLYIMIDE CONTAINING SILICONES

Abe Berger, 1504 Barclay Place, Schenectady, N.Y. 12309

Division of Ser. No. 597,971, July 21, 1975, Pat. No. 4,030,948. This application Mar. 18, 1977, Ser. No. 779,072
Int. Cl.² C07F 7/10
U.S. Cl. 260—448.2 N **5 Claims**

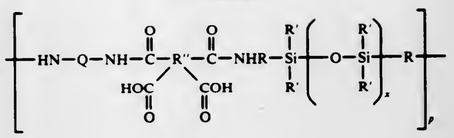
1. A reaction product of a tetracarboxylic acid dianhydride, an organic diamine and a di(aminoalkyl) polysiloxane which is a copolymer having recurring structural units of a block copolymer of the formulas :





and a random polymer of the formula:

-continued



wherein:
R is a divalent hydrocarbon radical;
R′ is a monovalent hydrocarbon radical;
R″ is a tetravalent organic radical;
Q is a divalent organic radical which is a residue of an organic diamine
x is an integer having a value of from 1 to 10;
m is an integer greater than 1, and
n is an integer greater than 1.
p is an integer greater than or equal to 0.
and the recurring units designated by m, n, and p are such that the mole percent of silicone diamine in the total polymer constitutes 18 to 45 mole percent of the total diamines in the copolymer.

4,051,164
ENOL ESTER OF α-DIKETONES

Jo-Fen Tung Kung, North Bergen, N.J., and Martin Franklin Epstein, Pearl River, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 550,102, Feb. 14, 1975, abandoned, which is a division of Ser. No. 453,222, March 21, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,952
Int. Cl.² C07F 7/18
U.S. Cl. 260—448.8 R **2 Claims**

2. The trimethylsilyl ether of the enol of pentane-2,3-dione.

4,051,165
PREPARATION OF BIURET POLYISOCYANATES

Kuno Wagner, Leverkusen, and Kurt Klinkmann, Hitdorf, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 17, 1970, Ser. No. 47,134
Claims priority, application Germany, June 19, 1969, 1931055
Int. Cl.² C07C 119/042
U.S. Cl. 260—453 AB **10 Claims**

1. A process for the preparation of biuret polyisocyanates which comprises reacting at a temperature of from about 60° C to about 210° C diisocyanates and up to about 0.4 mol per mol of diisocyanate of a tertiary alcohol selected from the group consisting of tertiary butyl alcohol, 2-methyl-2-butanol, 2-methyl-2-pentanol, 3-mehtyl-3-pentanol, 3-ethyl-3-pentanol, 1-methyl cyclo-pentanol, 1-methylcyclohexanol, 1-ethylcyclohexanol and 1,1-dimethylallyl alcohol in the presence of from about 0.001 to about 0.1 mol per mol of tertiary alcohol of a catalyst selected from the group consisting of hydrochlorides of ammonia and aliphatic, cycloaliphatic, araliphatic, aromatic and heterocyclic nitrogen containing bases wherein the nitrogen atoms of said bases are primary secondary or tertiary.

4,051,166
ARALIPHATIC DIISOCYANATES

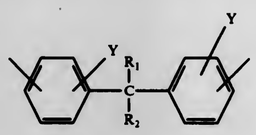
Reinhard H. Richter, North Haven; Benjamin W. Tucker, Bethany, and Henri Ulrich, Northford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed June 8, 1976, Ser. No. 693,793
Int. Cl.² C07C 119/048
U.S. Cl. 260—453 AR **9 Claims**

1. An araliphatic diisocyanate having the formula

$$OCN(CH_2)_3OArX(CH_2)_3NCO$$

wherein X is oxygen or a single bond and Ar is an arylene radical selected from the group consisting of phenylene, tolylene, naphthylene, diphenylylene, and radicals having the formula



wherein R_1 and R_2 each represent a moiety selected from the class consisting of hydrogen and alkyl having from 1 to 4 carbon atoms inclusive, and Y is selected from the group consisting of hydrogen, alkyl from 1 to 4 carbon atoms, and alkoxy from 1 to 4 carbon atoms.

4,051,167

ALPHA HALO SUBSTITUTED PEROXYESTERS AND THEIR USE AS POLYMERIZATION INITIATORS

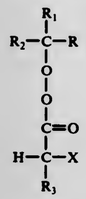
Roger N. Lewis, Martinez, Calif., assignor to Argus Chemical Corporation, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 532,966, Dec. 16, 1974, abandoned. This application Dec. 19, 1975, Ser. No. 642,432

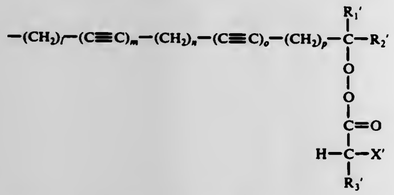
Int. Cl.² C07C *179/18*; C08L *67/06*

U.S. Cl. 260—453 RZ **16 Claims**

1. An organic peroxide of the formula:



wherein each of R_1 and R_2 are alkyl of up to about 7 carbon atoms, X is selected from bromine and chlorine, R_3 is alkyl of up to about 18 carbon atoms provided that R_3 is not methyl when R is alkyl, and R is selected from alkyl of up to about 7 carbon atoms and



in which *l, m, n, o,* and *p* are integers from 0–5 provided the sum of *l, m, n, o,* and *p* is at least 1, and R_1', R_2' and R_3' are each the same as R_1, R_2 and R_3, respectively.

4,051,168

FLUORINATION PROCESS

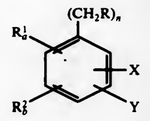
Andrew Edward Feiring, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 12, 1976, Ser. No. 685,805

Int. Cl.² C07C *143/24, 17/14*

U.S. Cl. 260—456 R **26 Claims**

1. The fluorination process which consists essentially in reacting under substantially anhydrous conditions one mode of an aromatic compound of the formula



wherein

n is 1 to 3;

a and *b* are each 0 or 1 with the proviso that *n* is at least 1 and the sum of *n, a* and *b* does not exceed 3;

R is H, alkyl of 1-3 carbons or Z in which Z is F, Cl, Br or I;

R^{21} and R^2 are H or phenyl or together are 1,2-phthaloyl;

X and Y are H, NO_2, COOH, CHO, $CONH_2$, $COOR^3$, COR_3, SO_3H, CF_3, CN, SO_2OR^3, $SO_2NR_2^3$, F, Cl, Br or I with the proviso that only one of X and Y can be H, F, Cl, Br or I; and

R^3 is alkyl of 1–4 carbons or phenyl;

with at least three moles of HF and at least one mole of a metal oxide selected from the group consisting of lead dioxide and nickel dioxide at a temperature range of about −30° to about +80° C for about 10 minutes to about 22 hours with the proviso that when nickel dioxide is used it is the last reactant added, and recovering an aromatic compound having a mono- or di-fluorinated benzylic carbon compound.

4,051,169

AMINO ACID ESTERS

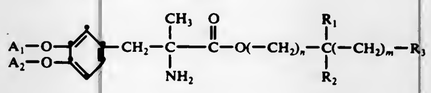
Walfred S. Saari, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 482,102, June 25, 1974, Pat. No. 3,983,138, which is a continuation-in-part of Ser. No. 400,609, Sept. 25, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,834

Int. Cl.² C07C *101/77, 103/84, 153/07*

U.S. Cl. 560—40 **22 Claims**

1. A compound of the formula



wherein

n is 0, 1, 2 or 3;

m is 0, 1, 2 or 3;

A_1 and A_2 are individually H or a lower alkanoyl

P_1 and R_2 are individually H or alkyl of 1 to 3 carbon atoms and;

R_3 is the radical X—R_4

wherein

X is —O—, —S— or —NH— and

R_4 contains up to 21 carbon atoms and is (1) a hydrocarbon radical or (2) an acyl radical of an organic acyclic or non-heterocyclic, monocyclic carboxylic acid

or a pharmaceutically acceptable acid addition salt thereof.

4,051,170

DIPHENOXYACETIC ACID DERIVATIVES

Erich Schacht; Werner Mehrhof; Zdenek Simane; Detlev Kayser, and Herbert Nowak, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

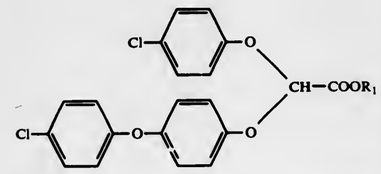
Filed Dec. 11, 1974, Ser. No. 531,475

Claims priority, application Germany, Dec. 15, 1973, 2362416

Int. Cl.² C07G *69/76*

U.S. Cl. 560—62 **5 Claims**

1. A compound of the formula



wherein R_1 is H or alkyl of 1–4 carbon atoms, or when R_1 is H, a physiologically acceptable salt thereof.

4,051,171

VINYLBENZYL ESTERS OF N-BOC-AMINO ACIDS

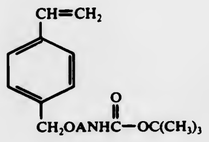
Nicholas D. Harris, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Feb. 20, 1976, Ser. No. 659,967

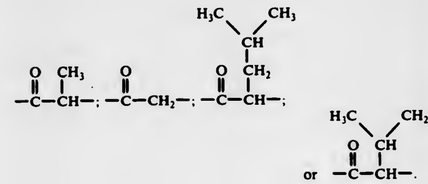
Int. Cl.² C07C *125/06*

U.S. Cl. 560—157 **5 Claims**

5. A compound of the formula:



wherein A is



4,051,172

MOLYBDENUM AND TUNGSTEN COMPOUNDS, THEIR MANUFACTURE AND THEIR USE AS CATALYSTS IN THE STEREOSPECIFIC POLYMERIZATION OF UNSATURATED ORGANIC COMPOUNDS

Francois Dawans, Bougival, and Emmanuel Goldenberg, Poissy, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Division of Ser. No. 429,209, Dec. 28, 1973, Pat. No. 3,931,242, which is a continuation-in-part of Ser. No. 215,425, Jan. 4, 1972, abandoned. This application Jan. 9, 1975, Ser. No. 539,825

Claims priority, application France, Jan. 18, 1971, 71.00583; Jan. 18, 1971, 71.00584

Int. Cl.² C07C *69/54*

U.S. Cl. 526—90 **17 Claims**

1. A process for polymerizing at least one monomer selected from the group consisting of straight-chain and cyclic ethylenic unsaturated organic compounds of 2 to 8 carbon atoms, comprising contacting, at a temperature of from − 20° to 100° C, said at least one monomer substantially in the liquid phase with a catalytic amount of at least one compound of the general formula $(H_{3-n}X_n)$ C-$CO_2M(CO)_m(R)_p(L)_q$ in which each X is fluorine, bromine or chlorine with the provision that at least one X is fluorine, *n* is an integer selected from 1, 2 and 3, M is a metal selected from the group consisting of molybdenum and tungsten, R is selected from the group consisting of a hydride ion, or a methyl, ethyl, allyl, methallyl, crotyl, phenyl or benzyl radical, L is a Lewis base selected from the group consisting of aliphatic mono-, di- and tri-ethers, heterocyclic mono- and diethers, aliphatic monoether-monoalcohols, and aliphatic mono- and diketones, *m* is an integer from 1 to 3 inclusive, *p* is 1 and *q* is an integer selected from the values 1 to 2, with the proviso that the values of *m, p,* and *q* are such that, in the valence shell of said metal M, the sum of the number of electrons contributed by said metal M and the number of electrons contributed by the ligands is 18.

4,051,173

PHENOXYALKANOL DERIVATIVES

Erich Schacht; Werner Mehrhof; Zdenek Simane, and Herbert Nowak, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Continuation of Ser. No. 564,474, April 2, 1975, abandoned. This application June 9, 1976, Ser. No. 694,447

Claims priority, application Germany, Apr. 2, 1974, 2415867

Int. Cl.² C07C *69/06, 43/20*

U.S. Cl. 560—255 **11 Claims**

1. A compound selected from the group consisting of 2-[4-(4-chloro-phenoxy)-phenoxy]-propanol, 2-[4-(4-chlorophenoxymethyl)-phenoxy]-2-methyl-propanol, 2-[4-(4-chlorophenoxy)-phenoxy]-2-phenyl-propanol, 2-(4-biphenylyloxy)-2-phenyl-ethanol, 2-(4-biphenylyloxy)-2-phenyl-propanol, 2-(4'-chloro-4-biphenylyloxy)-2-phenyl-propanol, 2-(4-biphenylyloxy)-2-phenyl-ethyl acetate, 2-[4-(4-chlorophenoxy)-phenoxy]-propyl acetate, 2-[4-(4-fluorophenoxymethyl)-phenoxy]-2-methyl-propanol, and 2-[4-(4-chlorophenoxymethyl)-phenoxy]-propanol.

4,051,174

ISOMERIZATION PROCESS

Hansjorg Stoller, Reinach, and Hans Peter Wagner, Itingen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 16, 1974, Ser. No. 498,161

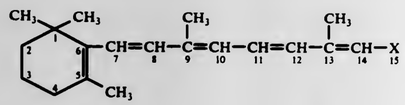
Claims priority, application Switzerland, Aug. 21, 1973, 11994/73; July 3, 1974, 9101/74; July 18, 1974, 9879/74

Int. Cl.² C07C *67/00, 45/00, 41/00, 29/00*

U.S. Cl. 560—234 **15 Claims**

1. A process for geometrically isomerizing an isomeric com-

position selected from the group consisting of 9-cis and 11-cis isomers of a compound of the formula:



wherein X is



—$COOR_2$, —$CONHR_3$ or —$CON(R_3)_2$; R is lower alkoxy or the two R's taken together form lower alkylenedioxy; R_1 is alkanoyl or aroyl; R_2 is alkyl, aryl or aralkyl; and R_3 is hydroxy, alkyl, aryl or aralkyl; mixtures thereof, or mixtures thereof with the all trans isomer of said compound comprising contacting at a temperature of from 0° C to 250° C, said composition in an inert solvent medium with a palladium compound catalyst where the palladium compound is other than palladium phthalocyanin or other than a palladium compound containing a cyanide ion and producing a geometric isomeric mixture of said composition from which the all trans isomer can be separated therefrom in pure form by crystallization.

5. The process of claim 1, wherein the mixture contains from about 0% to about 15% by weight of 9-cis vitamin A acetate and from about 20% to about 40% by weight 11-cis vitamin A acetate and from about 40% to about 70% by weight all-tras vitamin A acetate based on the total weight of vitamin A acetate.

4,051,175

PHOSPHONOPHENYLAMINONAPHTHALENE COMPOUNDS

Herbert Francis Andrew; Cecil Vivian Stead, and Ronald Thompson, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

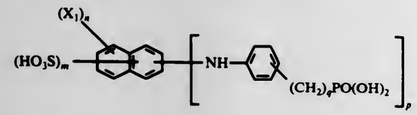
Filed Apr. 30, 1976, Ser. No. 682,047

Claims priority, application United Kingdom, May 16, 1975, 20848/75

Int. Cl.² C07F *9/38*; C09B *29/00*

U.S. Cl. 260—502.5 **5 Claims**

1. A naphthalene compound of the formula



wherein

m is 0, 1 or 2

n is 0 or can be 1 if *m* is 1 or 2 in which case X_1 is OH or NH_2 in *m* position to a SO_3H group,

p is 1 or 2,

q is 0 or 1 and

the benzene ring can be further substituted by OCH_3 or CH_3.

4,051,176

UREIDOPHENYLENEBIS(CARBONYLIMINO)DINAPHTHALENETRISULFONIC ACID COMPOUNDS

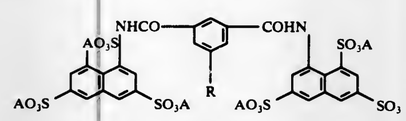
Seymour Bernstein, New City, N.Y.; Robert Herman Lenhard, Paramus, N.J., and Ransom Brown Conrow, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 10, 1976, Ser. No. 684,690

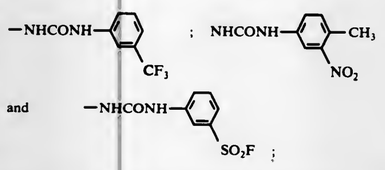
Int. Cl.² C07C *143/30*; A61K *31/185*

U.S. Cl. 260—506 **9 Claims**

1. A compound selected from those of the formula



wherein R is selected from the group consisting of



and A is hydrogen, alkali metal or alkaline earth metal, with the proviso that each A is identical in the same compound.

4,051,177

PROCESS FOR THE PREPARATION OF UNSATURATED AMINO COMPOUNDS

Rudolf Braden, Odenthal-Scheuren; Hans Knupfer, Schildgen, and Heinz Ziemann, Leichlingen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 12, 1974, Ser. No. 532,185

Claims priority, application Germany, Dec. 18, 1973, 2362780

Int. Cl.² C07C *143/56, 85/11, 101/46*; C07D *209/34*

U.S. Cl. 260—510 **6 Claims**

1. Process for the slective catalytic reduction of the nitro group of aromatic nitro compounds containing at least one non-aromatic C—C double or triple bond comprising hydrogenating said aromatic nitro compounds at 20° C to 140° C and at 5 to 150 bars of hydrogen pressure in the presence of a cobalt sulfide catalyst to produce the corresponding aromatic amino compounds which additionally still contain C—C multiple bonds by reduction of said nitro groups.

4,051,178

PROCESS FOR PRODUCING TEREPHTHALIC ACID

Tsuneo Kimura; Hiroshi Hashizume, and Yoshiaki Izumisawa, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed June 9, 1976, Ser. No. 694,361

Claims priority, application Japan, June 25, 1975, 50-79279

Int. Cl.² C07C *51/42*

U.S. Cl. 260—524 R **7 Claims**

1. In a process for the production of terephthalic acid comprising oxidizing p-xylene in an acetic acid solvent with an oxygen-containing gas in the presence of a catalyst, the improvement which comprises the reaction temperature being from 205° C to 225° C, and said catalyst consisting essentially of

a. a cobalt compound containing 200 to 600 parts of cobalt per million parts of said solvent,

b. a manganese compound containing 0.5 to 1.5 times the weight of said cobalt of manganese, and

c. a bromine compound taken from the class consisting of hydrogen bromide, manganese bromide, and cobalt bromide, said bromine compound comprising 400 to 2000 parts of bromine per million parts of said solvent.

4,051,179

CATALYTIC PROCESS FOR THE PREPARATION OF UNSATURATED CARBOXYLIC ACID

Hiroshi Sonobe, Otake; Masaaki Kato, Yamaguchi; Hideo Matsuzawa, Otake; Hiromichi Ishii, Otake, and Masao Kobayashi, Otake, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1976, Ser. No. 667,677

Claims priority, application Japan, Apr. 3, 1975, 50-40660

Int. Cl.² C07C *51/32*

U.S. Cl. 260—530 N **10 Claims**

1. A process for the preparation of unsaturated carboxylic acids, which comprises catalytically oxidizing acrolein, methacrolein or mixtures thereof in the gas phase at a temperature of 240° to 390° C with molecular oxygen to form the corresponding unsaturated carboxylic acid in the presence of a catalyst having the composition

$$P_a Mo_b As_c X_d Y_e Z_f O_g$$

wherein *a, b, c, d, e, f* and *g* represent the atomic ratios of each component and *a* is within the range of 0.03 to 0.2, *b* is 1, *c* is within the range of 0.015 to 0.15, *d* is within the range of 0.003 to 1, *e* is within the range of 0.003 to 0.417, *f* is within the range of 0.003 to 1, and *g* is a value determined by the degree of oxidation of the elements present in the catalyst, and wherein X is copper, vanadium, or a mixture thereof, Y is at least one alkali metal selected from the group consisting of lithium, sodium, potassium rubidium and cesium, and Z is at least one metal selected from the group consisting of magnesium, aluminum, calcium, titanium, zirconium, silver, antimony, tellurium, barium, tantalum and silicon.

4,051,180

PREPARATION OF ACRYLIC ACID AND METHACRYLIC ACID

Wilfrid G. Shaw, Lyndhurst, and David B. Terrill, Bedford Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 2, 1976, Ser. No. 646,224

Int. Cl.² C07C *51/32*

U.S. Cl. 260—530 N **4 Claims**

1. The process for the production of acrylic acid or methacrylic acid by the oxidation of acrolein or methacrolein, respectively, in the vapor phase with molecular oxygen in the presence of steam, at a temperature of about 200° to about 500° C employing a catalyst having the empirical formula:

$$Mo_a V_b Cu_c X_d O_e$$

wherein X in the formula is an element selected from the group consisting of antimony and the combination of antimony and germanium, and wherein

a is a number from 6 to about 18;

b, c and *d* each are about 0.1 to about 6; and

e is the number of oxygens required to satisfy the valence requirements of the other elements present.

4,051,181

OXIDATION OF ALLYL ALCOHOL TO ACRYLIC ACID

Jawad H. Murib, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,907

Int. Cl.² C07C *45/16, 51/32*

U.S. Cl. 260—531 R **8 Claims**

1. A vapor phase process which comprises oxidizing allyl alcohol by reacting the allyl alcohol with an oxygen containing gas in the presence of a supported two-metal catalyst at a temperature of 125°–320° C., wherein one metal is palladium and the second metal is copper or silver, and recovering a gaseous reaction product mixture containing acrolein and acrylic acid.

4,051,182

PROCESS FOR THE MANUFACTURE OF α-CHLOROPROPIONYL CHLORIDE

Harold M. Pitt, Lafayette, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 12, 1976, Ser. No. 676,022

Int. Cl.² C07C *51/58*

U.S. Cl. 260—544 Y **24 Claims**

1. A process for the manufacture of α-chloropropionyl chloride comprising the steps of

a. reacting 1,2-dichloropropane in the liquid phase at a temperature in the range of from about 25° C to 90° C with gaseous chlorine in the presence of a catalyst selected from the group consisting of ferric chloride, aluminum chloride, iodine, sulfur, iron, iron in the presence of ultraviolet light and mixtures thereof, to form 1,1,2-trichloropropane, and separating the product 1,1,2-trichloropropane;

b. reacting the 1,1,2-trichloropropane of step (a) with a base selected from aqueous or alcohol solutions of sodium and/or potassium hydroxides, alkaline earth metal hydroxides and sodium carbonate in the liquid phase or in the gaseous phase in the presence of a hydrogen chloride removing catalyst at a temperature in the range of from about 60° C to 110° C, and separating the product 1,1-dichloropropene-1; and

c. reacting the 1,1-dichloropropene-1 of step (b) in the liquid phase at a temperature in the range of from about 24° C to about 100° C with oxygen in the presence of chlorine or bromine and an activating agent for the chlorine or bromine and further in the presence of a lower alkyl-primary- or -secondary-amide and recovering the produced α-chloropropionyl chloride.

4,051,183

1-BENZOYL-3-(1,2,3,4-TETRAHYDRO-4-OXO-1-NAPHTHYL)-UREA, A NOVEL AND USEFUL INTERMEDIATE FOR THE PREPARATION OF ANIMAL GROWTH PROMOTING AGENTS

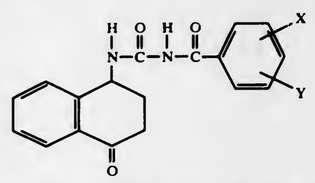
Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sept. 2, 1976, Ser. No. 720,164

Int. Cl.² C07C *127/19, 127/22*; A61K *31/17*

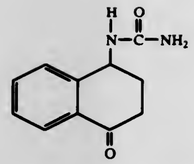
U.S. Cl. 260—553 A **6 Claims**

1. A compound of the formula:

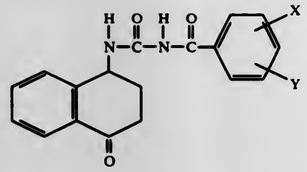


wherein X is selected from the group consisting of hydrogen, methyl, methoxy, chloro and nitro; Y is selected from the group consisting of hydrogen, chloro and nitro; and the racemic mixture and the optical isomers thereof.

5. A process for the preparation of a compound, racemic mixture and optical isomers thereof, of the formula:



which comprises hydrolyzing a compound of the formula:



wherein X is selected from the group consisting of hydrogen, methyl, methoxy, chloro and nitro; Y is selected from the group of consisting of hydrogen, chloro and nitro; and the racemic mixture and the optical isomers thereof.

4,051,184

N-(1,1 SUBSTITUTED PROPYNYL)-α-(3,5-SUBSTITUTED PHENOXY) ALKYL AMIDES AND THEIR USE AS HERBICIDES

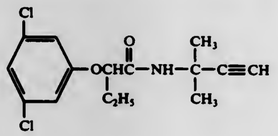
Duane R. Arneklev, Sunnyvale; Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 464,715, April 26, 1975, abandoned, which is a continuation of Ser. No. 353,871, April 23, 1973, abandoned, which is a continuation of Ser. No. 157,058, June 25, 1971, abandoned. This application Sept. 29, 1975, Ser. No. 617,454

Int. Cl.[2] C07C *103/178*

U.S. Cl. 260—559 B **2 Claims**

1. The compound N-(1,1-dimethyl propargyl-α-(3,5-dichlorphenoxy) butyramide having the structural formula



4,051,185

PROCESS FOR THE RECLAMATION OF ALKALI METAL ALKYLAMIDES

John Fraser Prescott, Sherwood Park, and Emerson Cecil Sanford, Edmonton, both of Canada, assignors to Atomic Energy of Canada Ltd., Canada

Division of Ser. No. 574,421, May 5, 1975, abandoned. This application Feb. 10, 1976, Ser. No. 656,839

Claims priority, application Canada, May 7, 1975, 199202

Int. Cl.[2] C07C *102/00*

U.S. Cl. 260—561 R **17 Claims**

1. A process for reclaiming alkali metal alkylamide systems in purified form which comprises:

adding ammonia to a solution in a primary alkylamine of an alkali metal alkylamide together with impurities, including N,N'-dialkylformamidine, and allowing reaction between the ammonia and said alkali metal alkylamide to occur;

separating the alkali metal amide so obtained from the solution; and

reacting said alkali metal amide with a primary alkylamine under conditions where NH_3 is removed to form alkali metal alkylamide free from said impurities.

4,051,186

AMINO-PROPRANOLOL

Nathan O. Kaplan, La Jolla, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 523,618, Nov. 13, 1974, abandoned, and a continuation-in-part of Ser. No. 481,282, June 20, 1974, Pat. No. 3,950,422. This application Jan. 28, 1976, Ser. No. 652,951

Int. Cl.[2] C07C *93/06*

U.S. Cl. 260—570.7 **1 Claim**

1. Amino-propranolol.

4,051,187

METHOD OF PRODUCING AMINOPHENOL USING A RHODIUM/CARBON CATALYST WITH SYNERGISTIC QUANTITIES OF RHODIUM, TRICHLORIDE OR RHODIUM TRIBROMIDE

Eugene Medcalf, Sommerville, N.J., assignor to Oxamine, Inc., Mount Vernon, N.Y.

Continuation-in-part of Ser. No. 555,428, March 5, 1975, abandoned. This application Apr. 26, 1976, Ser. No. 680,174

Int. Cl.[2] C07C *91/44*

U.S. Cl. 260—575 **4 Claims**

1. A method of preparing aminophenol comprising the steps of:

a. hydrogenating a nitrobenzene substantially to completion by feeding hydrogen to a reaction mixture containing the nitrobenzene in the presence of aqueous sulfuric acid and a hydrogenation catalyst which comprises platinum group metal wherein from 10 to 80% of said platinum group metal is in the form of a rhodium salt selected from the group which consists of $RhCl_3$ and $RhBr_3$ and from 20 to 90% of said platinum group metal is in the form of elemental Rh, Pt, Pd or Ru and wherein the balance of said catalyst comprises carbon to produce a para-aminophenol in an aqueous phase containing the latter at a temperature of from 80 to 110° C and at 1 to 3 atmospheres;

b. terminating hydrogen feed to said reaction mixture:

c. thereafter charging the reaction mixture with a quantity of fresh nitrobenzene as required to repeat step (a);

d. thereafter premitting said aqueous phase to separate from the nitrobenzene phase;

e. next removing said aqueous phase from said reactor while retaining said nitrobenzene phase and said catalyst therein;

f. thereafter adding fresh sulfuric acid to the reactor;

g. repeating steps (a) through (f) in succession to transform nitrobenzene semicontinuously into said para-aminophenol; and

h. recovering the para-aminophenol thus formed from the aqueous phases removed from said reactor.

4,051,188

NOVEL BICYCLOALKANE DERIVATIVES AND THE PRODUCTION THEREOF

Gerhard Sauer, Berlin; Helmut Häuser, Unna; Gregor Haffer, Berlin; Juergen Ruppert, Berlin; Ulrich Eder, Berlin, and Rudolf Wiechert, Berlin, all of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

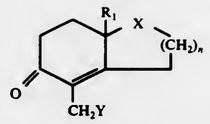
Continuation-in-part of Ser. No. 317,549, Dec. 22, 1972, Pat. No. 4,008,253. This application Dec. 27, 1976, Ser. No. 753,997

Claims priority, application Germany, Dec. 24, 1971, 2165320; Apr. 29, 1972, 2221704; Nov. 2, 1972, 2254175

Int. Cl.[2] C07C *49/76*

U.S. Cl. 260—590 FA **14 Claims**

1. A bicycloalkane of the formula



wherein n is 1 or 2, R_1 is alkyl of 1–4 carbon atoms, X is carbonyl, hydroxymethylene, or hydroxymethylene etherified with alkyl, carbocyclic aryl or carbocyclic aralkyl of up to 10 carbon atoms; and Y is —S—R_3, —SO_m—R_2, or



wherein m is 1 or 2, R_2 is aryl or aralkyl of up to 12 carbon atoms, R_3 is hydrogen or alkyl of 1–4 carbon atoms, R_4 is phenyl or phenyl substituted by alkoxy of 1–4 carbon atoms or benzyloxy, and Z is nitro, alkanoyl of 2–4 carbon atoms, alkylsulfinyl of 1–4 carbon atoms or alkylsulfonyl of 1–4 carbon atoms.

4,051,189

CYCLIC ETHERS OF PHENOLIC COMPOUNDS AND POLYMERS THEREOF

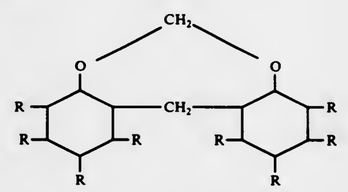
Alvin F. Shepard, and Bobby F. Dannels, both of Grand Island, N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 570,545, April 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 450,945, March 13, 1974, abandoned. This application Aug. 4, 1976, Ser. No. 711,651

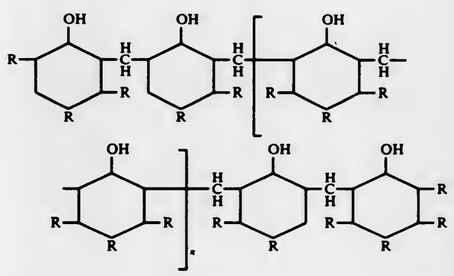
Int. Cl.[2] C07C *37/00, 39/16*

U.S. Cl. 260—619 A **3 Claims**

1. The method of preparing a polymer by reaction of the monomer



in the presence of a polymerization catalyst selected from the group consisting of BF_3, BCl_3 or PF_5 to form



wherein R in both formulas is independently selected from the group of hydrogen, chlorine, bromine and fluorine and n is at least 5.

4,051,190

MANUFACTURE OF 3-ARYLPROPYL CHLORIDE

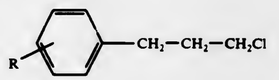
Daniel Ambrose Dunnigan, Winthrop Harbor, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Jan. 30, 1976, Ser. No. 653,809

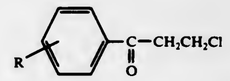
Int. Cl.[2] C07C *25/14*

U.S. Cl. 260—651 R **9 Claims**

1. A two-step process for the preparation of an arylpropyl chloride of the formula



wherein R is hydrogen, loweralkyl or halogen, consisting essentially in hydrogenating a solution of an arylpropiophenone of the formula



in an inert solvent in the presence of a catalyst containing metallic ruthenium on a suitable inert support at a temperature between 10° C and 100° C and at a hydrogen pressure between 1 and 100 atm. until an equimolar amount of gaseous hydrogen is used and, after removing said catalyst from said solution, hydrogenating the mixture in the presence of a mineral acid and a catalyst containing metallic palladium on a suitable solid support at a temperature between 10° C and 100° C and at a hydrogen pressure between 1 and 100 atm. until a second equimolar amount of the gaseous hydrogen has been used.

4,051,191

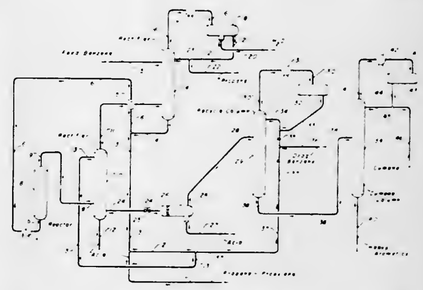
SOLID PHOSPHORIC ACID CATALYZED ALKYLATION OF AROMATIC HYDROCARBONS

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 3, 1977, Ser. No. 756,523

Int. Cl.[2] C07C *3/54*

U.S. Cl. 260—671 R **2 Claims**



1. In the process for the production of alkylaromatic hydrocarbons wherein an aromatic hydrocarbon and an olefin are contacted with a solid phosphoric acid-containing catalyst in a reaction zone maintained at alkylation-promoting conditions; a reaction zone effluent stream comprising the aromatic hydrocarbon and an alkylaromatic hydrocarbon are passed into a first fractionation zone; a bottoms stream comprising the aromatic hydrocarbon and the alkylaromatic is removed from the first fractionation zone at a first temperature and then passed into a second fractionation zone at a lower pressure and at a

lower second temperature; the improvement which comprises flashing the bottoms stream at an intermediate point between the first fractionation zone and the second fractionation zone and then passing the bottoms stream into a settling vessel and removing released phosphoric acid from the settling vessel to thereby reduce the amount of phosphoric acid which enters the second fractionation zone.

4,051,192

SEPARATION OF BI-ALKYL SUBSTITUTED MONOCYCLIC AROMATIC ISOMERS

Richard W. Neuzil, Downers Grove, and Donald J. Korous, Bensenville, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 136,199, April 21, 1971. This application Nov. 11, 1976, Ser. No. 740,892
Int. Cl.² C07C *7/13*
U.S. Cl. 260—674 SA **16 Claims**

1. A process for separating the para-isomer from a feed stream comprising at least two bi-alkyl monosubstituted aromatic isomers, including the para-isomer, said isomers having more than eight and less than about eighteen carbon atoms per molecule which process employs an adsorbent comprising a X or a Y zeolite containing at exchangeable cationic sites a cation pair selected from the group consisting of barium and potassium, potassium and beryllium, potassium and magnesium, rubidium and barium, cesium and barium, potassium and rubidium and potassium and cesium and which process comprises the steps of:

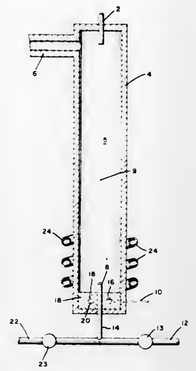
a. maintaining net fluid flow through a column of said adsorbent in a single direction, which column contains at least three zones having separate operational functions occurring therein and being serially interconnected with terminal zones of said column connected to provide a continuous connection of said zones;
b. maintaining an adsorption zone in said column, said zone defined by the adsorbent located between a feed input stream at an upstream boundary of said zone and a raffinate output stream at a downstream boundary of said zone;
c. maintaining a purification zone immediately upstream from said adsorption zone, said purification zone defined by the adsorbent located between an extract output stream at an upstream boundary of said purification zone and said feed input stream at a downstream boundary of said purification zone;
d. maintaining a desorption zone immediately upstream from said purification zone, said desorption zone defined by the adsorbent located between a desorbent input stream at an upstream boundary of said zone and said extract output stream at a downstream boundary of said zone;
e. passing said feed stream into said adsorption zone at adsorption conditions to effect the selective adsorption of said para-isomer by said adsorbent in said adsorption zone and withdrawing a raffinate output stream from said adsorption zone;
f. passing a desorbent material into said desorption zone at desorption conditions to effect the displacement of said para-isomer from the adsorbent in said desorption zone;
g. withdrawing an extract stream comprising said para-isomer and desorbent material from said desorption zone;
h. passing at least a portion of said extract output stream to a separation means and therein separating at separation conditions at least a portion of said desorbent material to produce a para-isomer product; and
i. periodically advancing through said column of adsorbent in a downstream direction with respect to fluid flow in said adsorption zone the feed input stream, raffinate output stream, desorbent input stream, and extract output stream to effect the shifting of zones through said adsorbent and the production of extract output and raffinate output streams.

4,051,193

PROCESS FOR PRODUCING ETHYLENE FROM ETHANE

Bruce E. Kurtz, Marcellus, and Edmund W. Smalley, Brewerton, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 14, 1975, Ser. No. 622,326
Int. Cl.² C07C *5/42, 5/44, 5/48*
U.S. Cl. 260—683.3 **10 Claims**



1. A process for the production of ethylene by the oxidative dehydrogenation of ethane which comprises introducing, under pressure via a gas jet a first gas feed stream containing oxygen and chlorine into an elongated reaction zone internally disposed within an elongated housing; introducing a second gas feed stream containing ethane into said reaction zone as an annulus surrounding said first gas feed stream and flowing co-currently therewith; maintaining said reaction zone under conditions sufficient to effect reaction of oxygen, chlorine and ethane in said zone to form ethylene; and withdrawing the product reaction mixture containing ethylene from said reaction zone.

4,051,194

THERMOSETTING RESIN COMPOSITION FOR POWDER PAINT COMPRISING OF A (I) POLYMER CONSISTING OF β-METHYLGLYCIDYL (METH)ACRYLATE, STYRENE, UNSATURATED DIALKYL ESTER, ALKYLACRYLATE AND (II) SATURATED ALIPHATIC DIBASIC ACID

Noboru Ishikawa, Sakai; Hidehisa Nakamura, Osaka; Kazuyoshi Maruyama, Izumiohtsu, and Akio Shoji, Sennan, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Nov. 5, 1975, Ser. No. 629,129
Claims priority, application Japan, Nov. 11, 1974, 49-129045
Int. Cl.² C08L *63/00*; C08F *22/00, 8/00, 224/00*
U.S. Cl. 260—836 **10 Claims**

1. A thermosetting resin composition which comprises

I. a polymer consisting of (1) 10 to 40% by weight of β-methylglycidyl (meth)acrylate or a mixture thereof with glycidyl (meth)acrylate, (2) 20 to 80% by weight of styrene (3) 3 to 40% by weight of a dialkyl ester of an aliphatic unsaturated dibasic acid and (4) 0 to 30% by weight of an alkyl (meth)acrylate, said polymer being prepared by polymerizing said components (1), (2), (3) and (4) in the above-indicated amounts in the presence of a radical polymerization catalyst, said polymer having a softening point of 80° to 150° C as measured by the ring-and-ball method, and a number average molecular weight of 3,000 to 15,000 as measured by osmometry, and

II. an aliphatic saturated dibasic acid.

4,051,195

POLYEPOXIDE-POLYACRYLATE ESTER COMPOSITIONS

Wayne F. McWhorter, Louisville, Ky., assignor to Celanese Polymer Specialties Company, Louisville, Ky.

Filed Dec. 15, 1975, Ser. No. 640,674
Int. Cl.² C08L *63/00*
U.S. Cl. 260—837 R **9 Claims**

1. A curable composition which comprises: (1) a blend of an epoxide resin containing more than one 1,2-epoxy group per molecule and a polyacrylate or polymethacrylate ester of a polyol wherein said ester contains more than one terminal acrylate or methacrylate group, the epoxide resin and the ester being present in the weight ratio of about 100 parts of epoxide resin to about 5 to about 100 parts of ester; and (2) an aliphatic polyamine curing agent containing at least 3 amine hydrogen atoms per molecule in the amount of about 0.75 to about 1.25 amine hydrogen atoms for each epoxy group of the epoxide resin and for each acrylic unsaturated group of the polyacrylate or polymethacrylate ester said amine atoms reacting with the epoxide ring and adding across the double bond of the acrylate group of the composition.

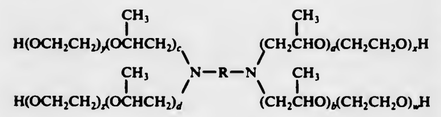
4,051,196

ANTISTATIC FIBER CONTAINING CHAIN-EXTENDED TETROLS BASED ON DIAMINES

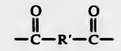
Rodney Lee Wells, and Lamberto Crescentini, both of Chester, Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation of Ser. No. 581,194, May 27, 1975, abandoned. This application Aug. 4, 1976, Ser. No. 711,764
Int. Cl.² C08L *77/00*
U.S. Cl. 260—857 PG **5 Claims**

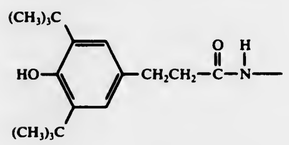
1. An antistatic polyamide fiber having less than 4×10^3 nubs per pound of fiber, said fiber containing about 1% to 12% by weight of an antistatic compound which is a chain-extended reaction product of a tetrol compound represented by the formula:



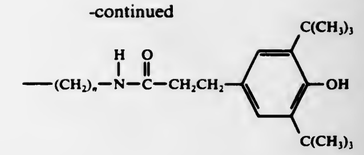
where *a, b, c, d, w, x, y* and *z* are each a whole number and R is a difunctional radical from a hydrocarbon containing 1 to 13 carbon atoms, said tetrol compound having a molecular weight between about 4,000 and about 50,000, and at least one compound selected from the group consisting of compounds which yield the divalent radical



where R′ is a difunctional radical from a hydrocarbon containing 1 to 30 carbon atoms; and about 0.5% to 12% by weight, based on the weight of the antistatic compound, of a phenol compound of the formula



-continued



where *n* is 2 to 6.

4,051,197

BLEND OF RADIAL BLOCK COPOLYMERS HAVING HIGH IMPACT STRENGTH

Lawrence M. Fodor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 10, 1975, Ser. No. 630,607
Int. Cl.² C08L *53/02*
U.S. Cl. 260—876 B **9 Claims**

1. A composition comprising a blend of at least two separately prepared resinous radial block copolymers of a monovinyl-substituted aromatic compound and a conjugated diene, each of said copolymers having a heterogeneity index of polymerized monovinyl-substituted aromatic compound blocks outside the range of 2.8 to 3.5, said blend having a heterogeneity index of polymerized monovinyl-substituted aromatic compound blocks within the range of about 2.8 to 3.5.

4,051,198

MODIFIED WATER-DILUTABLE POLYMER OIL IMIDES CONTAINING CARBOXYL GROUPS

Hans-Peter Patzschke, Wuppertal, Germany, assignor to Dr. Kurt Herberts & Co. Gesellschaft mit Beschrankter Haftung Vorm. Otto Louis Herberts, Wuppertal, Germany

Filed Dec. 1, 1975, Ser. No. 636,368
Int. Cl.² C08F *8/30*
U.S. Cl. 260—879 **4 Claims**

1. A modified, water-dilutable olefin polymer oil imide resin wherein the olefin polymer oil portion has a molecular weight of from about 500 to 2500 and comprises at least 50% by weight of 1,4-cis-polybutadiene oil, and wherein the imide resin has a viscosity of from about 300 to 1500 m Pas as measured on a 50% solution (weight/weight) in butyl glycol at 25° C. and the imide resin contains, per gram of resin, from about 2.0 to about 3.5 milliequivalents of carboxyl groups and from about 0.3 to 2.0 milliequivalents of imide groups wherein from about 10 to 40 milliequivalents out of 100 milliequivalents of the total milliequivalents of carboxyl groups and of imide groups being imide groups.

4,051,199

EPOXIDIZED COPOLYMERS OF STYRENE, BUTADIENE AND ISOPRENE

Kisbore Udipi, and Henry L. Hsieh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 4, 1976, Ser. No. 663,892
Int. Cl.² C08F *257/02, 279/02, 297/04*
U.S. Cl. 260—880 R **12 Claims**

1. As a composition of matter, a polymer defined by the formula

S-D/S-S

in which S is a polystyrene block, D/S is a tapered copolymer block of styrene and an alkadiene selected from the group consisting of butadiene and isoprene having an alkadiene-rich end and a styrene-rich end of which the styrene-rich end is attached to one block S, with the further provision that 5–95% olefinic unsaturations in the D/S blocks have been removed by epoxidation.

4,051,200
THERMOPLASTIC VINYL CHLORIDE POLYMER COMPOSITIONS WITH IMPROVED PROCESSING PROPERTIES

Petr Simak, Mannheim; Karl Herrle, Ludwigshafen; Franz Haaf, Bad Duerkheim, and Guenter Hatzmann, St. Ilgen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed July 6, 1976, Ser. No. 702,973
Claims priority, application Germany, July 12, 1975, 2531198
Int. Cl.[2] C08L *27/06*
U.S. Cl. 260—899 9 Claims

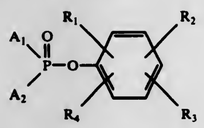
1. A thermoplastic composition comprising a mixture of
A. from 99.9 to 80 parts by weight of a homopolymer of vinyl chloride or a copolymer of vinyl chloride with up to 30 percent by weight of one or more other monomers copolymerizable with vinyl chloride, and
B. from 0.1 to 20 parts by weight of a copolymer of an acrylic acid ester or a methacrylic acid ester, which copolymer contains
B1. from 99.9 to 60 percent by weight of copolymerized units of an acrylic acid alkyl ester or methacrylic acid alkyl ester of 2 to 6 carbon atoms in the alcohol component,
B2. from 0.1 to 30 percent by weight of units which contain a lactone ring structure and
B3. from 0 to 39.9 percent by weight of units of one or more other copolymerizable monomers, the percentages being based on the above copolymer B.

4,051,201
THIOBISPHENOL ESTERS OF PENTAVALENT PHOSPHORUS ACIDS

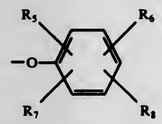
Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 26,060, April 6, 1970, abandoned. This application July 23, 1975, Ser. No. 598,297
Int. Cl.[2] C07F *9/09*; C10M *1/48*
U.S. Cl. 260—930 12 Claims

1. A process for the preparation of polymeric phosphorus acid esters comprising: reacting an aryl ester of a pentavalent phosphorus acid of the formula:



with a sulfur compound of the formula S_nY_2, in a ratio of less than or equal to about 1.5:1 wherein A_1 and A_2 are independently selected from the group consisting of alkyl, alkoxy, aryl, alkaryl, haloaryl, arylalkyl, alkoxyaryl, alkaryloxy, aryloxy, hydroxy, chlorne, bromine and



each of said alkyl, alkoxy, aryl, alkaryl, haloaryl, arylalkyl, alkoxyaryl, alkaryloxy, and aryloxy groups having from 1 to 20 carbon atoms; R_1, R_2, R_3, R_4, R_5, R_6, R_7, and R_8 are independently selected from the group consisting of hydrogen, alkyl, alkoxy, aryl, alkaryl, haloaryl, arylalkyl, aryloxy, and halogen; each of said alkyl, alkoxy, aryl, alkaryl, haloaryl, arylalkyl, and aryloxy groups having from 1 to 20 carbon atoms, Y is a halogen of atomic weight between 33 and about 84 and n is an integer having a value of from 1 to about 6 inclusive; said reaction being conducted in the presence of a Friedel-Crafts catalyst.

4,051,202
METHOD FOR SEPARATING MONO- AND DI-OCTYLPHENYL PHOSPHORIC ACID ESTERS

Wesley D. Arnold, Jr., Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 17, 1975, Ser. No. 632,749
Int. Cl.[2] C07F *9/09*
U.S. Cl. 260—990 4 Claims

1. A method of separating a mono-octylphenyl phosphoric acid ester from a mixture containing mono- and di-octylphenyl phosphoric acid esters, said method comprising:
a. contacting said mixture with an organic solvent selected from the group consisting of methanol, ethanol, n-propanol, isopropanol, n-butanol, 2-butanol, and tert-butanol;
b. contacting said mixture with a source of ions of an alkali metal selected from the group consisting of sodium and lithium to cause alkali metal mono-octylphenyl phosphate salt to be distributed in a solid phase;
c. separating the resulting alkali metal mono-octylphenyl phosphate salt in said solid phase from said organic solvent; and
d. acidifying the separated mono-octylphenyl phosphate salt to form the mono-octylphenyl phosphoric acid ester.

4,051,203
METHOD FOR PURIFYING BIDENTATE ORGANOPHOSPHORUS COMPOUNDS

Wallace W. Schulz, Richland, Wash., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 8, 1976, Ser. No. 703,325
Int. Cl.[2] C07F *9/32*
U.S. Cl. 260—990 6 Claims

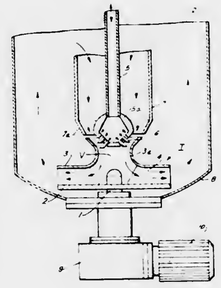
1. A method for removing acidic impurities present in bidentate organophosphorus compounds comprising: diluting the organophosphorus compound selected from the group consisting of dihexyl-N,N-diethylcarbamylmethylenephosphonate and dibutyl-N,N-diethylcarbamylmethylenephosphonate with a water immiscible, organic solvent to form an extractant, contacting the extractant with ethylene glycol whereby the impurities in the extractant are taken by the ethylene glycol, and separating the purified extractant from the ethylene glycol.

4,051,204
APPARATUS FOR MIXING A LIQUID PHASE AND A GASEOUS PHASE

Hans Muller, Zurich, and Konstantin Sotirianos, Stafa, both of Switzerland, assignors to Hans Muller, Mannedorf, Switzerland

Continuation of Ser. No. 534,898, Dec. 20, 1974, abandoned. This application June 11, 1976, Ser. No. 694,943
Claims priority, application Switzerland, Dec. 21, 1973, 18125/73; Dec. 21, 1973, 18126/73
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—36 R 5 Claims

1. In an apparatus for mixing a liquid phase and a gaseous phase, particularly a fermentor for biologically growing microorganisms, a combination comprising a vessel adapted to contain a liquid phase; a tubular guide baffle in said vessel and having spaced open ends one of which at least in part bounds a venturi-shaped passage having a throat portion; a rotary impeller mounted in said vessel for rotation about an axis and having an axial inlet communicating with said open end, and a plurality of peripheral outlets which communicate with said axial inlet; drive means for rotating said impeller about said axis so that centrifugal action causes expulsion of liquid phase from said outlets and creates suction in said venturi-shaped passage to thereby draw additional liquid phase from said guide baffle into said inlet; and gas admitting means including a conduit which communicates with a source of gaseous phase, and a plurality of tubular nipples each having an elongated tubular end portion which extends into said throat portion in direction generally transverse to the axial flow of liquid phase, each tubular end portion terminating in a bevelled discharge port which is inclined at a substantially constant angle of inclination

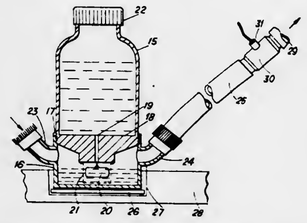


relative to the elongation of the respective tubular end portion and which faces generally downstream of the axial flow of liquid phase, said discharge ports communicating with different locations of said passage so that the suction in said throat portion of said passage draws said gaseous phase from said source via said conduit and ejects said gaseous phase out of said discharge ports of said nipples across different transverse sections of said throat portion without requiring said gaseous phase to be in pressurized condition.

4,051,205
APPARATUS FOR SATURATED GAS DELIVERY

Graham Cameron Grant, 16149 Campbell Parade, Manly Vale 2093, Sydney, New South Wales, Australia

Continuation-in-part of Ser. No. 396,032, Sept. 10, 1973, abandoned. This application Sept. 10, 1975, Ser. No. 612,149
Claims priority, application Australia, Sept. 13, 1972, 0427/72; Nov. 17, 1972, 1267/72
Int. Cl.[2] A61M *15/00*; B01F *15/06*
U.S. Cl. 261—70 9 Claims

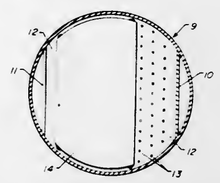


1. Humidifying apparatus comprising a reservoir chamber, a float chamber located beneath said reservoir chamber, a valve between said reservoir and float chambers, a float in said float chamber operatively controlling said valve whereby liquid is admitted from said reservoir chamber to said float chamber to maintain the liquid level therein sensibly constant when the apparatus is in use, a humidifying chamber surrounding said float chamber and which contains liquid vapour, means permitting equalizing of liquid levels in said float chamber and said humidifying chamber by allowing liquid flow from the float chamber to said humidifying chamber, a gas entry port leading into the upper portion of said humidifying chamber for admitting gas which is to be humidified thereto, a humidified gas exit port remote from said gas entry port and leading from the upper portion of said humidifying chamber, a flexible hose leading from said gas exit port and for conveying the humidified gas therefrom to a point of use, a heating element extending along said flexible hose, a gas temperature sensing element located at the gas outlet end of said hose, first electrical connections extending from said temperature sensing element, second electrical connections extending from said heating element, a temperature sensor in said humidifying chamber, third electrical connections extending from said sensor, a stand, a heater in said stand for heating said humidifying chamber, control circuitry having inputs receiving the first, second and third connections respectively and controlling operation of the hose heating element and said heater, independently operating closed loop control circuits of which the first automatically controls the hose heating element in response to the output of the temperature sensing element and the second automatically controls the heater in response to the output of the temperature sensor, and alarm circuitry monitoring the first and second control loops and providing a warning if, during operation of the apparatus, any of a number of predetermined hazard conditions develop.

4,051,206
SIEVE-TYPE FRACTIONATION TRAYS

Bennie I. Bunas, Chicago, and Kenneth D. Uitti, Bensenville, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 10, 1976, Ser. No. 684,995
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—109 1 Claim



1. A sieve-type fractionation tray which comprises a liquid support plate having a horizontal upper surface and adapted to be mounted horizontally in a fractionation column and to retain a body of liquid thereon, said liquid support plate being divided into a receiving lateral half and a discharging lateral half which is adjacent a chordal outlet downcomer, said discharging interal half and said receiving lateral half of said liquid support plate having sieve-type vapor passageways located thereon, said sieve-type vapor passageways having a total open area equal to from 2 to 20 percent of said upper horizontal surface, and a flat imperforate sealing plate which rests upon said upper horizontal surface in a manner which covers and seals all said sieve-type vapor passageways located on said discharging lateral half of said liquid support plate and which leaves unsealed those sieve-type vapor passageways located on said receiving lateral half of said liquid support plate.

4,051,207

PROCESS FOR THE PRODUCTION OF PROPELLANT CHARGE POWDERS, ESPECIALLY NITROGUANIDINE POWDERS

Heinrich Brachert, Troisdorf-Oberlar, and Joachim Kleiss, Liebenau, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Dec. 29, 1975, Ser. No. 644,949
Claims priority, application Germany, Dec. 27, 1974, 2461646
Int. Cl.² C06B *21/00*
U.S. Cl. 264—3 B **14 Claims**

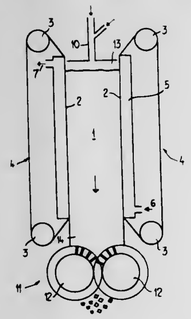
1. A process for the production of propellant charge powders from solvent-containing mixtures containing nitrocellulose, and components selected from the group consisting of diglycol dinitrate, nitroglycerin, nitroguanidine, penthrite, and hexogen and mixtures thereof, and further additives, which comprises premixing an alcohol-containing or a water-containing raw mixture containing nitrocellulose with additional required components of the propellant powder; then either incorporating a solvent in the alcohol-containing mixture and homogenizing and preplasticizing the solvent-containing premix of the components in a continuously operating kneading device or homogenizing and preplasticizing the water-containing premix of the components in the continuously operating kneading device, then only thereafter dewatering the mixture by drying and combining the mixture with a solvent; then plasticizing the solvent-containing preplasticized mixture in a continuously operating screw-type extruder; converting the resultant mixture into granular form; extruding the granulated material finally into a final powder form in a continuously operating screw-type extruder; and evaporating the solvent therefrom.

4,051,208

PROCESS FOR THE CONVERSION OF LIQUID PHASES OF NON-METALLIC SUBSTANCES, ESPECIALLY POLYMERIZABLE OR CRYSTALLIZABLE SUBSTANCES, INTO SOLID PHASES

Roland Jaccard, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 527,422, Nov. 26, 1974, abandoned, which is a continuation of Ser. No. 351,965, April 17, 1973, abandoned.
This application Oct. 29, 1975, Ser. No. 626,915
Int. Cl.² C08L *61/20*; B22D *23/08*
U.S. Cl. 264—5 **4 Claims**



1. A process for the fabrication of a condensation polymer based on urea and/or melamine and formaldehyde, said process comprising:

providing a vertically extending hollow reaction chamber having a horizontal cross-section shape in the form of a polygon and having a plurality of flat vertical walls each formed by a vertical run of a separate revolving endless band;

initially filling the upper end of said chamber with a liquid phase of a mixture of an aqueous solution of a pre-condensate of urea and/or melamine and formaldehyde in the presence of a protective colloid with a solution of sulphonic acid or a water-soluble ammonium hydrogen sulphate of the formula $[R—NH_3](^+).[SO_4H](^-)$, wherein R is a hydrogen atom or an organic radical which does not adversely affect the water-solubility, and allowing said liquid phase to convert to a solid phase;

supplying, at a rate dependent on the speed of conversion of said mixture from said liquid phase to said solid phase, a sufficient amount of said liquid phase into said chamber to maintain a thin layer of said liquid phase on top of said solid phase formed in said chamber; and

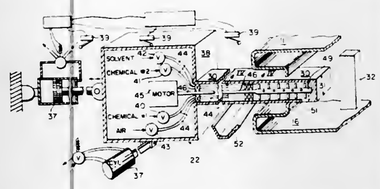
continuously passing said solid phase from said chamber and simultaneously comminuting said solid phase as it passes from said chamber.

4,051,209

CONTINUOUS RIGID FOAM PANEL PRODUCTION

Charles P. Tabler, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio

Filed Apr. 22, 1975, Ser. No. 570,451
Int. Cl.² B29D *27/04*
U.S. Cl. 264—39 **9 Claims**



1. In a method of mixing two separately supplied chemicals to provide a foamable mixture and in response to a deposit signal, depositing the foamable mixture in a mold form to produce rigid synthetic foam, with contact between the two chemicals being only within a common mixture area before depositing, the improvement comprising: depositing the foamable mixture in response to a deposit signal in a mold form as the chemicals are supplied to, mixed in and flow through the common mixture area; thereafter discontinuing the depositing; thereafter automatically timing the period wherein mixed chemicals are maintained in the common mixture area without substantial depositing and flow of the chemicals through the mixture area; after said step of timing, depositing additional foamable mixture in response to a deposit signal only if the period of time after the last depositing step was discontinued is less than a fixed period of time that would result in substantial solidification of the chemicals, and preventing the depositing of additional foamable mixture despite the deposit signal only if the period of time after the last depositing step was discontinued is more than a fixed period of time that would result in substantial solidification of the chemicals; and automatically washing the mixture area with a solvent in response to the period of time after the last depositing step and before additional depositing exceeding a fixed period of time that would result in substantial solidification of the chemicals.

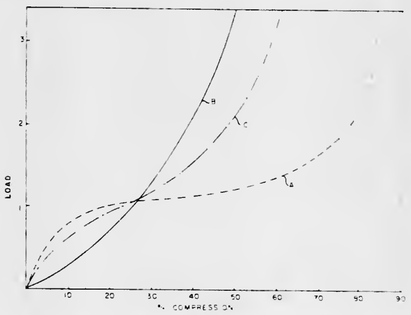
4. A method of forming rigid foam panels by depositing foamable chemicals in a generally horizontally extending closed top mold moving past a foam depositing apparatus in a molding direction with a transverse mold wall forming one end of the mold and thereafter allowing the foamable chemicals to foam and cure within the mold as it continuously moves through a foaming and curing zone, the improvement comprising the steps of: continuously moving the mold on an endless belt conveyor in the molding direction throughout the method; automatically sensing the position of the continuously moving transverse wall; automatically driving the foam depositing apparatus in the molding direction at the same speed as the continuously moving mold when the foam depositing apparatus is adjacent the interior edge of the transverse wall, and simultaneously moving the foam depositing apparatus transversely into the mold while depositing foamable chemicals along the interior edge of the transverse wall for substantially the full length of the transverse wall; thereafter reducing the speed of the foam depositing apparatus in the molding direction so as to provide a relative speed in the molding direction between the foam depositing apparatus and the continuously moving mold, and simultaneously moving the foam depositing apparatus transversely back and forth within the mold while depositing the foamable chemicals to form a zigzag pattern of chemicals deposited within the mold; withdrawing the foam depositing apparatus and thereafter curing the foam within the continuously moving mold in a pressure tunnel formed between the endless belt conveyor and an opposed endless belt conveyor.

4,051,210

PROCESS FOR COMOLDING A COMPOSITE CUSHIONING STRUCTURE FROM A PNEUMACEL FIBER BATT AND SYNTHETIC ELASTOMERIC FOAM

Frederick Theodore Wallenberger, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 27, 1975, Ser. No. 581,093
Int. Cl.² B29D *27/04*
U.S. Cl. 264—45.4 **9 Claims**



1. A process of comolding a resin-bonded nonwoven batt of pneumacel fiber with an elastomeric foam comprising heating while confined a compressed thermoplastic resin-bonded nonwoven batt of pneumacel fiber to soften the binder and expand the batt to about twice its thickness; cooling the resulting expanded batt to set it in the expanded form; placing the expanded batt in a mold or on a continuous belt having lateral confinement and adding a layer of a precursor of an elastomeric foam to at least one surface of said batt to form thereby a shaped composite, said precursor making a minor but definite penetration of said batt; and curing the shaped composite.

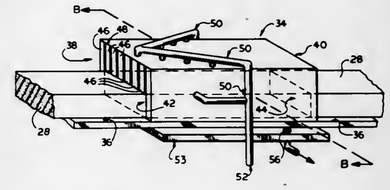
4,051,211

APPARATUS AND PROCESS

William Beser, Burbank, and Edwin R. Cole, Huntington Beach, both of Calif., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 20, 1976, Ser. No. 688,169
Int. Cl.² B29D *27/04*
U.S. Cl. 264—51 **6 Claims**

1. A process for minimizing atmospheric pollution produced by volatilization of isocyanate during formation of isocyanate-based polymer foam in a continuous bunstock operation which comprises passing said foam in the form of a continuous bun, after foam rise and gelatin have been completed, through a



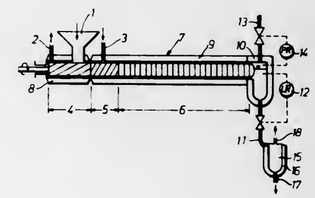
substantially enclosed zone of high relative humidity maintained at ambient temperature.

4,051,212

PROCESS FOR THE CONTINUOUS DEGRADATION OF PLASTICS

Ernst Grigat, and Hartmut Hetzel, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 29, 1975, Ser. No. 608,853
Claims priority, application Germany, Sept. 4, 1974, 2442387
Int. Cl.² C07C *87/14*; B29H *19/00*
U.S. Cl. 264—102 **5 Claims**



1. A process for the continuous hydrolytic degradation of waste plastics comprising

a. continuously introducing a hydrolyzable plastic waste material into a screw machine,

b. continuously allowing air to escape from said screw machine,

c. continuously introducing water into said screw machine, thereby producing a plastic-water mixture,

d. subjecting said mixture to a temperature of from 100° to 300° C, a pressure from 5 to 100 bars, and intensive screw mixing in a reaction zone of said screw machine for a period of from 2 to 100 minutes whereby liquid and gaseous hydrolysis products are formed,

e. continuously allowing the liquid and gaseous hydrolysis products to enter a liquid-gas separatory nozzle,

f. continuously allowing the liquid to leave the nozzle through a first regulating valve which maintains a constant liquid level in the nozzle, and

g. continuously allowing the gas to leave the nozzle through a second regulatory valve which maintains a constant pressure in the nozzle at a pressure of the reaction zone.

4,051,213

PROCESS FOR PRESSING BRIQUETTES FROM FINE-GRAINED FLUORSPAR AND PRESSED BRIQUETTES THUS OBTAINED

Albertus Adrianus Kooy, Schoorl, and Jacobus van Rijkom, Ijmuiden, both of Netherlands, assignors to Hoogovens Ijmuiden BV, Ijmuiden, Netherlands

Filed Mar. 25, 1975, Ser. No. 561,691

Claims priority, application Netherlands, Apr. 5, 1974, 7404651

Int. Cl.[2] C04B *35/00*

U.S. Cl. 264—109 3 Claims

1. A process for pressing fine-grained fluorspar into briquettes, comprising mixing intimately fine-grained fluorspar having a maximum grain size of 6 mm with 1 to 5% by weight of blast furnace cement and then with 1 to 6% by weight of water glass at room temperature and subsequently pressing the mixture into briquettes in a briquet press.

4,051,214

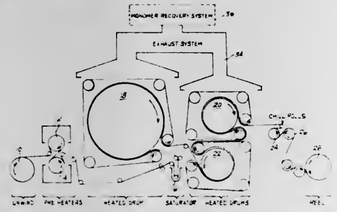
METHOD OF CONTROLLING MONOMER LOSS DURING THE PRODUCTION OF A FIBER-THERMOPLASTIC MATRIX BY IN SITU BULK POLYMERIZATION

Richard R. Casper, and Myron P. Marander, both of Longview, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 653,980, Jan. 30, 1976, abandoned. This application Jan. 14, 1977, Ser. No. 759,603

Int. Cl.[2] B29D *7/20, 27/00*

U.S. Cl. 264—137 8 Claims



1. In a method for making a moldable, fiber-thermoplastic matrix by in situ bulk polymerization wherein a fibrous web of less than 0.25 inch thickness is impregnated with a liquid polymerizable composition, comprising a monomer and a thermally activated free radical initiator wherein the matrix after polymerization contains at least 25% polymer by weight and said bulk polymerization is completed in less than 8 minutes, the improvement whereby monomer loss is controlled during polymerization, which comprises:

confining the impregnated web matrix between heat transfer surfaces wherein the matrix is subjected to a pressure of 0.2 to 20 psig;

heating the impregnated matrix to an initial temperature sufficient to initiate polymerization but below the boiling point of the polymerizable composition;

raising the temperature as the boiling point of the composition increases during polymerization while still maintaining the temperature below said boiling point; and

increasing the temperature above the boiling point when polymerization is nearly complete in order to evaporate residual monomer from the composition.

4,051,215

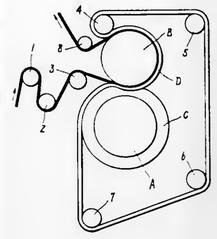
PROCESS FOR IMPARTING ELASTICITY TO WOVEN TEXTILE FABRICS

Motohiro Tsuruta, Kyoto; Hiroshiro Kimura, Ashiya; Akio Koshimo; Hirohisa Nara, both of Uji, all of Japan; Tokuju Goto, Dusseldorf, Germany, and Kunio Amemiya, Kyoto, Japan, assignors to Unitika Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 552,453, Feb. 24, 1975, abandoned, which is a continuation of Ser. No. 68,263, Aug. 26, 1970, abandoned, which is a division of Ser. No. 711,668, March 8, 1968, Pat. No. 3,538,563. This application Dec. 31, 1975, Ser. No. 645,721

Int. Cl.[2] B29G *5/00*

U.S. Cl. 264—137 4 Claims



1. A process for imparting elasticity to a woven textile fabric made of thermoplastic blended spun yarns made of 50–80% of poly-ether-ester or polyester fibers and 50–20% of cellulose fibers in its warp direction and in its weft direction a member of the group consisting of the same yarns as used in its warp direction, 100% of textured poly-ether-ester yarns, and 100% of textured polyester yarns, wherein said woven fabric fed to said process has a low initial web density in its weft direction, and the resultant fabric of the instant process has an elastic recovery of 65 to 90% and an elongation of 10 to 25% in its warp direction and has 5 to 60% greater web density than said feed fabric, which comprises:

a. rotating a heating drum,

b. rotating a deformable elastic roller, the drum and the roller having a parallel axis and the same peripheral velocity,

c. passing a flexible elastic belt through the nip between the drum and the roller,

d. contacting the belt with the heating drum around a substantial proportion of its periphery beyond the nip,

e. applying a cellulose reactive resin solution to the fabric,

f. feeding the fabric so treated in its warp direction into the nip between the heating drum and the flexible belt so as to shrink the fabric by 10–30% in its warp direction, whereby said fabric is compressed owing to the deformation of the deformable elastic roller as well as the deformation of the flexible elastic belt,

g. temporarily heat-setting the fabric in its altered state by contacting it with the heating drum at a temperature of 130°–150° C, and

h. completely heat-setting the fabric at a temperature of 150°–200° C for a period of 1–5 minutes.

4,051,216

IN-LINE MOULDING OF PRESTRESSED CONCRETE ARTICLES

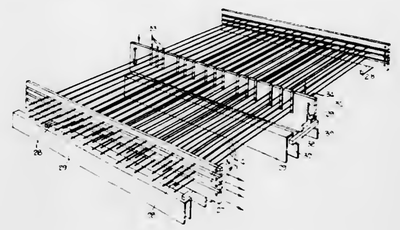
Robert Lyndon Bratchell, Ottoway, Australia, assignor to Concrete Industries (Monier) Limited, Ottoway, Australia

Continuation-in-part of Ser. No. 295,996, Oct. 10, 1972, abandoned. This application Dec. 4, 1974, Ser. No. 529,365

Claims priority, application Australia, Oct. 27, 1971, 6809/71

Int. Cl.[2] B28B *23/04*

U.S. Cl. 264—157 6 Claims



1. A method of moulding concrete ties comprising the steps:

aligning a series of similar multi-cavity open ended moulds end to end in a plurality of groups, and between end beams at the ends of a bay,

positioning a series of reinforcing wires in parallel spaced relationship with one another in the aligned cavities of the moulds and between the end beams,

securing the ends of the reinforcing wires to said end beams and straining said reinforcing wires,

positioning a series of flat sided bar-like spacers between the ends of adjacent moulds of each group and between the reinforcing wires so that:

a. the spacers function as closure members for the ends of the moulds, the opposite flat sides thereof becoming contiguous mould ends, and

b. the upper and lower edges of the spacers engage the reinforcing wires to retain them in horizontal rows,

each said flat-sided bar-like spacer extending across the width of the multi-cavity moulds and spaced vertically from adjacent said flat-sided bar-like spacers solely by the wires retained by said adjacent bars in a said horizontal row,

positioning a plurality of flat spacer plates each between adjacent ends of said groups, each plate extending across the width of the multi-cavity moulds and having transversely spaced vertically extending slots extending downwardly from its upper edge, and elevating the flat plates to engage the wires in the slots and also to cause its opposite side faces to function as closure means for contiguous mould ends, the edges defining the slots retaining the wires in vertical rows,

driving the moulds towards one another by an amount sufficient to close any gaps which exist between the mould ends and said spacers and said spacer plates,

discharging a wet mix of concrete into the moulds to surround the reinforcing wires and allowing the concrete to set,

withdrawing the flat-sided bar-like spacers endwise from between the horizontal rows of wires in a lateral direction and depressing flat spacer plates from between the rows of wires in a vertically downwards direction against resistance to concrete fracture by the mould bases to thereby expose the wires between adjacent ends of aligned moulds, and between the groups, and

severing the wires between each pair of adjacent moulds.

4,051,217

FABRICATION PROCESS FOR MULTIPHASED PLASTICS

Robert D. Landberg, Somerville, and Henry S. Makowski, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 483,977, June 28, 1974, Pat. No. 3,939,242, which is a division of Ser. No. 331,628, Feb. 12, 1973, Pat. No. 3,842,154, which is a division of Ser. No. 199,799, Nov. 17, 1971. This application Sept. 5, 1975, Ser. No. 610,821

Int. Cl.[2] B29C *25/00*

U.S. Cl. 264—230 12 Claims

1. An improved process for fabricating an article from an ionomer derived from a thermoplastic backbone polymer having groups pendant thhereto, said groups being selected from the group consisting essentially of metal sulfonate groups or metal carboxylate groups, said groups being present in from at least about 0.2 to about 15 mole percent (i.e. 0.002 to .15 moles per mole of monomer) and being capable of forming ionic physical crosslink said ionomer containing about 0.5 to about 10 moles of a volatile preferential plasticizer per mole of ionic groups, which said ionomer has been previously formed in a first desired shape, said first desired shape being substantially free of said volatile preferential plasticizer wherein the improvement comprises:

a. re-forming the product in a second desired shape; at a temperature above the softening point of the thermoplastic backbone but below the ultimate softening point, wherein the ultimate softening point is the temperature at which the ionomer flows; and

b. cooling below the softening point of the softening point while retaining the second desired shape.

4,051,218

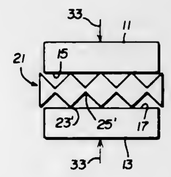
METHOD OF WELDING PLASTIC SEAMS

Joseph G. Hotton, Sterling Heights, Mich., assignor to Neumann Engraving Company, Madison Heights, Mich.

Filed Apr. 30, 1976, Ser. No. 681,980

Int. Cl.[2] B29C *17/00;* B29D *9/00;* B29F *5/00*

U.S. Cl. 264—248 7 Claims



1. A method of welding together first and second thermoplastic surfaces to form a strong watertight bond therebetween comprising the steps of simultaneously serrating the first and second surfaces by simultaneously softening and shaping said surfaces with a heated forming element interposed therebetween to form ridges and valleys on each of said surfaces; withdrawing said forming element; and thereafter pressing the first and second surfaces together, with the ridges of the first surface substantially opposite and aligned with the ridges of the second surface to collapse the ridges and to flow the softened thermoplastic material into the valleys until a single continuous watertight seam is formed therebetween.

4,051,219

METHOD OF PREPARING FLUORINE-FREE RARE EARTH METAL COMPOUNDS FROM SUCH COMPOUNDS CONTAINING FLUORINE

Leo Hafner, Althofen, Austria, assignor to Treibacher Chemische Werke Aktiengesellschaft, Treibach, Austria

Filed July 21, 1976, Ser. No. 707,382
Claims priority, application Austria, July 25, 1975, 5802/75
Int. Cl.² C01F *17/00*
U.S. Cl. 423—21 **5 Claims**

1. A method of producing a fluorine-free rare earth metal compound from a rare earth metal salt containing fluorine, the rare earth metal including cerium, comprising the steps of preparing an acidic solution of the salt in the presence of an amount of boric acid sufficient to sequester the fluorine ions in the salt, the amount of boric acid being determined by the equation

$$4\,HF + H_3BO_3 = 3\,H_2O + HBF_4,$$

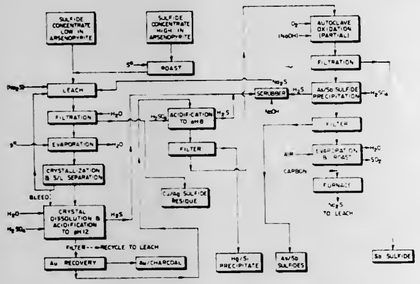
whereby the fluorine ions are bound in the solution, and separating the fluorine-free earth metal salt from the solution.

4,051,220

SODIUM SULFIDE LEACH PROCESS

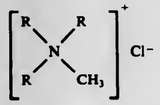
Enzo L. Coltrinari, Arvada, Colo., assignor to Equity Mining Corporation, Vancouver, Canada

Filed Mar. 1, 1976, Ser. No. 662,583
Int. Cl.² C01G *7/00, 57/00*
U.S. Cl. 423—24 **16 Claims**



10. A process for treating metal sulfides including gold in the presence of antimony sulfide comprising:

a. leaching the metal sulfides with sodium sulfide in order to produce a residue containing insoluble sulfides and a solution comprising sodium thioantimonite and the remaining metal sulfide values;
b. separating the insoluble metal sulfides from the solution;
c. oxidizing the sodium thioantimonite in solution to sodium thioantimonate;
d. crystallizing a portion of the sodium thioantimonate from the solution;
e. separating the crystallized sodium thioantimonate from the solution;
f. redissolving the crystallized sodium thioantimonate;
g. adjusting the pH of the solution resulting from the redissolving of the crystals to about 12;
h. contacting the redissolved sodium thioantimonate solution with an ion exchange agent loaded onto an activated carbon surface, the ion exchange agent comprising:



wherein R is a mixture of C_8 and C_{10} carbon chains, in order to remove substantially all of the gold from solution.

11. A process for treating metal sulfides including arsenic sulfides in the presence of antimony sulfide comprising:

a. leaching the metal sulfides with sodium sulfide in order to produce a residue containing insoluble sulfides and a solution comprising sodium thioantimonite and the remaining metal sulfide values;
b. separating the insoluble metal sulfides from the solution;
c. oxidizing the sodium thioantimonite in solution to sodium thioantimonate;
d. crystallizing a portion of the sodium thioantimonate from the solution;
e. separating the crystallized sodium thioantimonate from the solution;
f. redissolving the crystallized sodium thioantimonate to form a solution comprising sodium thioantimonate and sodium thioarsenate;
g. subjecting the sodium thioantimonate/sodium thioarsenate solution to partial oxidation by injecting sufficient oxygen so as to maintain a final solution e.m.f. of from about 300 millivolts to about 500 millivolts, measured with platinum/saturated Calomel electrodes while maintaining the product solution at a pH of from about 7 to about 11 in order to oxidize and precipitate a substantial portion of the sodium thioantimonate as antimony sulfide while leaving substantially all of the sodium thioarsenate in solution.

4,051,221

PROCESS FOR THE SEPARATE RECOVERY OF VANADIUM AND MOLYBDENUM

Wilhelmus Pannekeet, Haarlem, Netherlands; Gerhard E. W. K. Steenken, Berzbuir, Germany, and Roeland H. Voogd, Purmerend, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Apr. 12, 1976, Ser. No. 675,659
Claims priority, application Netherlands, Apr. 16, 1975, 7504500
Int. Cl.² C01G *31/00, 39/00*
U.S. Cl. 423—54 **8 Claims**

1. A process of separately recovering vanadium and molybdenum from an aqueous solution containing a vanadium compound and a molybdenum compound, comprising the steps of:

a. adjusting the pH of said aqueous vanadium-and-molybdenum-containing solution to a value between 1.5 and 7;
b. contacting said solution with a weakly basic anion exchanger in the salt form;
c. eluting said anion exchanger with an ammonium hydroxide solution having a strength between about 1 and 4N; and
d. crystallizing the resulting ammonium vanadate and separating same from the vanadium-and molybdenum solution obtained in said elution.

4,051,222

COARSENING OF PARTIALLY CALCINED ALUMINA DUST

Bohdan Gnyra, Arvida, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Continuation-in-part of Ser. No. 182,481, Sept. 21, 1971, Pat. No. 3,906,084. This application June 26, 1975, Ser. No. 590,593
The portion of the term of this patent subsequent to Sept. 16, 1992, has been disclaimed.
Int. Cl.² C01F *7/06, 7/14*
U.S. Cl. 423—127 **26 Claims**

1. A method of coarsening partially calcined alumina dust recovered during the calcining of alumina trihydrate to produce alumina which comprises forming an aqueous admixture or slurry consisting essentially of partially calcined alumina dust recovered during the calcining of alumina trihydrate to alumina, said partially calcined alumina dust exhibiting a loss on ignition of about 12–20% by weight after 1 hour at 1000° C. and being comprised of a mixture of α-Al_2O_3, γ-Al_2O_3, $Al_2O_3 \cdot H_2O$ and $Al_2O_3 \cdot 3H_2O$, said $Al_2O_3 \cdot H_2O$ being present in said mixture in an amount of about 5% up to about 20% by weight, said mixture having a particle size such that at least 80–90% weight is less than 44 microns, and finely divided calcium carbonate or calcite and introducing the resulting aqueous admixture or slurry into filtered Bayer pregnant liquor and precipitating alumina trihydrate from the resulting Bayer pregnant liquor.

4,051,223

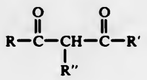
PROCESS FOR THE RECOVERY OF MAGNESIUM

Kenneth D. MacKay, Circle Pines, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Nov. 10, 1975, Ser. No. 630,599
Int. Cl.² B01D *11/04*
U.S. Cl. 423—157 **13 Claims**

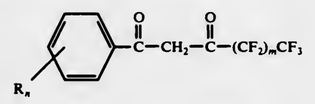
1. The process of selectively recovering magnesium from an aqueous solution thereof which also contains calcium ions which comprises contacting said solution with a solution of a quaternary ammonium salt of a hydrogen ion exchange reagent in an essentially water-immiscible organic solvent to extract at least a portion of but less than 100% of the magnesium values into the organic phase, separating the magnesium loaded organic phase from the aqueous phase and stripping magnesium from the organic phase, said hydrogen ion exchange reagent being selected from the group consisting of:

A. β-diketones having the formula



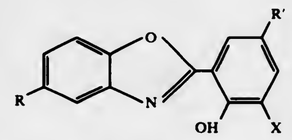
where R is phenyl or alkyl substituted phenyl, R′ is alkyl, alkyl substituted phenyl or chloro substituted phenyl and R″ is H or —CN with the provisos that (1) when R is phenyl, R′ is a branched chain alkyl group of at least seven carbon atoms and (2) when R is alkyl substituted phenyl, the number of carbon atoms in the alkyl substituent or substituents is at least 7 and at least one such alkyl substituent is branched chain;

B. fluorinated β-diketones having the formula



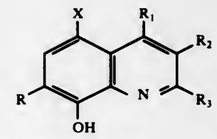
where n is a whole integer of 1 to 4, m is 0, 1 or 2 and R is an alkyl group of 1–25 carbon atoms;

C. benzoxazoles having the formula



where R is hydrogen or an alkyl group having from 1 to 20 carbon atoms, R′ is hydrogen, chlorine or an alkyl group containing from 1 to 20 carbon atoms, X is H or chlorine and the total number of carbon atoms in R and R′ is 6 to 40 with the proviso that one of R and R′ must be an alkyl group of at least 6 carbon atoms; and

D. 8-hydroxyquinolines of the formula



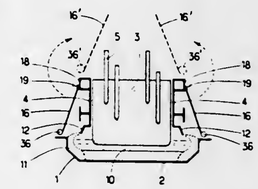
where R is a branched chain alkyl or alkenyl radical containing about 8 to 20 carbon atoms, R_1, R_2 and R_3 are hydrogen or alkyl groups of 1 to 4 carbon atoms and X is H, chlorine or bromine.

4,051,224

PROCESS AND APPARATUS FOR COLLECTING THE FUMES GIVEN OFF DURING THE PRODUCTION OF ALUMINIUM IN AN ELECTROLYSIS CELL WITH A CONTINUOUS ANODE

Daniel Duclaux, Lille; Andre J. A. Pontier, and Georges Paul Ferret, both of St. Jean de Maurienne, all of France, assignors to Aluminum Pechiney, Lyon, France

Division of Ser. No. 569,080, April 17, 1975, Pat. No. 4,002,551. This application Oct. 31, 1975, Ser. No. 627,596
Int. Cl.² B01D *53/34*
U.S. Cl. 423—210 **1 Claim**



1. A process for collecting the fumes given off during the production of aluminum in an electrolysis cell with a continuous anode consisting of a carbon mass accommodated in a tube and immersed in an electrolysis bath accommodated in a tank closed at its lower end by a cathode, comprising providing the lower end of the tube with a skirt forming a primary collection circuit for the gases and dust given off at the lower end of the anode, displacing a panel which extends longitudinally across the bath to within a short distance from the surface of the bath thereby permitting free flow of air through the narrow passage between the lower edge of the panel and the bath when in operative position, moving the panel in the direction away from the surface of the bath whereby access can be had to the surface of the bath when in raised position, closing the surface of the electrolysis bath along each of the short sides or cell "heads", by a fixed hooding closed laterally in fluid-tight manner by the two longitudinal panels, withdrawing the gases from the primary circuit and processing such gases for purification and treatment, separately withdrawing the gases from between the panel and the tube and separately processing such gases for purification and treatment.

4,051,225
METHOD FOR THE HEAT RECOVERY IN THE PROCESSES OF THE REMOVAL OF NITROGEN OXIDES FROM EXHAUST GASES

Shujiro Shiga, Chiba; Takeshi Katsumata, Ichihara; Yasushi Okamoto, Ichihara, and Tadashi Hikasa, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 17, 1975, Ser. No. 641,536
Claims priority, application Japan, Dec. 18, 1974, 49-145901; July 17, 1975, 50-87963
Int. Cl.² C01B *21/00, 17/00*
U.S. Cl. 423—235 **4 Claims**

1. In a method for heat recovery during processes for the removal of nitrogen oxides from combustion gases containing sulfur oxides and nitrogen oxides by a catalytic or non-catalytic reduction thereof with ammonia wherein the exhaust gases are introduced into a heat exchanger supplied with air wherein the improvement comprises maintaining at the entrance to said heat exchanger the molar ratio of ammonia to sulfuric anhydride sufficient to form ammonium hydrogen sulfate and in the range of about $O<NH_3/SO_3<2$ and a steam concentration of more than 12% by volume, and removing the ammonium hydrogen sulfate in the molten state from the heat exchanger.

4,051,226
PREVENTION OF EXPLOSIVE MIXTURES IN THE REGENERATION OF SULFUR OXIDE ACCEPTORS

Gernot Staudinger, and Jaap E. Naber, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

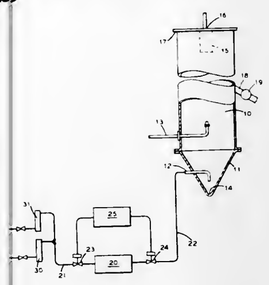
Continuation of Ser. No. 555,322, March 4, 1975, abandoned. This application May 12, 1976, Ser. No. 685,823
Claims priority, application Netherlands, Mar. 5, 1974, 7402928
Int. Cl.² C01B *17/00;* B01J *8/00*
U.S. Cl. 423—244 **4 Claims**

1. In a process wherein (A) a flue gas containing sulfur dioxide and oxygen is passed through a first inlet duct and open valve communicating therewith to a first reactor containing a copper-containing acceptor on a refractory carrier at a temperature of between 200° and 600° C, to remove sulfur dioxide from the flue gas, and then the purified flue gas is passed from the first reactor through an open valve communicating with a first outlet duct, and (B) wherein the valves communicating with the first inlet duct and the first outlet duct of said first reactor are closed, and the flue gas containing the sulfur dioxide and oxygen is then passed through another first inlet duct and open valve communicating therewith to a second reactor containing a copper-containing acceptor on a refractory carrier at a temperature between 200° and 600° C, to remove sulfur dioxide from the flue gas, and then the purified flue gas is passed from the second reactor through an open valve communicating with another first outlet duct, while, (C) concomitantly passing a hydrogen-containing gas through a second inlet duct and open valve communicating therewith to said first reactor at a temperature between 200° and 600° C to regenerate the acceptor and then passing the hydrogen-containing gas from said first reactor through an open valve-communicating with a second outlet duct, the improvement comprising, preventing hydrogen build-up from valve leakage into the first inlet duct of the first reactor during step (C) by passing a quantity of flue gas sufficient to prevent hydrogen build-up through the first inlet duct of the first reactor and then to the first inlet duct of the second reactor.

4,051,227
METHOD FOR REDUCING URANIUM TETRAFLUORIDE

Henry M. Heidt, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Division of Ser. No. 444,624, Feb. 22, 1974, Pat. No. 3,979,499, which is a continuation of Ser. No. 17,682, March 9, 1970, abandoned. This application June 28, 1976, Ser. No. 700,377
Int. Cl.² C01G *43/06*
U.S. Cl. 423—259 **1 Claim**



1. A process for the treatment of uranium hexafluoride which comprises the steps of passing a flow of gaseous uranium hexafluoride to a reaction zone, passing a pulsed flow of a gaseous reactant medium comprising an organic halide into the reaction zone to maintain a zone temperature on the order of 600° F and a pressure slightly above atmosphere to enable the uranium hexafluoride to initially form only from said gases fine solid particles containing substantially only UF_4, continuing the treatment of the uranium hexafluoride within said reaction zone to increase the size of the formed fine particles and to accumulate further fine particles in the reaction zone, and adjusting the rate of pulsed flow of reactant medium to the reaction zone by increasing the pressure of the reactant medium to a maximum pressure about twice atmospheric while simultaneously reducing the frequency of the pulsed flow in accordance with the amount of solid particles therein.

4,051,228
PREVENTING CAKING AND OBTAINING FLOWABILITY OF ALKALI CHLORIDES AND SALT MIXTURES THEREOF

Helmut Knorre, Seligenstadt; Joachim Fischer, and Gerhard Pohl, both of Hanau, all of Germany, assignors to Deutsch Gold-und Silber-Scheideanstalt, Frankfurt, Germany

Filed May 20, 1975, Ser. No. 579,158
Claims priority, application Germany, Nov. 29, 1974, 2456434
Int. Cl.² C01G *3/26*
U.S. Cl. 423—268 **7 Claims**



1. A flowable alkali metal chloride composition resistant to caking on storage including as an anticaking agent (A) in complex iron cyanide (B) a water insoluble, inorganic, inert, finely divided hydroxyl group containing carrier material, optionally (C) and including (D) where (C) is a hydrophobizing material and (D) is

1. is a polyacrylate (2) poly-(alpha-hydroxyacrylate), (3) maleic acid homo or copolymer, (4) itaconic acid homo or copolymer or (5) a salt of (1), (2), (3) or (4), said materials (A), (C) and (D) being present on B, said anticaking agent providing a permanent moisture content of at least 0.01 weight % of water on the salt.

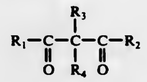
6. A flowable alkali metal chloride composition resistant to caking on storage including as an anticaking agent (A) sodium, potassium or calcium ferrocyanide (B) a water insoluble, inorganic, inert finely divided hydroxyl group containing carrier material, optionally (C) and including (D) where C is a hydrophobizing material and (D) is the sodium salt of a polycarboxylate having carbonyl groups, hydroxyl groups, or both carbonyl and hydroxyl groups and (D) is present in an amount of 0.001 to 0.1 weight % based on alkali metal chloride, said materials (A) (C) and (D) being present on B, said anticaking agent providing a permanent moisture content of at least 0.01 weight % of water on the salt.

4,051,229
PROCESS FOR MANUFACTURING CHLORINE DIOXIDE

Isao Isa, Misato; Morioki Shibuya, Shibukawa, and Makoto Ebisawa, Kiryu, all of Japan, assignors to The Japan Carlit Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1976, Ser. No. 730,196
Claims priority, application Japan, July 12, 1976, 51-82707
Int. Cl.² C01B *11/02*
U.S. Cl. 423—478 **20 Claims**

1. A process for manufacturing chlorine dioxide by reducing a chlorate selected from the group consisting of sodium chlorate, potassium chlorate, calcium chlorate and magnesium chlorate, in a strong acid selected from the group consisting of sulfuric acid present in a concentration of from about 0.5 to about 6 moles per liter of reaction medium, hydrochloric acid in a concentration of from about 0.01 to about 4 moles per liter of reaction medium and a mixture thereof, in the presence of a complex catalyst consisting of palladium (II) and a β-diketone of the formula



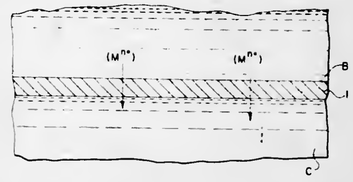
wherein R_1 and R_2 are selected from the group consisting of hydrogen, an alkyl radical having from 1 to 10 carbon atoms and an aryl radical; and R_3 and R_4 are selected from the group consisting of hydrogen and a methyl radical.

4,051,230
LIQUID-LIQUID EXTRACTION PROCESS OF METALS

Terukatsu Miyauchi, Yokohama, Japan, assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Dec. 17, 1974, Ser. No. 533,645
Claims priority, application Japan, Dec. 18, 1973, 48-142040
Int. Cl.² B01D *11/04*
U.S. Cl. 423—658.5 **7 Claims**

1. A continuous liquid-liquid extraction process of extracting heavy metal cations from an aqueous solution extraction feed containing said cations, which process comprises bringing said aqueous solution into contact with one side of a chemically resistant membrane, said membrane having continuous fine pores impregnated and filled with a first organic extractant containing a chelating agent, and bringing a second aqueous extractant in contact with the other side of said membrane, while maintaining the pH value of the extraction feed greater than that of the second extractant, whereby said heavy metal cations dissolved in said feed solution are transferred from said extraction feed to said first extractant supported in said fine pores with complexing, through said membrane, due to the decreasing concentration of the metal chelate and into said

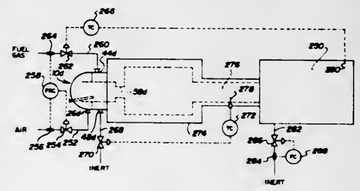


second extractant from said membrane with regeneration of the chelating agent and release of said metal cation.

4,051,231
PRODUCTION OF INTERNAL ATMOSPHERES FOR KILNS

Desmond H. Bond; George W. Taggart, both of Dallas, and Kurt S. Jaeger, Hurst, all of Tex., assignors to Ford, Bacon & Davis Texas, Inc., Garland, Tex.

Division of Ser. No. 508,671, Sept. 23, 1974, Pat. No. 3,963,443. This application Mar. 31, 1976, Ser. No. 672,408
Int. Cl.² B01J *7/00;* C01B *1/00;* F27B *1/26;* G05D *23/00*
U.S. Cl. 423—659 **7 Claims**



7. A process for producing atmospheres for kilns comprising:

a. creating an elongated air flow zone the outlet of which communicates with a thermal reaction zone wherein air is passed uniformly about the inner periphery of said air flow zone, toward said thermal reaction zone, in a parabolic velocity front;
b. injecting a fuel gas, in a controlled amount, from points radial of said elongated air flow zone and adjacent its outlet in a manner such that said fuel gas impinges the air being passed in said thermal reaction zone;
c. injecting an inert gas in a controlled amount from points adjacent to the points of injection of said fuel gas and in substantially the same direction as said fuel gas;
d. igniting the mixture of fuel gas, air, and inert gas in said thermal reaction zone to produce an atmosphere of desired composition; and
e. passing said atmosphere of desired composition into a kiln.

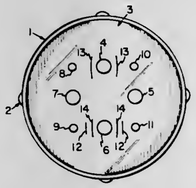
4,051,232
SEROLOGIC TEST FOR SYSTEMIC CANDIDIASIS

Walter P. Protzman, Hopewell, and George L. Evans, Hopatcong, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Aug. 12, 1975, Ser. No. 603,896
Int. Cl.² G01N *33/16, 31/02*
U.S. Cl. 424—12 **6 Claims**

1. In an in vitro test method for the diagnosis of systemic candidiasis in a mammalian host, said test method being based on precipitin formation between antibodies in a blood serum sample from said host and antigens in solution, said antibodies and antigens each diffusing through an agar layer maintained at

a pH of 7 to 9.6, to encounter one another and form said precipitin, the improvement which comprises incorporating in said antigen solution a concentration of protein antigens in the range of 0.5 to 10 mg. per ml and a concentration of mannan



antigen in the range of 0.025 to 1 mg. per ml, the weight ratio of said protein antigens to mannan being in the range of 5:1 to 10:1 said protein and mannan antigens prepared from the yeast phase, whereby false readings are reduced.

4,051,233

2-NAPHTHYLACETIC ACID DERIVATIVES AND COMPOSITIONS AND METHODS THEREOF

John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Palo Alto, Calif.

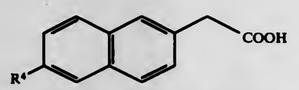
Division of Ser. No. 494,652, Aug. 5, 1974, Pat. No. 3,980,699, which is a division of Ser. No. 195,878, Nov. 4, 1971, Pat. No. 3,896,157, which is a division of Ser. No. 694,771, Dec. 7, 1967, abandoned, which is a continuation-in-part of Ser. No. 608,997, Jan. 13, 1967, abandoned. This application May 10, 1976, Ser. No. 684,993

Int. Cl.[2] A61K *31/19*; C07C *63/36*

U.S. Cl. 424—317 **9 Claims**

1. A compound selected from the group of compounds represented by the formula:

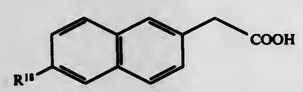
(XI)



wherein R^4 is aryl, and the corresponding esters, and pharmaceutically accepted addition salts thereof.

4. A method of effecting treatment of inflammation, pain, pyrexia, and pruritus which comprises administering an effective therapeutic dose of a compound selected from the group of compounds represented by the formula:

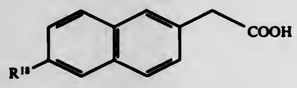
(I)



wherein R^{18} is aryl, or a corresponding ester or pharmaceutically acceptable addition salts thereof.

7. A pharmaceutical composition for use in effecting treatment of inflammation, pain, fever, and itching which comprises a pharmaceutically acceptable non-toxic excipient and a therapeutically effective amount of a compound represented by the formula:

(I)



wherein R^{18} is aryl, or a corresponding ester or pharmaceutically acceptable addition salt thereof.

4,051,234

ORAL COMPOSITIONS FOR PLAQUE, CARIES, AND CALCULUS RETARDATION WITH REDUCED STAINING TENDENCIES

Henry Anthony Gieske, Covington, Ky., and Prem Sagar Juneja, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

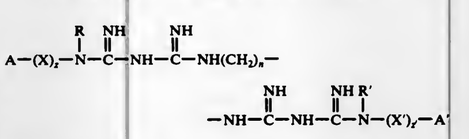
Continuation-in-part of Ser. No. 584,304, June 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 495,951, Aug. 9, 1974, abandoned. This application Apr. 29, 1976, Ser. No. 681,867

Int. Cl.[2] A61K *7/18, 7/22*

U.S. Cl. 424—52 **20 Claims**

1. An oral composition effective in inhibiting bis-biguanide tooth staining and the formation of plaque, caries and calculus comprising a carrier suitable for use in the oral cavity and

A. from about 0.01% to about 2.5% by weight of a tooth staining bis-biguanide compound, otherwise tending to produce a rather offensive brown tooth stain upon continuous oral use and having the generic formula:



wherein A and A' each represent either (1) a phenyl radical which can contain as substituents up to two alkyl or alkoxy groups containing from 1 to about 4 carbon atoms, a nitro group, or a halogen atom; (2) an alkyl group containing from 1 to about 12 carbon atoms; or (3) alicyclic groups containing from 4 to about 12 carbon atoms; wherein X and X' each represent an alkylene radical containing from 1 to 3 carbon atoms; wherein z and z' each can be either 0 or 1; wherein R and R' each represent either hydrogen, an alkyl radical containing from 1 to about 12 carbon atoms, or an aralkyl radical containing from 7 to about 12 carbon atoms; wherein n is an integer from 2 to 12 inclusive; and wherein the polymethylene chain $(CH_2)_n$ can be interrupted by up to 5 ether, thioether, phenyl, or naphthyl moieties; or the pharmaceutically acceptable salts thereof; and

B. from about 0.10% to about 1.25% by weight of the composition of a chelator in excess of the amount of chelator which will react with the bis-biguanide compounds, and which in said concentration range effectively reduces said bis-biguanide tooth stain without precipitating said tooth-staining bis-biguanide, said chelator being an amino carboxylate compound selected from the group consisting of: Ethylene-diaminediacetic acid and the water-soluble pharmaceutically acceptable salts thereof, said composition having a pH of from about 4.5 to about 9.5.

4,051,235

METHOD OF PREPARING BOVINE COLOSTRUM FOR USE IN TREATING LIVESTOCK

Robert R. Plymate, 1079 South St., Blair, Nebr. 68008

Filed Apr. 22, 1976, Ser. No. 679,470

Int. Cl.[2] A61K *39/00*

U.S. Cl. 424—85 **9 Claims**

1. The method of preparing bovine colostrum for use in treating livestock comprising the following steps,

collecting bovine colostrum milk,

removing substantially all of the fat from the colostrum milk,

removing the casein from the colostrum milk to obtain bovine colosteral whey,

dializing the whey,

adjusting the pH of the dialsate to 4.0–4.5,

precipitating the whey,

removing the supernant from the precipitated whey,

clarifying the supernant,

adding a water, saline and phenol mixture to the clarified supernant to obtain the desired concentration,

sterilizing the mixture,

and placing the sterilized mixture into containers for subsequent storage and use.

4,051,236

INHIBITION OF BLOOD PLATELET AGGREGATION

Don Navarro Harris, Somerset; Marie B. Phillips, Skillman, and Harold Jacob Goldenberg, Highland Park, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 332,847, Feb. 15, 1973, abandoned. This application May 20, 1976, Ser. No. 688,501

Int. Cl.[2] A61K *35/14*

U.S. Cl. 424—101 **7 Claims**

1. A method of inhibiting aggregation of human blood platelets which comprises contacting the platelets with PGE_1 and a compound which potentiates the effectiveness of PGE_1, which compound is a member selected from the group consisting of

4-(Butylamino)-1-ethyl-1H-pyrazolo[3,4-b]pyridine-5-carboxylic acid, ethyl ester

4-Chloro-1-ethyl-3-methyl-1H-pyrazolo[3,4-b]pyridine-5-acetonitrile

1-Ethyl-4-(isopropylidenehydrazino)-3-methyl-1H-pyrazolo[3,4-b]pyridine-5-carboxylic acid, ethyl ester, or its hydrochloride, hemihydrate

3-Ethyl-7,12-dimethylpyrazolo[4',3':5,6]pyrido[4,3-b]-[1,5]benzodiazepin-6-(3H)-one

3-Ethyl-7,12-dihydro-9-methoxy-7,12-dimethyl-pyrazolo[3',4':2,3]pyrido[4,5-b][1,5]benzodiazepin-6(3H)-one

4-(Butylamino)-1H-pyrazolo[3,4-b]pyridine-6-carboxylic acid, ethyl ester

4-(Butylamino)-1-ethyl-1,7-dihydro-7-hydroxy-5H-furo-[3,4-e]pyrazolo[3,4-b]pyridin-5-one

10-Chloro-3-ethyl-7,12-dimethyl-7,12-dihydropyrazolo-[4',3':5,6]pyrido[4,3-b][1,5]benzodiazepin-6(3H)-one, said PGE_1 being present in a concentration of from about 10^{-6} molar to about 10^{-9} molar, and said compound being present in a concentration of from about 0.1 mM to about 4 mM.

5. A composition for inhibiting aggregation of human blood platelets which comprises PGE_1 and a member which potentiates the effectiveness of PGE_1, which member is selected from the group consisting of

4-(Butylamino)-1-ethyl-1H-pyrazolo[3,4-b]pyridine-5-carboxylic acid, ethyl ester

4-Chloro-1-ethyl-3-methyl-1H-pyrazolo[3,4-b]pyridine-5-acetonitrile

1-Ethyl-4-(isopropylidenehydrazino)-3-methyl-1H-pyrazolo[3,4-b]pyridine-5-carboxylic acid, ester, or its hydrochloride, hemihydrate

3-Ethyl-7,12-dimethylpyrazolo[4',3':5,6]pyrido[4,3-b]-[1,5]benzodiazepin-6-(3H)-one

3-Ethyl-7,12-dihydro-9-methoxy-7,12-dimethyl-pyrazolo[3',4':2,3]pyrido [4,5-b][1,5]benzodiazepin-6(3H)-one

4-(Butylamino)-1H-pyrazolo[3,4-b]pyridine-6-carboxylic acid, ethyl ester

4-(Butylamino)-1-ethyl-1,7-dihydro-7-hydroxy-5H-furo[3,4-e]pyrazolo[3,4-b]pyridin-5-one

10-Chloro-3-ethyl-7,12-dimethyl-7,12-dihydropyrazolo-[4',3':5,6]pyrido[4,3-b][1,5]benzodiazepin-6(3H)-one, said PGE_1 being present in a concentration of from about 10^{-6} molar to about 10^{-9} molar, and said member being present in a concentration of from about 0.1 mM to about 4 mM

4,051,237

GLYCOPEPTIDE ANTIBIOTICS BU-2231 A AND B AND PROCESS FOR PRODUCING SAME

Hiroshi Kawaguchi, Tokyo; Koji Tomita, Kawasaki; Hiroshi Tsukiura, Mitaka, and Masataka Konishi, Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,494

Int. Cl.[2] A61K *35/74*

U.S. Cl. 424—117 **15 Claims**

1. The glycopeptide antitiotic Bu-2231 A or a pharmaceutically acceptable acid addition salt thereof; which antibiotic substance is a base capable of existing in both a copper complex form and a copper-free form; which when subjected to acid hydrolysis gives the amino acids L-threonine, β-amino-β-(4-amino-6-carboxy-5-methylpyrimidine-2-yl)propionic acid, β-hydroxyhistidine, L-β-aminoalanine, 4-amino-3-hyroxy-n-valeric acid, β-lysine and an amino acid exhibiting an ultraviolet absorption maximum at 283 mμ($E_{1cm}^{1\%}$ 280), the terminal amine spermidine and the carbohydrates mannose and gulose; which in the copper complex form (1) is a bluish amorphous solid soluble in water and methanol, slightly soluble in ethanol and practically insoluble in other organic solvents, (2) gives a positive reaction with ninhydrin, (3) has the following elemental analysis (percent): C, 42.66; H, 6.16; N, 15.31; and S, 3.14, (4) shows ultraviolet absorption $\lambda_{MAX}^{H_2O}$ 243 and 291 mμ ($E_{1cm}^{1\%}$ 125 and 98), (5) has a specific rotation of $[\alpha]_D^{23} = +50°$ (c, 0.5, H_2O), and (6) exhibits an Rf of 0.22 in thin layer chromatography using silica gel and methanol—10% ammonium acetate (1:1) and an Rf of 0.05 using silica gel and methanol-10% ammonium acetate-10% ammonium hydroxide (10:9:1), which in the copper-free form (1) is a white amorphous solid, (2) has a specific rotation of $[\alpha]_D^{23} = -21°$ (c, 0.5, H_2O), (3) has the following elemental analysis (percent): C, 45.10; H, 6.51; N, 16.05; and S, 3.55, (4) shows ultraviolet absorption $\lambda_{MAX}^{H_2O}$ 235 and 290 mμ ($E_{1cm}^{1\%}$ sh and 67), and (5) exhibits an Rf of 0.16 in thin layer chromatography using silica gel and methanol — 10% ammonium formate (1:1) and an Rf of 0.04 using silica gel and methanol— 10% ammonium acetate — 10% ammonium hydroxide (10:9:1); which as the copper-free hydrochloride salt when pelleted in potassium bromide has an infrared spectrum substantially as shown in FIG. 1 and when dissolved in deuterium oxide at a concentration of 10% gives an NMR spectrum substantially as shown in FIG. 2; and which in both the copper-free and copper complex forms is effective in inhibiting the growth of bacteria and fungi.

4,051,238

TREATMENT OF GENITAL TRACT DISEASES OF DOMESTIC ANIMALS WITH PROSTAGLANDINS

James H. Sokolowski, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed June 3, 1976, Ser. No. 692,440

Int. Cl.[2] A61K *31/71, 31/215, 31/19*

U.S. Cl. 424—181 **20 Claims**

1. A method for treating a female domestic animal suffering from a purulent genital tract disease which comprises:

administering to said animal an amount of a domestic animal luteolytic-uterine smooth muscle stimulating prostaglandin (DALUSMUS-PG) effective to cure said disease.

4,051,239

METHOD OF USE AND PROCESS FOR PREPARING PHOSPHOROIMINOBENZOYLUREA INSECTICIDES

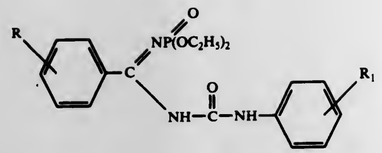
Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 26, 1976, Ser. No. 652,039

Int. Cl.[2] A01N *9/36*; C07F *9/24*

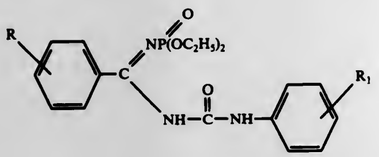
U.S. Cl. 424—211 **35 Claims**

1. A compound having the formula



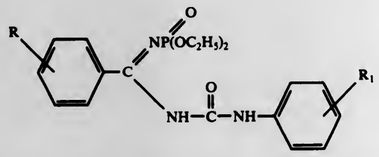
in which R and R_1 are independently selected from the group consisting of hydrogen, 2-halogen, 4-halogen, and 2,6-dihalogen.

14. A method of controlling insects comprising applying to the habitat thereof an insecticidally effective amount of a compound having the formula



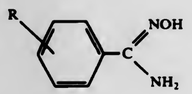
in which R and R_1 are independently selected from the group consisting of hydrogen, 2-halogen, 4-halogen, and 2,6-dihalogen.

30. A process for the manufacture of a compound having the formula

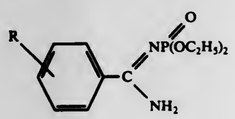


wherein R and R_1 are independently selected from the group consisting of hydrogen, 2-halogen, 4-halogen, and 2,6-dihalogen comprising

a. reacting a compound having the formula

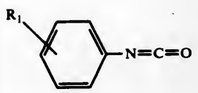


wherein R is defined above with diethyl chlorophosphite and a suitable organic base to produce a compound having the formula



and

b. reacting the product of step (a) with a compound having the formula



wherein R_1 is defined above to produce the end product.

4,051,240

O,S-DIALKYL-O-(4-PHENYLAZOPHENYL)-THIOPHOSPHATES AND PESTICIDAL COMPOSITIONS THEREOF

Alexis A. Oswald, Mountainside, and Paul L. Valint, Woodbridge, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

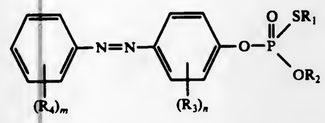
Continuation-in-part of Ser. No. 377,855, July 9, 1973, abandoned. This application Mar. 11, 1976, Ser. No. 666,120

Claims priority, application Switzerland, July 7, 1972, 10210/72; May 11, 1973, 6720/73

Int. Cl.[2] **A01N** *9/36;* **A61K** *31/665, 13/00;* **C07C** *107/06*

U.S. Cl. 424—225 **13 Claims**

1. A compound of the formula



wherein R_1 represents propyl or butyl; R_2 represents methyl or ethyl; each of R_3 and R_4 represents hydrogen, halogen or alkyl having from 1 to 5 carbon atoms; *n* is a number from 1 to 4; and *m* is a number from 1 to 5.

10. A pesticidal composition comprising (1) a pesticidally effective amount of a compound according to claim 1 and (2) a carrier.

4,051,241

METHOD OF TREATING DISEASES BY DAILY ADMINISTRATION OF 6-CHLORO-11β,17α,21-TRIHYDROXYPREGNA-1,4,6-TRIENE-3,20-DIONE

Eugene J. Segre, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 557,137, March 10, 1975, abandoned. This application Aug. 12, 1976, Ser. No. 713,769

Int. Cl.[2] **A61K** *31/56*

U.S. Cl. 424—243 **5 Claims**

1. The method of treating allergic, dermatologic and rheumatic diseases in mammals while, at the same time, lessening the deleterious side effects associated with the hypothalamic-pituitary-adrenal (HPA) axis function during corticosteroid administration, which comprises daily orally administering to said mammal in a single dose in the morning an effective amount of from about 2.5 mg. to about 20 mg. of the compound 6-chloro-11β,17α,21-trihydroxypregna-1,4,6-triene-3,20-dione.

4,051,242

SUBSTITUTED N-ACYL-N''-(3-AMINO-2-CYANOACRYLOYL-)FORMAMIDRAZONES

Kurt Klemm, Allensbach, Germany, and Erhard Langenscheid, late of Constance, Germany, assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany

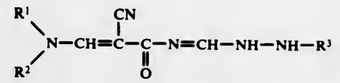
Filed Aug. 22, 1974, Ser. No. 499,522

Claims priority, application Luxembourg, Aug. 27, 1973, 68317

Int. Cl.[2] **C07D** *295/00*

U.S. Cl. 424—246 **27 Claims**

2. A compound of the formula



wherein

R^1 is a member selected from the group consisting of straight- or branch-chained alkyl with from 1 to 7 carbon atoms and cycloalkyl with from 3 to 6 carbon atoms;

R^2 is —H or one of the meanings of R^1; or

R^1 and R^2 together denote (a) pentamethylene or (b) pentamethylene in which at least one methylene is replaced by a member selected from the group consisting of —O—, —S— and —NR^7—;

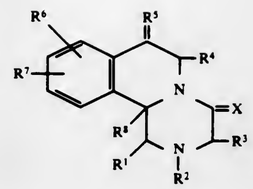
R^3 is a member selected from the group consisting of CO—R^4, —CO—OR^4 and —CO—$N(R^5)R^6$

R^4 is an $R^5(R^6)$N-substituted or unsubstituted member selected from the group consisting of straight- or branch-chained alkyl with from 1 to 14 carbon atoms, a methylene (other than a methylene) group of which is optionally replaced by an oxygen atom; cycloalkyl with from 3 to 6 carbon atoms; phenyl; phenyl substituted by at least one member selected from the group consisting of straight- or branch-chained alkyl, alkoxy or alkylmercapto having from 1 to 7 carbon atoms, alkoxycarbonyl with from 2 to 5 carbon atoms, halo, trifluoromethyl, nitro and cyano; phenylalkyl, the alkyl of which has from 1 to 6 carbon atoms and the phenyl of which is optionally substituted by at least one member selected from the group consisting of straight- or branch-chained alkyl, alkoxy or alkylmercapto having from 1 to 7 carbon atoms, alkoxycarbonyl with from 2 to 5 carbon atoms, halo, trifluoromethyl, nitro and cyano; or a C_{3-6}—cycloalkyl substituted by —$N(R^5)R^6$;

each of R^5 and R^6 is, independently, a member selected from the group consisting of -H; straight- or branch-chained alkyl with from 1 to 7 carbon atoms, a methylene group of which is optionally replaced by an oxygen atom; and cycloalkyl with from 3 to 6 carbon atoms; or

R^5 and R^6 together denote alkylene with from 2 to 5 carbon atoms or such alkylene in which at least one methylene group is replaced by —O—, —S— or —NR^7—;

R^7 is a member selected from the group consisting of —H; hydroxy-substituted or unsubstituted straight- or branch-chained alkyl with from 1 to 7 carbon atoms; and phenyl optionally substituted by straight- or branch-chained alkyl or alkoxy with from 1 to 7 carbon atoms, halo or trifluoromethyl.



wherein R^1 is a hydrogen atom, hydroxy or alkyl; R^2 is



R^3 is a hydrogen atom, alkyl or hydroxyalkyl; R^4 is a hydrogen atom, alkyl or phenyl; R^5 is an oxygen atom, two hydrogen atoms, or a hydrogen atom and one of alkyl, phenyl, halogen atoms, or hydroxy; R^6 and R^7, which can be alike or different, each are a hydrogen atom, a halogen atom, hydroxy, amino, nitro, cyano, alkyl, alkoxy, alkanoyl, monoalkylamino, dialkylamino, alkanoylamino, or benzoyloxy; R^8 is a hydrogen atom or alkyl; R^9 is cycloalkyl or cycloalkenyl of 5 to 7 carbon atoms which is unsubstituted or, substituted by a carbonyl oxygen atom X and Y, which can be the same or different, each is an oxygen or sulfur atom; with the proviso that R^2 is



when R^1 and R^3 to R^8, inclusive, each are hydrogen atoms and X is an oxygen atom alkyl, hydroxyalkyl, alkoxy and alkanoyl being up to 4 carbon atoms.

17. An anthelmintic composition comprising an anthelmintically effective amount per unit dosage of at least one compound of claim 1 in admixture with a pharmaceutically acceptable carrier or in admixture with an animal feed or feed concentrate.

4,051,243

RING SUBSTITUTED PYRAZINO-ISOQUINOLINE DERIVATIVES AND THEIR PREPARATION

Jürgen Seubert; Rolf Pohlke, both of Darmstadt; Herbert Thomas, and Peter Andrews, both of Wuppertal, all of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

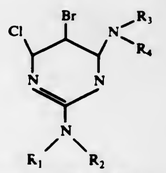
Filed Aug. 26, 1975, Ser. No. 607,810

Claims priority, application Germany, Aug. 28, 1974, 2441261

Int. Cl.[2] **C07D** *241/36;* **A61K** *31/495*

U.S. Cl. 424—250 **22 Claims**

1. A compound of the formula



in which R_1 represents hydrogen or alkyl containing from 1 to 4 carbons, R_2 represents hydrogen, alkyl having 1 to 8 carbons, dialkylaminoalkyl or aryl, and

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4,051,244

2,4-DIAMINO 5-BROMO 6-CHLORO PYRIMIDINES, PROCESS FOR THEIR PREPARATION AND USE AS PHARMACEUTICALS

Georges Dominique Mattioda, Deuil-la-Barre, and Francois Louis Albert Rocquet, Viarmes, both of France, assignors to Mar-Pha Societe d'Etudes et d'Exploitation de Marques, Paris, France

Filed May 20, 1976, Ser. No. 687,972

Claims priority, application France, May 23, 1975, 75.16088

Int. Cl.[2] **A61K** *31/495, 31/505;* **C07D** *239/00*

U.S. Cl. 424—250 **17 Claims**

1. A compound of the general formula:

in which R_1 represents hydrogen or alkyl containing from 1 to 4 carbons, R_2 represents hydrogen, alkyl having 1 to 8 carbons, dialkylaminoalkyl or aryl, and



is piperazinyl which may be substituted in position 4 by methyl or benzyl, or when R_3 represents hydrogen or alkyl having 1 to 4 carbons, and when R_4 represents hydrogen, alkyl having 1 to 8 carbons, dialkylaminoalkyl or aryl, then



is piperazinyl which may be substituted in position 4 by methyl or benzyl.

15. A method for producing anti-ulcer therapy in a human requiring such therapy which comprises internally administering to said human an amount effective to produce anti-ulcer therapy of a compound of the formula of claim **1**.

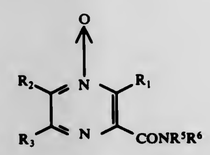
4,051,245

PYRAZINE 4-OXIDE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Vittorio Ambrogi, Bresso, Milan; Willy Logemann, Milan; Marc'Antonio Parenti, Milan, and Raffaele Tommasini, all of Milan,, Italy, assignors to Carlo Erba, S.p.A., Milan, Italy

Division of Ser. No. 578,820, May 19, 1975, Pat. No. 4,002,750, which is a continuation of Ser. No. 354,909, April 26, 1973, abandoned. This application Oct. 15, 1976, Ser. No. 732,982
Claims priority, application Italy, Apr. 28, 1972, 23663/72
Int. Cl.² A61K *31/495*; C07D *241/24*
U.S. Cl. 424—250 **11 Claims**

1. A compound of the formula



wherein at least one of R_1, R_2 and R_3 is C_{1-6} alkyl and the others are hydrogen atoms; each of R^5 and R^6, which may be the same or different, is hydrogen or C_{1-6} alkyl.

8. A pharmaceutical composition consisting essentially of a compound according to claim **1** and a pharmaceutically acceptable carrier or diluent.

4,051,246

2-SUBSTITUTED-1H-BENZ(DE)-ISOQUINOLINE-1,3-(2H)-DIONES

Peter C. Wade, Pennington, N.J., and Berthold Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sept. 29, 1976, Ser. No. 727,836
Int. Cl.² A61K *31/47*; C07D *405/04*
U.S. Cl. 424—258 **6 Claims**

1. A compound of the formula

wherein R^1 is hydrogen, methyl or ethyl; R^2 is methyl, ethyl, halogen, hydroxy, nitro, amino, acetamido or formamido; n is zero, one or two, and when n is two, R^2 may be methylenedioxy or ethylenedioxy bonded to adjacent carbon atoms; and when R^2 is ethyl, methoxy, nitro, amino, acetamido or formamido, and n is two, each R^2 must be different; or a lower alkyl ester or pharmaceutically acceptable salt derivative thereof.

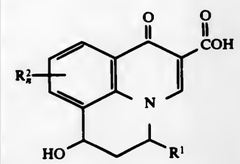
4,051,247

METHOD OF USING 7-HYDROXY-BENZO[IJ]QUINOLIZINE-2-CARBOXYLIC ACID DERIVATIVES

Dietrich Schuppan, St. Paul; John F. Gerster, and Charles M. Leir, both of Woodbury, all of Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Division of Ser. No. 567,510, April 14, 1975, Pat. No. 3,985,753.
This application Mar. 24, 1976, Ser. No. 669,845
Int. Cl.² A61K *31/47*
U.S. Cl. 424—258 **2 Claims**

1. A method for inhibiting the growth of microorganisms which comprises applying to said microorganisms an effective growth-inhibiting amount of a compound of the formula



wherein R^1 and ^{2} are independently selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen, lower alkylthio, nitro, cyano, and trifluoromethyl; and n is 1 or 2.

5. A pharmaceutical composition useful for treating inflammation in a mammalian specie comprising as the active ingredient from about 1 mg./kg. to about 30 mg./kg. of a compound or mixture of compounds of claim **1** and a pharmaceutically acceptable carrier.

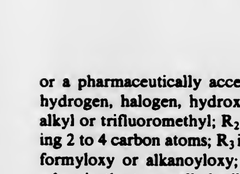
4,051,248

1,3,8-TRIAZASPIRO(4.5)DECAN-4-ONE DERIVATIVES

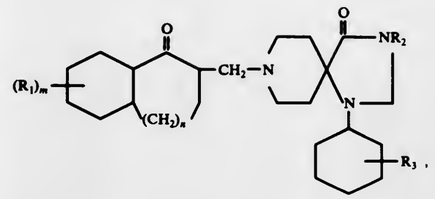
B. Richard Vogt, Yardley, Pa., and David A. Cullison, Princeton, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 595,947, July 14, 1975, abandoned. This application May 20, 1976, Ser. No. 688,438
Int. Cl.² C07D *471/10*; A61K *31/445*
U.S. Cl. 424—267 **16 Claims**

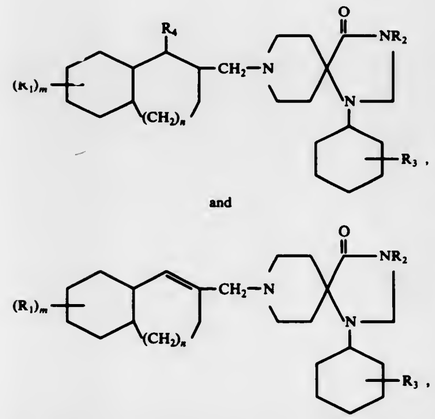
1. A compound having the formula



wherein R^1 is hydrogen, methyl or ethyl; R^2 is methyl, ethyl, halogen, hydroxy, nitro, amino, acetamido or formamido; n is zero, one or two, and when n is two, R^2 may be methylenedioxy or ethylenedioxy bonded to adjacent carbon atoms; and when R^2 is ethyl, methoxy, nitro, amino, acetamido or formamido, and n is two, each R^2 must be different; or a lower alkyl ester or pharmaceutically acceptable salt derivative thereof.



and



or a pharmaceutically acceptable salt thereof, wherein R_1 is hydrogen, halogen, hydroxy, alkanoyloxy, alkoxy, alkylthia, alkyl or trifluoromethyl; R_2 is hydrogen, alkyl or alkenyl having 2 to 4 carbon atoms; R_3 is hydrogen, halogen or alkyl; R_4 is formyloxy or alkanoyloxy; m is 1 or 2; and n is 0, 1 or 2; wherein the terms alkyl, alkoxy and alkylthio refer to groups having 1 to 10 carbon atoms and the term alkanoyloxy refers to groups having 2 to 11 carbon atoms.

15. A neuroleptic composition comprising a therapeutic amount of a compound as defined in claim **1** and a pharmaceutically acceptable carrier thereof.

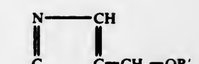
4,051,249

SALTS OF 2-ALKYLTHIAZOLE-5-METHANOL DERIVATIVES

Michel Hardy, Maisons-Alfort, and Daniel Humbert, Paris, both of France, assignors to Roussel-UCLAF, Paris, France

Filed Jan. 19, 1976, Ser. No. 650,291
Claims priority, application France, Jan. 22, 1975, 75.01972
The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.
Int. Cl.² C07D *277/24*
U.S. Cl. 424—270 **9 Claims**

1. The non-toxic, pharmaceutically acceptable acid addition salts of a compound of the formula



wherein R is an alkyl of 2 to 12 carbon atoms and R′ is selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms and acyl of an organic carboxylic acid of 1 to 12 carbon atoms selected from the group consisting of alkanoic acids, cycloalkylcarboxylic acids, cycloalkylalkanoic acids, benzoic acid and phenylalkanoic acids.

5. An hypolipemiant and vasodilatatory composition comprising an hypolipemiantly and vasodialatatorily effective amount of at least one acid addition salt of claim **1** and an inert pharmaceutical carrier.

7. A method of inducing hypolipemic and vasodilatatory activity in warm-blooded animals comprising administering to warm-blooded animals an hypolipemically and vasodilatatorily effective amount of at least one salt of claim **1**.

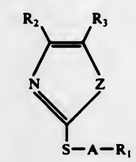
4,051,250

ANTIINFLAMMATORY AZOLE DERIVATIVES

Johann Dahm, Eschollbrucken; Joachim Borck, Darmstadt; Albrecht Wild, Darmstadt, and Jan Willem Hovy, Darmstadt, all of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Division of Ser. No. 260,307, June 6, 1972, Pat. No. 3,933,840. This application Oct. 21, 1975, Ser. No. 624,447
Claims priority, application Germany, June 11, 1971, 2129012
Int. Cl.² A61K *31/42, 31/425*
U.S. Cl. 424—272 **19 Claims**

1. A pharmaceutical composition comprising, in admixture with a solid, liquid or semiliquid pharmaceutically acceptable carrier, an antinflammatorily effective amount per unit dosage of a compound of the formula



wherein R_1 is carboxyl, a physiologically acceptable C_{1-12} alkyl ester thereof, —$CONH_2$ or —CN; R_2 and R_3 each are phenyl or phenyl mono- or di-substituted by at least one member selected from the group consisting of alkyl, alkoxy alkylmercapto, monoalkylamino, dialkylamino or alkanoylamino wherein the alkyl, alkoxy and alkanoyl are each of up to 4 carbon atoms, F, Cl, Br, I, CF_3, OH, methylenedioxy, NH_2 and NO_2; A is C_nH_{2n} wherein n is an integer from 1 to 10 inclusive; and Z is O or S, or a physiologically acceptable salt thereof.

4,051,251

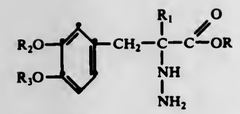
NOVEL ANTI-HYPERTENSIVE COMPOSITIONS

Clement A. Stone, Blue Bell, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 13, 1976, Ser. No. 657,824
Int. Cl.² A61K *31/415, 31/24, 31/195*
U.S. Cl. 424—273 R **7 Claims**

1. A pharmaceutical composition for treating hypertension comprising

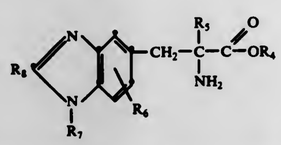
A. a decarboxylase inhibitor compound having the formula



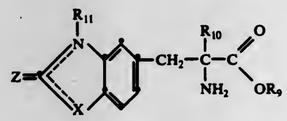
wherein R, R_1, R_2 and R_3 are independently selected from hydrogen and C_1–C_4 alkyl, and pharmaceutically acceptable salts thereof and

B. an arylalanine selected from compounds having the formulae:

(1)



wherein R_4, R_5, R_7 and R_8 are independently selected from hydrogen and C_1–C_4 alkyl, R_6 is selected from the group consisting of hydrogen, halogen, hydroxy and C_1–C_4 alkyl, and pharmaceutically acceptable salts thereof, and



wherein R_9, R_{10} and R_{11} are independently selected from hydrogen and C_1–C_4 alkyl, X is



wherein R_{12} is hydrogen or C_1–C_4 alkyl, and Z is =O or —O—R_{13} wherein R_{13} is selected from hydrogen or C_1–C_4 alkly, and pharmaceutically acceptable salts thereof wherein the weight ratio of (A):(B) is about 400:1 to about 1:4.

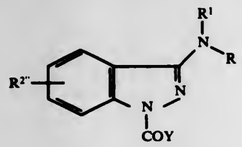
4,051,252

3-AMINOINDAZOLE-1 AND 2-CARBOXYLIC ACID DERIVATIVES

Karl Heinrich Mayer; Siegfried Petersen; Erich Klauke, all of Leverkusen; Friedrich Hoffmeister, and Wolfgang Wuttke, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Nov. 24, 1975, Ser. No. 634,914
Claims priority, application Germany, Dec. 13, 1974, 2458965
Int. Cl.² A61K *31/415;* C07D *231/56*
U.S. Cl. 424—273 P **30 Claims**

1. A compound selected from the group consisting of a 3-aminoindazole-1-carboxylic acid derivative of the formula:



wherein

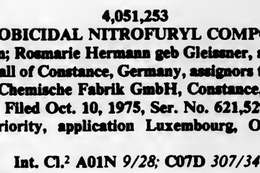
Y is lower alkoxy, lower alkylamino or di(lower alkyl)amino wherein each alkyl or alkoxy group contains from 1 to 6 carbon atoms;

R is hydrogen or lower alkyl of 1 to 6 carbon atoms;

R^1 is hydrogen or lower alkyl of 1 to 6 carbon atoms or, when R is hydrogen, formyl; and

$R^{2''}$ is chloro or trifluoromethyl in the 5- or 6-position of the indazole ring.

16. A compound selected from the group consisting of 3-aminoindazole-2-carboxylic acid derivative of the formula:



wherein

Y is lower alkoxy, lower alkylamino or di(lower alkyl)amino wherein each alkyl or alkoxy group contains from 1 to 6 carbon atoms;

R is hydrogen or lower alkyl of 1 to 6 carbon atoms;

R^1 is hydrogen or lower alkyl of 1 to 6 carbon atoms or, when R is hydrogen, formyl; and

$R^{2''}$ is chloro or trifluoromethyl in the 5- or 6-position of the indazole ring.

29. The method of achieving an analgesic anti-inflammatory and/or antipyretic effect in humans and other warm blooded animals which comprises administering thereto an effective amount of a compound according to claim **16.**

4,051,253

MICROBICIDAL NITROFURYL COMPOUNDS

Helmut Hein; Rosmarie Hermann geb Gleissner, and Hartmann Schaefer, all of Constance, Germany, assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany

Filed Oct. 10, 1975, Ser. No. 621,529
Claims priority, application Luxembourg, Oct. 15, 1974, 71111
Int. Cl.² A01N *9/28;* C07D *307/34*
U.S. Cl. 424—285 **18 Claims**

1. A microbicidal 2-{[o-(lower)alkylaroylhydrazone]propen-1-yl}-5-nitrofuran which is essentially non-toxic to mammals and birds upon administration thereto in microbicidally-effective doses and the aroyl of which comprises one ring, which is a 6-membered carbocyclic ring, or a mixture of such microbicidal nitrofurans.

13. A therapeutically-active and pharmaceutically-acceptable medicament comprising a pharmaceutical vehicle and havingg a microbicidally-effective concentration of nitrofuryl microbicide according to claim **1.**

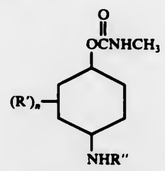
4,051,254

SULFONAMIDO-AND AMIDOPHENYL N-METHYLCARBAMATES AND USE AS INSECTICIDES

Lester L. Maravetz, Westfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,265
Int. Cl.² C07D *307/68;* A01N *9/20;* C07C *125/06, 143/75*
U.S. Cl. 424—285 **39 Claims**

1. A compound having the structure:

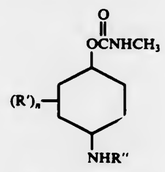


wherein R' is (C_1–C_5) alkyl, Cl, or (C_1–C_4) alkoxy; *n* is 1 to 3; R" is —SO_2R"' wherein R"' is (C_1–C_4) alkyl, (C_3–C_6) cycloalkyl, (C_1–C_4) monohaloalkyl, phenyl, or tolyl or R"' is



wherein R"" is (C_1–C_4) alkoxy (C_1–C_4) alkyl, (C_1–C_4) haloalkyl, phenoxy (C_1–C_4) alkyl, (C_1–C_4) alkylthio (C_1–C_4) alkyl, and furyl.

14. An insecticidal composition comprising a carrier and between about 0.0001 percent and about 80 percent, by weight of said composition of a compound having the structure:



wherein R' is (C_1–C_5) alkyl, Cl, or (C_1–C_4) alkoxy; *n* is 1 to 3; R" is —SO_2R"', wherein R"'is (C_1–C_4) alkyl, (C_3–C_6) cycloalkyl, (C_1–C_4) monohaloalkyl, phenyl, or tolyl or R"' is



wherein R"" is (C_1–C_4) alkoxy (C_1–C_4) alkyl, (C_1–C_4) haloalkyl, phenoxy (C_1–C_4) alkyl, (C_1–C_4) alkylthio (C_1–C_4) alkyl, and furyl.

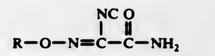
4,051,255

2-CYANO-2-HYDROXYIMINOACETAMIDES AS PLANT DISEASE CONTROL AGENTS

Sidney Hayes Davidson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 453,392, March 21, 1974, Pat. No. 3,954,992, which is a continuation-in-part of Ser. No. 375,376, July 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 330,457, Feb. 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 234,997, March 15, 1972, abandoned. This application Feb. 6, 1976, Ser. No. 655,956
Int. Cl.² A01N *9/20*
U.S. Cl. 424—289 **1 Claim**

1. A method for controlling fungus diseases in plants consisting essentially of applying to the plants a fungicidally effective amount of a compound of the formula



wherein

R is selected from the group consisting of iron, zinc and manganese.

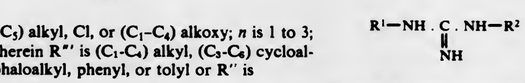
4,051,256

GUANIDINE DERIVATIVES

Douglas Lintin Swallow, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sept. 19, 1976, Ser. No. 706,554
Int. Cl.² C07C *129/12*
U.S. Cl. 424—304 **10 Claims**

1. A compound of the formula:



wherein R^1 is selected from the group consisting of adamantyl, bicyclo[2,2,1]heptanyl, bicyclo[2,2,1]hept-5-enyl, tricyclo[2,2,1,$0^{2,6}$]heptanyl and tetracyclo[4,3,0,$0^{2,4}$,$0^{3,7}$]-nonanyl and R^2 is selected from the group consisting of phenyl optionally substituted by a substituent selected from the group consisting of halogen, alkyl and cyanoalkyl of 1 to 6 carbons, alkoxycarbonyl of 2 to 6 carbons and amino, and the pharmaceutically-acceptable acid-addition salts thereof.

4,051,257

TOPICAL VETERINARY DERMATOLOGICAL MEDICAMENT

Carl Jelenko, III, Medical College of Ga., Augusta, Ga. 30902

Continuation-in-part of Ser. No. 432,216, Jan. 10, 1974, Pat. No. 3,920,848. This application Nov. 3, 1975, Ser. No. 628,143
Int. Cl.² A61K *31/23*
U.S. Cl. 424—312 **5 Claims**

1. A method of relieving non-bacterial dermatoses selected from one member of the group consisting of contact dermatitis, licking disease, erythema, and pruritis in verterinary animals which consists of applying to such affected dermatoses on an animal an effective amount of ethyl-cis,cis-(9,12)-octadecadienoate in a dosage of one drop to cover an area up to 36 square inches.

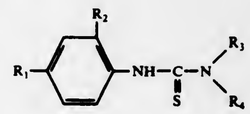
4,051,258

THIOUREA DERIVATIVES FOR COMBATTING MITES AND TICKS

Dieter Durr, Bottmingen, and Marcus von Orelli, Muenchenstein, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 379,536, July 6, 1973, Pat. No. 3,927,087. This application Oct. 20, 1975, Ser. No. 623,875
Claims priority, application Switzerland, July 24, 1972, 11003/72
Int. Cl.² A01N *9/12*
U.S. Cl. 424—322 **11 Claims**

1. A method for combatting mites and ticks which comprises applying thereto a pesticidally effective amount of a compound of the formula



wherein R_1 represents halogen or methyl, R_2 represents C_1–C_4 alkyl, and R_4 represents C_2–C_3 alkyl.

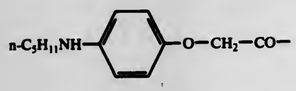
4,051,259

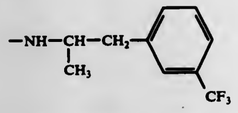
PHENOXYACETIC ACID AMIDE

André Buzas, Bievres, and Jacques Bruneau, Neuilly-sur-Seine, both of France, assignors to Les Laboratoires Bruneau & Cie, France

Filed Apr. 2, 1976, Ser. No. 672,967
Claims priority, application France, Apr. 8, 1975, 75.10890
Int. Cl.² A61K *31/165;* **C07C** *103/75*
U.S. Cl. 424—324 **3 Claims**

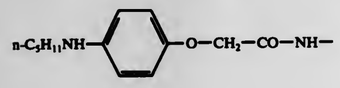
1. Phenoxyacetic acid derivative of the formula:

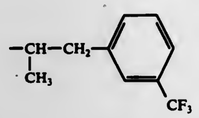




and its pharmaceutically acceptable acid addition salts.

2. A method of inducing anorexia in man which comprises orally administering a compound of the formula





or a pharmaceutically acceptable acid addition salt thereof to a patient in an amount sufficient to induce anorexia.

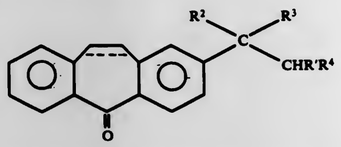
4,051,260

2-SUBSTITUTED-5-OXO-5H-DIBENZO[A,D]CYCLOHEPTENES, AND DERIVATIVES THEREOF, AND METHODS AND COMPOSITIONS FOR THE USE THEREOF

Peter H. Nelson, and Karl G. Untch, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 572,477, April 28, 1975, Pat. No. 3,975,540. This application Apr. 8, 1976, Ser. No. 675,095
Int. Cl.² C07C *49/76;* **A01N** *9/24*
U.S. Cl. 424—331 **26 Claims**

1. A compound selected from the group of compounds represented by the formula:



where one of R^2 and R^3 is hydrogen and the other is hydrogen, methyl, ethyl or together R^2 and R^3 are methylene; R′ and R^4 taken together are =O and the dotted line refers to an optional, additional bond between the carbon atoms at the 10- and 11-positions.

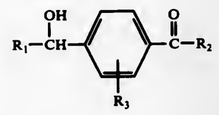
4,051,261

1-(P-ALKANOYLPHENYL) ALKANOLS AND DERIVATIVES

Paul L. Anderson, Dover, and Jeffrey Nadelson, Lake Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 505,936, Sept. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 432,832, Jan. 14, 1974, abandoned. This application Aug. 26, 1975, Ser. No. 607,779
Int. Cl.² C07C *49/82;* **A01N** *9/24*
U.S. Cl. 424—331 **10 Claims**

1. A compound of the formula



where

R_1 is t-butyl or cycloalkyl having 3 to 6 carbon atoms, and

R_2 is lower alkyl having 1 to 4 carbon atoms or lower alkenyl having 3 to 5 carbon atoms, and

R_3 is hydrogen or halo having an aomic weight of about 19 to 80,

provided that when R_1 is cycloalkyl, R_2 is lower alkyl.

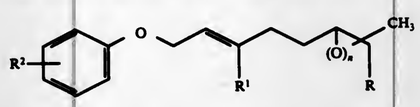
4,051,262

CERTAIN GERANYL PHENYL ETHERS AND THEIR EPOXIDES AND THEIR USE IN CONTROLLING INSECTS

Ferenc M. Pallos, Pleasant Hill; Hwalin Lee, Palo Alto, and Julius J. Menn, Saratoga, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 578,580, May 19, 1975, Pat. No. 3,970,758, which is a division of Ser. No. 856,140, Sept. 8, 1969, Pat. No. 3,907,783, which is a continuation-in-part of Ser. No. 815,229, April 10, 1969, abandoned. This application May 10, 1976, Ser. No. 684,710
Int. Cl.² A01N *9/12, 9/24*
U.S. Cl. 424—337 **1 Claim**

1. A method of controlling *Tenebrio molitor* comprising applying thereto at any stage of their development a metamorphosis hindering amount of a compound of the formula:



in which R and R^1 are independently methyl or ethyl; *n* is the integer zero; R^2 is hydrogen; halogen; lower alkyl having 1 to 6 carbon atoms; lower alkoxy having 1 to 4 carbon atoms; lower alkenyl having 2 to 6 carbon atoms; lower alkylthio having 1 to 5 carbon atoms, or nitro.

4,051,263

DERIVATIVES OF 1,2-DIPHENYL-ETHANE

John Cameron Turner, West Wickham, and Rosalind Po-Kuen Chan, London, both of England, assignors to Biorex Laboratories Limited, London, England

Continuation of Ser. No. 116,274, Feb. 17, 1971, abandoned. This application Mar. 27, 1975, Ser. No. 563,119
Claims priority, application United Kingdom, Mar. 16, 1970, 12554/70
Int. Cl.² A61K *31/055;* **C07C** *39/16, 39/24*
U.S. Cl. 424—347 **3 Claims**

1. 3,3′-Difluoro-4,4′-dihydroxy-α-ethyl-α′-methyl-dibenzyl.

2. A pharmaceutical composition for the treatment of hypertrophied conditions of the prostate, said composition suitable for oral administration which comprises an effective amount of 3,3′-difluoro-4,4′-dihydroxy-α-ethyl-α′-methyl-dibenzyl, in admixture with a solid or liquid pharmaceutical diluent or carrier.

4,051,264

COLD WATER EXTRACTABLE TEA LEAF AND PROCESS

Gary Warner Sanderson, Englewood; Andrew Charles Hoefler, Cresskill; Harold Nathaniel Graham, Englewood, all of N.J., and Philip Coggon, Orangeburg, N.Y., assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 610,647, Sept. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 559,232, March 17, 1975, abandoned. This application Nov. 16, 1976, Ser. No. 742,281
Int. Cl.² A23F *3/00*
U.S. Cl. 426—52 **16 Claims**

14. A cold water extractable fired black tea leaf prepared by comminuting freshly harvested green tea leaf, treating the comminuted fresh green tea leaf with tannase at a temperature and for a time sufficient to impart a substantial cold water extractability to the manufactured tea leaf, fermenting the treated green tea leaf and firing the fermented tea leaf to reduce the moisture content of the tea leaf to below about 5% and produce a cold water extractable fired black tea leaf.

4,051,265

PACKAGE FOR LIGHT AND OXYGEN SENSITIVE FOOD

Gerald S. Kirshenbaum, Fanwood, and Elliot A. Vogelfanger, Edison, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 513,688, Oct. 10, 1974, abandoned. This application Aug. 26, 1976, Ser. No. 717,840
Int. Cl.² B65B *25/00*
U.S. Cl. 426—107 **11 Claims**



1. A package comprising:

a blow molded thermoplastic container defining a volume filled with a liquid food sensitive to light and oxygen, said container providing means for ingress and egress of said liquid, said thermoplastic container including titanium dioxide, present in a concentration of at least 0.5% by weight, based on the total weight of the container which essentially bars the transmittance therethrough of light having a wavelength in the range of between about 3500 and 5500 Angstrom units; and

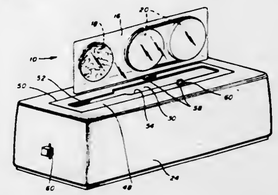
an overwrap of polyethylene terephthalate film having a thickness of about 0.5 to 2.5 mils and disposed over said thermoplastic container, completely enclosing it.

4,051,266

PACKAGE FOR HEATING FOOD IN ELECTRICAL APPLIANCES

Costas E. Goltsos, Weston, Mass., assignor to Teckton, Inc., Wellesley, Mass.

Division of Ser. No. 417,907, Nov. 21, 1973, Pat. No. 3,941,044. This application Dec. 4, 1975, Ser. No. 637,700
Int. Cl.² B65B *25/22*
U.S. Cl. 426—120 **2 Claims**



1. A food package comprising:

a sealed envelope formed from plastic sheet material transparent to radiation of a character which is adapted to heat condition foods and capable of withstanding temperatures produced by such heat conditioning, said envelope being formed to define at least two distinct sealed compartments;

a multi-component food product comprised of different food components with a component disposed in each compartment wherein; at least two of said food components each require different degrees of heating in order to heat-condition said food product for serving; said food components being adapted for serving as a unitary food product;

said envelope being of a generally elongate configuration and having said compartments formed therein in longitudinally spaced side-by-side relation, at least one of said compartments being of a thickness which is less than that of the other compartment in said package, said compartments being arranged in the package as to be disposed asymmetrically with respect to a transverse center line of said envelope which is orthogonal to the longitudinal center line of said envelope, and said compartments disposed in central registry with the longitudinal center line of said envelope and symmetrical about a cross-sectional plane extending through the longitudinal center line of the envelope.

4,051,267

PROCESS FOR STABILIZING TEA EXTRACT AND PRODUCT

Herman Jongeling, Leusden, Netherlands, assignor to D.E.J. International Research Company B.V., Utrecht, Netherlands

Continuation of Ser. No. 613,447, Sept. 15, 1975, abandoned. This application Jan. 26, 1977, Ser. No. 762,743
Claims priority, application United Kingdom, Sept. 17, 1974, 40365/74
Int. Cl.² A23F *3/00*
U.S. Cl. 426—330.3 **5 Claims**

1. Process for stabilization of tea extract for preventing sedimentation of "creaming" substances on chilling and/or during storage at cold temperatures, the extract being stabilized without substantial viscosity increase so that it is capable of being used in autonatic dispensing machines without impairing the accuracy of dosing, the process avoiding removal

of creaming substances, or changing the natural pH of the extract, the process consisting essentially of:

a. extracting a tea extract from tea with hot water; and

b. mixing the tea extract at a temperature of at least about 60° C for at least about 1½ minutes with an effective stabilizing amount of carrageenan for preventing creaming on cooling of either the extract or a diluted tea drink made therefrom and also effective to provide an extract that is stable without substantial increase in viscosity.

4,051,268

DRY LOW CALORIE BEVERAGE CRYSTALS

Philip John Shires, Mount Healthy, and Timothy James Kennedy, Springfield Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 21, 1975, Ser. No. 570,332
Int. Cl.² A23L *1/22*
U.S. Cl. 426—548 **14 Claims**

1. A stable, substantially dry crystalline, rapidly dissolvable diet beverage composition comprising a porous uniform matrix of

a. from 5% to 55% of a dipeptide sweetener;

b. from 1% to 15% edible gum;

c. from 7% to 30% of a crystalline sugar carrier; and

d. from 25% to 85% of a beverage flavorant; and

wherein said substantially dry crystalline rapidly dissolvable diet beverage composition is made from a process which comprises:

e. forming a dry mixture of a dipeptide sweetener, a crystalline sugar carrier, and a water-soluble, edible gum;

f. forming a homogeneous slurry by uniformly mixing said dry mixture with a liquid flavorant, thereby to provide a slurry comprising by weight of from 35% to 70% of said flavorant, 2% to 45% of said dipetide sweetener, 5% to 30% of said crystalline sugar carrier and 1% to 15% of said watersoluble, edible gum; and wherein said homogeneous slurry has a total solids content of about 50% to about 75%;

g. drying said homogeneous slurry in such manner as to provide a stable, porous, substantially dry, and rapidly dissolving diet beverage crystalline matrix.

4,051,269

LOW CALORIE, HIGH PROTEIN TABLESPREADS FROM SWEET MILK AND THEIR PRODUCTION

Olof Bo Sven Strisning, Saltsjobaden, Sweden, assignor to Mjolkcentralen, Ekonomisk Forening, Stockholm, Sweden

Continuation-in-part of Ser. No. 608,700, Aug. 28, 1975, abandoned, and Ser. No. 673,059, April 2, 1976, abandoned. This application Jan. 14, 1977, Ser. No. 759,471
Claims priority, application Sweden, Aug. 29, 1974, 7410940
Int. Cl.² A23D *3/00*
U.S. Cl. 426—603 **10 Claims**

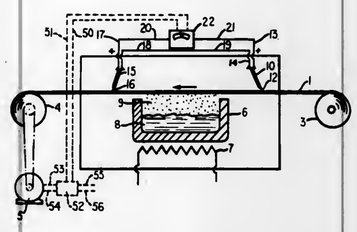
1. A method for the production of low calorie, high protein edible water-in-oil emulsion tablespreads from sweet milk proteins, which comprises heating to an aqueous concentrate of sweet milk proteins at 70°-105° C. for a period of time that the proteins thereof are denatured in such a way that both its water holding and its emulsifying properties are increased, said concentrate is obtained by membrane filtration of at least the aqueous phase of sweet milk and having a protein content of about 9–24% by weight and a pH value of at least 5,1; cooling the heated protein concentrate to 55°–38° C; introducing the cooled protein solution into an edible oil and forming a 65–35% aqueous phase, 35–65% oil phase water-in-oil emulsion; and then further cooling the emulsion to a temperature at which it is storable to form a margarine-like tablespread.

4,051,270

METHOD OF MEASURING VAPOR DEPOSITED COATING THICKNESS

John F. Butler, Bethel Park, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 813,790, Feb. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 540,705, April 6, 1966, abandoned. This application Oct. 10, 1972, Ser. No. 296,419
Int. Cl.² C23C *13/00, 13/02*
U.S. Cl. 427—8 **13 Claims**



1. A method of vacuum vapor coating a thin metal substrate in strip form with a metal coating of a desired thickness without heating the substrate over about 1000° F comprising:

measuring the temperature of the substrate immediately before coating;

moving the substrate past a source which contains a pool of liquid coating metal which gives off metal vapor at its surface so as to condense coating metal on the substrate, to form a coating of said metal on said substrate, to supply heat to the substrate, and to increase the temperature of the substrate;

immediately thereafter measuring the increase in temperature of the substrate resulting therefrom under conditions where temperature equilibrium through the substrate thickness is reached in less than 0.1 second and substrate heat loss is negligible;

adjusting coating conditions to obtain the desired metal coating thickness in accordance with the equation,

$$t_c \frac{C_M (T_f - T_o)\, \rho_M t_M}{\rho_c [C_k + C_c (T_c - T_f)}$$

t_c is the thickness of the coating in mils,

C_M is the average heat capacity of the substrate for temperatures between T_o and T_f in BTU's per pound per degree F.,

T_f is the final temperature of the substrate immediately after coating in degrees F.,

T_o is the temperature of the substrate immediately before coating in degrees F.,

ρ_M is the density of the substrate in pounds per cubic inch,

t_M is the thickness of the substrate in mils, ρ_c is the density of the coating metal in pounds per cubic inch,

C_k is the heat of condensation of the coating metal at T_c in BTU's per pound,

C_c is the average heat capacity of the solid coating metal for temperatures between T_f and T_o in BTU's per pound per degree F., and

T_c is the temperature of condensation of the coating metal in degrees F.; and

measuring the increase in temperature of the substrate caused by radiation from the vapor source, subtracting said temperature increase caused by radiation from T_f, as defined above, to obtain a value, and using said value for T_f in the equation.

4,051,271

METHOD FOR FORMING IMAGES BY IRRADIATION OF ELECTRON RAYS AND RESIST COMPOSITIONS UTILIZABLE THEREFOR

Shoei Fujishige, Yokohama, Japan, assignor to Director-General of the Agency of Industrial Science and Technology, Japan

Filed Mar. 18, 1976, Ser. No. 668,046
Claims priority, application Japan, June 30, 1975, 50-81323
Int. Cl.² B05D *3/06*
U.S. Cl. 427—43 **11 Claims**

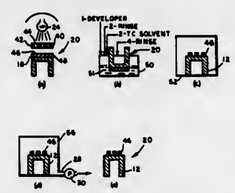
1. A method for forming images characterized by applying onto a substrate a thin film of a stereocomplex composed of syndiotactic poly(methyl methacrylate) obtained by radical polymerization and poly(methyl methacrylate) obtained by anionic polymerization and containing the isotactic structure, exposing said thin film to irradiation by electron rays through an original to effect depolymerization of the polymer in the exposed areas and thereafter washing off the depolymerized substance with an organic solvent.

4,051,272

LOW-TEMPERATURE THERMIONIC EMITTER

Richard W. Remington, San Carlos, Calif., assignor to Electron Emission Systems, Tucson, Ariz.

Continuation of Ser. No. 129,443, March 30, 1971, abandoned. This application June 13, 1975, Ser. No. 586,592
Int. Cl.² B05D *5/12*
U.S. Cl. 427—54 **8 Claims**



1. A method of forming a low temperature thermionic emitter comprising the steps of:

a. forming a layer comprising a mixture of a pyrolitically decomposable alkaline earth oxide precursor dispersed in an actinically hardenable organic binder photoresist resin on the surface of a conductive substrate, said dispersion containing from 15% to 75% by weight of said precursor based on resin solids;

b. exposing said layer to actinic radiation to harden said binder; and

c. heating said layer to a temperature sufficiently high to pyrolitically decompose said precursor and volatize said binder, said precursor being primarily reduced by the carbon remaining in said layer after said binder has volatized, to form a porous alkaline earth oxide containing coating on said surface.

4,051,273

FIELD EFFECT TRANSISTOR STRUCTURE AND METHOD OF MAKING SAME

Shakir Ahmed Abbas, Wappingers Falls, and Robert Charles Dockerty, Highland, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,523
Int. Cl.² B05D *5/12*
U.S. Cl. 427—86 **10 Claims**

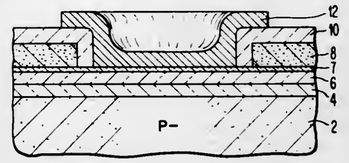
1. In the method of fabricating a field effect transistor which includes the steps of:

forming a composite silicon dioxide-silicon nitride insulating layer over the active regions of said field effect transistor, said active regions including a channel region disposed between source and drain regions;

depositing a field shield electrode of polycrystalline silicon over a portion of said composite layer;

forming a conductive silicon dioxide layer over the upper and sidewall surfaces of said polycrystalline silicon layer; and

depositing a gate electrode over said composite layer;



the improvement comprising:

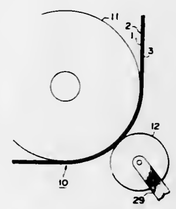
forming a layer of highly resistive material between said conductive silicon dioxide layer and said silicon nitride layer prior to the step of forming said field shield electrode; said material selected from the group consisting of silicon oxynitride and silicon dioxide.

4,051,274

METHOD FOR COATING THE PHOTORESIST ONTO A BELT-LIKE MATERIAL COMPRISING A PERFORATED CARRIER AND METALLIC FOIL

Kazuo Hata, Kameoka, and Sumio Mitani, Hikone, both of Japan, assignors to Dainippon Screen Seizo Kabushiki-Kaisha, Kyoto, Japan

Filed Mar. 31, 1976, Ser. No. 672,329
Claims priority, application Japan, Apr. 3, 1975, 50-39797; Apr. 15, 1975, 50-44757
Int. Cl.² B05C *1/08*
U.S. Cl. 427—172 **6 Claims**



1. In a method for uniformly coating a photoresist by roller coating means utilizing a back-up roller, a coating roller or the like onto a belt-like material consisting of a perforated carrier having longitudinally spaced device holes or apertures and a metallic foil laminated on said perforated carrier, said method comprising:

winding said belt-like material around said back-up roller in such a manner that said perforated carrier directly contacts the outer surface of the back-up roller and a slight tension is produced on the metallic foil, and

making said coating roller directly contact the surfaces of the metallic foil of the belt-like material at a portion where the belt-like material is wound around the back-up roller and thereby preventing said belt-like material from being depressed adjacent to said device holes or aperatures during the coating process.

4,051,275

EMBEDDING AND COMPACTING PARTICLES IN POROUS SURFACES

Clarence W. Forestek, c/o The Forester Plating & Manufacturing Co. 9607 Quincy Ave., Cleveland, Ohio 44106

Continuation-in-part of Ser. No. 481,703, June 21, 1974, abandoned. This application Mar. 3, 1976, Ser. No. 663,458
Int. Cl.[2] B05D 1/38
U.S. Cl. 427—201 16 Claims

1. In the process for preparing a metallic surface having pores in which particles are embedded therein which comprises:

a. heating a porous metallic surface to at least 100° F and not more than 650° F to enlarge the pores thereof, said pores initially having an average width not greater than 100 microns;

b. promptly thereafter depositing finely divided particles having an average size no greater than 50 microns onto said heated surface and working said particles into said pores, said particles being at a temperature at least 100° F below the temperature of said heated surface and being selected from the class consisting of perfluorocarbon polymers, elemental metals, metal oxides, metal nitrides, metal carbides and metal disulfides; and

c. permitting said surface and particles to reach room temperature thereby to lock said particles into said pores;

the improvement comprising:

d. subjecting a surface produced according to steps (a), (b) and (c) to a fluid stream having finely divided solid particles suspended therein at a pressure of 30–120 psi for a sufficient period to compact the embedded particles, said suspended particles having an average size no greater than 50 microns;

e. thereafter heating said surface to a temperature of at least 100° F.

f. promptly thereafter depositing additional finely divided particles similar to those already embedded in said pores onto said heated surface and working said particles into said pores, said particles being at a temperature at least 100° F below the temperature of said heated surface; and

g. permitting said surface and particles to reach temperature equilibrium, thereby to lock said additional particles into said pores.

4,051,276

METHOD OF DEACIDIFYING PAPER

John C. Williams, Alexandria, Va., and George B. Kelly, Jr., Gaithersburg, Md., assignors to The United States Government as represented by the Librarian of Congress, Washington, D.C.

Division of Ser. No. 536,125, Dec. 24, 1974, Pat. No. 3,969,549.
This application Feb. 23, 1976, Ser. No. 660,286
Int. Cl.[2] C23C 11/00, 13/00; B05D 3/02
U.S. Cl. 427—248 C 4 Claims

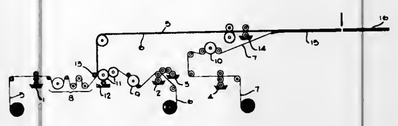
1. A method of deacidifying paper having a cellulosic base comprising impregnating said paper with a solution of an organo-metallic compound capable of being rapidly hydrolyzed to an alkaline material wherein said compound is selected from the group consisting of lower alkyl compounds of lithium, aluminum, magnesium, gallium, zinc, and mixtures thereof, and wherein the solvent for said compound is an organic liquid, unreactive with said organo-metallic compound and non-destructive to inks used on printed matter, and subsequently hydrolyzing said organo-metallic compound to an alkaline material.

4,051,277

RIGID-WHEN-WET PAPERBOARD CONTAINERS AND THEIR MANUFACTURE

Robert M. Wilkinson, Florissant, Mo., and James R. Lyon, Godfrey, Ill., assignors to Alton Box Board Company, Alton, Ill.

Division of Ser. No. 277,646, Aug. 3, 1972, Pat. No. 3,886,019, which is a continuation-in-part of Ser. No. 39,086, May 20, 1970, abandoned. This application Apr. 14, 1975, Ser. No. 567,639
Int. Cl.[2] B31F 1/20; C09J 5/02; B32B 3/28, 29/00
U.S. Cl. 427—288 5 Claims



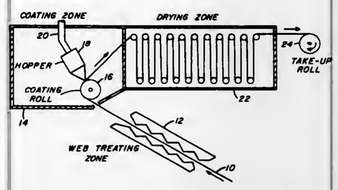
1. In the art of manufacturing rigid-when-wet corrugated-board from a preformed web of medium and at least one performed web of liner, each of which has an obverse face and reverse face, the process comprising, surface-treating the reverse face of the liner web by printing thereon a controlled amount of a mixture composed with a curable thermosetting resinous material entrained in a vaporizable liquid vehicle without effecting the moisture absorbency of said obverse face, the thermosetting resinous material comprising about 35 to 65 percent by weight of the mixture when entrained in the vaporizable liquid vehicle, and immediately vaporizing at least a substantial part of the vehicle from the web by heating at a temperature and for a time less than that required to substantially advance the cure of the resinous material therein.

4,051,278

METHOD FOR REDUCING MOTTLE IN COATING A SUPPORT WITH A LIQUID COATING COMPOSITION

Roger E. Democh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 6, 1975, Ser. No. 584,322
Int. Cl.[2] B05D 3/00, 3/04
U.S. Cl. 427—326 16 Claims



1. In a method of coating a support with a coating composition comprising a film-forming material in an evaporable liquid vehicle in which said support is coated with a layer of said coating composition and said coated layer is dried, coating of said layer taking place within a coating zone containing a gaseous atmosphere and evaporation of said liquid vehicle occuring within said coating zone to thereby cause the temperature of the surface of said coated layer to decrease, the improvement which comprises maintaining at least two of (1) the temperature of the atmosphere within said coating zone, (2) the temperature of said support at the point where said coating composition is applied thereto, and (3) the temperature of said coating composition at the point where it is applied to said support, at a temperature which is substantially equivalent to the equilibrium surface temperature of said coated layer within said coating zone, said equilibrium temperature being the temperature assumed by the surface of said coated layer under steady state conditions of heat transfer following evaporative cooling of said layer in said zone, whereby the formation of mottle in said coated layer is reduced.

4,051,279

PROTECTIVE COATINGS

Donald J. Peterson, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 455,466, March 27, 1974, Pat. No. 3,889,025, which is a division of Ser. No. 208,024, Dec. 3, 1971, Pat. No. 3,839,052, which is a continuation-in-part of Ser. No. 158,527, June 30, 1971, abandoned. This application Mar. 11, 1975, Ser. No. 557,447
Int. Cl.[2] B05D 3/12
U.S. Cl. 427—355 2 Claims

1. A process for removing marine organisms from surface comprising:

a. coating the organisms with an effective amount of an organotin composition comprising from about 0.1 to about 40% by weight of (organothiomethyl) triorganotin, (organosulfonylmethyl) triorganotin or (N,N-disubstituted aminomethyl)triorganotin compounds; and from about 60 to about 99.9% by weight of a carrier to render the organisms nonviable; and

2. scraping the surface to remove the non-viable organisms.

4,051,280

PROCESS FOR COATING TO FORM A FOAM FIND PROTECTIVE PACKAGE

Frank W. Mellows, Columbia, Md., assignor to Westvaco Corporation, New York, N.Y.

Filed June 9, 1975, Ser. No. 584,949
Int. Cl.[2] B05D 3/02
U.S. Cl. 427—373 1 Claim

1. A method of producing a packaging material particularly for use in making heat sealable protective envelopes, said packaging material consisting of an outer paper substrate, an aqueous based heat sensitizable coating applied to one surface of said substrate and a foamed polymeric material of cellular structure adhered to substantially the entire area of the coated surface of said substrate comprising:

a. forming an aqueous coating of powdered polyethylene and a copolymer of ethylene and acrylic acid, said coating comprising from about 30 to 100 parts of a copolymer consisting of from about 70–85% ethylene and from about 30–15% acrylic acid and up to about 70 parts of a powdered polyethylene material having a particle size in the range of from about 10–30 microns, said coating having a solids content of from about 25 to 45%;

b. applying a continuous film of said coating uniformly to one surface of a paper substrate to produce a coat weight of at least about 3 pounds per ream;

c. drying said coating;

d. adhering a polyethylene foam material to substantially the entire area of the coated surface of said substrate under the influence of heat and pressure while leaving portions of said coating surface exposed to be heat sealed to themselves; and,

e. heat sealing said exposed surfaces to one another to form a foam lined protective envelope.

4,051,281

COMPOSITE OF RUBBER BONDED TO GLASS FIBERS

Gerard E. van Gils, Tallmadge, and Edward F. Kalafus, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 380,939, July 19, 1973, Pat. No. 3,930,095.
This application Sept. 29, 1975, Ser. No. 617,459
Int. Cl.[2] B05D 3/02, 7/24; B29H 9/10, 13/00
U.S. Cl. 427—379 11 Claims

1. A method for adhering a glass fiber reinforcing element to a rubber compound which comprises treating said element with a composition comprising essentially an aqueous alkaline dispersion of 100 parts by weight of a rubbery vinyl pyridine copolymer, from about 2 to 28 parts by weight of trimethylol phenol, from about 1.25 to 24 parts by weight of at least one water soluble, thermoplastic and non heat hardenable resorcinol compound selected from the group consisting of resorcinol and a resorcinol-formaldehyde novolak, from about 0 to 3 parts by weight of an alkaline material selected from the group consisting of NH_4OH and NaOH, and from about 170 to 1100 parts by weight of water, heating said treated element at a temperature and for a time sufficient to remove essentially all of the water from said composition and to provide said element with a heat cured adhesive in an amount of from about 10 to 40% by weight (dry) based on the weight of said reinforcing element, combining said dried and heat cured adhesive containing reinforcing element with an unvulcanized rubber compound, and vulcanizing the same, said composition coating and at least substantially totally impregnating said element.

4,051,282

PRODUCTION OF TREATED WOOD HAVING EASY PENETRABILITY

Dan L. Davies, Gibsonia, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed June 14, 1976, Ser. No. 695,577
Int. Cl.[2] B05D 1/18, 3/02
U.S. Cl. 427—393 10 Claims

1. In a pressure treating process for wood wherein wood is impregnated with a treating solution containing one or more impregnants selected from the group of preservatives and fire retardants and a liquid carrier selected from the group consisting of aliphatic hydrocarbons and halogenated aliphatic hydrocarbons that are liquids at elevated pressures and that have boiling points below 130° C. at atmospheric pressure and wherein the impregnated wood is treated to evaporate the liquid carrier, the improvement which comprises:

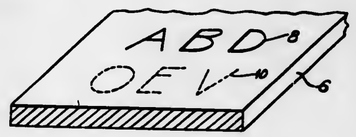
adding to the treating solution an effective lubricating amount of an oil having a kinematic viscosity of not less than 2.5 centistokes at 100° F. and not more than 5.8 centistokes at 100° F. and having a distillation range such that not more than about 50 percent of the volume distills below or about 450° F. and not more than about 90 percent of the volume distills below or about 550° F.

4,051,283

PRINTED SHEETS CONTAINING CONCEALED IMAGES AND METHOD AND MATERIALS FOR PREPARATION AND VISUAL DEVELOPMENT OF SAME

Richard E. Thomas; Robert T. Florence; Rustom H. Dalal, all of Chicago, Ill., and Raymond I. Scheuer, Sunnyvale, Calif., assignors to A. B. Dick Company, Niles, Ill.

Division of Ser. No. 757,067, Sept. 3, 1968, Pat. No. 3,632,364.
This application June 28, 1971, Ser. No. 157,482
The portion of the term of this patent subsequent to Jan. 4, 1989, has been disclaimed.
Int. Cl.[2] B41M 5/16, 5/18, 5/22, 3/17
U.S. Cl. 428—29 4 Claims



1. A transfer sheet for spirit duplication to produce concealed images containing an oxidizing agent capable of oxidizing a subsequently applied iodide to produce a color forming iodine reactant, in which the transfer sheet comprises a flexible paper base sheet having a transfer coating containing a colorless, soluble copper salt and an amine selected from the group

consisting of piperidine, piperazine, phenylenediamine, tallowamine, trichloromelamine, triisopropenolamine, and melamine to improve the hygroscopic character of the copper salt.

4,051,284

METHOD FOR PRODUCING HEAT RESISTANT SYNTHETIC RESIN TUBES

Noriyoshi Ohkubo, and Nobu Kitamura, both of Hiratsuka, Japan, assignors to The Furukawa Electric Company Limited, Tokyo, Japan

Filed May 15, 1974, Ser. No. 470,139

Claims priority, application Japan, May 16, 1973, 48-54370; Jan. 25, 1974, 49-10437[U]

Int. Cl.² B29C *1/12*

U.S. Cl. 428—36 **28 Claims**

1. Resin tubes for thin wire electrical insulator comprising non-extrudable heat resistant resin varnish, said varnish being such that when it is applied and cured on American Wire Gauge No. 18, copper wire, thereby increasing the overall diameter of the wire by 0.003 inch, the resin layer formed will have a thermal life of at least 20,000 hours at 120° C and a cut-through temperature of at least 250° C, said tubes being seamless and having an inner diameter not greater than 5mm and a thickness not greater than 0.3mm.

2. A method for molding seamless heat resistant synthetic resin tubes from non-extrudable resin, said tubes having an inner diameter of not more than 5 mm. and a thickness of not more than 0.3 mm., comprising applying a heat resistant synthetic resin varnish on American Wire Gauge No. 18, copper wire, thereby increasing the overall diameter of the wire by 0.003 inches, the resin layer formed having a thermal life of at least 20,000 hours at 120° C, and a cut-through temperature of at least 250° C after curing, curing said resin varnish to form a synthetic resin layer on the metal wire, drawing the heat resistant synthetic resin coating and wire above the yield point of the metal wire and separating the resulting synthetic resin tube from the metal wire.

4,051,285

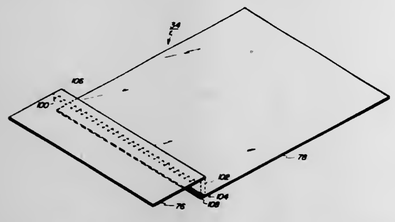
TEARABLE EDGE STRIP FOR PLASTIC SHEET

William E. Kramer, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 6, 1973, Ser. No. 367,608

Int. Cl.² B65D *65/28; G09F 3/00*

U.S. Cl. 428—43 **4 Claims**



1. A sheet of support material employed in a sheet feeding apparatus of the type having a rotary driven feed roll cooperating with a retard roll for seriatim feeding of sucessive sheets of support material from a stack thereof, including:

a transparent non-fibrous flexible polymeric portion; and

a fibrous flexible paper portion extending in an outwardly direction from said non-fibrous portion having the trailing marginal region thereof overlapping and secured adhesively to the leading marginal region of said non-fibrous portion with said fibrous being interposed between the feed roll and retard roll during the forward advancement of the sheet of support material to facilitate separation of successive sheets of support material from the stack thereof, said fibrous portion being serrated in the region thereof adjacent to said non-fibrous portion to permit the portions to be readily separated from one another.

4,051,286

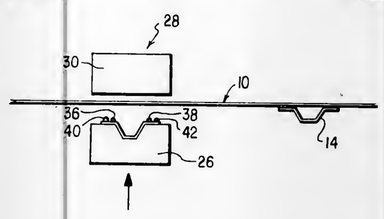
DUAL ADHESIVE METHOD AND ARTICLE

Richard Abbott, Dearborn Heights, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Division of Ser. No. 534,802, Dec. 20, 1974, Pat. No. 3,971,688. This application Feb. 27, 1976, Ser. No. 662,007

Int. Cl.² B32B *15/04, 15/08*

U.S. Cl. 428—77 **2 Claims**



1. A reinforced sheet particularly for roofs and walls of trucks and trailers, comprising in combination:

a metal sheet and a plurality of bow elements, said sheet and bow elements having juxtaposed bonding surfaces; and

side-by-side layers of adhesive extending substantially throughout the areas of said bonding surfaces and joining the sheet to said bow elements, one of said layers of adhesive being a hot melt adhesive which provides an initial bond of moderate strength and the other layer of adhesive being a catalyzed room temperature curing adhesive which develops a high bonding strength after said hot melt adhesive is set.

4,051,287

RAISED WOVEN OR KNITTED FABRIC AND PROCESS FOR PRODUCING THE SAME

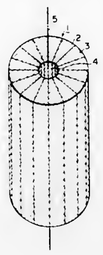
Kazushige Hayashi; Norihiro Minemura, both of Ibaraki; Iwao Fujimoto, Waki; Kiyotaka Ozaki, Iwakuni; Norio Yoshida, Ibaraki; Toshio Morishita, Iwakuni, and Takanori Shinoki, Matsuyama, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 8, 1975, Ser. No. 638,595

Claims priority, application Japan, Dec. 12, 1974, 49-142040

Int. Cl.² B32B *7/00*

U.S. Cl. 428—91 **40 Claims**



1. A raised woven or knitted fabric having at least one raised surface, which comprises at least one yarn consisting of synthetic hollow composite fibers each composed of at least four alternating segments of fiber-forming polyester and fiber-forming polyamide in which composite fibers said polyester and polyamide segments are adhered and encompass the hollow

core and extend along the longitudinal axes of said fibers to form a tube-shaped body, said polyester and polyamide segments of said composite fibers located in at least said raised surface portion of said fabric being separated from each other to form numerous very fine fibrils.

4,051,288

METHOD OF PRODUCING REINFORCED SHEET MATERIAL

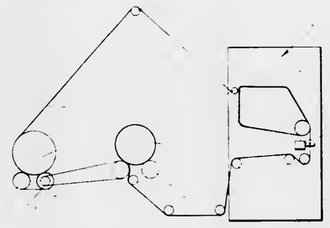
Alister Wilson, Kilmory, Rosebank Lane; William David Marr, 13 Pitreuchie Place, both of Forfar, Angus, and George Arthur Guild, 2 Golf Road, Kirriemuir, Angus, DD8 4PY, all of Scotland

Filed May 20, 1976, Ser. No. 688,305

Claims priority, application United Kingdom, May 21, 1975, 21762/75

Int. Cl.² B32B *31/12*

U.S. Cl. 428—102 **8 Claims**



1. In a method of producing a reinforced sheet of a foam material comprising a layer of a foam material reinforced with a stitched system of substantially non-extensible yarn disposed generally parallel to the surface of the foam material which method includes feeding a layer of foam material through a stitching machine and thereby incorporating the reinforced stitching in the foam material, the improvement comprising feeding the foam material to the stitching machine at a rate greater than that at which the stitched system of reinforcing is produced by the machine.

4,051,289

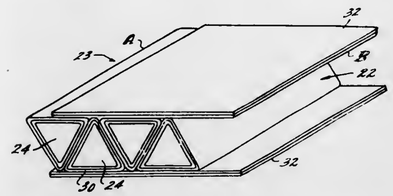
COMPOSITE AIRFOIL CONSTRUCTION

Arthur P. Adamson, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Apr. 12, 1976, Ser. No. 675,902

Int. Cl.² B32B *5/12*

U.S. Cl. 428—113 **22 Claims**



1. A composite article having an upper surface and a lower surface and comprising a plurality of columnar elements bonded together along adjacent complementary interfaces, each of said element characterized by:

a bundled core of high modulus, substantially parallel core filaments embedded in a core matrix; and

a sheet of high modulus, substantially parallel sheet filaments embedded in a sheet matrix, wherein

the longitudinal axes of the sheet filaments are oriented at an angle to the core filaments and said sheet is wrapped and bonded about said core such that at least a portion of the sheet filaments run transverse to the core filaments through the article in a direction from the upper surface to the lower surface, at the interface.

4,051,290

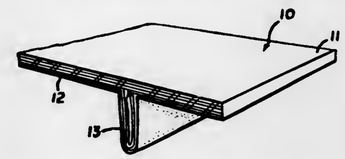
SINK-FREE PANELS

Ralph B. Jutte, Granville, and Roger L. Lehman, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 430,844, Jan. 4, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,488

Int. Cl.² B32B *3/00;* B29D *3/02*

U.S. Cl. 428—168 **4 Claims**



1. An as molded glass fiber reinforced plastic panel having an integrally formed rib and an exposed smooth surface free of visual surface distortion, comprising,

chopped glass strands having an average length of not more than one inch extending into said rib to reinforce the rib,

continuous glass strands having an average length of at least two inches interposed between said chopped strands and said exposed surface, the continuous strands bridging the rib, and

the juncture of said rib with said panel being defined by sharp, essentially fillet-free corners in that any lead-in radius is less than the order of magnitude of approximately 0.01 inch.

4,051,291

GYPSUM WALLBOARD

William J. Long, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 221,324, Jan. 27, 1972, abandoned. This application July 23, 1974, Ser. No. 491,097

Int. Cl.² B32B *7/14, 3/00*

U.S. Cl. 428—201 **6 Claims**



1. In a panel comprising a rehydrated gypsum core securely bonded to a paper cover sheet by a starch adhesive disposed at the interface of said core and said cover sheet, the improvement wherein said starch adhesive is nonmigratory and is disposed at limited areas of said interface, the amount of starch present at said limited areas being sufficient to provide secure

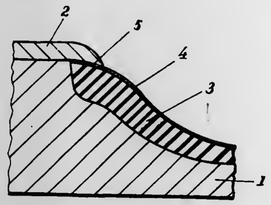
bonding of said paper cover sheet to said gypsum core when said starch adhesive has set, and wherein substantial areas of said interface are free of said starch adhesive, said free areas being sufficient to provide wet bonding of said cover sheet to said core prior to the setting of said starch adhesive, the portion of said paper cover sheet spaced from said interface being substantially free of starch.

4,051,292

PNEUMATIC TIRE BLANKS AND PROCESS

Erich Kresta, Perchtoldsdorf, and Werner Gorter, Baden, both of Austria, assignors to Semperit Aktiengesellschaft, Vienna, Austria

Filed Mar. 2, 1973, Ser. No. 337,610
Claims priority, application Austria, Feb. 29, 1972, 1648/72
Int. Cl.² B32B *7/02*; B60C *15/00*
U.S. Cl. 428—212 **5 Claims**



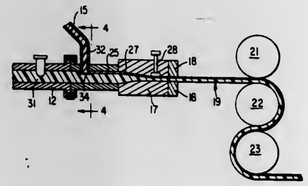
1. A pneumatic tire blank for vulcanization in a bellowless vulcanizing device having a clamping system, said tire blank comprising a bead region which circumferentially engages said clamping system when positioned therein, the bead region of the tire blank being formed of a first vulcanizable material positioned only at the bead region of the tire blank, a second vulcanizable material forming the remaining portions of the tire blank, said first vulcanizable material being vulcanizable more rapidly than the second vulcanizable material, whereby vulcanization of the entire tire blank in said clamping system is effected in a manner which precludes the adverse effects of temperature gradients produced in the tire blank by the engagement of the clamping system against the bead region.

4,051,293

CO-EXTRUSION OF POLYVINYLIDENE FLUORIDE/POLYSTYRENE MULTIPLE-LAYERED SHEETING

Donald F. Wiley, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

Division of Ser. No. 128,939, March 29, 1971, Pat. No. 3,968,196. This application Mar. 2, 1976, Ser. No. 663,192
Int. Cl.² B32B *7/02, 27/00*
U.S. Cl. 428—213 **5 Claims**



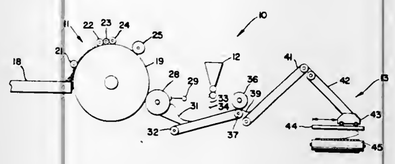
1. A composite sheeting material having a thickness of from about 10 mils to about three-eighths inch comprising a major layer constituting at least 80% of the thickness of said sheeting of a styrene polymer selected from the group consisting of homopolystyrene, impact polystyrene and normal styrene copolymers containing a minor portion of a copolymerizable monomer, and a minor surface layer constituting less than about 20% of the thickness of said sheeting of a vinylidene fluoride polymer, said surface layer being firmly united to said layer of styrene polymer solely by the adhesive forces of said styrene polymer and said vinylidene fluoride polymer, said vinylidene fluoride polymer being characterized by having an intrinsic or adjusted melt viscosity under extrusion conditions which is within the range of about 50 to 150% of the melt viscosity of said styrene polymer under said conditions.

4,051,294

FIBEROUS BATT AND METHOD FOR PRODUCING SUCH

George Sumner Buck, Jr.; Robert George Weyker, both of Memphis, and Arthur Gerard Ward, Arlington, all of Tenn., assignors to Fiberlok, Inc., Memphis, Tenn.

Filed Sept. 12, 1975, Ser. No. 612,783
Int. Cl.² B32B *31/00*
U.S. Cl. 428—283 **8 Claims**



1. A process for producing a fibrous batt comprising the steps of:

I. forming a thin web of 5 to 95 weight percent cotton fibers, balance polyester fibers,

II. contacting the web with an adhesive amount of particles of a copolymer of vinyl chloride and vinylidene chloride;

III. forming the web into a batt by laying the web transversely back and forth on a moving belt such that the batt comprises a plurality of webs; and

IV. heating the batt to a temperature above the sticking point of the copolymer but below the melting point of the polyester

wherein the weight ratio of vinyl chloride to vinylidene chloride is 1:99 to 40:60, and

wherein the weight ratio of the copolymer to the fibers is 1:99 to 30:70 and

wherein the copolymer particles have a size range of from 1 to 200 microns.

4,051,295

ALTERATION-SENSITIVE SURFACE

Donald J. Bernstein, 2 Grover Terrace, Fairlawn, N.J. 07410

Filed Dec. 20, 1974, Ser. No. 534,726
Int. Cl.² B42D *15/02*
U.S. Cl. 428—288 **11 Claims**

1. A sheet articles for providing information as in a form, card or other type document for identification or other like purposes, having at least a portion thereof sensitive to alteration comprising: a sheet of interconnected, continuous, spun strands of thermoplastic polymer fibres bonded together with heat and pressure so as to form a relatively smooth surface of a texture suitable for printing; said alteration-sensitive portion of said surface having been treated with a solvent so as to have caused swelling of the surface fibres during the treatment and to result in a surface which is rendered permanently more easily degraded by abrasion; the solvent being sufficient to provide at least about 2% selling of the fibres at 86° F after a five minute immersion of the sheet material in pure solvent; and information applied onto the treated portion of the surface; so that an attempt to erase said information will simultaneously

cause a visible abrasion of at least some part of said treated portion of said surface, thereby revealing that an alteration has been made.

4,051,296

SILICONE RUBBER MOLD

Leo J. Windecker, Midland, Tex., assignor to International Harvester Company, Chicago, Ill.

Filed Mar. 14, 1977, Ser. No. 777,378
Int. Cl.² B32B *3/26*
U.S. Cl. 428—311 **8 Claims**

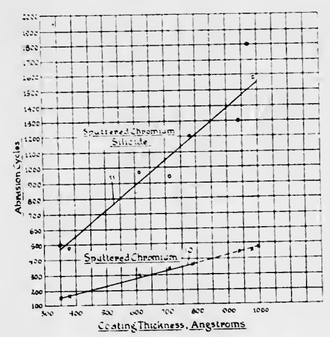
1. A reinforced silicone rubber mold comprising a silicone rubber mold member having a mold surface conforming to the desired pattern and a rigid laminated member, said laminated member including a flexible open-celled foam having one surface bonded to the back surface of said silicone rubber mold member by a layer of silicone rubber impregnated into the layer of open cells of said foam that are adjacent to said one surface, and a layer of cured resin impregnated into the remainder of said open cells of said flexible foam.

4,051,297

TRANSPARENT ARTICLE AND METHOD OF MAKING THE SAME

Neil D. Veigel, Novi, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Aug. 16, 1976, Ser. No. 714,783
Int. Cl.² C23C *15/00*; B32B *17/06*
U.S. Cl. 428—336 **5 Claims**



1. An article of manufacture, a transparent glazing element comprising, a transparent sheet of glass having a smooth continuous surface, and a continuous abrasion resistant transparent reflective film of chromium silicide adhered to said smooth continuous surface, said chromium silicide film consisting essentially of chromium and silicon and being of a thickness of from about 200 to 1,000 Angstroms.

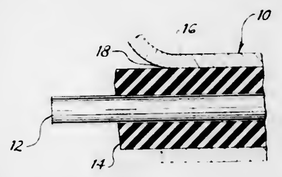
5. In the method of making a transparent glazing element comprising a transparent sheet of glass having a smooth continuous surface and a continuous abrasion resistant reflective film adhered to said smooth continuous surface, the improvement which comprises providing a sputtering target of chromium silicide consisting essentially of chromium and silicon, and sputtering said chromium silicide from said target in a low-pressure atmosphere containing an inert gas onto said smooth continuous surface of the glass sheet to form a transparent film having a thickness of from about 200 to 1,000 Angstroms.

4,051,298

STRIPPABLE COMPOSITE OF POLYMERIC MATERIALS FOR USE IN INSULATED ELECTRICAL CONDUCTORS, A METHOD OF FORMING THE SAME AND PRODUCTS THEREOF

Thaddeus Dominick Misiura, Sandy Hook; Joseph Edward Vostovich, Bridgeport, and Ralph Edward Wahl, Trumbull, all of Conn., assignors to General Electric Company, Bridgeport, Conn.

Division of Ser. No. 468,397, May 9, 1974, Pat. No. 3,925,597. This application Aug. 28, 1975, Ser. No. 608,447
Int. Cl.² B32B *27/00*
U.S. Cl. 428—383 **7 Claims**



1. An easily and cleanly strippable composite of cured polymeric materials comprising a body of a copolymer of ethylene and propylene having an ethylene content of not more than about 50% by weight with a surface adheringly joined to a contacting surface of a body comprising an elastomeric blend of about 20 to about 40 parts by weight of a copolymer of ethylene and propylene admixed with about 60 to about 80 parts by weight of chlorosulfonated polyethylene, said contacting surfaces of the bodies of polymeric materials being adheringly joined at their contacting surfaces by applying the body of the elastomeric blend while in an uncured condition to the body of the copolymer of ethylene and propylene in a cured condition and thereafter curing said body of the elastomer blend while a surface thereof is in adjoining physical contact with a surface of the cured body of the copolymer of ethylene and propylene.

5. A method of preparing an easily and cleanly strippable composite or cured polymeric materials comprising a body of a copolymer of ethylene and propylene having an ethylene content of not more than about 50% by weight with a surface adhereingly joined to a contacting surface of a body comprising an elastomeric blend of about 20 to about 40 parts by weight of a copolymer of ethylene and propylene admixed with about 60 to about 80 parts by weight of chlorosulfonated polyethylene, comprising curing a body of said copolymer of ethylene and propylene, applying to a surface of said cured body of copolymer of ethylene and propylene a body comprising said elastomeric blend in an uncured condition, and while the surfaces of said bodies of cured and uncured polymeric materials are in adjoining physical contact, curing said body of uncured elastomeric blend.

4,051,299

SYNTHETIC FIBERS OF ENHANCED PROCESSABILITY

William G. Steinmiller, Charlotte, N.C., assignor to Fiber Industries Inc., Charlotte, N.C.

Division of Ser. No. 451,631, March 15, 1974, Pat. No. 3,997,450, which is a continuation-in-part of Ser. No. 242,776, April 10, 1972, abandoned. This application Aug. 9, 1976, Ser. No. 712,635
Int. Cl.² B32G *27/00*
U.S. Cl. 428—394 **7 Claims**

1. A synthetic copolymer or copolymer fiber having a finish thereon of from about 0.3 to about 1 percent by weight of a synthetic fiber finish composition consisting essentially of:

(1) an emulsifier comprising an alkylene (lower) oxide condensate of a synthetic ester of a branched or straight chain, saturated or unsaturated, aliphatic $C_3 - C_{18}$ alcohol and a

branched or straight chain, saturated or unsaturated, aliphatic C_8 - C_{18} mono- or di-carboxylic acid; an alkylene oxide condensate of a polyhydric aliphatic C_6 - C_{18}, branched or straight chain, saturated or unsaturated, alcohol, or partial ester thereof with said aliphatic C_8 - C_{18} mono- or di-carboxylic acid, branched or straight chain, saturated or unsaturated; an alkylene oxide condensate of a long chain, branched or straight chain, saturated or unsaturated, aliphatic C_6 - C_{18} monohydric alcohol; an alkylene oxide condensate of an amide derived from an alkanol (lower) amine and a long chain saturated or unsaturated, branched or straight chain, aliphatic C_8 - C_{18} mono- or di-carboxylic acid; or an alkylene oxide condensate of an alkyl(C_6 - C_{18})-substituted, hydroxy-terminated aryl; or a mixture of these; (2) a lubricant comprising a mono- or di-ester of an aliphatic C_8 - C_{18}, branched or straight chain, saturated or unsaturated, carboxylic acid with a monohydric aliphatic alcohol C_3 - C_{18}, branched or straight chain, or a refined mineral, animal or vegetable oil; said emulsifiers containing up to about 50 moles of alkylene oxide per mole of ester, alcohol, or amide and the reactive hydroxyl sites of said emulsifiers containing deactivating end cap groups selected from the group consisting of methyl, acetyl, sulfate, the residue of a fatty acid (C_8 - C_{18}), phosphate, and mixtures thereof and (3) as an emulsifier-stabilizer component, a small but effective amount of an alkali salt of a dialkyl sulfosuccinate acid.

4,051,300

HOLLOW SYNTHETIC FIBERS

Elias Klein, New Orleans; James K. Smith, Slidell, and Frederick C. Morton, New Orleans, all of La., assignors to Gulf South Research Institute, Baton Rouge, La.

Continuation-in-part of Ser. No. 394,335, Sept. 3, 1973, abandoned. This application Feb. 27, 1976, Ser. No. 662,010

Int. Cl.² B05D *3/00*; D02G *3/22*

U.S. Cl. 428—398 **14 Claims**

1. In the method of forming a microporous high strength hollow fiber suitable for reverse osmosis, ultrafiltration and gas separations, said fiber having a continuous axial channel, said micropores having a size range less than 0.25 microns and said fibers capable of withstanding over 600 psi of applied pressure, the steps comprising:

a. forming a solution of a fiber-forming polymer, and adding to said solution a second polymer consisting of polyvinylpyrrolidone having an average molecular weight of at least 2000 to form a stable two polymer solution from which the two polymers separate on coagulation, where the sum of the weight percent of the fiber-forming polymer and the weight percent of the second polymer of polyvinylpyrrolidone is at least 15 and not over 65, and the ratio of the fiber-forming polymer to the weight percent of the second polymer of polyvinylpyrrolidone is at least 0.5 and not over 55;

b. extruding the resulting polymer solution through an orifice equipped for coaxial extrusion;

c. contacting the extrudate with a precipitating liquid that is miscible with the solvent for the fiber-forming polymer, is a non-solvent for the fiberforming polymer, and is a solvent for the second polymer of polyvinylpyrrolidone, and

d. washing the resulting hollow fiber substantially free of residual solvents and non-fiber-forming material.

4,051,301

FURAN-PHENOLIC RESIN COATED SAND FOR COLLAPSIBLE FOUNDRY MOLDS

Robert Laitar, Chicago, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Oct. 16, 1975, Ser. No. 623,132

Int. Cl.² B22C *1/16*

U.S. Cl. 428—404 **12 Claims**

1. A resin coated sand comprising:

1. particles of sand coated with from about 1% to about 8% by weight of the sand of a furan-modified novolak resin prepared by

a. reacting of furfuryl alcohol with a phenol at an acid pH; with the mole ratio of furfuryl alcohol to the phenol being within the range of 0.04 to 0.9, to produce a furfuryl-phenolic intermediate, and

b. reacting of said intermediate with a C_1 to C_3 aliphatic aldehyde at an acid pH, with the molar ratio of aldehyde to the total of the phenol and furfuryl alcohol being within the range of 0.5 to 0.85

c. and separating the resin; and

2. a curing agent.

4,051,302

METHOD OF IMPROVING ADHESIVE PROPERTY OF PLASTIC SUPPORTS

Masayoshi Mayama, and Kiyoyuki Miura, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1976, Ser. No. 663,076

Claims priority, application Japan, Mar. 4, 1975, 50-26384

Int. Cl.² B05D *3/06*

U.S. Cl. 428—411 **2 Claims**

1. A method of improving adhesive property of plastic supports which comprises coating the plastic support on the surface with an aqueous liquid containing a hydrophilic polymer and hydrogen peroxide and irradiating the coated surface with ultraviolet rays while keeping said coated surface in its wet state where the hydrogen peroxide is present.

4,051,303

RECORDING SHEET

Takao Hayashi, and Hajime Kato, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 387,228, Aug. 9, 1973, abandoned. This application July 17, 1975, Ser. No. 596,798

Claims priority, application Japan, Aug. 15, 1972, 47-81681

Int. Cl.² B41M *5/22*

U.S. Cl. 428—411 **14 Claims**

1. The process for forming a recording sheet comprising a support having thereon a color developer layer containing (1) a metal compound of an aromatic carboxylic acid which is the reaction product of an alkali metal salt of an aromatic carboxylic acid and a water soluble metal salt wherein the metal is selected from the group consisting of a metal of Group 1B of the Periodic Table, a metal of Group IIA, a metal of Group IIB, a metal of Group IIIB, a metal of Group IVA, a metal of Group VIA, a metal of Group VIIB or a metal of Group VIII and (2) at least one of gelatin or a gelatin derivative formed by reacting gelatin with an aromatic or aliphatic compound, said metal compound of an aromatic carboxylic acid being capable of forming a colored image when reacted with a color former, which process comprises:

reacting said alkali metal salt of said aromatic carboxylic acid and said water-soluble metal salt in the presence of at least one of said gelatin or said gelatin derivative and thereafter coating the resulting product on said support to provide said recording sheet.

4,051,304

ELECTRIC BATTERIES

James Chetwood Snook, Hale, England, assignor to Chloride Group Limited, London, England
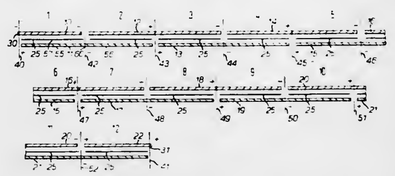
Filed Feb. 20, 1976, Ser. No. 659,894

Claims priority, application United Kingdom, Feb. 21, 1975, 7489/75

Int. Cl.² H01M *4/00*

U.S. Cl. 429—94 **17 Claims**

1. A multi-cell lead acid electric storage battery in which each cell electrode structure comprises an assembly of a single first electrode incorporating a lead support of one polarity separated by a separator from a single second electrode incorporating a lead support of the other polarity an integral portion of said first electrode support extending out to one side of its cell and an integral portion of said second electrode support extending out to the other side of its cell, said first integral portion being connected to or integral with an electrode support structure in the adjacent cell, or a battery terminal, on its



side of each cell, and the other integral portion being connected to an integral with an electrode support structure in the adjacent cell on its side of each cell, said integral portions extending substantially the full width or substantially the full height of the side of each cell, the cells being arranged to provide an array of multiple layers of electrodes of alternating polarity.

4,051,305

ELECTRODES FOR GALVANIC ELEMENTS

Gabor Benczür-Urmössy, Stuttgart, and Ute Baumeyer, Rommelshausen, both of Germany, assignors to Deutsche Automobilgesellschaft m.b.H., Germany

Filed May 31, 1974, Ser. No. 475,175

Claims priority, application Germany, June 1, 1973, 2327931

Int. Cl.² H01M *4/52*; B22F *9/00*

U.S. Cl. 429—217 **27 Claims**



1. In a electrode for galvanic elements including one of an active mass and an electrocatalyst, an organic binding agent, and a conductive substance. the improvement wherein said conductive substance is a comminuted form of a moss-like material of fiber-shaped crystal aggregates obtained by thermal decomposition of a gaseous carbonyl selected from the group consisting of nickel carbonyl, iron carbonyl and mixtures thereof in the presence of a non-preheated inert gas in a decomposition zone heated to about 300° to 500° C., the gaseous carbonyl being mixed with said inert gas at a ratio of 1:1 to about 1:100.

22. A method for producing a conductive substance for use in electrodes for galvanic elements, comprising the steps of evaporating a material selected from the group consisting of nickel carbonyl, iron carbonyl and mixtures thereof to produce a carbonyl gas, mixing the carbonyl gas obtained thereby with an inert gas having undergone no preheating when mixed with said carbonyl gas, and causing the gas mixture to undergo thermal decomposition by conducting the gas mixture at atmospheric pressure to a decomposition zone heated to the decomposition temperature of said carbonyl gas whereby the growth of crystals one upon the other into a voluminous product comprising a moss-like material of fiber-shaped crystal aggregates is attained and thereafter comminuting the voluminous product obtained from the decomposition zone into particle size smaller than 1 mm.

4,051,306

CONTROLLED ENVIRONMENTAL DETERIORATION OF PLASTICS

John W. Tobias, East Lansing; Lynn J. Taylor, Haslett, and Stuart J. Gaumer, Midland, all of Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 238,466, March 27, 1972, abandoned. This application Feb. 12, 1976, Ser. No. 657,657

Int. Cl.² C08J *3/20*

U.S. Cl. 526—1 **16 Claims**

1. A process for preparing a degradable plastic composition, which process comprises:

a. preparing a partially oxidized organic polymer by heating an oxidizable organic polymer in the presence of gaseous oxygen;

b. and then incorporating said partially oxidized organic polymer into a thermoplastic organic base polymer different from said oxidizable polymer.

4,051,307

POLYMERIZATION PROCESS

Anthony David Caunt, Welwyn Garden City, and Michael Stanley Fortnin, St. Albans, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 4, 1973, Ser. No. 367,006

Claims priority, application United Kingdom, June 9, 1972, 27008/72; June 9, 1972, 27009/72; July 7, 1972, 31884/72; Feb. 9, 1973, 7985/73; Feb. 19, 1973, 7986/73

Int. Cl.² C08F *4/66, 10/06*

U.S. Cl. 526—77 **20 Claims**

1. An olefine polymerisation catalyst comprising

1. a solid halide or oxyhalide compound of a transition metal of Group IVA to VIA of the Periodic Table, wherein the said metal has a valency below its maximum;

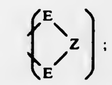
2. an organo-metallic compound of aluminium, or of a non-transition metal of Group II of the Periodic System, or a complex of an organo-metallic compound of a non-transition metal of Group I or II of the Periodic System, and an organo-aluminium compound; and

3. at least one phosphorus compound selected from materials of the formula

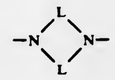
$$R''_2P(Q)_nXP(Q)_nR''_2$$

wherein

R'' is halogen, a hydrocarbyl group, a group —NR'''$_2$ or —OR''', a heterocyclic group, a group (E—Z—G), or both groups R'' attached to the same P atom together form a group



R''' is a hydrocarbyl group; X is —O—, NR''''—, —E(CH_2)$_m$E— or



R'''' is a hydrogen atom or a hydrocarbyl group;
each L is a bivalent hydrocarbyl radical and may be the same or different;
each E is —O—, —S— or —NR'''— and may be the same or different;
G is —OR''', —SR''', —NR'''$_2$, —PR'''$_2$ or a heterocyclic ring system whereof the heteroatom is O, S, N or P;
Q is an oxygen or sulphur atom;
Z is a bivalent hydrocarbyl radical such that E and G, or E and E are separated by not more than 3 carbon atoms;
each *a* is independently zero or one; and
m is a positive integer.

4,051,308

PROCESS FOR POLYMERIZING BUTADIENE WITH COBALT COMPLEX, ALR_3 AND CS_2

Adel Farhan Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 491,721, July 25, 1974, abandoned. This application Nov. 6, 1975, Ser. No. 629,437
The portion of the term of this patent subsequent to Nov. 23, 1993, has been disclaimed.
Int. Cl.^{2} C08F *1/52, 3/18*
U.S. Cl. 526—141 **14 Claims**

1. A process for the preparation of polybutadiene high in syndiotactic 1,2 structure range of 190°–227° C., which comprises polymerizing 1,3-butadiene in the liquid phase in the presence of a catalyst composition consisting essentially of:
a. a complex of a cobalt salt selected from the class consisting of halides, carboxylates, carbonate and thiocarboxylates, said complex being formed with a cyclic compound having an amino nitrogen and a keto or thioketo group therein selected from the class consisting of N-methylpyrrolidone, pyrrolidone, caprolactam, p-aminoacetophenone, N,N-dimethyl-p-aminoacetophenone, N-methyl-2-aminocyclohexanone, N-methyl-thiopyrrolidone and thiocaprolactam;
b. a reducing agent having the formula AlR_3, wherein R is a hydrocarbon radical of 1-8 carbon atoms; and
c. CS_2.

4,051,309

PROCESS FOR COPOLYMERIZING CONJUGATED DIENE AND ALPHA-OLEFIN

Jung Woog Kang, Clinton, and James Oziomek, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 627,983, Nov. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 509,525, Sept. 26, 1974, abandoned. This application Feb. 17, 1977, Ser. No. 769,745
Int. Cl.^{2} C08F *236/02*
U.S. Cl. 526—141 **13 Claims**

1. A process for the hydrocarbon solution polymerization of a monomer composition containing 10–90 percent by weight of a conjugated diene and 10–90 percent by weight of an alpha-olefin having 2–10 carbon atoms to produce a copolymer having 5–90 percent of the alpha-olefin in the resultant copolymer comprising the steps of maintaining said monomer composition at a temperature in the range of −30° to 50° C in intimate contact with a catalyst composition consisting essentially of:
a. an aluminum hydride of the formula R_2AlH where R is hydrogen or a hydrocarbon radical of 1–20 carbon atoms, there being at least one hydrocarbon radical per molecule;
b. a metal halide compound having the formula $TiBr_nCl_{4-n}$ or VBr_mCl_{3-m} wherein *n* has a value of 0–4 and *m* has a value of 0–5; and
c. a carbonyl-containing compound having no more than 20 carbon atoms selected from the class consisting of aldehydes, ketones and carboxylic acids, esters, amides and carbamates; said carbonyl-containing compound having no halogen atoms therein except that there may be a chlorine attached directly to a carbon of an aromatic ring in said compound; the concentration of said titanium or vanadium halide being 0.1–4 millimoles per 100 grams of said monomer composition, said aluminum hydride being present in a proportion of 1–4 moles per mole of titanium or vanadium halide, and said carbonyl compound being present in a proportion of 0.7–4 moles per mole of titanium or vanadium halide, said polymerization being conducted for a period of at least one hour.

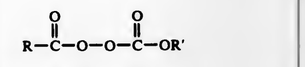
4,051,310

THERMALLY STABLE HIGH MOLECULAR WEIGHT ACYL PEROXYCARBONIC ESTERS

Roger N. Lewis, Martinez; Ronald L. Pastorino, Larkspur, and James F. Wilts, Richmond, all of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed June 16, 1976, Ser. No. 696,463
Int. Cl.^{2} C08F *4/34*; C08G *63/12, 77/04*; C08F *20/10*
U.S. Cl. 526—230 **16 Claims**

1. A process for the production of polymers which comprises subjecting a compound selected from ethylene, styrene, vinyl chloride, vinyl chloride-vinyl acetate comonomers, and methyl methacrylate in the presence of a polymerization initiating amount of an acyl peroxycarbonic ester of the formula:



where R is selected from methyl and ethyl; and R' is an alkyl group which together with R contains a total of 17 to about 25 carbon atoms.

4,051,311

INTERPOLYMERS OF A STYRENIC MONOMER, A MALEIC OR HALOMALEIC ANHYDRIDE MONOMER AND A BROMINATED MONOMER

Yoon C. Lee, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 644,490
Int. Cl.^{2} C08F *212/08, 214/14, 214/16*
U.S. Cl. 526—271 **6 Claims**

1. A solid polymer consisting essentially of the interpolymerization product of:
A. from 55 to 90 percent by weight of a styrene monomer selected from the group consisting of styrene, alpha methyl styrene, chlorostyrene and bromostyrene;
B. from 5 to 25 percent by weight of a maleic anhydride monomer selected from the group consisting of maleic anhydride, monochloro maleic anhydride and bromo maleic anhydride;
C. from 5 to 20 percent by weight of a brominated monomer selected from the group consisting of bromophenyl acrylates, bromophenyl methacrylates, bromoneopentyl acrylates and bromoneopentyl methacrylates; and
D. from 0 to 30 percent by weight of a monomer selected from the group consisting of acrylonitrile, methacrylonitrile and methyl methacrylate;
and with the proviso that the amount of bromine in the polymer due to the brominated monomer of component (C) is at least 3 percent by weight.

4,051,312

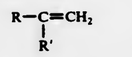
SULFUR VULCANIZABLE INTERPOLYMERS

Irving Kuntz, Linden, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 452,969, March 20, 1974, abandoned. This application Nov. 6, 1975, Ser. No. 629,567
Int. Cl.^{2} C08F *210/00, 210/12, 212/02, 214/02*
U.S. Cl. 526—329 **3 Claims**

1. An alternating sulfur vulcanizable elastomeric interpolymer having a glass transition temperature of less than 0° C, an

inherent viscosity greater than 0.5 when measured in benzene at a temperature of 20° C and concentration of 0.1 g/dl, and a number average molecular weight in the range of about 10,000 to 700,000 comprising:
a. one or more C_2-C_{20} acyclic or alicyclic olefins having the general formula



wherein R and R' are independently selected from the group consisting of chloride, hydrogen, straight and branched chain alkyl radicals, aryl, alkylaryl, arylalkyl and cycloalkyl radicals;
b. one or more C_1-C_{20} acyclic or alicyclic esters of acrylic acid, said esters having the general formula

$$CH_2 = CH - COOR$$

wherein R is selected from the group consisting of straight or branched chain primary alkyl radicals, arylalkyl radicals and cycloalkyl alkylene radicals, and is free of olefinic unsaturation; and
c. a minor molar proportion, about 0.10 to 10 mol percent of the total monomers present in said interpolymer, of one or more C_4-C_{10} hydrocarbon acyclic conjugated diolefins, wherein the mol percent of the esters of acrylic acid and the sum of the mol percentages of the olefin and diolefin present in said interpolymer are each substantially equal to 50 mol percent, and wherein olefin monomer units of (A) above and acrylate monomer units of (B) above alternate to form polymer segments of variable length, interconnected by randomly distributed diolefin monomer units of (C) above and the microstructure of said interpolymer can be represented by

$$(A - B)_n \quad (C) \quad (B) \quad (A - B)_n$$

wherein *n* is an integer from 1 to 500.

4,051,313

PROCESS FOR PURIFYING POLYPROPYLENE

Luciano Luciani, and Gianni Nava, both of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 494,221, Aug. 2, 1974, abandoned. This application Oct. 29, 1975, Ser. No. 626,704
Claims priority, application Italy, Aug. 3, 1973, 27504/73
Int. Cl.^{2} C08F *6/08*
U.S. Cl. 528—496 **6 Claims**

1. A process for practically completely removing magnesium dihalide from a polypropylene obtained by polymerizing propylene in contact with a catalyst prepared by mixing (A) an aluminum trialkyl partially complexed with an electron-donor compound with (B) a titanium tri- or tetra-halide supported on an anhydrous magnesium dihalide, or a complex of a titanium tri- or tetra-halide with an electron donor compound supported on an anhydrous magnesium dihalide, and which polypropylene contains catalyst residues including magnesium dihalide, said process comprising mixing an aliphatic alcohol containing from 3 to 8 carbon atoms with a suspension of the polypropylene in a hydrocarbon solvent at a temperature of from 60° C to 100° C to thereby solubilize catalyst residues present in the polypropylene, including the magnesium halide, and thereafter separating both the solvent and the solubilized catalyst residues including the solubilized magnesium dihalide, from the polypropylene.

4,051,314

POLYSACCHARIDES AND METHOD FOR PRODUCING SAME

Shigeto Ohtsuka; Saburo Ueno; Chikao Yoshikumi; Fumio Hirose, all of Tokyo; Yoshio Ohmura, Tanashi; Toshihiko Wada, Mibu; Takayoshi Fujii, Tokyo, and Eiichi Takahashi, Urawa, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 80,755, Oct. 14, 1970, abandoned. This application Oct. 11, 1974, Ser. No. 513,958
Int. Cl.^{2} C08B *37/00*
U.S. Cl. 536—1 **9 Claims**

6. The polysaccharide produced by the process comprising forming a culture medium or liquid extract of mycelium of a species of fungi belonging to the class Basidiomycetes and selected from the group consisting of *Coriolus versicolor, Coriolus conchifer, Coriolus paragamenus, Coriolus hirsutus, Coriolus biformis, Coriolus consors* and *Coriolus pubescens*, and separating the polysaccharide from said culture medium or liquid extract.

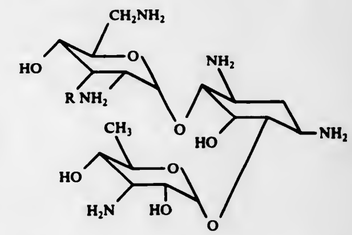
4,051,315

6''-DEOXYKANAMYCIN B AND 6''-DEOXYTOBRAMYCIN

John Carl Godfrey, Syracuse, and Joseph Rubinfeld, Northport, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 523,292, Nov. 13, 1974, abandoned. This application Dec. 2, 1975, Ser. No. 636,886
Int. Cl.^{2} C07H *15/22*
U.S. Cl. 536—10 **4 Claims**

1. A compound having the formula



in which R is hydrogen or OH; or a nontoxic pharmaceutically acceptable acid addition salt thereof,

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4,051,316

REMOVAL OF HEAVY METAL IONS FROM AQUEOUS SOLUTIONS WITH INSOLUBLE CROSSLINKED-STARCH-XANTHATES

Robert E. Wing, Peoria, and William M. Doane, Morton, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 515,262, Oct. 16, 1974, Pat. No. 3,979,286. This application June 14, 1976, Ser. No. 695,617
Int. Cl.^{2} C08B *31/02*
U.S. Cl. 536—107 **6 Claims**

1. A composition useful for removing heavy metal ions from aqueous solutions comprising an alkali metal-magnesium salt of crosslinked-starch-xanthate having a degree of crosslinking (DCL) such that said salt exhibits a degree of swelling in water at 95° C. of from 65% to 450%, wherein said crosslinking occurs between the starch molecules of said salt through the hydroxyl oxygens of said molecules, and having said magnesium present in an amount ranging from about 0.5% to about 12.0% by weight of said salt.

4,051,317

XANTHAN RECOVERY PROCESS

Gordon Anson Towle, Landenberg, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 2, 1976, Ser. No. 710,812
Int. Cl.² C08B *37/00*
U.S. Cl. 536—114 **4 Claims**

1. A method of precipitating xanthan gum from an aqueous solution which comprises adding an aluminum salt to said solution, and thereafter increasing the pH of the solution to a level between about 3.5 and 4.5, said aluminum salt being selected from the class consisting of aluminum acetate, aluminum chloride, and aluminum nitrate.

4,051,318

PROCESS FOR PREPARING FORMATE ESTERS OF ALKYL-SUBSTITUTED AROMATIC HYDROXY COMPOUNDS

Takashi Suzuki, and Susumu Naito, both of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jan. 5, 1976, Ser. No. 646,594
Claims priority, application Japan, Jan. 16, 1975, 50-7210; Apr. 18, 1975, 50-47260
The portion of the term of this patent subsequent to Aug. 24, 1993, has been disclaimed.
Int. Cl.² C07C *69/06*
U.S. Cl. 560—131 **13 Claims**

1. A process for preparing formate esters of the formula

HCOOAr

wherein Ar is an aromatic hydrocarbon group containing alkyl aromatic aldehyde of the general formula

ArCHO

wherein Ar is the same as defined above, with an organic peroxy acid in the presence of hydrogen fluoride in the presence or absence of a solvent under the conditions that (1) the molar ratio of the organic peroxy acid to the alkyl aromatic aldehyde is 1.0 to 1.5 : 1 and (2) the molar ratio of the hydrogen fluoride to all the oxygen-containing compounds is 0.5 to 4.0: 1.

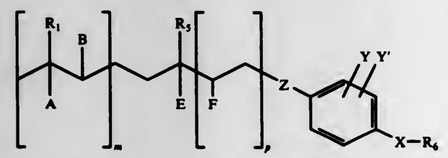
4,051,319

ALKYNYLOXY-PHENYL DERIVATIVES

Madhukar Subraya Chodnekar, Basel; Albert Pfiffner, Pfaffhausen; Norbert Rigassi, Arlesheim; Ulrich Schwieter, Reinach, and Milos Suchy, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 548,469, Feb. 10, 1975, Pat. No. 3,957,833, which is a division of Ser. No. 312,074, Dec. 4, 1972, Pat. No. 3,880,935, which is a division of Ser. No. 123,060, March 10, 1971, Pat. No. 3,718,686. This application Mar. 29, 1976, Ser. No. 671,453
Claims priority, application Switzerland, Mar. 25, 1970, 4621/70
Int. Cl.² C07D *303/38*
U.S. Cl. 542—413 **2 Claims**

1. A compound of the formula



wherein R_1 and R_5 are methyl or ethyl; R_6 is lower alkynyl; A and B taken together form an oxygen bridge, and E and F taken together form a carbon to carbon bond; Z is oxygen; Y and Y' are hydrogen; X is —COO—; and *m* and *p* are 1.

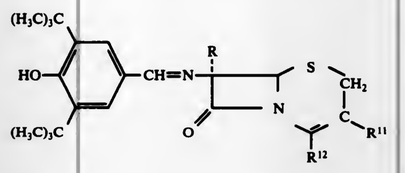
4,051,320

PROCESS FOR PREPARING ALKOXYLATED DERIVATIVES OF CEPHALOSPORIN COMPOUNDS

Hiroaki Yanagisawa; Akiko Ando; Masami Fukushima, and Hideo Nakao, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed July 3, 1975, Ser. No. 592,947
Claims priority, application Japan, July 24, 1974, 49-85007
Int. Cl.² C07D *501/02, 499/04*
U.S. Cl. 542—420 **7 Claims**

1. A process for preparing a compound having the formula



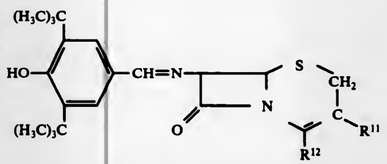
wherein

R^{11} is methyl, acetoxymethyl, (1-methyl-1H-tetrazol-5-yl) thiomethyl or 5-methyl-1,3,4-thiadiazol-2-yl-thiomethyl;

R^{12} is tert-butoxycarbonyl, benzhydryloxycarbonyl, p-bromophenacyloxycarbonyl, p-methoxybenzyloxycarbonyl or 2,2,2-trichloroethyloxycarbonyl; and

R is an alkoxy group having from 1 to 3 carbon atoms, which comprises contacting a compound having the formula

(IVa)



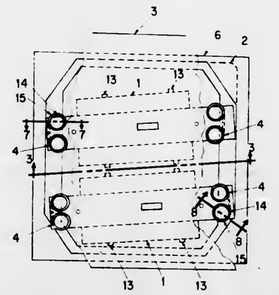
wherein R^{11} and R^{12} are as defined above, with from about 1.1to about 4 equivalents of a halide cation-producing compound per equivalent of said compound of formula (IV*a*), in the presence of a lower alkanol having from 1 to 4 carbon atoms and from about 1.2 equivalents to about 2 equivalents of a base per equivalent of said compound of formula (IV*a*), at a temperature of from about 0° C. to about −70° C., said halide cation-producing compound being selected from the group consisting of a halogen, N-chlorosuccinimide, N-bromosuccinimide, N-chloroacetamide, N-chlorophthalimide, N-bromophthalimide, N-chlorbenzenesulfonamide, N-bromobenzenesulfonamide, N-chloro-p-toluenesulfonamide, N-bromo-p-toluenesulfonamide, 1-bromobenzotriazole, 1-chlorotriazine, N,N-dibromohydantoin, tert-butylhypochlorite and tert-butylhypoiodite, and said base being selected from the group consisting of an alkali metal hydroxide, an alkaline earth metal hydroxide, lithium methoxide, sodium methoxide, potassium methoxide, lithium ethoxide, sodium ethoxide, potassium ethoxide, calcium ethoxide, potassium tert-butoxide, lithium cyclopropoxide, lithium propargyloxide, lithium benzyloxide, sodium benzyloxide, lithium hydride, sodium hydride, calcium hydride, butyl lithium, phenyl lithium, trimethylamine, triethylamine, tributylamine, N-methylpiperidine, N,N'-dimethylpiperidine, N-methylpyrrolidine, 1,8-diazabicyclo-[5,4,0]-7-undecene, pyridine and picoline.

4,051,321

DUAL SPRING CLIP FOR MOUNTING ELECTRICAL DEVICES

Donald D. Buell, 3040 Harris Road, Kelso, Wash. 98626

Filed Sept. 18, 1975, Ser. No. 614,422
Int. Cl.² H02G *3/08*
U.S. Cl. 174—57 **4 Claims**



1. In an electrical outlet assembly the combination of the following:

a. an outlet box having an open end and mounting lips projecting partially across the open end of the box,

b. an electrical device having a mounting ear on each end thereof for attachment to an outlet box, and

c. a dual spring clip securing a mounting ear of the electrical device to a mounting lip of the box, said dual spring clip comprising two parallel springs, each of which is in clamping engagement with a mounting ear of the electrical device and a member joining the two springs and serving to clamp the dual spring clip to the box.

4,051,322

ELECTRICAL JUNCTION BOX

William Park, 7522 Valjean, Van Nuys, Calif. 91403, and Leo A. LeVitre, 20762 Schoolcraft, Canoga Park, Calif. 91306

Filed June 27, 1975, Ser. No. 590,950
Int. Cl.² H02G *3/08*
U.S. Cl. 174—65 R **10 Claims**

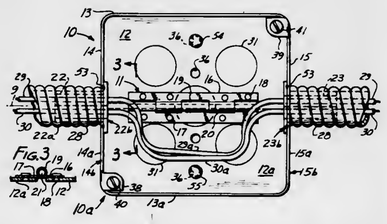


FIG. 3

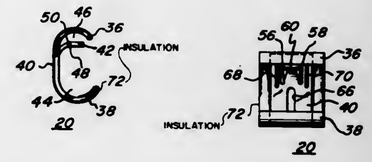
1. An electrical junction box comprising a base formed of two base parts with a peripheral wall structure, including opposite end walls each comprising a pair of end wall parts joined to the periphery of the base, and a pair of opposite tubular split connectors attached to and projecting from said opposite end walls for attaching to a cable sheath, said end walls being split in a plane through the connectors, one of said connector parts being attached to each of said end wall parts and hinge means connected and related to the end walls permitting the end wall parts to pivot relative to each other from a normal position in which the parts of the respective end walls and connectors are in abutment, to another position in which said parts separate from each other so that the tubular connectors become open laterally to receive a conductor, said end wall parts being shaped to provide an opening for said conductors.

4,051,323

CONNECTOR FOR COUPLING A GROUND CONDUCTOR TO THE SHIELD OF A SHIELDED CONDUCTOR

John J. Churla, Belle Mead, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Oct. 14, 1976, Ser. No. 732,331
Int. Cl.² H01R *5/10*
U.S. Cl. 174—78 **9 Claims**

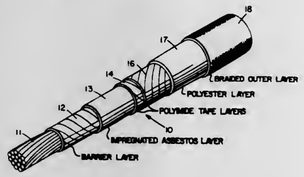


1. A connector for grounding the exposed shield of a jacketed shielded conductor from which a portion of the jacket has been removed to expose the shield, said connector being of the type having a central portion being preformed in a generally C-shaped configuration and having a first curved end portion of a first predetermined radius of curvature and a second curved end portion of a second predetermined radius of curvature larger than said first predetermined radius of curvature, said first curved end portion moving within said second curved end portion when said cental portion is wrapped about the exposed shield of a shielded conductor, the improvement comprising: an aperture in said central portion, said aperture defined by first and second generally parallel edges extending in the direction from said first curved end portion towards said second curved end portion and third and fourth edges each extending generally transverse to said first and second edges; a tab having an interior surface and an exterior surface and extending from said third edge and generally overlying said aperture; said tab having a first edge generally parallel with said first edge defining a portion of said aperture and a second edge generally parallel with said second edge defining a portion of said aperture; said tab having a first strengthening rib adjacent said tab's first edge and a second strengthening rib adjacent said tab's second edge, said tab's first and second strengthening ribs preventing the bending of said tab as said connector is brought into intimate contact with the exposed shield of a shielded conductor; said tab being curved and having a third predetermined radius of curvature greater than said first predetermined radius of curvature; said interior surface of said tab and said second curved end portion defining therebetween a shielded conductor receiving cavity, and the exterior surface of said tab and said first curved end portion defining therebetween a ground conductor receiving cavity; said first curved end portion moving within said second curved end portion as said connector is brought into intimate contact with the exposed shield of a shielded conductor when placed in said shielded conductor receiving cavity and said moving first curved end portion closing said ground conductor receiving cavity upon a ground conductor when placed therein.

4,051,324
RADIATION RESISTANT CABLE AND METHOD OF MAKING SAME

Robert W. Anderson, deceased, late of Burlington, Vt., by Dorothy M. Anderson, executrix; Robert E. Smith, Jr., Burlington, Vt., assignors to Haveg Industries, Inc., Wilmington, Del.

Filed May 12, 1975, Ser. No. 576,522
Int. Cl.² H01B 7/00
U.S. Cl. 174—121 R **5 Claims**

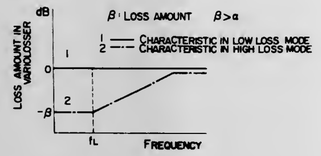


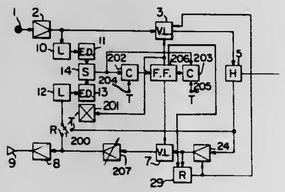
1. An electrical cable comprising:
an inner conductor;
a first barrier layer on said conductor;
a compacted asbestos layer impregnated with a saturant on said barrier layer to provide high temperature and radiation resistance;
at least one layer of polyimide tape over said asbestos layer to provide high dielectric strength;
a layer of heat-sealable polyester sealed about said polyimide tape layer to provide a moisture impervious barrier; and
a braided filamentary outer layer to provide protection against abrasion, said braided outer layer sealed to said heat-sealable polyester layer.

4,051,325
SPEECH INTERCOMMUNICATION SYSTEM

Yasuo Mafune, and Jubei Takahashi, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 27, 1976, Ser. No. 652,847
Claims priority, application Japan, Jan. 31, 1975, 50-13888; July 8, 1975, 50-84244; Nov. 14, 1975, 50-137437
Int. Cl.² H04M 9/10
U.S. Cl. 179—1 HF **4 Claims**



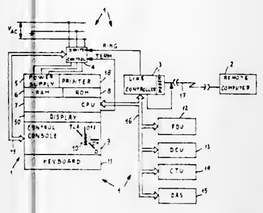


1. An intercommunication system comprising
a transmit channel and a receive channel, said transmit channel including a microphone operative in the transmit mode and a first variolosser circuit, and said receive channel including a loudspeaker operative in the receive mode, a manually gain-adjustable circuit, a second variolosser circuit and an automatic gain control amplifier, said first and second variolosser circuits each providing a variable amount of loss and permitting the high frequency region of the voice frequency band to pass therethrough including a mode wherein the amount of loss is relatively large,
a hybrid transformer connecting said transmit and receive channels,
first means for deriving a firt control signal from said transmit channel,
second means including a switch for selectively deriving a second control signal from said receive channel, said second control signal being derived in the transmit mode from a point in said system adjacent said hybrid transformer and in the receive mode from a point in said system adjacent said loudspeaker,
subtraction means for subtracting said first control signal from said second control signal,
first and second comparators having first and second different threshold values coupled to the output of said subtraction means, said first threshold value corresponding to the second control signal derived adjacent said loudspeaker and said second threshold value corresponding to the second control signal derived adjacent said hybrid transformer, and
a flip-flop having first and second inputs coupled to the outputs of said first and second comparators, respectively, and first and second outputs coupled to said first and second variolosser respectively, said flip-flop selecting the variable amount of loss in said first and second variolosser in accordance with the outputs of said comparators.

4,051,326
ARRANGEMENT FOR THE REMOTE SWITCHING-ON AND INITIALIZATION OF A DATA TERMINAL

Guido Badagnani, Fiorano, and Giancarlo Carioli, Banchette, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Aug. 17, 1976, Ser. No. 715,127
Claims priority, application Italy, Sept. 30, 1975, 69411/75
Int. Cl.² H04M 11/00
U.S. Cl. 179—2 DP **3 Claims**

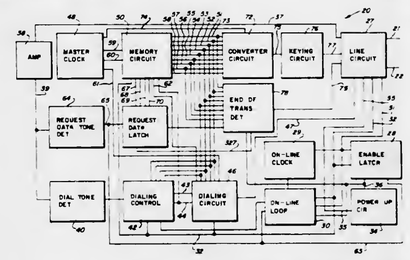


1. A terminal apparatus including an arrangement for switching on and initializing the terminal when connected to a telephone line connecting said terminal to a remote computer, comprising
a read/write memory for storing instructions and data,
a power supply unit connectable to a voltage source for supplying power voltage to the terminal apparatus,
a manually operable switch actuatable for controlling the switching on of the terminal apparatus by the remote computer,
a switch control unit,
means responsive to the actuation of said switch for connecting said voltage source to said switch control unit,
means included in said switch control unit for recognizing a call signal transmitted by the remote computer on the telephone line,
a logical circuit included in said switch conrol unit and activated by said recognizing means in presence of the call signal for connecting the power supply unit to the voltage source and for generating a signal activating the initialization operations of the data terminal,
a plurality of peripheral units connected to said terminal, at least one of said peripheral units comprising an information record for storing an initialization program for said terminal,
a first register included in said memory for storing information relating to the actuation of said switch,
a second register in said memory for storing information designating one of said peripheral units, and means controlled by said activating signal and by the contents of the first register for transferring to the memory the initialization program recorded in the peripheral unit designated by the second register.

4,051,327
TELEPHONE ALARM SYSTEM

Jesse H. Rigsby, Clarksville, Tenn., assignor to Pan-X Corporation, Indian Mound, Tenn.

Filed Apr. 30, 1976, Ser. No. 681,834
Int. Cl.² H04M 11/04
U.S. Cl. 179—5 R **22 Claims**

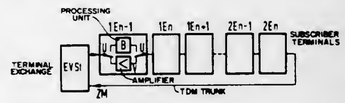


1. In a telephone alarm system, transmitter and receiver units for connection to first and second pairs of telephone lines interconnectable through a telephone exchange system, said transmitter unit including a line circuit for establishing a low impedance connection between the first pair of telephone lines and for receiving a dial tone signal back from the exchange system, a memory in said transmitter unit for storing information identifying said receiver unit and for storing a code word unique to said transmitter unit, a clock circuit for supplying signals to said memory, dialing means in said transmitter unit controllable from said memory for transmitting dial signals through the first pair of telephone lines to the exchange system, means responsive to receipt of a dial tone signal for applying clock signals from said clock circuit to said memory and transmission of said dial signals to the exchange system, a line circuit in said receiver unit for responding to a ring signal applied through the second pair of lines from the exchange system and for establishing a connection to the second pair of lines and to thereby complete a connection between said transmitter and receiver units through the telephone lines and the exchange system for signal transmission therebetween, means in said receiver unit for transmitting a request data tone signal following the establishment of said completed connection, request data tone detector means in said transmitter unit for detecting a request data tone signal transmitted back from said receiver unit through said completed connection, code signal transmission means in said transmitter unit controllable from said memory for transmitting keyed signals to said receiver unit through said completed connection, means responsive to detection of a request data tone signal by said detector means for applying clock signals from said clock circuit to said memory and transmission of said keyed signals to said receiver unit through said completed connection, signal receiving means in said receiver unit arranged for responding to said transmitted keyed signals to develop output signals, and means for applying said output signals to display means to display said code word unique to said transmitter unit.

4,051,328
METHOD FOR OPERATING A DIGITAL TIME DIVISION MULTIPLEX COMMUNICATION NETWORK

Alfred Mattern, Grobenzell, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 5, 1975, Ser. No. 601,987
Claims priority, application Germany, Aug. 8, 1974, 2438199
Int. Cl.² H04J 3/00
U.S. Cl. 179—15 AL **12 Claims**



1. A method of operation for a digital communication network wherein subscriber terminals are connected in a predetermined order to at least one time division multiplex (TDM) trunk, said trunk having its ends connected to a central exchange, comprising the steps of:
transmitting from said exchange on said TDM trunk communication data for predetermined ones of said subscriber terminals participating in a given call in the order of the connection of said predetermined subscriber terminals to said TDM trunk, all other subscriber terminals being blocked from receiving, but passing, said communication data,
readying said participating subscriber terminals for receiving said communication data, while blocking subscriber terminals other than said participating subscriber terminals from receiving communication data,
receiving in each said participating subscriber terminal, processing and transmitting further said communication data transmitted from said exchange, while blocking the others of said participating subscriber terminals from receiving a communication data transmitted from the aforementioned participating subscriber terminal and
disabling said participating subscriber terminals from receiving further communication data transmitted from said exchange after performing said receiving, processing and transmitting step.

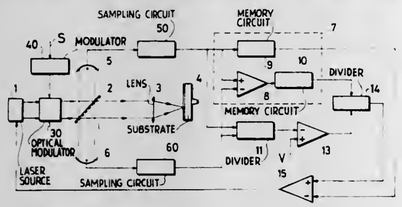
4,051,329
OPTICAL INFORMATION RECORDING SYSTEM IN WHICH THE ENERGY WHEN TRANSMITTED TO THE RECORDING LAYER IS CONSTANT

Bruno Blondet; Sylvain Kretschmer; Jean Pierre Lacotte, and Jean Paul Peltier, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Mar. 16, 1976, Ser. No. 667,442
Claims priority, application France, Mar. 21, 1975, 75.08945
Int. Cl.² G11B 7/72; H04N 5/76, 5/84
U.S. Cl. 179—100.3 N **5 Claims**

1. An optical system for recording information on a photosensitive layer deposited on a substrate, comprising a coherent light source for emitting a radiation beam, said source having a control input, optical means for dividing said beam into a reference beam and a second beam, an optical device for focusing said second beam onto said photosensitive layer, a first part of said second beam being transmitted to said photosensitive layer and a second part being reflected by said photosensitive layer, first means for detecting said reference beam having a first output for delivering a first signal proportional to the energy E(t) of said second beam, second means having a sec-

ond output for delivering a second signal proportional to the energy R(t) E(t) reflected by said photosensitive layer, storage means for storing signals characteristic of the energies E(t) and R(T) E(t) at an instant taken as reference, said energies being Eo and RoEo, said storage means having two outputs, and



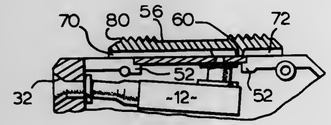
logic means having four inputs respectively connected to said first and second outputs of said storage means for forming an error signal, said logic means having an output for delivering said error signal, said output of said logic means being connected to said control input of said source, the energy when transmitted to said photosensitive layer being kept constant.

4,051,330

HEARING AID HAVING ADJUSTABLE DIRECTIVITY

William A. Cole, Brantford, Canada, assignor to Unitron Industries Ltd., Kitchener, Canada

Filed May 17, 1976, Ser. No. 687,434
Claims priority, application Canada, June 23, 1975, 229948
Int. Cl.² H04R *1/38, 25/00*
U.S. Cl. 179—107 FD **3 Claims**



1. In a hearing aid comprising:
1. a casing,
2. a microphone having first and second spaced sound ports, the improvement comprising:
3. means defining a third port in said casing,
4. means communicating said third port to said first port,
5. means defining fourth and fifth ports, said fourth port being located adjacent said third ports and said fifth port being spaced substantially from said third port,
6. means communicating said fourth and fifth ports to said second port,
7. a movable member having sound barrier means thereon,
8. means mounting said movable member for movement between a first position in which said sound barrier means blocks communication between said second port and said fourth port while permitting communication between said second port and said fifth port, and a second position in which said sound barrier means blocks communication between said second port and said fifth port while permitting communication between said second port and said fourth port,
9. said movable member being a slider plate having a longitudinal channel in the lower surface thereof, said means (8) including means mounting said slider plate for sliding movement on said casing, said channel having front and rear openings, said front opening being said fourth port and said rear opening being said fifth port, a divider wall located in said channel and constituting said sound barrier means, said means (8) including sound conduit means communicating said channel to said second port,
10. said means mounting said second tube on said casing comprising a thin rectangular support plate having an opening therein, means securing said second tube to said support plate with the opening in said support plate member aligned with the interior opening of said second tube, said casing having an upper substantially rectangular opening therein, said rectangular opening being of substantially the same length as said support plate and being of width slightly greater than that of said support plate, said casing having a pair of lips therein to support said support plate with the upper surface of said support plate flush with the upper surface of said casing, said slider plate having a pair of L-shaped legs extending through said opening in said casing and under said casing for said slider plate to slide in said opening in said casing with said channel aligned with the opening in said support plate.

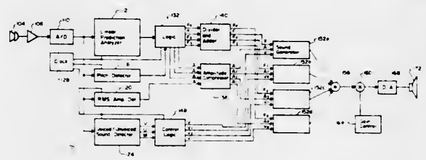
2. In a hearing aid comprising:
1. a casing,
2. a microphone having first and second spaced sound ports, the improvement comprising:
3. means defining a third port in said casing
4. means communicating said third port to said first port,
5. means defining fourth and fifth ports, said fourth port being located adjacent said third port and said fifth port being spaced substantially from said third port,
6. means communicating said fourth and fifth ports to said second port,
7. a movable member having sound barrier means thereon,
8. means mounting said movable member for movement between a first position in which said sound barrier means blocks communication between said second port and said fourth port while permitting communication between said second port and said fifth port, and a second position in which said sound barrier means blocks communication between said second port and said fifth port while permitting communication between said second port and said fourth port,
9. said means communicating said third port to said first port including a first soft flexible tube connected between said casing and said microphone, and said means communicating said fourth and fifth ports to said second port including a second soft flexible tube connected to said microphone, and means supporting said second soft flexible tube on said casing, said microphone being supported by said tubes and said tubes thereby providing vibrational isolation between said microphone and said casing,
10. said movable member being a slider plate having a cover surface and a longitudinal channel in said lower surface, and means (8) including means mounting said slider plate for sliding movement on said casing with said lower surface contacting said casing, said channel having front and rear openings, said front opening being said fourth port and said rear opening being said fifth port, a divider wall located in said channel and constituting said sound barrier means, said second tube communicating with said channel,
11. said means mounting said second tube on said casing comprising a thin rectangular support plate having an opening therein, means securing said second tube to said support plate with the opening in said support plate member aligned with the interior opening of said second tube, said casing having an upper substantially rectangular opening therein, said rectangular opening being of substantially the same length as said support plate and being of width slightly greater than that of said support plate, said casing having a pair of lips therein to support said support plate with the upper surface of said support plate flush with the upper surface of said casing, said slider plate having a pair of L-shaped legs extending through said opening in said casing and under said casing for said slider plate to slide in said opening in said casing with said channel aligned with the opening in said support plate.

4,051,331

SPEECH CODING HEARING AID SYSTEM UTILIZING FORMANT FREQUENCY TRANSFORMATION

William James Strong, and Edward Paul Palmer, both of Provo, Utah, assignors to Brigham Young University, Provo, Utah

Filed Mar. 29, 1976, Ser. No. 671,420
Int. Cl.² G10L *1/00*
U.S. Cl. 179—107 R **17 Claims**



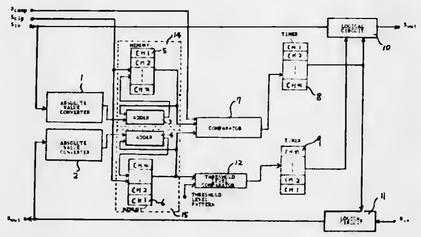
1. A hearing aid system comprising
means for receiving a vocal speech signal,
an analog to digital converter coupled to said receiving means,
an analyzer means coupled to said converter for producing signals representative of the spectral envelope of said speech signal at predetermined intervals therein,
logic means for processing the signals produced by said analyzer means and for producing, at said intervals, frequency signals representing the frequencies F_n of n formants of the speech signal,
means for reducing said frequency signals by some predetermined value to obtain frequency signals F'_n,
a plurality of sound generators adapted to produce digital information representing oscillatory signals having frequencies F'_n,
means for combining said digital information representing said oscillatory signals to produce an output signal,
a digital to analog converter coupled to said combining means, and
transducer means for producing an auditory signal from the output signal of said digital to analog converter.

4,051,332

MULTIPLEX DIGITAL ECHO SUPPRESSION SYSTEM

Kazuo Izumi, and Kazuto Izumi, both of Yokohama, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 495,885, Aug. 8, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 661,381
Claims priority, application Japan, Aug. 20, 1973, 48-92371
Int. Cl.² H04B *3/20*
U.S. Cl. 179—170.2 **5 Claims**



1. A multiplex digital echo suppression system comprising
a. a transmitter-side absolute value converter for converting the transmitting-side PCM signal for each channel into a parallel PCM signal with the sign bit eliminated and representing the absolute value of the transmitting-side PCM signal,
b. a receiving-side absolute value converter for converting the receiving-side PCM signal for each channel into a parallel PCM signal with the sign bit eliminated and representing the absolute value of the receiving-side PCM signal,
c. a transmitting-side accumulator and a receiving-side accumulator each for accumulating the output signal from the corresponding absolute value converter for a predetermined time,
d. first comparator means for comparing the output signal of each channel derived from said transmitting-side accumulator in synchronism with the transmitting-side PCM signal with the output signal for the corresponding channel derived from said receiving-side accumulator in synchronism with the receiving-side PCM signal and for generating the output signal when the output from said transmitting-side accumulator is higher than the output from said receiving-side accumulator,
e. first timer means which is set for a first predetermined time in response to the output signal from said first comparator means and continuously generates an output signal during said first predetermined time,
f. second threshold lever comparator means for comparing a predetermined threshold leverl with the output for each channel derived from said receiving-side accumulator and for generating an output signal when the output from said receiving-side accumulator is higher than said predetermined threshold level,
g. second timer means which is set for a second predetermined time shorter than said first predetermined time in response to the output signal from said second comparator means and continuously generates an output signal during said second predetermined time,
h. receiving-side logic circuit means including attenuator means for attenuating the receiving-side input PCM signal in said certain channel in response to the output for said certain channel from said first timer means, and
i. transmitting-side logic circuit means including echo switching means for opening and closing said echo switching means for said certain channel in response to a logical combination of the outputs for said certain channel from said first and second timer means.

4,051,333

TIP AND RING CONDUCTOR VOLTAGE TESTER

Richard A. Schomburg, Hillsboro, Oreg., assignor to Communication Sciences Corporation, Hillsboro, Oreg.

Filed Apr. 14, 1976, Ser. No. 676,700
Int. Cl.² H04B *3/46*
U.S. Cl. 179—175.3 R **22 Claims**



1. A circuit-energized voltage tester for simultaneously testing a pair of related conductors of a telecommunication system to determine whether or not the voltages on said conductors are within their normal ranges, said circuit-energized voltage tester comprising:
probe means for making a separate electrical connection to each conductor of a pair of related conductors;
ground means for making a ground connection;
energy storage means, connected to said probe means and to

said ground means, for storing electrical energy derived from the power present on said conductors;

sensing means, connected to said probe means, for sensing the voltage applied to said probe means by each conductor of said pair of conductors and providing first and second information signals related thereto, the nature of said first information signal being related to whether or not the voltage on one of said conductors is within its normal range and the nature of said second information signal being related to whether or not the voltage on the other of said conductors is within its normal range;

interrogation means, connected to said energy storage means so as to be energized thereby, said interrogation means including: (i) detecting means for detecting said first and second information signals; and, (ii) enabling means for selectively producing enabling signals when the nature of either or both of said first and second information signals indicates that the voltage on their related conductor is outside of its normal range; and

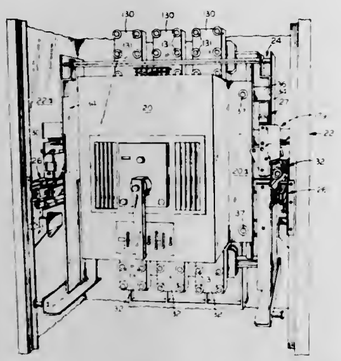
indicating means, connected: (i) to said energy storage means so as to be energized thereby; and (ii) to said interrogation means so as to receive said enabling signals, for producing an indication when an enabling signal is produced by said interrogation means, the nature of said indication denoting whether the voltage on one or both of said conductors are outside of their normal ranges.

4,051,334

SWITCHBOARD DRAWOUT APPARATUS WITH INTERLOCKED JOINT CLAMPING AND RACKING MECHANISMS

Eric Axel Ericson, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed June 21, 1976, Ser. No. 698,294
Int. Cl.² H02B 1/04
U.S. Cl. 200—50 AA **11 Claims**



1. Drawout apparatus for racking an electrical device into and out of a compartment in an electrical enclosure, wherein the device and enclosure are respectively equipped with plural associated stab and receiver primary terminal connectors, said drawout apparatus comprising, in combination:

A. a carriage mounting the device;

B. means mounted by the enclosure and supporting said carriage for movement between a disengaged position and an engaged position through an intermediate test position;

C. a racking mechanism mechanically assisting movement of said carriage and device between said test and engaged positions, said racking mechanism including a racking lead screw rotatably mounted by said carriage and having a head accessible at the front of said carriage to facilitate manual rotation pursuant to operating said racking mechanism to effect movement of said carriage and device between said test and engaged positions;

D. a joint clamping mechanism mounted by said carriage, said clamping mechanism having joint clamped and unclamped conditions, with said clamping mechanism in said unclamped position, contact elements of associated stab and receiver connectors readily move into and out of lapped relation as said carriage and device are moved into and out of said engaged position, with said clamping mechanism in its clamped condition and the device and carriage in its engaged position, the lapped contact elements of associated stab and receiver connectors are clamped by said clamping mechanism in secure electrical interconnection, said clamping mechanism including a clamping lead screw rotatably mounted by said carriage and having a head accessible at the front of said carriage to facilitate manual rotation pursuant to operating said joint clamping mechanism to its clamped and unclamped conditions; and

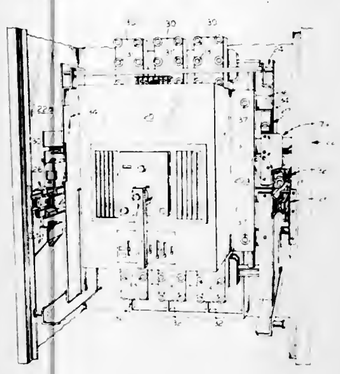
E. an access control assembly mounted by said carriage for movement between a first position affording access to said racking lead screw head while denying access to said clamping lead screw head and a second position affording access to said clamping lead screw head and denying access to said racking lead screw head, said assembly mechanically interlocked with the position of said carriage and the condition of said clamping mechanism such as to regulate movement of said access control assembly between said first and second positions.

4,051,335

SWITCHBOARD DRAWOUT HAVING TRIP INTERLOCK AND POSITION INDICATING APPARATUS

Eric Axel Ericson, Plainville, and Frederick Daniel Kaufhold, Forestville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed June 21, 1976, Ser. No. 698,277
Int. Cl.² H02B 1/04
U.S. Cl. 200—50 AA **11 Claims**



1. Drawout apparauts for racking a circuit breaker into and out of a compartment in an electrical enclosure, wherein the breaker and the enclosure are respectively equipped with plural associated stab and receiver primary terminal connectors, said drawout apparatus comprising, in combination:

A. a carriage mounting the circuit breaker;

B. means mounted by the enclosure and supporting said carriage for movement between a test position where the stab and receiver connectors are in separated relation and an engaged position where contact elements of the associated primary stab and receiver connectors are in lapped relation;

C. a racking mechanism mechanically assisting manually induced movement to said carriage and breaker between said test and engaged positions;

D. a joint clamping mechanism mounted by said carriage, said clamping mechanism manually operable between joint unclamped and joint clamped conditions, with said racking mechanism in said unclamped condition, the contact elements of associated stab and receiver connectors readily move into and out of lapped relation as said carriage and breaker move into and out of said engaged position, with said clamping mechanism in its clamped condition and the breaker and carriage in said engaged position, the lapped contact elements of associated stab and receiver connectors are clamped by said clamping mechanism in secure electrical connection; and

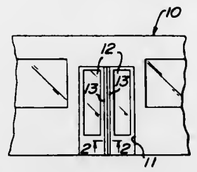
E. a trip interlock controllably operated by said racking and clamping mechanisms to selectively actuate a tripping element of the circuit breaker such as to enable closure of the circuit breaker only while said carriage and circuit breaker are in said test position and while in said engaged position with said clamping mechanism in said clamped condition, further to inhibit closure of the circuit breaker while removed from said test position when said clamping mechanism is in its unclamped condition, and still further to trip the circuit breaker incident to initial movement of said carriage out of said test position and upon initial operation of said clamping mechanism from its clamped to unclamped conditions.

4,051,336

PRESSURE SENSITIVE DOOR EDGE SWITCH AND ACTUATOR CONSTRUCTION

Norman K. Miller, Concordville, Pa., assignor to Miller Brothers, Concordville, Pa.

Filed Apr. 29, 1976, Ser. No. 681,430
Int. Cl.² H01H 3/16; E05F 15/02
U.S. Cl. 200—61.43 **10 Claims**



1. A pressure sensitive door edge construction comprising a rigid channel for extension along a door facing outwardly therefrom, inturned lips on said channel spaced apart to define therebetween a longitudinal slot communicating between the interior and exterior of said channel, a resiliently depressible bead extending exteriorly along said channel in overlying engagement with said lips and bridging said slot, a reduced neck on the inner side of said bead extending through and substantially occupying said slot, an inner enlargement on said neck interiorly of said channel and engageable with said lips to retain said bead in position without other securement to said channel, and pressure responsive switch means extending longitudinally along and entirely within said bead and operative responsive to depression of said bead for stopping door movement on bead depression.

4,051,337

DENTAL HANDPIECE SWITCH

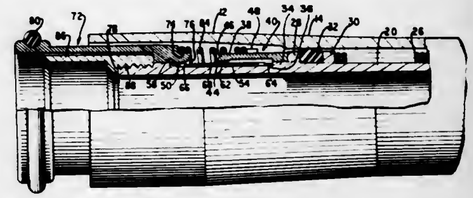
George E. Warrin, North Merrick, N.Y., assignor to Cavitron Corporation, New York, N.Y.

Filed Jan. 27, 1976, Ser. No. 652,682
Int. Cl.² H01H 9/06
U.S. Cl. 200—61.85 **2 Claims**

1. A dental handpiece switching apparatus for controlling an ultrasonic dental prophylaxis handpiece in which a substantial portion of the volume of the handpiece contains a magnetostrictive stack and a stack energizing coil comprising:

a thin membrane contact assembly that is retained in a generally circumferential arrangement in the outer portion of the handpiece to minimize the size of the handpiece and including (1) a first metallic foil contact mounted on a coextensive insulating backing, (2) a second metallic foil contact mounted on a coextensive insulating backing, said first and second contacts being arranged in circumferential facing relationship and (3) a thin, non-conducting separator between said contacts and having an opening therein to permit electrical communication between said first and second contacts;

actuation means for controlling the electrical communication between said first and second contacts including (1)



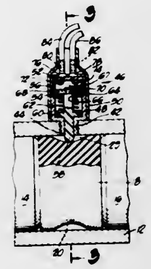
an actuation finger attached to the handpiece and cantilevered over said contact assembly and having a free end with (a) a flat tip generally facing said assembly in proximity to the opening in said separator and (b) an end surface adjacent said tip that is inclined with respect to said assembly, (2) a slideable moveable actuator that surrounds said handpiece and is moveable to strike said inclined surface to force said tip into contact with said assembly so that electrical communication is realized between said first and second contacts and (3) biasing means in contact with said handpiece and said actuator for normally biasing said actuator away from contact with said finger.

4,051,338

LOAD RESPONSIVE SWITCH ACTUATOR

Newton T. Harris, III, Canoga Park, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed May 23, 1975, Ser. No. 580,310
Int. Cl.² H01H 3/14
U.S. Cl. 200—85 R **4 Claims**



1. A switch and switch actuator assembly comprising:

a generally cylindrical housing member having a peripheral wall; means defining an opening in said peripheral wall of said housing;

said peripheral wall of said cylindrical housing having an interior peripheral surface defining a chamber;

a generally cylindrical body of deformable material disposed within said housing chamber; said cylindrical body of deformable material being co-axially aligned with said cylindrical housing; said cylindrical body having a central portion;

said interior peripheral surface of said peripheral wall of said cylindrical housing and the outer peripheral surface of said central portion of said deformable cylindrical body

defining a generally annular space therebetween in said housing chamber;

a switch mechanism mounted in said opening in said peripheral wall of said housing; said switch mechanism including a switch actuator arm extending into said annular space and terminating in relatively close proximity to said central portion of said deformable cylindrical body;

a pair of piston members slidably and co-axially disposed within said chamber of said cylindrical housing;

each of said pistons having an inner end wall contacting one end of said deformable cylindrical body, whereby said cylindrical body may be compressed when said pistons move inwardly toward one another;

said central portion of said deformable body being enlarged in response to compression thereof by said pistons to move said switch actuating arm and operate said switching mechanism, and

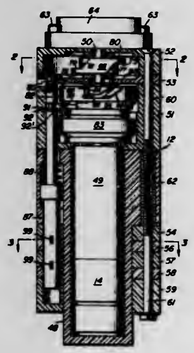
retaining means within said cylindrical body for retaining said pistons within said cylindrical housing.

4,051,339

VARIABLE TIME MISSILE SAFETY TIMER

Albert S. Will, Bethesda; Robert R. Wilson, Chillum, and Paul L. Calver, Ellicott City, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 28, 1964, Ser. No. 423,644
Int. Cl.² H01H *3/32*
U.S. Cl. 200—153 L **5 Claims**



1. A variable delay arming timer comprising

a cylindrical housing,

a motor and gearing contained within said housing,

a shaft coupled to said gearing to be rotated thereby at a predetermined rate, said shaft being coaxial with said cylindrical housing,

cam means mounted on said shaft for rotation therewith,

snap-action switch means carried by said housing and controlled by said cam means, said snap-action switch means having at least one spring biased actuating rod controlled between a retracted switch open position to an advanced switch-closed position by means of said cams, said rod being carried by said housing and being arranged in parallel relationship to said shaft and radially displaced from said shaft by a distance greater than the radius of said cylindrical housing, and

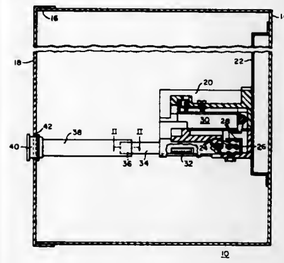
switch carrying discs surrounding said cylindrical housing in coaxial relation thereto, said discs carrying switch elements in position to be actuated by said actuating rods.

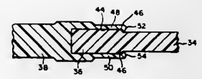
4,051,340

OVERLOAD RELAY RESET ASSEMBLY

Jerome C. Wolski, Downers Grove, Ill., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1976, Ser. No. 717,964
Int. Cl.² H01H *3/00*
U.S. Cl. 200—329 **11 Claims**





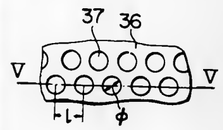
1. An electric control device comprising an enclosure including a rear wall, a front opening, and an access door for the front opening and having an aperture therein; a circuit interrupter mounted in the enclosure on the rear wall and spaced from the access door, the interrupter comprising relatively movable contacts, means for activating the contacts between open and closed positions and comprising a latch member movable between unlatched and latched positions corresponding respectively to the open and closed positions of the contacts, reset means for moving the latch member to the latched position and comprising a reset rod having an end portion spaced from the access door, an extension rod between said end portion and the access door, and the extension rod comprising one end detachably mounted on the reset rod and having another end located at the door aperture.

4,051,341

MICROWAVE OVEN DOOR SCREEN

Junzo Tanaka, Fujiidera, and Toshio Kai, Yamatokoriyama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 3, 1976, Ser. No. 682,860
Claims priority, application Japan, May 20, 1975, 50-60693
Int. Cl.² H05B *9/06*
U.S. Cl. 219—10.55 D **3 Claims**



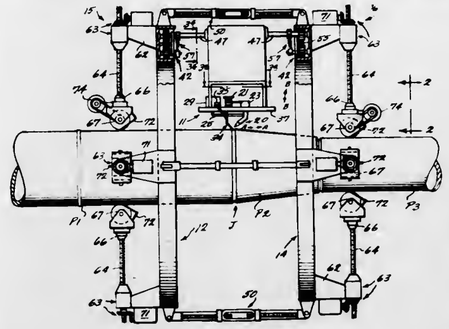
1. A microwave oven comprising a main body having a heating cavity therein, a door mounted to said main body for closing a front opening of said heating cavity, a microwave generator for radiating microwave energy into said heating cavity, and a door screen mounted on said door, said door screen including a punched metal plate interposed between transparent plates, said punched metal plate having a thickness of 0.10 to 0.35 mm, an aperture diameter of not larger than 1.2 mm and a ratio of the aperture diameter to a center-to-center distance of the apertures of 0.67 to 0.85, an extended portion of said punched metal plate being coupled to a metal plate which electrically couples the heating cavity body to the door body.

4,051,342

CONTINUOUS WELDER

James Henry Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed Feb. 9, 1976, Ser. No. 656,590
Int. Cl.² B23K *9/02, 9/12*
U.S. Cl. 219—60 A **25 Claims**



1. A welding assembly for welding together adjacent ends at a joint of substantially horizontally disposed pipes of a horizontal pipeline comprising

a welding nozzle mounted exteriorly of pipes to be welded together,

means for mounting said welding nozzle exteriorly of pipes to be welded together for substantially 360° movement around said pipes to circumferentially weld adjacent pipes together,

means for supporting said welding nozzle mounting means for substantially horizontal movement on said pipes on the exterior thereof,

means for powering said support means for automatic movement of said welding nozzle from one joint between two pipes to another joint between two pipes along said pipelines, and

automatic adjustment means for mounting said supporting means so that said supporting means can adapt to pipes of different diameter automatically and so that transition pipes may be welded to pipes of different diameters at either end thereof.

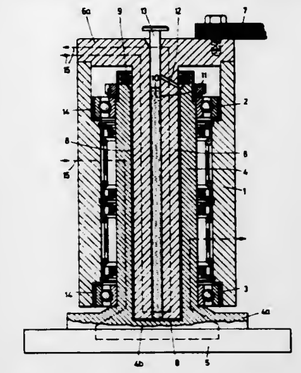
4,051,343

WELDING HEAD FOR RESISTANCE - WELDING MACHINE

Paul Opprecht, Im hinteren Bernold, 8962 Bergdietikon, Switzerland

Filed Dec. 4, 1975, Ser. No. 637,683
Claims priority, application Germany, Dec. 6, 1974, 2457684
Int. Cl.² B23K *11/06*
U.S. Cl. 219—84 **2 Claims**

1. A welding head adapted for use in a vertical orientation in resistance-welding machines utilizing a welding current, said head comprising a current lead. a housing adapted for the connection of said current lead, a vertical-axis rotor having a lower end and a body mounted rotatingly and non-displaceably in said housing, a roller electrode attached to said lower end of said rotor, and means for supplying said welding current to said roller electrode through said rotor body, said means comprising an interstice filled with mercury, said welding head further comprising a cylindrical central chamber having a wall surface and a base, the base being located adjacent said lower end and extending through almost the entire length of said rotor body, and a current-transmission rod secured to said housing and extending downwards through said central chamber almost to said base thereof, said interstice being formed within said cylindrical central chamber between said wall



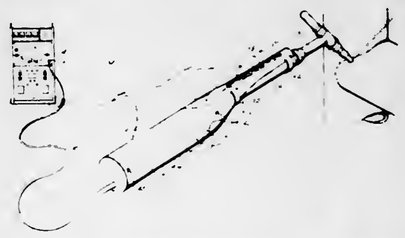
surface and base thereof and said current-transmission rod free of fluid seals adjacent the lower end portions of said interstice.

4,051,344

REMOTE CONTROL FOR AN ARC WELDING MACHINE

Dennis R. Robbins, 20134 2nd South, Seattle, Wash. 98148

Filed Apr. 28, 1975, Ser. No. 572,381
Int. Cl.² B23K *9/10*
U.S. Cl. 219—132 **4 Claims**



1. Remote-control mechanism for an electric welding torch, comprising:

an axially elongated body including a forward torch mounting portion and a handle forming portion, sized to be held in a user's hand, said body being longitudinally split into two parts which together define an inner cavity;

a linear potentiometer within said inner cavity, said linear potentiometer including an elongated housing including opposite side parts and a top wall which includes a longitudinal slot, and a sliding control member for said linear potentiometer movable between longitudinal end positions, including a control arm which projects outwardly through said slot;

said body parts including side recess means which are sized to snugly receive and hold said opposite side portions of said potentiometer housing when the two body parts are assembled about said potentiometer; and are positioned to orient the slot in the top wall of the potentiometer housing and the longitudinal path of travel of the control arm generally within the separation plane of the body parts;

said body parts including means defining an elongated slot generally at the separation plane of the body parts and forwardly of the location of the linear potentiometer;

a sliding external control member mounted on said body for movement longitudinally of said slot;

an elongated internal control link interconnected between said external control member and the control arm of the linear potentiometer, for moving the linear potentiometer between its longitudinal end portions in response to the

external control member being moved between its end positions by the user's hand; and

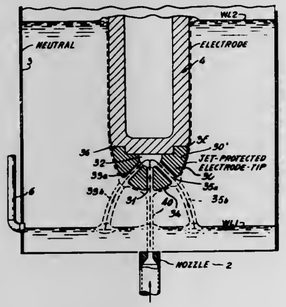
an off-on switch carried within said body at one end of the path of travel of the control arm, said switch including a movable contact, and said control arm carrying an actuating means positioned to contact and move said movable contact, to actuate the switch when the control arm is at said one end of its path of travel.

4,051,345

ELECTRODE TIP FOR HIGH VOLTAGE ELECTRODES OF THE TYPE UTILIZED IN HIGH VOLTAGE BOILERS

Milton Eaton, 363 Ninth Street, Shawinigan, Quebec, Canada

Filed Sept. 26, 1975, Ser. No. 617,152
Int. Cl.² H05B *3/60*; F22B *1/30*; H01C *10/02*
U.S. Cl. 219—288 **9 Claims**



1. An electrode tip for electrodes of the type utilized in high voltage electrode boilers from which water is taken, mixed with water of lower temperature from an outside source and the mixture pumped through a nozzle located below and pointed upward towards the tip of each electrode, said electrode tip comprising a body having an outer wall for contact with water in a steam generating chamber, an inlet passage extending into said body from said outer wall to a central chamber in said electrode tip and disposed on the central longitudinal axis of said electrode, at least two return passages extending from said central chamber to said outer wall of said body in a downward direction relative to said longitudinal axis of said electrode whereby water entering said central chamber of said electrode tip through said inlet passage in an upward direction is returned out of said central chamber of said electrode tip through said return passages to the space below the electrode tip where the cooling effect of the returned water limits the steam generation in said space below the electrode tip.

4,051,346

TANK HEATING AND CONTROL UNIT

Voigt O. Lenmark, 7505 Highway 7, Minneapolis, Minn. 55426

Filed Mar. 10, 1976, Ser. No. 665,513
Int. Cl.² H05B *1/00*; F24H *1/00*
U.S. Cl. 219—328 **7 Claims**

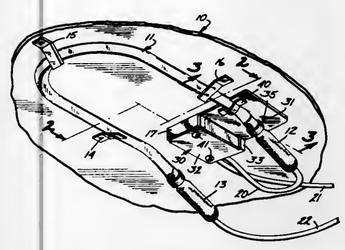
1. In a heating unit for application to the outer surface of a stock watering tank, comprising a substantially rigid linear heating element configured to be held in contact with said surface when brought into engagement with securing means depending therefrom, and a surface thermostat connected to control said element and having a flat face for thermal engagement with said surface, the improvement which comprises:

a mounting plate for said thermostat, including

a first portion to bear inwardly against said surface,

a second portion secured to said thermostat to bear inwardly thereagainst,

and means located between said portions for securing said plate directly to said element, so that when said element



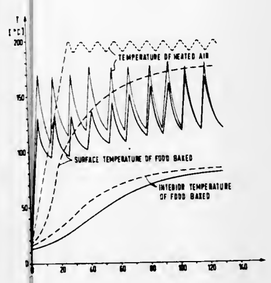
is held against said surface said thermostat and said plate are also held against said surface.

4,051,347

METHOD AND APPARATUS FOR BAKING FOOD IN A CLOSED COOKING SPACE IN WHICH HEATED AIR IS CIRCULATED

Franz Röhrl, Obing; Josef Ackermann, and Heinrich Detterbeck, both of Traunreut, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 418,980, Nov. 26, 1973, Pat. No. 3,984,578.
This application June 15, 1976, Ser. No. 696,436
Claims priority, application Germany, Nov. 24, 1972, 2257795; Feb. 8, 1973, 2306265; Oct. 18, 1973, 2352340
Int. Cl.² F27D *11/02*
U.S. Cl. 219—400 **17 Claims**



1. In an electric baking oven including a closed cooking space, and means for heating air and circulating heated air therewithin including a grill heater, the improvement comprising:

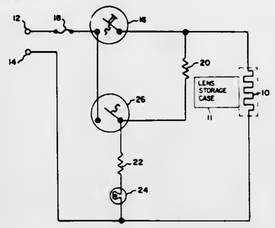
temperature control means, coupled to said grill heater, for coupling said grill heater to full line voltage and intermittantly activating said grill heater during the baking of food within said cooking space so that the surface temperature of said grill heater is raised to a value ranging between 600° C and 900° C for a predetermined period of time and thereby generates a plurality of sequential heat radiation pulses within said cooking space of a predetermined amplitude, frequency, and duration to vary the temperature of the heated air within said cooking space in sawtooth fashion about a mean temperature value ranging between about 120° and 160° C and to bake said food and to brown the surface thereof with minimum of soiling of said cooking space.

4,051,348

CONTACT LENS DISINFECTING CIRCUIT

Kurt H. Kreckel, Fairport, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed July 18, 1975, Ser. No. 597,124
Int. Cl.² H05B *1/02*
U.S. Cl. 219—506 **10 Claims**



1. A contact lens disinfecting electrical control circuit for use in thermally disinfecting lenses by elevating the temperture of the contact lenses for a predetermined period of time, comprising:

heating means responsive to electrical energy for providing heat to a contact lens storage device and elevating the temperature of the contact lenses to disinfect the lenses;

indicator means for providing a readily detectable indication that during operation of the heating means the temperature of the contact lenses is elevated above ambient temperature;

first control means including switching contacts for manual operation of the switching contacts to connect the heating means to an electrical source and for automatic operation of the switching contacts responsive to the heat provided to the contact lens storage device by the heating means to disconnect the heating means from the energy source; and

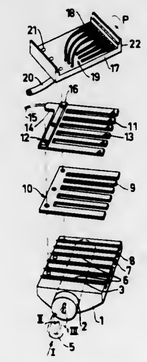
second control means for automatic operation responsive to the heat provided to the contact lens storage device by the heating means to energize the indicator means for a period of time after the heating means has been disconnected from the energy source.

4,051,349

RECORDING UNIT

Sven Englund, Ektorp, Sweden, assignor to Hugin Kassaregister AB, Stockholm, Sweden

Filed Mar. 18, 1976, Ser. No. 668,186
Int. Cl.² G06C *25/00*
U.S. Cl. 235—130 R **7 Claims**



1. A key-operated switch comprising:

a block having a bore therein;

a key-operated cylinder rotatably mounted in the bore of said block, said cylinder adapted to receive any of a plurality of associated keys,

a row of pins mounted in a row parallel to the axis of said cylinder and adapted for sliding radial movement within said cylinder, said pins adapted to be displaced and project beyond the surface of said cylinder, said displacements corresponding to the irregularities of a selected key when inserted in said cylinder;

a set of spring members including parallel sections of flexible wire mounted on said block, each of said wire sections extending across the path of travel of a corresponding one of said pins and in a direction transverse to said pin row;

a set of contact reeds mounted on said block and adjacent said spring member, each of said reeds aligned with a corresponding one of said pins and being adapted for displacement responsive to displacement of said corresponding spring member;

insulating means for electrically insulating said spring members from said contact reeds; and

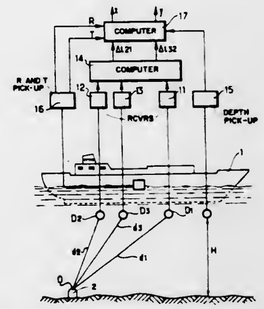
a set of contact members fixedly mounted on said block and adjacent said contact reeds, each of said contact members being aligned with a corresponding contact reed, and being positioned to contact said corresponding contact reed displaced by said corresponding spring member when a key is inserted in said cylinder.

4,051,350

POSITION MEASURING DEVICE

Guy Parent, Le Plessis-Robinson, France, assignor to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Feb. 18, 1976, Ser. No. 659,061
Claims priority, application France, Feb. 27, 1975, 75.06084
Int. Cl.² G06G *7/22, 7/70, 7/78*
U.S. Cl. 364—432 **11 Claims**



1. In a position measuring device enabling the calculating of the magnitudes proportional to the coordinates X and Y of a vessel which can move on the water in relation to two axes of orthogonal coordinates IX and IY, comprising a sound wave emitter placed at a point 0 situated, at the bottom of the water, at least three detectors D1, D2, D3 on the bottom of the vessel and arranged at the apexes of a triangle, IX being parallel to D2 D1 and the plane of the axes IX, IY being the plane of the triangle D1, D2, D3, the distance between the detectors D1, D2 being $2a$, the distance between the detectors D2, D3 being $2b$, the distance between the point 0 and the detector D1 being d_1, the distance between the point 0 and the detector D2 being d_2, the distance between the point 0 and the detector D3 being d_3;

Means for calculating the depth of water H below the vessel;

Means for calculating the difference in the travel time Δt_{21} of

the sound waves between 0 and D2 on the one hand and 0 and D1 on the other hand;

Means for calculating the difference in the travel time Δt_{32} of the sound waves between 0 and D3 on the one hand and 0 and D2 on the other hand; the improvement comprising:

First means (18, 19) supplying, on the basis of the difference in travel time Δt_{21}, by multiplication by a coefficient depending on the propagation speed c of sound waves in water, a signal xo equal to the difference between d_2 and d_1 and, on the basis of the difference in travel time Δt_{32} by multiplication by a coefficient depending on c, a signal yo equal to the difference between d_3 and d_2;

Second means (20, 20') supplying, by algebraic multiplications and additions of the signals xo and d_1, a signal equal to kx, x being the distance of the point 0 in relation to the mid plane of D1 D2;

Third means (30, 30') supplying, by algebraic multiplications and additions of the signals xo, yo and d_1, a signal ky, y being equal to the distance of 0 in relation to the mid plane of D2 D3;

Fourth means (40) supplying, on the basis of kx, the signal kX;

Fifth means (50) supplying, on the basis of the signals kx, ky, the signal kY;

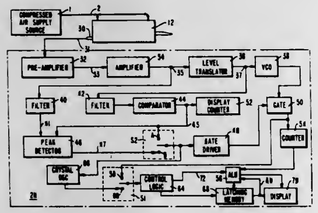
Sixth means (60, 60') supplying, by algebraic multiplications and additions of the signals kx, ky and H, a signal equal to $k^2d_1^2$ which, after application to a square root extractor (70, 70'), is applied to the second and third means (20, 20') (30, 30').

4,051,351

ELECTRONIC SYSTEM FOR MONITORING PNEUMATIC TOOL PERFORMANCE

George T. Mallick, Jr., and Robert C. Miller, both of Penn Hills, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1976, Ser. No. 740,444
Int. Cl.[2] G06G 7/48; G01L 23/00; F15B 21/02
U.S. Cl. 364—400 16 Claims



1. An electronic system for generating signals representative of the performance of a pneumatic tool during one or more work cycles wherein said pneumatic tool includes a working cylinder and gaseous actuating fluid contained therein, said electronic system comprising:

means to generate a signal in real time representative of the actuating gaseous fluid pressure in the work cylinder of said pneumatic tool;

first means to operate at times on said real time pressure signal only over a selected time portion of each of said work cycles for generating a signal representative of the energy developed in said pneumatic tool during said time portions; and

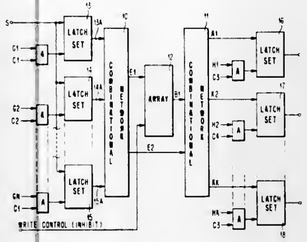
second means to operate at times on said real time pressure signal only over a selected time portion of each of said work cycles for generating a signal representative of the friction developed in said pneumatic tool during said time portions.

4,051,352

LEVEL SENSITIVE EMBEDDED ARRAY LOGIC SYSTEM

Edward Baxter Eichelberger, Purdy Station, N.Y.; Eugene Igor Muehldorf, Potomac, Md.; Ronald Gene Walther, Vestal, N.Y., and Thomas Walter Williams, Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,052
Int. Cl.[2] G06F 7/38; H03K 19/00
U.S. Cl. 364—716 16 Claims



1. A level sensitive embedded array logic system fabricated by large scale integration techniques on a semiconductor chip: said system comprising:

means for generating a set of system input signals;

means for generating a plurality of clock signal trains having a predetermined duration between the occurrence of signals in successive trains;

a first group of latch circuit means connected to said means for generating said set of input signals and said means for generating said plurality of clock signals, said first group of latch circuit means receiving at least certain ones of said set of system input signals and selected ones of said clock signal trains;

a second group of latch circuit means including system output means, said second group of latch circuit means being connected to said means for generating said plurality of clock signal trains and receiving at least certain other selected ones of said clock signal trains;

combinational logic circuit means including at least one read/write array and said combinational logic circuit means connecting said first group of latch circuit means to said second group of latch circuit means.

4,051,353

ACCORDION SHIFT REGISTER AND ITS APPLICATION IN THE IMPLEMENTATION OF LEVEL SENSITIVE LOGIC SYSTEM

Hua-Tung Lee, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,055
Int. Cl.[2] G06F 13/00
U.S. Cl. 364—716 17 Claims

1. A functional logic unit for use in a digital computer or the like comprising:

a plurality of latches;

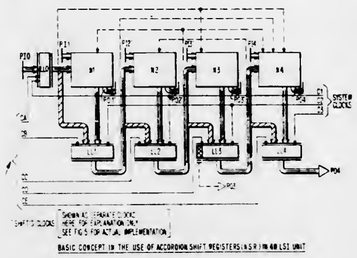
first connection means for connecting said latches into an accordion shift register;

means for generating a plurality of clock signal trains;

means selectively connecting each of said clock signal trains to at least certain ones of said plurality of latches;

a plurality of networks, each network receiving a binary input and providing a binary output bearing a fixed logical relationship to its binary input;

means selectively interconnecting at least certain ones of said latches with the input and output of selected ones of



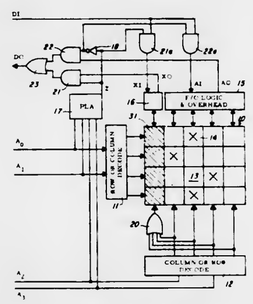
said networks, whereby said functional logic unit performs at least one predetermined logical function.

4,051,354

FAULT-TOLERANT CELL ADDRESSABLE ARRAY

William Clay Choate, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 3, 1975, Ser. No. 593,090
Int. Cl.[2] G11C 29/00, 8/00; G06F 11/00
U.S. Cl. 235—312 54 Claims



1. A defect-tolerant cell addressable array comprising:

a. an array of functional cells arranged in rows and columns;

b. cell selection means responsive to cell address code signals for selectively addressing an individual functional cell in a respective row and column;

c. a plurality of redundant functional cells;

d. memory means in which cell address codes of defective functional cells indicative of row and column locations are selectively storable, said memory means being responsive to said cell address code signals for detecting when the cell address code signals correspond to the address codes of defective ones of said functional cells and for generating a signal indicative thereof; and

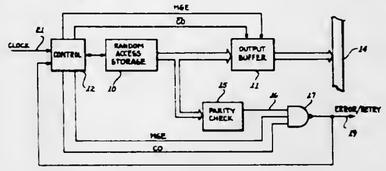
e. logic means responsive to the signal generated by said memory means for selecting a corresponding one of said redundant functional cells and for inhibiting the selection of the respective defective cell of said array.

4,051,355

APPARATUS AND METHOD FOR INCREASING THE EFFICIENCY OF RANDOM ACCESS STORAGE

Juei-po Lin, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 29, 1976, Ser. No. 681,675
Int. Cl.[2] G11C 29/00
U.S. Cl. 235—302.3 9 Claims



1. An improved method for receiving a message, having data bits therein, from a random access storage and transmitting said message, said data bits having a typical data bit delivery time and a worst case data bit delivery time, comprising the steps of:

a. storing said data bits in a buffer as they are received from a random access storage;

b. simultaneously transmitting said data bits from said buffer for a predetermined period of time ending after said worst case data bit delivery time;

c. checking the parity of said message as the data bits therein are stored in said buffer;

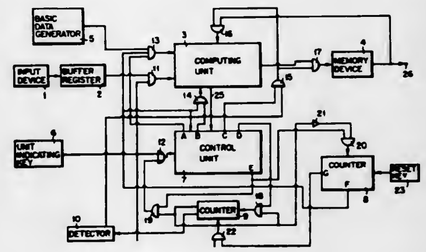
d. generating an error signal, when message is being transmitted to the bus and non-parity occurs.

4,051,356

KEYBOARD CONTROLLED DATA CONVERTER

Masayuki Hakata, Iruma, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 505,151, Sept. 11, 1974, which is a continuation of Ser. No. 299,823, Oct. 24, 1972, Pat. No. 3,855,459. This application Mar. 25, 1976, Ser. No. 670,424
Claims priority, application Japan, Oct. 23, 1971, 46-84187
Int. Cl.[2] G06F 5/00
U.S. Cl. 235—310 1 Claim



1. Apparatus for converting input data expressed in units of scale-of-m into data expressed in units of scale-of-n, comprising:

data input means supplying data expressed in a basic unit of scale-of-n and data expressed in another unit of scale-of-m;

unit indicating means including a unit indication input key operated according to the unit of said data input;

means coupled to said unit indication input key for generating signals corresponding to the respective unit of said input data in accordance with the number of operations of said unit indication input key when the data expressed in the basic unit of scale-of-n and data expressed in the other

unit of scale-of-*m* are supplied to said unit indicating means;

data generating means for generating basic data used to convert said data expressed in the other units of scale-of-*m* to data expressed in the basic units of scale-of-*n*;

an operation unit connected to receive the data from said data input means and the basic data from said data generating means;

memory means for storing the output of said operation unit; and

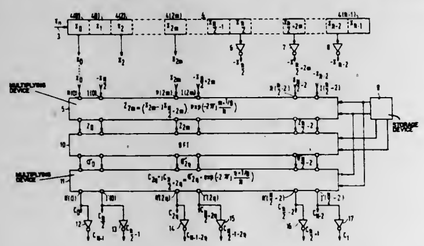
control means responsive to the signals generated by said unit indicating means, said control means including means for storing said input data in said memory means when said unit indicating means produces a signal corresponding to the basic unit of said input data, means for causing said operation unit to convert the input data which is expressed in any other unit than said basic unit into data of said basic unit when said unit indicating means produces a signal indicating that the input data is expressed in said other unit, means for causing said operation unit to add said converted data to said data which has been stored in said memory means, and means for storing the result of said addition in said memory means.

4,051,357

DOUBLE ODD DISCRETE FOURIER TRANSFORMER

Georges Bonnerot, L'Hay les Roses, France, assignor to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Mar. 1, 1976, Ser. No. 662,898
Claims priority, application France, Mar. 5, 1975, 75.06861
Int. Cl.² G06F *15/34*
U.S. Cl. 364—726 **6 Claims**



1. An arrangement for computing Fourier coefficients C_n of a real input signal corresponding to a time sequence of N time-and amplitude discrete samples X_k, comprising

an input for supplying N discrete samples X_k;

a preprocessing device connected to said input, and comprising a storage device having two outputs for producing N/4 signal samples X_h and N/4 signal samples $X_{(N/2)+h}$ respectively, said signal samples X_l and $X_{(N/2)+l}$ being shifted in relation to one another by N/2 samples;

a first multiplying device connected to said outputs of said storage device and comprising a complex number generator for multiplying signals from said preprocessing device by predetermined complex numbers, and producing an output signal N/4 complex samples Z_l in response to the pairs of output samples X_h $X_{(N/2)+l}$ of the storage device and the complex numbers generated by the complex number generator;

a DFT computer having an input connected to said output of said multiplying device and having an output for producing N/4 complex signals σ_q in response to the N/4 complex samples Z_l on said input; and

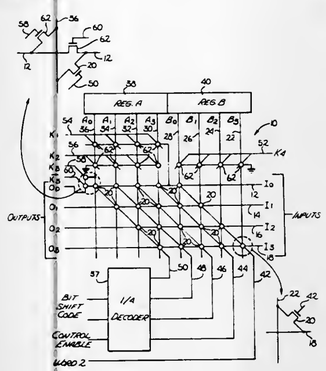
a second multiplying device and associated second complex number generator means connected to said output of said DFT computer for producing the real Fourier coefficients C_q and the real Fourier coefficients $C_{(N/2)+q}$ as real and imaginary part respectively of a complex number $C_q + jC_{N/2+q}$ in response to said signals σ_q and the complex numbers generated by said second complex numbers generating means.

4,051,358

APPARATUS AND METHOD FOR COMPOSING DIGITAL INFORMATION ON A DATA BUS

Samuel Schwartz, Saratoga, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 20, 1976, Ser. No. 659,767
Int. Cl.² G06F *7/00*
U.S. Cl. 364—716 **18 Claims**



1. A digital logic circuit for the manipulation of digital signals comprising:

an array of conductive lines forming a matrix of columns and rows;

a plurality of bidirectional coupling means for coupling selected columns with selected rows, each of said selected columns being coupled to one of said corresponding selected rows at an intersection of said selected column with said selected row within said matrix, said bidirectional coupling means coupling said digital signals from said rows to said columns, and from said columns to said rows;

a plurality of conductive control lines, each of said control lines being coupled to a subset of said coupling means lying along a diagonal of said matrix, said control lines communicating a control signal to each of said coupling means included in said subset on said matrix diagonal; and

a plurality of register means for storing digital information, each of said register means being coupled to a different one of said columns of said matrix.

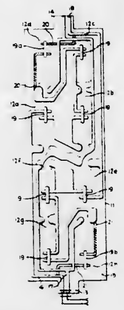
4,051,359

ELECTRIC MULTIPLE FLASH ARRANGEMENT

Heinz Stretcher, Grotzingen, Germany, assignor to General Electric Company, Schenectady, N.Y.

Filed June 21, 1976, Ser. No. 697,961
Claims priority, application Germany, Aug. 27, 1975, 2538049
Int. Cl.² G03B *15/02*
U.S. Cl. 362—4 **2 Claims**

1. A multiple electric flash lamp array comprising a unitary structure having definable first and second regions, a first group of flash lamps in said first region and a second group of flash lamps in said second region, first and second electrical connector means forming a part of said structure and disposed in or adjacent to said first and second regions respectively, said first group of lamps being separated from said second connector means by said second region and said second group of lamps being separated from said first connector means by said first region, a first flash sequencing circuit connected between said second connector means and the lamps of said first group for causing them to flash in sequence from first to last in response to flash signals applied to said second connector means, a second flash sequencing circuit connected between said first connector means and the lamps of said second group for causing them to flash in sequence from first to last in response to flash signals applied to said first connector means, wherein the



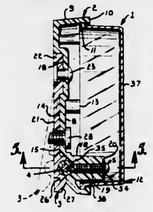
improvement comprises a first switching circuit for connecting flash signals applied to said first connector means to said second flash sequencing circuit after said last-to-flash lamp of the first group has been flashed, and a second switching circuit for connecting flash signals applied to said second connector means to said first flash sequencing circuit after said last-to-flash lamp of the second group has been flashed.

4,051,360

LAMP AND MOUNTING STRUCTURE THEREFOR

Charles A. Slater, Jr., Overland Park, Kans., and Spencer Darby, Kansas City, Mo., assignors to Peterson Manufacturing Company, Grandview, Mo.

Filed Mar. 17, 1976, Ser. No. 667,512
Int. Cl.² B60Q *1/00, 3/00, 11/00*
U.S. Cl. 362—363 **6 Claims**



1. A lamp assembly comprising:

a. a housing having a base wall of electrically non-conductive material and a side wall extending therefrom to define an open top compartment, said base wall having an exterior surface and a first recessed portion therein extending across said base wall, said base wall having an elongated channel in said first recessed portion for receiving therein an insulated conductor, said base wall having a second recessed portion extending laterally from said first recessed portion and having one end portion thereof spaced from said first recess;

b. a conductor retaining member having a first portion and a second portion received in said first and second recessed portions respectively of said housing base wall, said second portion having an end portion thereof secured to said base wall in spaced relation to said first portion, said first portion having an elongated channel therein in facing mating relation with said channel in said first recessed portion of said base wall to receive the insulated conductor in said channels, said conductor retaining member being of resilient electrically non-conductive material to normally retain the insulated conductor in the channels and permit said first portion of the retaining member to be moved away from said base wall of said housing to expose said channels for movement of the insulated conductor to and from said channels;

c. an electrical light bulb and means in the compartment of said housing for receiving same and including an electrical conductor connected to an electrical ground and having a terminal on one end thereof;

d. means mounted on said housing and in electrical contact with the terminal of said electrical conductor of said bulb receiving means and with the insulated conductor for completing an electrical circuit to said bulb; and

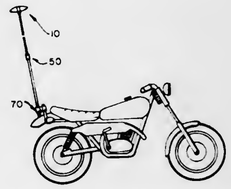
e. a lens mounted on said housing and closing the compartment with said bulb therein.

4,051,361

VEHICLE IDENTIFICATION SIGNAL DEVICE

James F. Lichon, 1116 River Forest Drive, Saginaw, Mich. 48603, and Charles Earl Cone, 5701 Woodview Pass, Midland, Mich. 48640

Filed Nov. 17, 1975, Ser. No. 632,396
Int. Cl.² B62J *5/00*
U.S. Cl. 362—211 **5 Claims**



1. For use with vehicles such as motorcycles or the like, a signal device comprising:

a casing having forward and rearward lamp sockets disposed thereon;

forward and rearward transparent domes detachably secured to said casing, each of said domes being cooperable with said casing to enclose one of said lamp sockets, said domes being color coded to indicate the forward and rearward directions;

circuit means connected at one end to said lamp sockets for connection at the other end to the vehicle indicator circuits; and

a mast having a first tubular member adapted proximate its lower end for attachment to the vehicle and a second tubular member secured at its upper end to said casing, said second member being telescopically extendible from and retractable into said first member, said first member having a knurl disposed on its inner wall proximate its upper end and said second member having a striation substantially along the length of its outer wall, said knurl being cooperable with said striation to prevent rotational motion of said second member in relation to said first member.

4,051,362

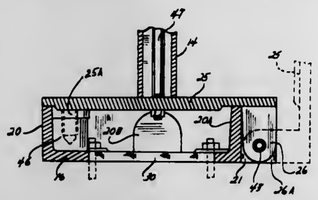
WALL MOUNTED HINGED BASE

Kenneth F. Guggemos, 135 Fairlawn Circle, Winsted, Minn. 55395

Filed Mar. 8, 1976, Ser. No. 664,511
Int. Cl.² F21S *13/10*; F21V *21/00*
U.S. Cl. 362—432 **10 Claims**

1. A hinged base assembly for mounting onto generally upright surfaces comprising a base housing including a base

wall having first means adapted to rest on an upright surface on which it is to be mounted, and a plurality of side walls attached to said base wall and extending outwardly therefrom to define an interior chamber having a depth extending from said first means to outer edges of said side walls, a cover member overlying the side walls, means to hingedly mount said cover member to said base housing adjacent one upright edge thereof about an upright axis, said side walls including two spaced, generally parallel side walls extending at right angles to said one upright edge, and mounting slot means defined in said base wall of said housing comprising at least four keyhole slots arranged in pairs, each pair being adjacent one of the two side walls of said base at right angles to said one upright edge, said keyhole slots each having a main aperture portion and a single bolt receiving tang portion of smaller transverse dimension



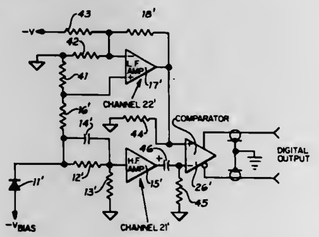
than said main aperture portion, the tang portions of each pair of slots extending toward the adjacent side wall only and facing in opposite direction from the tang portions of the other pair of keyhole slots, said keyhole slots in each pair being spaced apart an amount equal to the spacing of the other pair of keyhole slots, said tang portions having end surfaces aligning along a line parallel to the respective adjacent side wall and at substantially an equal distance from the side wall as the distance of the end surfaces of the tang portions of the other pair of keyhole slots from its adjacent side wall to permit rotating the base housing to place the means to hingedly mount on either side of the housing and having the tang portions of one pair of keyhole slots extending upwardly to form interchangeable support for the housing adjacent the upper of the two side walls.

4,051,363

SPLIT-PATH RECEIVER FOR FIBER OPTICS APPLICATION

Franklin H. Fish, Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 24, 1976, Ser. No. 670,013
Int. Cl.² H01S 3/02
U.S. Cl. 250—199 **2 Claims**



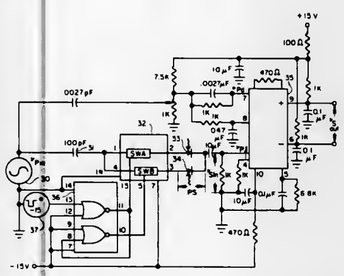
1. In an electro-optical transmission line, a receiver for converting light signals to electrical signals comprising,
   a photodiode for receiving light inputs and having an output signal port for providing electrical signals having responses from direct current to a high frequency cut-off,
   a first amplifier circuit channel connected to said output signal port of said photodiode comprised of a wide-band-width amplifier for amplifying the high frequency portion of a signal from said output signal port and providing an output,
   a second amplifier circuit channel connected to the output signal port of said photodiode comprised of a low frequency amplifier for amplifying direct current and the low frequency portions of said electrical signals and providing an output,
   a load resistor capacitively coupled to the output of said wide-bandwidth amplifier, and
   an error amplifier coupled with said load resistor and said output of said low frequency amplifier for comparing the high frequency signal with the low frequency signal and providing a feedback signal for correcting direct current and low frequency errors in the output of said wide-band-width amplifier.

4,051,364

PHOTOPARAMP ARRAY MULTIPLEXER

Michael K. Giles, China Lake, and Myren L. Iverson, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 6, 1976, Ser. No. 712,456
Int. Cl.² H04D 9/00
U.S. Cl. 250—199 **2 Claims**



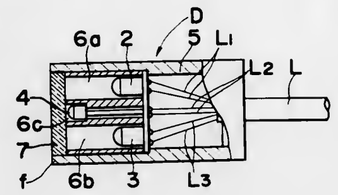
1. A photoparamp array multiplexer comprising;
   pump means for outputting pump energy at a predetermined frequency;
   an array of photodiodes connected in parallel and having an input for receiving a modulated light signal, and outputs;
   multiplexing means operatively connected between the output of said pump means and the input to each of said photodiodes;
   demodulating means operatively connected to the outputs of the photodiodes and having an output therefrom corresponding to the output signal of the photodiodes;
   a multiplexing pulse input operatively coupled to said multiplexing means to cause said multiplexing means to couple the output of said pump means to the input of each of said photodiodes one at a time;
   whereby the output of said demodulating means corresponds to the amplified output of an individual photodiode as determined by said multiplexing means.

4,051,365

PHOTOELECTRIC DETECTOR HAVING AN INDICATOR FOR INDICATING THE OPERATING CONDITION THEREOF

Toshifumi Fukuyama; Yasunori Asakura, and Norio Onji, all of Nagaokakyo, Japan, assignors to Omron Tateisi Electronics Co., Japan

Continuation of Ser. No. 493,157, July 30, 1974, abandoned. This application June 2, 1976, Ser. No. 692,148
Claims priority, application Japan, Aug. 8, 1973, 48-93679[U]; Aug. 13, 1973, 48-90759
Int. Cl.² G01D 21/04
U.S. Cl. 250—222 R **15 Claims**



1. A photoelectric detector having an indicator for indicating the operating condition thereof which comprises a housing, and at least a light ray projecting element and a light ray receiving element received in corresponding bores formed in said housing with front surfaces of said projecting element and said receiving element spaced away from a light ray receiving front surface of said housing by a predetermined distance so that each of said bores forms a passage of light rays between said light ray receiving front surface of said housing and each of said front surfaces of said projecting element and said receiving element, said bores for receiving said light ray projecting and receiving elements being in parallel to one another and said distance between said front surface of said housing and each front surface of said elements being determined in such an extent that an optimum angle of directivity of said detector can be obtained with any light rays due to irregular reflection prevented from reaching said light ray receiving element, and with only light rays emitted by said light ray projecting element and reflected by an object to be detected reaching said light ray receiving element, and said photoelectric detector being further provided with a third bore in parallel to and in spaced relation to said bores for said projecting element and said receiving element, said third bore receiving therein a luminescent element for indicating the operating condition of said photoelectric detector at a position visible at the front surface of said housing.

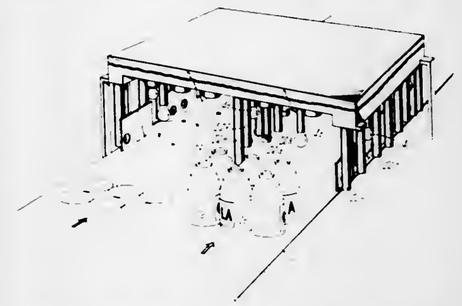
4,051,366

OPTICAL APPARATUS FOR SENSING CLUSTERED PACKAGE ORIENTATION

Jason Morse Gordon, Katonah, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 31, 1975, Ser. No. 645,590
Int. Cl.² H01J 39/12
U.S. Cl. 250—223 B **8 Claims**

1. A subassembly for optically sensing the orientation of a plurality of labeled containers spinning, on axes, at respective stations on an associated container handling assembly, comprising:
   a plurality of light sources disposed substantially in a first plane, there being fewer of said light sources than containers illuminated thereby;
   a plurality of optical sensors thus disposed in longitudinally extending tubular housings mounted with their axes parallel to the spin axes of the containers, one for each of the containers, each having an optically-sensitive aperture focused at a spot substantially in the path of the peripheral surface of a related rotating container and in a plane separated from said first plane by a distance which is sufficiently great so as to render said sensors substantially insensitive to specular reflection of light reflecting from



containers illuminated by said light sources, yet sufficiently small so as to render said sensors substantially sensitive to diffuse reflection of light reflecting from labels on the containers illuminated by the light sources.

4,051,367

MEASUREMENT APPARATUS

Leonard Alfred Sayce, decreased, late of Glasgow, Scotland, by Ethel Margaret Lindsay Sayce, executrix; Robert Martin Pettigrew, Carluke, Scotland, assignors to National Research Development Corporation, London, England

Filed Mar. 6, 1975, Ser. No. 555,817
Claims priority, application United Kingdom, Mar. 15, 1974, 11598/74
Int. Cl.² H01J 3/14
U.S. Cl. 250—237 G **23 Claims**



1. An apparatus for measuring displacement of a first member relative to a second member in a manner corresponding to motion with one degree of freedom in a given plane, said apparatus comprising:
   a substantially planar grating mounted in a fixed position relative to said first member so as to lie substantially in a first plane parallel to said given plane, said grating having lines which are spatially periodic in the sense of said motion and having a given pitch, the spatial periodicity of said grating in said sense being denoted by f_1;
   means for illuminating said grating diffusely with light and comprising means mounted in a fixed position relative to said second member and defining an optical object which lies substantially in a second plane parallel to said given plane and is spatially periodic in said sense, the spatial periodicity of said object in said sense being denoted by f_2 and being less than $2f_1$, the spacing between said first plane and said second plane being denoted by u, and said light including light of at least one given wavelength such that the product of that given wavelength and u is not less than half the square of said pitch, for causing said grating to form a substantially planar image of said object extending substantially parallel to said given plane at a spacing v from said first plane effectively determined by the equation $f_2/f_1 = 2v/(u+v)$, said image being spatially periodic in said sense with a periodicity f_3 effectively determined by the equation $f_3/f_1 = 2u/(u+v)$ and moving in said manner relative to said second member when relative

movement in said manner occurs between said first and second members; and

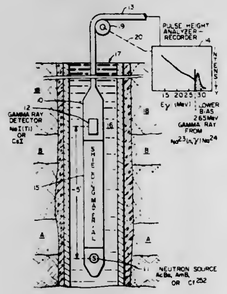
photodetector means responsive to light of said given wavelength and comprising means mounted in a fixed position relative to said second member and defining a light-receiving array which lies at least approximately in the plane of said image and which is spatially periodic in said sense with a periodicity at least approximately equal to f_3 for producing at least one signal which varies cyclically by virtue of interaction between said image and light-receiving array which said relative movement occurs between said first and second members.

4,051,368

METHOD OF MEASURING HORIZONTAL FLOW SPEED OF FLUIDS IN EARTH FORMATIONS PENETRATED BY A WELLBOREHOLE

Dan M. Arnold; Hans J. Paap, and Hubert D. Scott, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed June 21, 1976, Ser. No. 698,394
Int. Cl.² G01V 5/00
U.S. Cl. 250—270 **10 Claims**



1. A method for determining the location and flow rate of earth formation fluids moving in a horizontal direction past a well borehole, comprising the steps of:

irradiating the earth formations in the vicinity of a well borehole with fast neutrons for a predetermined length of time to neutron activate at least one selected tracer element having a known radioactive half life and comprising a portion of the earth formation fluid moving past a well borehole;

moving a gamma ray detector past the earth formation which has been irradiated and detecting a first count rate signal representative of gamma radiation caused by the radioactive decay of said selected tracer element;

waiting a predetermined selected length of time and then again moving said gamma ray detector past the earth formation which has been irradiated and detecting a second count rate signal representative of gamma radiation caused by the radioactive decay of said selected tracer element; and

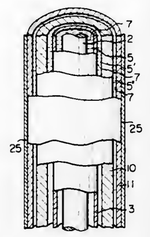
combining said first and second count rate signals according to a predetermined relationship to derive an indication of the horizontal flow rate of earth formation fluid past the well borehole.

4,051,369

METHOD FOR INSPECTING NUCLEAR FUEL ROD OR IRRADIATION CAPSULE

Isao Takeshita, Oarai, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Feb. 6, 1975, Ser. No. 547,743
Claims priority, application Japan, Feb. 9, 1974, 49-16686
Int. Cl.² G03B 41/16
U.S. Cl. 250—321 **6 Claims**



1. A method for inspecting a nuclear fuel rod, said method comprising:

providing a nuclear fuel material enclosed within a sleeve with a gap therebetween;

filling said gap with a heat transfer medium including a liquid metal uniformly admixed with a radioactive element;

winding a film which is sensitive to said radioactive element around said sleeve, and allowing said film to be exposed to said radioactive element through said sleeve; and

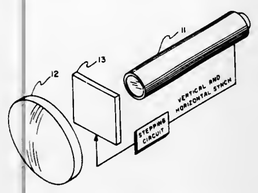
developing said film and detecting the condition of said film, after exposure to said radioactive element, to determine areas of said film not exposed to said radioactive element, as indications of the location of the level of said heat transfer medium within said nuclear fuel rod and of the existence of voids in said heat transfer medium within said gap.

4,051,370

OPTICAL SYSTEM FOR THERMAL IMAGER

Vincent T. Bly, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 24, 1976, Ser. No. 717,080
Int. Cl.² H01J 31/50; G02F 1/13
U.S. Cl. 250—331 **7 Claims**



6. A method of detecting a light image from a distant object comprising the steps of:

projecting light received from said object onto the target of a pyroelectric vidicon tube;

scanning said target with at least one beam of electrons; and

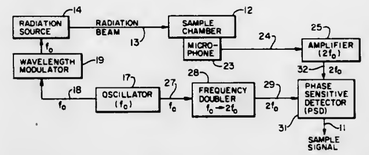
periodically focussing and defocussing said light at individual portions of said target such that said portions are focussed for a storage period commencing prior to and including any readout period when they are being scanned by an electron beam and are defocussed for a given period between each of said storage periods.

4,051,371

OPTO-ACOUSTIC SPECTROSCOPY EMPLOYING AMPLITUDE AND WAVELENGTH MODULATION

C. Forbes Dewey, Jr., Belmont, and Lon O. Hocker, Newton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 26, 1976, Ser. No. 680,622
Int. Cl.² G01N 21/26
U.S. Cl. 250—339 **16 Claims**



1. Apparatus for detecting the presence of a species in a medium comprising,

means defining a sample chamber for receiving said medium,

a source of a beam of radiant energy incident upon said sample chamber for producing pressure waves therein of intensity related to the degree of absorption by said medium,

means modulating the wavelength of said radiant energy through a wavelength range including a spectral line characteristic of said species at a rate corresponding to a wavelength modulation frequency,

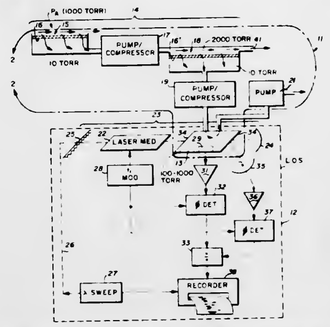
and first acoustical detecting means for detecting the intensities of individual frequency components of said pressure wave signals produced in said sample chamber to provide an output signal representative of the degree of absorption of the medium in said sample chamber.

4,051,372

INFRARED OPTOACOUSTIC GAS ANALYZER HAVING AN IMPROVED GAS INLET SYSTEM

Harry E. Aine, 1804 Stierlin Road, Mountain View, Calif. 94040

Filed Dec. 22, 1975, Ser. No. 643,179
Int. Cl.² B01D 53/22; G01J 1/00, 3/42; G01V 9/00
U.S. Cl. 250—343 **21 Claims**



1. In an inlet system for introducing gaseous material from a source into the optoacoustic region of an infrared optoacoustic gas analyzer:

membrane separator means having a membrane of the type which has a higher value of diffusion conductance to a first gaseous component than to a second gaseous component of the gas mixture to be analyzed and is dimensioned and arranged for diffusion therethrough of amounts of said first gaseous component at a sufficient rate for detection in the optoacoustic detector region;

means for diffusing a portion of said gas mixture through said membrane of said membrane separator means so as to conduct said first gaseous component through said membrane with a higher value of conductance than that of said second gaseous component; and

means for operation at a total pressure in excess of 10 torr and for conducting said separated first gaseous component of said gas mixture at a total pressure in excess of 10 torr into the optoacoustic detection region of optoacoustic gas analyzer.

4,051,373

DELAY LINE CLIPPING IN A SCINTILLATION CAMERA SYSTEM

Kenneth F. Hatch, Prospect, Conn., assignor to Picker Corporation, Cleveland, Ohio

Continuation of Ser. No. 478,200, June 11, 1974, abandoned.
This application July 28, 1975, Ser. No. 599,657
Int. Cl.² G01T 1/164, 1/20
U.S. Cl. 250—363 S **17 Claims**



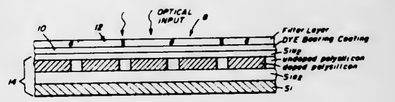
1. In a scintillation camera system having scintillator means for producing scintillations in response to impinging radiation, light responsive means responsive to the scintillations for generating sequences of data signals representative of radiation impinging on a respective portion of said scintillator means, signal processing circuitry including pulse shaping circuitry responsive to the data signals for generating a plurality of data pulses defining the situs of respective scintillations and a display mechanism for producing images representing the radiation impinging on the scintillator means, the improvement wherein the pulse-shaping circuitry comprises a compensating circuit means including circuitry coupled to produce and combine first signals representing data signals and second signals representing data pulses for decreasing base line fluctuation of the data pulses and thereby improving pulse detection.

4,051,374

IMAGING DEVICE HAVING IMPROVED BLUE RESPONSE

Karl Heinz Drexhage, Rochester, and Robert Lewis Lamberts, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 4, 1976, Ser. No. 693,233
Int. Cl.² G01J 1/58
U.S. Cl. 250—370 **13 Claims**



1. In a silicon imaging device of the type adapted to convert a visible light image directed into a face thereof to electrical signal form and having a sensitivity characteristic that gener-

ally increases with wavelength over the visible spectral range, the improvement comprising:

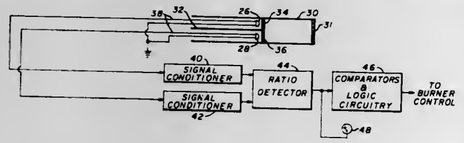
a dye-bearing layer superposed over said face, the dye thereof being of a type that fluoresces by absorbing short wavelength visible light and in response thereto emits longer wavelength visible light which is within the operative range of said imaging device, said layer being substantially transparent to green and red light whereby short visible wavelength response is effectively upgraded without degrading green or red response.

4,051,375

DISCRIMINATING FLAME DETECTOR

Adolph August Schuetz, East Hampton, and Gary Edward Bosak, Bristol, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 2, 1976, Ser. No. 646,087
Int. Cl.² G01J *1/42*
U.S. Cl. 250—372 **8 Claims**



1. An apparatus for discriminating between the presence in a selected position of a flame having a base and the presence of flame in nearby locations in a combustion area comprising:

a. means for producing a first signal indicative of the intensity of any electromagnetic radiation within a predetermined first spectrum which reaches it from locations in a path comprising a set of locations which includes the location at which the base of the flame to be detected will occur if the flame is in the selected position and excludes the locations at which bases of the flames in the nearby locations will occur;

b. means for producing a second signal indicative of the intensity of any electromagnetic radiation within at least one predetermined second spectrum which reaches it from locations in the path; and

c. means receiving the first and second signals for producing a signal indicative of the ratio of the radiation intensities represented by the signals which it receives, the ratio indicating the presence of flame in the selected position when the ratio is within predetermined limits and indicating the absence of flame or the malfunction of the apparatus when the ratio is outside the limits.

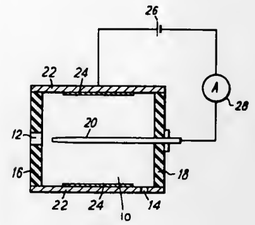
4,051,376

IONIZATION DETECTORS

Edgar Adolf Lorch, and David John Dwight, both of Amersham, England, assignors to The Radiochemical Centre Ltd., England

Filed Jan. 26, 1976, Ser. No. 652,579
Claims priority, application United Kingdom, Jan. 28, 1975, 3742/75
Int. Cl.² G01T *1/18*; H01J *17/32*
U.S. Cl. 250—381 **5 Claims**

5. A method of analysing the effluent from a gas chromatography apparatus, which method comprises passing the effluent gas through the ionisation cell of an electron capture detector having entry and exit ports for gas and a pair of electrodes defining between them a region for the passage of gas to be analysed, the pair of electrodes being positioned so that gas flowing through the cell passes through the region between them, and a source of iron-55 emitting electrons into the said region and thereby causing ionisation of gas in the said region,



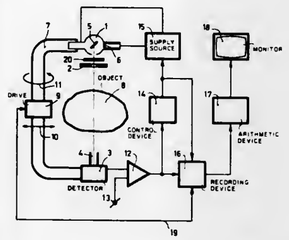
and operating the detector so as to cause an ion current of from 0.05 to 10 nanoamps to flow between the electrodes in the cell, and measuring the ion current.

4,051,377

SCANNING X-RAY EXAMINATION APPARATUS

Rudolf Kemner, and Frans Wessel Zonneveld, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1975, Ser. No. 642,159
Claims priority, application Netherlands, Dec. 23, 1974, 7416756
Int. Cl.² H05G *1/34*
U.S. Cl. 250—401 **9 Claims**



1. A device for measuring local radiation absorption differences in a body, comprising:

means for scanning a body with a locally incident radiation beam;

means for detecting the resulting radiation intensity emerging from the body;

control means responsive to said detecting means for automatically varying the locally incident dose of radiation so as to keep the detected intensity substantially constant during the entire scanning of the body; and

means responsive to said control means for deriving a signal indicative of the locally incident radiation dose, said signal being a measure of local radiation absorption in the body.

4,051,378

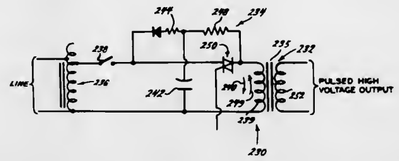
HIGH SPEED X-RAY PULSING DEVICE

Kenneth E. Krippner, St. Louis, Mo., assignor to Artronix, Inc., St. Louis, Mo.

Filed Nov. 28, 1975, Ser. No. 636,100
Int. Cl.² H05G *1/10*
U.S. Cl. 250—421 **7 Claims**

1. An apparatus for examining an object by radiation having a source of radiation and means to generate radiation from that source, the means to generate radiation including a high voltage transformer to supply a pulsed, high-voltage output to the radiation source to rapidly pulse the radiation generated from

the source of radiation, the high voltage transformer having means to pulse a low voltage input to the high voltage transformer for one cycle of the input voltage and having means to apply a low direct current bias to the high voltage transformer.

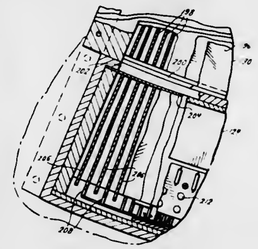


4,051,379

AXIAL TOMOGRAPHIC APPARATUS AND DETECTOR

Albert R. Zacher, Jr., University City, Mo., assignor to Artronix, Inc., St. Louis, Mo.

Filed Nov. 28, 1975, Ser. No. 636,104
Int. Cl.² G01N *23/00*
U.S. Cl. 250—445 T **10 Claims**



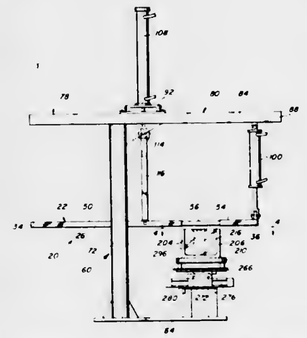
1. An apparatus for examining an object by radiation having a source of radiation and spaced detector elements and having means rotating the source of radiation about the object, the apparatus having means placing the detector elements so that a beam portion of radiation projected from the source of radiation and passing through the axis of rotation passes asymmetrically between adjacent detector elements.

4,051,380

APPARATUS AND METHOD FOR SUPPORTING AND POSITIONING THE BODY TO FACILITATE RADIOGRAPHIC MAMMOGRAPHY PROCEDURES

Harold J. Lasky, 2756 Euclid Park Place, Evanston, Ill. 60202

Filed Mar. 31, 1976, Ser. No. 672,303
Int. Cl.² G03B *41/16*
U.S. Cl. 250—451 **19 Claims**



1. The combination with radiation apparatus including a radiation source for presentation to body tissue to be examined, and means responsive to radiations from said radiation source to provide a visual image of said tissue, of a shiftable cradle for manipulatively supporting a female subject in a prone position to facilitate the gravitational suspension of the subject's breast in diverse selectible depending angles relative to the body of the subject,

said cradle comprising an elongated frame including a pair of opposed, coextensive, generally parallel bar means, and strut means retaining said bar means apart and fixed relative to each other to maintain a spacial span therebetween,

body-support sling means bridging said parallel bar means and secured thereto along the opposed lengths thereof,

said sling means being formed with an open areal section extending at least partially transversely thereacross at a position intermediate forward and rearward extremities of said frame,

said open areal section being adapted to receive therethrough a gravitationally suspended breast depending from the body of a subject supported on said sling means to present the breast into a zone below said cradle and accessible to a radiated beam eminating from the radiation source and directed toward the breast,

frame tilting means operatively connected to said frame for arcuately adjustably pivoting said frame to vary the spacial orientation thereof,

said tilting means including means for arcuately pivoting said frame about each of two different axes,

said tilting means thereby rendering feasible the suspension of the breast in the zone below said cradle at diverse selectible angles relative to the body of the subject,

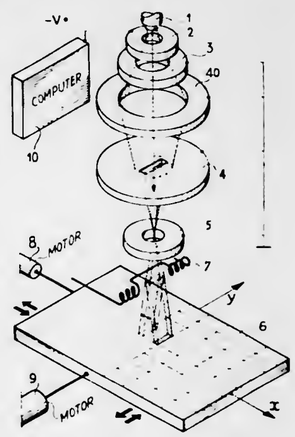
whereby fidelity and diagnostic value of film images produced in radiographic mammography procedures carried out on the breast of the subject are enhanced.

4,051,381

DEVICE FOR THE PROGRAMMED TRACING OF DESIGNS BY PARTICLE BOMBARDMENT

Jacques Trotel, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 9, 1975, Ser. No. 639,105
Claims priority, application France, Dec. 13, 1974, 74.41130
Int. Cl.² H01J *29/00*
U.S. Cl. 250—492 A **6 Claims**



1. An automatic device for forming programmed patterns upon a substrate, comprising an electron optical system, for forming an electron beam, means for deflecting said beam, a control electrode for controlling its intensity by all or nothing fashion, a data processing system for controlling said deflect-

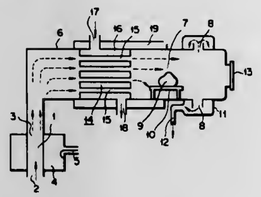
ing means and said control electrode, said device comprising upon the beam trajectory, a diaphragm in order to delimit the beam trajectory, and a lens for projecting onto the substrate a very small scale image of said diaphragm, said deflection means making it possible to displace said image, in order to scan said substrate line by line parallel to a first direction Ox, motor displacing means, actuated by said data processing system, for scanning the substrate line by line, by displacement of the substrate in a second direction Oy, perpendicularly to the first, by all or nothing control of the beam causing said pattern to be formed line by line by the succession of exposed and unexposed areas.

4,051,382

ACTIVATED GAS REACTION APPARATUS

Kazuyuki Ogawa; Masahiko Hirose, both of Yokohama; Masaaki Yada, Kawasaki, and Hitoshi Imamura, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed July 15, 1976, Ser. No. 705,695
Claims priority, application Japan, July 18, 1975, 50-87236
Int. Cl.² B01K *1/00*
U.S. Cl. 250—531 **7 Claims**



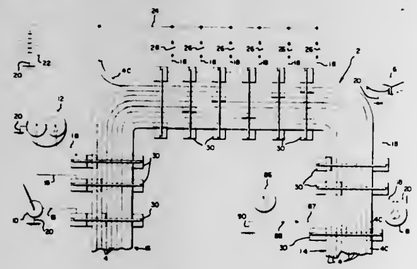
1. A gas reaction apparatus comprising:
an activation chamber having a gas inlet and outlet;
means for introducing a gas into the activation chamber through the inlet;
means for activating the gas in the activation chamber by electric discharge;
a reaction chamber positioned downstream of the activation chamber for providing a reaction with the gas;
means positioned between the activation chamber and the reaction chamber for changing the temperature of the activated gas supplied from the activating means and for introducing the gas into the reaction chamber.

4,051,383

ELECTRICAL HARNESSES AND CONNECTING DEVICES THEREFOR

Frank Peter Dola, Port Richey, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 30, 1976, Ser. No. 671,786
Int. Cl.² H02G *3/00*
U.S. Cl. 307—11 **14 Claims**



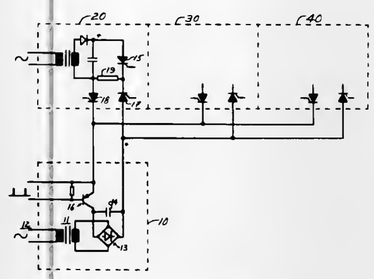
8. In an electrical harness of the type comprising a plurality of insulated conductors, a plurality of electrical loads, a plurality of switches, and a power source, each of said loads being connected to a predetermined one of said conductors by a load conductor and each of said switches being connected to said power source and to a predetermined one of said conductors by a tap conductor whereby said loads can be energized by closing said switches, the improvement comprising:
said switches and said loads being connected to said conductors by substantially identical connecting devices,
each of said connecting devices comprising an insulating body member, said body member having conductor supporting surface portions; said conductors being supported on said conductor supporting surface portions in side-by-side parallel relationship, said conductors having electrically exposed portions which are selectively located adjacent to said conductor supporting surface portions of said connecting devices,
a metallic contact member on each of said body members, each of said contact members extending transversely across its associated body member with said conductors between said contact members and said supporting surface portions, each of said contact members being in electrical contact with one of said electrically exposed portions of one of said conductors, and
said load conductors and said tap conductors being selectively connected to said contact members whereby
said loads are selectively connected through said switches to said power source.

4,051,384

BLOCKING CIRCUIT FOR THYRISTORS

Werner Ansorge, Vogelbeerweg 3, 733 Villingen, Black Forest, Germany

Filed Feb. 17, 1976, Ser. No. 658,382
Claims priority, application Germany, May 9, 1975, 2520626; June 12, 1975, 2526304; Oct. 21, 1975, 2547009
Int. Cl.² H02J *1/06*
U.S. Cl. 307—18 **7 Claims**



1. The combination comprising:
at least two DC circuits and a thyristor blocking circuit, each of said DC circuits comprising:
a power supply having first and second output terminals;
a thyristor having its anode connected to said first output terminal;
a load connected to the cathode of said thyristor, which load is connected to said second output terminal, and an auxiliary thyristor connected by its cathode to the cathode of said thyristor; and,
said thyristor blocking circuit comprising:
a source of unidirectional current having a pair of power supply terminals;
a first power supply line connected to one terminal of said source of unidirectional current and to the anode of said auxiliary thyristor of each of said DC circuits;
capacitive reactance means connected across both sides of said source of unidirectional current;

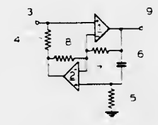
a semi-conductor switching device coupled to the other side of said capacitive reactance means; and
a second power supply line coupled between said semiconductor switching device and the second power supply terminal of the current source for each of said DC circuit.

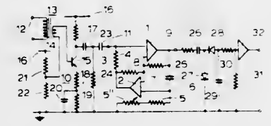
4,051,385

ACTIVE NETWORKS AND SIGNALLING EQUIPMENT

Philip Ernest Greenaway, and John Mortimer Rollett, both of London, England, assignors to The Post Office, London, England

Filed June 9, 1976, Ser. No. 694,290
Claims priority, application United Kingdom, June 11, 1975, 25103/75
Int. Cl.² H04M *1/00*; H03H *7/02, 11/00*
U.S. Cl. 307—233 R **6 Claims**





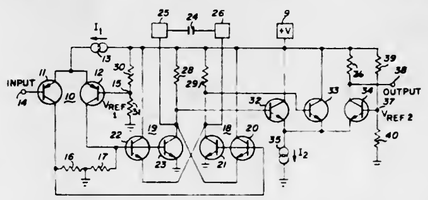
1. An active network incorporating a gyrator, having a first and a second operational amplifier each said operational amplifier having an inverting input and a non-inverting input, the inverting inputs of said first and said second operational amplifiers being directly connected, and wherein the outputs of each of said first and said second operational amplifiers are resistively connected to the inverting inputs of their respective operational amplifiers, an input terminal connected to said non-inverting input of said first operational amplifier which said input terminal is connected resistively to said output of said second operational amplifier, said output of said first operational amplifier is capacitively coupled to said non-inverting input of said second operational amplifier and said non-inverting input of said second operational amplifier is resistively connected to earth.

4,051,386

FREQUENCY DOUBLING CIRCUIT

David K. Long, and Robert W. Miller, both of Sunnyvale, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed July 22, 1976, Ser. No. 707,729
Int. Cl.² H03K *1/16*
U.S. Cl. 307—271 **5 Claims**



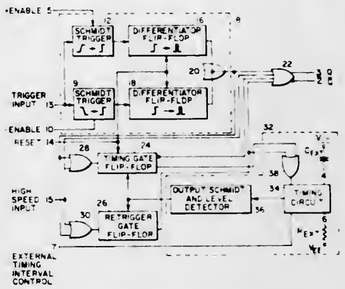
1. A frequency doubling circuit having an input for accommodating an input signal, including driver means responsive to said input signal for operating said circuit and means for coupling said circuit to first and second power supply terminals, said circuit comprising:
a capacitor having first and second terminals;
a first switching transistor having a collector coupled to said first capacitor terminal, an emitter coupled to said first power supply terminal, and a base coupled to said driver means;
a second switching transistor having an emitter coupled to said second capacitor terminal, a collector coupled to said second power supply terminal and a base coupled to said base of said first switching transistors;
a third switching transistor having a collector coupled to said second capacitor terminal, an emitter coupled to said first power supply terminal and a base coupled to said driver means;
a fourth switching transistor having an emitter coupled to said first capacitor terminal, a collector coupled to said second power supply terminal, and a base coupled to said base of said third switching transistor;
resistive means coupling each terminal of said capacitor to said second power supply terminal;
means in said driver means for driving said fist and second switching transistor bases in phase opposition to said third and fourth switching transistor bases in response to said input signal; and
output logic means coupled to said terminals of said capacitors whereby two output pulses are produced for each cycle of said input signal.

4,051,387

HIGH SPEED ECL ONE-SHOT MULTIVIBRATOR

Stephen Read Black, Bountiful, Utah, assignor to Motorola, Inc., Schaumburg, Ill.

Filed July 1, 1976, Ser. No. 701,722
Int. Cl.² H03K *3/10, 5/04*
U.S. Cl. 307—273 **9 Claims**



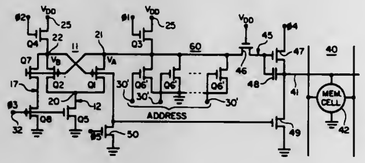
1. An ECL one-shot logic circuit comprising:
a. input circuit means for receiving input signals and having at least one output,
b. timing gate flip-flop means having a first input terminal coupled to said at least one output of said input circuit means and generating a first digital control signal,
c. retrigger gate flip-flop means having a second input terminal coupled to said at least one output of said input circuit means and generating a second digital control signal,
d. timing circuit means coupled to and being responsive to said first and second digital control signals for providing an output which is coupled to said timing gate flip-flop means and said retrigger gate flip-flop means for controlling output pulse length of said one-shot, and
e. output gate means for generating an output for said one-shot logic circuit and being responsive to and coupled to said input circuit means and to said first and second digital control signals.

4,051,388

FLIP-FLOP ACCOMPANIED BY TWO CURRENT SWITCHES, ONE HAVING A SMALLER CURRENT SINK CAPABILITY THAN THE OTHER

Hidemori Inukai, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Japan

Filed Apr. 29, 1976, Ser. No. 681,601
Claims priority, application Japan, May 7, 1975, 50-55723
Int. Cl.[2] H03K *3/286, 3/353, 19/34*
U.S. Cl. 307—279 **8 Claims**



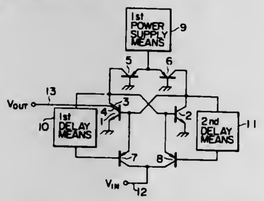
1. A circuit arrangement comprising: a flip-flop circuit including a first field-effect transistor having a first electrode connected to a common point, a second electrode connected to a first node, and a control electrode connected to a second node, a second field-effect transistor having a first electrode connected to said common point, a second electrode connected to said second node, and a control electrode connected to said first node, and a third field-effect transistor having a first electrode connected to a reference point, a second electrode connected to said common point, and a control electrode connected to a source of an activation signal; precharge means connected to said first and second nodes for rendering said first node voltage higher than said second node voltage when said flip-flop circuit is in quiescent state; a first current switching circuit including a fourth field-effect transistor having a first electrode connected to said reference point, a second electrode connected to said first node, and a control electrode connected to an input terminal; and a second current switching circuit including a fifth field effect transistor having a first electrode, a second electrode connected to said second node, and a control electrode connected to said first node, and a sixth field-effect transistor having a first electrode connected to said reference point, a second electrode connected to said first electrode of said fifth transistor, and control electrode connected to the source of said activation signal; said second switching circuit having a smaller current sink capability than said first switching circuit.

4,051,389

FLIP-FLOP CIRCUIT

Kenji Kaneko, Kokubunji, and Takahiro Okabe, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 12, 1976, Ser. No. 666,418
Claims priority, application Japan, Mar. 12, 1975, 50-29020; July 23, 1975, 50-89254
Int. Cl.[2] H03K *3/29*
U.S. Cl. 307—291 **7 Claims**



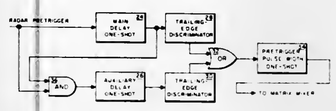
1. A trigger-type flip-flop circuit comprising:
a pair of inversely operated vertical type first and second transistors, said first transistor having dual collectors;
a pair of lateral type third and fourth transistors, each having a polarity opposite to that of said first transistor and operated as a load;
a pair of triggering fifth and sixth transistors, each of which has a polarity opposite to that of said first transistor;
the bases of said first and second transistors being connected to the collector of said second transistor and to one of the dual collectors of said first transistor, respectively;
the collectors of said third and fourth transistors being connected to said one of the dual collectors of said first transistor and to the collector of said second transistor, respectively;
the emitters of said third and fourth transistors being connected to a first power supply means;
the bases of said first and second transistors being connected to the emitters of said fifth and sixth transistors, respectively;
the bases of said fifth and sixth transistors being connected to said one of the dual collectors of said first transistor through first delay means and to the collector of said second transistor through second delay means, respectively;
the collectors of said fifth and sixth transistors being connected to an input terminal for trigger signals;
an output terminal connected to the other collector of the dual collectors of said first transistor;
the emitters of said first and second transistors being electrically connected to a ground terminal; and
the bases of said third and fourth transistors being electrically connected to said ground terminal.

4,051,390

PARALLEL/TIME-SHARED VARIABLE TIME DELAY GENERATOR WITH COMMON TIMING CONTROL AND FAST RECOVERY

Charlie F. Reeves, Del Mar, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 18, 1976, Ser. No. 697,514
Int. Cl.[2] H03K *5/13, 5/159*
U.S. Cl. 307—293 **7 Claims**



1. A system for providing output pulses of a predetermined width after a predetermined delay from the receipt of a pretrigger pulse including a non-retriggerable, main delay one-shot for receiving said pretrigger pulse and having a predetermined timing cycle for providing said predetermined delay, and further comprising:
a first trailing edge discriminator connected to the output of said main delay one-shot;
auxiliary delay means operably coupled to said main delay one-shot for responding to pretrigger pulses occurring during said main delay one-shot timing cycle when said predetermined delay is greater than said predetermined width;
and a retriggerable pulse width one-shot connected to the output of said auxiliary delay means and operably coupled to the output of said first trailing edge discriminator for providing said output pulses of a predetermined width.

4,051,391

CURRENT-OPERATED CIRCUITS AND STRUCTURES

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,606
Int. Cl.[2] H03K *1/12;* H01L *27/02*
U.S. Cl. 307—297 **21 Claims**



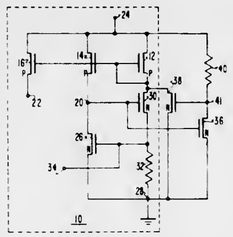
1. A current-mode or gate comprising, in combination:
an output terminal and a common terminal for connection to an output circuit;
a plurality of switches, each having a conduction path and a control electrode for controlling the conductivity of its conduction path, said conduction paths connected in parallel between said output terminal and a third terminal, said control electrodes serving as input terminals;
means direct current conductively coupling said third terminal to said common terminal;
means responsive to an input current of greater than a given value applied to one of said input terminals for causing the path of the switch connected to that input terminal to be conductive; and
regulator means connected for sensing the current flow through said direct current conductive coupling means and responsive to said current exceeding a given fixed value for establishing between each separate one of said input terminals and said common terminal a shunt path for diverting that portion of the signal current applied to its input terminal which would tend to cause the current through said direct current conductive current conductive coupling means to exceed further said given value.

4,051,392

CIRCUIT FOR STARTING CURRENT FLOW IN CURRENT AMPLIFIER CIRCUITS

Bruce David Rosenthal, Highland Park, and Andrew Gordon Francis Dingwall, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 8, 1976, Ser. No. 675,206
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—297 **10 Claims**



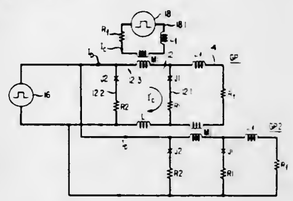
1. In a circuit comprising first and second current amplifiers, each amplifier having input and output terminals, said first current amplifier input and output terminals connected to said second current amplifier output and input terminals respectively, forming a positive feedback loop thereby, wherein said circuit has the undesirable tendency to fail to initiate conduction within said loop upon application of an operating voltage thereto, the improvement comprising a starting circuit for overcoming said undesirable tendency, said improvement comprising:
first means responsive to said application of an operating voltage for initiating a current flow through said first amplifier input terminal, said first means including a first transistor with a control electrode and with a conduction path connected at one end to said first current amplifier input terminal and at its other end to a point at a reference potential; and
second means responsive to the initiation of current flow within said loop for effectively disconnecting said first means from said loop, said second means including an impedance and a second transistor with a control electrode and with a conduction path, said impedance and said second transistor conduction path being serially connected between a terminal for an operating voltage and said point at a reference potential, the point of interconnection between said impedance and said second transistor conduction path being connected to said first transistor control electrode, and said second transistor control electrode being connected to said first amplifier output terminal.

4,051,393

CURRENT SWITCHED JOSEPHSON JUNCTION MEMORY AND LOGIC CIRCUITS

Theodore Alan Fulton, Warren Township, Somerset, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 16, 1976, Ser. No. 751,127
Int. Cl.[2] H03K *19/95*
U.S. Cl. 307—306 **17 Claims**



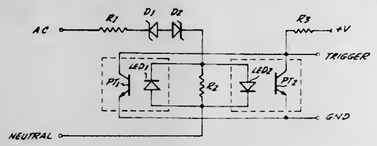
1. A superconductive circuit comprising:
a loop circuit including a resistor, and first and second branches in parallel with one another,
said first and second branches including first and second Josephson junction devices, respectively;
a fan-out line connected in parallel with said branches,
bias means for applying a pulsed bias current to said loop circuit so that said devices are biased below their critical current I_J for switching said devices from their zero voltage state to their finite voltage state, and
control means for generating a pulsed control current in said loop circuit so that in said first branch the bias and control currents add and exceed I_J causing said first device to switch to its finite voltage state, which then causes substantially the entire bias current to flow through said second branch exceeding I_J and causing said second device to switch to its finite voltage state, which in turn causes substantially the entire bias current to divert to said fan-out line.

4,051,394

ZERO CROSSING AC RELAY CONTROL CIRCUIT

Jansey D. Tieden, Puyallup, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 15, 1976, Ser. No. 666,642
Int. Cl.² H03K *17/00*
U.S. Cl. 307—310 **9 Claims**



1. A zero crossing AC relay control circuit for controlling the closure of the contacts of a relay having a known, predetermined time interval between the application of a trigger voltage to said relay and the actual closing of said relay contacts, said zero crossing AC relay control circuit comprising:

voltage breakdown means for controlling current flow through a circuit such the AC current only flows through said circuit if the instantaneous value of the AC voltage applied to said circuit is above a predetermined level, said voltage breakdown means further controlling said current flows such that current flow terminates a predetermined period of time before the AC voltage crosses zero, said predetermined period of time remaining generally constant from one AC cycle to the next and being substantially equal to the known predetermined time interval between the application of a trigger voltage to said relay and the closure of the switch contacts of said relay;

sensing means connected to said voltage breakdown means for sensing the absence of current flow controlled by said voltage breakdown means; and,

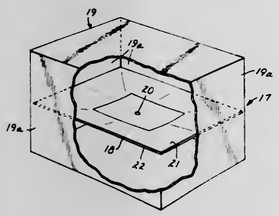
trigger signal generating means connected to said sensing means for producing a relay-operating trigger signal when said sensing means senses the absence of the current flow controlled by said voltage breakdown means.

4,051,395

WEIGHT ACTUATED PIEZOELECTRIC POLYMERIC TRANSDUCER

Allen L. Taylor, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing, St. Paul, Minn.

Filed Aug. 8, 1975, Ser. No. 603,155
Int. Cl.² H01L *41/04*
U.S. Cl. 310—329 **1 Claim**



1. A piezoelectric polymeric transducer for converting mechanical energy to electrical energy comprising:

a support means;

at least one layer of compliant, poled, polymeric, piezoelectric material attached by at least two opposite ends to said support means, said piezoelectric material being such as to produce electrostatic charges of opposite polarity on its opposite major surfaces when subjected to bending;

first conductive electrodes carried on only the outer portions of at least two opposite ends of each planar surface of said one piezoelectric layer adjacent to said support means;

second conductive electrodes carried on the center portions of the planar surfaces of said one piezoelectric layer, said first and second conductive electrodes being electrically connected to each other to adjust the electrical energy output of said transducer; and

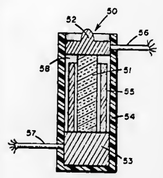
a weight connected to said one piezoelectric layer in such fashion that said weight acts as an inertial mass to produce bending of said one piezoelectric layer in response to movement of said support means.

4,051,396

ENCAPSULATION TO PREVENT FRACTURE OF PIEZOELECTRIC HIGH VOLTAGE MECHANISM

Don A. Berlincourt, Russell Township, Ohio, assignor to Channel Products, Inc., Chagrin Falls, Ohio

Continuation-in-part of Ser. No. 446,627, Feb. 28, 1974, abandoned. This application Dec. 17, 1974, Ser. No. 533,646
Int. Cl.² H01L *41/08*
U.S. Cl. 310—340 **10 Claims**



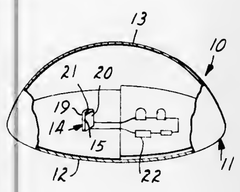
1. A high voltage piezoelectric mechanism with piezoelectric element means essentially coated with viscid insulating material.

4,051,397

TWO SENSITIVITY LEVEL KINETIC SENSOR

Allen L. Taylor, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 8, 1975, Ser. No. 603,156
Int. Cl.² H01L *41/04*
U.S. Cl. 310—351 **4 Claims**



1. A motion detector providing a large or small scale sensitivity sensing operation depending upon the configuration of the surface constituting the base of the detector, said detector comprising:

a housing means having a first surface configured to provide a planar base and a first sensitivity for said detector and a second surface configured to provide a curved base and a second sensitivity greater than said first sensitivity for said detector.

sensing means disposed within and operatively associated with said housing means, said sensing means including piezoelectric means responsive to movement of said detector to provide an electrical current having a first magnitude when said detector is supported on said planar base and a second magnitude larger than said first magnitude when said detector is supported on said curved base, and

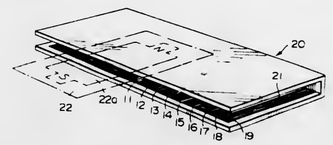
electrical circuit means disposed within said housing means in electrical association with said sensing means to receive said electrical current provided by said sensing means, said electrical circuit means including signal means energizable to provide a detectable signal in response to movement of said detector.

4,051,398

COIL MEANS FOR DRIVING A LINEAR MOTOR

Toshihiro Kondo, Chofu, Japan, assignor to Toshihiro Kondo, Tokyo and Fuji Film Co., Ltd., Minami-ashigara, both of, Japan

Filed Apr. 15, 1976, Ser. No. 677,163
Claims priority, application Japan, Apr. 17, 1975, 50-46704
Int. Cl.² H02K *33/00*
U.S. Cl. 310—12 **10 Claims**



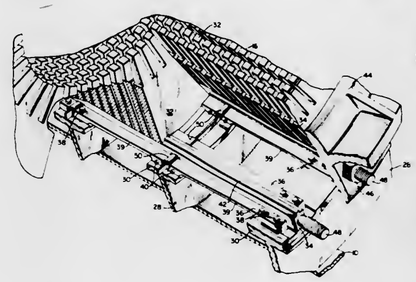
1. A coil means for driving a movable member in a linear motor system comprising a series of electromagnetic coils arranged in a line along a path in which the movable member travels, and energized successively from one at one end thereof to the one at the other end in the direction of movement of the movable member, said series of electromagnetic coils being in the form of thin coils and arranged in a line partially overlapped with each other and fixed together to form an elongated one-piece coil group, and said coil group having a cross-section of a shape of "U" to guide the movable member therein.

4,051,399

DYNAMOELECTRIC MACHINE INCLUDING GAS BAFFLES

Casmer P. Stanwick, and Lawrence E. Jordan, both of Amsterdam, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 17, 1976, Ser. No. 696,908
Int. Cl.² H02K *5/24*
U.S. Cl. 310—51 **7 Claims**



1. A dynamoelectric machine comprising:

a. a frame,

b. a plurality of circumferentially spaced spring bars adjacent said frame extending longitudinally thereof and secured to said frame at spaced points,

c. a plurality of circumferentially spaced keybars adjacent to but spaced from said frame and extending longitudinally thereof, each of said keybars being supported by a corresponding spring bar but spaced from said spring bar along a substantial portion of its length,

d. a stator core mounted on said keybars but spaced from said spring bars to minimize transmission of vibration from said core to said frame, said core comprising a plurality of core sections, each core section being mounted on two keybars, said core having alternate first passages for inflow of cooling gas and second passages for outflow of cooling gas, and

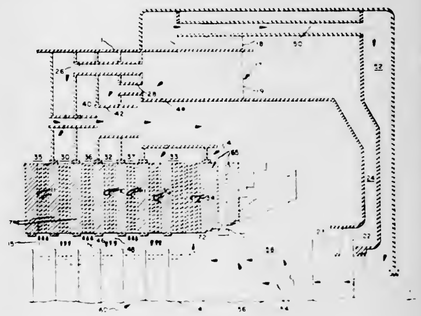
e. a plurality of baffles, one baffle being positioned on each of said spring bars in each region between said first and second passages, each baffle including a portion disposed between said spring bar and said core and resiliently engaging said core to block flow of cooling gas between said core and said spring bar while minimizing transmission of vibration from said core to said frame.

4,051,400

END GAS GAP BAFFLE STRUCTURE FOR REVERSE FLOW COOLED DYNAMOELECTRIC MACHINE

Anthony F. Armor, and David H. Winne, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 5, 1976, Ser. No. 655,392
Int. Cl.² H02K *9/00*
U.S. Cl. 310—58 **13 Claims**



1. A reverse flow cooled dynamoelectric machine comprising:

a gas-tight casing containing cooling gas;

a stator disposed within said casing and including a core of stacked laminations having axially spaced radially extending cooling passages disposed therein, the end regions of said core comprising radially foreshortened laminations with inboard ends progressively farther removed from the axis thereof providing an array of progressively stepped laminations;

a rotor disposed within said stator and spaced therefrom by a gas gap;

fan means disposed in said casing for the reverse flow circulation of the cooling gas; and,

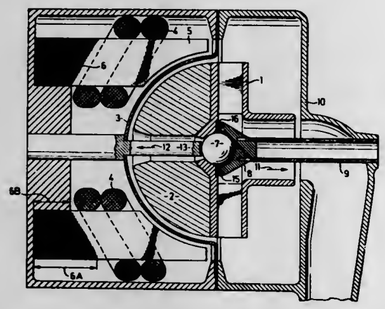
a baffle disposed in said gap and spaced from said stepped laminations for directing a flow of cooling gas flowing axially outwardly from said gas gap to said end regions across said stepped laminations and for increasing the velocity of flow of cooling gas across said stepped laminations and said baffle includes an annular member having outer face spaced from and generally parralell to the inboard edtes of said stepped laminations.

4,051,401

MAGNETIC LOOPS CLOSURE ELEMENTS FOR ELECTRIC MOTOR

William George Hayward, 76 Woodcrest Walk, Reigate, Surrey, England

Filed June 1, 1976, Ser. No. 691,288
Claims priority, application United Kingdom, June 2, 1975, 23773/75
Int. Cl.[2] H02K *1/06*
U.S. Cl. 310—216 **4 Claims**



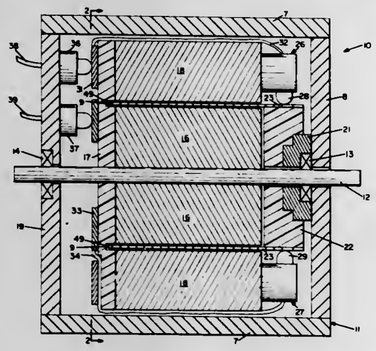
1. An electric motor including a stator having a plurality of radially extending magnetically soft iron elements forming pole teeth having portions of greater and lesser diameters, a rotor at one axial end of said pole teeth adapted to conduct magnetic flux between said pole teeth, and a magnetic closure loop element at the opposite axial end of said pole teeth than said rotor having portions thereof which are associated with portions of said pole teeth; the improvement comprising in that the cross-sectional areas of a portion of said closure loop element associated with a portion of said pole teeth of greater diameter is greater than the cross-sectional area of a portion of said closure loop element associated with a portion of said pole teeth of lesser diameter.

4,051,402

SHELL ROTOR DIRECT CURRENT GENERATOR

John R. Gruber, 1421 E. 32nd St., Cleveland, Ohio 44114

Filed Oct. 31, 1975, Ser. No. 627,664
Int. Cl.[2] H02K *1/22*
U.S. Cl. 310—266 **8 Claims**



1. A current generator comprising in combination:

a. a pair of magnetic members each comprising an annularly arranged series of alternate magnetic poles, said members being spaced axially from each other to define therebetween an annular axial air gap;

b. a cylindrical rotor mounted for continuous rotation within said axial air gap and formed of longitudinally aligned non-ferrous conducting segments, said segments being separated by an air gap a substantial portion of the longitudinal length of said conducting segments, said conducting segments further being in electrical communication at one end thereof and having commutator means at the opposite end thereof; and

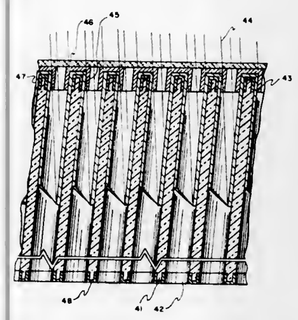
c. means for maintaining a relative velocity between said cylindrical rotor and said magnetic members.

4,051,403

CHANNEL PLATE MULTIPLIER HAVING HIGHER SECONDARY EMISSION COEFFICIENT NEAR INPUT

Robert M. Feingold, Annandale; Carl W. Hoover, Jr., Woodbridge, and John Rennie, Alexandria, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 10, 1976, Ser. No. 713,165
Int. Cl.[2] H01J *43/22, 43/24*
U.S. Cl. 313—105 CM **4 Claims**



1. In a microchannel plate electron multiplier comprising a plurality of channels, each of said channels having a diameter on the order of 10–15 microns and a length on the order of about 20 mils, the channel wall comprising a conductive glass having a relatively low coefficient of secondary emission, the improvement comprising:

a first layer of booster material having a relatively high coefficient of secondary emission, and covering said wall from the microchannel plate input for a distance on the order of about 10 channel diameters.

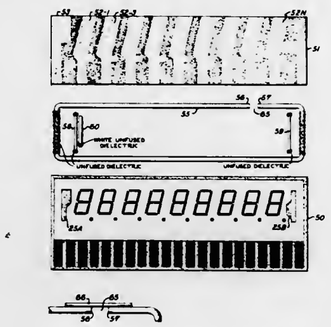
4,051,404

GAS DISCHARGE DISPLAY PANEL WITH FUSED SEALING PLUG

George A. Kupsky, State College, Pa., assignor to Panel Technology, Inc., Lewistown, Pa.

Filed July 30, 1974, Ser. No. 492,991
Int. Cl.[2] H01J *61/36*
U.S. Cl. 313—220 **6 Claims**

1. A gas discharge information display panel having a pair of flat glass substrate plates carrying electrode segments and dielectric members thereon, seal means rendering said display panel tubulationless comprising a glass seal member joining said flat glass substrate plates in spaced apart relation, said glass seal member having a configuration defining the perimeter of a gas chamber in said panel, said glass seal member having at least a pair of spaced apart ends defining a vacuumization and gas fill port, a fill gas in said chamber, and a glass plug member



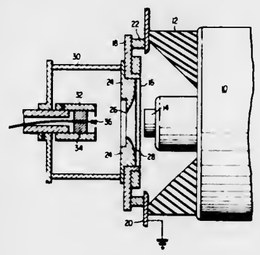
having a fiber softening temperature below the fiber softening temperature of said glass seal member filling said port.

4,051,405

METHOD FOR CONTROLLING LOW-ENERGY HIGH CURRENT DENSITY ELECTRON BEAMS

John N. Lee, Silver Spring, and Robert B. Oswald, Jr., Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 10, 1975, Ser. No. 612,053
Int. Cl.[2] H01J *1/00;* H05H *1/00*
U.S. Cl. 313—361 **6 Claims**



1. A method of controlling the angle of incidence of electrons in low energy, high current density, pulsed relativistic electron beams comprising the steps of:

producing a freely drifting electron beam;

placing a grounded mesh electrode in the path of said beam;

said step of producing further includes the steps of accelerating an electron beam from a cathode electrode to an anode electrode through a significant potential difference; and,

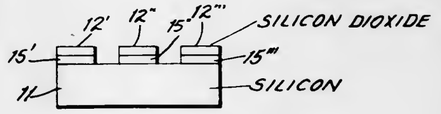
said step of placing includes the step of positioning said grounded mesh electrode between said anode and a target at a point where internal forces within the drifting beam have become apparent.

4,051,406

ELECTRONIC STORAGE TUBE TARGET HAVING A RADIATION INSENSITIVE LAYER

Albert S. Waxman, Santa Clara, Calif., assignor to Princeton Electronic Products, Inc., North Brunswick, N.J.

Continuation of Ser. No. 430,257, Jan. 2, 1974, abandoned. This application Sept. 24, 1975, Ser. No. 616,125
The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.
Int. Cl.[2] H01J *29/41, 31/08*
U.S. Cl. 313—391 **8 Claims**



1. An electronic storage tube for storing images by means of a modulated electron beam, said tube having a target structure including first means substantially unaffected by ionizing radiation which is present during operation of the tube for significantly increasing the image retention time of the target structure wherein said tube comprises:

second means including means for generating an electron beam for applying a signal to the target structure to establish a desired stored charge distribution on the target structure representative of the image to be stored;

third means for detecting the stored charge distribution established on the target structure and wherein said first means comprises a pattern of conducting and insulating areas, said conducting areas being electrically connected to each other to form a conducting member having at least one planar surface;

said insulating areas being formed of a plurality of layers of insulating materials placed on the planar surface of said conducting member;

each of said layers having first and second planar surfaces, the first planar surface of one of said layers being in contact with the planar surface of the conducting member and the second planar surface of said one of said layers being in contact with the first planar surface of another one of said layers;

the second planar surface of the insulating layer furthest removed from said conducting member constituting the surface for storing the charge pattern;

the first planar surface of said last mentioned insulating layer being in contact with the second surface of the insulating layer adjacent thereto;

all of said layers being arranges to overlie portions of said conducting member planar surface while the remaining portions of said conducting member planar surface are exposed to said electron beam;

at least one of said insulating layers being formed of an insulating material whose conductivity is unaffected by the presence of ionizing radiations to prevent the transfer of charge stored on the stored charge surface to significantly increase image retention time of the charge pattern being stored, even after repeated readout.

4,051,407

ARRANGEMENT INCLUDING A GAS AND/OR VAPOR DISCHARGE LAMP

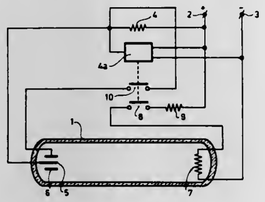
Jan Evert van der Werf; Jean Johan Heuvelmans, and Hendricus Franciscus Johannes Jacobus van Tongeren, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,586

Claims priority, application Netherlands, Apr. 1, 1975, 7503826

Int. Cl.[2] H05B *41/14, 41/36*

U.S. Cl. 315—106 **10 Claims**



1. Apparatus for operating an electric discharge lamp substantially free of any ballast device comprising, a pair of input terminals for applying electric power to the apparatus, a substantially impedance free electric coupling means connecting the discharge lamp across the input terminals, said discharge lamp having first and second main electrode systems defining a discharge path through the lamp, one of said electrode systems comprising a preheatable electrode operable as a cathode, an auxiliary circuit responsive to the lamp current flow between the first and second main electrode systems and including means for altering the electrode voltge drop in the vicinity of at least one of said main electrode systems, said auxiliary circuit, in the operating condition of the discharge lamp, being responsive to a change in the effective value of the current flowing between the lamp first and second main electrode systems so as to change said electrode voltage drop in a manner such as to oppose said change in current between said first and second main electrode systems, said change in the electrode voltage drop being effected at least partly by changing the magnitude of the heating current supplied to said preheatable electrode.

4,051,408

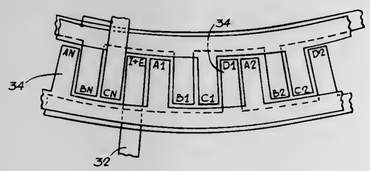
CIRCULAR PLASMA CHARGE DISPLAY DEVICE

Herman Albertine, Jr., Geneva; Donald G. Craycraft, and William E. Coleman, both of St. Charles, all of Ill., assignors to NCR Corporation, Dayton, Ohio

Filed Jan. 13, 1976, Ser. No. 648,766

Int. Cl.[2] H05B *41/14, 41/44*

U.S. Cl. 315—169 R **11 Claims**



1. In a plasma charge transfer device of the type having a channel containing an ionizable medium, said channel being defined within a walled structure, at least one wall thereof being transparent, input and transfer electrodes positioned on inside wall surfaces, said transfer electrodes being arranged in alternating sequence and offset from one another on opposite inside wall surfaces, and means for applying a potential difference between adjacent electrodes whereby the medium will emit light proximate said adjacent electrodes and leave a charge proximate one of the adjacent electrodes, the improvement wherein: said channel comprises an endless length, a single input electrode is utilized located at a first position along the length of said channel, said transfer electrodes extending along the entire length of said channel whereby sequential application of potential differences enables shifting of light emission and charge positions in either direction relative to said first position.

4,051,409

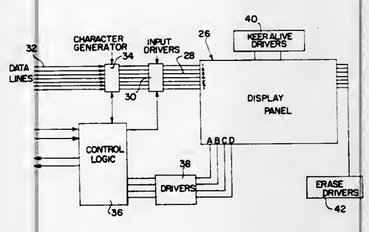
LOAD AND HOLD SYSTEM FOR PLASMA CHARGE TRANSFER DEVICES

Donald Gregory Craycraft, St. Charles, Ill., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 13, 1976, Ser. No. 648,767

Int. Cl.[2] H05B *41/30, 41/44*

U.S. Cl. 315—169 TV **13 Claims**



1. In a plasma charge transfer device of the type having a channel containing an ionizable medium, said channel being defined within a walled structure, input and transfer electrodes positioned on the inside wall surfaces, said transfer electrodes being arranged in alternating sequence and opposite from one another on opposite inside wall surfaces, and means for applying a potential difference between adjacent electrodes whereby the medium will emit light proximate said adjacent electrodes and leave a charge proximate one of said adjacent electrodes, the application of succeeding potential differences between adjacent transfer electrodes along the length of the device operating to shift said charge away from the position of the input electrode, the improvement comprising means for holding a charge in that location of the device to which the charge has been shifted, said holding means including means for circulating the charge between the electrodes of a set of at least four sequentially positioned transfer electrodes.

4,051,410

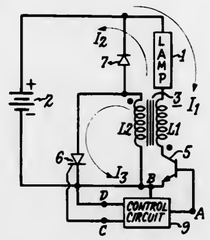
DISCHARGE LAMP OPERATING CIRCUIT

David W. Knoble, East Flat Rock, N.C., assignor to General Electric Company, New York, N.Y.

Filed Sept. 2, 1976, Ser. No. 719,763

Int. Cl.[2] H05B *41/34*

U.S. Cl. 315—205 **17 Claims**



1. A lamp operating circuit comprising, in combination, a direct current power source, a first branch including first controlled switch means across said power source, a second branch including unidirectional conducting means across said power source, a transformer having a primary winding in said first branch in series with said first controlled switch means and a secondary winding in said branch in series with said unidirectional conducting means, means for connecting a gaseous discharge lamp to said power source in series with at least one of said branches, second controlled switch means coupled to said secondary winding for substantially stopping current flow to said unidirectional conducting means and for storing magnetic energy in said transformer while said second controlled switch means is on, and control means coupled to said first and second controlled switch means for repetitively and sequentially operating the same at predetermined intervals, whereby DC pulses may be applied to the gaseous discharge lamp for operation thereof.

4,051,411

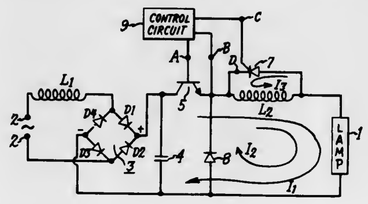
DISCHARGE LAMP OPERATING CIRCUIT

David W. Knoble, East Flat Rock, and Don Morais, Hendersonville, both of N.C., assignors to General Electric Company, New York, N.Y.

Filed Sept. 2, 1976, Ser. No. 719,764

Int. Cl.[2] H05B *41/34*

U.S. Cl. 315—205 **16 Claims**



1. A lamp operating circuit comprising. in combination, a direct current power source, first controlled switch means and inductance means connected in series across said power source, means for serially connecting a gaseous discharge lamp to said first controlled switch means and said inductance means, unidirectional conducting means connected across said series connected inductance means and said lamp connecting means, second controlled switch means coupled to said inductance means for stopping current flow to the gaseous discharge lamp and for storing magnetic energy in said inductance means while said controlled switch means is on, and control means coupled to said first and second controlled switch means for repetitively and sequentially operating the same at predetermined intervals, whereby DC pulses may be applied to the gaseous discharge lamp for operation thereof.

4,051,412

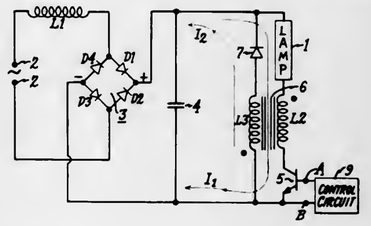
DISCHARGE LAMP OPERATING CIRCUIT

David W. Knoble, and Daniel V. Owen, both of East Flat Rock, N.C., assignors to General Electric Company, New York, N.Y.

Filed Sept. 2, 1976, Ser. No. 719,765

Int. Cl.[2] H05B *41/34*

U.S. Cl. 315—205 **16 Claims**



1. A lamp operating circuit comprising, in combination, a direct current power source, controlled switch means across said power source, a transformer having a primary winding and a secondary winding, said primary winding in series with said controlled switch means, unidirectional conducting means in series with said secondary winding across said power source, means for connecting a gaseous discharge lamp in series with said controlled switch means and said primary winding, and control means coupled to said controlled switch means for repetitively operating the same at predetermined intervals, whereby DC pulses may be applied to the gaseous discharge lamp for operation thereof.

4,051,413

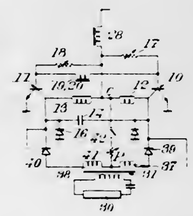
TRANSISTORIZED STATIC INVERTERS

Henry J. L. Abadie, "Le Chateau", 65140 Monfaucon, France

Filed May 26, 1976, Ser. No. 690,355

Int. Cl.[2] H02M *7/48*; H05B *41/29*

U.S. Cl. 315—219 **8 Claims**



1. A static inverter for converting direct voltage into alternating voltage, comprising:

a. a first and a second switching transistors each having emitter, collector and base,

b. a first resistor and a second resistor respectively connecting the bases of said first and second transistors to a junction point and operating as current generator for said transistors,

c. a source of DC voltage connected to said junction point,

d. inductance means inductively coupling said bases,

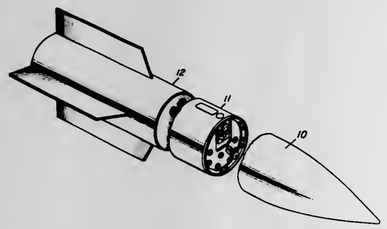
e. first and second coils inductively coupled to said inductance means and respectively connecting the collectors of said transistors to said junction,
f. capacitor means connecting said collectors, said capacitor means, coils and inductance means constituting a frequency pilot circuit for said transistors,
g. first and second switching rectifier means connecting the collectors of said transistors to ground for uncoupling said collectors,
h. and at least one output transformer, each said transformer having a primary connected across said collectors and a secondary whose ends constitute terminals for connection of an output load.

4,051,414

MISSILE ADAPTATION KIT ASSEMBLY

Albert S. Will, Bethesda; Robert R. Wilson, Chillum, and Samuel J. Black, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 28, 1964, Ser. No. 423,643
Int. Cl.² H02B *1/04*
U.S. Cl. 361—415 **7 Claims**



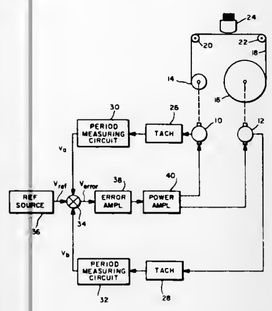
1. A cylindrical mechanical package for electrical equipment, comprising:
a plurality of circular supporting plates having a prescribed number of aligned holes therein;
spacer means for supporting said plates in spaced relation;
electrical components supported between said plates either by a direct mounting on a single one of said supporting plates and/or by a mounting between two adjacent supporting plates;
a projecting boss on one end of each of said electrical components fitting slideably in one of said holes in one of said plates; and
a projecting threaded shaft on the other end of each of said electrical components projecting through an aligned hole in the other plate; and
a nut engaged with said threaded shaft to secure each component rigidly with respect to said other plate;
whereby displacements of said plates away from and toward each other due to shock loadings do not impose any strains on the electrical components;
each of said electrical components having a terminal board thereon, said components being mounted so as to dispose said terminal boards adjacent the cylindrical periphery of the package; and
electrical interconnecting means coupling said terminal boards, said interconnecting means consisting of flat tape cables extending around the cylindrical periphery of said package.

4,051,415

WEB SPEED CONTROL SYSTEM

Peter G. Martin, Arlington, Mass., assignor to Braemar Computer Devices, Inc., Burnsville, Minn.

Filed Mar. 5, 1975, Ser. No. 555,358
Int. Cl.² H02P *5/50*
U.S. Cl. 318—7 **19 Claims**



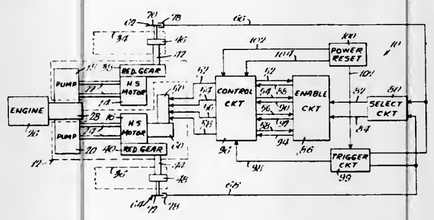
1. For use in a reel driven web transport system including a supply reel, a takeup reel, a drive motor coupled to said takeup reel, a control circuit for maintaining substantially constant linear web speed of a web moving between said reels, said control circuit comprising:
first means for determining a rotational characteristic of said supply reel and providing a first signal representative thereof;
second means for determining a rotational characteristic of said takeup reel and providing a second signal representative thereof;
first and second non-linear processing means respectively operative in response to said first and second signals to provide respective non-linear signal representations of said rotational characteristics;
means for summing said non-linear signal representations;
means for providing an error signal from said summed signal; and
means operative in response to said error signal to provide a control signal to said drive motor to govern its speed of rotation and produce substantially constant linear web speed.

4,051,416

INCREMENTAL DIGITAL CONTROL CIRCUIT

Gary L. Golobay, Valley Center, Kans., assignor to J. I. Case Company, Racine, Wis.

Filed May 27, 1976, Ser. No. 690,383
Int. Cl.² H02P *5/46*
U.S. Cl. 318—85 **14 Claims**



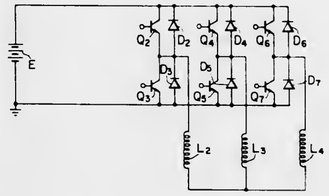
1. In an implement having a plurality of drive motor means, a plurality of driven members coupled to and driven by said drive motor means, and actuator means selectively operating said drive motor means to drive said driven members;
a digital control system enabled in response to operation of said actuator means to operate said drive motor means in synchronism for producing selected control signals to effect incremental adjustment of the operation of at least a first one of said drive motor means relative to the operation of a second one of said drive motor means to achieve said synchronized operation thereof, said control system comprising:
control circuit means for selectively producing different ones of a plurality of possible control signals and for applying said control signals to said first drive motor means to effect an incremental adjustment of the operations thereof relative to said second drive motor means;
transducer means for producing a plurality of pulse trains in response to operation of said drive motor means, the relationship between individual pulses of said pulse trains being indicative of the operational relationship between said drive motor means;
selection circuit means responsive to said pulse trains for producing a first selection signal in response to a first relationship between individual pulses of said pulse trains;
enabling circuit means for producing an enabling signal in response to said selection signal to enable said control circuit for production of a selected control signal; and
trigger circuit means responsive to said pulse trains for producing a trigger signal;
said enabled control circuit producing said selected control signal in response to said trigger signal.

4,051,417

CONTROL SYSTEM FOR A BRUSHLESS MOTOR

Masaaki Fujinawa, Hachioji; Kiyoo Takeyasu, Tokorozawa; Kenichi Iizuka, Shimotsuga; Motokazu Uchida, Setagaya, and Hideo Uzuhashi, Shimotsuga, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 4, 1975, Ser. No. 610,289
Claims priority, application Japan, Sept. 4, 1974, 49-100903
Int. Cl.² H02K *29/00*
U.S. Cl. 318—138 **6 Claims**



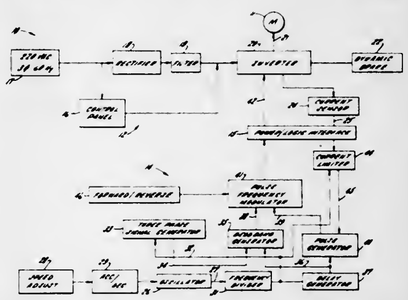
1. A control system for a brushless motor comprising:
a power source;
a plurality of driving coils inductively coupled with a rotor of said motor, one terminal of each coil being connected in common;
detector means for detecting the rotor position of said rotor and generating rotor position signals corresponding to the position of said rotor;
an oscillator for generating a chopping signal;
a logic circuit, coupled to said detector means and said oscillator, for chopping a portion of said rotor position signals in response to the chopping signal from said oscillator;
a plurality of first semiconductor switching elements each having a first terminal connected to another terminal of each of said coils, respectively, a second terminal connected to one terminal of said power source, and a control terminal;
a plurality of second semiconductor switching elements each having a first terminal connected to another terminal of said power source, a second terminal connected to the first terminal of a respective one of said first semiconductor switching elements, and a control terminal;
a plurality of rectifying elements respectively connected across the first and second terminals of each of said first and second semiconductor switching elements, so as to be rendered conductive in a direction opposite to the conduction direction of said first and second semiconductor switching elements;
first means for applying the portion of the rotor position signals chopped by said logic circuit to the control terminals of said first semiconductor switching elements; and
second means for directly applying a portion of the rotor position signals from said detector means to the control terminals of said second semiconductor switching elements.

4,051,418

THREE PHASE A.C. MOTOR DRIVE SYSTEM

Gerald N. O'Berto, 850 Lorraine Road, Wheaton, Ill. 60187, and Gisuke Murakami, 496 Imaiminami-cho, Nakahara, Kawasaki, Japan (211)

Filed Nov. 3, 1975, Ser. No. 627,980
Int. Cl.² H02P *5/40*
U.S. Cl. 318—227 **2 Claims**



1. A system for generating a three phase variable frequency signal for driving a three phase a.c. motor, said system comprising the combination of a d.c. voltage source having positive and negative voltage levels, an inverter having a plurality of controllable solid state switching means for selectively applying said positive and negative voltage levels alternately to each of three output lines to generate a three phase a.c. output, means for controlling the rise times of the positive and negative currents flowing to the inverter, current sensing means for generating a control signal in response to an increase in the magnitude of the inverter current flow through said inverter above a predetermined level, and current limiting means responsive to said control signal for limiting the inverter current flow to said predetermined level, said current sensing means comprising a resistor between said d.c. voltage source and the inverter, the voltage drop across said resistor being proportional to the current therethrough, an amplifier for amplifying the magnitude of the voltage drop across said resistor, and a silicon bidirectional switch which generates a control signal when said amplified resistor voltage drop exceeds a predetermined level.

4,051,419
CONTROL SYSTEM OF AN ALTERNATING-CURRENT MOTOR

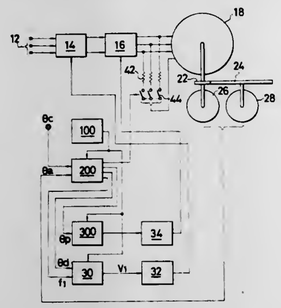
Shuichi Takahashi, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 4, 1976, Ser. No. 693,262

Claims priority, application Japan, June 9, 1975, 50-068500; June 19, 1975, 50-073685; July 16, 1975, 50-086168; Nov. 17, 1975, 50-137291

Int. Cl.² H02P 5/40

U.S. Cl. 318—227 **23 Claims**



1. A control system of a polyphase alternating-current motor comprising:

a polyphase alternating-current motor;

power supply means for generating a polyphase alternating-current voltage to be supplied to said motor, the amplitude and the instantaneous phase angle of said alternating-current voltage being controllable;

position detector means for detecting the instantaneous electrical angular position of the rotor of said motor with respect to a stator reference;

means for producing an initial value for the control variable to control the torque generated by said motor;

phase signal generator means for generating an instantaneous phase angle signal from said initial value for the control variable and said detected instantaneous electrical angular position of said rotor;

phase angle control means for controlling said instantaneous phase angle of said alternating-current voltage with said generated instantaneous phase angle signal as the reference signal;

voltage signal generator means for generating a voltage signal in accordance with a predetermined voltage control law; and

voltage control means for controlling said amplitude of said alternating-current voltage with said generated voltage signal as the reference signal.

4,051,420
HALL MOTOR CONTROL SYSTEM

Kinji Tanikoshi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Mar. 5, 1976, Ser. No. 664,385

Claims priority, application Japan, Mar. 10, 1975, 50-28821; Apr. 11, 1975, 50-43943

Int. Cl.² H02K 29/00

U.S. Cl. 318—254 **12 Claims**

1. A DC motor having a control system therefor comprising, in combination:

a. a rotor having thereon magnetic poles of the opposite polarities;

b. a stator having flux-producing windings positioned in torque-producing relationship with said rotor, each of said windings producing an induced voltage upon rotation of said rotor;
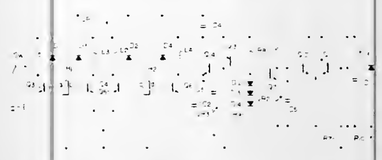
c. detecting means for detecting and synthesizing the induced voltages in said windings;

d. voltage level shift means for level-shifting the output voltage of said detecting means, said level shift means having a transistor circuit connected to said detecting means;

e. constant voltage means connected to one electrode of a power source for producing always a constant potential with respect to the potential of said electrode;

f. reference rotational speed information input means connected across said constant voltage means for producing a constant voltage corresponding to the reference rotational speed of said motor;

g. comparing means comprising a differential amplifier circuit having two input terminals, one of said input terminals being connected to said voltage level shift means and the other input terminal being connected to said reference rotational speed information input means so as to provide a signal representing the difference between said two inputs;



h. Hall generators positioned in flux-producing relationship with said magnetic poles for producing a Hall voltage corresponding to the output voltage of said comparing means;

i. driving control means connected to the output of said Hall generators and said stator windings to apply an exciting current to said windings in response to the output voltage of said Hall generators; and

j. temperature compensating means including at least one diode connected to the input circuit of said transistor of said voltage level shift means.

4,051,421
BRAKING MODE CONTROL FOR A CHOPPER CONTROLLED D-C ELECTRIC MOTOR

Thomas Richard Brinner, and Thomas Deltor Stitt, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Dec. 16, 1975, Ser. No. 641,217

Int. Cl.² H02P 3/14

U.S. Cl. 318—367 **14 Claims**

FIG.1A
FIG.1B

1. A control system for effecting smooth resistor staging during electrical braking of a chopper controlled d-c electric motor comprising:

a. a plurality of resistor stages serially connected in a motor current path, each of said stages including a resistor and power switching means having normally open main contacts connected in parallel circuit arrangement with said resistor;

b. a chopper circuit including dynamic braking means connected in said motor current path for providing a series impedance the magnitude of which can be varied between minimum and maximum limits;

c. sensor means for sensing motor current in said path and for providing a feedback signal proportional thereto;

d. means for supplying a reference signal proportional to a desired motor current;

e. summing means for summing said reference signal and said feedback signal and for providing an error signal proportional to any difference in magnitude therebetween;

f. control means connected to receive said error signal and responsive thereto to vary the impedance of said chopper circuit in a manner tending to reduce said error signal to a minimum value, said control means including means for selectively actuating the power switching means in said resistor stages when the impedance of said chopper circuit reaches said minimum limits, each power switching means being operative when actuated to effect closure of its respective main contacts to thereby short-circuit the corresponding resistor;

g. detector means coupled to the main contacts of each power switching means for sensing operation thereof, said detector means providing an output signal during operation of said main contacts; and

h. means responsive to said output signal for changing said error signal only during closing operation of said main contacts to a magnitude which causes said control means to adjust said chopper circuit impedance to a value intermediate said minimum and maximum limits.

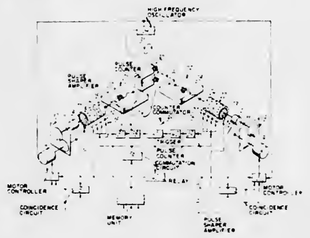
4,051,422
PROGRAMMING APPARATUS FOR ELECTROEROSION CUTTING MACHINE

Konstantin Nikitich Lavrentiev, ulitsa Dzerzhinskogo, 23, kv. 8; Natalya Isaakievna Borisova, Piskarevsky prospekt, 40, kv. 82; Jury Ivanovich Vasiliev, Menshikovsky prospekt, 19, kv. 56; Jury Nikolaevich Rodionov, Tallinskoe shosse, 54, kv. 61; Vadim Konstantinovich Strashinsky, ulitsa B.Zelenina, 26, kv. 24; Vladimir Fedorovich Ioffe, Kirovsky prospekt, 69/71, kv. 5, all of Leningrad, U.S.S.R., and Iosif Yakovlevich Vyatskin, deceased, late of Leningrad, U.S.S.R., by Itta Moiseevna Vyatskina, administrator

Filed Oct. 16, 1975, Ser. No. 623,072

Int. Cl.² G05B 19/24

U.S. Cl. 318—570 **1 Claim**

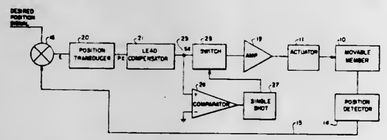


1. A programming device for an electroerosion cutting machine with first and second jig tables displaced by first and second motion screws comprising: an input memory unit with three inputs and five outputs, said first input serving to receive the programme carrier; a first motor controller with four inputs and one output, said first input being connected to said first output of said input memory unit; a second motor controller with four inputs and one output, said first input being connected to said second output of said memory unit; a first coincidence circuit with a first and a second inputs and one output, said first input connected to said third output of said input memory unit and said output being connected to said second input of said first motor controller and to said second input of said input memory unit; a second coincidence circuit with a first and a second inputs and an output, said first input being connected to said fourth output of said input memory unit and said output being connected to said second input of said second motor controller and to said third input of said input memory unit; a first motor the input of which is connected electrically to said output of said first motor controller; a second motor the input of which is connected electrically to said output of said second motor controller; a first position code transmitter of said first jig table input of which is coupled mechanically to the output of said motor while the output is connected electrically to said second input of said first coincidence circuit; a second position code transmitter of said second jig table the input of which is coupled mechanically to the output of said second motor while the output is connected electrically to said second input of said second coincidence circuit; a first pulse angular displacement transmitter with an input and an output for electrical signals which is coupled mechanically to said output of said first motor; a second pulse angular displacement transmitter with an input and an output for electrical signals which is coupled mechanically to said output of said second motor; said output of said first motor rotating said first position code transmitter of the first jig table and the first pulse angular displacement transmitter is coupled mechanically to said first motion screw which moves said first jig table; said output of said second motor rotating said second position code transmitter of the second jig table and the second pulse angular displacement transmitter is coupled mechanically to said second motion screw which moves said second jig table; an element of said first pulse angular displacement transmitter sensing the revolutions of said first motion screw and converting then into actions; sensors of said first pulse angular displacement transmitter which react to said actions of said element of said first angular displacement transmitter sensing the revolutions of said first motion screw, the number of said actions produced by said element of the first pulse angular displacement transmitter as per every revolution of said first motion screw being different for everyone of said sensors that react to these actions; an element of said second pulse angular displacement transmitter sensing the revolutions of said second motion screw and converting them into actions; sensors of said second pulse angular displacement transmitter reacting to said actions of said element of said second pulse angular displacement transmitter sensing the revolutions of said second motion screw, the number of said actions produced by said element of said second pulse angular displacement transmitter as per every revolution of said second motion screw being different for everyone of said sensors reacting to these actions; a counter-commutator; a first shaper-amplifier of pulses of said counter-commutator, the input of which is connected to the output of all said sensors of said first pulse angular displacement transmitter; a second shaper-amplifier of pulses of said counter-commutator the input of which is connected to the output of all said sensors of said second pulse angular displacement transmitter; a first pulse counter of said counter-commutator the number of digits in which corresponds to the number of said sensors of said first pulse angular displacement transmitter and the input of which is connected to the output of said first pulse amplifier-shaper; a second pulse counter of said counter-commutator the number of digits in which corresponds to the number of said sensors of said second pulse angular displacement transmitter and the input of which is connected to the output of said second pulse shaper-amplifier; a trigger of said counter-commutator with a first and a second inputs and an output, said first input being connected to the output of said first pulse counter and said second input being connected to the output of said second pulse counter; a relay of said counter-commutator with a first and a second outputs and an input connected to said output of said trigger, the first output of said relay being connected to the third input of said first motor controller and the second output of said relay being connected to the third input of said second motor controller; a commutation circuit of said counter-commutator the input of which is connected to the fifth output of said input memory unit and the output of which is connected to the inputs of all said sensors.

4,051,423
SERVO SYSTEM WITH FEEDBACK SIGNAL COMPENSATION

James J. Touchton, Santa Clara; John Cuda, Saratoga, and Frank J. Sordello, Los Gatos, all of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 10, 1976, Ser. No. 656,897
Int. Cl.² G05B 5/01
U.S. Cl. 318—611 **10 Claims**



1. A servo system for controlling the energization of an actuator employed to move a movable member in response to a cyclic power signal for positioning the movable member in accordance with a desired position signal, said system comprising:

position detecting means for generating a signal responsive to the present position of said movable member;

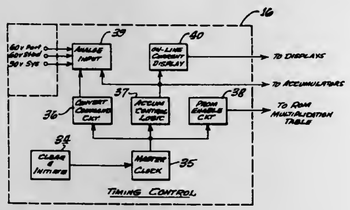
servo control means for comparing the desired and present position signals to generate a position error signal for controlling the magnitude and polarity of said cyclic power signal energizing said actuator to move said member toward the desired position; and

attenuation means for reducing the magnitude of a portion of each cycle of said error signal after a predetermined time period and to a predetermined magnitude to attenuate said cyclic signal without causing a substantial phase shift thereof.

4,051,424
DIGITAL AMP-HOUR MONITOR

James A. Privee, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 13, 1976, Ser. No. 704,906
Int. Cl.² H01M 45/06
U.S. Cl. 320—48 **6 Claims**



1. A battery monitor system comprising:

input circuit means adapted to make connection with a battery pack for producing an electrical analog of the current therefrom;

digital panel meter means connected to said input circuit means for converting the output thereof to a binary code digital signal and displaying the display analog thereof;

first signal converter means connected to said digital panel meter means for converting the binary code digital signal output to a binary signal;

read-only-memory means connected to said first signal converter means and programmed to serve as a multiplication table storing the product of a time interval and a current corresponding to the binary input signal;

accumulator circuit means connected to said read-only-memory for summing the product outputs thereof;

second signal converter means connected to said accumulator circuit means for converting the digital output signal therefrom to a binary code signal;

panel display means connected to said second signal converter means for providing a visual read out; and

timing control means connected to each of the aforerecited means for providing a timing signal therefor.

4,051,425
AC TO DC POWER SUPPLY CIRCUIT

Jerry L. Smith, Broad Brook, Conn., assignor to Telephone Utilities and Communications Industries, Inc., Chester, Conn.

Filed Feb. 3, 1975, Ser. No. 546,555
Int. Cl.² H02M 1/08
U.S. Cl. 363—86 **14 Claims**



1. A power supply circuit for converting alternating current power into a voltage regulated direct current output, said power supply circuit comprising a pair of input terminals for connection to a source of AC power and a pair of output terminals for connection to a DC load, a transformer with a primary winding and a secondary winding, a phase control switching means an an inductor connected in series with one another and with said primary winding across said input terminals, a rectifier having an input connected across said secondary winding and an output connected across said two output terminals, a filter capacitor connected across said two output terminals, and a voltage regulating means responsive to the DC output voltage appearing across said output terminals for controlling the firing angle of said phase control switching means so as to maintain said DC output voltage at a desired value, said inductor being one which does not saturate during any half cycle of the voltage waveform of said AC power source even when said output terminas are shorted, and said transformer having a core of an optimally small size capable of supporting volt-time integrals associated with normal firing angles without saturating but incapable of supporting volt-time integrals associated with abnormally small firing angles whereby said core is of substantially smaller size than the size required to support volt-time integrals associated with such abnormally small firing angles and whereby in the event of said core saturating said inductor imposes an impedance to limit current through said primary winding.

4,051,426
SHOOT THROUGH PROTECTED CURRENT DRIVEN TRANSISTOR INVERTER CIRCUIT

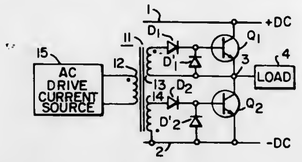
Peter Wood, Murrysville, Pa., assignor to White-Westinghouse Corporation, Cleveland, Ohio

Continuation of Ser. No. 475,234, May 31, 1974, abandoned. This application Oct. 9, 1975, Ser. No. 621,034
Int. Cl.² H02M 7/537
U.S. Cl. 363—131 **4 Claims**

1. An inverter circuit operative with a direct current power source having a pair of terminals of opposite polarities and with an alternating current load comprising:

first and second transistor switching means each having a base electrode, an emitter electrode and a collector electrode, said emitter electrode of said first transistor switching means being electrically connected to said collector electrode of said second transistor switching means and to said load, said collector electrode of said switching means being electrically connected to one of said terminals, said emitter electrode of said second switching means being electrically connected to the other of said terminals;

transformer means having at least two secondary windings each for applying alternating current to one of said base electrode one of said secondary windings being electrically connected to said base electrode of said first transistof switching means, the other of said secondary windings being electrically connected to said base electrode of said second transistor switching means,



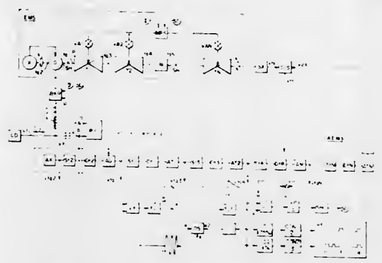
first diode means electrically connected in series relationship between one of said secondary windings and one of said base electrodes and second diode means electrically connected in series relationship between the other of said secondary windings and the other of said base electrodes, one of said first and second diode means being in a conducting condition when the other of said first and second diode means is in a non-conducting condition, said first and second diode means conducting reverse current after said first and second transistor switching means are in a non-conducting condition,

another diode means for supplying reverse current to said first and second diode means, said another diode means being in a non-conducting condition when said first and second diode means are in a non-conducting condition.

4,051,427
SUPERVISORY SYSTEM FOR DETECTING TORSIONAL OSCILLATION IN THE SHAFT OF A ROTATING ELECTRO-MECHANICAL SYSTEM

Lee A. Kilgore, Export; Edgar R. Taylor, Jr., Pittsburgh, and William H. South, McKeesport, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1974, Ser. No. 518,915
Int. Cl.² H02H 7706; G01M 7/00; G01H 1/08
U.S. Cl. 322—99 **12 Claims**



1. An analog supervisory system for simulating the torsional oscillation characteristic of an electro-mechanical power generating system, which latter system has rotatable masses therein which are interconnected by rotatable shaft, said shaft having mechanical resilience, said electro-mechanical system having mechanical damping, said mechanical resilience, said mechanical damping and said masses having the capability of causing torsional oscillation in said shaft when said shaft rotates, said generating system having an output electrical generator with terminals, comprising:

transducer detecting means interconnected with said electro-mechanical system for measuring the real component of electrical power provided at said terminals of said output electrical generator in said electro-mechanical system for thus detecting shaft torque in a local part of said shaft and thus providing an output signal having a value related to said local shaft torque;

analog simulating means adjusted to represent said masses, said shaft damping and said resilience of said electro-mechanical system, said transducer detecting means output signal being provided to said analog simulating means to cause said analog simulating means to thereby simulate a torsional oscillation in said shaft relative to any of said masses;

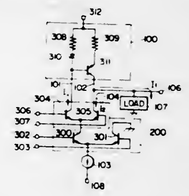
shut-down means interconnected with said analog simulating means and said electro-mechanical system to shut said electro-mechanical system down if a predetermined torsional oscillation value is achieved; and

fault detecting means for detecting an electrical fault current at said terminals of said output electrical generator, a signal having a value which is relative to said fault being provided by said fault detecting means to said shut-down means to disable the shut-down of said electro-mechanical system until the effect on said generator of said fault has been reduced.

4,051,428
CURRENT CONTROL CIRCUIT WITH CURRENT PROPORTIONAL CIRCUIT

Kunio Imai, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 12, 1976, Ser. No. 666,416
Claims priority, application Japan, Mar. 12, 1975, 50-29021
Int. Cl.² G05F 3/08; H03K 5/01, 13/22; H03D 13/00
U.S. Cl. 323—4 **7 Claims**



1. A current control circuit comprising:

first means, having first and second terminals, for controlling currents such that the current flowing into the first terminal is in a proportional relationship with the current flowing into the second terminal;

second means, connected between the first terminal of said first means and a common potential terminal, from which an output signal is delivered;

third means for supplying a constant current to each of said first and second terminals; and

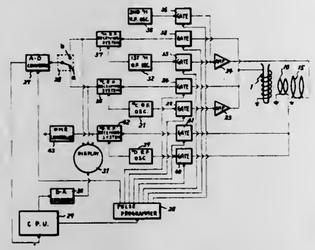
fourth means connected between said first and third means for selectively steering the constant current from said third means to one of said first and second terminals of said first means in response to a first digital input information signal applied to said fourth means.

4,051,429

NUCLEAR MAGNETIC RESONANCE APPARATUS

Mamoru Imasari; Makoto Takeuchi; Shozo Shimizu, and Hisashi Higuchi, all of Tokyo, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1976, Ser. No. 654,527
Claims priority, application Japan, Feb. 4, 1975, 50-14663; Mar. 17, 1975, 50-32051; Mar. 18, 1975, 50-32705
Int. Cl.² G01R *33/08*
U.S. Cl. 324—.5 A **15 Claims**



1. In a nuclear magnetic resonance apparatus for producing two types of spectrums the improvements comprising:

a. a trans-receiver coil arranged perpendicularly with respect to the static magnetic field H_0,

b. an internal lock trans-receiver coil interposed along a third axis perpendicular to both the static magnetic field H_0 and said trans-receiver coil axis,

c. a transmission coil arranged along the same axis as the internal lock trans-receiver coil,

d. a means for tuning said trans-receiver coil to a first nuclear resonance frequency or a second nuclear resonance frequency,

e. a transmitting means for supplying said trans-receiver coil or transmission coil with a burst first nuclear resonance RF,

f. a first receiving means for amplifying and detecting a first nuclear resonance F.I.D. signal induced in said trans-receiver coil by the burst of said first RF said first receiving means being connected to said trans-receiver coil via tuning means,

g. a transmitting means for supplying said trans-receiver coil via said tuning means with a burst of a second nuclear resonance RF,

h. a second receiving means for amplifying and detecting the second nuclear resonance F.I.D. signal induced in said trans-receiver coil, said second receiving means being connected to said trans-receiver coil via said tuning means,

i. a transmitting means for supplying said internal lock trans-receiver coil with a third nuclear resonance RF,

j. a third receiving means for amplifying and detecting a third nuclear resonance signal induced in said internal lock trans-receiver coil, said third receiving means being connected to said internal lock trans-receiving coil and to a means for stabilizing the static magnetic field,

k. an adjustable transmitting means for supplying said transmission coil with a nuclear RF pulse so as to decouple a selected nucleus,

l. a means for Fourier transforming the output signal from said first or second receiving means, and

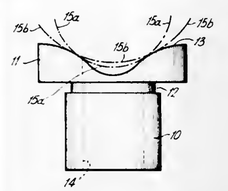
m. a means for displaying said Fourier transformed signals whereby the adjustable transmitting means may be adjusted until observation of decoupling of a selected nucleus on one Fourier transformed spectrum and then the other spectrum may be observed with the selected nucleus decoupled without change of apparatus conditions.

4,051,430

APPARATUS FOR MEASURING, AND INDICATING, THE THICKNESS OF A NON-METALLIC COATING OF AN ARCUATE METAL SURFACE

Louis Guy Millette, Pointe Claire; Peter Murphy, Longueuil, and Georges Michel Miller, Chateauguay, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed June 21, 1976, Ser. No. 698,009
Claims priority, application Canada, Apr. 30, 1976, 251592
Int. Cl.² G01R *33/12*
U.S. Cl. 324—34 TK **3 Claims**



1. Apparatus for measuring, and indicating, the thickness of a non-metallic coating on an arcuate metal surface, comprising:

at least one measuring head for positioning relative to said coating;

at least one support member on each measuring head for supporting said measuring head relative to said coating;

a sensing member on each measuring head and arranged to develop a signal representative of the distance between said sensing member and said arcuate metal surface;

a profiled surface on said support member for presentation to said coating, said profiled surface having a V shape with convex arcuate sides when viewed in a direction parallel to the axis of the arcuate metal surface, the arcuate sides initially defined by sequentially positioning a series of metal cylindrical mandrels of different diameters relative to the sensing member with the axes of the mandrels lying in a common plane normal to the sensing member, so as to develop a signal of the same magnitude from the sensing member for each mandrel, each arcuate side being a curve which is tangential to the peripheries of the mandrels at these respective positions, the penetration of said arcuate metal surface and coating into said V shape varying with the outer diameter of the coating to offset variations in the signal resulting from variations in the outer diameter of the non-metallic coating.

4,051,431

APPARATUS FOR MEASURING RATES OF URINE FLOW ELECTRICALLY

Helmut Wurster, Oberderdingen, Germany, assignor to Richard Wolf GmbH, Knittlingen, Germany

Filed Jan. 5, 1976, Ser. No. 646,445
Claims priority, application Germany, Jan. 3, 1975, 2500094
Int. Cl.² G01R *27/26*
U.S. Cl. 324—61 R **8 Claims**



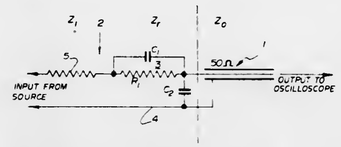
8. A method of determining the flow rate (F(t)) of urine comprising, immersing an electrical capacitor in a vessel for receiving the urine, said capacitor having a capacitance which varies with the level of urine, interposing the capacitor in an electrical differentiating circuit which emits signals corresponding to the rate of change in capacitance, varied by the level of urine, and deriving from said signals the urine flow rate equivalent.

4,051,432

ATTENUATOR FOR MEASURING HIGH VOLTAGE FAST RISE TIME PULSES

Walter J. Sarjeant, Ottawa, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Aug. 2, 1976, Ser. No. 710,786
Int. Cl.² G01R *31/02*; H01P *1/22*
U.S. Cl. 324—72.5 **7 Claims**



1. An attenuator for measuring high voltage pulses from point voltage sources comprising:

coaxial connector means having a first central conductor, for connecting the attenuator to a coaxial line;

resistance means having one end connected to the central conductor, said resistance means being enclosed within a conducting shield to form a transmission line section;

terminal means for connecting the attenuator to the point voltage source to be measured, said terminal means being connected to the resistance means by a second central conductor;

frequency dependent distributed resistance means mounted on the second central conductor, said frequency independant resistance being substantially resistive at frequencies greater than 10 MHz, to maintain frequency independent attenuation of the attenuator and to absorb reflected energy from the attenuator; and

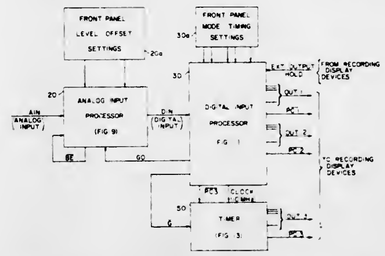
ground conductor means fixed to the conducting shield for connecting the shield to the point voltage source ground.

4,051,433

SIGNAL RESPONSIVE BURST PERIOD TIMER AND COUNTER FOR LASER DOPPLER VELOCIMETRY AND THE LIKE

Paul E. Dimotakis, Altadena, and Daniel B. Lang, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Sept. 11, 1975, Ser. No. 612,269
Int. Cl.² G01R *23/02*
U.S. Cl. 324—78 R **30 Claims**



1. A method of detecting and qualifying a first and each successive cycle of a signal as to a criterion relating to voltage amplitude for accurate timing of the period of each succeeding cycle, comprising the steps of

comparing said signal with voltages of first and second levels with respect to a reference to determine when said signal exceeds said voltages in a predetermined order of the first level followed by the second level and then a reference crossing, and always in that order, to determine the presence of a valid cycle,

detecting the time said signal crosses said reference in a direction from the second one of said two levels for each cycle, and

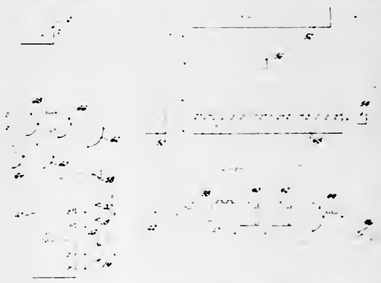
producing a pulse for each cycle qualified, said pulse having a voltage transition coincident with said reference crossing.

4,051,434

DIGITAL FREQUENCY MEASURING CIRCUITRY

Douglas W. Sweet, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 28, 1976, Ser. No. 690,848
Int. Cl.² G01R *23/02*
U.S. Cl. 324—78 D **6 Claims**

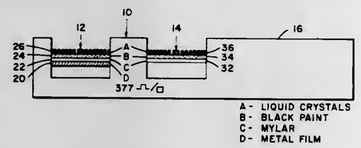


1. Digital frequency measuring circuitry for developing a binary word related to the frequency of a pulsating input signal comprising a serial-in serial-out accumulator register, said accumulator register comprising first and second serial-in serial-out shift registers, the output of said first shift register being connected with the input of said second shift register, means for complementing the output of said first register for providing a complemented output, a single bit serial adder having first and second inputs and an output, said second input being connected with the output of said second shift register, said output of said adder being connected with the input of said first shift register, clock means for establishing a fixed computation cycle the frequency of which is substantially higher than the highest frequency input signal to be measured, means responsive to said clock means for developing a serial bit stream corresponding to a predetermined binary number, gate means having inputs connected with said complemented output of said first register and with said means for generating said binary number, said clock means controlling said gate means to connect the complemented output of said first register to said first input of said adder during a portion of each computation cycle said gate means also responsive to said pulsating signal for passing said predetermined binary number to said first input of said adder during at least one of the computation cycles occurring each cycle of said input signal, a serial-in serial-out memory register, means responsive to said input signal for transferring the word in said accumulator register to said memory register each cycle of said input signal, whereby the binary word stored in said accumulator register is increased by a constant amount each cycle of said input signal and said binay word is decreased by a predetermined proportion each computation cycle.

4,051,435
MICROWAVE FIELD DETECTOR

Glenn Ellsworth Fanslow, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 18, 1976, Ser. No. 733,219
Int. Cl.² G01R *21/04, 5/22;* G02F *1/13*
U.S. Cl. 324—95 **20 Claims**

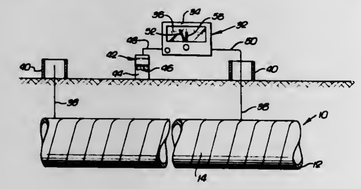


1. A detector for determining the intensity of a microwave field comprising: a layer of resistive material adapted to receive said microwave field for providing induced internal electrical currents in response thereto thereby establishing a temperature on said layer corresponding to the microwave field; a first plurality of regions of temperature sensitive film means disposed in thermal conducting relation with said layer of resistive material for facilitating heat transfer between said film means and said layer and for providing a visible color play representative of said temperature, each region exhibiting color play at a different temperature and said regions arranged in spaced relation in a predetermined pattern; a second plurality of regions of temperature sensitive film means disposed in thermal isolating relation with said layer of resistive material to inhibit heat transfer between said second plurality of film means and said layer, each region of said second plurality corresponding to an associated region of said first plurality and exhibiting a corresponding color play at the same temperature as the associated region, all of said regions of said second plurality being arranged in a pattern similar to the pattern of said first regions; whereby one region of said second plurality has a given visible display responsive only to ambient temperature, and a region of said first plurality exhibits color play responsive to the cumulative effect of ambient temperature and heating in the resistive layer due to incident microwave energy, the difference in color play of said first and second plurality of regions being a measure of the intensity of microwave energy.

4,051,436
APPARATUS FOR AND METHOD OF MEASURING POLARIZATION POTENTIAL OF A METALLIC STRUCTURE

Casper J. Weir, Jr., Rte. 3, Box 215-B, San Luis Obispo, Calif. 93401

Filed Apr. 14, 1976, Ser. No. 676,710
Int. Cl.² G01R *19/00, 1/14*
U.S. Cl. 324—102 **8 Claims**



1. An improved portable testing system for measuring the polarization potential of a metallic structure to determine if existing proper electrical current is presently being applied to said metallic structure to assure adequate cathodic protection of said metallic structure, wherein said cathodic protection is independently accomplished through at least one drain station in which the metallic structure is in contact with an electrolytic environment, a metallic lead from said metallic structure to an external normally energized power source, a metallic lead from said power source to an anode within said electrolytic environment, and a current interrupter is associated with said external normally energized electrical power source which can be activated to turn said power source off for a predetermined momentary period of time for testing said polarization potential and then on again, in which said portable testing system includes:

at least one metallic test lead projecting from said metallic structure through said electrolytic environment for external access away from said drain station;

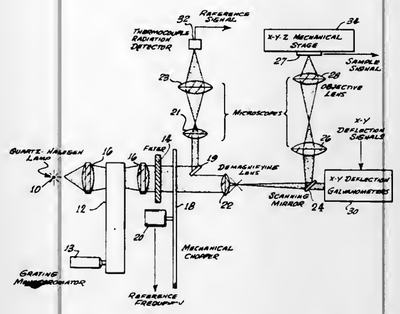
an electrode half-cell adapted to contact said electrolytic environment adjacent said metallic test lead;

an electrometer connected to said electrode half-cell and having a terminal adapted to detachably receive said metallic test lead, said electrometer having a dial incrementally marked and a needle overlying said dial and adapted for movement back and fourth across said dial when said meter is connected to said metallic test lead, an adjustable stop means associated with said needle to prevent excursion of said needle across said dial in one direction to an incremental value when said power source is on, yet maintain said needle at an optimum incremental polarization potential value to acheive more nearly true indication of an instantaneous off when said power is momentarily off to visually determine if said needle remains relatively fixed which in turn indicates existing current is adequate.

4,051,437
METHOD AND APPARATUS FOR SEMICONDUCTOR PROFILING USING AN OPTICAL PROBE

Derek L. Lile, and Neil M. Davis, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 2, 1976, Ser. No. 673,223
Int. Cl.² G01R *31/26*
U.S. Cl. 324—158 R **10 Claims**



1. A method of semiconductor profiling, the steps of

a. forming a light beam having a diameter of less than 100μm,

b. positioning a semiconductor sample of the type which generates a signal voltage in response to optical excitation in an electrolytic solution,

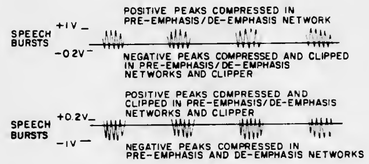
c. scanning said light beams over said sample in a raster format;

d. utilizing the signal voltages generated by said sample in response to being scanned by said light beam to determine the presence of anomalities in said sample.

4,051,438
CO-CHANNEL MULTIPLE SIGNAL BROADCASTING SYSTEM

Robert B. Pickett, Lompoc, Calif., and Elie J. Baghdady, Weston, Mass., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sept. 11, 1975, Ser. No. 612,391
Int. Cl.² H04H *1/00*
U.S. Cl. 325—45 **5 Claims**



1. A co-channel multiple signal broadcasting system to suppress co-channel interference in overlapping areas of transmission signals comprising:

at least two angularly modulated transmitters disposed in spaced relation with respect to each other such that their respective transmission signals have at least one overlapping area, each of said two transmitters transmitting identical speech bursts by angularly modulating a carrier signal having a given carrier frequency;

first means disposed in one of said two transmitters to deviate its associated carrier frequency in primarily a first given direction; and

second means disposed in the other of said two transmitters to deviate its associated carrier frequency in primarily a second given direction opposite said first given direction;

the opposite deviations of said carrier frequencies of said two transmitters providing an effective root mean square separation of said carrier frequencies of said two transmitters to suppress said co-channel interference;

said first means including

a first source of said identical speech bursts,

a first pre-emphasis network coupled to said first source,

a base clipper coupled to said first pre-emphasis network, and

a first de-emphasis network coupled to said base clipper; and

said second means including

a second source of said identical speech bursts,

a second pre-emphasis network coupled to said second source,

a peak clipper coupled to said second pre-emphasis network, and

a second de-emphasis network coupled to said peak clipper.

4,051,439
SHORT PULSE MAGNETRON TRANSMITTER

Reuben E. Nyswander, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 2, 1972, Ser. No. 304,574
Int. Cl.² H04B *1/04*
U.S. Cl. 325—121 **6 Claims**

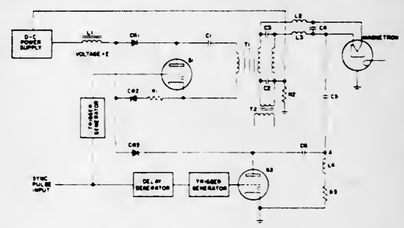
1. A short pulse magnetron transmitter, comprising:

a control signal input;

a long pulse generator coupled to said input for generating a long, low power level pulse in response to said control signal;

a short pulse generator coupled to said input for generating a short, high power level pulse in response to said control signal, including means for delaying the generation of said short, high power level pulse;

a magnetron coupled to said long pulse generator and said short pulse generator such that said magnetron is placed in oscillation by said long, low power level pulse and is

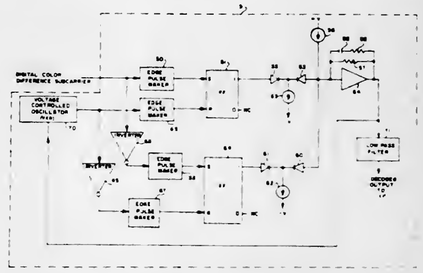


driven to high power by said short, high power level pulse.

4,051,440
PHASE LOCKED DEMODULATOR

Larry A. Nelson, Hillsboro, and Philip Stephen Crosby, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 504,415, Sept. 9, 1974, abandoned, which is a division of Ser. No. 360,519, May 15, 1973, Pat. No. 3,863,254.
This application Mar. 4, 1976, Ser. No. 663,663
Int. Cl.² H03B *3/04;* H03D *13/00, 3/00;* H03K *9/06*
U.S. Cl. 328—134 **4 Claims**



1. A circuit for providing a voltage output which depends on the phase difference between a digital input signal corresponding to a frequency modulated signal and a voltage controlled oscillator, comprising:

edge pulse making means for producing pulses corresponding to the positive transitions of said input signal;

inverting means for inverting said input signal;

second edge pulse making means for producing pulses corresponding to the negative transitions of said input signal;

digital means defining a set-reset flip-flop having its set input connected fto the output of said first edge pulse making means to produce an output thereoutof which directly corresponds to positive excursions of said digital input signal;

second digital means defining a set-reset flip-flop having its set input connected to the output of said second edge pulse making means to produce an output thereoutof which directly corresponds to negative excursions of said digital input signal;

switch means defining diodes in pairs and having separate current sources connected to the outputs of said first and second digital means to route a comparison current in accordance with the output of said first and second digital means;

amplifier means defining an operational amplifier connected

to the output of said switch means for amplifying said comparison of said switch means;

voltage controlled oscillator means connected to the output of said amplifier means to provide an output thereoutof having two stable states, said states being 180° out of phase with said digital input signal in accordance with said amplified comparison signal;

third edge pulse making means connected to the output of said voltage controlled oscillator and the reset input of said first set-reset flip-flop means for producing pulses thereoutof which correspond to the positive excursions of said voltages controlled oscillator output square wave to change the state of said first flip-flop output;

second inverter means connected to the output of said voltage controlled oscillator to provide thereoutof an output signal 180° of phase with said voltage controlled oscillator output; and

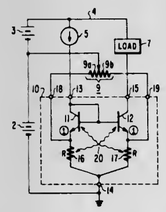
fourth edge pulse making means connected between the output of said second inverter means and the reset input of said second set-reset flip-flop means for producing pulses thereoutof which correspond to the negative excursions of said voltage controlled oscillator output square wave to change the state of said second flip-flop output.

4,051,441

TRANSISTOR AMPLIFIERS

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,578
Int. Cl.² H03F *3/04*; H03G *3/10*
U.S. Cl. 330—288 **6 Claims**



6. A transistor amplifier for operation in a range of temperature around an absolute temperature T_0, said amplifier comprising:

first and second transistors, each having base and emitter electrodes with a base-emitter junction therebetween and having a collector electrode;

means for maintaining said base electrodes at substantially the same quiescent potential;

a common terminal;

a first resistance connecting the emitter electrode of said first transistor to said common terminal and having a positive temperature coefficient $1/T_0$;

a second resistance connecting the emitter electrode of said second transistor to said common terminal and having a positive temperature coefficient $1/T_0$;

means providing mutual thermal coupling amongst said first transistor, said second transistor, said first resistance and said second resistance for maintaining them at substantially the same operating temperature; and

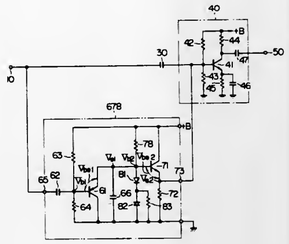
means other than said transistors for applying temperature independent currents to said two resistance means, in a desired ratio, for controlling the gain of said amplifier.

4,051,442

GAIN CONTROL CIRCUITS FOR AUDIO AMPLIFIERS

Seishi Yamazaki, Mito, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 8, 1976, Ser. No. 675,239
Claims priority, application Japan, Apr. 11, 1975, 50-48205[U]
Int. Cl.² H03G *3/30*
U.S. Cl. 330—281 **18 Claims**



1. A gain control circuit for an audio signal amplifier operatively amplifying audio signals supplied to an audio signal input terminal thereof and providing amplified audio signals at an audio signal output terminal thereof and further having a bias circuit for supplying bias voltage to said amplifier to control amplifying gain thereof,

said gain control circuit comprising:

a. a detection circuit supplied at an input terminal thereof with the audio signals for decreasing and increasing output impedance thereof in accordance with the increasing and decreasing of said audio signals, respectively;

b. a first capacitor connected across said detection circuit so as to form a first discharging circuit therewith while said detection circuit is conductive;

c. a power source and a first resistor connected in series with said first capacitor to form a first charging circuit therewith, so that said first capacitor is charged up by said power source through said first resistor while said detection circuit is not conductive;

d. a second capacitor and a second resistor connected in parallel to form a second discharging circuit, the time constant of said second discharging circuit being larger than that of said first discharging circuit;

e. a switching circuit connected in series with said second discharging circuit, said series connected switching circuit and said second discharging circuit being coupled across said detecting circuit, and being also connected in series to said power source through said first resistor to form a second charging circuit therewith, so that said second capacitor is charged up by said power source while said switching circuit is conductive; and

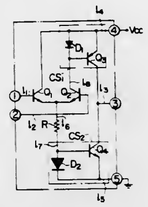
f. a control circuit having input terminal supplied with output potential of said detection circuit and output terminal connected to said bias circuit, said control circuit providing at the output terminal thereof a control voltage the potential of which varies in dependence upon the potential supplied to the input terminal thereof thereby to correspondingly control the bias voltage of said bias circuit for controlling the gain of said amplifier.

4,051,443

DIFFERENTIAL AMPLIFIER

Kunio Seki; Yukio Suzuki, both of Tokyo, and Yoshio Sakamoto, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 28, 1976, Ser. No. 691,100
Claims priority, application Japan, Oct. 6, 1975, 50-119765
Int. Cl.² H03F *3/45*
U.S. Cl. 330—258 **9 Claims**



1. A differential amplifier comprising a pair of differential amplifying elements each having an input electrode, a ground electrode and an output electrode, a first power supply terminal, a second power supply terminal, a common impedance means, a first current source means including a first diode means and a first transistor of a first conductivity type, a second current source means including a second diode means and a second transistor means of a second conductivity type, and an output terminal, the ground electrodes of said two differential amplifying elements being connected in common to one end of said common impedance means, said second diode means being connected between the other end of said common impedance means and said second power supply terminal, said second transistor having a base and an emitter connected to the other end of said common impedance means and the second power supply terminal, respectively, said first diode means being connected between said first power supply terminal and the output electrode of one of said two differential amplifying elements, said first transistor having a base and an emitter connected to the output electrode of said one of the two differential amplifying elements and said first power supply terminal, respectively, said output terminal being connected to the collectors of said first and second transistors and deriving a differential output signal current of the two signals applied to the respective input electrodes of said two differential amplifying elements, the operationally effective pn-junction area of said first diode means being selected substantially equal to that of said first transistor, and the operationally effective pn-junction area of said second diode means being selected substantially equal to twice of that of said second transistor.

4,051,444

AMPLIFIER STRUCTURE FOR LOW-LEVEL VOLTAGE MEASUREMENTS

Heinz Walter Gruner, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

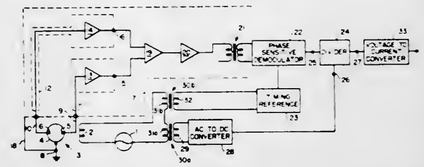
Continuation of Ser. No. 541,456, Jan. 16, 1975, abandoned, which is a division of Ser. No. 254,000, May 17, 1972, Pat. No. 3,902,366. This application June 7, 1976, Ser. No. 693,258
Int. Cl.² H03F *1/00*
U.S. Cl. 330—68 **6 Claims**

1. An amplifier module having amplifier structure, shielding structure, and housing structure;

said amplifier structure including an input lead, an output lead, and a circuit board for carrying an amplifier whose input terminal and output terminal are connected to said leads for amplifying an input voltage from a source of low-level voltage applied to said input lead and producing a corresponding output voltage on said output lead, said circuit board including said terminals of said amplifier;

said shielding structure comprising an electrically conductive shell enveloping said input lead and said circuit board;

said housing structure including a body of electrically-insulating potting material enveloping said circuit board, said body substantially filling said shell, and said body having said input lead and said output lead both extending therefrom;



said shell having an electrically-conductive input lead shield DC-connected to said shell; said input lead shield extending from within said shell to said source, said input lead shield extending into said body to said input terminal, and said input lead shield enveloping said input lead, but being electrically insulated therefrom;

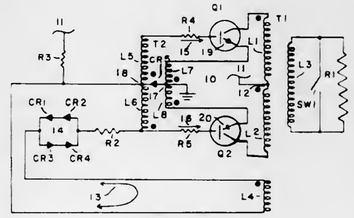
said shell being DC-connected to said output lead for maintaining said input lead shield and said shell at the potential of said output voltage.

4,051,445

INVERTER CONVERTER CIRCUIT FOR MAINTAINING OSCILLATIONS THROUGHOUT EXTREME LOAD VARIATIONS

Robert J. Boschert, San Jose, Calif., assignor to Boschert Assoc., Sunnyvale, Calif.

Filed Nov. 22, 1976, Ser. No. 743,859
Int. Cl.² H02M *3/28*; H03K *3/16*
U.S. Cl. 331—113 A **5 Claims**



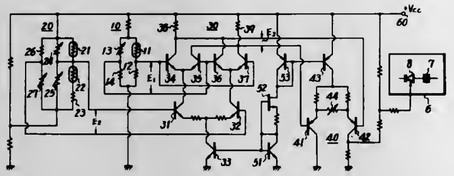
1. A two transistor magnetically coupled multivibrator for use with power supplies capable of maintaining oscillations under extreme load conditions comprising:

a conventional multivibrator with a collector driven output transformer having load windings and transistor base drive feedback windings,

a base drive transformer in addition to the said output transformer having primary windings powered by emitter currents of the two transistors, and having secondary windings connected to drive the base/emitter circuits of the two transistors and powered by feedback from both the output transformer feedback windings and the said base drive transformer primary windings,

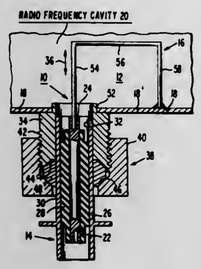
and an electronic means of disconnecting the said output transformer feedback windings from the said base drive transformer upon the occurrence of a load short circuit so that the electrically "dead" output transformer is thereafter prevented from drawing power from the said base drive transformer and oscillations will continue solely due to feedback within the said base drive transformer.

4,051,446
TEMPERATURE COMPENSATING CIRCUIT FOR USE WITH A CRYSTAL OSCILLATOR
Masanao Owaki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 16, 1976, Ser. No. 678,031
Claims priority, application Japan, Apr. 23, 1975, 50-49241
Int. Cl.² H03B 5/04, 5/36
U.S. Cl. 331—116 R 8 Claims



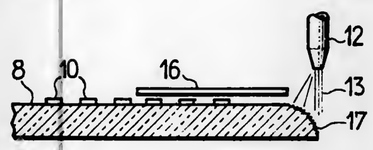
1. A temperature compensating circuit for use with a crystal oscillator, comprising:
a. an oscillation circuit;
b. a first bridge circuit for generating a first DC voltage having a linear functional temperature characteristic and including at least one temperature responsive variable resistance element;
c. a second bridge circuit for generating a second DC voltage having a quadratic functional temperature characteristic and including at least two temperature responsive variable resistance elements;
d. means for multiplying said first DC voltage by said second DC voltage so as to generate a third DC voltage having a cubic functional temperature characteristic; and
e. means for applying said third DC voltage to said oscillation circuit.

4,051,447
RADIO FREQUENCY COUPLER
LeRoy Francis Heckman, Jr., New Holland, Pa., assignor to RCA Corporation, New York, N.Y.
Filed July 23, 1976, Ser. No. 708,095
Int. Cl.² H01P 5/04, 5/08, 1/16
U.S. Cl. 333—24 R 11 Claims



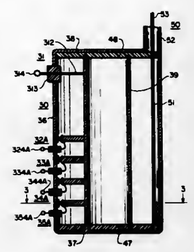
1. In combination,
first transmission means including a first conductor,
second transmission means including a second conductor having an end extending therefrom,
means for securing said extended end to said first conductor with said second conductor formed into an inductive coupling loop having an inductive coupling value defined by a settable transverse area value and a settable depth value for coupling a radio frequency signal between said first and second means, said loop having a given orientation with respect to said first means, and
means for flexing said extended end to alter said loop coupling vaue while maintaining said given orientation to thereby provide optimum coupling between said first and second transmission means.

4,051,448
SURFACE ACOUSTIC WAVE TRANSMISSION DEVICE AND METHOD OF MANUFACTURING SAME
Gerard Coussot, Paris, France, assignor to Thomson-CSF, Paris, France
Filed Feb. 14, 1975, Ser. No. 550,036
Claims priority, application France, Feb. 15, 1974, 74.05202
Int. Cl.² H03H 9/26, 9/30, 9/04; H01L 41/22
U.S. Cl. 333—30 R 10 Claims



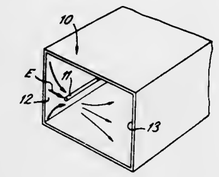
1. Surface acoustic wave transmission device comprising: a substrate having at least one smooth face for propagating said waves, the edge of said substrate located on the trajectory of said waves, being a ground scattering edge resulting from cutting said edge in a wafer using a jet of abrasive particles directed on to said smooth face; the mean profile of said ground scattering edge having a radiused form merging in said smooth face.

4,051,449
TIME FREQUENCY DIVERSITY SYSTEM
George C. Fincke, West Allenhurst, and George W. Taylor, Brielle, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Oct. 12, 1976, Ser. No. 731,159
Int. Cl.² H01P 1/20, 7/04, 3/08
U.S. Cl. 333—73 C 10 Claims



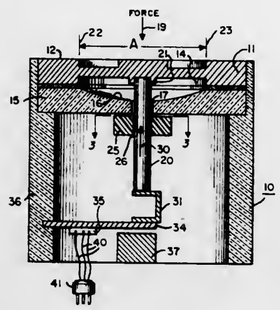
1. A time-frequency diversity system comprising a plurality of sources of input signals of differing frequencies; a broad band amplifier; means for coupling said plurality of sources of input signals to the input of said broad band amplifier; a fast-tuned filter; means for coupling the output of said broad band amplifier to the input of said fast-tuned filter; an output load; means for coupling the output of said fast-tuned filter to said output load; said fast-tuned filter comprising a coaxial filter; means for tuning said coaxial filter comprising a plurality of inductive spokes positioned at various intervals between the inner and the outer coaxial conductors of said coaxial filter; and means for connecting and disconnecting said inductive spokes between said inner and outer conductors of said coaxial filter.

4,051,450
WAVEGUIDES
Harold Everard Monteagle Barlow, Epsom, England, assignor to National Research Development Corporation, London, England
Filed Apr. 1, 1976, Ser. No. 672,600
Claims priority, application United Kingdom, Apr. 3, 1975, 13691/75
Int. Cl.² H01P 1/16, 3/12, 3/20
U.S. Cl. 333—95 R 26 Claims



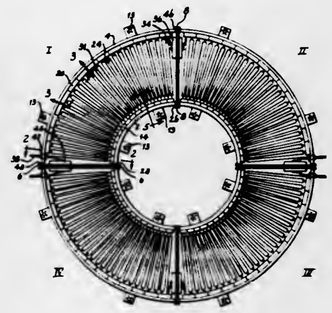
1. Apparatus for supporting electromagnetic waves including a hollow dielectric filled member having generally planar inner conducting walls defining an elongated space of substantially constant cross-section, and at least one elongated conductor passing along the length of the space between and parallel to first and second facing walls, the conductor being positioned relatively near the first wall and relatively far from the second wall, and the apparatus being such that electromagnetic waves are able to propagate principally in the region between the conductor and the first wall.

4,051,451
BEAM TYPE TRANSDUCERS EMPLOYING DUAL DIRECTION FORCE LIMITING MEANS
Anthony D. Kurtz, Englewood; Joseph R. Mallon, Alpine, and Amnon Brosh, Demarest, all of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.
Filed Sept. 22, 1976, Ser. No. 725,418
Int. Cl.² H01L 10/10
U.S. Cl. 338—42 15 Claims



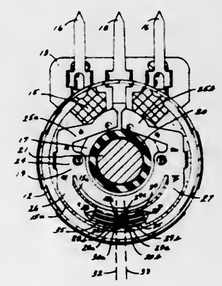
1. In a beam type transducer of the type employing a deflectable beam having at least one force responsive element positioned on a surface thereof, a rod having one end coupled to said beam and said other end coupled to a semiconductor diaphragm member, said diaphragm having a central depression with a glass sheet covering said depression and having a central aperture through which said rod as coupled to said diaphragm is directed, said rod capable of transmitting a force applied to said diaphragm to said beam in a positive direction, the improvement therewith of apparatus for stopping said rod for forces applied in a direction opposite to said positive forces, comprising means coupled to said rod and located beneath said aperture to coact with said glass sheet and hence, limit the motion of said rod for said opposite direction forces.

4,051,452
ANNULAR RESISTOR
William R. Luy, Colgate, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.
Continuation of Ser. No. 605,673, Aug. 18, 1975, abandoned.
This application Jan. 21, 1977, Ser. No. 761,217
Int. Cl.² H01C 1/08
U.S. Cl. 338—51 21 Claims



1. A resistor comprising in combination:
a supporting frame having inner and outer annular portions and portions holding them in spaced apart concentric relationship;
insulating means attached to the opposing faces of said inner and outer annular portions;
a reflexed resistance ribbon means having inner and outer U-shaped bends in proximity to said insulating means and segments connecting and arranged in a radial relation between said inner and outer bends;
support means providing individual support for each of said bends with respect to said insulating means to keep said ribbon means within the annulus defined by opposing faces of said insulating means; and
terminal means connected to said ribbon means for connecting the latter to a source of electrical current.

4,051,453
VARIABLE RESISTANCE CONTROL WITH LOW NOISE CONTACTOR
Wayne A. Barden, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.
Filed Feb. 9, 1976, Ser. No. 656,184
Int. Cl.² H01C 10/32
U.S. Cl. 338—171 9 Claims



1. A variable resistance control comprising a base having a first surface, an arcuate resistance element carried by the first

surface and provided with at least one terminal for connection to an external circuit, a collector in spaced relationship to the resistance element and provided with a terminal for connection to an external circuit, a contactor wipably engaging the resistance element and the collector and providing an electrical connection therebetween, and means for rotating the contactor, the contactor comprising a body portion, a pair of arms extending outwardly from sides of the body portion and converging toward each other, a plurality of fingers integral with each of the arms, the fingers of one of the arms being in opposing relationship to the fingers of the other of the arms, a contact projecting from each of the fingers and wipably engaging the resistance element along a path intermediate the ends thereof, the contacts projecting from the fingers of one of the arms lying in a first plane generally transverse to the length of the resistance element, the contacts projecting from the fingers of the other of the arms lying in a second plane generally transverse to the length of the resistance element, the contacts projecting from the fingers of one of the arms being closer to one of the ends of the resistance than the contacts projecting from the fingers of the other of the arms, the first plane being spaced from the second plane a distance less than ten percent of the distance intermediate the ends of the resistance element.

4,051,454

ADHESIVE COMPOSITIONS AND FLEXIBLE HEATING DEVICE FABRICATED THEREWITH

Manfred Leiser; Karl-Heinrich Wegehaupt, and Wilhelm Marsch, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Continuation of Ser. No. 443,533, Feb. 19, 1974, abandoned. This application Feb. 3, 1975, Ser. No. 546,246
Claims priority, application Germany, Feb. 16, 1973, 2307776
Int. Cl.² H01C 1/14; C09J 5/00
U.S. Cl. 338—328 **7 Claims**

1. A flexible electrically conducting heating device comprising a heat resistor and a pair of electrodes in contact with and adhered to the surface of the resistor by a cured electrically conductive composition, said conductive composition is obtained from a mixture which consists essentially of (a) a vinyl containing organopolysiloxane having the formula

$$R_2(CH_2=CH)SiO\ (R'_2SiO)_n\ Si\ R_2(CH=CH_2)$$

wherein R is selected from the group consisting of methyl and phenyl radicals, R' is selected from the group consisting of methyl, vinyl and phenyl radicals, *n* is a number sufficient to provide an organopolysiloxane having a viscosity of at least 100,000 cP at 25° C, in which 0.1 to 1 mol percent of the diorganopolysiloxane units are vinylmethylsiloxanes and at least 90 percent of the remaining organic radicals consist of methyl radicals, and some or all of the terminal $CH=CH_2$ groups may be R groups, (b) an organopolysiloxane containing at least three Si-bonded hydrogen atoms in which the Si-bonded hydrogen atoms are present in an amount of from 0.01 to 1.7 weight percent, (c) a catalyst which promotes the addition of Si-bonded hydrogen atoms to the vinyl groups, and (d) an electrically conductive material.

3. A method for preparing the flexible heating device of claim 1 which comprises applying an adhesive composition to a pair of electrodes which are in contact with a heat resistor and thereafter curing the adhesive composition at an elevated temperature, said adhesive composition consisting essentially of (a) a vinyl containing organopolysiloxane having the formula

$$R_2(CH_2=CH)\ SiO\ (R'_2SiO)_n\ SiR_2(CH=CH_2)$$

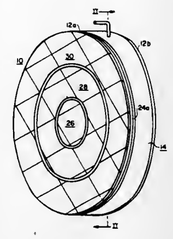
wherein R is selected from the group consisting of methyl and phenyl radicals, R' is selected from the group consisting of methyl, vinyl and phenyl radicals, *n* is a number sufficient to provide an organopolysiloxane having a viscosity of at least 100,000 cP at 25° C, in which 0.1 to 1 mol percent of the diorganopolysiloxane units are vinylmethylsiloxanes and at least 90 percent of the remaining organic radicals consist of methyl radicals, and some or all of the terminal $CH_2=CH$ groups may be R groups, (b) an organopolysiloxane containing at least three Si-bonded hydrogen atoms in which the Si-bonded hydrogen atoms are present in an amount of from 0.01 to 1.7 weight percent, (c) a catalyst which promotes the addition of Si-bonded hydrogen atoms to the vinyl groups, and (d) an electrically conductive material.

4,051,455

DOUBLE FLEXURE DISC ELECTRO-ACOUSTIC TRANSDUCER

Ralph A. Fowler, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 20, 1975, Ser. No. 634,003
Int. Cl.² 340/10; h04b 13/00
U.S. Cl. 340—9 **9 Claims**



1. Underwater electro-acoustical transducer apparatus, comprising:
- first and second electro-mechanical flexure discs including a radially continuous disc member and a series of concentric electro-mechanical strain translating means affixed to said radially continuous disc member at various radial distances from its center;
- annular spacer means for supporting said first and second electro-mechanical flexure discs in parallel spaced relationshp; and
- means for selectively energizing the concentric electro-mechanical strain translating means with predetermined alternating current signal frequency spectral components, wherein the upper frequency limit of the frequency spectral components varies in inverse relation to the radical distance of the electro-mechanical strain translating means from the center of the radially continuous disc member.

4,051,456

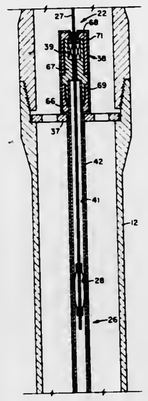
APPARATUS FOR ESTABLISHING AND MAINTAINING ELECTRIC CONTINUITY IN DRILL PIPE

Joe K. Heilhecker; Everett H. Lock, and Fred H. Deily, all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Dec. 8, 1975, Ser. No. 638,715
Int. Cl.² G01V 1/40
U.S. Cl. 340—18 LD **11 Claims**

1. Apparatus for maintaining electric continuity between a subsurface terminal and a surface terminal within a pipe string which comprises:
- an externally insulated conductor tube adapted to be mounted in said pipe string and extending upwardly from said subsurface terminal through a portion, at least, of said pipe string; and
- an insulated conductor wire having its lower end disposed within said tube and being in electrical contact with the interior of said tube, said conductor wire extending upwardly from said tube to said surface location, and being telescopically movable with respect to said tube, electric continuity being maintained during telescopic movement.

5. A wellbore telemetry apparatus for a pipe string which includes a subsurface instrument mounted in said drill string and adapted to detect a subsurface condition and generate an electric signal indicative of that condition; and a device for receiving said electric signal, and an electric conductor interconnecting the instrument and the device; the improvement wherein said electric conductor comprises an externally insulated conductor tube extending upwardly from said subsurface instrument through a portion, at least, of said pipe string; an insulated conductor wire mounted in said tube and extending through the upper end of said tube upwardly to the surface said wire being separable at the surface to permit the addition of a pipe section to the pipe string; contact means mounted on the lower end of said wire and providing a movable contact between said wire and the interior of said tube; and means for moving said wire relative to said tube.



10. An electric drilling system which includes a subsurface motor mounted within a drill string and a surface power source, an improved conductor system for maintaining electric continuity as individual pipe sections are added to the drill string, said conductor system comprising:
- an externally insulated conductor tube mounted within said drill string and extending through a portion thereof, said tube having a length greater than the length of an individual pipe section;
- means for electrically connecting said tube to said motor;
- an insulated conductor wire having a lower end disposed within said tube and extending upwardly to the surface;
- contact means mounted on said lower end for providing a movable contact on the interior of said tube; and
- means for elevating said conductor wire relative to said tube, said movable contact maintaining electric continuity during such movement, thereby permitting additional pipe sections to be added to said drill string.

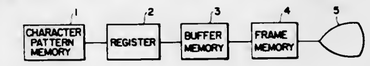
4,051,457

SYSTEM FOR GENERATING A CHARACTER PATTERN

Fumiyaki Inose, San Jose, Calif.; Kenji Fujikata, Hachioji, and Norio Yokozawa, Fuchi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 3, 1976, Ser. No. 655,139
Claims priority, application Japan, Feb. 3, 1975, 50-13430
Int. Cl.² G11C 15/00
U.S. Cl. 340—146.3 MA **9 Claims**

1. A character pattern generating system comprising
- a character pattern memory which is made up of a circulating sequential access memory and which stores therein patterns of plural types of characters and information for discriminating character codes corresponding to the character patterns,
- register means for temporarily storing a code and a pattern for each of the respective characters sequentially obtained from said character pattern memory,
- buffer memory means having stored therein the codes of a plurality of characters to be displayed for receiving and storing the character patterns corresponding to said character codes in the order of the display,
- coincidence means for comparing a character code stored in said register means with each of the respective character codes stored in said buffer memory means each time the character code from said character pattern memory is



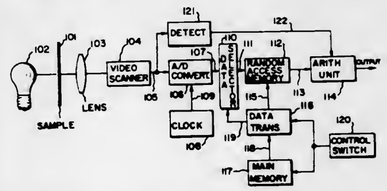
stored in said register means and for generating a coincidence output upon detecting coincidence therebetween,
- storage control means for causing the character pattern of said register means to be stored in said buffer memory means in response to a coincidence output of said coincidence means, and
- display means for displaying the character patterns of said buffer memory means when the character patterns corresponding to all of said character codes in said buffer memory means have been stored in said buffer memory means.

4,051,458

VIDEO AMPLITUDE RELATED MEASUREMENTS IN IMAGE ANALYSIS

Roger R. Morton, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 24, 1976, Ser. No. 689,217
Int. Cl.² G06K 9/00
U.S. Cl. 340—146.3 AG **21 Claims**

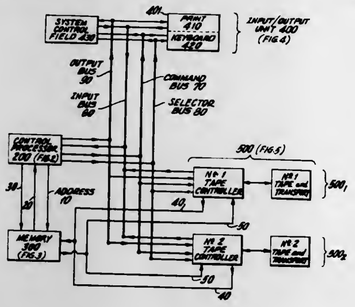


1. An image analysis and, optical and detection system for analyzing a field of view to produce optical characteristic data, comprising:
- scanning means for line scanning such field of view to produce a video signal having analog values representative of optical characteristic data;
- conversion means for converting the video signal analog values corresponding to discrete points along the scan line to discrete digital data having values which are a function of video signal analog values corresponding to such points; and
- memory means for storing image analysis optical characteristic data corresponding to digital data including means for automatically compensating for the response characteristics of the optical and detection system and for generating in response to the discrete digital data an output as a function of the stored optical characteristic data corresponding to the received discrete digital data to produce optical characteristic data.

4,051,459
STORED PROGRAM CONTROLLED TYPEWRITING/EDITING SYSTEM

James Joseph Steranko, Weston; Gerardo Rogoff, Chelmsford; Randall Dean Scott, Andover; Angela Frances Gallagher, Framingham, and Peter Burger, West Newton, all of Mass., assignors to Editext Word Processing, Inc., Burlington, Mass.

Filed Jan. 30, 1974, Ser. No. 437,783
Int. Cl.² G06F 7/00
U.S. Cl. 364—900 34 Claims



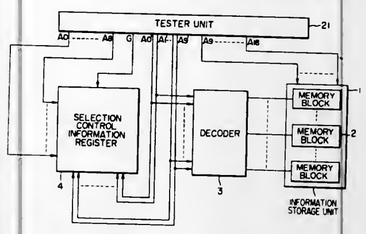
1. In combination in an automated editing system, text supplying means for serially supplying alpha-numeric characters and encoded control characters, first data storage means, a central processor for receiving and assembling said characters serially supplied by said text supplying means, storage means for storing said assembled characters in said first storage means, the improvement comprising means for supplying to said central processor in batched form editing commands for editing the text represented by the characters stored in said storage means, second storage means for storing signals representative of said editing commands, third storage means, and means connected to said storage means and said second and third storage means for operating upon said stored characters and said stored editing commands for generating a revised ensemble of alpha-numeric and control characters and for storing said revised character ensemble in said third storage means.

4,051,460
APPARATUS FOR ACCESSING AN INFORMATION STORAGE DEVICE HAVING DEFECTIVE MEMORY CELLS

Shinichiro Yamada; Akira Ishida, both of Tokyo, and Hisakazu Mukai, Musashino, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Jan. 23, 1976, Ser. No. 651,740
Claims priority, application Japan, Feb. 1, 1975, 50-13660
Int. Cl.² G06F 11/00
U.S. Cl. 364—900 2 Claims

1. An information storage device capable of being accessed by a memory utilization means, comprising:
an information storage unit having a given number of memory blocks, each block comprising a plurality of memory cells, one or more of said blocks containing at least one defective cell, each block having a unique address within said memory defined by a digital block address word, each cell being capable of storing a first digital word having an information portion and an address portion identifying the location of said cell within the corresponding block;
a selection control information register having a number of memory cells equal to a desired number of said blocks to be utilized, said desired number being substantially less than said given number,
first means for addressing with a second digital address word a selected memory cell of said register to generate a digital block address word in accordance with information in said selected cell;
second means responsive to the value of said digital block address word to address a corresponding selected block of said storage unit;
third means for testing each cell of said selected block and for generating a test signal having a first value indicative of the absence of defective cells therein, and a second value indicative of the presence of defective cells therein;
fourth means responsive to the first value of said test signal for storing said digital block address word in said selection control information register, for identifying the location of said selected block in said storage unit;
fifth means responsive to said second value of said test signal and coupled to said first means, for changing the value of the digital block address word generated by said first means to test another block of said storage unit corresponding to said changed value of said digital block address word and for actuating said third means; and



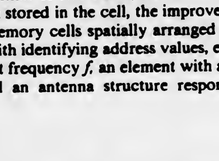
sixth means responsive to said first value of said test signal and coupled to said first means, for changing the value of said second digital address word to address another selected memory cell of said register for generating a further digital block address word and for actuating said third means to test the corresponding newly selected block of said storage unit,
whereby the cells of selected blocks of said storage unit are sequentially tested, and said third means for testing further including means for entering a digital block address word identifying a corresponding operative block in each memory cell of said register to establish a one-to-one correspondence between each value of said second digital address word the address of said corresponding operative block; and
wherein said memory utilization means comprises means for selectively accessing said information storage unit by providing a desired value of said second digital address word to said register to cause the corresponding digital block address word to address a corresponding operative block of said storage unit.

4,051,461
MANAGEMENT TABLE APPARATUS IN MEMORY HIERARCHY SYSTEM

Masahiro Hashimoto, Sagamihara, and Kenichi Furumaya, Hadano, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 27, 1976, Ser. No. 680,851
Claims priority, application Japan, Apr. 30, 1975, 50-51374
Int. Cl.² G06F 11/06, 11/10, 13/00
U.S. Cl. 364—900 3 Claims

1. A management table apparatus in a memory hierarchy system having a main memory for storing data and a buffer memory consisting of plural memory regions which hold a part of the data stored in said main memory as a copy of said data, said part of data being divided into certain memory units, said management table apparatus comprising:
a managemen tablehaving memory locations corresponding to said memory regions of said buffer memory, said memory locations holding the addresses of the data in said corresponding memory regions and flags for indicating whether or not the replacement of said data stored in said corresponding memory regions is prohibited;
a searching means for searching said table to check whether or not the data having an address which is demanded by a data processor is stored in said buffer memory by comprising said address demanded by the data processor with addresses stored in respective memory locations of said management table;
a replace control means responsive to the indication of the absence of the demanded data by said searching means for selecting any memory location other than those in which said flags indicate the prohibition of replacement to transfer from said main memory and store in said buffer memory said data having address demanded by the data processor;

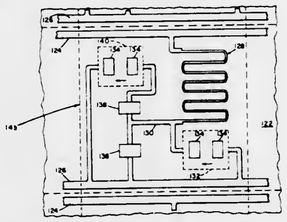


a means for demanding the transfer of said demanded data from said main memory directly to said data processor in case where said searching means indicates the absence of said demanded data and where no memory location is selected by said replace control means; and
means for setting said flags upon the detection of a fault in the main memory; a means for stopping the detection of faults in said main memory while the flags corresponding to the data whose existence in said buffer memory is indicated by said searching means, are showing the prohibition of replacement; and
a means for detecting the faults whose number is greater than that of said memory locations of said management table have occurred in said main memory.

4,051,462
COMPUTER MEMORY

Ali Javan, Cambridge, and Charles F. Davis, Jr., Concord, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed July 16, 1975, Ser. No. 596,207
Int. Cl.² G11C 11/02
U.S. Cl. 340—173 LT 20 Claims



1. In a memory system having an assembly of memory cells with identifying address values, each cell capable of assuming alternatively either of two states, the states defining the value of information stored in the cell, the improvement comprising an array of memory cells spatially arranged on a substrate in accordance with identifying address values, each cell comprising resonant at frequency f, an element with a non-linear characteristic, and an antenna structure responsive to incident radiation of frequency $2f$, said non-linear element, antenna structure, and resonant circuitry being connected to form a sub-harmonic oscillator driven by radiation incident on said antenna structure, said oscillator oscillating at frequency f alternatively in two stable states of two distinct phase relations with respect to said radiation of frequency $2f$, said circuitry being arranged and connected so that when said antenna structure is stimulated by optical radiation of frequency f having a first of two distinct phase relationships said circuitry is coerced into a first of said stable states and when said antenna structure is stimulated by optical radiation of frequency f having a second of two distinct phase relationships said circuitry is coerced into a second of said stable states.

4,051,463
METHOD AND APPARATUS FOR INVERTING THE POLARITY OF AN INPUT IMAGE FORMED ON A SURFACE OF AN IMAGE RECORDING DEVICE

Jan S. Snyder, Upland, Calif., and Clark I. Bright, Kula Kai, Hawaii, assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 21, 1976, Ser. No. 650,826
Int. Cl.² G03G 16/00
U.S. Cl. 340—173 TP 25 Claims



1. A method for forming a negative image on a surface of an image recording device, said image comprising information in the form of deformations on said surface, comprising the steps of:
a. providing an image recording device comprising a first conductive layer, a layer of photoconductive material adjacent said conductive layer, an electric field deformable elastomer layer adjacent said layer of photoconductive material, and a deformable conductive layer adjacent said elastomer layer,
b. subjecting said image recording device to an electric field,
c. generating radiation to which the photoconductive layer is responsive,
d. illuminating said photoconductive layer with said radiation whereby substantially uniform deformations are created on said elastomer layer,
e. removing the electric field applied to said image recording device,
f. creating a short-circuited condition between said first conductive layer and said deformable conductive layer,
g. modulating said radiation in accordance with information to be formed on said elastomer layer as deformations, and
h. directing said information modulated radiation to selected areas of said image recording device to create deformations on said elastomer layer which correspond to said selected areas are erased.

4,051,464
SEMICONDUCTOR MEMORY CELL

Jack S. T. Huang, New Hope, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 8, 1975, Ser. No. 611,295
Int. Cl.² G11C 11/40
U.S. Cl. 340—173 R 8 Claims

1. A memory cell circuit provided in a semiconductor device having a semiconductor substrate of a first conductivity type except for selected regions thereof including first and second

selected regions, said selected regions having a second conductivity type such that a semiconductor junction is formed between first conductivity portions of said substrate and each of said selected regions including a first semiconductor associated with said first selected region and a second semiconductor junction associated with said second selected region, said semiconductor substrate having first and second major surfaces, said memory cell circuit comprising:

a memory cell including at least a field effect memory transistor comprising:

said first selected region which intersects said first major surface,

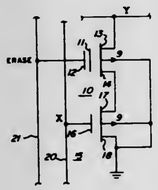
said second selected region which intersects said first major surfaces and which is spaced apart from said first selected region in said first major surface, and

insulating means disposed on said first major surface with said insulating means having provided therewith a first gate conductive means, said first gate conductive means being located at least in part by that region of said first major surface which is between said first and second selected regions but with said first gate conductive means separated from said first major surface by said insulating means; and

associated memory cell means associated with said memory cell including:

a voltage setting means which, in response to a writing signal, selectively impresses between said first selected region and first conductivity portions of said semiconductor substrate a cell writing voltage of a value to reverse bias said first semiconductor junction, but where also said cell writing voltage is of a value insufficient to cause significant accumulation of charge on said first gate conductive means if solely impressas aforesaid while, concurrently, any significant current is prevented from flowing through said second selected region; and

a voltage setting active device formed at least in part in said substrate which, in response to a select signal being provided thereto to indicate in conjunction with said writing signal that said memory cell has been selected, selectively places said second selected region at a voltage value to effectively forward bias said second semiconductor junction sufficiently to allow charge to accumulate in said first gate conductive means to an extent permitting said field effect memory transistor to be in an "on" condition when said cell writing voltage is concurrently impressed as aforesaid, said voltage setting active device being capable of selectively placing said second selected region at a voltage value as a foresaid when said select signal has a magnitude substantially smaller than that of said writing signal, and said voltage setting active device, in response to said select signal provided thereto indicating said memory cell has not been selected, places said second selected region at a voltage value which provides a reverse bias on said second semiconductor junction.



4,051,465

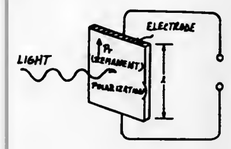
FERROELECTRIC CERAMIC DEVICES

Philip S. Brody, Brookmont, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 411,853, Nov. 1, 1973. This application Dec. 16, 1974, Ser. No. 533,365

Int. Cl.[2] G11C *11/42*

U.S. Cl. 340—173.2 25 Claims



1. A photovoltaic memory apparatus comprising: a substrate of a ferroelectric ceramic; means for selectively applying a voltage pulse of a predetermined polarity across a region of said substrate to thereby effect a remanent ferroelectric polarization in said region of said substrate representative of the information to be stored; means for selectively illuminating said poled region of said substrate with a source of radiation, whereby a photovoltaic voltage is produced at said region of a polairy dependent upon said predetermined polarity of said polarizing voltage pulse; and means for detecting said photovoltaic voltage whereby the stored information is retrieved.

4,051,466

ARRANGEMENT FOR DETECTING THE PRESENCE OF SNOW, ICE AND OTHER FREEZING PRECIPITATION, PARTICULARLY ON RAILWAY TRACK STRUCTURES, AND THE LIKE

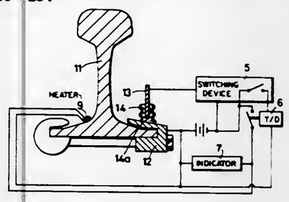
Karl-Heinz Protze, Bickenbach, Germany, assignor to Eltra KG Leicht & Trambauer, Pfungstadt, Germany

Filed July 11, 1975, Ser. No. 595,219

Claims priority, application Germany, July 12, 1974, 2433523

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—234 4 Claims



1. An arrangement for detecting the presence of snow, ice and other forms of freezing precipitation, particularly on road surfaces and railroad track structures, comprising, in combination, at least one first and at least one second electrode positioned one above the other and spaced from each other in the vertical direction by at least one respective interelectrode gap which can be bridged over by snow, ice and other forms of freezing precipitation, wherein the lower of said electrodes has the configuration of a clamp adapted to be secured to the foot portion of a railway track rail and both of said electrodes normally being at ambient temperature; and circuit means electrically connected across said electrodes and operative for detecting the bridging of the interelectrode gap by snow, ice or other forms of freezing precipitation by detecting the interelectrode gap resistance decrease resulting from such bridging of the interelectrode gap, the lower of said electrodes being provided with a sloping run-off surface for effecting the run-off or rain water falling upon said lower electrodes, whereby to prevent rain water from accumulating within said interelectrode gap and activating said circuit means.

4,051,467

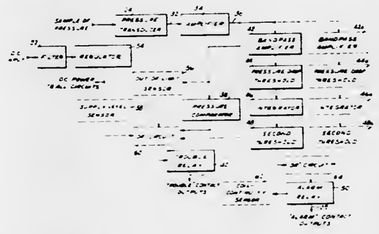
FLUID FLOW DETECTOR FOR A FIRE ALARM SYSTEM

Aaron A. Galvin, Lexington, Mass., assignor to American District Telegraph Company, Jersey City, N.J.

Filed Feb. 5, 1976, Ser. No. 655,436

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—239 S 18 Claims



1. A sprinkler flow detector for providing an alarm signal when a predetermined condition of fluid flow exists in a sprinkler system which includes a system side containing a fluid under pressure, said system side having at least one outlet port for allowing fluid to escape from the system side and at least one inlet port for admitting fluid into the system side, said detector comprising:

a pressure transducer in communication with said system side for providing a first electrical output signal from which pressure of the fluid in the system side can be determined, and

an electrical signal processing circuit for receiving the first electrical output signal from the pressure transducer and for providing the alarm signal whenever the rate of change of the first electrical output signal has a predetermined polarity relative to a predetermined threshold level for a predetermined interval of time, said processing circuit including a band-pass amplifier for providing a second electrical output signal representative of the component of said first output signal within a predetermined frequency range, a threshold detector for producing a third electrical output signal when said second output signal has a predetermined polarity relative to a predetermined threshold level, and means responsive to said third output signal for producing the alarm signal when said third output signal has been produced for a predetermined interval of time.

4,051,468

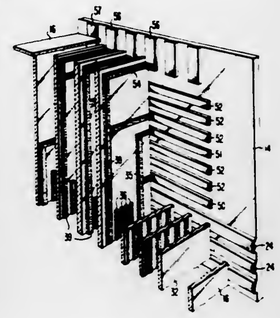
APPARATUS AND METHOD FOR MODULATING A FLAT PANEL DISPLAY DEVICE

Jan Aleksander Rajchman, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 28, 1976, Ser. No. 709,411

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—324 M 21 Claims



1. A system for modulating a display device having a cathodoluminescent screen comprising:

means for sensing an electrical charge on the screen; and

means for regulating the flow of electrons to the screen in response to the sensed charge.

4,051,469

CHARGE-COUPLED AMPLIFIER

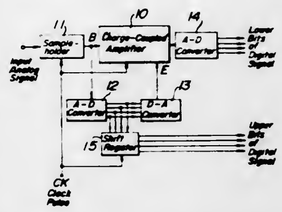
Yuichi Ninomiya, Kawasaki, Japan, assignor to Nippon Hoso Kyokai, Tokyo, Japan

Filed Nov. 25, 1975, Ser. No. 635,076

Claims priority, application Japan, Nov. 29, 1974, 49-137229

Int. Cl.[2] H03K *13/00*

U.S. Cl. 340—347 AD 8 Claims



8. In combination with a charge-coupled amplifier, an analog to digital converting device comprising:

a sample-holder for storing an input analog signal coupled to the input of said charge-coupled amplifier,

a first analog-to-digital converter coupled to the junction between the output of said sample-holder and the input of said charge-coupled amplifier, said first analog-to-digital converter converting the analog signal at the output of said sample-holder to upper bits of a digital signal,

a digital-to-analog converter coupled to the output of said first analog-to-digital converter and to said charge-coupled amplifier for converting said upper bits to an analog signal and coupling said analog signal to said charge-coupled amplifier, said amplifier delaying the analog signal from the sample-holder and acting as a differential amplifier, and

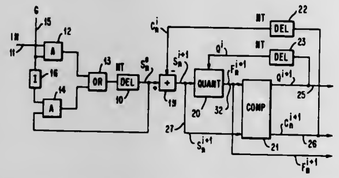
a second analog-to-digital converter coupled to the output of said charge-coupled amplifier, said second analog-to-

digital converter converting the differential output analog signal at the output of said charge-coupled amplifier to lower bits of said digital signal.

4,051,470
PROCESS FOR BLOCK QUANTIZING AN ELECTRICAL SIGNAL AND DEVICE FOR IMPLEMENTING SAID PROCESS

Daniel J. Esteban, LaGarde, and Jean E. Menez, Nice, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,203
Claims priority, application France, May 27, 1975, 75.17189
Int. Cl.² H03K 13/22
U.S. Cl. 340—347 AD **5 Claims**



1. A quantizing process for determining the components of a reference polynomial, a quantization parameter and a sequence of data bits for each section of a signal, each section being defined by a plurality of discrete information signals (S*n*) with each signal being derived from the amplitude taken by said signal at an associated one of N points, said process being characterized by the steps of:

a. determining a sequence of data bits (F*n*) wherein each bit represents a parameter of an associated one of the S*n*'s;

b. determining the means quantization error of said sequence of data bits (F*n*) for sqid signal of N points, said mean quantization error (E) satisfying the expression:

$$E = \sum_{n=1}^{N} \left| Sn - Cn - Q \cdot Fn \right|^{p}$$

in which *p* is a positive integer, *Cn* is a reference polynomial and *Q* is the quantization parameter for said S*n* signals and,

c. the determination of new values of *Cn* and *Q* defining the minimum value of said mean quantizing error *E*, said determination including;

c1. the generation of a new sequence of data bits *Fn* using the values of *Cn* and *Q* derived from step (b) with the same plurality of discrete information signals (*Sn*) of said section;

c2. the generation of a new error E1 by using the newly generated values of *Cn*, *Q* and *Fn*, and

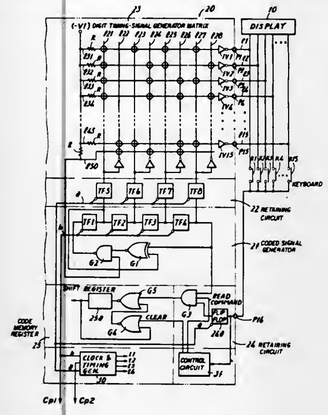
c3. the further repetition of steps (c1) and (c2) until a relatively fixed value of polynomial *Cn* is obtained.

4,051,471
KEY INPUT MEANS PROVIDING COMMON KEY IDENTIFYING AND DISPLAY DRIVING DIGIT TIMING SIGNALS

Isao Hatano, Kyoto; Akira Nagano, Nagaokakyo, and Kazuaki Urasaki, Muko, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 29, 1974, Ser. No. 528,321
Claims priority, application Japan, Nov. 30, 1973, 48-135565
Int. Cl.² G06F 3/02
U.S. Cl. 340—365 S **23 Claims**

22. A keying input apparatus in accordance with claim 21, in which said means for changing forcibly a logic state of a predetermined unit comprises means responsive to a logic state of a predetermined unit of said plurality of logic state storing units

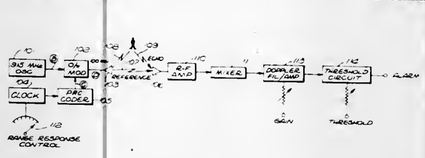


for changing forcibly a logic state of said predetermined unit of said plurality of logic state storing units.

4,051,472
LARGE AREA MOTION SENSOR USING PSEUDO-RANDOM CODING TECHNIQUE

Damian F. Albanese, Chatsworth, and Richard R. Waer, Northridge, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 458,808, April 8, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 646,289
Int. Cl.² G01S 9/42; G08B 13/22
U.S. Cl. 343—5 PD **8 Claims**



1. A system for detecting a moving intruder entering within a predetermined area of coverage, comprising:

a pair of substantially omni-directional antennas, one for transmitting and the other for receiving, one of said antennas being located at one of the two foci of an ellipse generally defining the boundary of said predetermined area of coverage and the other antenna being located at the other of said foci;

first means for energizing said transmitting antenna with a pseudo-random coded, bi-phase modulated RF carrier;

second means responsive to said receiving antenna for receiving signals including direct radiation from said transmitting antenna and delayed signals corresponding to reflections from objects illuminated by said transmitting antenna;

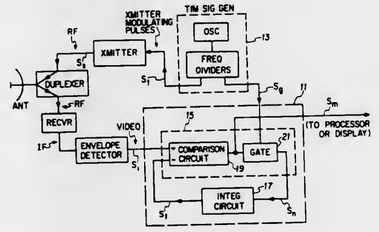
third means within said second means for autocorrelating said delayed received signals against said direct radiation received signal to produce an autocorrelation output signal having a maximum value when said coded signals reflected from said illuminated objects arrive at said receiving antenna at substantially the same time as the coded signals received by said direct radiation, said autocorrelation output signal decreasing toward zero amplitude as a function of increasing reflected signal delay as the differential delay between said direct and reflected signals at said receiving antenna approaches one bit duration of said code, thereby to produce a response cut-off perimeter which is along the perimeter of said ellipse substantially bounding said predetermined area.

and a Doppler filter responsive to the output of said third means for passing Doppler signals representative of the velocity of corresponding moving objects within said predetermined area.

4,051,473
INPUT TRACKING THRESHOLD DETECTOR

Marvin L. Hooker, Jr., Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 27, 1976, Ser. No. 727,112
Int. Cl.² G01S 7/34
U.S. Cl. 343—7 A **14 Claims**



1. In a radar system including receiver means, and detector means for providing a video signal S_i from the receiver means output, the improvement comprising, in combination,

first means for generating a gating signal S_g having enablement intervals occurring in a predetermined time relation to the transmitted signal,

second means for receiving S_i, S_g, and a feedback signal S_f, and outputting a signal S_n which, during the S_g enablement intervals, is a binary signal indicative of the relative amplitudes of S_i and S_f, and

third means for receiving S_n and outputting the signal S_f, S_f being indicative of the duty cycle of S_n.

4,051,474
INTERFERENCE REJECTION ANTENNA SYSTEM

Richard B. Mack, Winchester; John A. Strom, Nahnasett, and Anthony Martinez, Westford, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 18, 1975, Ser. No. 549,403
Int. Cl.² H04B 7/00
U.S. Cl. 343—100 LE **3 Claims**

1. An interference rejection antenna system comprising

at least one antenna radiating lement, each radiating element comprising a vertical dipole and a horizontal dipole disposed in crossed planar relationship,

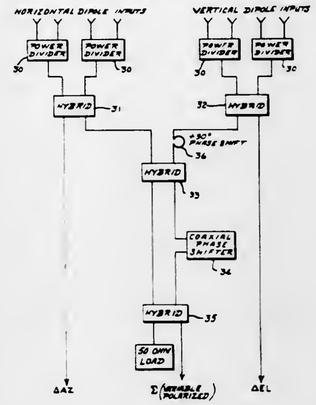
a coaxial feed for each dipole,

a balun connecting each dipole with a coaxial cable feed, each said balun comprising

shorting means connected to provide a quarter wavelength termination extension of a coaxial cable feed,

a quarter wavelength coaxial cable stub is spaced juxtaposition with said quarter wavelength termination extension and terminating on said shorting means, the center conductor of said coaxial cable feed being connected to the outer conductor of said quarter wavelength coaxial stub, and means for connecting dipole segments to the outer conductors of said quarter wavelength termination extension and said quarter wavelength coaxial stub, and

a power dividing network connected to said coaxial cable feeds effective to control the ratio of electromagnetic

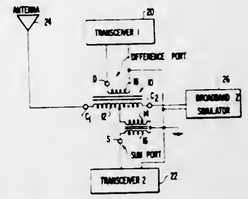


wave energy propagating through vertical and horizontal dipoles.

4,051,475
RADIO RECEIVER ISOLATION SYSTEM

Dona V. Campbell, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 21, 1976, Ser. No. 707,166
Int. Cl.² H04L 5/06
U.S. Cl. 343—180 **10 Claims**



1. A system for permitting simultaneous transmission and reception of two colocated transceivers operating on different frequencies without mutual interference therebetween, comprising in combination:

a single hybrid transformer having a sum port, a difference port, and first and second conjugate ports;

means continuously coupling one of said two transceivers operating at a first frequency to said sum port;

means continuously coupling the other of said two transceivers operating at a second frequency to said difference port;

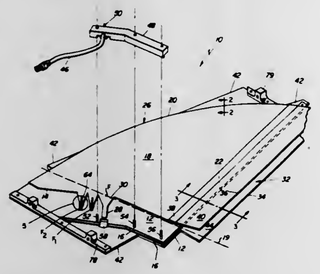
antenna means coupled to said first conjugate port and having first and second predetermined operating impedance characteristics dependent upon the different predetermined operating frequency of each of said two tranceivers; and

electrical load impedance means continuously coupled to said second conjugate port and being operative to substantially simulate said first and second operating impedance characteristics of said antenna means at both of said frequencies simultaneously whereby power coupld to said sum and difference ports at each of said operating frequencies is substantially equally divided between said antenna means and said electrical load impedance means coupled to said two conjugate ports.

4,051,476
PARABOLIC HORN ANTENNA WITH MICROSTRIP FEED

Donald H. Archer; Sherwood A. McOwen, Jr., and Robert J. Prickett, all of Santa Barbara, Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 1, 1976, Ser. No. 672,707
Int. Cl.² H01Q *13/02*
U.S. Cl. 343—700 MS **8 Claims**

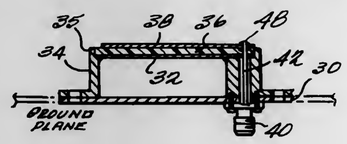


1. An antenna element comprising:
a planar dielectric substrate having a pair of conductive sheets formed on opposite sides thereof to form a parallel plate region having a parabolically shaped edge and a radiating edge;
a conductive material deposited over the parabolically shaped edge to form a parabolically shaped reflecting wall;
a microstrip feed formed on such dielectric substrate, such feed being offset from the reflecting wall and disposed adjacent the focal point of the reflecting wall; and
a radiating structure disposed along the radiating edge and flared in shape from the radiating edge outwardly to free space.

4,051,477
WIDE BEAM MICROSTRIP RADIATOR

Lawrence R. Murphy, Longmont, and Gary G. Sanford, Boulder, both of Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Filed Feb. 17, 1976, Ser. No. 658,534
Int. Cl.² H01Q *1/38*
U.S. Cl. 343—700 MS **14 Claims**

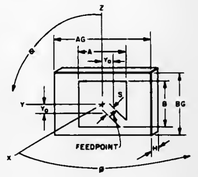


1. A radio frequency antenna structure which produces increased radiation power at low pointing angles near the ground plane without substantially sacrificing radiation efficiency, said structure comprising:
a base electrically conductive reference surface;
a raised pedestal electrically conductive reference surface disposed a predetermined distance above said base reference surface and electrically connected thereto;
dielectric material overlying said raised pedestal reference surface;
an electrically conductive antenna element surface spaced from said raised pedestal reference surface by said dielectric material defining an actual radiating aperture between the periphery of said antenna element surface and said raised pedestal reference surface while at the same time defining an image or virtual radiating aperture of like dimensions disposed below said base reference surface by said predetermined distance, said predetermined distance being related to the intended antenna operating frequency so as to shape the radiated pattern of fields and produce increased radiation power at low pointing angles near the base surface without substantially sacrificing radiation efficiency as compared to the case where said predetermined distance is reduced to zero; and
r.f. feed means electrically connected to said antenna element surface for conducting r.f. energy to/from said antenna element surface.

4,051,478
NOTCHED/DIAGONALLY FED ELECTRIC MICROSTRIP ANTENNA

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 10, 1976, Ser. No. 740,696
Int. Cl.² H01A *9/28, 1/38*
U.S. Cl. 343—700 MS **17 Claims**

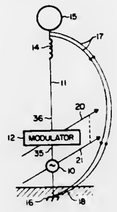


1. A notched/diagonally fed electric microstrip dipole antenna having low physical profile and conformal arraying capability, comprising:
a. a thin ground plane conductor;
b. a thin rectangular radiating element for producing a radiation pattern being spaced from said ground plane;
c. said radiating element being electrically separated from said ground plane by a dielectric substrate;
d. said radiating element having an optimum feed point located along a diagonal line of the element between the outer edge and the center point of said element;
e. said radiating element having a notch extending into said element from the outer edge thereof along said diagonal line of the element to said optimum feed point;
f. the resonant frequency of the antenna being determined primarily by the length of said radiating element; the width of said notch having a slight effect on the resonant frequency, as the notch width is increased the resonant frequency being increased slightly, and vice versa;
g. the antenna input impedance being variable to match most practical impedances as said feed point is moved along said diagonal line;
h. the antenna bandwidth being variable with the width of the radiating element and the spacing between said radiating element and said ground plane, said spacing between the radiating element and the ground plane having somewhat greater effect on the bandwidth than the element width;
i. said radiating element being operable to oscillate in two modes of current oscillation, each of said two modes being orthogonal to the other;
j. antenna polarization being linear when the radiating element length and width are equal, and the antenna polarization being circular when the phase difference between the two modes of oscillation are in quadrature due to differences between the length and width of the antenna.

4,051,479
ELF VERTICAL DIPOLE ANTENNA SUSPENDED FROM AIRCRAFT

Saul Altshuler, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 17, 1976, Ser. No. 667,795
Int. Cl.² H01Q *1/28, 9/18*
U.S. Cl. 343—703 **2 Claims**

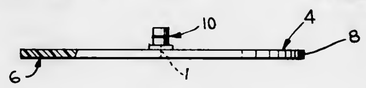


1. A vertical dipole antenna suitable for radiating information in the ELF range, said antenna comprising:
a. a generator for generating alternating electric currents in the ELF range;
b. an inductor;
c. a lighter-than-air craft;
d. an extended conductor connecting said generator and said inductor and connected to said lighter-than-air craft for carrying said conductor, said inductor and the distributed capacitance of said antenna forming a series resonant circuit;
e. means for grounding said conductor;
f. a modulator connected to said conductor and consisting of a saturable reactor;
g. means controlled by the information for changing at will the inductance of said reactor; and
h. means for changing the frequency of said generator in unison with the change of inductance provided by said saturable reactor, so that the series resonant circuit of said antenna including the inductance of said reactor will resonate at the instantaneous frequency of said generator, thereby to increase the communication bandwidth of the antenna.

4,051,480
CONFORMAL EDGE-SLOT RADIATORS

Frank Reggia, Bethesda, Md., and Howard S. Jones, Jr., Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 27, 1976, Ser. No. 736,014
Int. Cl.² H01Q *1/28*
U.S. Cl. 343—705 **8 Claims**

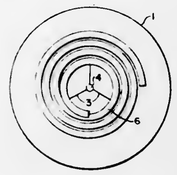


1. A dielectric loaded edge-slot radiator whose exterior dimensions can be chosen to allow flush-mounting on cylindrical and conical bodies comprising:
a dielectric substrate having a plurality of holes uniformly positioned in radial lines over the substrate;
a conductive plating disposed on the surfaces of the substrate acting as radiating elements;
a coupling means for exciting the radiating elements, and
a plurality of inductive shorting posts conformal to the holes in the substrate, whereby the edge-slot radiator can be frequency tuned without changing the physical dimensions of the antenna.

4,051,481
HELICAL BAND ANTENNA

João do Espirito Santo Abreu, Av. Anita Garibaldi, 5147-Curitiba, Parana, Brazil

Filed Feb. 3, 1976, Ser. No. 654,938
Claims priority, application Brazil, Jan. 29, 1975, 7500557
Int. Cl.² H01Q *1/36*
U.S. Cl. 343—895 **2 Claims**

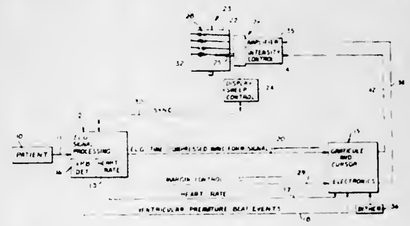


1. In an antenna structure, a ground plane member, an elongated support member extending at a right angle from said ground plane member, stand off insulators extending from said support member, an antenna element mounted on said insulators in the form of a helix of gradually decreasing diameter from said ground plane member, said element having a rectangular cross section having two wide surfaces and two narrow surfaces, and being arranged with its wide surfaces facing in the direction of the axis of the elongated support member.

4,051,482
GRATICULE WITH CURSORS

Richard Paul Andresen, Arlington, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 26, 1976, Ser. No. 680,016
Int. Cl.² A61B *5/04*
U.S. Cl. 346—23 **12 Claims**



1. In a graphical recorded display system for obtaining a record of at least one electrical signal such as one corresponding to at least one vital sign of a patient, a scribing surface medium, scribing means, means for advancing said recording surface medium relative to said scribing means, said scribing means scribing on said scribing surface medium in scribing directions generally transverse to the direction of said advance of said scribing medium relative to said scribing means, means for sensing said at least one of said electrical signal and providing corresponding responsive electrical signals therefor, the improvement comprising:
means for generating time-incremented electrical signals for extension to said scribing means for scribing a graticule on said scribing surface medium, said graticule being graduated in the direction of said relative advance between said scribing means and said scribing surface medium;
means for extending said time-incremented electrical signals to said scribing means during a predetermined period for scribing said graticule;
means providing at least one electrical control signal respectively representative of the value of a respective parameter of a said electrical signal measured during a predeter-

mined period of time, said at least one parameter value control signal having a particular time relationship with said graticule signals determined by said value of said parameter;

means selectively extendible to said scribing means for scribing a cursor on said scribing surface medium; and

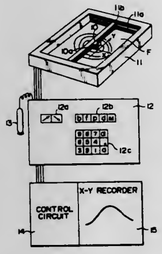
means responsive to said at least one parameter value signal for extending said cursor scribing means to said scribing means during said graticule scribing period to scribe a respective cursor on said scribing surface medium in timed relation to said graticule, thereby to indicate the value of said at least one respective parameter.

4,051,483

SYSTEM FOR MEASURING AND RECORDING THREE DIMENSIONAL CONFIGURATION OF OBJECT

Masane Suzaki, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Sept. 3, 1976, Ser. No. 720,383
Int. Cl.² G01D *9/00*; B43L *13/16*; G01C *11/12*; G01B *11/30*
U.S. Cl. 346—33 A **2 Claims**



1. A three dimensional contour measuring system for measuring and recording the contour of a three dimensional object comprising an encoder for measuring the distance between adjacent moire fringes of a moire obtained by the interference between a standard grating and a deformed image of a standard grating deformed by the surface of a three dimensional object, a computer connected with said encoder for calculating the depth or height of a point on the object on one moire fringe with respect to the depth or height of a point on the object on the moire fringe adjacent to said one moire fringe, signal input means provided in said computer for input of a signal which indicates whether the surface of the object represented by the moire fringes is convex or concave, magnification input means provided in said computer for input of a signal which indicates the magnification of an optical system for projecting the image of the standard grating on the surface of the object, and an X-Y recorder connected with said computer for recording the output of the computer, whereby said X-Y recorder records the contour of the three dimensional object and said computer computes the cross-sectional area and the cross-sectional line length of the object.

4,051,484

MAGNETIC PRINTER AND METHOD OF PERFORMING SAME

Samuel W. Martin, Martin Road, Weston, Conn. 06880

Filed Nov. 3, 1975, Ser. No. 628,499
Int. Cl.² G03G *19/00*
U.S. Cl. 346—74.1 **31 Claims**

1. A magnetic printer comprising:

A. means for receiving data to be printed;

B. a magnetic recording medium;

C. means for driving said recording medium;

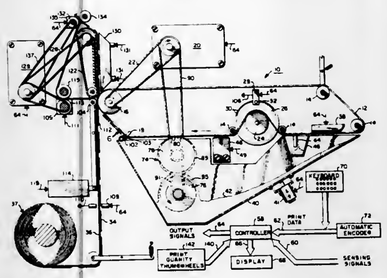
D. means, disposed in operative association with the recording medium for generating a timing signal corresponding to the speed of the medium;

E. writing means disposed in operative association with the recording medium and operating in response to the timing signal of the recording medium speed timing means, for magnetically writing the received data on said recording medium;

F. means, in operative association with the recording medium for applying a magnetic toner to the magnetically written portions of the recording medium, said toner application means incorporating;

1. a toner reservoir,

2. at least one rotatable toner drum communicating with the toner reservoir and in proximity with the recording medium, having a magnetized outer periphery forming a circumferentially non-uniform magnetic field, said field attracting a layer of magnetic toner about the outer periphery of the drum, and



3. at least one magnetizable member positioned between the recording medium and the toner drum for mechanically and magnetically interacting with the toner drum and the toner layer for generating a moving ridge of toner between the magnetizable member and the recording medium corresponding to an induced magnetic field in the magnetizable member by the nonuniform magnetic field on the toner drum, so that the recording medium attracts toner at each magnetically written area along the medium;

G. a data recording material for permanently recording said received data; and

H. transfer means interacting with the data material, and the toner applied portions of the recording medium, for transferring the toner applied to the recording medium to the data recording material.

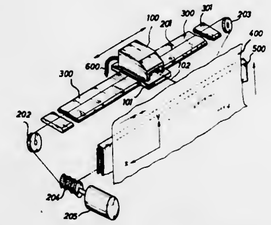
4,051,485

PRINTING APPARATUS

Kozo Yamada, Hachioji, Japan, assignor to Oki Electric Industry Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 545,740, Jan. 30, 1975, abandoned, which is a division of Ser. No. 409,289, Oct. 24, 1973, Pat. No. 3,972,052. This application Aug. 13, 1976, Ser. No. 714,130
Claims priority, application Japan, Oct. 24, 1972, 47-105834
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **7 Claims**

1. For an ink jet printer in which an ink stream is ejected from a nozzle and travels along a path to reach a printing medium, said printer comprising means for splitting said ink stream into ink drops, a charging electrode provided at a position along said path where said ink stream splits into said ink drops, said ink drops passing through said charging electrode, voltage means connected to said electrode for supplying a periodic voltage to said electrode to charge said ink drops, at least a pair of main electrostatic deflection plates located along said path and having a length in the direction of said path at least slightly greater than the distance between sequential ink drops, voltage means for applying a periodic voltage to deflect at least two of said charged ink drops simultaneously in a main scanning direction, said ink drops passing therethrough in a time period, digital data pulse means representing the pattern figures to be printed connected to said voltage means applied to said charging electrode, means synchronizing said periodic



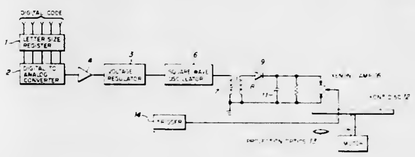
voltage applied to said charging electrode with the time it takes for an ink drop to pass through said main electrostatic deflection plates to provide a printing period during which said ink drops may be charged and a dummy period when said ink drops are prevented from being charged.

4,051,486

DIGITAL FLASH INTENSITY CONTROL SYSTEM FOR PHOTOTYPESETTERS

Peter R. Ebner, South Nashua, and Louis E. Griffith, Hampstead, both of N.H., assignors to Itek Corporation, Lexington, Mass.

Filed Nov. 3, 1975, Ser. No. 628,692
Int. Cl.² B41B *13/00*
U.S. Cl. 354—7 **8 Claims**



1. In a phototypesetter:

a. a font storage medium;

b. a light generator for momentarily illuminating selected characters of said font storage medium;

c. a letter size control means for producing a code related to the desired letter size to be typeset; and

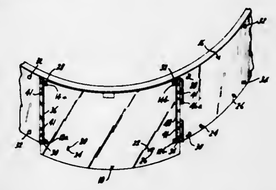
d. light flux generator control means coupled between said letter size control means and said light flux generator for applying a variable flux control signal to said light flux generator proportional to the code produced by said letter size control circuit, said light flux generator control means including an electrical charge generator for producing an electrical charge proportional to the code produced by said letter size control means for controlling the degree of light flux generated by said light flux generator, said charge generator further including an electrical pulse generator for producing an output having energy proportional to said code produced by said letter size control means, together with a storage capacitor coupled to said electrical pulse generator for storing a charge therein proportional to said energy of the output produced by said electrical pulse generator.

4,051,487

FILM FONT FOR PHOTOCOMPOSING APPARATUS

Leonard Storch, New York, N.Y., and George H. Thomas, Dallas, Tex., assignors to Leonard Storch Enterprises, Inc., New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 661,948
Int. Cl.² B41B *13/00*
U.S. Cl. 354—12 **5 Claims**



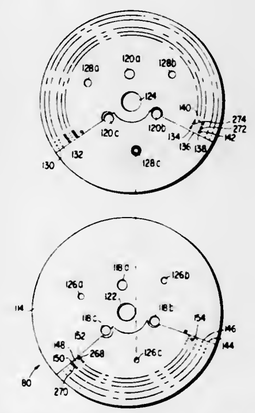
1. A font adapted to be secured to a font carrier having a plurality of font support pins projecting therefrom, said font comprising a piece of film containing characters arranged in desired sequence and having an elongated dimension terminating in first and second lateral edges, at least one area on said film adjacent said first lateral edge adapted to engage at least one of said support pins on said carrier, slide latching means secured to said film at said second lateral edge, said slide latching means including a slide bar mounted for sliding movement in a direction along the surface of said film transverse to said elongated dimension between an open position and a closed position, said slide bar including at least one engagement surface which engages at least one other of said support pins when said slide bar is in its closed position and is removed from said at least one other of said support pins when said slide bar is in its open position so that movement of said slide bar locks said font in position on said carrier.

4,051,488

PHOTOTYPESETTING MACHINE

James Alfred Tidd, Haverhill, Mass., assignor to Alphatype Corporation, Skokie, Ill.

Filed Nov. 12, 1975, Ser. No. 631,419
Int. Cl.² G03B *15/16*
U.S. Cl. 354—13 **47 Claims**



47. A character carrier for a phototypesetting machine comprising a disc bearing light transmitting characters for photographic projection, said characters being arcuately arranged on an opaque background, a position mark for each character,

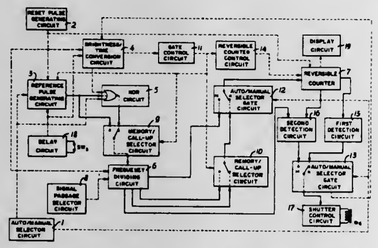
a width indication means for each character positioned between the position mark for that character and a position mark for the next preceding character, said width indication means operating to provide character width information and including two spaced marks for each character, the distance between said two marks being indicative of character width, said position marks and width indication means being arranged concentrically with said characters, and set size indicator means for providing a set size indication for said characters, said set size indicator means being formed by two spaced set size marks for a group of characters, the distance between said set size marks being indicative of the set size for said group of characters.

4,051,489

EXPOSURE TIME CONTROL DEVICE FOR ELECTRIC CAMERA SHUTTER

Takeo Saito, Yotsukaido, and Youichi Seki, Chiba, both of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed May 15, 1975, Ser. No. 577,768
Claims priority, application Japan, May 16, 1974, 49-54909
Int. Cl.² G03B *7/08*
U.S. Cl. 354—23 D **3 Claims**



1. In an exposure time control device of an electric camera shutter: means including a brightness/time conversion circuit for developing a single pulse having a width representative of the brightness of a subject to be photographed; a reference pulse generating circuit for generating reference pulses at a constant rate; multi-stage counting means responsive to the single pulse and the reference pulses applied to a selected one of its counting stages for counting reference pulses during the duration of the single pulse; means for reading-out the count stored in said counting circuit upon the termination of said single pulse for controlling the exposure time of a camera shutter; and means for selectively varying the pulse width of the single pulse by accordingly selecting the particular counting stage to which the reference pulses are applied to said multi-stage counting means in dependence upon an exposure time parameter other than the brightness of the subject to thereby vary the number of reference pulses counted by said counting means and thereby effect control of the exposure time in dependence upon both the subject brightness and another exposure time parameter.

4,051,490

PHOTOGRAPHIC EXPOSURE METER CIRCUIT HAVING TEMPERATURE COMPENSATION

Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

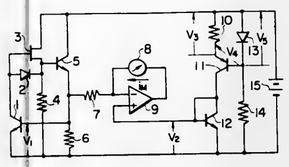
Filed Nov. 10, 1976, Ser. No. 740,464
Claims priority, application Japan, Nov. 12, 1975, 50-153834[U]
Int. Cl.² G03B *17/18*; G01J *1/44*
U.S. Cl. 354—24 **4 Claims**

1. In a temperature compensating photographic exposure meter circuit including means incorporating a photo sensitive element for producing a first logarithmically compressed voltage proportional to the apex value of the brightness of a photographic object, the improvement characterized by:

a. a transistor (11),

b. a resistor (10) connected to the emitter of said transistor,

c. a light emitting diode (13) having its cathode connected to the base of said transistor,



d. means (12) for converting the collector output of said transistor into a second logarithmically compressed voltage, and

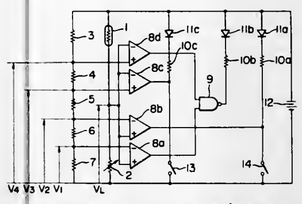
e. meter indication means responsive to the difference between said first and second logarithmically compressed voltages.

4,051,491

INDICATING EXPOSURE METER FOR A CAMERA

Kenji Toyoda, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,440
Claims priority, application Japan, Dec. 3, 1974, 49-137691
Int. Cl.² G03B *17/20, 7/00*
U.S. Cl. 354—60 L **2 Claims**



1. An indicating exposure meter for a camera having adjustable means to set exposure factors of the camera comprising:

a. first, second and third indicating elements, each having an inactive state and an active state ascertainable by visual inspection;

b. a photoelectric element for receiving light from an object to be photographed;

c. control means connected with said photoelectric element and with said adjustable means for producing a proper exposure signal when the combination of the intensity of the light from the object and the exposure factors provides a proper exposure, an over-exposure signal when the combination provides an over-exposure and an under-exposure signal when the combination provides an under-exposure, said first indicating element having an active state produced in response to the over-exposure signal, said second indicating element having an active state produced in response to the under-exposure signal and said third indicating element having an active state produced in response to the proper exposure signal; and

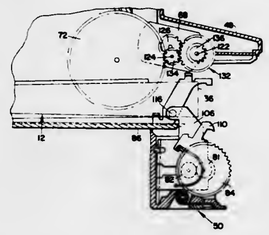
d. switch means associated with said first indicating element and with said adjustable means, said switch means being normally in a first state and being placed in a second state in response to adjustment of said adjustable means so as to obtain a proper exposure for a light intensity lower than the lower limit of the light measuring range of said photoelectric element for rendering said first indicating element active irrespective of signals from said control means, whereby both the active state of said second indicating element due to said under-exposure signal and the active state of said first indicating element due to the second state of said switch means indicate that said light intensity is lower than the lower limit of the light measuring range of said photoelectric element.

4,051,492

PHOTOGRAPHIC APPARATUS GEAR TRAIN HAVING A UNIQUE SET OF GEARS

Irving Laskin, Sharon, and David Van Allen, Malden, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 13, 1976, Ser. No. 648,765
Int. Cl.² G03B *17/50*
U.S. Cl. 354—86 **20 Claims**



1. Photographic apparatus having at least one motor driven component, said apparatus comprising:

a housing including first and second housing sections interconnected for movement between an operative position wherein said first and second sections are in operative alignment and an inoperative position wherein said first and second sections are spaced apart and are not operatively aligned;

a motor in said first housing section for driving at least one component of said apparatus;

at least one component of said apparatus on said second housing section adapted to be driven by said motor when said first and second housing sections are located in said operative position and said motor is operative; and

a gear train, coupling said motor to said at least one component when said first and second housing sections are in said operative position, for transmitting power from said motor to said at least one component, when said motor is operative;

said gear train including at least one pinion mounted on one of said first and second housing sections and at least one gear mounted on the other of said first and second sections, said pinion and gear being configured to be engaged in operative mesh when said first and second housing sections are located in said operative position and to be disengaged from each other when said first and second housing sections are located in said inoperative position;

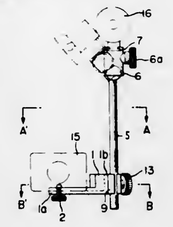
said pinion and gear having respective tooth profiles whereby the addendums said pinion and gear are unequal, said pinion teeth having a shorter addendum than said teeth on said gear, said respective tooth profile being configured for conjugate action based on involute curves, and said respective tooth profiles also being configured such that tip spacing, as measured between the midpoints of radial end tips of adjacent teeth on said pinion and said gear, is substantially equal for facilitating bringing said pinion and gear into operative mesh when said first and second housing sections are moved from said inoperative position to said operative position.

4,051,493

FLASH PHOTOGRAPHING DEVICE

Sadao Nakagawa, Yokohama; Masaaki Tsukamoto, and Toshio Dobashi, both of Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 16, 1976, Ser. No. 649,636
Claims priority, application Japan, Jan. 23, 1975, 50-10086
Int. Cl.² G03B *15/03*
U.S. Cl. 354—126 **9 Claims**



1. A flash photographing device adapted to be attached to a camera body and a flash gun for illuminating an object to be photographed, said device comprising:

a. a rod member for supporting said flash gun;

b. a supporting member secured to said camera body;

c. holder means displaceable between a restraining position in which said holder means holds said rod member against sliding and rotating movement and a half-restraining position in which said holder means holds said rod member for at least sliding movement upon application of an extraneous force on said rod member, said holder means being rotatable about said supporting member;

d. adjusting means provided on said supporting member for displacing said holder means between said restraining position and said half-restraining position; and

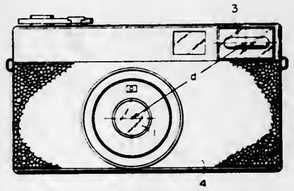
e. restraining means provided to restrain said holder means from rotating when said holder means is in said restraining position and to release the restraint when said holder means is in said half-restraining position.

4,051,494

PHOTOGRAPHIC CAMERA WITH BUILT-IN STROBO FLASH LIGHT DEVICE

Yoshihiro Fujita; Ikuo Fuutagawa, and Katsuji Muramatsu, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 12, 1975, Ser. No. 612,947
Claims priority, application Japan, Sept. 13, 1974, 49-105573
Int. Cl.² G03B *15/03*
U.S. Cl. 354—145 **2 Claims**



1. A photographic camera with a built-in strobo flash light device comprising a camera body having a taking lens on the front face thereof and a strobo flash tube provided on the front face of the camera body wherein in order to minimize the occurrence of a so-called "red-eye phenomenon" the distance from the center of the strobo flash tube to the optical axis of the

taking lens is within the range of 4.5cm to 6.5cm, and that the guide number of the strobo flash tube is selected to satisty the following formula;

$$GN < \frac{1}{0.37 - 0.73\,(\tan^{-1}\frac{d}{400}/2.5^{\circ})}$$

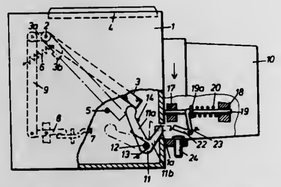
where GN is the guide number and *d* is the distance from the center of the strobo flash tube to the optical axis of the taking lens.

4,051,495

SINGLE LENS REFLEX CAMERA WITH INTERCHANGEABLE LENS

Waldemar Rentschler, and Franz Starp, both of Wildbad, Germany, assignors to Carl Zeiss Stiftung, Oberkochen, Germany

Filed Oct. 29, 1976, Ser. No. 736,706
Claims priority, application Germany, Nov. 4, 1975, 2549287
Int. Cl.² G03B *17/00, 19/12*
U.S. Cl. 354—152 **12 Claims**



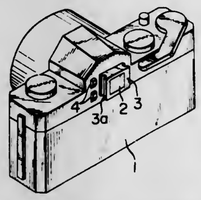
1. A single lens reflex camera of the type having a mirror movable to and from a normal reflecting position in which the mirror reflects an image of a scene onto a viewfinder screen and having an interchangeable lens detachable from the camera and attachable thereto in a definite functional operative position, characterized by the provision of means for blurring said image on said screen if an interchangeable lens is not attached in said definite operative position.

4,051,496

REMOTE CONTROL CAMERA

Yoso Iida, Komae; Shigeo Akasaka, Kodaira, and Yasuhito Kawahara, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 2, 1976, Ser. No. 654,333
Claims priority, application Japan, Feb. 12, 1975, 50-18566[U]
Int. Cl.² G03B *13/02*
U.S. Cl. 354—219 **2 Claims**



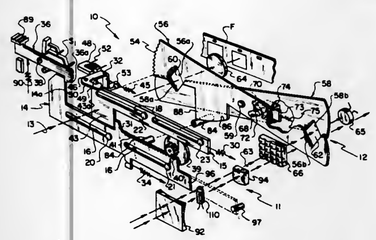
1. A remote control camera which comprises:
a camera body;
an eye-piece associated with said camera body; and
means for mounting and dismounting a signal receiving device which actuates the camera upon receipt of a remote control signal, said mounting and dismounting means being provided at an appropriate position on said camera body so that the body of said signal receiving device may be mounted at a position where it entirely covers said eye-piece of the camera to prevent any undesirable light from entering into the camera body through the eye-piece, said signal receiving device having engaging means corresponding to said mounting and dismounting means.

4,051,497

PROGRAMMED EXPOSURE CONTROL APPARATUS

Donald Malcolm Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 28, 1976, Ser. No. 653,065
Int. Cl.² G03B *9/00, 7/14*
U.S. Cl. 354—231 **2 Claims**



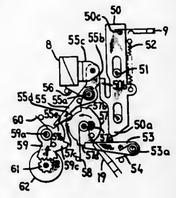
1. In a camera having exposure control apparatus for controlling the amount of scene light reaching a film exposure plane, said exposure control apparatus including (1) a variable speed shutter having at least one light regulating member movable for varying an exposure interval, and (2) a diaphragm for defining an exposure aperture of variable size, said exposure control apparatus being of the type in which the duration of the exposure interval is proportional to the size of the exposure aperture to effect a compromise between shutter speed and depth of field, the improvement comprising:
control means for actuating said light regulating member and said diaphragm to establish an exposure interval and an exposure aperture prior to an exposure, said control means further defining means for setting said diaphragm in an exposure aperture defining position in synchronism with actuating said shutter to initiate an exposure independent of the particular combination of aperture size and shutter speed employed to effect an exposure.

4,051,498

CAMERA ELECTRIC SHUTTER WITH MECHANICAL DELAY DEVICE

Kiyoshi Kitai, Tokyo, Japan, assignor to Seiko Koki Kabushiki Kaisha, Japan

Division of Ser. No. 317,709, Dec. 21, 1972, Pat. No. 3,829,877, which is a continuation of Ser. No. 97,512, Dec. 14, 1970, abandoned. This application Aug. 2, 1974, Ser. No. 494,374
Claims priority, application Japan, Dec. 16, 1969, 44-100815
Int. Cl.² G03B *9/58, 17/40*
U.S. Cl. 354—234 **3 Claims**



1. In an electric shutter having a lense aperture, sector means operable to a position for opening the lens aperture and a

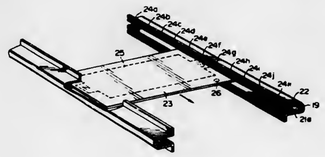
position for closing the lens aperture, operating means to operate the sector means to the position opening the lens aperture and the position closing the lens aperture, control means to render the operating means effective to operate the sector means to open the lens aperture including automatic timing means to determine a delay period after which the sector means closes the shutter lens aperture, said timing means comprising an electromagnet, normally controlling said delay period, and including mechanical delay means normally rendered ineffective by said electromagnet and rendered effective by said electromagnet for effecting a delayed closing of the shutter lens aperture only when the electromagnet is insufficiently energized or completely deenergized.

4,051,499

LINEAR MOTOR-DRIVEN FOCAL PLANE SHUTTER

Toshihiro Kondo, Chofu, Japan, assignor to Toshihiro Kondo, Chofu and Fuji Photo Film Co., Ltd., Minami-ashigara, both of Japan

Filed Apr. 15, 1976, Ser. No. 677,392
Claims priority, application Japan, Apr. 18, 1975, 50-47867
Int. Cl.² G03B *9/42*
U.S. Cl. 354—234 **18 Claims**



1. A linear motor-driven focal plane shutter for a camera comprising in combination:
a flat shutter blind slidable back and forth along a fixed path to open and close the film aperture in the camera,
a flat permanent magnet sealed within the shutter blind along a plane approximately bisecting the thickness thereof,
a series of electromagnetic coils arranged in a line in the direction of travel of the shutter blind, said electromagnetic coils being situated along the path followed by a pole of the permanent magnet of the shutter blind,
means for sequentially energizing the electromagnetic coils to cause the shutter blind in which the associated permanent magnet is sealed to run in the direction in which the electromagnetic coils are energized in accordance with the principle of a linear motor,
a shutter control circuit for sequentially energizing the series of electromagnetic coils.

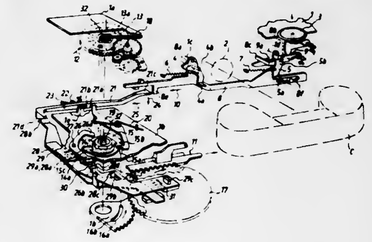
10. A linear motor-driven focal plane shutter for a camera comprising in combination:
a leading blind movable back and forth along a fixed path to open and close the film aperture in the camera,
a trailing blind movable back and forth along a fixed path to close and open the film aperture in the camera,
a first permanent magnet sealed within the leading blind along a plane approximately bisecting the thickness thereof,
a second permanent magnet sealed within the trailing blind along a plane approximately bisecting the thickness thereof,
at least two series of electromagnetic coils arranged in lines in the direction of travel of the leading blind and the trailing blind, each series of electromagnetic coils being situated along the path followed by a pole of the permanent magnet of the associated blind,
means for sequentially energizing the electromagnetic coils in each series to cause the associated permanent magnet and the blind in which it is sealed to run in the direction in which the electromagnetic coils are energized in accordance with the principle of a linear motor,
a shutter control circuit for first sequentially energizing the series of electromagnetic coils associated with the leading blind and then after the lapse of a period of time corresponding to the shutter speed sequentially energizing the series of electromagnetic coils associated with the trailing blind.

4,051,500

PHOTOGRAPHIC CAMERA WITH A TIME-DELAY MECHANISM

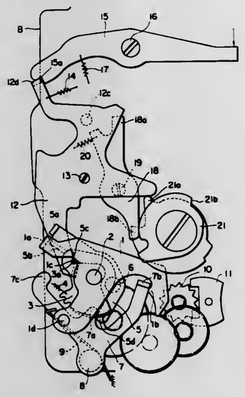
Dieter Maas, Poring, and Gerda Linke, Munich, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 4, 1975, Ser. No. 628,822
Claims priority, application Germany, Nov. 16, 1974, 2454509
Int. Cl.² G03B *9/64*
U.S. Cl. 354—239 **6 Claims**



4. In a photographic camera of the type having a shutter and a shutter setting and releasing mechanism including an operating member mounted in the camera for translation in a straight path and in a predetermined direction upon release, a combination comprising an elongated coupling element having a first, second and third portion longitudinally spaced from one another, the latter having an inclined surface; means for mounting said coupling component in the camera for pivoting between a first and a second position in which said first portion is located without and within said path, respectively, and also for limited joint translation with the operating member upon engagement of said first portion with the latter in said second position of said coupling component; a time-delay mechanism; an arresting member mounted in the camera for movement between an arresting and a releasing position in which it arrests and releases said time-delay mechanism, respectively, and engaged by said second portion of said coupling component for movement therewith toward said releasing position during said limited joint translation thereof; and means for pivoting said coupling component between said positions thereof, including at least one sliding member mounted in the camera for displacement between a retracted and an extended position upon release by said time-delay mechanism and having a projection which engages said inclined surface of said third portion during the displacement of said sliding member toward said extended position thereof to pivot said coupling component toward said first position, and an actuating element accessible from the exterior of the camera and operatively connected to said sliding member for displacing the same between said positions thereof.

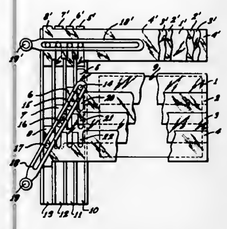
4,051,501
BUILT-IN SELF-TIMER FOR CAMERAS
Nobuyoshi Inoue, Kawagoe, and Toshihisa Saito, Tokyo, both of Japan, assignors to Copal Company Limited, Japan
Filed June 28, 1976, Ser. No. 700,183
Claims priority, application Japan, June 26, 1975, 50-90368; Dec. 22, 1975, 50-173845
Int. Cl.² G03B 9/64
U.S. Cl. 354—239 2 Claims



1. A self-timer device for cameras comprising a base plate, a sector gear supported rotatably on said base plate and movable between its cocked position and uncocked position, a gear train meshed with said sector gear and including a star gear and anchor therein, a cocking member supported rotatably relatively with said sector gear on said base plate and arranged so as to be engageable with said sector gear only when said sector gear is moved from its uncocked position to its cocked position, a checking member supported rotarably on said base plate and engageable with said star gear to stop the operation of said gear train, a locking member supported rotatably on said base plate and engaged with said cocking member and checking member, and an interlocking member supported rotatably on said base plate and arranged so as to engage with said locking member and checking member, said locking member being adapted to be movable to a position of not engaging with said interlocking member through said cocking member even after said sector gear is moved to the cocked position.

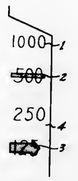
4,051,502
MULTIPLE ELEMENT FOCAL PLANE SHUTTER FOR PHOTOGRAPHIC CAMERAS
Bodo Mielke, Wolfenbuttel, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany
Filed Nov. 10, 1975, Ser. No. 630,341
Claims priority, application Germany, Dec. 20, 1974, 2460442
Int. Cl.² G03B 9/38
U.S. Cl. 354—249 9 Claims

1. In a focal plane shutter for photographic cameras having two shutter means respectively for colinearly moving across an image aperture in the camera, thereby respectively providing for opening and closing functions depending on the direction of movement and whereby one of the shutter means provides for opening movement for film exposure, while the other one of the shutter means provides for a delayed closing movement, each of the shutter means comprising:
- a plurality of lamellas including an exposure slit defining lamella, each of said lamellas extending for the entire width of the image aperture, the lamellas each providing for movement in planes respectively parallel to the plane of the aperture, the planes being spaced transversely to this parallel extension so that each lamella can move independently from the others;
- a plurality of slide elements respectively connected to or being a part of the lamella of the plurality of lamellas and being laterally offset in relation to each other;
- means defining a plurality of straight, parallel slide paths and respectively receiving for guiding each of said slide elements, so that said slide elements move in said paths parallel to each other and to the direction of movement of said lamellas;



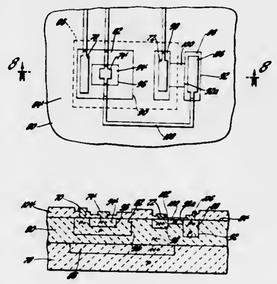
- a plurality of pins respectively on said slide elements of the plurality of slide elements; and
- a slotted crank lever receiving and engaging the pins and extending parallel to said planes but transversely to said direction of guiding, said lever upon turning moving said pins and slide elements in said slide tracks thereby moving said lamellas in unison and at different speeds.

4,051,503
EXPOSURE DISPLAY DEVICE FOR A SINGLE LENS REFLEX CAMERA
Nayuki Uno, Urawa; Tetsuji Shono, Ranzan; Fumio Urano, Omiya; Masahiro Kawasaki, and Katsuhiko Miyata, both of Saitama, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sept. 12, 1975, Ser. No. 612,945
Claims priority, application Japan, Sept. 30, 1974, 49-118012[U]
Int. Cl.² G03B 17/00, 17/20
U.S. Cl. 354—289 10 Claims



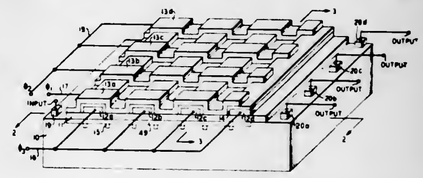
1. A digital type exposure display device for a single lens reflex camera comprising:
- a nominal value display including a transparent support member and a series of nominal values marked thereon, each of said nominal values being related to an exposure component of a photography system;
- a first set of selectively energizable light display elements at least equal in number to the number of nominal values marked on said transparent support, each of said light display elements having an optical characteristic that changes when a suitable voltage is applied to said light display element, said first set of selectively energizable light display elements and said transparent support being superimposed such that one of said first set of selectively energizable light display elements is associated with each of said nominal values so that the selective energization of one of said first set of selectively energizable light display elements causes a first display of a related one of said nominal values; and,
- a second set of selectively energizable light display elements at least equal in number to the number of nominal values marked on said transparent support, each of said light display elements having an optical characteristic that changes when a suitable voltage is applied to said light display element, said second set of selectively energizable light display elements and said first set of selectively energizable light display elements being superimposed such that one element on said second set of selectively energizable light display elements is associated with each of said nominal values so that the selective energization of one of said second set of selectively energizable light display elements causes a second display of a related one of said nomilnal values.

4,051,504
ION IMPLANTED ZENER DIODE
John W. Hile, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 14, 1975, Ser. No. 622,081
Int. Cl.² H01L 29/90
U.S. Cl. 357—13 4 Claims



1. A zener diode having an accurately predetermined breakdown voltage comprising:
- a body of semiconductive material having at least a portion of one conductivity type intersecting a surface of said body;
- a minimum electrical resistivity in said portion of not less than about 10 ohm-centimeter;
- a first island-like region of opposite conductivity type semiconductive material inset within said portion and intersecting said surface;
- said first region having a first predetermined concentration of conductivity determining impurity of said opposite type adjacent said surface that is in excess of 1×10^{19} atoms per cubic centimeter of semiconductive material;
- said first region and said portion forming a PN junction that has a breakdown voltage in excess of a predetermined voltage;
- a second region of more conductive one conductivity type within said portion and intersecting said surface, said second region being contiguous said first region and containing an accurately predetermined number of implanted one conductivity type impurity atoms in addition to one conductivity type impurity atoms determining said resistivity of said portion;
- said additional impurity atoms implanted in said secnd region having an accurately predetermined second concentration that is at least two orders of magnitude less than said first predetermined concentration and is within the range of 1×10^{16} to 1×10^{19} atoms per cubic centimeter of semiconductive material contiguous said first region;
- a PN junction between said first and second regions having an accurately predetermined breakdown voltage imparted by said predetermined concentrations that is lower than the breakdown voltage of the PN junction between said first region and said portion; and
- discrete low resistance electrical connections to said first and regions providing a zener diode having an accurately predetermined breakdown voltage.

4,051,505
TWO-DIMENSIONAL TRANSFER IN CHARGE TRANSFER DEVICE
Robert Harold Krambeck, South Plainfield; Carlo Heinrich Sequin, Summit, and Robert Henry Walden, Warren, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Mar. 16, 1973, Ser. No. 342,173
Int. Cl.² H01L 29/78
U.S. Cl. 357—24 11 Claims

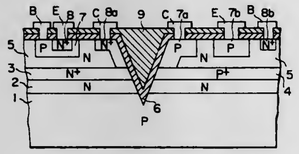


1. A charge transfer device comprising a charge storage medium the bulk of which is of a first conductivity type, a first insulating layer covering at least a portion of one surface of said medium, a first conductive pattern comprising a series of elongated electrodes disposed parallel to each other extending in a first direction upon said first insulating layer, means under each of said electrodes for preventing the transfer of mobile charge in the medium in said first direction under said electrodes, a second insulating layer overlying said first conductive pattern, a second conductive pattern comprising a series of elongated electrodes disposed over said second insulating layer parallel to each other extending in a second direction which is noncollinear with said first direction, each of said electrodes overlying the first conductive pattern at certain areas and overlying said storage medium in the area between said first conductive pattern, the electrodes of said second conductive pattern defining transfer paths for movement of mobile charge carriers in the medium in said first direction in the spaces between the electrodes of the first conductive pattern extending substantially the length of the electrodes of the first conductive pattern and the electrodes of the first conductive pattern defining transfer paths in the medium in said second direction extending substantially the length of the electrodes of said second conductive pattern, and means for sequentially biasing a series of electrodes of one of said conductive patterns to transfer charge carriers in one of said noncollinear directions while biasing the other conductive pattern so as to form blocking potentials to movement of charge carriers in the other of said noncollinear directions.

4,051,506
COMPLEMENTARY SEMICONDUCTOR DEVICE
Nobora Horie, Kodaira, Japan, assignor to Hitachi, Ltd., Japan
Filed May 25, 1976, Ser. No. 689,819
Claims priority, application Japan, May 28, 1975, 50-62862
Int. Cl.² H01L 29/06, 27/12, 29/34, 27/02
U.S. Cl. 357—55 11 Claims

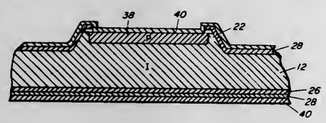
1. A complementary semiconductor device comprising
a. a *p*-type Si substrate;

b. a first N-type epitaxial layer formed through epitaxial growth on said P-type Si substrate;
c. N+ and P+ embedded layers formed in said first N-type epitaxial layer through diffusion using a mask;
d. a second N-type epitaxial layer formed on said first N-type epitaxial layer including both said embedded layers;
e. a V-shaped groove dividing into two parts said first epitaxial layer, said second epitaxial layer and separating said N+ and P+ embedded layers from each other;
f. a SiO_2 film formed on the surface of said second N-type epitaxial layer including said V-shaped groove;
g. a first, second and third P-type regions formed in said second N-type epitaxial layer by using said SiO_2 film as a diffusion mask, with their surfaces exposed, said first P-type region being formed in the left side part of said second epitaxial region divided by said V-shaped groove, said second and third P-type regions being formed in the right side part of said second epitaxial region and said



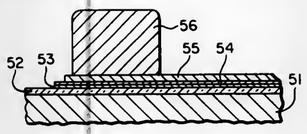
second P-type region being in contact with the side surface of said V-shaped groove and said P+ embedded layer;
h. a first N+ region formed in said first P-type region with its surface exposed, a second N+ region formed in the left side part of said second epitaxial layer with its surface exposed and in contact with the side surface of said V-shaped groove and said N+ embedded layer, and a third N+ region formed in the right side part of said second epitaxial layer with the surface exposed;
i. an organic insulating material filling said V-shaped groove with said SiO_2 film disposed underneath, the surface of said organic insulating material being flat; and
j. a first base electrode attached to said first P-type region, a first emitter electrode attached to said first N+ region, a first collector electrode attached to said second N+ region, a second collector electrode attached to said second P-type region, a second emitter electrode attached to said third P-type region and a second base electrode attached to said third N+ regions.

4,051,507
SEMICONDUCTOR STRUCTURES
Warren C. Rosvold, Sunnyvale, Calif., assignor to Raytheon Company, Lexington, Mass.
Continuation of Ser. No. 524,723, Nov. 18, 1974, abandoned, which is a continuation of Ser. No. 255,284, May 19, 1972, abandoned, which is a division of Ser. No. 86,960, Nov. 4, 1970, which is a continuation of Ser. No. 795,977, Feb. 3, 1969, abandoned. This application May 11, 1976, Ser. No. 685,204
Int. Cl.² H01L *29/04, 29/06, 29/12, 23/48*
U.S. Cl. 357—60 **5 Claims**



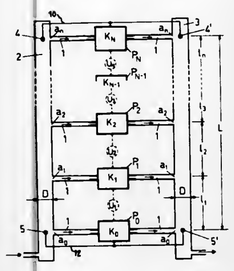
1. A semiconductor device comprising:
a semiconductor body having a region of different conductivity type layers with surfaces of such layers lying in the <100> crystallographic plane of the semiconductor body;
such region having wall portions with sides parallel to the <111> crystallographic plane of the semiconductor body;
such wall portions being disposed along at least a portion of the periphery of the device.

4,051,508
SEMICONDUCTOR DEVICE HAVING MULTISTEPPED BUMP TERMINAL ELECTRODES
Susumu Sato, and Hideo Tsunemitsu, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan
Filed June 9, 1976, Ser. No. 694,358
Claims priority, application Japan, June 13, 1975, 50-71748
Int. Cl.² H01L *23/48, 29/46, 29/54*
U.S. Cl. 357—71 **8 Claims**



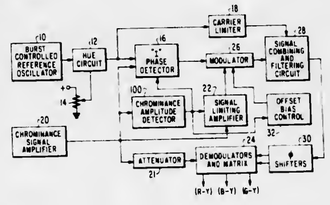
1. A semiconductor device having an improved bump terminal electrode comprising a semiconductor substrate having at least one element and one major surface, an insulator film formed on said major surface, and a bump terminal formed on said insulator film electrically connected through a conductive layer to said element, said bump terminal electrode including a first metal layer, a second metal layer, and a third metal layer of the same material as said second metal layer, said first metal layer being formed on said insulator film and being electrically connected to said conductor layer, said second metal layer being disposed directly on the surface of said first metal layer, said second metal layer not extending beyond said first metal layer, the area of said second metal layer being smaller than that of said first layer, said third metal layer being disposed directly on the surface of said second metal layer, the area of said third metal layer being smaller than that of said second metal layer.

4,051,509
APPARATUS FOR COOLING ELECTRICAL DEVICES AT DIFFERENT ELECTRICAL POTENTIALS BY MEANS OF A FLOWING MEDIUM
Conrad Beriger, Aarau, and Eduard Keller, Wettingen, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland
Filed Feb. 5, 1976, Ser. No. 655,558
Int. Cl.² H01L *25/04, 23/02*
U.S. Cl. 357—82 **5 Claims**



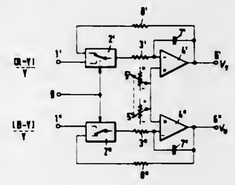
1. An apparatus for cooling electrical devices at different electrical potentials by means of a flowing cooling medium and for preventing corrosion thereof, comprising a plurality of electrically conductive devices at different electrical potentials, means for circulating a cooling agent for cooling the electrically conductive devices, control electrodes in contact with the cooling agent, means for connecting the control electrodes with predetermined ones of said electrically conductive devices such that the greatest potential difference between the electrically conductive devices drops at the control electrodes to avoid corrosion effects at the electrically conductive devices, said control electrodes essentially possessing the same potential as the electrically conductive devices having the greatest potential difference with which said control electrodes are connected, means for connecting the remaining electrically conductive devices between the control electrodes parallel to said electrically conductive devices having the greatest potential difference and at equipotential points relative to their own potential.

4,051,510
HUE CORRECTION APPARATUS CONTROLLED BY CHROMINANCE SATURATION
Larry Allen Cochran, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.
Filed May 5, 1976, Ser. No. 683,391
Int. Cl.² H04N *9/535*
U.S. Cl. 358—28 **11 Claims**



1. In a system for processing color television signals including chrominance signals having a phase representative of hue and an amplitude representative of saturation of colors present in a scene, said television signals further including a reference subcarrier signal having a nominal phase relative to said chrominance signals, hue correction apparatus comprising:
means having at least a first input responsive to said reference subcarrier signal and at least a second input responsive to said chrominance signals for providing a gating signal representative of a phase relationship between said chrominance signals and chrominance signals representative of flesh tones as determined by the nominal phase of said reference subcarrier;
signal modulating means responsive to said chrominance signals and to said gating signal for passing a selected amplitude portion of said chrominance signals;
signal combining means responsive to said reference subcarrier signal and to said selected amplitude portion of said chrominance signals for providing a corrected reference subcarrier having a phase modified towards the phase of said chrominance signals according to said selected amplitude portion of said chrominance signals; and
control means responsive to the amplitude of said chrominance signals for providing a control signal for reducing the amplitude of said selected amplitude portion of said chrominance signals so as to reduce the correction of said reference subcarrier phase in the presence of chrominance signals having an amplitude representative of relatively saturated colors.

4,051,511
SYSTEM FOR AUTOMATIC COLOR BALANCE CORRECTION
Dieter Poetsch, Ober Ramstadt, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany
Continuation-in-part of Ser. No. 620,409, Oct. 7, 1975. This application Sept. 24, 1976, Ser. No. 726,144
Claims priority, application Germany, Sept. 11, 1974, 2448505; Sept. 27, 1975, 2543236
Int. Cl.² H04N *9/535*
U.S. Cl. 358—29 **4 Claims**

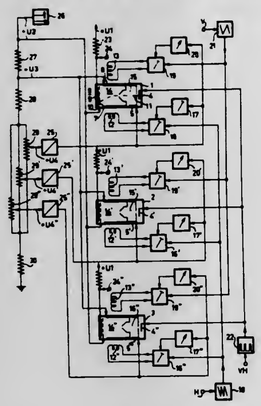


1. In a system for automatic correction of the color balance of signals that control color and luminosity of a color television picture, in which system, when a prespecified luminosity gradation in the color television picture is detected and when at the same time the chroma-saturation is below a prespecified chroma-saturation threshold, a chromaticity of the television picture prevailing at this moment is stored, so as to derive, as a function of the stored chromaticity, control signals for regulating a color-correction device in such a way that a chromatic aberration in the color balance of the signals that control color and luminosity of a color television picture is reduced, the improvement comprising: integrator means operative at one time constant when said prespecified luminosity gradation in the color television picture is detected to up-integrate color difference signals, and operative at a different time constant when any luminosity other than said prespecified luminosity gradation is detected to down integrate in response to a different input signal.

4,051,512
COLOR TELEVISION CAMERA HAVING AT LEAST TWO PICK-UP TUBES
Johannes Hendrikus Theodorus van Roosmalen, and Pieter Zuidhof, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 31, 1976, Ser. No. 672,231
Claims priority, application Netherlands, Apr. 10, 1975, 7504250
Int. Cl.² H04N *9/09*
U.S. Cl. 358—51 **7 Claims**

1. A color television camera circuit for use with a plurality of camera pick-up tubes each of said tubes having electro-magnetic deflection means for line and field deflection and electrostatic focusing means for a raster scanned electron beam, said deflection and focusing means providing a substantially spatially removed action for deflection and focusing within each tube, said circuit comprising line and field deflection circuits adapted to be coupled to said deflection means respectively, each of said deflection circuits comprising a deflection stage means for adjusting the raster registration of said respective tubes, a plurality of focusing circuits adapted to be coupled to

said focusing means respectively, a voltage source, and a plurality of voltage setting stages for each of said tubes coupled



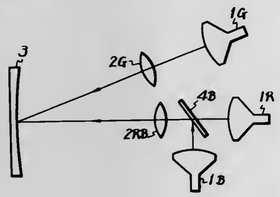
between said source and the focusing means and deflection circuits for each tube respectively.

4,051,513

COLOR IMAGE PROJECTING APPARATUS

Kouichi Takeuchi, Kamakura; Norio Itoh, Tokyo; Kuniyoshi Koyama, Chofu; Satoshi Shimada, Yokohama, and Masami Hinaro, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 5, 1976, Ser. No. 664,256
Claims priority, application Japan, Mar. 12, 1975, 50-29710
Int. Cl.² G03B *21/00*
U.S. Cl. 358—60 **6 Claims**



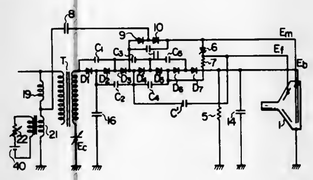
1. A color image projecting apparatus comprising: a first cathode ray tube for producing a first primary color image; first projecting lens means disposed in front of said first cathode ray tube and arranged to project said image along a first optical axis onto a screen; a second cathode ray tube for producing a second primary color image; a third cathode ray tube for producing a third primary color image and disposed at right angles to said second cathode ray tube; a dichroic mirror disposed in front of said second and third cathode ray tubes to receive said images in said second and third primary colors and synthesize therefrom a two color image; and second projecting lens means disposed to receive said two color image and project said two color image along a second optical axis intersecting said first optical axis at an acute angle at said screen, said two color image conforming in shape to said first primary color image projecting on said screen.

4,051,514

HIGH-VOLTAGE CIRCUIT FOR POST FOCUSING TYPE COLOR PICTURE TUBE

Nobuyuki Suzuki, and Toyotaro Nishihara, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed July 29, 1974, Ser. No. 492,926
Claims priority, application Japan, July 31, 1973, 48-85385
Int. Cl.² H04N *9/20*; H01J *29/08*
U.S. Cl. 358—65 **28 Claims**



1. A high voltage circuit for generating a plurality of high voltages of different values for a color picture tube of post focusing type, comprising:

a fly-back transformer including a first resonance circuit having such a parasitic constant as to be tuned to a higher harmonic with a frequency which is an odd number times as high as the fundamental frequency of fly-back pulses, said odd number being not less than 7;

a voltage-multiplying rectifier circuit with multiple stages connected to a secondary winding of said fly-back transformer and having an output terminal at the final stage thereof and another output terminal at an intermediate stage thereof, said voltage-multiplying rectifier circuit further including a plurality of rectifier elements and a plurality of capacitor elements;

a voltage stabilizing element and a resistor both connected in series between an output terminal of the *m*-th stage and another output terminal of a higher middle stage of said multiple-stage voltage-multiplying rectifier circuit; and

means for collecting a third high voltage from the junction point of said voltage stabilizing element and said resistor.

4,051,515

COLOR VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS PROVIDING PREFERENTIAL DROPOUT COMPENSATION AND TIME BASE ERROR CORRECTION

Lenard M. Metzger, and William Kelsey Hickok, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

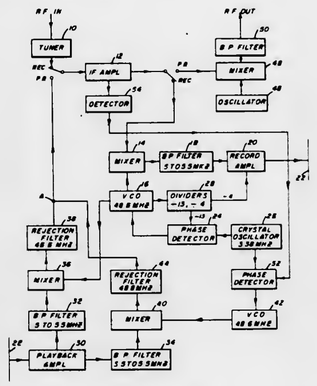
Filed Apr. 15, 1976, Ser. No. 677,101
Int. Cl.² H04N *5/76*
U.S. Cl. 358—8 **5 Claims**

1. Apparatus for processing a carrier-supported television signal for recording on a record medium, the carrier-supported televison signal comprised of video signal information residing on a video carrier and audio signal information residing on an audio carrier, the audio carrier being situated at a higher frequency than the video carrier, said apparatus comprising:

a. means for receiving the carrier-supported television signal having a format such that the audio carrier is at a higher frequency than the video carrier;

b. an even-numbered plurality of mixers for successively frequency converting the carrier-supported television signal so that the frequency of the video carrier after

mixing remains, frequency-wise, below the frequency of the audio carrier; and



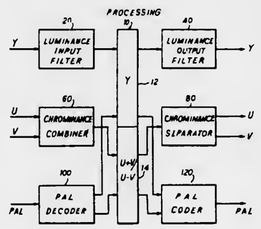
c. means for receiving the successively frequency converted television signal and for recording the successively frequency converted televison signal on a record medium.

4,051,516

DIGITAL PROCESSING OF PAL COLOR TELEVISION SIGNALS IN THE FORM OF A Y SIGNAL AND A COMPOSITE U+V/U−V SIGNAL

Martin Weston, Epsom, England, assignor to The Marconi Co. Ltd. and Standard Telephones and Cables Ltd., both of London, England

Filed Dec. 23, 1975, Ser. No. 643,800
Claims priority, application United Kingdom, Dec. 30, 1974, 56049/74
Int. Cl.² H04N *9/32, 9/39*
U.S. Cl. 358—11 **18 Claims**



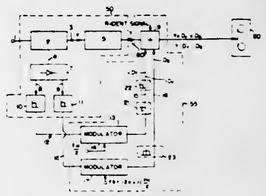
1. Apparatus for generating digital PAL chrominance signals, the apparatus including input means for receiving television signals comprising chroma signals U and V of PAL type, combining means coupled to the input means and operative to form the sum U + V of the signals U and V on one television line and their difference U − V on the next, and digitising means for digitising the signals with a sampling frequency substantially equal to the PAL colour subcarrier frequency.

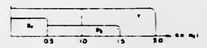
4,051,517

HYBRID SEQUENTIAL AND CARRIER ENCODED COLOR TELEVISION TRANSMISSION METHOD AND CIRCUITS

Bernhard A. Hjortzberg, Mission Viejo, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation-in-part of Ser. No. 515,148, Oct. 16, 1974, abandoned. This application Apr. 25, 1975, Ser. No. 571,706
Int. Cl.² H04N *9/36*
U.S. Cl. 358—15 **5 Claims**





4. An apparatus for processing of a color video signal comprising:

a. means for separating the luminance information of the color video signal from the chrominance information of the color video signal;

b. means for demodulating the chrominance information into a first chrominance signal and a second chrominance signal; and

c. means for processing the luminance information, first chrominance signal, and second chrominance signal to form a line-sequentially encoded signal in which one half the sum of two successive horizontal scan lines of the encoded signal equaling the luminance information of the color video signal alternates with one half of the difference of the two successive horizontal scan lines of the encoded signal equaling the chrominance information of the color video signal;

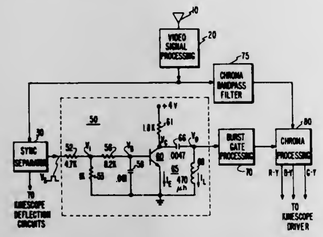
wherein said chrominance information is represented by a first chrominance signal and a second chrominance signal which are contained in two non-overlapping frequency regions; and

wherein the means for processing the luminance information, first chrominance signal, and second chrominance signal to form said encoded signal further comprises means for amplitude modulating a first suppressed carrier in dependence on one of said first and second chrominance signals, the frequency of said first suppressed carrier being an odd multiple of the video horizontal scan line frequency, means for combining the other of said first and second chrominance signals with said first amplitude modulated suppressed carrier, means for amplitude modulating a second suppressed carrier by the signal representing the combination of said other chrominance signal and said first amplitude modulated suppressed carrier, the frequency of said second carrier being an odd multiple of one half of the video horizontal scan frequency, and means for combining said luminance information of said color video signal with said second amplitude modulated suppressed carrier, thereby producing said encoded signal.

4,051,518
BURST GATE PULSE GENERATOR

Gene Karl Sendelweck, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 661,855
Int. Cl.² H04N 9/46
U.S. Cl. 358—20 10 Claims



1. Apparatus for generating a burst gate pulse suitable for use in processing color information contained in a chrominance component of a color television video signal also having a horizontal synchronizing component and a color reference burst component occurring during a burst interval, said apparatus comprising:

a source of operating potential;

input means for providing a pulse representative of said horizontal synchronizing component;

transistor switch means having an inverse current conduction characteristic and an input electrode coupled to said input means, an output electrode coupled to said source of operating potential, and a common electrode, said output and common electrodes defining a main current conduction path therebetween; and

resonant circuit means comprising at least an inductance and a first capacitance, coupled across said main current conduction path of said transistor switch means and having a predetermined first time constant, said resonant circuit means being excited into ringing when said transistor switch means conducts in response to said pulse to produce a ringing waveform with a period determined by said first time constant and with a duration determined by current conduction of said transistor, wherein said resonant circuit means coacts with said inverse conduction characteristic of said transistor to render said transistor non-conductive prior to exceeding a first full cycle of said waveform, to inhibit amplitude excursions of said waveform beyond said first full cycle and to provide said waveform with an output pulse corresponding to a first full half cycle of one polarity of said waveform and coincident with said burst interval.

4,051,519
PHASE CONTROL CIRCUIT SUITABLE FOR USE IN A TINT CONTROL STAGE OF A COLOR TELEVISION SYSTEM

Leopold Albert Harwood, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,820
Int. Cl.² H04N 9/535
U.S. Cl. 358—21 22 Claims

1. A controllable phase shifting circuit comprising:

a source of first alternating signals;

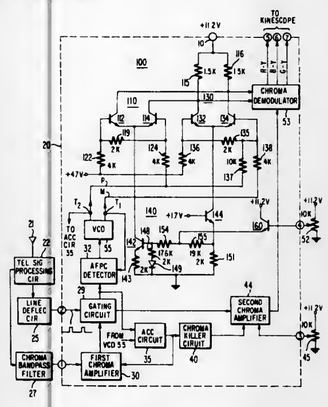
a source of second alternating signals in predetermined phase relation with said first signals;

first amplifier means having a signal input coupled to said source of first signals, and a gain control input;

second amplifier means having a signal input coupled to said source of second signals, and a gain control input;

circuit means coupled from said second source of signals to said signal input of said first amplifying means for developing a third alternating signal at said last-named input with a magnitude proportional to and a phase in predetermined relation with that of said second alternating signals;

gain control means having first and second gain control signal outputs respectively coupled to separate ones of said gain control inputs of said first and second amplifier means for controlling the signal gains thereof in complementary fashion; and

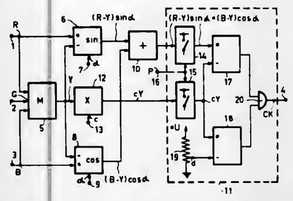


combining means for summing output signals from said first and second amplifier means to produce a resultant output signal with a phase within a range of phases between that of alternating signals applied to said signal input of said first amplifier means and that of alternating signals applied to said signal input of said second amplifier means, the phase of said resultant output signal being controlled in response to said gain control means.

4,051,520
COLOR TELEVISION CHROMA KEYING SIGNAL GENERATOR

Jan Davidse, Rotterdam, and Rudolf P. Koppe, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 9, 1976, Ser. No. 712,947
Claims priority, application Netherlands, Aug. 20, 1975, 7509871
Int. Cl.² H04N 9/535
U.S. Cl. 358—22 6 Claims

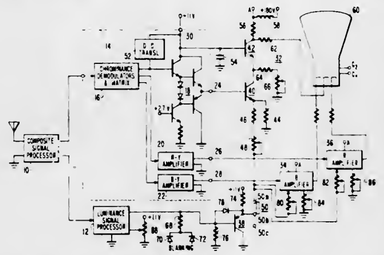


1. A colour television chroma keying signal generator comprising a matrix circuit means for supplying to an output a colour signal combination of colour signals supplied to inputs thereof, two signal combination and multiplication circuits coupled to the matrix circuit output, each having an adjustable multiplication factor and output means for providing colour difference signals, a signal adder circuit means coupled to said output means for forming a composite colour difference signal, and a chromaticity signal operated threshold circuit means coupled to the adder circuit for supplying a chroma keying signal to an output of the generator.

4,051,521
VIDEO AMPLIFIER FOR COMBINING LUMINANCE AND CHROMINANCE SIGNALS

Leopold Albert Harwood, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 30, 1976, Ser. No. 728,171
Int. Cl.² H04N 9/52
U.S. Cl. 358—30 11 Claims



1. In a color television receiver, a video amplifier circuit for combining chrominance and luminance signal components and for supplying resultant color representative signals to an image reproducing device comprising:

means, having at least first and second terminals, for providing a direct operating voltage;

chrominance signal amplifying means comprising at least one amplifier section including a load circuit, first and second semiconductor devices of a first conductivity type, each having a control electrode and a main current conduction path associated with said control electrode, said conduction paths of said first and second devices and said load circuit being direct current coupled in series relation to said first terminal, and means for coupling a source of direct bias voltage less than said operating voltage to said control electrode of said second device;

luminance signal amplifying means comprising a third semiconductor device of a second conductivity type arranged in a voltage follower configuration and having a main current conduction path direct current coupled to said second terminal and a control electrode associated with said path;

a source of chrominance signals;

a source of luminance signals;

means for direct current coupling said chrominance signals to said control electrode of said first device such that said first and second devices operate as a cascode amplifier for said chrominance signals;

means for direct current coupling said luminance signals to said control electrode of said third device;

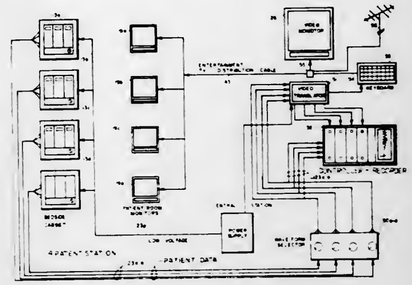
means for direct current coupling said main current conduction paths of said first, second and third devices in series relation with said load circuit between said first and second terminals such that a combination of chrominance signals, luminance signals and associated direct current components is produced in said main current paths of said first and second devices; and

means for direct current coupling output signals from said load circuit to said image reproducing device, whereby amplified color representative signals including direct current components are provided to said image reproducing device.

4,051,522
PATIENT MONITORING SYSTEM

James W. Healy, Malibu, and Bob L. Currier, Gardena, both of Calif., assignors to Jonathan Systems, Los Angeles, Calif.

Filed May 5, 1975, Ser. No. 574,315
Int. Cl.² H04N 7/18
U.S. Cl. 358—86 5 Claims



1. A patient monitoring system comprising a central control console including:

a. a power supply;

b. a controller for establishing alarm limits for patient data;

c. a video translator for converting patient analog date into video traces representative of the analog values thereof;

d. keyboard means for generating alpha numeric data;

e. means for combining alpha numeric data with said video traces of patient analog data;

f. means for introducing said combined data into a television distribution medium;

at least one patient station including means connectable to patient sensor for amplifying a patient parameter sensor to a predetermined level;

said amplifying means powered by said power supply of said central control console;

means conducting said amplified parameter to said central control console;

wherein said video translator includes means for storing analog patient data for a selected period of time and for introducing said data into said distribution system at the end thereof; and

wherein said video translator includes means for establishing a WRITE and an ERASE cycle, including switch means for temporarily terminating the WRITE and ERASE cycle of said video translator and for enabling said recorder to record the analog data stored in said video translator.

4,051,523
SUBMERSIBLE CAMERA

Milton Laikin, Los Angeles, and George L. Hatchett, El Cajon, both of Calif., assignors to Hydro Products, Inc., San Diego, Calif.

Filed July 3, 1975, Ser. No. 593,116
Int. Cl.² H01J 29/89
U.S. Cl. 358—99 7 Claims

1. A camera which includes:

a housing;

a transparent closure at one end of said housing;

an image pick-up tube within said housing;

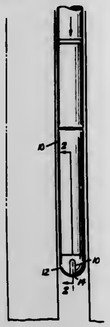
a lens within said housing positioned with its field of view extending through said transparent closure, adapted to form an image on said pick-up tube;

means for rotating said lens about a scan axis so that its field of view will sweep from side to side, the plane in which said lens rotates passing through the axis of said housing;

an optical joint rotatable about said scan axis to transmit said image from said lens toward said image pick-up tube;

image rotating means adapted to rotate said image on said

pick-up tube and in a plane perpendicular to the plane of rotation of said lens; and



motor means operable to rotate said lens about said scan axis and simultaneously to rotate said image rotating means.

4,051,524

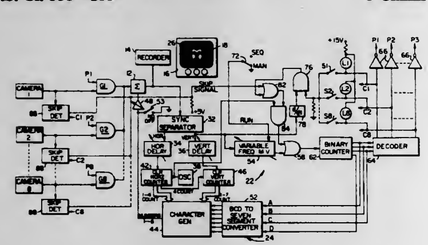
SEQUENTIAL VIDEO SWITCHING SYSTEM

Larry K. Baxter, Lexington, Mass., assignor to QSI Systems, Inc., West Newton, Mass.

Continuation of Ser. No. 535,909, Jan. 24, 1975. This application May 7, 1976, Ser. No. 684,145

Int. Cl.² H04M *7/18*

U.S. Cl. 358—108 **5 Claims**



1. A video surveillance system comprising

A. two or more video cameras, each camera generating a video signal corresponding to the scene viewed by that camera,

B. means responsive to the video signals for reproducing the scenes viewed by the cameras,

C. counter means for generating a sequence of counter signals, each signal corresponding to one of said video cameras,

D. switching means connected between the cameras and the reproducing means for automatically applying the video signals from the cameras to the reproducing means in response to the counter signals for a selected time interval and in a selected sequence so that the reproducing means can reproduce the scenes viewed by said cameras during said time intervals and in said sequence,

E. means for generating, in response to the counter signals, video signals representing the characters identifying the respective video cameras, and

G. means whereby the reproducing means reproduce the camera identifying characters at a selected location in the reproduced scene.

4,051,525

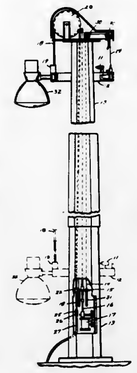
RAISABLE AND LOWERABLE SURVEILLANCE CAMERA ASSEMBLY

Daniel L. Kelly, Flushing, Mich., assignor to Anderson Safeway Guard Rail Corporation, Flint, Mich.

Filed May 17, 1976, Ser. No. 687,025

Int. Cl.² H04N *5/26*

U.S. Cl. 358—108 **3 Claims**



1. In surveillance camera assembly for use with raisable and lowerable support platforms provided on high mast or pole shafts, the combination including:

a surveillance camera adapted for mounting on a raisable and lowerable support platform provided on a pole shaft;

a coaxial power and control cable operatively connected to said surveillance camera, said coaxial power and control cable in rollable engagement with a sheave member positioned at the top of the pole shaft, said coaxial cable fixedly attached to a transition plate fixedly provided on a raising and lowering drive cable within the pole shaft; and

an electrical connector plug provided at the terminal end of said coaxial cable positioned below said transition plate, said electrical connector plug adapted to selectively engage a corresponding ground-mounted coaxial cable positioned at the base of the pole shaft.

4,051,526

TELEVISION SYSTEM COMPRISING A VIDEO STORAGE DEVICE AND A TELEVISION RECEIVER

Wolfgang Otto Gotthard Steinkopf, Eindhoven, Netherlands, and Rudolf Drabek, Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

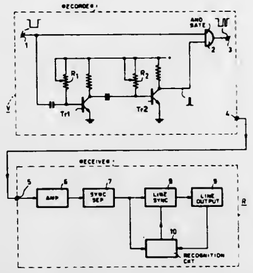
Filed July 3, 1975, Ser. No. 592,866

Claims priority, application Netherlands, July 15, 1974, 7409514

Int. Cl.² G11B *5/02*

U.S. Cl. 358—127 **3 Claims**

1. A television receiver for use with both a standard television signal and a recorded television signal from a player that adds an identification signal, said receiver comprising a switchable circuit, means for recognizing said identification signal, and means for switching said switchable circuit in response to said reconizing means when said recognizing means recognizes said identification signal.



4,051,527

FOCUS DETECTION SYSTEM FOR A VIDEO DISC PLAYER USING A PLURALITY OF RADIATION SENSORS IN THE FAR FIELD OF THE INFORMATION STRUCTURE

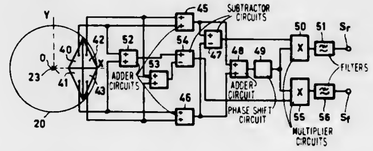
Josephus Johannes Maria Braat, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 23, 1976, Ser. No. 669,641

Claims priority, application Netherlands, Jan. 28, 1976, 7600843

Int. Cl.² H04N *5/76*; G11B *7/12*

U.S. Cl. 358—128 **11 Claims**



1. Apparatus for reading a record carrier on which information is stored in an optically readable track-shaped information structure, said apparatus comprising a radiation source; a radiation-sensitive information signal detector; objective system means for directing a radiation beam from said radiation source to a spot on the information structure of the record carrier and for thereafter directing said radiation from said record carrier to said radiation-sensitive information signal detector; means for relatively moving said record carrier and said radiation spot; and a focus error detection system comprising two radiation-sensitive focus signal detectors disposed in the far field of the information structure at one side of a plane defined by the optical axis of the objective system means and a line normal to the center line of the track portion on which said radiation is directed, said detectors being disposed symmetrically relative to a line effectively extending transversely to the track direction, a subtraction circuit having inputs connected to said two focus signal detectors, an adder circuit connected to said two focus signal detectors, a multiplier circuit, shift circuit means for connecting outputs of said adder circuit and said subtraction circuit to said multiplier circuit and for relatively phase shifting the outputs of said adder circuit and said subtraction circuit, and filter circuit means connected to the output of said multiplier circuit for transmitting only frequencies lower than a frequency corresponding to twice the average spatial frequency of the information structure in the track direction multiplied by the relative velocity of the radiation spot and the record carrier in the track direction, a focus signal being thereby provided from an output of said filter circuit means.

4,051,528

APPARATUS FOR OPTICALLY RECONSTRUCTING INFORMATION

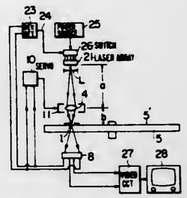
Yasutsugu Takeda, Tokorozawa; Hiroshi Nakamura, Tokyo; Yoshito Tsunoda, Mitaka; Toshihisa Tsukada, Tokyo, and Toshimitsu Miyauchi, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 26, 1976, Ser. No. 661,806

Claims priority, application Japan, Feb. 26, 1975, 50-22878

Int. Cl.² H04N *5/86*

U.S. Cl. 358—128 **12 Claims**



1. In an apparatus for optically reconstructing information provided on a disc on which a plurality of information bearing dots are arrayed in at least one track, including means to rotate said disc, a light source capable of projecting a beam onto the plurality of dots, and a photodetector which detects diffracted light waves from the plurality of dots, the improvement beng characterized in that said light source comprises an array formed of a plurality of semiconductor light emitting elements which can be driven independently and said photodetector comprises at least one set of light detecting elements capable of detectng a deviation of said beam from the tracks of dots, and further including driving means responsive to said photodetector for individually driving selected light emitting elements in said array to effect a tracking of said array of dots by said light source.

4,051,529

FOCUS CONTROL SYSTEM WITH MOVABLE MIRROR

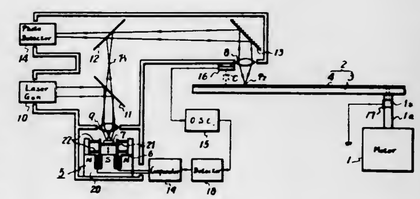
Seari Miyaoka, Zushi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 15, 1976, Ser. No. 696,830

Claims priority, application Japan, June 19, 1975, 50-74659

Int. Cl.² H04N *5/76*; G11B *7/12*

U.S. Cl. 358—128 **12 Claims**



1. A focus control system for an optical record carrier having a reflective surface, said system comprising:

a. a light beam source;

b. first lens means disposed facing said reflective surface and spaced therefrom along a first optical path section for focusing a light beam from said light beam from source on said reflective surface;

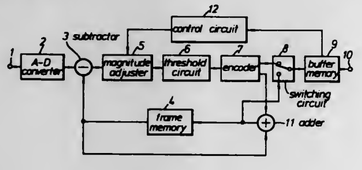
c. a movable mirror;

d. second lens means disposed facing said movable mirror and spaced therefrom along a second optical path section;
e. means for directing an incident light beam from said light beam source onto said movable mirror through said second lens means;
f. means for directing a light beam reflected from said movable mirror through said second lens means to said reflective surface of said carrier through said first lens means; and
g. means for driving said movable mirror so that the distance between said movable mirror and said second lens means along said second optical path section is controlled in response to the distance between said reflective surface of said carrier and said first lens means along said first optical path section, whereby said directed light beam to said reflective surface remains focused on said reflective surface in spite of fluctuations of said reflective surface.

4,051,530
FRAME-TO-FRAME CODING SYSTEM

Hideo Kuroda, Kodaira, and Fumio Kanaya, Seki, both of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Oct. 20, 1975, Ser. No. 624,021
Claims priority, application Japan, Oct. 21, 1974, 49-121165; Nov. 18, 1974, 49-132016
Int. Cl.² H04N 7/12
U.S. Cl. 358—136 **10 Claims**

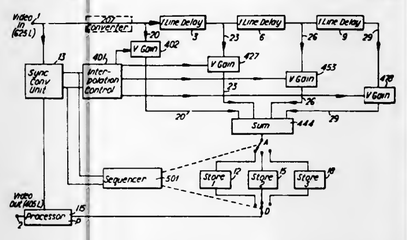


1. An interframe coding system comprising:
a subtracter for outputting a difference signal between an input signal and an output from a frame memory;
a magnitude adjuster connected with the output of the subtracter for controlling the magnitude of the difference signal;
an encoder connected with the output of the magnitude adjuster for quantizing the output therefrom to output a code having a smaller number of bits than that of the difference signal, and including means for converting the code into a representative level output signal having the same number of bits as that of the difference signal and indicative of a quantization level;
an adder connected with the output of the encoder for adding together the representative level output signal and the output from the frame memory;
the frame memory being connected with the output of the adder for delaying its output by one frame of the input signal;
a combination of a synchronizing signal generator and an address generator for deriving from the input signal a synchronizing signal and an address signal for defining the position of the output code of the encoder on the frame;
a buffer memory connected with the output of the encoder for receiving the code output therefrom and the outputs from the synchronizing signal generator and the address generator, which are written into the buffer memory and read out therefrom as code signals of a uniform bit rate; and
a controller for monitoring the occupancy of the buffer memory to thereby control the magnitude adjuster in accordance with the occupancy so as to prevent an overflow of the buffer memory.

4,051,531
TELEVISION SYSTEMS

John Lewis Edwin Baldwin, Croydon, England, assignor to Independent Broadcasting Authority, Great Britain

Division of Ser. No. 126,538, March 22, 1971, Pat. No. 3,742,135. This application June 4, 1973, Ser. No. 366,595
Claims priority, application United Kingdom, Mar. 26, 1970, 14976/70
The portion of the term of this patent subsequent to June 26, 1990, has been disclaimed.
Int. Cl.² H04N 5/00
U.S. Cl. 358—140 **2 Claims**

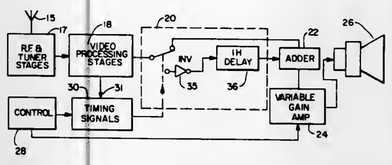


1. An apparatus for the processing of digitized input signals of high bit rate which comprises storage elements arranged to provide *n* similar paths, means operable to distribute the digitized signal between said paths and write them in the storage elements thereof so that the bit rate within a single path is one *n*th of said high bit rate and the total bit rate of the writing is said high bit rate, means for reading out the signals from the storage elements to provide *n* digital outputs, one from each path, and means for combining the *n* digital outputs to provide a delayed replica of the digitized input signals having said high bit rate.

4,051,532
AUXILIARY SIGNAL PROCESSING CIRCUIT FOR TELEVISION RECEIVERS

Francis H. Hilbert, Addison, and Theodore S. Rzeszewski, Lombard, both of Ill., assignors to Matsushita Electric Company of America, Franklin Park, Ill.

Filed June 19, 1975, Ser. No. 588,250
Int. Cl.² H04N 7/08
U.S. Cl. 358—142 **8 Claims**

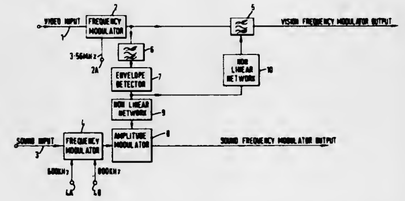


1. A television receiver for selectively displaying conventional television signals and auxiliary television signals on the cathode ray tube thereof, wherein the conventional television signals comprise a composite signal containing at least video information and horizontal and vertical synchronizing signal components, and said auxiliary signal components comprise alternating signal portions containing opposite-polarity, redundant information during successive ones of the signal portions thereof, said receiver including in combination:
means for simultaneously processing a combined signal comprising said conventional signals and said auxiliary signal components for producing a video signal to be displayed on the cathode ray tube of the receiver wherein the redundant and opposite polarity portions of said auxiliary signal are substantially visually cancelled from the display on said cathode ray tube;
selectively operated switching circuit means responsive to at least some of the synchronizing signal components of the composite television signal for processing said combined signal to cause the redundant auxiliary signal portions to be visually reinforced so that the auxiliary signal components are reproduced on said cathode ray tube; and
control means for selectively initiating operation of said switching circuit means.

4,051,533
SIGNAL PROCESSOR FOR REDUCING INTERFERENCE BETWEEN FREQUENCY-MODULATED SIGNALS

Frank Anthony Griffiths, 105 Hillcroft Crescent, Oxhey, Hertfordshire, England

Filed Sept. 21, 1976, Ser. No. 725,281
Claims priority, application United Kingdom, Sept. 24, 1975, 39195/75
Int. Cl.² H04N 7/06; H04B 15/00
U.S. Cl. 358—167 **6 Claims**

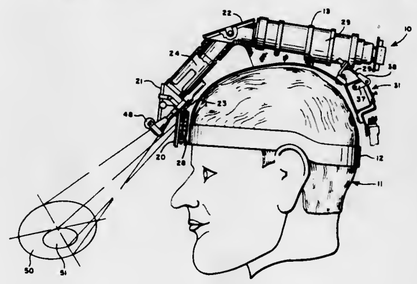


1. A method of reducing the interference between a primary frequency-modulated carrier signal and a secondary frequency-modulated carrier signal, comprising both increasing the amplitude of the secondary frequency-modulated carrier signal and decreasing at least those sideband components of the primary carrier signal in the region of the secondary carrier signal as those sideband components tend to increase to interfere with the secondary carrier signal.

4,051,534
HEAD ATTACHED TELEVISION

Peter P. Dukich, Blaine; Isaac W. Metzger, Robbinsdale, and John A. Volk, West St. Paul, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 27, 1976, Ser. No. 735,934
Int. Cl.² H04N 5/30
U.S. Cl. 358—210 **4 Claims**

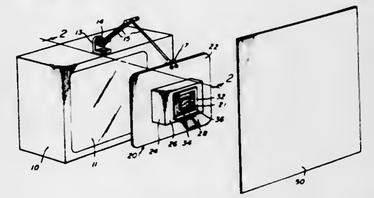


1. In a remotely controlled head-mounted visual apparatus for viewing manual operations carried on by the wearer, said apparatus including camera means for generating signals representative of a visual image received, aiming and focusing means for said camera means, remote control means for controlling said aiming and focusing means, means for reconverting said signals to reproduce said visual image, means for transmitting said signals from said camera means to said means for reconverting, real-time viewing means for viewing said reconverted image, and mounting means for mounting said camera, aiming and focusing means on the head of said wearer, the improvement comprising:
forward directed illumination means fixed on said head-mounted apparatus in a manner such that the location of the field lighted thereby is determined locally by the attitude of the head of said wearer.

4,051,535
MAGNIFICATION OF TELEVISION IMAGES

James M. Inglis, 24 Cotton Ave., Braintree, Mass. 02184

Filed Apr. 9, 1976, Ser. No. 675,603
Int. Cl.² H04N 5/72
U.S. Cl. 358—231 **10 Claims**



1. A system for magnifying a television image comprising:
a fresnel lens of focal length up to 10 inches,
an enclosure fitting all around the circumference of said lens and extending in a direction parallel to the optical axis of the lens,
a means defining an aperture in the end of said enclosure away from said lens,
a means for intercepting light arranged in combination with said lens so that if a television image source is placed on the side of the lens opposite to the direction in which said enclosure extends, substantially along the optical axis of the lens and within 18 inches of the lens, substantially all light emitted from said source and not passing through said lens will be intercepted,
the distance between said lens and said aperture being between 20% and 50% of said focal length, and
the area of said aperture being between 25% and 50% of the area of said lens.

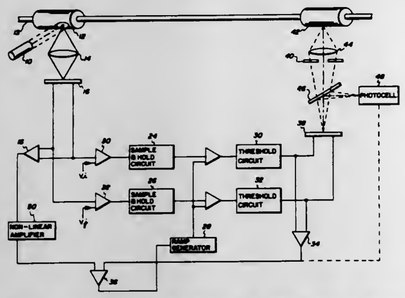
4,051,536
ELECTRONIC HALFTONE IMAGING SYSTEM

Paul G. Roetling, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 14, 1975, Ser. No. 558,594
Int. Cl.² H04N 1/22
U.S. Cl. 358—298 **12 Claims**

1. A method for creating on a light sensitive recording medium a halftone reproduction of an original image comprising the steps of:
a. providing an electronic signal representing the average gray scale of said original image over a halftone dot period;
b. providing a plurality of electronic signals representing details of said original image over said halftone dot period;
c. providing a halftone screen function in electronic form;
d. combining said halftone screen signals of (c) with said original image signals of (b) to provide a plurality of sum functions; and

e. dynamically adjusting the threshold for each of said sum functions so as to match the average gray scale of the



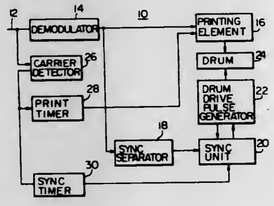
original image over a halftone dot period with the sum function for the corresponding halftone dot period.

4,051,537

FACSIMILE RECEIVING APPARATUS

Mitsuru Kondoh, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed July 27, 1976, Ser. No. 709,019
Claims priority, application Japan, July 31, 1975, 50-93815
Int. Cl.² H04N *1/36*
U.S. Cl. 358—264 **6 Claims**



1. A facsimile receiving apparatus responsive to a synchronization signal and a picture signal for reproducing a picture corresponding to the picture signal, the synchronization signal being produced for a first predetermined length of the time followed by the picture signal, the apparatus comprising:

printing means including printing element means responsive to the picture signal and scan drive means;

synchronization means responsive to the synchronization signal for synchronizing the scan drive means in accordance therewith;

synchronization timing means responsive to initiation of the synchronization signal and connected to enable the synchronization means to receive the synchronization signal only for a second predetermined length of time between said initiation of the synchronization signal and termination thereof, the second predetermined length of time being shorter than the first predetermined length of time; and

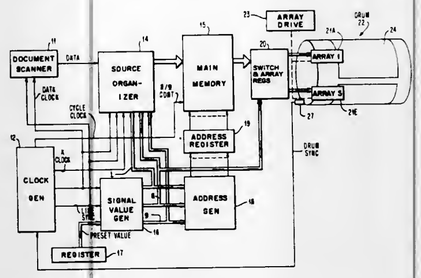
print timing means responsive to said initiation of the synchronization signal and connected to enable the printing element means to receive the picture signal only after a third predetermined length of time after said initiation of the synchronization signal.

4,051,538

INK JET COPIER

Sidney Jared Fox; Van Clifton Martin, and Danny Allen Van Hook, all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1976, Ser. No. 700,632
Int. Cl.² H04N *1/22*
U.S. Cl. 358—296 **6 Claims**



1. An array copier comprising:

first means for providing a serial digital data stream corresponding to lines of video information of an image to be reproduced;

second means for supporting a medium for receiving the image and including a positionable array of printing elements in juxtaposition said medium support and for providing a synchronizing signal indicative of the relative position of said array and medium support;

clock means responsive to said synchronizing signal from said second means for providing first control signals;

a first control signal generator responsive to said first control signals for providing second control signals corresponding to positional information relative to said serial digital data stream;

a source organizer responsive to said first and second control signals for receiving and storing said serial digital data stream in predetermined storage locations under control of said first control signals and for supplying said stored data signals from different predetermined storage locations under control of said first and second control signals;

random access memory means responsive to the said first and second control signals for alternately reading the data signals stored in addressable memory locations predetermined by the said first and second control signals and providing the said signals to the array of printing elements included in the said second means for controlling the state of the said printing elements and for storing the data signals supplied by the said source organizer in addressable memory locations predetermined by the said first and second control signals;

third means for translating said array with respect to the medium support in a first direction; and

fourth means for translating said array with respect to the medium support in a second direction substantially orthogonal to the first direction N print resolution elements in a single complete scan of the array and medium support in the said first direction.

4,051,539

DIFFERENTIAL DURATION DEMULTIPLEXING METHOD AND SYSTEM

Leslie A. Geddes, and Joe D. Bourland, both of W. Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

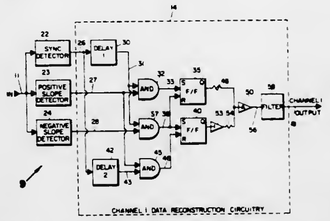
Filed Apr. 30, 1976, Ser. No. 681,832
Int. Cl.² G11B *5/02*
U.S. Cl. 360—44 **5 Claims**

1. A method for demultiplexing a pulse train signal reflecting

data encoded through utilization of a time variable technique, said method comprising:

receiving said pulse train signal;

determining through the use of gating and a first multivibrator the time of presence of a pulse in a predetermined portion of said pulse train and providing an output indicative thereof from the first multivibrator;



determining through the use of gating and a second multivibrator the time of absence of a pulse in said predetermined portion of said pulse train and providing an output indicative thereof from the second multivibrator;

comparing the determined time of presence with the determined time of absence of said pulse by comparing the outputs from said first and second multivibrators; and

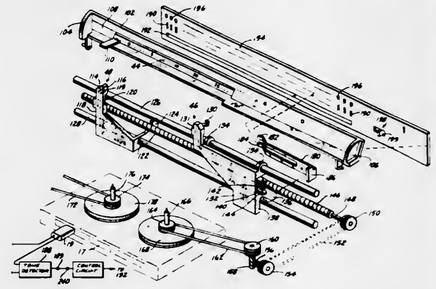
providing an output signal based upon said comparison that is indicative of said data carried by said pulse train signal.

4,051,540

INSTRUCTION INDICATING APPARATUS FOR A RECORD AND/OR PLAYBACK DEVICE

Leslie N. Wilder, New Rochelle, N.Y.; James C. Whitney, Fairfield, Conn., and Gary Matison, Tempe, Ariz., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Apr. 20, 1976, Ser. No. 678,697
Int. Cl.² G11B *15/18*
U.S. Cl. 360—72 **13 Claims**



1. Apparatus for indicating the location of particular information on a previously recorded record medium, said particular information being represented by predetermined recorded signals, comprising:

scanning means for scanning said record medium;

an array of selectively actuable light emitting sources;

indexing means for scanning said array of light emitting sources in synchronism with the scanning of said record medium, said indexing means being in actuating relation sequentially with each of said light emitting sources;

detecting means for detecting the presence of said predetermined recorded signals during the scanning of said record medium to produce an actuating signal; and

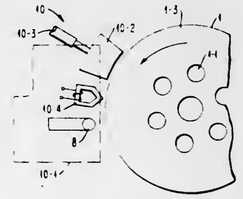
temporary storage means for temporarily storing said actuating signal until said indexing means is in actuating relation with an unenergized light emitting source to energize said light emitting source.

4,051,541

ACCESS TO FLOPPY DISK STACK

Bernard William McGinnis, and James Amos Weidenhammer, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,792
Int. Cl.² G11B *5/60, 5/82, 25/04*
U.S. Cl. 360—98 **16 Claims**



1. In a mass storage flexible disk file containing multiple flexible storage disks rotating coaxially in a spaced stack configuration, said stack receiving ventilation fluid internally to replenish ambient fluid expelled from between said disks by centrifugal action, the pressure of said received fluid being variable to cause storage surfaces of said disks to rotate alternatively in distinct first and second states of axial displacement equilibrium, said states serving respectively to inhibit and support formation of a circumferentially uniform auto-sustaining split suitable for storage transducing access at any axial coordinate position in said stack when said stack is transiently disturbed at said position, the method of quickly and precisely aligning a source of said transient disturbance with a target coordinate position in said stack prior to formation of said circumferentially uniform split comprising:

while said ventilation pressure is controlled to retain said surfaces in said first state of equilibrium, applying an external disturbance at a selected trial position in said stack estimated to coincide with said target coordinate but subject to imprecise determination due to varying motion of the eges of the disks interfacing at said target coordinate; said disturbance forming and sustaining a partial split having circumferentially irregular shape at said trial position; said partial split being unsuited for storage transducing access;

determining location of said partial split relative to said target coordinate by using a widened portion of said partial split as a relatively stable positional reference for distinguishing said relative location;

when said trial position coincides with said target coordinate position varying the pressure of said ventilation fluid to form said auto-sustaining split at said target coordinate position; and

when said trial and target positions do not coincide, shifting the position of said external disturbance incrementally until said trial and target positions do coincide and then excecuting said above-mentioned pressure varying step to form said auto-sustaining split.

4,051,542

MAGNETIC HEAD WITH THIN SHEET EXHIBITING MAGNETORESISTIVE PROPERTY

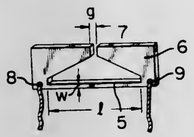
Kenji Kanai, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 18, 1975, Ser. No. 605,223

Claims priority, application Japan, Aug. 20, 1974, 49-95762; Aug. 20, 1974, 49-95763; Aug. 20, 1974, 49-95764

Int. Cl.² G11B 5/12, 5/22

U.S. Cl. 360—113 **6 Claims**



1. A magnetic head comprising a thin substantially U-shaped ferromagnetic sheet which is made of a material exhibiting magnetoresistance property and which is connected magnetically in at least one portion of a magnetic circuit having an air gap with the open end of said U-shaped ferromagnetic sheet forming at least part of said air gap, and a pair of current electrodes or terminals attached to the ends of said thin ferromagnetic sheet for receiving current flow of a predetermined magnitude through said thin ferromagnetic sheet, whereby the variation in magnetic field across said air gap of said ferromagnetic sheet may be detected as the variation in voltage across said pair of current electrodes or terminals.

4,051,543

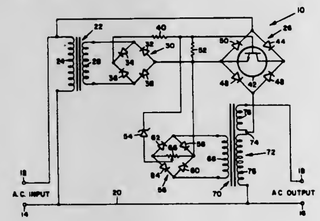
OVER VOLTAGE PROTECTOR USING CURRENT MONITORING

Norval Jeff McLellan, 1002 N. Main St., Pleasanton, Tex. 78064

Filed Jan. 12, 1976, Ser. No. 648,010

Int. Cl.² H02H 9/04

U.S. Cl. 361—18 **7 Claims**



1. An over voltage regulator for alternating voltages to prevent an output voltage exceeding a predetermined peak voltage, said regulator comprising:
- first diode bridge connected to one of two input terminals;
- transistor means connected across said first diode bridge for current flow therethrough;
- an output transformer having a primary and secondary winding, said primary winding being connected on one side thereof to a common input and output terminal and towards the other side of said primary winding to said first diode bridge;
- means for biasing said transistor means in response to an A.C. input, said biasing means being connected between a base of said transistor means and one side of said first diode bridge;
- first rectifying means connected to said secondary winding for rectifying voltages received therefrom;
- Zener diode means connected to said rectifying means, said Zener means also being connected in parallel with said biasing means, said Zener diode means conducting to prevent a further increase in bias voltage when said output voltage reaches said predetermined peak voltage.

4,051,544

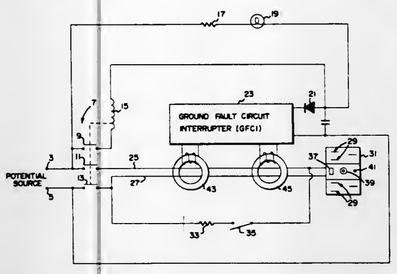
FAIL-SAFE GROUND FAULT RECEPTACLE CIRCUIT

Edward J. Vibert, Muncy, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 23, 1976, Ser. No. 669,505

Int. Cl.² H02B 3/28

U.S. Cl. 361—45 **2 Claims**



1. A fail-safe ground fault receptacle circuit comprising:
- a pair of parallel connected female contacts formed to receive an electrical load;
- a GFCI unit;
- a potential source having first and second input terminals;
- circuit means including a series connected impedance and indicating lamp coupling said first input terminal of said potential source to said GFCI unit and conductor means directly connecting said second input terminal of said potential source to said GFCI unit; and
- circuit breaker means including a plurality of ganged contact members and a solenoid winding, one of said contact menbers selectively coupling said first input terminal of said potential source to said solenoid winding coupled to said GFCI unit, another of said contact members selectively coupling said first input terminal of said potential source to said female contacts and another of said contact members selectively coupling said second input terminal of said potential source to said female contacts whereby manually activating said circuit breaker means causes activation of said GFCI unit by current flow through said solenoid winding and de-energization of said indicating lamp and a ground fault causes activation of said GFCI unit which short circuits said solenoid to activate said circuit breaker and cause current flow through said indicating lamp.

4,051,545

APPARATUS FOR OVERVOLTAGE PROTECTION OF A DIRECT CONVERTER IN THE ROTOR CIRCUIT OF AN ASYNCHRONOUS MACHINE

Albert Kloss, Nussbaumen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

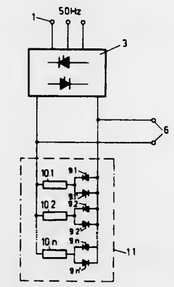
Filed Jan. 6, 1976, Ser. No. 646,979

Claims priority, application Switzerland, Jan. 16, 1975, 523/75

Int. Cl.² H02H 7/122

U.S. Cl. 361—58 **6 Claims**

1. Apparatus for overvoltage protection of a direct converter utilizing controllable semi-conductor valves and whose output is connected to the rotor circuit of an asynchronous electrical machine which comprises a stepped impedance circuit connected across the output of said direct converter, said impedance circuit being constituted by a plurality of impedance elements selectively connectible electrically in parallel, and a stepped current valve switching circuit comprising controllable semi-conductor valves connected respectively in circuit with said impedance elements, the valves of said switching circuit being controlled in accordance with the amplitude of any transient overvoltage induced in said rotor circuit such that the total resistance of said impedance circuit varies inversely with the amplitude of said overvoltage.



4,051,546

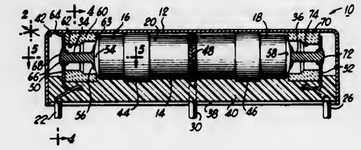
GAS TUBE ARRESTER PROTECTOR

Eric A. Scheithauer, Chicago, Ill., assignor to Cook Electric Company, Morton Grove, Ill.

Filed Dec. 4, 1975, Ser. No. 637,713

Int. Cl.² H02H 3/22

U.S. Cl. 361—124 **5 Claims**



1. An overvoltage arrester protector for protecting telephone lines from high voltages and surge currents comprising:
- a housing means,
- a gas tube overvoltage arrester having a first line electrode and a ground electrode coupled to a reference potential,
- a first line terminal means coupled to one of said telephone lines,
- a cavity means disposed adjacent said gas tube arrester such that a cavity is disposed adjacent said first line electrode, said cavity means includes a first insulating spacer means having a first cavity extending through said first spacer means from a first end of said first spacer means to the second end of said first spacer means, said first cavity being closed at said first end by said first line electrode and said first cavity being closed at said second end by said first terminal means,
- a first fusible lead coupling said first terminal means to said first line electrode, said first fusible lead extends through said cavity and is in thermal relationship with said gas tube arrester, said first fusible lead being fusibly connected to said first line electrode and to said first terminal means so as to assist in maintaining said first terminal means against said second end of said first spacer means, and
- maintaining means to maintain said gas tube arrester in said housing.

4,051,547

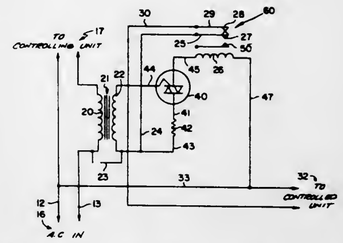
SOLID STATE RELAY

Frederick Wood, 8111 Yonge St., Apt. 1504, Thornhill, Ontario, Canada

Filed Oct. 16, 1975, Ser. No. 623,092

Int. Cl.² H01H 47/22

U.S. Cl. 361—160 **2 Claims**



1. An electrical relay control circuit device comprising power input means connectable to a source of electrical power for receiving power therefrom, first power output means connectable to a controlling load unit device for delivering power from said power input means thereto, second power output means connectable to a controlled load unit device for delivering power from said first power input means thereto, and switching circuit means between said power input means and second power output means for selectively regulating the delivery of said power to said controlled load unit device in response to the flow or nonflow of power to said first power output means, said switching circuit means including normally closed relay switch means between said power input means and said second power output means, and solid state bidirectional switch means for opening said relay means to de-energize said controlled unit in response to the flow of power from said power input means to said first power output means.

4,051,548

ELECTRIC LOCKING DEVICE

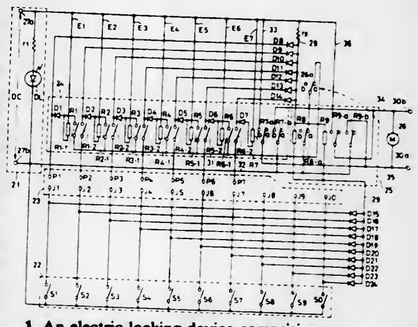
Morio Hamada, Hino, Japan, assignor to Tokao Murata, Tokyo, Japan

Filed Dec. 9, 1975, Ser. No. 639,174

Claims priority, application Japan, Aug. 14, 1975, 50-98042; Aug. 14, 1975, 50-98043

Int. Cl.² H01H 47/00

U.S. Cl. 361—171 **1 Claim**



1. An electric locking device comprising:
- locking means for performing locking and unlocking operations;
- a plural number (n) of manipulative control switches;
- presetting circuit means having a plural number (k) of vari-

able connecting means, respectively connected to said manipulative control switches, for selectively varying and presetting connection states with respect to said manipulative control switches;

a relay circuit for effecting an unlocking operation comprising a plurality (*k*) of relays for unlocking operation respectively connected to the variable connecting means of said presetting means and being successively supplied with electrical power from a power supply in a short-circuit manner as a result of closure of the plurality (K) of manipulative control switches, to which said variable connecting means are selectively connected, in a specific sequence determined by the variable connecting means;

electromagnetically energized self-holding circuits connected to said relays for the unlocking operation for respectively self-holding said relays for the unlocking operation as a result of electromagnetic energization of the self-holding circuits, whereby the succeeding relay in said specific sequence assumes an energizable state;

unlocking operation means operated by the energization of the final relay in said specific sequence of the relays for the unlocking operation in said relay circuit to cause said locking means to perform the unlocking operation;

a relay circuit for releasing the self-holding including one relay for releasing self-holding connected in a by-pass circuit to both sides of said presetting circuit means and to said relay circuit for the unlocking operation in parallel therewith;

said one relay for releasing self-holding not being energized when said relays for an unlocking operation are successively energized in a short-circuit manner as a result of closure of the manipulative control switches in said specific sequence, said one relay for releasing self-holding being energized in bypass circuit manner only when any one relay for the unlocking operation is not energized as a result of closure of the manipulative control switches in a sequence other than that corresonding to said specific sequence, thereby causing all the self-holding circuits of the relays for the unlocking operation to open for returning the device to the state prior to manipulation of said manipulative control switches; and

a relay circuit for locking operation including one relay for a locking operation connected in parallel with said circuit for releasing self-holding;

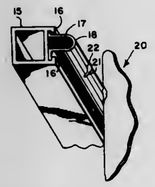
said one relay for the locking operation, when said locking means is unlocked, being energized as a result of closure of at least any but the first in the sequence of the plurality (n) of manipulative control switches and operating said unlocking operation means to cause said locking means to perform the locking operation.

4,051,549

RETAINING BAR FOR CIRCUIT CARD FILE

L. Gail Flege, 4210 Darnall Road, Baltimore, Md. 21236

Filed Nov. 17, 1976, Ser. No. 742,571
Int. Cl.² H02B *1/02*
U.S. Cl. 361—399 5 Claims



1. A circuit card retaining bar assembly for a circuit card file, said retaining bar assembly including an elongated bar hingedly mounted upon said file for movement to a latched retaining position extending across the open side of the card file and having a retention face opposed to the edges of circuit cards contained in said file, said retention face comprising a composite structure including:

A. a resilient element for engagement with the edges of said cards,

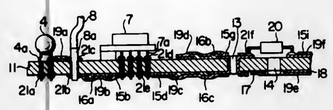
B. a rigid element including means embracing portions of the sides of said circuit card immediately adjacent to the resiliently engaged edges thereof to define limits of movement of said card in directions normal to the plane thereof when said retaining bar is in said latched retaining position.

4,051,550

THICK FILM INTEGRATED CIRCUITS

Shougo Seno; Tatsuro Toyama, both of Yokohama; Teruo Takai, Isehara, and Yasuomi Ueda, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 25, 1975, Ser. No. 635,237
Claims priority, application Japan, Nov. 29, 1974, 49-136193
Int. Cl.² H05K *1/04*
U.S. Cl. 361—402 6 Claims



1. A thick film integrated circuit comprising:

a ceramic substrate;

conductors formed on at least one surface of said ceramic substrate;

printed fixed resistances formed on at least one surface of said ceramic substrate so as to be connected to said conductors formed on said one surface;

a conductor for a variable resistor formed on the other surface of said ceramic substrate;

a protection film of negligible resistance formed on said conductor for said variable resistor;

a printed resistance for a variable resistor formed on the other surface of said ceramic substrate;

externally mounted circuit components mounted on the one surface of said ceramic substrate and electrically connected to said conductors;

the elements of the variable resistor including an adjusting shaft and a slider member which constitute said variable resistor in cooperation with said printed resistance for the variable resistor; and

means for mounting said variable resistor elements on the other surface of said ceramic substrate.

4,051,551

MULTIDIMENSIONAL PARALLEL ACCESS COMPUTER MEMORY SYSTEM

Duncan H. Lawrie, Champaign, Ill., and Chandrakant Ratilal Vora, Audubon, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 3, 1976, Ser. No. 682,526
Int. Cl.² G06F *15/16, 15/32*
U.S. Cl. 364—200 6 Claims

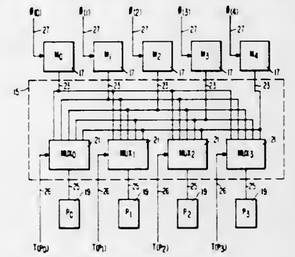
1. A parallel data processing storage and accessing system comprising:

a plurality of memory modules for storing a matrix and for providing non-conflicting access to matrix elements along all individual linear vectors thereof, each module in said plurality of memory modules having a plurality of addressable storing locations, each location therein capable of storing a single matrix element, the number of memory modules in said plurality thereof being relatively prime to the memory ordering of each linear vector of said matrix stored, wherein the memory ordering of each linear vector is equal to the distance between two consecutive elements therein times the increment to be accessed;

a plurality of data processing units, each unit therein for performing data processing operations on matrix elements;

alignment means interposing said plurality of memory modules and said plurality of data processing units for providing data communications paths between designated individual data processing units from said plurality thereof and designated individual memory modules from said plurality thereof;

tag generating means cooperating with said alignment means and said plurality of memory modules for designating individual data processing units from said plurality thereof and individual memory modules from said plurality thereof for data communications therebetween and for addressing each memory module in said plurality thereof



whereby matrix elements along all individual linear vectors of said matrix stored are non-conflictingly accessible.

DESIGN PATENTS

GRANTED SEPTEMBER 27, 1977

ERRATA

For CLASS	See PATENT NO.
087–001 R	245,944

245,881
COMBINED SWIMMING SUIT AND INFLATABLE COLLAR
Ronald Desmond Siddons, 197 Princes Highway, Sylvania, New South Wales 2224, Australia
Filed Aug. 13, 1974, Ser. No. 496,971
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—40



245,882
COMBINED SWIMMING SUIT AND INFLATABLE COLLAR
Ronald Desmond Siddons, 197 Princes Highway, Sylvania, New South Wales 2224, Australia
Division of Ser. No. 496,971, Aug. 13, 1974. This application Feb. 19, 1976, Ser. No. 659,333
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—40



245,883
ELECTRIC COMPLEXION BRUSH
Masao Tsuji, North Plainfield, and William J. Rakocy, Nutley, both of N.J., assignors to North American Philips Corporation, New York, N.Y.
Filed Apr. 26, 1976, Ser. No. 680,110
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—14

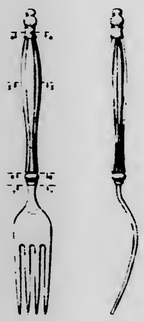


245,884
FOLDABLE SOLAR COOKER
Donald L. Jackson, 7359 Alix Parkway, Sacramento, Calif. 95823
Filed June 30, 1975, Ser. No. 591,645
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—107





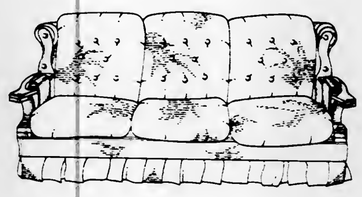
245,885
ARTICLE OF FLATWARE
Robert J. King, Wallingford, Conn., assignor to International Silver Company, Meriden, Conn.
Filed May 3, 1976, Ser. No. 682,356
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



245,886
CHAIR
Robert L. Wilson, Senatobia, Miss., assignor to Chromcraft Corporation, Amsterdam, N.Y.
Filed Aug. 15, 1975, Ser. No. 604,961
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



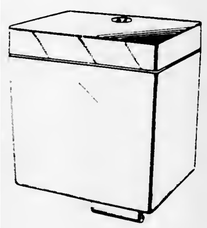
245,887
SOFA OR SIMILAR ARTICLE
Lester Beall, High Point, N.C., assignor to Trend Line Furniture Corporation, Amsterdam, N.Y.
Filed Oct. 9, 1975, Ser. No. 621,198
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



245,888
SEAT
Mario Bellini, Milan, Italy, assignor to B & B Italia S.p.A., Milan, Italy
Continuation of Ser. No. 559,138, March 17, 1975, and Ser. No. 559,139, March 17, 1975. This application Oct. 28, 1976, Ser. No. 736,342
Claims priority, application Italy, Sept. 19, 1974, 21970/74
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



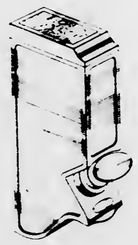
245,889
SOAP DISPENSER
Antonio Macchi Cassia, Milan, Italy, assignor to Steiner American Corporation, Salt Lake City, Utah
Filed July 19, 1976, Ser. No. 706,371
Claims priority, application Italy, May 21, 1976, 21,463/76
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95



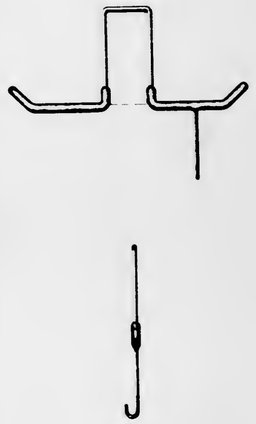
245,890
DISPENSER TO BE MOUNTED IN CORNERS
Benjamin King Milbourne, Jr., San Pedro, Calif., assignor to Safe Concepts, Incorporated, Gardena, Calif.
Filed July 27, 1976, Ser. No. 709,198
Term of patent 14 years
Int. Cl. D23—*02*; D6—*04*
U.S. Cl. D6—95



245,891
DISPENSER
Benjamin King Milbourne, Jr., San Pedro, Calif., assignor to Safe Concepts, Incorporated, Gardena, Calif.
Filed July 27, 1976, Ser. No. 709,197
Term of patent 14 years
Int. Cl. D23—*02*; D6—*04*
U.S. Cl. D6—95



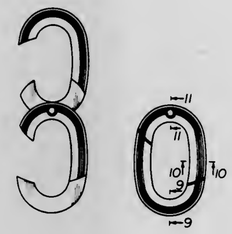
245,892
COMBINED STORAGE RACK FOR SKIS AND SKI POLES
Wyett M. Yocum, 5025 Dixon Line Way, Sacramento, Calif. 95821
Filed June 4, 1976, Ser. No. 693,087
Term of patent 14 years
Int. Cl. D6—*04*, *08*
U.S. Cl. D6—113



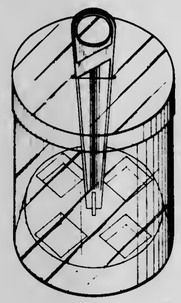
245,893
ROOM DIVIDER SCREEN
Donald N. Page, 12060 Corporate Drive, Dallas, Tex. 75228
Filed Apr. 19, 1976, Ser. No. 677,871
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—139



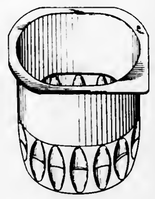
245,894
SPLIT LINK
Ruediger Einhorn, Katonah, and Lee Richard Chasen, Port Chester, both of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.
Filed Jan. 14, 1976, Ser. No. 648,953
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—499



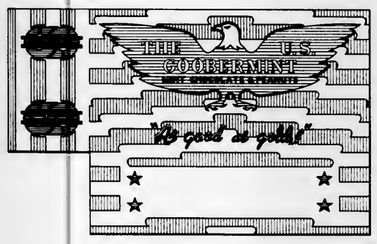
245,895
COMBINED CARRIER AND DISPLAY CONTAINER FOR BEVERAGE CONTAINERS OR THE LIKE
Reinhart Kroos, Mainz, Germany, assignor to Kuemmerling GmbH, Bodenheim, Germany
Filed Feb. 28, 1975, Ser. No. 554,148
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—179



245,896
CONTAINER FOR LIQUIDS OR THE LIKE
Raymond Charles Philippon, Saint-Cloud, France, assignor to Etudes Realisations de Chaines Automatiques (E.R.C.A.), Orsay, France
Filed Sept. 29, 1975, Ser. No. 617,372
Claims priority, application France, Mar. 28, 1975, 75.1248
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220



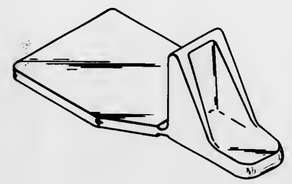
245,897
APPLIQUE FOR A CANDY BOX
John Clinton Evans, Jr., P.O. Box 138, North Olmsted, Ohio 44070, and Harold Eugene Kautz, 5923 Clearview Drive, Parma Heights, Ohio 44130
Filed July 18, 1975, Ser. No. 597,147
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—245



245,898
CASING FOR AN ELECTRONIC WRISTWATCH OR THE LIKE
Brent Nilson, San Jose, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Filed Oct. 24, 1975, Ser. No. 625,428
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



245,899
ELECTRONIC WATCH ACTUATOR
Howard Kenig, Bristol, Pa., assignor to Consumer Products Management Corporation, Philadelphia, Pa.
Filed Jan. 19, 1976, Ser. No. 650,381
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—128



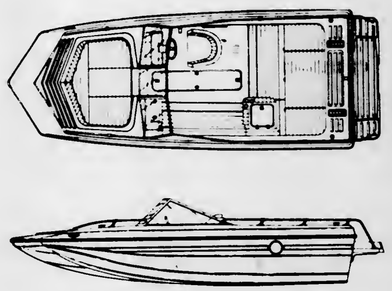
245,900
NON-SMOKERS PLAQUE
John A. Lambrecht, 121 E. Live Oak, San Gabriel, Calif. 91775
Filed Mar. 29, 1976, Ser. No. 671,560
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—133



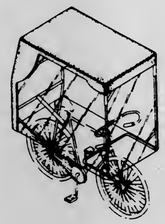
245,901
PLAQUE
Donald R. Ditto, 4938 Sharp St., Dallas, Tex. 75247
Filed Jan. 23, 1976, Ser. No. 651,618
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—139



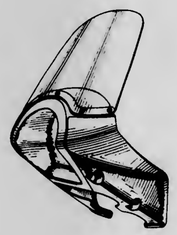
245,902
BOAT
Roy A. Rogers, 7801 Driftwood Court, Lake Country Estates, Fort Worth, Tex. 76179
Filed Sept. 29, 1976, Ser. No. 728,016
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



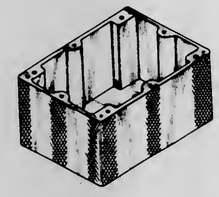
245,903
PROTECTIVE COVER FOR A BICYCLE
James Harris, Jr., 105 Rose St., Buffalo, N.Y. 14204
Filed May 14, 1976, Ser. No. 686,320
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—156



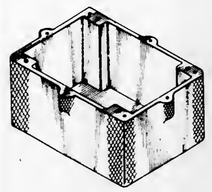
245,904
MOTORCYCLE FAIRING
Craig W. Vetter, Rantoul, Ill., assignor to Vetter Fairing Company, Rantoul, Ill.
Filed Aug. 4, 1976, Ser. No. 711,533
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182



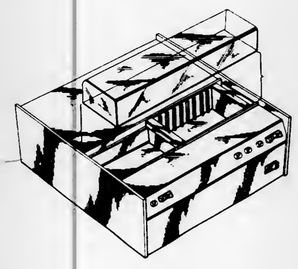
245,905
ENCLOSURE FOR ELECTRICAL COMPONENTS OR THE LIKE
Philip W. Taylor, Howell, Mich., assignor to Taylor Industries, Inc., Howell, Mich.
Filed Apr. 8, 1976, Ser. No. 674,965
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—41



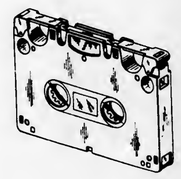
245,906
ENCLOSURE FOR ELECTRICAL COMPONENTS OR THE LIKE
Philip W. Taylor, Howell, Mich., assignor to Taylor Industries, Inc., Howell, Mich.
Filed Apr. 8, 1976, Ser. No. 675,128
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—41



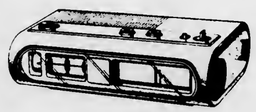
245,907
CASSETTE CHANGER OR THE LIKE
Fred C. Bolick, Jr., Atlanta, Ga., assignor to Lanier Business Products, Inc., Atlanta, Ga.
Filed Oct. 6, 1972, Ser. No. 295,452
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



245,908
TAPE CASSETTE
Yoshio Kishi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed June 25, 1976, Ser. No. 699,797
Claims priority, application Japan, Dec. 27, 1975, 50-51655
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—11



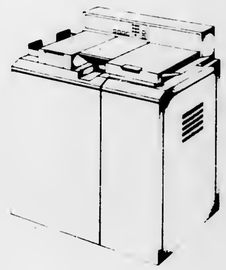
245,909
CLOCK RADIO
Takeyoshi Kawano, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Nov. 18, 1975, Ser. No. 633,137
Claims priority, application Japan, May 20, 1975, 50-20069
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—73



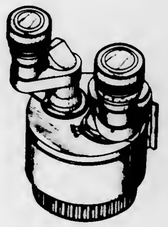
245,910
CULTIVATOR TINE
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland
Filed Jan. 5, 1976, Ser. No. 646,553
Claims priority, application Belgium, July 18, 1975, 50.446.00
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—29

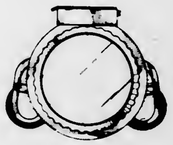


245,911
ELECTROPHOTOGRAPHIC MACHINE OR THE LIKE
Ernest Michael Bevilacqua, Wilton; Allen Dana Hawthorne, and Eliot Fette Noyes, both of New Canaan, all of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 4, 1976, Ser. No. 663,643
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—27

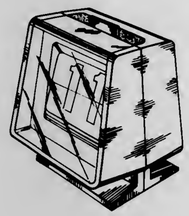


245,912
MICROSCOPE OPTICAL ASSEMBLY
Kazuo Masuyama, Osaka; Kuniomi Abe, Kobe, and Yuji Maekawa, Nishinomiya, all of Japan, assignors to Konan Camera Research Institute, Japan
Filed Jan. 21, 1976, Ser. No. 651,119
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—58

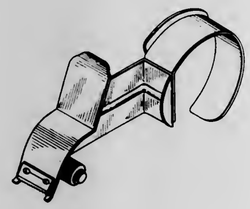




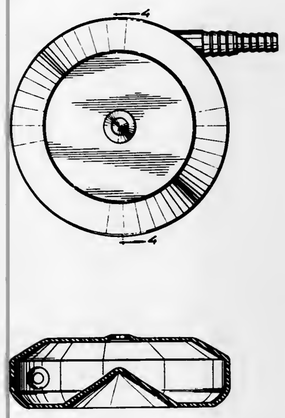
245,913
DATE CALENDAR
William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Rossland, N.J.
Filed Apr. 16, 1976, Ser. No. 677,802
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D19—25



245,914
COMBINED TAPE DISPENSER AND APPLICATOR
George H. Fritzinger, 15 Standish Ave., West Orange, N.J. 07052
Filed Dec. 22, 1975, Ser. No. 643,395
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—69



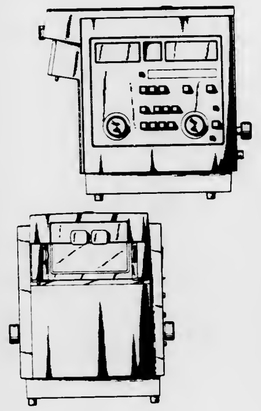
245,915
SPRINKLER
Wells Sixten Ragnar Pearson, Gnosjo, Sweden, assignor to Gnosjoplast AB, Sweden
Filed Apr. 7, 1976, Ser. No. 674,315
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—13



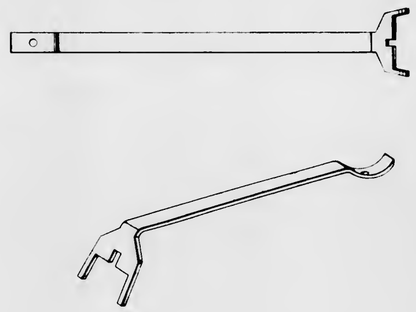
245,916
LAWN SPRINKLER VALVE HANDLE
Robert W. Thede, 1740 N. Catalina St., Burbank, Calif. 91505
Filed July 14, 1976, Ser. No. 705,068
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28



245,917
OPTOMETER
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.
Filed Sept. 17, 1976, Ser. No. 723,850
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—17



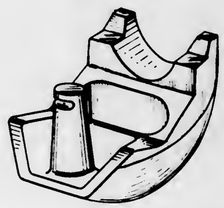
245,918
COMBINATION TIBIAL RESECTION AND TALAR DRILL GUIDE
George Shen, Warsaw, Ind., assignor to Zimmer, U.S.A. Inc.
Filed Oct. 1, 1976, Ser. No. 728,705
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26



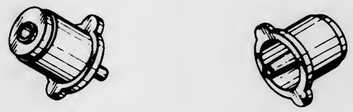
245,919
TALAR RESECTION GUIDE
George Shea, Warsaw, Ind., assignor to Zimmer, U.S.A. Inc.
Filed Oct. 1, 1976, Ser. No. 728,706
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26



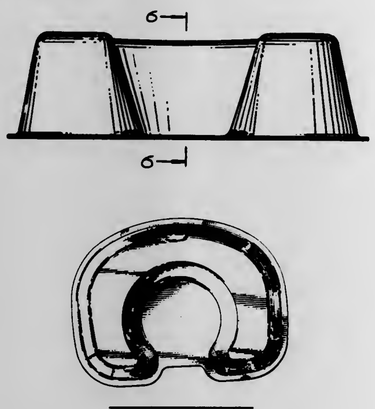
245,920
OS CALSIS PROSTHESIS
George Shea, Warsaw, Ind., assignor to Zimmer, U.S.A. Inc.
Filed Oct. 1, 1976, Ser. No. 728,830
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33



245,921
COUPLER FOR RESPIRATORY APPARATUS
Anthony V. Beran, 3802 Teakwood, Santa Ana, Calif. 92707
Filed Dec. 15, 1975, Ser. No. 640,399
Term of patent 14 years
Int. Cl. D24—*99*; D23—*01*
U.S. Cl. D24—53



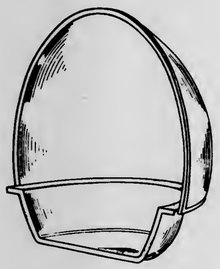
245,922
DISPOSABLE SUPPORT FOR A DISPOSABLE BED PAN
Kenneth Wilson Mills, 11 Redcar Road, Smithills Dean, Bolton, Lancashire, England
Filed Oct. 8, 1975, Ser. No. 620,582
Claims priority, application United Kingdom, Apr. 26, 1975, 970884/75
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—57



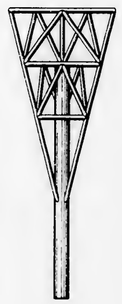
245,923
BUILDING WITH INTEGRAL RAMPS
William L. Shaffer, 254 Victoria, Costa Mesa, Calif. 92627
Filed Mar. 19, 1976, Ser. No. 668,434
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—3



245,924
WINDOW SEAT ASSEMBLY
Martin Hardy Hansen, 8626 Gilley, Burnaby, British Columbia, Canada (V5J 4Y5)
Filed Feb. 17, 1976, Ser. No. 658,226
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—35



245,925
GEODESIC GRAPE ARBOR
John L. Debes, III, 303 Erie Street Road, Macedon, N.Y. 14502
Filed July 12, 1976, Ser. No. 704,417
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—71

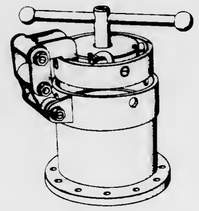


245,926
CEILING TILE
Phillip Schuss, Columbus, Ohio, assignor to Certain-teed Corporation, Valley Forge, Pa.
Filed May 13, 1976, Ser. No. 686,633
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80



245,927
GLASS BIRD HOUSE OR THE LIKE
Edward M. Edwards, Sylvania, and Theodore H. Harbaugh, Maumee, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 18, 1976, Ser. No. 733,831
Term of patent 14 years
Int. Cl. D30—*2*
U.S. Cl. D30—3





245,928
AIR LOCK FOR PRESSURIZED CHAMBERS
Tormod Frafjord, Hj. Johannesens gt. 28, N-4000 Stavanger, Norway
Filed Oct. 2, 1975, Ser. No. 619,011
Claims priority, application Norway, May 13, 1975, 56643/75
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D31—24

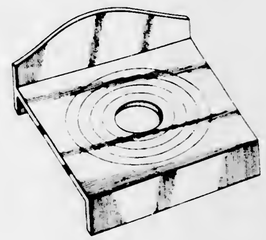
245,929
FIRE EXTINGUISHER BRACKET
Roger Jay Montambo, Red Wing, Minn., assignor to The Ansul Company, Marinette, Wis.
Filed June 2, 1975, Ser. No. 582,888
Term of patent 14 years
Int. Cl. D29—*01*
U.S. Cl. D29—5



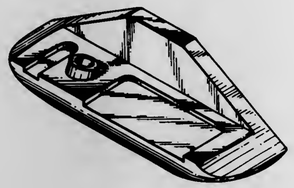
245,930
BOY DOLL
Dovie Blankenship, 4708 W. 26th Ave., Gary, Ind. 46406
Filed May 28, 1976, Ser. No. 690,833
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



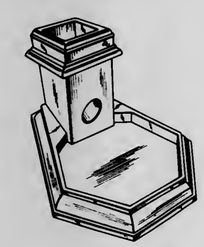
245,931
LAWN GAME GOAL
Harold E. Alter, 24680 Kelly Road, and Roger W. Alter, 22488 Rein, both of East Detroit, Mich. 48021
Filed Aug. 2, 1975, Ser. No. 606,562
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 PP



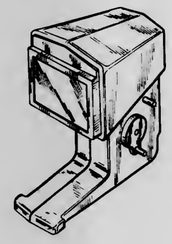
245,932
GOLF PUTTER HEAD
Roger Pete Lowry, 3444 Scott Circle, Salt Lake City, Utah 84115
Filed Dec. 11, 1975, Ser. No. 639,663
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



245,933
DICE AGITATOR
Stephen E. Blum, 8 Ledgewood Road, Framingham, Mass. 01701
Filed Jan. 9, 1976, Ser. No. 647,974
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GG



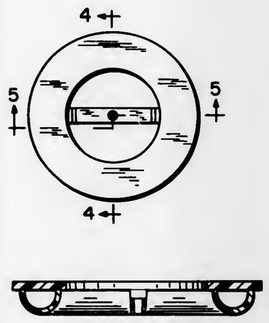
245,934
TOY PROJECTOR
Linda Jansen Donaldson, Cincinnati, Ohio, assignor to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed June 16, 1975, Ser. No. 587,948
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R



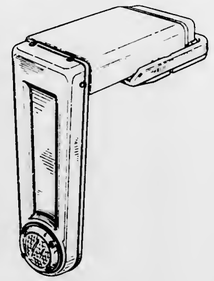
245,935
AUDIBLE FIGURE TOY
Albert Stubbmann, Franklin Lakes, N.J., assignor to Kohner, Inc., New York, N.Y.
Filed Aug. 29, 1975, Ser. No. 609,118
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C



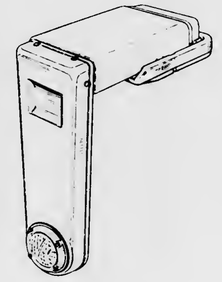
245,936
CANDLE FLOAT OR THE LIKE
Gary B. Roush, Painted Post, N.Y., assignor to Corning Glass Works
Filed June 10, 1976, Ser. No. 694,898
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



245,937
UNDERWATER LIGHTING MODULE
Frank D. Shaw, 185 Markland Drive, Etobicoke, Ontario, Canada
Filed July 22, 1975, Ser. No. 598,059
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 E



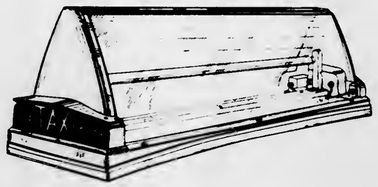
245,938
UNDERWATER LIGHTING MODULE
Frank D. Shaw, 185 Markland Drive, Etobicoke, Ontario, Canada
Filed July 22, 1975, Ser. No. 598,060
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 E



245,939
LAMP
Chester Urban, 2832 Wilmot St., Philadelphia, Pa. 19137
Filed May 27, 1976, Ser. No. 690,451
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 C



245,940
COMBINED TAXI LIGHT AND ILLUMINATED ADVERTISEMENT DISPLAY
James Rembrandt George, Garden City, N.Y., assignor to Vango Media, Inc., New York, N.Y.
Filed Sept. 15, 1975, Ser. No. 613,046
Term of patent 14 years
Int. Cl. D26—*06*; D20—*03*
U.S. Cl. D48—32 R



245,941
PERCUSSION MUSICAL INSTRUMENT
John E. Loftus, 2210 Douglas Drive North, Minneapolis, Minn. 55422
Filed Nov. 25, 1974, Ser. No. 527,165
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D56—1 E

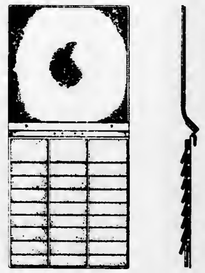


245,942
DECALCOMANIA OR SIMILAR ARTICLE FOR CULINARY WARE
Estelle G. Rothstein, Corning, N.Y., assignor to Corning Glass Works
Filed Nov. 7, 1975, Ser. No. 630,665
Term of patent 14 years
Int. Cl. D19—*08*; D7—*01*
U.S. Cl. D96—12 R

245,943
DECALCOMANIA FOR CULINARY WARE
William C. McBurney, New Castle, Pa., and Thomas J. Strawser, Jr., Corning, N.Y., assignors to Corning Glass Works
Division of Ser. No. 632,452, Nov. 17, 1975. This application Feb. 10, 1977, Ser. No. 767,552
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D96—12 R



245,944
CARPET SAMPLE DISPLAY CARRIER
James L. Benson, Newport Beach, Calif., assignor to Custom Carpets, Inc., Fountain Valley, Calif.
Filed Jan. 22, 1976, Ser. No. 651,364
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D87—1 R



245,945
PORTABLE ILLUMINATED SIGN
Steven Mihojevich, Elkhart, Ind., assignor to Metaline Products, Inc., Elkhart, Ind.
Filed Oct. 15, 1976, Ser. No. 732,819
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF SEPTEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Thomas, Richard E.; Florence, Robert T.; Dalal, Rustom H.; and Scheuer, Raymond I., 4,051,283, Cl. 428-29.000.
A/S Hotaco: *See—*
Benthin, Finn, 4,050,677, Cl. 366-11.000.
AAA Products International Inc.: *See—*
Womack, Robert C., 4,050,835, Cl. 408-11.000.
AAI Corporation: *See—*
Sweeney, Patrick E., 4,050,680, Cl. 266-48.000.
AB Nike Hydraulik: *See—*
Borup, Jorgen, 4,050,287, Cl. 72-457.000.
Abadie, Henry J. L. Transistorized static inverters. 4,051,413, Cl. 315-219.000.
Abbas, Shakir Ahmed; and Dockerty, Robert Charles, to International Business Machines Corporation. Field effect transistor structure and method of making same. 4,051,273, Cl. 427-86.000.
Abbott Laboratories: *See—*
Dunnigan, Daniel Ambrose, 4,051,190, Cl. 260-651.00R.
Abbott, Richard, to Fruehauf Corporation. Dual adhesive method and article. 4,051,286, Cl. 428-77.000.
Abe, Shinichiro: *See—*
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Aboshi, Michihiro: *See—*
Koseki, Toshinori; Maeda, Kunio; Aboshi, Michihiro; and Kinoshita, Haruo, 4,051,096, Cl. 260-31.80M.
Abreu, Joao do Espirito Santo. Helical band antenna. 4,051,481, Cl. 343-895.000.
Acar, Ali, to International Telephone and Telegraph Corporation. Valve. 4,050,477, Cl. 137-625.650.
Ackermann, Hans; and Beffa, Fabio, to Ciba-Geigy AG. Water-soluble disazo dyestuffs containing a 3- or 4-[pyrazolylene-(1)-benzoylamino]-6-sulphophenyl moiety. 4,051,118, Cl. 260-153.000.
Ackermann, Josef: *See—*
Rohrl, Franz; Ackermann, Josef; and Detterbeck, Heinrich, 4,051,347, Cl. 219-400.000.
Ackrell, Jack, to Syntex (U.S.A.) Inc. 6,11-Dihydrodibenzo-[b.e.]-thiepin-11-one-3-acetonitrile. 4,051,149, Cl. 260-327.00B.
Ackrell, Jack: *See—*
Prince, Anthony; Halpern, Otto; and Ackrell, Jack, 4,051,148, Cl. 260-327.00B.
Acme-Cleveland Corporation: *See—*
Skingle, Thomas Jerome, 4,050,840, Cl. 408-144.000.
Acroform Corporation: *See—*
Miller, Jack V., 4,050,403, Cl. 116-124.00R.
Acton, John Edward: *See—*
Robbins, Joseph Henry, deceased; and Acton, John Edward, 4,050,674, Cl. 254-93.00H.
Adalbert, Gerhard; Hess, Jurgen; and Hecht, Ulrich, to Robert Bosch G.m.b.H. Arrangement for controlling the operation of a cooling system in an automotive vehicle. 4,050,263, Cl. 62-243.000.
Adamovske strojirny, narodni podnik: *See—*
Hynst, Karel, 4,050,383, Cl. 101-349.000.
Adams, Frank H.: *See—*
Knapik, H. Peter G.; and Adams, Frank H., 4,051,018, Cl. 208-139.000.
Adams, Jack W.: *See—*
Kemper, James M.; O'Neill, Robert J.; Wagenhals, Bruce E.; and Adams, Jack W., 4,050,102, Cl. 4-10.000.
Adamson, Arthur P., to General Electric Company. Composite airfoil construction. 4,051,289, Cl. 428-113.000.
Adelman, Stanley M.; Ellington, Donal G.; and Quatrochi, Philip J., to United States of America, Army. Method for producing explosive trains. 4,050,347, Cl. 86-20.00R.
Adolf Diener, Apparate- U. Maschinenbau: *See—*
Bosch, Karl; and Fritzenschaft, Max, 4,050,285, Cl. 72-391.000.
Adrema Pitney Bowes: *See—*
Heider, Michael; and Gurgens, Rainer Eberhard, 4,050,565, Cl. 197-6.300.
AGFA-Gevaert Aktiengesellschaft: *See—*
Maas, Dieter; and Linke, Gerda, 4,051,500, Cl. 354-239.000.
Wagensonner, Eduard; Huber, Theodor; and von Fischern, Bernhard, 4,050,795, Cl. 352-141.000.
Ahlgren, Nils Harald. Methods of shifting heavy and/or loaded structures. 4,050,255, Cl. 61-45.00C.
Ahlgren, Raymond E.; Schwoerer, Danial W.; and Lundstrom, Boyce H., to Bullseye Glass Co. Process for opalizing glass. 4,050,947, Cl. 106-52.000.
Ahmed, Adel Abdel Aziz, to RCA Corporation. Current-operated circuits and structures. 4,051,391, Cl. 307-297.000.
Ahrweiler, Karl-Heinz, to Kusters, Eduard. Roller chain guide arrangement. 4,050,872, Cl. 425-371.000.
Aine, Harry E. Infrared optoacoustic gas analyzer having an improved gas inlet system. 4,051,372, Cl. 250-343.000.
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Sakai, Toshimitsu; Saitou, Tadashi; and Suzuki, Isamu, 4,050,861, Cl. 417-471.000.
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Akasaka, Shigeo: *See—*
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Kilsdonk, Harley, 4,050,866, Cl. 425-192.00S.
Akzona Incorporated: *See—*
Pannekeet, Wilhelmus; Steenken, Gerhard E. W. K.; and Voogd, Roeland H., 4,051,221, Cl. 423-54.000.
Aladdin Industries, Incorporated: *See—*
Seiverling, John S., 4,050,442, Cl. 126-213.000.
Albanese, Damian F.; and Waer, Richard R., to International Telephone and Telegraph Corporation. Large area motion sensor using pseudo-random coding technique. 4,051,472, Cl. 343-5.0PD.
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Haag, Walter, 4,050,649, Cl. 242-130.100.
Albertine, Herman, Jr.; Craycraft, Donald G.; and Coleman, William E., to NCR Corporation. Circular plasma charge display device. 4,051,408, Cl. 315-169.00R.
Albright, Alva Z. Cam actuated tree cutting shears and buncher. 4,050,488, Cl. 144-309.0AC.
Alcan Research and Development Limited: *See—*
Gnyra, Bohdan, 4,051,222, Cl. 423-127.000.
Aldrich, Francis William, to Bendix Corporation, The. Carbon metallic friction composition. 4,051,097, Cl. 260-38.000.
Alduk, Frank P., to Newcastle Company, Inc. Case packer container feeding apparatus. 4,050,217, Cl. 53-62.000.
Alfranseder, Josef: *See—*
Rebsdat, Siegfried; Mayer, Sigmund; and Alfranseder, Josef, 4,051,068, Cl. 252-412.000.
Alleman, Raymond J.; Batina, Raymond T.; and Clark, Ralph J., to Libby, McNeil & Libby. Can fabrication system. 4,050,394, Cl. 113-120.00R.
Allemand, Pierre M., to S.A. Beauplat Fils & Cie. Improvements in a turret alignment system. 4,050,337, Cl. 83-552.000.
Allied Chemical Corporation: *See—*
Bishop, Robert J., 4,050,483, Cl. 141-4.000.
Hoare, Robert C., 4,051,155, Cl. 260-379.000.
Kurtz, Bruce E.; and Smalley, Edmund W., 4,051,193, Cl. 260-683.300.
Tanner, Lee Elliot; Ray, Ranjan; and Cline, Carl F., 4,050,931, Cl. 75-175.500.
Wells, Rodney Lee; and Crescentini, Lamberto, 4,051,196, Cl. 260-857.0PG.
Allis-Chalmers Corporation: *See—*
Kohl, Robert F.; Karis, Lyle A.; and Shy, James L., 4,050,882, Cl. 432-14.000.
Allyn, Jerome B.; Wileman, Richard D.; and Kozak, John, to Midland-Ross Corporation. Method for continuously casting a strip of alloyed metal. 4,050,502, Cl. 164-68.000.
Almo Manifold & Tool Company: *See—*
Courson, Richard B., 4,050,633, Cl. 239-550.000.
Alphatype Corporation: *See—*
Tidd, James Alfred, 4,051,488, Cl. 354-13.000.
Altec Corporation: *See—*
Henricksen, Clifford A., 4,050,541, Cl. 181-159.000.
Altermatt, Ruedi, to Sandoz Ltd. Monoazo compounds having a 5-nitrothiazolyl-2 diazo component radical and a 1,4-phenylene coupling component radical having an n-(alkyl or allyl)-n-(alkoxyl- or alkoxyethoxy-ethoxycarbonyloxyalkyl)amino group in its para position. 4,051,120, Cl. 260-158.000.

Alton Box Board Company: *See—*
Wilkinson, Robert M.; and Lyon, James R., 4,051,277, Cl. 427-288.000.

Altshuler, Saul, to TRW Inc. ELF vertical dipole antenna suspended from aircraft. 4,051,479, Cl. 343-703.000.

Aluminum Company of America: *See—*
Haupin, Warren E., 4,050,302, Cl. 73-190.00H.

Aluminum Pechiney: *See—*
Duclaux, Daniel; Pontier, Andre J. A.; and Ferret, Georges Paul, 4,051,224, Cl. 423-210.000.

Amagai, Susumu; and Oikawa, Shigeru, to Nissan Motor Co., Limited. Intake air warming device. 4,050,430, Cl. 123-122.00D.

Amano, Yoshinari: *See—*
Motoyoshi, Kenya; Kume, Masahiro; and Amano, Yoshinari, 4,050,930, Cl. 75-173.00A.

Amaudric du Chaffaut, Patrick; and Petrulacci-Stephanopoli, Georges. Sling device for suspending animals or articles. 4,050,416, Cl. 119-97.00R.

Ambrogi, Vittorio; Logemann, Willy; Parenti, Marc'Antonio; and Tommasini, Raffaele, to Carlo Erba, S.p.A. Pyrazine 4-oxide derivatives and process for their preparation. 4,051,245, Cl. 424-250.000.

Amemiya, Kunio: *See—*
Tsuruta, Motohiro; Kimura, Hiroshiro; Koshimo, Akio; Nara, Hirohisa; Goto, Tokuju; and Amemiya, Kunio, 4,051,215, Cl. 264-137.000.

Amerace Corporation: *See—*
Storck, Glenn E.; and Kominiak, Andrew A., 4,050,149, Cl. 29-630.00R.

American Color & Chemical Corporation: *See—*
Botros, Raouf, 4,051,119, Cl. 260-156.000.

American Cyanamid Company: *See—*
Asato, Goro, 4,051,183, Cl. 260-553.00A.
Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, 4,051,176, Cl. 260-506.000.

American District Telegraph Company: *See—*
Galvin, Aaron A., 4,051,467, Cl. 340-239.00S.

American Home Products Corporation (Del.): *See—*
Robinson, Charles A., 4,051,131, Cl. 544-28.000.

American Optical Corporation: *See—*
Andresen, Richard Paul, 4,051,482, Cl. 346-23.000.
Polanyi, Michael Lajos; and Ostrowski, David Stanley, 4,050,450, Cl. 128-2.00L.

Ameron, Inc.: *See—*
Wilms, Carl A., 4,050,585, Cl. 212-48.000.

Ames, Ronald B.: *See—*
Plant, Howard L.; Zukel, John W.; and Ames, Ronald B., 4,050,921, Cl. 71-94.000.

Ammon, J. Preston, to Elfab Corporation. Electrical connector. 4,050,769, Cl. 339-196.00M.

Amon, Anton; and Sedam, Jason K., to Coca-Cola Company, The. System for water disinfection. 4,051,034, Cl. 210-206.000.

AMP Incorporated: *See—*
Dola, Frank Peter, 4,051,383, Cl. 307-11.000.
Hopkins, John Root; Renn, Robert Maurice; and Southard, Robert Keith, 4,050,764, Cl. 339-103.00M.

Anahara, Meiji; and Fujita, Takayoshi, to Toyo Boseki Kabushiki Kaisha. Process and apparatus for measuring false twist in thermoplastic synthetic yarn. 4,050,225, Cl. 57-34.0HS.

Anders, Ronald J., to Rockwell International Corporation. Portable field machine for cutting, grinding and lapping valve seats. 4,050,836, Cl. 408-20.000.

Anderson, Arnold L.; and Nulph, Robert J., to Velsicol Chemical Corporation. Plastic compositions. 4,051,105, Cl. 260-45.95G.

Anderson Company, The: *See—*
Stratton, Donald W.; and Moorhead, John P., 4,050,832, Cl. 403-321.000.

Anderson, David Bowen: *See—*
Wilson, William Crawford; and Anderson, David Bowen, 4,050,725, Cl. 292-304.000.

Anderson, Dorothy M., executrix: *See—*
Anderson, Robert W., deceased; and Smith, Robert E., Jr., 4,051,324, Cl. 174-121.00R.

Anderson, Paul L.; and Nadelson, Jeffrey, to Sandoz, Inc. 1-(p-Alkanoylphenyl) alkanols and derivatives. 4,051,261, Cl. 424-331.000.

Anderson, Robert W., deceased (by Anderson, Dorothy M., executrix); and Smith, Robert E., Jr., to Haveg Industries, Inc. Radiation resistant cable and method of making same. 4,051,324, Cl. 174-121.00R.

Anderson Safeway Guard Rail Corporation: *See—*
Kelly, Daniel L., 4,051,525, Cl. 358-108.000.

Anderson, Thomas M. Articulated hull construction. 4,050,395, Cl. 114-77.00R.

Ando, Akiko: *See—*
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, 4,051,320, Cl. 542-420.000.

Ando, Yujiro: *See—*
Tanaka, Keiji; Ando, Yujiro; and Ohara, Katsunobu, 4,050,802, Cl. 355-3.00R.

Andresen, Joh. H.: *See—*
Van Sluis, Jan Adolf; Reinhart, Frans Remko; Johansen, Johan Peter; and Pedersen, Rolf, 4,050,467, Cl. 131-147.00A.

Andresen, Richard Paul, to American Optical Corporation. Graticule with cursors. 4,051,482, Cl. 346-23.000.

Andrew, Herbert Francis; Stead, Cecil Vivian; and Thompson, Ronald, to Imperial Chemical Industries Limited. Phosphonophenylaminonaphthalene compounds. 4,051,175, Cl. 260-502.500.

Andrews, Jeffery Frederick; Chauhan, Harjinder Singh; and Bristow, Ian Trevor, to Eaton Corporation. Viscous shear fluid coupling. 4,050,559, Cl. 192-58.00B.

Andrews, Michael Joseph; Davis, William Allen; and Senske, Roger Alvin, to Boeing Company, The. Apparatus and method of measuring surface roughness. 4,050,294, Cl. 73-105.000.

Andrews, Peter: *See—*
Seubert, Jurgen; Pohlke, Rolf; Thomas, Herbert; and Andrews, Peter, 4,051,243, Cl. 424-250.000.

Angelucci, Joseph L.: *See—*
Angelucci, Thomas L.; and Angelucci, Joseph L., 4,050,618, Cl. 228-6.00A.

Angelucci, Thomas L.; and Angelucci, Joseph L. Flexible lead bonding apparatus. 4,050,618, Cl. 228-6.00A.

Anhegger, Sigmund; and Colell, Hans, to Dr. -Ing. H.c.F. Porsche Aktiengesellschaft. Closing apparatus for ventilation lines of fuel tanks in motor vehicles. 4,050,471, Cl. 137-39.000.

Annichiarico, Angelo V.: *See—*
Boschen, William O.; Annichiarico, Angelo V.; and Johnson, Arthur L., 4,051,035, Cl. 210-220.000.

Anshus, Byron E., to Chevron Research Company. Recovery of 2-pyrrolidone from dilute alkaline solutions. 4,050,994, Cl. 203-35.000.

Ansorge, Werner. Blocking circuit for thyristors. 4,051,384, Cl. 307-18.000.

Antonescu, Virgil: *See—*
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,050,704, Cl. 280-6.00R.

Anzur, Gregory C.: *See—*
Yant, Howard W.; Stinebiser, Karl W.; and Anzur, Gregory C., 4,050,985, Cl. 176-61.000.

Aqua-Chem, Inc.: *See—*
Craig, Glenn D.; Feuling, David T.; and LaHaye, Paul G., 4,050,877, Cl. 431-76.000.

Araki, Kenji: *See—*
Nakaoka, Kazuhide; Araki, Kenji; Iwase, Koji; Koike, Yasuo; and Fukunaka, Shiro, 4,050,959, Cl. 148-12.300.

Archer, Donald H.; McOwen, Sherwood A., Jr.; and Prickett, Robert J., to Raytheon Company. Parabolic horn antenna with microstrip feed. 4,051,476, Cl. 343-700.0MS.

Arenco Machine Company, Inc.: *See—*
Gorski, Dennis M.; Neuber, Dieter; and Wildmoser, Martin Michael, 4,050,579, Cl. 206-460.000.

Argo, Wesley B.; Edwards, James W.; Little, Albert P.; and Lumb, William M., to Monsanto Company. Catalyst preparation utilizing metal nitrates and nitrogen oxide scavenger. 4,051,070, Cl. 252-428.000.

Argus Chemical Corporation: *See—*
Lewis, Roger N., 4,051,167, Cl. 260-453.0RZ.
Lewis, Roger N.; Pastorino, Ronald L.; and Wilts, James F., 4,051,310, Cl. 526-230.000.

Ariga, Masao: *See—*
Ito, Yoshio; Ariga, Masao; and Suda, Masashi, 4,050,691, Cl. 271-124.000.
Ogawa, Hiroshi; and Ariga, Masao, 4,050,800, Cl. 355-75.000.

Armor, Anthony F.; and Winne, David H., to General Electric Company. End gas gap baffle structure for reverse flow cooled dynamoelectric machine. 4,051,400, Cl. 310-58.000.

Armstrong, Jack W., to Lipe-Rollway Corporation. Accumulator and feeder. 4,050,572, Cl. 198-347.000.

Armstrong, Lee R.: *See—*
Pettingell, James R.; and Armstrong, Lee R., 4,050,297, Cl. 73-117.200.

Arndt, Erhard; Brodmann, Nikolaus; and Roser, Horst R., to Hochtemperatur-Reaktorbau GmbH. Closed cycle gas coolant nuclear power plant. 4,050,984, Cl. 176-60.000.

Arneklev, Duane R.; Baker, Don R.; and Walker, Francis H., to Stauffer Chemical Company. N-(1,1 substituted propynyl)-α(3,5-substituted phenoxy) alkyl amides and their use as herbicides. 4,051,184, Cl. 260-559.00B.

Arnold, Dan M.; Paap, Hans J.; and Scott, Hubert D., to Texaco Inc. Method of measuring horizontal flow speed of fluids in earth formations penetrated by a wellborehole. 4,051,368, Cl. 250-270.000.

Arnold, Fred E.: *See—*
Helminiak, Thaddeus E.; and Arnold, Fred E., 4,051,108, Cl. 260-47.0CP.

Arnold, Wesley D., Jr., to United States of America, Energy Research and Development Administration. Method for separating mono- and di-octylphenyl phosphoric acid esters. 4,051,202, Cl. 260-990.000.

Aronoff, Elihu J.; and Dhami, Kewal Singh, to International Telephone and Telegraph Corporation. Curable compositions diallyl esters of dicarboxylic acids and fluoropolymers. 4,051,003, Cl. 204-159.170.

Arthur G. McKee & Company: *See—*
Greaves, Melvin J.; and Razgaitis, Frank V., 4,050,592, Cl. 214-18.200.

Artronix, Inc.: *See—*
Krippner, Kenneth E., 4,051,378, Cl. 250-421.000.
Zacher, Albert R., Jr., 4,051,379, Cl. 250-445.00T.

Asada, Eiichi, to Shoei Kagaku Kogyo Kabushiki Kaisha. Resistor composition and method for its manufacture. 4,051,074, Cl. 252-503.000.

Asahi Glass Company, Ltd.: *See—*
Gunjima, Tomoki; and Ichiki, Toshio, 4,051,002, Cl. 204-180.00P.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Koseki, Toshinori; Maeda, Kunio; Aboshi, Michihiro; and Kinoshita, Haruo, 4,051,096, Cl. 260-31.80M.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kawasaki, Masahiro, 4,051,490, Cl. 354-24.000.
Uno, Nayuki; Shono, Tetsuji; Urano, Fumio; Kawasaki, Masahiro; and Miyata, Katsuhiko, 4,051,503, Cl. 354-289.000.

Asakura, Yasunori: *See—*
Fukuyama, Toshifumi; Asakura, Yasunori; and Onji, Norio, 4,051,365, Cl. 250-222.00R.

Asano, Toyohide; and Honda, Masahiro, to Ube Industries, Ltd. Apparatus for conveying products extruded out of an extruding press. 4,050,278, Cl. 72-257.000.

Asato, Goro, to American Cyanamid Company. 1-Benzoyl-3-(1,2,3,4-tetrahydro-4-oxo-1-naphthyl)-urea, a novel and useful intermediate for the preparation of animal growth promoting agents. 4,051,183, Cl. 260-553.00A.

Ashbrook, Clifford Logan. Beam balance weighing scale with self-aligning point contact support elements. 4,050,531, Cl. 177-198.000.

Askew, Herbert Frank: *See—*
Elliott, John Scotchford; Jayne, Gerald John Joseph; Askew, Herbert Frank; and Harrington, Colin John, 4,051,053, Cl. 252-78.300.

Aslund, Christer, to Granges NYBY AB. Method of producing dense metal tubes or the like. 4,050,143, Cl. 29-420.500.

Asper, William, to Raymond Lee Organization, Inc., The. Fly tie tool. 4,050,176, Cl. 43-1.000.

Aspro, Inc.: *See—*
Kraft, Derald H., 4,050,321, Cl. 74-230.800.

Atlantic Fluidics, Inc.: *See—*
Huse, Henry, 4,050,445, Cl. 126-271.000.

Atlantic Richfield Company: *See—*
Masologites, George P., 4,051,014, Cl. 208-88.000.
Myers, Gary A.; and Wunderlich, Donald K., 4,051,022, Cl. 208-253.000.

Atomic Energy of Canada Ltd.: *See—*
Prescott, John Fraser; and Sanford, Emerson Cecil, 4,051,185, Cl. 260-561.00R.

Audi NSU Auto Union Aktiengesellschaft: *See—*
Wieland, Werner, 4,050,132, Cl. 29-156.40R.

Auge, Bernard. Spectacle frames. 4,050,785, Cl. 351-120.000.

Aussatuft S.p.A.: *See—*
Frigo, Vito, 4,050,870, Cl. 425-317.000.

Aust, Walter Dean: *See—*
Still, Carl Otto; and Aust, Walter Dean, 4,050,992, Cl. 202-227.000.

Automation Steeg and Hoffmeyer GmbH: *See—*
Steeg, Emil; and Hoffmeyer, Uwe, 4,050,223, Cl. 53-381.00R.

Automobile Corporation of America: *See—*
Horwinski, Elwood R., 4,050,441, Cl. 126-121.000.

Automotive Products Limited: *See—*
Young, Alastair John, 4,050,552, Cl. 188-195.000.

Autotronic Controls Corporation: *See—*
Priegel, Jack C., 4,050,878, Cl. 431-90.000.

Avery International Corporation: *See—*
Richman, Edward B., 4,050,121, Cl. 24-73.0VA.

AVM Corporation: *See—*
Sheppard, William L., 4,050,472, Cl. 137-242.000.

Avon Products, Inc.: *See—*
Tsoucalas, Michael; Barclay, Kenneth W.; and Rogers, Jack M., 4,051,159, Cl. 260-404.500.

Awalt, Thomas Y., Jr. Supplemental heat and heat transfer subsystems for solar air conditioning systems. 4,050,626, Cl. 237-1.00A.

Azuma, Akira, to Yoshida Kogyo K.K. Knockdown apparatus for supporting and driving overhung doors. 4,050,191, Cl. 49-360.000.

B. F. Goodrich Company, The: *See—*
Holloway, John Ambrose, 4,051,111, Cl. 260-75.0NP.

B.W. Darrah, Inc.: *See—*
Draffone, A. Peter, 4,050,975, Cl. 156-217.000.

Babcock & Wilcox Company, The: *See—*
Heidt, Henry M., 4,051,227, Cl. 423-259.000.
McDonald, Bertrand N., 4,050,511, Cl. 165-162.000.

Babcock & Wilcox Limited: *See—*
Chapman, John Edward, 4,050,384, Cl. 104-138.00G.

Bachmann, Lothar; and Engemann, Karl-Heinz, to Veb Werkzeugmaschinenkombinat "7.Oktober. Index generation method and machine for production of bevel gears. 4,050,353, Cl. 90-5.000.

Badagnani, Guido; and Carioli, Giancarlo, to Ing. C. Olivetti & C., S.p.A. Arrangement for the remote switching-on and initialization of a data terminal. 4,051,326, Cl. 179-2.0DP.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Kissel, Ernst; Neumann, Eckart; Guenther, Ernst; Valentin, Guenter; and Hoerauf, Werner, 4,051,113, Cl. 260-78.00L.

Badische Maschinenfabrik GmbH: *See—*
Kemper, Gert; and Melzer, Roland, 4,050,505, Cl. 164-206.000.

Baghdady, Elie J.: *See—*
Pickett, Robert B.; and Baghdady, Elie J., 4,051,438, Cl. 325-45.000.

Bailey, Charles H.; and Dillon, James E., to UOP Inc. Combination muffler and catalytic converter. 4,050,903, Cl. 23-288.0FC.

Baird, William C., Jr.: *See—*
Bearden, Roby, Jr.; and Baird, William C., Jr., 4,051,015, Cl. 208-108.000.

Baker, Don R.; and Walker, Francis H., to Stauffer Chemical Company. N-benzyl-2-(3,5-dimethyl phenoxy)-2-alkoxy amide herbicides. 4,050,923, Cl. 71-118.000.

Baker, Don R.: *See—*
Arneklev, Duane R.; Baker, Don R.; and Walker, Francis H., 4,051,184, Cl. 260-559.00B.

Baker, William H. Two-in-one perimeter gutter for swimming pools. 4,050,104, Cl. 4-172.170.

Baldwin, John Lewis Edwin, to Independent Broadcasting Authority. Television systems. 4,051,531, Cl. 358-140.000.

Balevski, Angel Tonchev; Nikolov, Ivan Dimov; Nenov, Dragan Iliev; and Momchilov, Emil Nikolov, to Institute po Metaloznanie i Technologia na Metalite. Apparatus for controlling the rate of filling of casting molds. 4,050,503, Cl. 164-155.000.

Ball Brothers Research Corporation: *See—*
Murphy, Lawrence R.; and Sanford, Gary G., 4,051,477, Cl. 343-700.0MS.

Balsley, Richard L.: *See—*
Little, Harold A.; and Balsley, Richard L., 4,050,245, Cl. 60-313.000.

Barbieri, Siegfried, to Durst AG. Fabrik Fototechnischer Apparate Bozen. Process and device for copying photographic color images. 4,050,807, Cl. 355-32.000.

Barclay, Kenneth W.: *See—*
Tsoucalas, Michael; Barclay, Kenneth W.; and Rogers, Jack M., 4,051,159, Cl. 260-404.500.

Barden, Wayne A., to CTS Corporation. Variable resistance control with low noise contactor. 4,051,453, Cl. 338-171.000.

Barker, Bayetta, executrix: *See—*
Barker, Frank S., deceased; and Pehl, Willis G., 4,050,209, Cl. 52-478.000.

Barker, Frank S., deceased (Barker, Bayetta, executrix); and Pehl, Willis G., to Shakertown Corporation. Prefabricated shingle panels. 4,050,209, Cl. 52-478.000.

Barlow, Harold Everard Monteagle, to National Research Development Corporation. Waveguides. 4,051,450, Cl. 333-95.00R.

Barnett, George Henry, to ICI Australia Limited. Stabilized nitratoalkanol explosive composition. 4,050,970, Cl. 149-88.000.

Barnsbee, Clive D., to Eastman Kodak Company. Web stretching apparatus. 4,050,124, Cl. 26-73.000.

Barr, Dennis Arthur; and Rose, John Brewster, to Imperial Chemical Industries Limited. Aromatic polymers. 4,051,109, Cl. 260-49.000.

Barry, Robert J. Permanently implanted hair piece attaching means. 4,050,100, Cl. 3-1.000.

Bartner, Bernard I.: *See—*
Brumlik, George C.; and Bartner, Bernard I., 4,050,873, Cl. 425-371.000.

Barton, David W.; and Muller, George H., to Ford Motor Company. Pneumatic flexible bumper. 4,050,689, Cl. 293-71.00P.

BASF Aktiengesellschaft: *See—*
Hjortzberg, Bernhard A., 4,051,517, Cl. 358-15.000.
Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Henning, 4,050,962, Cl. 148-105.000.
Simak, Petr; Herrle, Karl; Haaf, Franz; and Hatzmann, Guenter, 4,051,200, Cl. 260-899.000.
Wendel, Kurt; Reichel, Fritz; and Taubitz, Christof, 4,051,093, Cl. 260-29.6TA.

BASF Wyandotte Corporation: *See—*
Cenker, Moses; and Kan, Peter Tai-Yuen, 4,051,082, Cl. 260-2.5AR.
Schweickart, Albert John; Collins, Stephen Michael; and Bortak, John Joseph, 4,051,009, Cl. 204-279.000.

Basi, Jagtar S., to International Business Machines Corporation. Surface treatment of semiconductor substrates. 4,050,954, Cl. 134-2.000.

Basile, Jerry. Book net for crabs, lobsters, and the like. 4,050,182, Cl. 43-105.000.

Bassoff, Arthur B.: *See—*
Tersch, Richard W.; and Bassoff, Arthur B., 4,050,350, Cl. 90-1.60R.

Batina, Raymond T.: *See—*
Alleman, Raymond J.; Batina, Raymond T.; and Clark, Ralph J., 4,050,394, Cl. 113-120.00R.

Batzer, Othmer F.; and Stewart, John A., to International Minerals & Chemical Corporation. Settling clay-containing slimes. 4,051,027, Cl. 210-42.00R.

Baum, Joerg Peter, to Pennsylvania Engineering Corporation. Method and apparatus for handling off-gases from metal refining vessel. 4,050,682, Cl. 266-158.000.

Baumann, Hans D., to Masoneilan International, Inc. Fluid resistance device. 4,050,479, Cl. 138-42.000.

Baumeyer, Ute: *See—*
Benczur-Urmossy, Gabor; and Baumeyer, Ute, 4,051,305, Cl. 429-217.000.

Bausch & Lomb Incorporated: *See—*
Kreckel, Kurt H., 4,051,348, Cl. 219-506.000.
Morton, Roger R., 4,051,458, Cl. 340-146.3AG.

Bautz, Frederick H., to Continental Can Company, Inc. U.V. curing machine. 4,050,412, Cl. 118-642.000.

Baxter, Larry K., to QSI Systems, Inc. Sequential video switching system. 4,051,524, Cl. 358-108.000.

Bayer Aktiengesellschaft: *See—*
Braden, Rudolf; Knupfer, Hans; and Ziemann, Heinz, 4,051,177, Cl. 260-510.000.
Friedrich, Adolf; Harnisch, Horst; and Raue, Roderich, 4,051,134, Cl. 544-217.000.
Grigat, Ernst; and Hetzel, Hartmut, 4,051,212, Cl. 264-102.000.
Hess, Bernhard; and Raichle, Karl, 4,051,085, Cl. 260-16.000.
Jaba, Gert; and Loew, Gunther, 4,051,081, Cl. 260-2.5AD.
Kuhlthau, Hans-Peter; and Beecken, Hermann, 4,051,084, Cl. 260-158.000.
Kuhlthau, Hans-Peter; and Beecken, Hermann, 4,051,117, Cl. 260-146.00R.
Mayer, Karl Heinrich; Petersen, Siegfried; Klauke, Erich; Hoffmeister, Friedrich; and Wuttke, Wolfgang, 4,051,252, Cl. 424-273.00P.

Raffel, Reiner; Ebeling, Wilfried; Nadolski, Klaus; and Schulte. Klaus, 4,050,896, Cl. 23-230.00A.
Wagner, Kuno; and Klinkmann, Kurt, 4,051,165, Cl. 260-453.0AB.
Wessling, Diether, 4,051,146, Cl. 260-314.500.

Bayerisches Leichtmetallwerk Graf Blucher von Wahlstatt KG: *See*—
Schober, Franz, 4,050,283, Cl. 72-344.000.

Bazhanov, Jury Mikhailovich: *See*—
Zaikovsky, Vladimir Borisovich; Kutuzov, Jury Prokhorovich; Zakharov, Mikhail Fedorovich; Kavtaev, Evgeny Emelyanovich; Poedinschikov, Jury Grigorievich; Bazhanov, Jury Mikhailovich; and Schapov, Valentin Andrianovich, 4,050,288, Cl. 72-468.000.

BBC Brown Boveri & Company Limited: *See*—
Beckershoff, Wolfgang, 4,050,850, Cl. 416-221.000.
Beriger, Conrad; and Keller, Eduard, 4,051,509, Cl. 357-82.000.
Del Matto, Antonio, 4,050,702, Cl. 277-148.000.
Eggmann, Jean; and Hartmann, Max, 4,050,660, Cl. 248-19.000.
Kloss, Albert, 4,051,545, Cl. 361-58.000.

Bean, Kenneth E.: *See*—
Smeltzer, Ronald K.; and Bean, Kenneth E., 4,050,979, Cl. 156-647.000.

Beard, Franklin: *See*—
Hereford, Judson A.; and Beard, Franklin, 4,050,854, Cl. 417-121.000.

Beard, James D.: *See*—
Stephens, Frederick N.; Rowlett, Glenford; and Beard, James D., 4,050,222, Cl. 53-381.00R.

Bearden, Roby, Jr.; and Baird, William C., Jr., to Exxon Research & Engineering Co. Hydroconversion of heavy hydrocarbons using copper chloride catalyst. 4,051,015, Cl. 208-108.000.

Beaty, William Ralph, Jr., to Continental Oil Company. Catalytic hydrocarbon reforming process and catalyst. 4,051,017, Cl. 208-135.000.

Beauhaire, Pierre, to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel. Connector for optical fibers. 4,050,781, Cl. 350-96.00C.

Beck, Edward G., Jr., to Stolle Corporation, The. Removable hatch structure for automobiles. 4,050,200, Cl. 52-19.000.

Beckershoff, Wolfgang, to BBC Brown Boveri & Company Limited. Arrangement for locking parts into the rotor of a turbomachine. 4,050,850, Cl. 416-221.000.

Beckman Instruments, Inc.: *See*—
Neti, Radhakrishna Murty; and Roggenkamp, Ray Lawrence, 4,051,006, Cl. 204-195.00P.

Beckmann, Gunter: *See*—
Pfeiffer, Kurt; Dietrich, Johannes; Beckmann, Gunter; and Herkt, Karl-Heinz, 4,050,901, Cl. 23-285.000.

Becton, Dickinson and Company: *See*—
Rapoza, Edward J., 4,050,316, Cl. 73-425.600.
Williams, Joel L.; Tulis, Jerry J.; and Taylor, Larry A., 4,050,576, Cl. 206-210.000.

Bedford, Raymond E.; and Berg, Morris, to General Motors Corporation. Method for making pellet type catalyst. 4,051,072, Cl. 252-464.000.

Beecken, Hermann: *See*—
Kuhlthau, Hans-Peter; and Beecken, Hermann, 4,051,084, Cl. 260-158.000.
Kuhlthau, Hans-Peter; and Beecken, Hermann, 4,051,117, Cl. 260-146.00R.

Beffa, Fabio: *See*—
Ackermann, Hans; and Beffa, Fabio, 4,051,118, Cl. 260-153.000.

Beitzel, Stuart Wallace: *See*—
Harter, Joseph William; and Beitzel, Stuart Wallace, 4,051,043, Cl. 250-531.000.

Belart, Juan, to ITT Industries, Incorporated. Braking system having anti-skid control. 4,050,748, Cl. 303-114.000.

Belco Industries, Incorporated: *See*—
Kohn, Thomas F., 4,050,889, Cl. 432-130.000.

Bell & Howell Company: *See*—
Broderick, Milan A.; and Mateja, Eugene V., 4,050,810, Cl. 355-40.000.
Fleischman, Andor A., 4,050,778, Cl. 350-2.000.
Fleischman, Andor A., 4,050,779, Cl. 350-2.000.
Gross, Roger A.; Radloff, Marvin D.; and Gault, Donald D., 4,050,799, Cl. 353-74.000.

Bell Telephone Laboratories, Incorporated: *See*—
Cuthbert, John David; and Munro, David Farnham, 4,050,821, Cl. 356-156.000.
Fulton, Theodore Alan, 4,051,393, Cl. 307-306.000.
Krambeck, Robert Harold; Sequin, Carlo Heinrich; and Walden, Robert Henry, 4,051,505, Cl. 357-24.000.
Rode, Daniel Leon, 4,050,964, Cl. 148-171.000.

Benczur-Urmossy, Gabor; and Baumeyer, Ute, to Deutsche Automobilgesellschaft m.b.H. Electrodes for galvanic elements. 4,051,305, Cl. 429-217.000.

Bender, Frank N. Apparatus for angulating forks on a fork lift truck. 4,050,599, Cl. 214-730.000.

Bendix Corporation, The: *See*—
Aldrich, Francis William, 4,051,097, Cl. 260-38.000.
Kwolek, John P.; Urso, William G.; and Jones, Trevor D., 4,050,620, Cl. 228-162.000.
Tarr, Walter R., 4,050,619, Cl. 228-162.000.

Bendix Westinghouse Limited: *See*—
Knight, David John, 4,050,743, Cl. 303-22.00R.

Benedict, Richard S., to United Technologies Corporation. Relative compression of an internal combustion engine. 4,050,296, Cl. 73-116.000.

Beneke, Jene A.; and Bozich, George J., to Verson Allsteel Press Company. Two-speed transmission having enclosed flywheel. 4,050,557, Cl. 192-4.00R.

Benford, Arthur E., to Whirlpool Corporation. Method of making refrigeration apparatus enclosure structure. 4,050,145, Cl. 29-460.000.

Benjamin, Joseph Reginald. Drilling rigs. 4,050,590, Cl. 214-2.500.

Bennett, Joan E., legal representative: *See*—
McMullen, Willard C.; Gee, Samuel, Sr., deceased; Whitney, Patricia E., legal representative; and Bennett, Joan E., legal representative, 4,050,307, Cl. 73-337.000.

Benthin, Finn, to A/S Hotaco. Mixing device. 4,050,677, Cl. 366-11.000.

Berend, Wolfgang, to Saurer-Allma GmbH Allgauer Maschinenbau. Spindle having an underwind crown for ring spinning and ring twisting frames, especially for cord twisting frames. 4,050,227, Cl. 57-34.500.

Beres, Steve W., to VCA Corporation. Spray pump assembly. 4,050,860, Cl. 417-444.000.

Berg, Morris: *See*—
Bedford, Raymond E.; and Berg, Morris, 4,051,072, Cl. 252-464.000.

Berger, Abe. Polyimide containing silicones. 4,051,163, Cl. 260-448.20N.

Berger Industries, Inc.: *See*—
Berger, Sidney; Buda, Salvatore; and Weintraub, Burton, 4,050,722, Cl. 285-175.000.

Berger, Sidney; Buda, Salvatore; and Weintraub, Burton, to Berger Industries, Inc. Joint for conduit. 4,050,722, Cl. 285-175.000.

Berggren, L. John; Chin, Charles L. D.; and Reilly, Joseph R., to Monsanto Company. Method and apparatus for temperature conditioning parts. 4,050,887, Cl. 432-122.000.

Berghahn, Walter G.; and Weinstein, Jack, to Bristol-Myers Company. Liquid applicator. 4,050,826, Cl. 401-196.000.

Bergman, Lawrence A., to Lord Corporation. Drive coupling. 4,050,266, Cl. 64-14.000.

Beriger, Conrad; and Keller, Eduard, to BBC Brown Boveri & Company Limited. Apparatus for cooling electrical devices at different electrical potentials by means of a flowing medium. 4,051,509, Cl. 357-82.000.

Berlincourt, Don A., to Channel Products, Inc. Encapsulation to prevent fracture of piezoelectric high voltage mechanism. 4,051,396, Cl. 310-340.000.

Bernardo, Matthew: *See*—
Cretella, Salvatore J.; Bernardo, Matthew; and DeMusis, Ralph T., 4,050,133, Cl. 29-156.80B.

Bernier, Edgar R.: *See*—
Hayner, Paul F.; Eldridge, David G.; Bernier, Edgar R.; and Henderson, Richard B., 4,050,476, Cl. 137-625.620.

Berning, Keith E. Automobile mount for citizens band radios. 4,050,767, Cl. 339-135.000.

Bernstein, Donald J. Alteration-sensitive surface. 4,051,295, Cl. 428-288.000.

Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, to American Cyanamid Company. Ureidophenylenebis(carbonylimino)dinaphthalenetrisulfonic acid compounds. 4,051,176, Cl. 260-506.000.

Bertschmann, Silvio; Koester, Waldemar; and Huber, Reinhold, to Friedrich Maurer Soehne, Firma. Expansion gap sealing device. 4,050,207, Cl. 52-396.000.

Beser, William; and Cole, Edwin R., to Upjohn Company, The. Apparatus and process. 4,051,211, Cl. 264-51.000.

Beucherie, Pierre, to European Atomic Energy Community (EURATOM). Apparatus for depositing thin layers of materials by reactive spraying in a high-frequency inductive plasma. 4,050,408, Cl. 118-49.100.

Bez, Ulrich, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Installation for the energy absorption of vehicles. 4,050,537, Cl. 180-91.000.

Bhargava, Rameshwar Nath; and Neumark, Gertrude F., to North American Philips Corporation. Gallium phosphide light emitting semiconductive materials. 4,051,061, Cl. 252-301.4P.

Biax-Werkzeuge K.G. Wezel & Co. Prazisionswerkzeug-Fabrik: *See*—
Lange, Klaus, 4,050,128, Cl. 407-59.000.

Biebuyck, Lawrence F.: *See*—
Hubbard, S. Eugene; and Biebuyck, Lawrence F., 4,050,201, Cl. 52-97.000.

Bienert, Walter B.; and Pravda, Milton F., to Dynatherm Corporation. Down-pumping heat pipes. 4,050,509, Cl. 165-45.000.

Biggs, Donald William; and Rayfield, Wilson Parker, to Burroughs Corporation. Method and apparatus for stuffing ribbons. 4,050,617, Cl. 226-1.000.

Billault, Michel, to Sofrance S.A. Device for assembling stacked annular filtering elements, under constant pressure. 4,051,037, Cl. 210-236.000.

Billings, Ronald Joseph: *See*—
Paulin, Robert Charles; and Billings, Ronald Joseph, 4,050,830, Cl. 403-205.000.

Binsbergen, Frederik L.; and Van Namen, Dick J., to Shell Oil Company. Lubricating oil compositions containing an acyclic polymer of cyclopentene. 4,051,051, Cl. 252-59.000.

Biorex Laboratories Limited: *See*—
Turner, John Cameron; and Chan, Rosalind Po-Kuen, 4,051,263, Cl. 424-347.000.

Birnholz, Jean; and Couty, Pierre. Unitary socket terminal for electronic circuits. 4,050,772, Cl. 339-220.00R.

Bishop, Robert J., to Allied Chemical Corporation. Inflation surge delay. 4,050,483, Cl. 141-4.000.

BJ-Hughes Inc.: *See*—
Gandy, Richard G.; and White, Vincent Cohee, 4,050,948, Cl. 106-76.000.
Giebeler, Bernhardt F., 4,050,512, Cl. 166-128.000.

Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., to Caterpillar Tractor Co. Fluoroelastomer-based composite material. 4,051,100, Cl. 260-42.180.

Blace Filtronics, Inc.: *See*—
Blace, Roy J., 4,051,033, Cl. 210-193.000.

Blace, Roy J., to Blace Filtronics, Inc. Filter device. 4,051,033, Cl. 210-193.000.

Black, Samuel J.: *See*—
Will, Albert S.; Wilson, Robert R.; and Black, Samuel J., 4,051,414, Cl. 361-415.000.

Black, Stephen Read, to Motorola, Inc. High speed ECL one-shot multivibrator. 4,051,387, Cl. 307-273.000.

Bland, Walter P.: *See*—
McKendry, Lennon H.; and Bland, Walter P., 4,051,130, Cl. 544-11.000.

Bloch, Peter K., to Krautkramer-Branson, Incorporated. Method and apparatus for testing railroad wheels. 4,050,292, Cl. 73-67.50R.

Blondet, Bruno; Kretschmer, Sylvain; Lacotte, Jean Pierre; and Peltier, Jean Paul, to Thomson-Brandt. An optical information recording system in which the energy when transmitted to the recording layer is constant. 4,051,329, Cl. 179-100.30N.

Bloomfield, Jordan J.; and Owsley, Dennis C., to Monsanto Company. Aroma chemicals. 4,051,076, Cl. 252-522.000.

Blount, David H. Process for the production of lignin silicate and lignin silicoformate. 4,051,115, Cl. 260-124.00R.

Bly, Vincent T., to United States of America, Army. Optical system for thermal imager. 4,051,370, Cl. 250-331.000.

Boccoli, Temistocle, to Piovanelli Macchinari e Impianti S.p.A. Method for reclaiming cured rubber scraps. 4,051,080, Cl. 260-2.300.

Boddicker, Major L.: *See*—
Shults, Otto C.; and Boddicker, Major L., 4,050,186, Cl. 46-180.000.

Bodem, Johann; and Raine, Thomas, to Schwarzkopf Development Corporation. Clamping tool holder. 4,050,127, Cl. 407-107.000.

Boeing Company, The: *See*—
Andrews, Michael Joseph; Davis, William Allen; and Senske, Roger Alvin, 4,050,294, Cl. 73-105.000.
Bogue, Robert Edgar; Jones, Donald Keith; Riggs, Ray Vere; and Vogele, Bruno Joseph, 4,050,655, Cl. 244-137.00R.
Pompei, Arturo; and Winters, Alden Bernard, 4,050,208, Cl. 52-460.000.
Syltebo, Bjarne Elroy, 4,050,631, Cl. 239-265.250.
Tieden, Jansey D., 4,051,394, Cl. 307-310.000.
Vanderleest, Siebold, 4,050,397, Cl. 114-274.000.

Bofors America, Inc.: *See*—
Reiters, Ludvigs O., 4,050,976, Cl. 156-233.000.

Bogaard, Johan J. H.; and Korteling, Gerrit-Jan, to U.S. Philips Corporation. Method of manufacturing a bulb for a cathode-ray tube, and bulb obtained by means of this method. 4,050,601, Cl. 220-2.10A.

Boggs, Roger L.: *See*—
Vanlandingham, Harold W.; Boggs, Roger L.; Bullock, David A.; and Maytum, James N., 4,050,141, Cl. 29-401.00R.

Boggs, William O. Visualizer. 4,050,798, Cl. 353-35.000.

Boggs, William O. Compact visualizer. 4,050,809, Cl. 353-35.000.

Bogue, Robert Edgar; Jones, Donald Keith; Riggs, Ray Vere; and Vogele, Bruno Joseph, to Boeing Company, The. Cargo loading method and apparatus. 4,050,655, Cl. 244-137.00R.

Boll, Bernd: *See*—
Metzinger, Wolfgang; Boll, Bernd; and Hergt, Peter, 4,050,846, Cl. 415-182.000.

Bolliand, Robert; and Saligny, Claude, to Rhone-Poulenc-Textile. Process and apparatus for continuously shrinking a non-woven sheet. 4,050,982, Cl. 162-100.000.

Bom, Cornelis Johannes Gerardus: *See*—
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,050,520, Cl. 172-59.000.

Bond, Desmond H.; Taggart, George W.; and Jaeger, Kurt S., to Ford, Bacon & Davis Texas, Inc. Production of internal atmospheres for kilns. 4,051,231, Cl. 423-659.000.

Bonin, Jean Claude, to Roto Diesel. Grinding head for machining constant internal profiles. 4,050,193, Cl. 51-101.00R.

Bonnerot, Georges, to Telecommunications Radioelectriques et Telephoniques T.R.T. Double odd discrete fourier transformer. 4,051,357, Cl. 364-726.000.

Bonnes, David R., to Union Fork & Hoe Company, The. Hand-shovel assembly and method of producing it. 4,050,727, Cl. 294-49.000.

Book, Nils Evert Erling, to Aktiebolaget Motala Verkstad. Apparatus for the hot-pressing of composite boards made from lignocellulosic material. 4,050,863, Cl. 425-84.000.

Bora, S.A., Firma: *See*—
Olsen, Niels Johan, 4,050,173, Cl. 38-143.000.

Borchardt, Jack A., to Environmental Filtration Products, Inc. Water treatment system. 4,051,032, Cl. 210-142.000.

Borck, Joachim: *See*—
Dahm, Johann; Borck, Joachim; Wild, Albrecht; and Hovy, Jan Willem, 4,051,250, Cl. 424-272.000.

Boren, John A., to North State Pyrophyllite Company. Refractory structure and method. 4,050,577, Cl. 206-322.000.

Borg, Karl S.; and Keith, Gareth A., to Masoneilan International, Inc. Variable force actuator. 4,050,670, Cl. 251-14.000.

Borgen, Jennings O. Method of reversible sterilization. 4,050,448, Cl. 128-1.00R.

Borisova, Natalya Isaakievna: *See*—
Lavrentiev, Konstantin Nikitich; Borisova, Natalya Isaakievna; Vasiliev, Jury Ivanovich; Rodionov, Jury Nikolaevich; Strashinsky, Vadim Konstantinovich; Ioffe, Vladimir Fedorovich; and Vyatskin, Iosif Yakovlevich, deceased, 4,051,422, Cl. 318-570.000.

Borrevang, Poul; and Petersen, Henning Borge, to Novo Industri A/S. Process for converting penicillin sulfoxides to the corresponding 3-desacetoxycephalosporins. 4,051,133, Cl. 544-18.000.

Borrill, James L., to International Harvester Company. Vehicle cab. 4,050,733, Cl. 296-28.00C.

Borrin, Jules. Method of reducing interliner remnant. 4,050,974, Cl. 156-159.000.

Borroughs Tool & Equipment Corporation: *See*—
Okamuro, James A., 4,050,139, Cl. 29-283.000.

Bortak, John Joseph: *See*—
Schweickart, Albert John; Collins, Stephen Michael; and Bortak, John Joseph, 4,051,009, Cl. 204-279.000.

Borup, Jorgen, to AB Nike Hydraulik. Method for vehicle alignment. 4,050,287, Cl. 72-457.000.

Bosch, Karl; and Fritzenschaft, Max, to Adolf Diener, Apparate- U. Maschinenbau. Air-hydraulic blind-riveting tool with short reset time. 4,050,285, Cl. 72-391.000.

Boschen, William O.; Annichiarico, Angelo V.; and Johnson, Arthur L., to Ralph B. Carter Company. Apparatus for the aerobic treatment of liquid waste. 4,051,035, Cl. 210-220.000.

Boschert Assoc.: *See*—
Boschert, Robert J., 4,051,445, Cl. 331-113.00A.

Boschert, Robert J., to Boschert Assoc. Inverter converter circuit for maintaining oscillations throughout extreme load variations. 4,051,445, Cl. 331-113.00A.

Bossak, Gary Edward: *See*—
Schuetz, Adolph August; and Bossak, Gary Edward, 4,051,375, Cl. 250-372.000.

Bosshart, John H.; and David, Emil J., to Eaton Yale Ltd. Articulated vehicle. 4,050,535, Cl. 180-51.000.

Bossi, Emilio: *See*—
Piccolo, Luigi; Calcagno, Benedetto; and Bossi, Emilio, 4,050,951, Cl. 106-300.000.

Botros, Raouf, to American Color & Chemical Corporation. Azomethine dyes derived from an o-hydroxy aromatic aldehyde and a 2-aminopyridine. 4,051,119, Cl. 260-156.000.

Bouley, Jean Claude, to Bunker Ramo Corporation. Method and apparatus for soldering electric terminals to double-sided circuit boards. 4,050,621, Cl. 228-180.00R.

Bourland, Joe D.: *See*—
Geddes, Leslie A.; and Bourland, Joe D., 4,051,539, Cl. 360-44.000.

Bourquardez, Gaston. Wind driven power system. 4,050,246, Cl. 60-398.000.

Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, to Henkel & Cie GmbH. Stable peroxy-containing microbicides. 4,051,058, Cl. 252-186.000.

Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, to Henkel & Cie GmbH. Peroxy-containing microbicides stable in storage. 4,051,059, Cl. 252-186.000.

Boxboard Research and Development Association: *See*—
Luey, A. Thomas; and Hite, Frederick S., 4,050,499, Cl. 162-317.000.

Boyd, John A. Refuse treatment apparatus. 4,050,388, Cl. 110-8.00P.

Boyer, Jo Clara, to Saviano, A.G. Process for forming panty hose and an article formed thereby. 4,050,268, Cl. 66-19.000.

Bozich, George J.: *See*—
Beneke, Jene A.; and Bozich, George J., 4,050,557, Cl. 192-4.00R.

Braat, Josephus Johannes Maria, to U.S. Philips Corporation. Focus detection system for a video disc player using a plurality of radiation sensors in the far field of the information structure. 4,051,527, Cl. 358-128.000.

Brachert, Heinrich; and Kleiss, Joachim, to Dynamit Nobel Aktiengesellschaft. Process for the production of propellant charge powders, especially nitroguanidine powders. 4,051,207, Cl. 264-3.00B.

Braden, Rudolf; Knupfer, Hans; and Ziemann, Heinz, to Bayer Aktiengesellschaft. Process for the preparation of unsaturated amino compounds. 4,051,177, Cl. 260-510.000.

Brader, Allen C. Arch form component. 4,050,158, Cl. 32-14.00A.

Braemar Computer Devices, Inc.: *See*—
Martin, Peter G., 4,051,415, Cl. 318-7.000.

Brandon, Paul W.: *See*—
Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., 4,050,869, Cl. 425-222.000.

Brandon, William D.: *See*—
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,051,100, Cl. 260-42.180.

Brandt, Arthur V. Centrifugal weights orienting system. 4,050,317, Cl. 74-64.000.

Braren, Rudolf. Cycloidal gears. 4,050,331, Cl. 74-804.000.

Bratchell, Robert Lyndon, to Concrete Industries (Monier) Limited. In-line moulding of prestressed concrete articles. 4,051,216, Cl. 264-157.000.

Brearley Company, The: *See*—
Provi, Mike A.; and Guinter, S. Robert, 4,050,532, Cl. 177-211.000.

Breazu, Stefan: *See*—
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,050,704, Cl. 280-6.00R.

Bredeweg, Roger L., to Dow Chemical Company, The. Method for

determining water vapor transmission rate or water content. 4,050,995, Cl. 204-1.00T.
Brewer, William E.; and Zimmer, Franklin V., to K-Krete, Inc. Method of building embankments and structure supports of backfilling. 4,050,258, Cl. 61-50.000.
Brewer, William E.; and Zimmer, Franklin V., to K-Krete, Inc. Method of backfilling. 4,050,261, Cl. 61-105.000.
Brewer, William E.; and Zimmer, Franklin V., to K-Krete, Inc. Controlled density fill material containing fly ash. 4,050,950, Cl. 106-97.000.
Bridgestone Tire Company Limited: *See*—
Wakana, Hiroshi; Harada, Isamu; and Honma, Tsutomu, 4,050,605, Cl. 220-5.00A.
Brigham Young University: *See*—
Strong, William James; and Palmer, Edward Paul, 4,051,331, Cl. 179-107.00R.
Bright, Clark I.: *See*—
Snyder, Jan S.; and Bright, Clark I., 4,051,463, Cl. 340-173.0TP.
Briles, Franklin S. Taper headed fastener to increase work fatigue life. 4,050,833, Cl. 403-405.000.
Brimhall, George H. Organic waste treating and conversion system. 4,050,907, Cl. 48-111.000.
Brinner, Thomas Richard; and Stitt, Thomas Deltor, to General Electric Company. Braking mode control for a chopper controlled d-c electric motor. 4,051,421, Cl. 318-367.000.
Bristol-Myers Company: *See*—
Berghahn, Walter G.; and Weinstein, Jack, 4,050,826, Cl. 401-196.000.
Godfrey, John Carl; and Rubinfeld, Joseph, 4,051,315, Cl. 536-10.000.
Kawaguchi, Hiroshi; Tomita, Koji; Tsukiura, Hiroshi; and Konishi, Masataka, 4,051,237, Cl. 424-117.000.
Bristow, Ian Trevor: *See*—
Andrews, Jeffery Frederick; Chauhan, Harjinder Singh; and Bristow, Ian Trevor, 4,050,559, Cl. 192-58.00B.
British Petroleum Company Limited, The: *See*—
Southgate, Donald Alan, 4,050,955, Cl. 134-8.000.
Broderick, Milan A.; and Mateja, Eugene V., to Bell & Howell Company. Instantaneous imaging microfilm recording camera with blip control. 4,050,810, Cl. 355-40.000.
Brodmann, Nikolaus: *See*—
Arndt, Erhard; Brodmann, Nikolaus; and Roser, Horst R., 4,050,984, Cl. 176-60.000.
Brody, Philip S.; to United States of America, Army. Ferroeléctric ceramic devices. 4,051,465, Cl. 340-173.200.
Broggie, Roger E.: *See*—
Gurr, Robert H.; and Broggie, Roger E., 4,050,385, Cl. 104-173.0ST.
Broken Hill Associated Smelters Proprietary Limited, The: *See*—
Lawson, Frank; Waverley, Glen; Ward, Denby Harcourt; and Kelly, Robert George, 4,050,926, Cl. 75-78.000.
Bromfield, Ian Derek; and Seddon, Peter, to Nippon Kogaku K.K. Manufacture of multi-layer structures. 4,050,817, Cl. 355-133.000.
Brosh, Amnon: *See*—
Kurtz, Anthony D.; Mallon, Joseph R.; and Brosh, Amnon, 4,051,451, Cl. 338-42.000.
Brotzmann, Karl; and Fassbinder, Hans Georg, to Eisenwerk-Gesellschaft Maximilianshutte mbH. Apparatus for the controlled feeding of a refining gas and of a fluid protective medium. 4,050,681, Cl. 266-82.000.
Brovedan, Antonio: *See*—
Ferrentino, Antonio; Brovedan, Antonio; and Sala, Angelo, 4,050,867, Cl. 425-114.000.
Brown, Albert, to Raymond Lee Organization, Inc., The. Quarter card deck. 4,050,698, Cl. 273-152.410.
Brown, Alfred: *See*—
Wu, Ching H.; Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 4,050,513, Cl. 166-274.000.
Brown, William E., to Dow Chemical Company, The. Ferrule and use thereof for cooling a melt spun hollow glass fiber as it emerges from a spinnerette. 4,050,915, Cl. 65-1.000.
Brozkova, Marie; Burysek, Frantisek; Janousek, Jan; Mikulecky, Karel; and Skoda, Stanislav, to Vyzkumny ustav bavlnarsky. Apparatus for timing a spinning-in operation of a textile machine. 4,050,226, Cl. 57-34.00R.
Brucken, Byron L.; and Watt, Roy E., to General Motors Corporation. Variable displacement radial piston compressor. 4,050,852, Cl. 417-273.000.
Bruckmann, Peter: *See*—
Geiger, Albert; and Bruckmann, Peter, 4,050,187, Cl. 47-45.000.
Brumlik, George C.; and Bartner, Bernard I. Train molding apparatus. 4,050,873, Cl. 425-371.000.
Brumm, Richard S., to Grove Valve and Regulator Company. Expansible tube valves. 4,050,669, Cl. 251-5.000.
Bruneau, Jacques: *See*—
Buzas, Andre; and Bruneau, Jacques, 4,051,259, Cl. 424-324.000.
Brunswick Corporation: *See*—
Mayer, William B., 4,050,359, Cl. 92-113.000.
Bryan, Hugh T. Fishing rod holder. 4,050,178, Cl. 43-212.000.
Bryand, Edward T., to Honeycomb Systems, Inc. Roll with inner and outer, spaced axially extending triangular mesh strips. 4,050,131, Cl. 29-121.300.
Buck, George Sumner, Jr.; Weyker, Robert George; and Ward, Arthur Gerard, to Fiberlok, Inc. Composite batt and method for producing same. 4,050,977, Cl. 156-283.000.
Buck, George Sumner, Jr.; Weyker, Robert George; and Ward, Arthur Gerard, to Fiberlok, Inc. Fiberous batt and method for producing such. 4,051,294, Cl. 428-283.000.
Buckley, Bruce Shawn, to Massachusetts Institute of Technology. Controllable heat transmission panels. 4,050,508, Cl. 165-32.000.
Buda, Salvatore: *See*—
Berger, Sidney; Buda, Salvatore; and Weintraub, Burton, 4,050,722, Cl. 285-175.000.
Buell, Donald D. Dual spring clip for mounting electrical devices. 4,051,321, Cl. 174-57.000.
Bullock, David A.: *See*—
Vanlandingham, Harold W.; Boggs, Roger L.; Bullock, David A.; and Maytum, James N., 4,050,141, Cl. 29-401.00R.
Bullseye Glass Co.: *See*—
Ahlgren, Raymond E.; Schwoerer, Danial W.; and Lundstrom, Boyce H., 4,050,947, Cl. 106-52.000.
Bunas, Bennie I.; and Uitti, Kenneth D., to UOP Inc. Sieve-type fractionation trays. 4,051,206, Cl. 261-109.000.
Bundy, Gordon L.; and Nelson, Norman A., to Upjohn Company, The. Cis-4,5-didehydro-11-deoxy-13,14-dihydro-PG compounds. 4,051,160, Cl. 260-413.000.
Bunker Ramo Corporation: *See*—
Bouley, Jean Claude, 4,050,621, Cl. 228-180.00R.
Bunn, Dorrance P., Jr.; Williams, Dale; Jones, Henry B.; and MacLean, John P., to Texaco Inc. Fluidized catalytic cracking regeneration process. 4,051,069, Cl. 252-417.000.
Burchette, Robert L., Jr.; and Harris, Edward J., to Plastic Injectors, Inc. Yarn carrier. 4,050,645, Cl. 242-125.100.
Burchette, Robert L., Jr. Yarn carrier. 4,050,646, Cl. 242-125.100.
Burgbacher, Donald E.: *See*—
Hales, Louis S.; Hamilton, Don R.; Weller, Harry F.; and Burgbacher, Donald E., 4,050,198, Cl. 51-281.00R.
Burger, Peter: *See*—
Steranko, James Joseph; Rogoff, Gerardo; Scott, Randall Dean; Gallagher, Angela Frances; and Burger, Peter, 4,051,459, Cl. 364-900.000.
Burroughs Corporation: *See*—
Biggs, Donald William; and Rayfield, Wilson Parker, 4,050,617, Cl. 226-1.000.
Lawrie, Duncan H.; and Vora, Chandrakant Ratilal, 4,051,551, Cl. 364-200.000.
Burysek, Frantisek: *See*—
Brozkova, Marie; Burysek, Frantisek; Janousek, Jan; Mikulecky, Karel; and Skoda, Stanislav, 4,050,226, Cl. 57-34.00R.
Buse, Frederic W., to Ingersoll-Rand Company. Multi-plunger reciprocating pump. 4,050,862, Cl. 417-539.000.
Bussard, Leon M., to Bussard, Leon M.; and Smith, C. Ed. Boat trailer extension assembly. 4,050,595, Cl. 214-84.000.
Butler, John F., to Jones & Laughlin Steel Corporation. Method of measuring vapor deposited coating thickness. 4,051,270, Cl. 427-8.000.
Butler, Roy I.: *See*—
Lowe, John G.; and Butler, Roy I., 4,051,024, Cl. 210-30.00A.
Buzas, Andre; and Bruneau, Jacques, to Les Laboratoires Bruneau & Cie. Phenoxyacetic acid amide. 4,051,259, Cl. 424-324.000.
Byk Gulden Lomberg Chemische Fabrik GmbH: *See*—
Hein, Helmut; Hermann geb Gleissner, Rosmarie; and Schaefer, Hartmann, 4,051,253, Cl. 424-285.000.
Klemm, Kurt; and Langenscheid, Erhard, 4,051,242, Cl. 424-246.000.
Byrne, John C.: *See*—
Castellana, Frank S.; Byrne, John C.; and Huckaba, Charles E., 4,050,449, Cl. 128-2.00S.
C. Hager & Sons Hinge Manufacturing Company: *See*—
Peterson, Francis C., 4,050,189, Cl. 49-26.000.
C M Industries: *See*—
Krausz, Francois, 4,051,127, Cl. 260-239.30D.
C. van der Lely N. V.: *See*—
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,050,520, Cl. 172-59.000.
Calcagno, Benedetto: *See*—
Piccolo, Luigi; Calcagno, Benedetto; and Bossi, Emilio, 4,050,951, Cl. 106-300.000.
California Institute of Technology: *See*—
Dimotakis, Paul E.; and Lang, Daniel B., 4,051,433, Cl. 324-78.00R.
Call, Daniel D., to Cummins-Allison Corporation. Coin roll packaging system. 4,050,218, Cl. 53-167.000.
Cambron, Robert B.: *See*—
Powers, Harold C.; and Cambron, Robert B., 4,050,360, Cl. 92-127.000.
Camilleri, Thomas M. Flexible plank support unit. 4,050,695, Cl. 273-53.000.
Campbell, Bowen, to Campbell, Cromwell B. Grain dryer construction. 4,050,164, Cl. 34-182.000.
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Campbell, Bowen, 4,050,164, Cl. 34-182.000.
Campbell, Donn V., to United States of America, Army. Radio receiver isolation system. 4,051,475, Cl. 343-180.000.
Campbell, Robert W.: *See*—
Scoggins, Lacey E.; and Campbell, Robert W., 4,051,087, Cl. 260-18.00N.
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Dennison, Graeme N., 4,050,766, Cl. 339-117.00P.
Power, John M., 4,050,382, Cl. 102-16.000.
Canadian Patents & Development Limited: *See*—
Sarjeant, Walter J., 4,051,432, Cl. 324-72.500.

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Ogawa, Hiroshi; and Ariga, Masao, 4,050,800, Cl. 355-75.000.
Candor, James T. Method and apparatus for removing liquid from liquid bearing material. 4,050,162, Cl. 34-1.000.
Canon Kabushiki Kaisha: *See*—
Ito, Yoshio; Ariga, Masao; and Suda, Masashi, 4,050,691, Cl. 271-124.000.
Komine, Yoshio, 4,050,796, Cl. 352-243.000.
Tanaka, Keiji; Ando, Yujiro; and Ohara, Katsunobu, 4,050,802, Cl. 355-3.00R.
Tanikoshi, Kinji, 4,051,420, Cl. 318-254.000.
Canon Seiki Kabushiki Kaisha: *See*—
Tanikoshi, Kinji, 4,051,420, Cl. 318-254.000.
Canron, Inc.: *See*—
Pearson, Eugene Walford, 4,050,338, Cl. 83-641.000.
Canterbury, Robert Houston, to Dresser Industries, Inc. Method of injecting fluids into underground formations. 4,050,516, Cl. 166-305.00R.
Cappel, Fred; Hastik, Walter; Fleming, Georg; and Hofmann, Pierre, to Dravo Corporation. Process of controlling Fe^{++} content of sintered iron ore. 4,050,924, Cl. 75-5.000.
Cardinal, Daniel E., Jr. Laying down of large sheets of film. 4,050,972, Cl. 156-71.000.
Carioli, Giancarlo: *See*—
Badagnani, Guido; and Carioli, Giancarlo, 4,051,326, Cl. 179-2.0DP.
Carl Hurth Maschinen- und Zahnradfabrik: *See*—
Schulz, Wolfgang, 4,050,543, Cl. 184-6.300.
Carl Still, Firma: *See*—
Lorenz, Kurt, 4,050,990, Cl. 201-5.000.
Still, Carl Otto; and Aust, Walter Dean, 4,050,992, Cl. 202-227.000.
Carl Zeiss Stiftung: *See*—
Rentschler, Waldemar; and Starp, Franz, 4,051,495, Cl. 354-152.000.
Carlo Erba, S.p.A.: *See*—
Ambrogi, Vittorio; Logemann, Willy; Parenti, Marc'Antonio; and Tommasini, Raffaele, 4,051,245, Cl. 424-250.000.
Carlson, Glenn R., to Rohm and Haas Company. 1-Aryl-4-pyridones. 4,051,142, Cl. 260-294.900.
Carlson, John A., to Conchemco, Incorporated. Bowstring changer cable fitting. 4,050,137, Cl. 29-235.000.
Carmichael, John Michael; Hill, James David; and West, Donald Lee, to International Business Machines Corporation. Electronic control for optimizing carrier turnaround in printing apparatus. 4,050,564, Cl. 197-1.00R.
Carnation Company: *See*—
Kramer, Norman C., 4,050,570, Cl. 198-398.000.
Carre, Jean-Jacques; and Muterel, Roland, to Societe Anonyme D.B.A. Hydraulic booster. 4,050,251, Cl. 60-550.000.
Carrier Corporation: *See*—
Watson, James J., Jr., 4,050,881, Cl. 432-5.000.
Carter, J. Warne, Jr.: *See*—
Carter, J. Warne, Sr.; and Carter, J. Warne, Jr., 4,050,357, Cl. 91-410.000.
Carter, J. Warne, Sr.; and Carter, J. Warne, Jr. Steam admission valve and variable clearance volume steam cylinder. 4,050,357, Cl. 91-410.000.
Cartwright, Dwayne L., to Holloway Farm Supply, Inc. Ground marking foam. 4,050,944, Cl. 106-19.000.
Casio Computer Co., Ltd.: *See*—
Hakata, Masayuki, 4,051,356, Cl. 235-310.000.
Casper, Richard R.; and Marander, Myron P., to Weyerhaeuser Company. Method of controlling monomer loss during the production of a fiber-thermoplastic matrix by in situ bulk polymerization. 4,051,214, Cl. 264-137.000.
Cassano, James R.: *See*—
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,050,688, Cl. 271-5.000.
Castaigne, Albert Rene Joseph, to Centre d'Etudes pour l'Industrie pharmaceutique. Thieno[3,2-c]pyridine derivatives. 4,051,141, Cl. 260-294.80C.
Castellana, Frank S.; Byrne, John C.; and Huckaba, Charles E., to Medical Products Development Corporation. Apparatus for exercising muscles of a female patient's pelvic diaphragm. 4,050,449, Cl. 128-2.00S.
Castillo, Horace T.; and Marriott, Henry J. L., to Concept, Inc. Radio-transparent electrode. 4,050,453, Cl. 128-2.06E.
Castrol Limited: *See*—
Elliott, John Scotchford; Jayne, Gerald John Joseph; Askew, Herbert Frank; and Harrington, Colin John, 4,051,053, Cl. 252-78.300.
Cataldo, Roy S., to General Motors Corporation. Constant pressure-temperature delayed combustion high compression ratio engine and method. 4,050,420, Cl. 123-30.00C.
Caterpillar Tractor Co.: *See*—
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,051,100, Cl. 260-42.180.
Molnar, John, 4,050,735, Cl. 296-102.000.
Powers, Harold C.; and Cambron, Robert B., 4,050,360, Cl. 92-127.000.
Vanlandingham, Harold W.; Boggs, Roger L.; Bullock, David A.; and Maytum, James N., 4,050,141, Cl. 29-401.00R.
Caunt, Anthony David; and Fortuin, Michael Stanley, to Imperial Chemical Industries Limited. Polymerization process. 4,051,307, Cl. 526-77.000.
CAV Limited: *See*—
Hollett, Reginald; and Potter, James Charles, 4,050,437, Cl. 123-139.0AC.
Cavitron Corporation: *See*—
Warrin, George E., 4,051,337, Cl. 200-61.850.
Celanese Corporation: *See*—
Kirshenbaum, Gerald S.; and Vogelfanger, Elliot A., 4,051,265, Cl. 426-107.000.
Celanese Polymer Specialties Company: *See*—
McWhorter, Wayne F., 4,051,195, Cl. 260-837.00R.
Cendak, Bruno, to Grandi Motori Trieste S.p.A. G.M.T. - Fiat, Ansaldo, C.R.D.A. Cylinder liner with internal cooling ducts for internal combustion reciprocating engines. 4,050,421, Cl. 123-41.720.
Cenker, Moses; and Kan, Peter Tai-Yuen, to BASF Wyandotte Corporation. Carbodiimide-isocyanurate foams modified with ethoxylated polyols. 4,051,082, Cl. 260-2.5AR.
Centre d'Etudes pour l'Industrie pharmaceutique: *See*—
Castaigne, Albert Rene Joseph, 4,051,141, Cl. 260-294.80C.
Centronics Data Computer Corporation: *See*—
Menhennett, Herbert E., 4,050,563, Cl. 197-1.00R.
Chan, Rosalind Po-Kuen: *See*—
Turner, John Cameron; and Chan, Rosalind Po-Kuen, 4,051,263, Cl. 424-347.000.
Channel Products, Inc.: *See*—
Berlincourt, Don A., 4,051,396, Cl. 310-340.000.
Chapman, John Edward, to Babcock & Wilcox Limited. Tube inspection and servicing apparatus. 4,050,384, Cl. 104-138.00G.
Charles E. Frosst & Co.: *See*—
Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., 4,051,144, Cl. 260-307.0FA.
Chasanoff, Daniel; and Schneider, Myles Z. Dental appliance. 4,050,156, Cl. 32-2.000.
Chauhan, Harjinder Singh: *See*—
Andrews, Jeffery Frederick; Chauhan, Harjinder Singh; and Bristow, Ian Trevor, 4,050,559, Cl. 192-58.00B.
Check, Frank T., Jr., to Pitney-Bowes, Inc. Meter setting mechanism. 4,050,374, Cl. 101-91.000.
Chemetron Corporation: *See*—
Crompton, Charles E.; and Kazi, Abdulla M. Z., 4,051,064, Cl. 252-309.000.
Glanz, Ronald Paul, 4,050,829, Cl. 403-205.000.
Paulin, Robert Charles; and Billings, Ronald Joseph, 4,050,830, Cl. 403-205.000.
Chemische Werke Huls Aktiengesellschaft: *See*—
Pfeiffer, Kurt; Dietrich, Johannes; Beckmann, Gunter; and Herkt, Karl-Heinz, 4,050,901, Cl. 23-285.000.
Chenevard, Alexis; and Torres, Jean, to SAPAL Societe Anonyme des Plieuses Automatiques. Device for transferring products between moulds of a production machine and a table of a wrapping machine. 4,050,574, Cl. 198-458.000.
Chevron Research Company: *See*—
Anshus, Byron E., 4,050,994, Cl. 203-35.000.
Liston, Thomas V., 4,051,047, Cl. 252-33.000.
Chiari, Gervasio. Multi-component, spherical, assemblable toy. 4,050,184, Cl. 46-17.000.
Childress, Ray. Safety shield and temporary roof support. 4,050,259, Cl. 61-63.000.
Chin, Charles L. D.: *See*—
Berggren, L. John; Chin, Charles L. D.; and Reilly, Joseph R., 4,050,887, Cl. 432-122.000.
Ching, Larry K. W.; Coleman, Charles E.; and Uba, Toshio, to Gates Rubber Company, The. Battery plate pasting method and apparatus. 4,050,482, Cl. 141-1.100.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt: *See*—
Guczoghy, Lajos; Pfliegel, Todor; Puklics, Maria; Institoris, Laszlo; and Seres, Jeno, 4,051,156, Cl. 260-393.000.
Chisholm, Douglas S.; and Dawson, David H., to Dow Chemical Company, The. Centrifugal extrusion apparatus which heat plastifies material by mechanical shearing action. 4,050,874, Cl. 425-382.00R.
Chloride Group Limited: *See*—
Snook, James Chetwood, 4,051,304, Cl. 429-94.000.
Cho, Jin Sul. Ladies handbag and radio. 4,050,493, Cl. 150-35.000.
Cho, Nakwon, to Electro-Nucleonics, Inc. Valve seat cleaning mechanism. 4,050,473, Cl. 137-244.000.
Choate, William Clay, to Texas Instruments Incorporated. Fault-tolerant cell addressable array. 4,051,354, Cl. 235-312.000.
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Alkynyloxy-phenyl derivatives. 4,051,319, Cl. 542-413.000.
Cholet, Jacques; and Layotte, Pierre-Claude, to Institut Francais du Petrole. Movable device for generating acoustic shear waves in the earth. 4,050,540, Cl. 181-114.000.
Christensen, Alton B.: *See*—
Ralston, Harold A.; and Christensen, Alton B., 4,050,522, Cl. 172-311.000.
Chromalloy American Corporation: *See*—
Poland, Robert L., 4,050,523, Cl. 172-311.000.
Chu, Joseph Y. C.: *See*—
Marsh, Dana G.; and Chu, Joseph Y. C., 4,050,937, Cl. 96-48.00R.
Marsh, Dana G.; and Chu, Joseph Y. C., 4,050,939, Cl. 96-88.000.
Chu, Richard C.; and Moran, Kevin P., to International Business Machines Corporation. Method for customizing nucleate boiling heat transfer from electronic units immersed in dielectric coolant. 4,050,507, Cl. 165-1.000.
Churla, John J., to Thomas & Betts Corporation. Connector for cou-

pling a ground conductor to the shield of a shielded conductor. 4,051,323, Cl. 174-78.000.
Ciba-Geigy AG: *See—*
Ackermann, Hans; and Beffa, Fabio, 4,051,118, Cl. 260-153.000.
Mayer, Fritz, 4,050,269, Cl. 68-5.00D.
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, 4,051,123, Cl. 260-178.000.
Ciba-Geigy Corporation: *See—*
Durr, Dieter; and von Orelli, Marcus, 4,051,258, Cl. 424-322.000.
Jaccard, Roland, 4,051,208, Cl. 264-5.000.
Oswald, Alexis A.; and Valint, Paul L., 4,051,240, Cl. 424-225.000.
Ramey, Chester E.; and Luzzi, John J., 4,051,102, Cl. 260-45.80N.
Ramey, Chester E.; and Luzzi, John J., 4,051,137, Cl. 260-268.0TR.
Ronco, Karl, 4,051,122, Cl. 260-174.000.
Spivack, John D.; and Luzzi, John J., 4,051,104, Cl. 260-45.85B.
von der Crone, Jost, 4,051,099, Cl. 260-40.00P.
Cimpoias, Ion: *See—*
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,050,704, Cl. 280-6.00R.
Clark, Ralph J.: *See—*
Alleman, Raymond J.; Batina, Raymond T.; and Clark, Ralph J., 4,050,394, Cl. 113-120.00R.
Clay, Carl D.: *See—*
Hughes, Raymond H.; and Clay, Carl D., 4,050,742, Cl. 302-66.000.
Clean Energy Corporation: *See—*
Cramer, Frank B., 4,050,904, Cl. 23-288.00E.
Cline, Carl F.: *See—*
Tanner, Lee Elliot; Ray, Ranjan; and Cline, Carl F., 4,050,931, Cl. 75-175.500.
Coca-Cola Company, The: *See—*
Amon, Anton; and Sedam, Jason K., 4,051,034, Cl. 210-206.000.
Cochran, Larry Allen, to RCA Corporation. Hue correction apparatus controlled by chrominance saturation. 4,051,510, Cl. 358-28.000.
Coggon, Philip: *See—*
Sanderson, Gary Warner; Hoefler, Andrew Charles; Graham, Harold Nathaniel; and Coggon, Philip, 4,051,264, Cl. 426-52.000.
Cohen, Lawrence S., to TRW Inc. Solderless electrical contact. 4,050,760, Cl. 339-97.00R.
Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Intermediates in the synthesis of vitamin E. 4,051,153, Cl. 260-345.500.
Cojocaru, Iosif: *See—*
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,050,704, Cl. 280-6.00R.
Cole, Edwin R.: *See—*
Beser, William; and Cole, Edwin R., 4,051,211, Cl. 264-51.000.
Cole, William A., to Unitron Industries Ltd. Hearing aid having adjustable directivity. 4,051,330, Cl. 179-107.0FD.
Colell, Hans: *See—*
Anbegger, Sigmund; and Colell, Hans, 4,050,471, Cl. 137-39.000.
Coleman, Charles E.: *See—*
Ching, Larry K. W.; Coleman, Charles E.; and Uba, Toshio, 4,050,482, Cl. 141-1.100.
Coleman, Ronald J., to Mott, Victor S.; Groetsch, Gilbert; Johnston, John R.; and Groetsch, Ewald, part interest to each. Door hanger device. 4,050,671, Cl. 254-7.00R.
Coleman, William E.: *See—*
Albertine, Herman, Jr.; Craycraft, Donald G.; and Coleman, William E., 4,051,408, Cl. 315-169.00R.
Coley, Charles L. Book ejection apparatus. 4,050,754, Cl. 312-319.000.
Colgate-Palmolive Company: *See—*
Schaar, Charles H., 4,050,463, Cl. 128-287.000.
Collins, George R.; and Large, William R., to General Motors Corporation. Control unit. 4,050,249, Cl. 60-290.000.
Collins, Stephen Michael: *See—*
Schweickart, Albert John; Collins, Stephen Michael; and Bortak, John Joseph, 4,051,009, Cl. 204-279.000.
Coltrinari, Enzo L., to Equity Mining Corporation. Sodium sulfide leach process. 4,051,220, Cl. 423-24.000.
Columbus, Richard Lewis, to Eastman Kodak Company. Blood collection and separation device. 4,050,451, Cl. 128-2.00F.
Combi Co., Ltd.: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 4,050,103, Cl. 4-110.000.
Combustion Engineering, Inc.: *See—*
Schuetz, Adolph August; and Bossak, Gary Edward, 4,051,375, Cl. 250-372.000.
Commissariat a l'Energie Atomique: *See—*
Lemercier, Guy, 4,050,988, Cl. 176-87.000.
Commonwealth Oil Refining Co. Inc.: *See—*
McDonald, Gerald W. G., 4,051,020, Cl. 208-213.000.
Commonwealth Scientific and Industrial Research Organization: *See—*
de Bruin, Henderikus Johannes; and Warble, Charles Edward, 4,050,956, Cl. 148-6.000.
Communication Sciences Corporation: *See—*
Schomburg, Richard A., 4,051,333, Cl. 179-175.30R.
Compagnie Generale d'Electricite: *See—*
Tardy, Andre, 4,050,783, Cl. 350-96.00C.
Comptex, Inc.: *See—*
Higgins, David M., 4,050,219, Cl. 53-183.000.
Concept, Inc.: *See—*
Castillo, Horace T.; and Marriott, Henry J. L., 4,050,453, Cl. 128-2.06E.
Foltz, Carl L.; Troutner, Vernon H.; and Trott, Arthur F., 4,050,528, Cl. 173-163.000.
Conchemco, Incorporated: *See—*
Carlson, John A., 4,050,137, Cl. 29-235.000.
Concrete Industries (Monier) Limited: *See—*
Bratchell, Robert Lyndon, 4,051,216, Cl. 264-157.000.
Cone, Charles Earl: *See—*
Lichon, James F.; and Cone, Charles Earl, 4,051,361, Cl. 362-211.000.
Conger, Robert Arthur. Self-cleaning animal feeder. 4,050,415, Cl. 119-51.500.
Connett, Donald C., to Eaton Corporation. Control valve for variable displacement pump or motor. 4,050,247, Cl. 60-444.000.
Connolly, Douglas P.: *See—*
McCarroll, Alan F.; and Connolly, Douglas P., 4,050,801, Cl. 355-3.00R.
Conrad, Ulrich; and Niemeier, Gerd, to Daimler-Benz Aktiengesellschaft. Filter for liquids. 4,051,036, Cl. 210-232.000.
Conrow, Ransom Brown: *See—*
Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, 4,051,176, Cl. 260-506.000.
Continental Can Company, Inc.: *See—*
Bautz, Frederick H., 4,050,412, Cl. 118-642.000.
Continental Gummi-Werke Aktiengesellschaft: *See—*
Pakur, Hearyk; and Tiemann, Reinhard, 4,050,497, Cl. 152-361.0FP.
Continental Oil Company: *See—*
Beaty, William Ralph, Jr., 4,051,017, Cl. 208-135.000.
Control Concepts, Inc.: *See—*
Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,050,596, Cl. 214-131.00A.
Cook Electric Company: *See—*
Scheithauer, Eric A., 4,051,546, Cl. 361-124.000.
Cooke, George Frederick: *See—*
Fairbairn, Geoffrey; Cooke, George Frederick; Winkworth, Reginald; and Koreki, Jan, 4,050,289, Cl. 73-1.00F.
Coone, Malcolm G.; Malone, Billy C.; and Holbert, Marvin Lee, Jr., to Lynes, Inc. Shifting apparatus. 4,050,731, Cl. 294-86.240.
Copal Company Limited: *See—*
Inoue, Nobuyoshi; and Saito, Toshihisa, 4,051,501, Cl. 354-239.000.
Yaguinuma, Jusuke, 4,050,232, Cl. 58-52.00R.
Corcoran, William J.: *See—*
Holzman, Allen L.; and Corcoran, William J., 4,050,243, Cl. 60-245.000.
Cornue, Robert L. Knee splint. 4,050,456, Cl. 128-88.000.
Corsette, Douglas F. Manual actuated dispensing pump. 4,050,613, Cl. 222-321.000.
Cosden Oil & Chemical Company: *See—*
Daniels, Calvin L., 4,050,993, Cl. 203-9.000.
Wiley, Donald F., 4,051,293, Cl. 428-213.000.
Cosgrove, James F.: *See—*
McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., 4,050,686, Cl. 270-54.000.
Courson, Richard B., to Almo Manifold & Tool Company. Spray bars for metal rolling. 4,050,633, Cl. 239-550.000.
Coussot, Gerard, to Thomson-CSF. Surface acoustic wave transmission device and method of manufacturing same. 4,051,448, Cl. 333-30.00R.
Couty, Pierre: *See—*
Birnholz, Jean; and Couty, Pierre, 4,050,772, Cl. 339-220.00R.
Cox, Robert C. Disassemblable ski clamping apparatus. 4,050,685, Cl. 269-296.000.
CPC International Inc.: *See—*
Laitar, Robert, 4,051,301, Cl. 428-404.000.
Crabtree, Roger A. Idle system blocking means. 4,050,436, Cl. 123-198.0DB.
Craft, Inc.: *See—*
Roy, Leo T., 4,050,117, Cl. 16-178.000.
Craig, Glenn D.; Feuling, David T.; and LaHaye, Paul G., to Aqua-Chem, Inc. Reduction of gaseous pollutants in combustion flue gas. 4,050,877, Cl. 431-76.000.
Cramer, Frank B., to Clean Energy Corporation. Solubilization and reaction of coal and like carbonaceous feedstocks to hydrocarbons and apparatus therefor. 4,050,904, Cl. 23-288.00E.
Craycraft, Donald G.: *See—*
Albertine, Herman, Jr.; Craycraft, Donald G.; and Coleman, William E., 4,051,408, Cl. 315-169.00R.
Craycraft, Donald Gregory, to NCR Corporation. Load and hold system for plasma charge transfer devices. 4,051,409, Cl. 315-169.0TV.
Cremers, Adrien Edgard Henri Julien; Maes, Andre Petrus Adolf; and Pleysier, Jozef Leonia, to Leuven Research & Development VZW. Recovery of silver from silver-containing solutions. 4,051,026, Cl. 210-38.00B.
Crescentini, Lamberto: *See—*
Wells, Rodney Lee; and Crescentini, Lamberto, 4,051,196, Cl. 260-857.0PG.
Cretella, Salvatore J.; Bernardo, Matthew; and DeMusis, Ralph T. Method of refurbishing turbine vanes and the like. 4,050,133, Cl. 29-156.80B.
Crompton, Charles E.; and Kazi, Abdulla M. Z., to Chemetron Corporation. Process for making colloidal sols of antimony pentoxide in polyhydroxy alcohols. 4,051,064, Cl. 252-309.000.
Crompton & Knowles Corporation: *See—*
Magill, Jacques R., 4,050,891, Cl. 8-2.50R.
Crosby, Philip Stephen: *See—*
Nelson, Larry A.; and Crosby, Philip Stephen, 4,051,440, Cl. 328-134.000.

Crown Zellerbach Corporation: *See—*
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Crum, James Roy, to International Nickel Company, Inc., The. Corrosion-resistant matrix-strengthened alloy. 4,050,928, Cl. 75-124.000.
Crump, Leslie L.; and Italiano, Victor J., to NCR Corporation. Record media advancing mechanism. 4,050,569, Cl. 197-120.000.
CTS Corporation: *See—*
Barden, Wayne A., 4,051,453, Cl. 338-171.000.
Cuda, John: *See—*
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Cullison, David A.: *See—*
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Culver, Paul L.: *See—*
Will, Albert S.; Wilson, Robert R.; and Culver, Paul L., 4,051,339, Cl. 200-153.00L.
Cummins-Allison Corporation: *See—*
Call, Daniel D., 4,050,218, Cl. 53-167.000.
Cunningham, Walter F. Color coded indexing system. 4,050,719, Cl. 283-36.000.
Curley, James H., to International Telephone and Telegraph Corporation. Zero insertion force connector. 4,050,758, Cl. 339-74.00R.
Curran, Adrian Charles Ward, to John Wyeth & Brother Limited. Pyridine grignard derivatives. 4,051,139, Cl. 260-290.0HL.
Currie, William Edgar: *See—*
Gasier, James Mills; and Currie, William Edgar, 4,050,286, Cl. 72-416.000.
Currier, Bob L.: *See—*
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Luy, William R., 4,051,452, Cl. 338-51.000.
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Scott, Harley D., 4,050,204, Cl. 52-262.000.
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Forster, Hans-Joachim M.; and Eltze, Ulrich, 4,050,556, Cl. 192-4.00B.
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Ishikawa, Noboru; Nakamura, Hidehisa; Maruyama, Kazuyoshi; and Shoji, Akio, 4,051,194, Cl. 260-836.000.
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Davidson, Stacy D. Sanitary mouth-to-mouth shield. 4,050,457, Cl. 128-145.500.
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Davies, James Francis: *See—*
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Davies, Michael LaVar; Johnson, Richard Servern; Noker, Alvin John; and Wilde, Veldon Lawrence, to Sperry Rand Corporation. Stylus carriage drive. 4,050,568, Cl. 197-90.000.
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Davis, Charles W.; Raufeisen, Robert; and Salzgeber, Daniel Edwin, to Stanadyne, Inc. Fuel injection pump and governor and timing control system therefor. 4,050,432, Cl. 123-139.0AQ.
Davis, Neil M.: *See—*
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Andrews, Michael Joseph; Davis, William Allen; and Senake, Roger Alvin, 4,050,294, Cl. 73-105.000.
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de Bruin, Henderikus Johannes; and Warble, Charles Edward, to Commonwealth Scientific and Industrial Research Organization; and Flinders University of South Australia, The. Chemical bonding of metals to ceramic materials. 4,050,956, Cl. 148-6.000.
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De France, Robert V., to Fargo Mfg. Company, Inc. Cup-shaped underground tap connector. 4,050,761, Cl. 339-97.00R.
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Nowick, Chester R.; and DeFranza, Alfred, 4,050,885, Cl. 432-31.000.
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Deike, Robert F., to Foresight Industries. Post driving machine. 4,050,526, Cl. 173-27.000.
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Del Matto, Antonio, to BBC Brown Boveri & Company Limited. Segmented sealing structure. 4,050,702, Cl. 277-148.000.
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Flaig, Heinz, 4,050,710, Cl. 280-112.00A.
de Massacre, Guy, to Hutchinson-Mapa. Method of and apparatus for removing puncture-resistant tubes from tires. 4,050,144, Cl. 29-427.000.
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Democh, Roger E., to Eastman Kodak Company. Method for reducing mottle in coating a support with a liquid coating composition. 4,051,278, Cl. 427-326.000.
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Dennison, Graeme N., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Corrosion-proof electrical connector assembly. 4,050,766, Cl. 339-117.00P.
Denzer, Richard E., to General Motors Corporation. Cambering device for cambering vehicle. 4,050,711, Cl. 280-278.000.
Denzer, Richard E.; Marsh, Gerald J.; and Shakespear, Horacio, to General Motors Corporation. Cambering device for cambering vehicle. 4,050,712, Cl. 280-278.000.
Desenfant, Andre L., to Societe d'Etudes Generales de Communica-

tions Industrielles et Civiles-Segic. Noise reducing screen. 4,050,538, Cl. 181-210.000.
DeToia, Vincent D., to Raymond Lee Organization, Inc., The, a part interest. Gyro foil. 4,050,652, Cl. 244-23.00C.
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Knorre, Helmut; Fischer, Joachim; and Pohl, Gerhard, 4,051,228, Cl. 423-268.000.
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Benczur-Urmossy, Gabor; and Baumeyer, Ute, 4,051,305, Cl. 429-217.000.
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Kobayashi, Masayoshi; and Yuzawa, Yasutaka, 4,050,856, Cl. 417-289.000.
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Dillon, Thomas J., to Thomas J. Dillon & Co., Inc. Method of erecting a multi-story building. 4,050,213, Cl. 52-743.000.
Dimotakis, Paul E.; and Lang, Daniel B., to California Institute of Technology. Signal responsive burst period timer and counter for laser doppler velocimetry and the like. 4,051,433, Cl. 324-78.00R.
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Director-General of the Agency of Industrial Science and Technology: *See*—
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Doane, William M.: *See*—
Wing, Robert E.; and Doane, William M., 4,051,316, Cl. 536-107.000.
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Bez, Ulrich, 4,050,537, Cl. 180-91.000.
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Dr. Kurt Herberts & Co. Gesellschaft mit Beschrankter Haftung Vorm. Otto Louis Herberts: *See*—
Patzschke, Hans-Peter, 4,051,198, Cl. 260-879.000.
Doi, Yoshio, to Toyoda Koki Kabushiki Kaisha. Apparatus for forming grooved wheels. 4,050,274, Cl. 72-82.000.
Dola, Frank Peter, to AMP Incorporated. Electrical harnesses and connecting devices therefor. 4,051,383, Cl. 307-11.000.
Dolamore, Peter William. Reflective device. 4,050,444, Cl. 126-271.000.
Dolza, Claudio. Pipe laying machines. 4,050,589, Cl. 214-1.0PA.
Domroski, Raymond J. Batting practice kit. 4,050,694, Cl. 273-26.00E.
Donnelly, Gerard J. Dust pan-push broom apparatus. 4,050,110, Cl. 15-105.000.
Dore, Jacky, to Sandoz Ltd. Asymmetrical 1:2 cobalt complexes of metallizable monoazo compounds having one sulfo group per complex. 4,051,116, Cl. 260-145.00A.
Dorgnon, Roger, to Olin Corporation. Expansible nail like plug. 4,050,344, Cl. 85-68.000.
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Brown, William E., 4,050,915, Cl. 65-1.000.
Chisholm, Douglas S.; and Dawson, David H., 4,050,874, Cl. 425-382.00R.
Markley, Lowell D., 4,050,922, Cl. 71-106.000.
McKendry, Lennon H.; and Bland, Walter P., 4,051,130, Cl. 544-11.000.
Smith, Hubert Stacy, 4,050,607, Cl. 220-9.0LG.
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Hall, John Emmett, 4,050,464, Cl. 128-303.00R.
Drabek, Rudolf: *See*—
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Draffone, A. Peter, to B.W. Darrah, Inc. O-ring splicing fixture. 4,050,975, Cl. 156-217.000.
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Cappel, Fred; Hastik, Walter; Fleming, Georg; and Hofmann, Pierre, 4,050,924, Cl. 75-5.000.
Heaney, Donald F., 4,051,039, Cl. 210-274.000.
Drennen, Thomas G.; and Neander, Allen, to United States of America, Navy. Force-displacement controller knob. 4,050,265, Cl. 64-11.00R.
Dresser Industries, Inc.: *See*—
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Drexhage, Karl Heinz; and Lamberts, Robert Lewis, to Eastman Kodak Company. Imaging device having improved blue response. 4,051,374, Cl. 250-370.000.
Drostholm, Frede Hilmar; Jensen, Harry; and Willadsen, Per, to Drostholm, Frede Hilmar. Brick press and associated equipment for making bricks. 4,050,865, Cl. 425-183.000.
DuBell, Thomas L., to General Electric Company. Stabilizing dimple for combustion liner cooling slot. 4,050,241, Cl. 60-39.660.
DuBois, Edmund H., to Outboard Marine Corporation. Unitary bushing and retainer assembly. 4,050,831, Cl. 403-243.000.
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, to Institutul de Cercetari si Proiectari de Masini Agricole-ICPMA. Device for maintaining an upright position of the body of a harvester-thresher machines. 4,050,704, Cl. 280-6.00R.
Duchenaud, Alain; and Duchenaud, Roger. Cylinder for reproducing raised patterns on all surfaces. 4,050,409, Cl. 118-406.000.
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Duclaux, Daniel; Pontier, Andre J. A.; and Ferret, Georges Paul, to Aluminum Pechiney. Process and apparatus for collecting the fumes given off during the production of aluminium in an electrolysis cell with a continuous anode. 4,051,224, Cl. 423-210.000.
Duesterhoeft, William C.; and McClain, James E., to Esco Manufacturing Company. Underwater cable connector assembly. 4,050,765, Cl. 339-117.00R.
Dukich, Peter P.; Metzger, Isaac W.; and Volk, John A., to Honeywell Inc. Head attached television. 4,051,534, Cl. 358-210.000.
Dulux Australia Ltd.: *See*—
Gibson, David Vincent, 4,051,088, Cl. 260-20.000.
Dunlap, Clifford E., to W. A. Krueger Co. Stacking apparatus and method. 4,050,591, Cl. 214-6.00D.
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Moring, Peter Lothar Ernst, 4,050,322, Cl. 74-231.00J.
Dunnigan, Daniel Ambrose, to Abbott Laboratories. Manufacture of 3-arylpropyl chloride. 4,051,190, Cl. 260-651.00R.
Dupasquier, Joseph H. Composite elongated steam chamber. 4,050,630, Cl. 239-121.000.
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Davidson, Sidney Hayes, 4,051,255, Cl. 424-289.000.
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Moore, Earl Phillip, Jr., 4,051,124, Cl. 260-192.000.
Nacci, George Raymond, 4,050,942, Cl. 96-115.00R.
Pazos, Jose Francisco, 4,050,941, Cl. 96-115.00P.
Proakow, Stephen, 4,051,161, Cl. 260-448.80R.
Wallenberger, Frederick Theodore, 4,051,210, Cl. 264-45.400.
Dupre, Victor Marie; Pechmeze, Jacques Pierre Edmond; and Sureau, Robert Frederic Michel, to Produits Chimiques Ugine Kuhlmann. Fluorinated indazole derivatives and a process for their preparation. 4,051,145, Cl. 548-372.000.
Durling, Harold, to Midland-Ross Corporation. Inversion brake valve and system therefor. 4,050,746, Cl. 303-40.000.
Durr, Dieter; and von Orelli, Marcus, to Ciba-Geigy Corporation. Thiourea derivatives for combatting mites and ticks. 4,051,258, Cl. 424-322.000.
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Pramstraller, Wilmuth, 4,050,813, Cl. 355-67.000.
Durst S.p.A. Fabbrica Macchine ed Apparecchi Fototecnici: *See*—
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Dusa, Donald J., to General Electric Company. Multiple bypass-duct turbofan with annular flow plug nozzle and method of operating same. 4,050,242, Cl. 60-204.000.
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Dykstra, Donald P., to Portable Laboratories, Inc. Modular laboratory cabinets adjustable in elevation. 4,050,752, Cl. 312-243.000.
Dynamit Nobel Aktiengesellschaft: *See*—
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E. R. Squibb & Sons, Inc.: *See*—
Harris, Don Navarro; Phillips, Marie B.; and Goldenberg, Harold Jacob, 4,051,236, Cl. 424-101.000.
Vogt, B. Richard; and Cullison, David A., 4,051,248, Cl. 424-267.000.
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Eakes, Marion L., to Marion L. Eakes Co. Ventilating system for industrial machines. 4,050,367, Cl. 98-115.0LH.
Eakes, Marion L., to Marion L. Eakes Co. Exhaust system for industrial processes. 4,050,368, Cl. 98-115.0LH.
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Columbus, Richard Lewis, 4,050,451, Cl. 128-2.00F.
Democh, Roger E., 4,051,278, Cl. 427-326.000.
Drexhage, Karl Heinz; and Lamberts, Robert Lewis, 4,051,374, Cl. 250-370.000.
Goffe, Charles A., deceased; Rand, Royden N.; and Wu, Tai W., 4,050,898, Cl. 23-253.0TP.
Hage, Charles Thomas, 4,050,805, Cl. 355-14.000.
Harvey, Donald Malcolm, 4,051,497, Cl. 354-231.000.
Metzger, Lenard M.; and Hickok, William Kelsey, 4,051,515, Cl. 358-8.000.
Smith, Wendell F., Jr; and Reynolds, George A., 4,050,938, Cl. 96-84.00R.
Wilson, William Crawford; and Anderson, David Bowen, 4,050,725, Cl. 292-304.000.
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Andrews, Jeffery Frederick; Chauhan, Harjinder Singh; and Bristow, Ian Trevor, 4,050,559, Cl. 192-58.00B.
Connett, Donald C., 4,050,247, Cl. 60-444.000.
Danis, Louis J., 4,050,250, Cl. 60-517.000.
Morgan, David F., 4,050,474, Cl. 137-596.000.
Nelson, Robert K.; and Mueller, James F., 4,050,534, Cl. 180-24.090.
Romick, Rowland C., 4,050,328, Cl. 74-711.000.
Schlegel, Fred, 4,050,275, Cl. 72-92.000.
Steinbacher, Jack T., 4,050,500, Cl. 164-16.000.
Zunkel, Richard L., 4,050,114, Cl. 16-48.500.
Eaton, Milton. Electrode tip for high voltage electrodes of the type utilized in high voltage boilers. 4,051,345, Cl. 219-288.000.
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Bosshart, John H.; and David, Emil J., 4,050,535, Cl. 180-51.000.
Whitcomb, Paul H., 4,050,486, Cl. 144-2.00Z.
Ebeling, Wilfried: *See*—
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Eberle, William J., to General Battery Corporation. Method of fusing a metal battery terminal post with a metal bushing. 4,050,501, Cl. 164-68.000.
Ebisawa, Makoto: *See*—
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Ebner, Peter R.; and Griffith, Louis E., to Itek Corporation. Digital flash intensity control system for phototypesetters. 4,051,486, Cl. 354-7.000.
Eckert, Robert L. Mandrel and clip magazine for clip dispenser and applicator. 4,050,578, Cl. 206-340.000.
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Econo Fuel Systems, Inc.: *See*—
Harpman, Webster B.; and Mahoney, Fred G., 4,050,419, Cl. 123-3.000.
Eda, Tadahiro: *See*—
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Ehas, Edward: *See*—
Pfister, Lewis; and Ehas, Edward, 4,050,888, Cl. 432-124.000.
Ehas, Stephan J.: *See*—
Webb, William E.; and Ehas, Stephan J., 4,050,566, Cl. 197-19.000.
Eichelberger, Edward Baxter; Muehldorf, Eugene Igor; Walther, Ronald Gene; and Williams, Thomas Walter, to International Business Machines Corporation. Level sensitive embedded array logic system. 4,051,352, Cl. 364-716.000.
Eirich, Gustav: *See*—
Eirich, Wilhelm; and Eirich, Gustav, 4,050,637, Cl. 241-56.000.
Eirich, Wilhelm; and Eirich, Gustav. Pulverizing apparatus with a toothed disc. 4,050,637, Cl. 241-56.000.
Eisai Co., Ltd.: *See*—
Kuwana, Noriaki; Hasegawa, Yoshikazu; and Nozu, Yukio, 4,050,989, Cl. 195-29.000.
Tanaka, Satoru; and Watanabe, Hideaki, 4,051,125, Cl. 260-239.0BC.
Eisele Apparate-und Geratebau GmbH: *See*—
Taddicken, Hermann, 4,050,392, Cl. 112-113.000.
Eisenwerk-Gesellschaft Maximilianshutte mbH: *See*—
Brotzmann, Karl; and Fassbinder, Hans Georg, 4,050,681, Cl. 266-82.000.
Ekholm, Carl Roger, to Williams Manufacturing Company. Chiropractic table. 4,050,454, Cl. 128-70.000.
Eldridge, David G.: *See*—
Hayner, Paul F.; Eldridge, David G.; Bernier, Edgar R.; and Henderson, Richard B., 4,050,476, Cl. 137-625.620.
Electro-Nucleonics, Inc.: *See*—
Cho, Nakwon, 4,050,473, Cl. 137-244.000.
Electron Emission Systems: *See*—
Remington, Richard W., 4,051,272, Cl. 427-54.000.
Elfab Corporation: *See*—
Ammon, J. Preston, 4,050,769, Cl. 339-196.00M.
Ellington, Donal G.: *See*—
Adelman, Stanley M.; Ellington, Donal G.; and Quatrochi, Philip J., 4,050,347, Cl. 86-20.00R.
Elliott, John Scotchford; Davis, Bryan Terence; and Howlett, Richard Martin, to Edwin Cooper and Company Limited. Lubricating oil containing alkanoic amide or ester-bridged hydrocarbyl substituted phenols. 4,051,049, Cl. 252-51.50A.
Elliott, John Scotchford; Jayne, Gerald John Joseph; Askew, Herbert Frank; and Harrington, Colin John, to Castrol Limited. Hydraulic fluids comprising orthosilicate esters. 4,051,053, Cl. 252-78.300.
Elliott, Richard Montgomery; and Newton, Albert Eugene, to USM Corporation. Hot melt dispenser body. 4,050,890, Cl. 432-210.000.
Elliott, Robert L.; and Gardiner, J. Brooke, to Exxon Research & Engineering Co. Oil-soluble hydrolyzed anionic-graft polymer of ethylene-propylene copolymer and anionically polymerizable nitrile monomer and derivatives thereof having utility as multifunctional V. I. improver for lubricating oils. 4,051,048, Cl. 252-51.50R.
Elliott, Robert L.; and Gardiner, John Brooke, to Exxon Research & Engineering Co. Oil-soluble anionic-graft polymer of ethylene-propylene copolymer and anionically polymerizable monomer having utility as multifunctional V. I. improver for lubricating oils. 4,051,050, Cl. 252-51.50R.
Ellis, Robert P. Cat and dog combination stretcher and scratcher. 4,050,417, Cl. 119-156.000.
Ellithorpe, Ernest Ralph; and Ellithorpe, Richard Calvin. Method of and apparatus for melting block sulphur. 4,050,740, Cl. 299-6.000.
Ellithorpe, Richard Calvin: *See*—
Ellithorpe, Ernest Ralph; and Ellithorpe, Richard Calvin, 4,050,740, Cl. 299-6.000.
Eltra KG Leicht & Trambauer: *See*—
Protze, Karl-Heinz, 4,051,466, Cl. 340-234.000.
Eltze, Ulrich: *See*—
Forster, Hans-Joachim M.; and Eltze, Ulrich, 4,050,556, Cl. 192-4.00B.
Endres, Dan D.: *See*—
Woon, Lin-Sun; and Endres, Dan D., 4,050,462, Cl. 128-287.000.
Engelking, Frederick S.: *See*—
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,051,100, Cl. 260-42.180.
Engemann, Karl-Heinz: *See*—
Bachmann, Lothar; and Engemann, Karl-Heinz, 4,050,353, Cl. 90-5.000.
Englund, Sven, to Hugin Kassaregister AB. Recording unit. 4,051,349, Cl. 235-130.00R.
Environmental Filtration Products, Inc.: *See*—
Borchardt, Jack A., 4,051,032, Cl. 210-142.000.
Epp, Walter H. Trailer hitch attachment. 4,050,714, Cl. 280-495.000.
Epstein, Martin Franklin: *See*—
Kung, Jo-Fen Tung; and Epstein, Martin Franklin, 4,051,164, Cl. 260-448.80R.
Equity Mining Corporation: *See*—
Coltrinari, Enzo L., 4,051,220, Cl. 423-24.000.
Ericson, Eric Axel, to General Electric Company. Switchboard drawout apparatus with interlocked joint clamping and racking mechanizms. 4,051,334, Cl. 200-50.0AA.
Ericson, Eric Axel; and Kaufhold, Frederick Daniel, to General Electric Company. Switchboard drawout having trip interlock and position indicating apparatus. 4,051,335, Cl. 200-50.0AA.
Ericson, Harry; and Fredriksson, Carl Otto. Solutions for cleaning surfaces of copper and its alloys. 4,051,057, Cl. 252-100.000.
Eriez Magnetics: *See*—
Fogle, Robert E.; and Floros, James, 4,051,023, Cl. 209-223.00A.

Ernst Koch & Co.: *See—*
Herzog, Gunter, 4,050,282, Cl. 72-286.000.

Esco Manufacturing Company: *See—*
Duesterhoeft, William C.; and McClain, James E., 4,050,765, Cl. 339-117.00R.

Eskeli, Michael. Thermodynamic machine. 4,050,253, Cl. 60-650.000.

Esteban, Daniel J.; and Menez, Jean E., to International Business Machines Corporation. Process for block quantizing an electrical signal and device for implementing said process. 4,051,470, Cl. 340-347.0AD.

Ettel, Victor Alexander: *See—*
Gendron, Aubrey Stewart; Abe, Shinichiro; Ettel, Victor Alexander; and O'Neill, Charles Edward, 4,051,000, Cl. 204-106.000.

Etudes Techniques et Realisations (E.T.R.): *See—*
Pasquier, Armand Rene, 4,050,169, Cl. 37-1.000.

European Atomic Energy Community (EURATOM): *See—*
Beucherie, Pierre, 4,050,408, Cl. 118-49.100.

Evans, Daniel J.; and Riester, Hubert, to Fischer & Porter Company. Shield and bracket assembly for flowmeter. 4,050,305, Cl. 73-209.000.

Evans, George L.: *See—*
Protzman, Walter P.; and Evans, George L., 4,051,232, Cl. 424-12.000.

Ever-Wear Products, Inc.: *See—*
Freeman, Eugene J., Jr., 4,050,365, Cl. 98-40.00C.

Everett/Charles, Inc.: *See—*
Hines, Clyde Kenneth; Long, Everett James; and Wysocki, Lawrence Eugene, 4,050,762, Cl. 339-108.0TP.

Ewbank, Charles R.: *See—*
Ewbank, Phillip K.; Ewbank, Charles R.; and Ewbank, Garen N., 4,050,858, Cl. 417-234.000.

Ewbank, Garen N.: *See—*
Ewbank, Phillip K.; Ewbank, Charles R.; and Ewbank, Garen N., 4,050,858, Cl. 417-234.000.

Ewbank, Phillip K.; Ewbank, Charles R.; and Ewbank, Garen N. Well pumping apparatus. 4,050,858, Cl. 417-234.000.

Exxon Production Research Company: *See—*
Heilhecker, Joe K.; Lock, Everett H.; and Deily, Fred H., 4,051,456, Cl. 340-18.0LD.

Exxon Research & Engineering Co.: *See—*
Bearden, Roby, Jr.; and Baird, William C., Jr., 4,051,015, Cl. 208-108.000.
Elliott, Robert L.; and Gardiner, J. Brooke, 4,051,048, Cl. 252-51.50R.
Elliott, Robert L.; and Gardiner, John Brooke, 4,051,050, Cl. 252-51.50R.
Hamner, Glen P., 4,051,021, Cl. 208-216.000.
Kuntz, Irving, 4,051,312, Cl. 526-329.000.
Lundberg, Robert D.; and Makowski, Henry S., 4,051,217, Cl. 264-230.000.
Metrailer, William J.; Rebick, Charles; and Lyon, Richard K., 4,051,016, Cl. 208-127.000.
Newman, Neil F., 4,051,083, Cl. 260-5.000.
Plumlee, Karl W.; and Vernon, Lonnie W., 4,051,012, Cl. 208-8.000.

Fagan, Maurice J., Jr.; and Fagan, Maurice J., III. Dental implant. 4,050,157, Cl. 32-10.00A.

Fagan, Maurice J., III: *See—*
Fagan, Maurice J., Jr.; and Fagan, Maurice J., III, 4,050,157, Cl. 32-10.00A.

Fairbairn, Geoffrey; Cooke, George Frederick; Winkworth, Reginald; and Koreki, Jan, to Techne(Cambridge) Limited. Method for temperature calibration of probes and the like. 4,050,289, Cl. 73-1.00F.

Fanslow, Glenn Ellsworth, to Iowa State University Research Foundation, Inc. Microwave field detector. 4,051,435, Cl. 324-95.000.

Farbolin, Richard P.: *See—*
Schmidt, Louis Charles; and Farbolin, Richard P., 4,050,370, Cl. 99-538.000.

Fargo Mfg. Company, Inc.: *See—*
De France, Robert V., 4,050,761, Cl. 339-97.00R.

Farmhand, Inc.: *See—*
Schurz, James L., 4,050,598, Cl. 214-518.000.

Fassbinder, Hans Georg: *See—*
Brotzmann, Karl; and Fassbinder, Hans Georg, 4,050,681, Cl. 266-82.000.

Fehler, Adolf: *See—*
Kappler, Guenter; and Fehler, Adolf, 4,050,239, Cl. 60-39.51R.

Feingold, Robert M.; Hoover, Carl W., Jr.; and Rennie, John, to United States of America, Army. Channel plate multiplier having higher secondary emission coefficient near input. 4,051,403, Cl. 313-105.0CM.

Feiring, Andrew Edward, to Du Pont de Nemours, E. I., and Company. Fluorination process. 4,051,168, Cl. 260-456.00R.

Feldman, Bernard, to Transparent Conductors, Inc. Liquid crystal display device having particulate spacers in liquid crystal area and method of fabrication. 4,050,786, Cl. 350-160.0LC.

Ference, Edward W.; Houtman, John L.; and Waldby, Robert N., to United States of America, Energy Research and Development Administration. Nuclear reactor I. 4,050,986, Cl. 176-61.000.

Ferrell, Wesley: *See—*
Neville, James J.; Ferrell, Wesley; and Schichman, Daniel, 4,050,973, Cl. 156-123.00R.

Ferrentino, Antonio; Brovedan, Antonio; and Sala, Angelo, to Industrie Pirelli Societa per Azioni. Extrusion head for extruding plastomeric or elastomeric material on filaments. 4,050,867, Cl. 425-114.000.

Ferret, Georges Paul: *See—*
Duclaux, Daniel; Pontier, Andre J. A.; and Ferret, Georges Paul, 4,051,224, Cl. 423-210.000.

Feuling, David T.: *See—*
Craig, Glenn D.; Feuling, David T.; and LaHaye, Paul G., 4,050,877, Cl. 431-76.000.

Fiber Industries Inc.: *See—*
Steinmiller, William G., 4,051,299, Cl. 428-394.000.

Fiberlok, Inc.: *See—*
Buck, George Sumner, Jr.; Weyker, Robert George; and Ward, Arthur Gerard, 4,050,977, Cl. 156-283.000.
Buck, George Sumner, Jr.; Weyker, Robert George; and Ward, Arthur Gerard, 4,051,294, Cl. 428-283.000.

Fiege, L. Gail. Retaining bar for circuit card file. 4,051,549, Cl. 361-399.000.

Fiessinger, Francois Marie, to Degremont. Process for purifying water. 4,051,028, Cl. 210-47.000.

Fincke, George C.; and Taylor, George W., to United States of America, Army. Time frequency diversity system. 4,051,449, Cl. 333-73.00C.

Firestone, Raymond A., to Merck & Co., Inc. Process for epimerizing beta-lactam antibiotic compounds by means of an acid quench. 4,051,132, Cl. 544-20.000.

Firestone Tire & Rubber Company, The: *See—*
Halasa, Adel Farhan, 4,051,308, Cl. 526-141.000.
Kang, Jung Wong; and Oziomek, James, 4,051,309, Cl. 526-141.000.
Lohr, Delmar Frederick, Jr.; and Kang, Jung Wong, 4,051,103, Cl. 260-45.75W.

Fischer, Artur; and Fischer, Klaus, to Fischer, Artur. Method and arrangement for anchoring an object to a support structure. 4,050,202, Cl. 52-127.000.

Fischer, Artur. Anchoring device for use in masonry and like structures with corrosion-protection feature. 4,050,346, Cl. 85-69.000.

Fischer, Joachim: *See—*
Knorre, Helmut; Fischer, Joachim; and Pohl, Gerhard, 4,051,228, Cl. 423-268.000.

Fischer, Klaus: *See—*
Fischer, Artur; and Fischer, Klaus, 4,050,202, Cl. 52-127.000.

Fischer & Porter Company: *See—*
Evans, Daniel J.; and Riester, Hubert, 4,050,305, Cl. 73-209.000.

Fish, Franklin H., to United States of America, Navy. Split-path receiver for fiber optics application. 4,051,363, Cl. 250-199.000.

Fisher, Donald J., to Xerox Corporation. Non-filming dual additive developer. 4,051,077, Cl. 252-62.10P.

Fisher, John Sergio. Premanufactured modular housing building construction. 4,050,215, Cl. 52-79.300.

Fisons Limited: *See—*
Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, 4,051,154, Cl. 260-346.220.

Flaig, Heinz, to DEMAG Aktiengesellschaft. Apparatus to reduce the effect of lateral forces during turns and/or one-sided loads on persons in a vehicle. 4,050,710, Cl. 280-112.00A.

Flanders, Robert D. Power tool track. 4,050,340, Cl. 83-743.000.

Flanders, Robert D. Disassembleable, reusable container. 4,050,604, Cl. 220-4.00F.

Fleischman, Andor A., to Bell & Howell Company. Ultra-violet microgaphic objective. 4,050,778, Cl. 350-2.000.

Fleischman, Andor A., to Bell & Howell Company. Ultra-violet microgaphic objective. 4,050,779, Cl. 350-2.000.

Fleming, Georg: *See—*
Cappel, Fred; Hastik, Walter; Fleming, Georg; and Hofmann, Pierre, 4,050,924, Cl. 75-5.000.

Flinders University of South Australia, The: *See—*
de Bruin, Henderikus Johannes; and Warble, Charles Edward, 4,050,956, Cl. 148-6.000.

Flisch, Felix. Cable and wire-rope cutter. 4,050,153, Cl. 30-250.000.

Florence, Robert T.: *See—*
Thomas, Richard E.; Florence, Robert T.; Dalal, Rustom H.; and Scheuer, Raymond I., 4,051,283, Cl. 428-29.000.

Floros, James: *See—*
Fogle, Robert E.; and Floros, James, 4,051,023, Cl. 209-223.00A.

Flynn Burner Corporation: *See—*
Pfister, Lewis; and Ehas, Edward, 4,050,888, Cl. 432-124.000.

Flynn, Joseph C.: *See—*
Garwood, George; and Flynn, Joseph C., 4,050,407, Cl. 118-58.000.

Fodor, Lawrence M., to Phillips Petroleum Company. Blend of radial block copolymers having high impact strength. 4,051,197, Cl. 260-876.00B.

Fogle, Robert E.; and Floros, James, to Eriez Magnetics. Combination electromagnet and permanent magnet separator. 4,051,023, Cl. 209-223.00A.

Fohl, Artur. Inertia responsive control device. 4,050,644, Cl. 242-107.40A.

Foltz, Carl L.; Troutner, Vernon H.; and Trott, Arthur F., to Concept, Inc. Wire inserter. 4,050,528, Cl. 173-163.000.

Ford, Bacon & Davis Texas, Inc.: *See—*
Bond, Desmond H.; Taggart, George W.; and Jaeger, Kurt S., 4,051,231, Cl. 423-659.000.

Ford, James M.; Kircher, Morton S.; and Mosher, Hugh A., to Olin Corporation. Flanged connection means for anode posts in electrolytic diaphragm cells. 4,051,008, Cl. 204-266.000.

Ford Motor Company: *See—*
Barton, David W.; and Muller, George H., 4,050,689, Cl. 293-71.00P.
Hollins, James E., 4,050,427, Cl. 123-119.00F.
Nelson, Thomas A., 4,050,424, Cl. 123-119.00F.

Foresight Industries: *See—*
Deike, Robert F., 4,050,526, Cl. 173-27.000.

Forestek, Clarence W. Embedding and compacting particles in porous surfaces. 4,051,275, Cl. 427-201.000.

Forman, Tracy H.; Herskowitz, Nat H.; and Lawida, Arthur E. Folding stand. 4,050,658, Cl. 248-13.000.

Forster, Hans-Joachim M.; and Eltze, Ulrich, to Daimler-Benz Aktiengesellschaft. Automatic transmission with retarder. 4,050,556, Cl. 192-4.00B.

Fortuin, Michael Stanley: *See—*
Caunt, Anthony David; and Fortuin, Michael Stanley, 4,051,307, Cl. 526-77.000.

Fowler, Ralph A., to Westinghouse Electric Corporation. Double flexure disc electro-acoustic transducer. 4,051,455, Cl. 340-9.000.

Fox, Sidney Jared; Martin, Van Clifton; and Van Hook, Danny Allen, to International Business Machines Corporation. Ink jet copier. 4,051,538, Cl. 358-296.000.

Fram Corporation: *See—*
New, Gordon R. A.; and Curry, William G., 4,050,847, Cl. 416-132.00A.

Frank L. Wells Company: *See—*
Sturm, Helmut, 4,050,610, Cl. 221-171.000.

Frankenberger, Horst, to Dragerwerk Aktiengesellschaft. Apparatus for continuously measuring the CO_2 content in breathing gases. 4,050,823, Cl. 356-186.000.

Frantz, Joseph F. Device for filling crank case or transmission of internal combustion engine with oil. 4,050,611, Cl. 222-88.000.

Franz Plasser Bahnbaumaschinen-Industrie-gesellschaft m.b.H.: *See—*
Theurer, Josef, 4,050,196, Cl. 51-178.000.

Fredriksson, Carl Otto: *See—*
Ericson, Harry; and Fredriksson, Carl Otto, 4,051,057, Cl. 252-100.000.

Freeman, Eugene J., Jr., to Ever-Wear Products, Inc. Air distribution assembly. 4,050,365, Cl. 98-40.00C.

Freeman, Joseph L., to John D. Holligsworth on Wheels, Inc. Textile carding machine operating system and method. 4,050,119, Cl. 19-106.00R.

Fried, John H.; and Harrison, Ian T., to Syntex Corporation. 2-Naphthylacetic acid derivatives and compositions and methods thereof. 4,051,233, Cl. 424-317.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Jester, Willi; and Tack, Hans, 4,050,129, Cl. 407-45.000.
Neubert, Rolf; and Wehling, Rolf, 4,050,235, Cl. 57-58.890.

Friedrich, Adolf; Harnisch, Horst; and Raue, Roderich, to Bayer Aktiengesellschaft. Reactive dyestuffs. 4,051,134, Cl. 544-217.000.

Friedrich Deckel Aktiengesellschaft: *See—*
Geiger, Michael, 4,050,146, Cl. 29-568.000.
Kuhnert, Hans, 4,050,354, Cl. 90-13.00C.

Friedrich Maurer Soehne, Firma: *See—*
Bertschmann, Silvio; Koester, Waldemar; and Huber, Reinhold, 4,050,207, Cl. 52-396.000.

Friend, Jack M., to Puritan-Bennett Corporation. Respiration system with patient assist capability. 4,050,458, Cl. 128-145.800.

Frigo, Vito, to Ausatuft S.p.A. Molding press having a device for gripping and delivering elements to be molded. 4,050,870, Cl. 425-317.000.

Fritzenschaft, Max: *See—*
Bosch, Karl; and Fritzenschaft, Max, 4,050,285, Cl. 72-391.000.

Frodin, Gunnar Sten: *See—*
Wiklund, Curt Helmer; and Frodin, Gunnar Sten, 4,050,366, Cl. 98-110.000.

Froehlich, Alfred: *See—*
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, 4,051,123, Cl. 260-178.000.

Fruehauf Corporation: *See—*
Abbott, Richard, 4,051,286, Cl. 428-77.000.

Fuchs, Francis Joseph, Jr., to Western Electric Company, Inc. Apparatus and methods for forming an elongated product. 4,050,279, Cl. 72-261.000.

Fuerst, Harry W. Air vent cover assembly. 4,050,363, Cl. 98-37.000.

Fuji Film Co., Ltd.: *See—*
Kondo, Toshihiro, 4,051,398, Cl. 310-12.000.

Fuji Photo Film Co., Ltd.: *See—*
Fujita, Yoshihiro; Fuutagawa, Ikuo; and Muramatsu, Katsuji, 4,051,494, Cl. 354-145.000.
Hayashi, Takao; and Kato, Hajime, 4,051,303, Cl. 428-411.000.
Kondo, Toshihiro, 4,051,499, Cl. 354-234.000.
Takeda, Keiji; Murata, Masataka; and Ikeda, Teppei, 4,050,936, Cl. 96-28.000.

Fuji Photo Optical Co., Ltd.: *See—*
Suzuki, Masane, 4,051,483, Cl. 346-33.00A.

Fujii, Akira: *See—*
Shibayama, Kyoichi; Ono, Hiroshi; Jidai, Eiki; and Fujii, Akira, 4,051,091, Cl. 260-29.2TN.

Fujii, Takayoshi: *See—*
Ohtsuka, Shigeto; Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,051,314, Cl. 536-1.000.

Fujikata, Kenji: *See—*
Inose, Fumiyuki; Fujikata, Kenji; and Yokozawa, Norio, 4,051,457, Cl. 340-146.3MA.

Fujima, Yukihisa: *See—*
Takahashi, Yasuro; Fujima, Yukihisa; Oguri, Masaharu; and Komori, Akito, 4,050,879, Cl. 431-174.000.

Fujimoto, Iwao: *See—*
Hayashi, Kazushige; Minemura, Norihiro; Fujimoto, Iwao; Ozaki, Kiyotaka; Yoshida, Norio; Morishita, Toshio; and Shinoki, Takanori, 4,051,287, Cl. 428-91.000.

Fujinawa, Masaaki; Takeyasu, Kiyoo; Iizuka, Kenichi; Uchida, Motokazu; and Uzuhashi, Hideo, to Hitachi, Ltd. Control system for a brushless motor. 4,051,417, Cl. 318-138.000.

Fujishige, Shoei, to Director-General of the Agency of Industrial Science and Technology. Method for forming images by irradiation of electron rays and resist compositions utilizable therefor. 4,051,271, Cl. 427-43.000.

Fujita, Hideo: *See—*
Kato, Hiroai; and Fujita, Hideo, 4,051,078, Cl. 260-2.00A.

Fujita, Masanori; and Suzuki, Sukenori, to Kabushiki Kaisha Seikosha. Electrooptic display device. 4,050,787, Cl. 350-160.0LC.

Fujita, Takayoshi: *See—*
Anahara, Meiji; and Fujita, Takayoshi, 4,050,225, Cl. 57-34.0HS.

Fujita, Yoshihiro; Fuutagawa, Ikuo; and Muramatsu, Katsuji, to Fuji Photo Film Co., Ltd. Photographic camera with built-in strobo flash light device. 4,051,494, Cl. 354-145.000.

Fujitsu Fanuc Limited: *See—*
Shichida, Hiromichi; Katsube, Hideo; Oyama, Shigeaki; Toyoda, Kenichi; and Saito, Mitsuo, 4,050,837, Cl. 408-35.000.

Fukunaka, Shiro: *See—*
Nakaoka, Kazuhide; Araki, Kenji; Iwase, Koji; Koike, Yasuo; and Fukunaka, Shiro, 4,050,959, Cl. 148-12.300.

Fukushima, Masami: *See—*
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, 4,051,320, Cl. 542-420.000.

Fukuyama, Toshifumi; Asakura, Yasunori; and Onji, Norio, to Omron Tateisi Electronics Co. Photoelectric detector having an indicator for indicating the operating condition thereof. 4,051,365, Cl. 250-222.00R.

Fuller, Harold L., Jr.; and Stubbs, Joseph E., to Fuller, Harold L., Jr. Valve control for cylinder cutout system. 4,050,435, Cl. 123-198.00F.

Fulton, Theodore Alan, to Bell Telephone Laboratories, Incorporated. Current switched Josephson junction memory and logic circuits. 4,051,393, Cl. 307-306.000.

Funabiki, Kyohei: *See—*
Takemura, Takeshi; Katoh, Yoshihisa; Kurita, Shigeyuki; Sasaki, Susumu; Funabiki, Kyohei; and Hatano, Keizo, 4,051,098, Cl. 260-38.000.

Furukawa Electric Company Limited, The: *See—*
Ohkubo, Noriyoshi; and Kitamura, Nobu, 4,051,284, Cl. 428-36.000.

Furukawa, Tokinobu: *See—*
Nakazato, Norio; Hiratsuka, Kosai; and Furukawa, Tokinobu, 4,050,953, Cl. 127-60.000.

Furumaya, Kenichi: *See—*
Hashimoto, Masahiro; and Furumaya, Kenichi, 4,051,461, Cl. 364-900.000.

Furusaki, Shintaro: *See—*
Miyauchi, Terukatsu; and Furusaki, Shintaro, 4,051,011, Cl. 204-299.00R.

Fuutagawa, Ikuo: *See—*
Fujita, Yoshihiro; Fuutagawa, Ikuo; and Muramatsu, Katsuji, 4,051,494, Cl. 354-145.000.

G. D. Searle & Co.: *See—*
Krimmel, Carl Peter, 4,051,136, Cl. 260-268.00R.

Gad-Jets, Inc.: *See—*
Wyse, Harold G., 4,050,632, Cl. 239-425.000.

Gallagher, Angela Frances: *See—*
Steranko, James Joseph; Rogoff, Gerardo; Scott, Randall Dean; Gallagher, Angela Frances; and Burger, Peter, 4,051,459, Cl. 364-900.000.

Galvin, Aaron A., to American District Telegraph Company. Fluid flow detector for a fire alarm system. 4,051,467, Cl. 340-239.00S.

Gambro AG: *See—*
Riede, Gerhard, 4,051,041, Cl. 210-321.00B.

Gandy, Richard G.; and White, Vincent Cohee, to BJ-Hughes Inc. Method of making lightweight cement slurries and their uses. 4,050,948, Cl. 106-76.000.

Gantke, Franz; Walter, Harald; and Zywietz, Walter, to Hoesch Werke Aktiengesellschaft. Profile steel. 4,050,212, Cl. 52-726.000.

Gardiner, J. Brooke: *See—*
Elliott, Robert L.; and Gardiner, J. Brooke, 4,051,048, Cl. 252-51.50R.

Gardiner, John Brooke: *See—*
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Garwood, George; and Flynn, Joseph C., to Wheaton Industries. Apparatus for fluid bed coating of glass bottles. 4,050,407, Cl. 118-58.000.

Gasier, James Mills; and Currie, William Edgar, to Parker-Hannifin Corporation. Swaging apparatus. 4,050,286, Cl. 72-416.000.

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Gates Rubber Company, The: *See—*
Ching, Larry K. W.; Coleman, Charles E.; and Uba, Toshio, 4,050,482, Cl. 141-1.100.
Neal, Ronald D.; Ross, Richard; and Hein, Joseph N., 4,050,651, Cl. 244-15.000.

Gault, Donald D.: *See—*
Gross, Roger A.; Radloff, Marvin D.; and Gault, Donald D., 4,050,799, Cl. 353-74.000.

Gaumer, Stuart J.: *See—*
Tobias, John W.; Taylor, Lynn J.; and Gaumer, Stuart J., 4,051,306, Cl. 526-1.000.
Geafer, Salahaddin: *See—*
Zbikowski, Gerhard; and Geafer, Salahaddin, 4,050,434, Cl. 123-140.0FG.
Gebr. Hofmann KG, Maschinenfabrik: *See—*
Hofmann, Dionys, 4,050,195, Cl. 51-169.000.
Geddes, Leslie A.; and Bourland, Joe D., to Purdue Research Foundation. Differential duration demultiplexing method and system. 4,051,539, Cl. 360-44.000.
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McMullen, Willard C.; Gee, Samuel, Sr., deceased; Whitney, Patricia E., legal representative; and Bennett, Joan E., legal representative, 4,050,307, Cl. 73-337.000.
Geiger, Albert; and Bruckmann, Peter, to Geiger Plastic KG. Wire support system for training hop vines. 4,050,187, Cl. 47-45.000.
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Geiger, Albert; and Bruckmann, Peter, 4,050,187, Cl. 47-45.000.
Gelbein, Abraham P.; Janssen, Paul, deceased (by Janssen, Almuth, heir); and Richtzenhain, Hermann, to Lummus Company, The. Preparation of pyridines and nicotinonitrile from piperidines. 4,051,140, Cl. 260-290.00P.
Gelsenberg Mannesmann Umweltschutz GmbH: *See—*
Luchsinger, Peter; Muckenheim, Heribert; Riemann, Hanns-Helmut; Sonnenschein, Hans; and Michel, Erich, 4,050,387, Cl. 110-8.00A.
Gemein, Rudolf; and Wotschofsky, Franz, to Kraftwerk Union Aktiengesellschaft. Device for stabilizing the position of rotors of large steam turbines. 4,050,845, Cl. 415-172.00A.
Gendron, Aubrey Stewart; Abe, Shinichiro; Ettel, Victor Alexander; and O'Neill, Charles Edward, to International Nickel Company, Inc., The. Non-contaminating anode suitable for electrowinning applications. 4,051,000, Cl. 204-106.000.
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Eberle, William J., 4,050,501, Cl. 164-68.000.
General Electric Company: *See—*
Adamson, Arthur P., 4,051,289, Cl. 428-113.000.
Armor, Anthony F.; and Winne, David H., 4,051,400, Cl. 310-58.000.
Brinner, Thomas Richard; and Stitt, Thomas Deltor, 4,051,421, Cl. 318-367.000.
DuBell, Thomas L., 4,050,241, Cl. 60-39.660.
Dusa, Donald J., 4,050,242, Cl. 60-204.000.
Ericson, Eric Axel, 4,051,334, Cl. 200-50.0AA.
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Graham, Alfred Rapp, 4,050,348, Cl. 89-7.000.
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Khalid, Syed J., 4,050,306, Cl. 73-212.000.
Knoble, David W., 4,051,410, Cl. 315-205.000.
Knoble, David W.; and Morais, Don, 4,051,411, Cl. 315-205.000.
Knoble, David W.; and Owen, Daniel V., 4,051,412, Cl. 315-205.000.
Misiura, Thaddeus Dominick; Vostovich, Joseph Edward; and Wahl, Ralph Edward, 4,051,298, Cl. 428-383.000.
Sheldon, Luther M., 4,050,774, Cl. 339-264.00R.
Stanwick, Casmer P.; and Jordan, Lawrence E., 4,051,399, Cl. 310-51.000.
Streicher, Heinz, 4,051,359, Cl. 362-4.000.
Tassie, Douglas Pray, 4,050,352, Cl. 89-7.000.
General Foods Corporation: *See—*
Kung, Jo-Fen Tung; and Epstein, Martin Franklin, 4,051,164, Cl. 260-448.80R.
Rose, Larry Edward; and Lawrence, Norman Francis, 4,051,162, Cl. 426-448.000.
General Mills Chemicals, Inc.: *See—*
MacKay, Kenneth D., 4,051,223, Cl. 423-157.000.
General Motors Corporation: *See—*
Bedford, Raymond E.; and Berg, Morris, 4,051,072, Cl. 252-464.000.
Brucken, Byron L.; and Watt, Roy E., 4,050,852, Cl. 417-273.000.
Cataldo, Roy S., 4,050,420, Cl. 123-30.00C.
Collins, George R.; and Large, William R., 4,050,249, Cl. 60-290.000.
Denzer, Richard E., 4,050,711, Cl. 280-278.000.
Denzer, Richard E.; Marsh, Gerald J.; and Shakespear, Horacio, 4,050,712, Cl. 280-278.000.
Hegedus, Louis; and Summers, Jack C., 4,051,073, Cl. 252-466.0PT.
Hile, John W., 4,051,504, Cl. 357-13.000.
Holleboom, Bruce W., 4,050,425, Cl. 123-119.0EC.
Kell, Nathaniel B., 4,050,330, Cl. 74-759.000.
Klingenmaier, Otto J., 4,050,996, Cl. 204-28.000.
Lemmer, Harold G., 4,050,932, Cl. 75-211.000.
Little, Harold A.; and Balsley, Richard L., 4,050,245, Cl. 60-313.000.
Sweet, Douglas W., 4,051,434, Cl. 324-78.00D.
Vaught, John M., 4,050,240, Cl. 60-39.650.
Watson, Richard D.; and Sowash, Thomas R., 4,050,771, Cl. 339-263.00R.
Williams, Jerry K., 4,050,713, Cl. 280-278.000.
General Tire & Rubber Company, The: *See—*
van Gils, Gerard E.; and Kalafus, Edward F., 4,051,281, Cl. 427-379.000.
Genis, Mariano Rodriguez. Sterilizing and sterility maintaining apparatus for dental and surgical tools and the like. 4,050,894, Cl. 21-86.000.
Georg Spiess GmbH: *See—*
Marass, Josef, 4,050,692, Cl. 271-267.000.
Gerritsen, Allen. Foldable fish net. 4,050,177, Cl. 43-12.000.
Gerster, John F.: *See—*
Schuppan, Dietrich; Gerster, John F.; and Leir, Charles M., 4,051,247, Cl. 424-258.000.
Gibson, David Vincent, to Dulux Australia Ltd. Liquid thermosetting coating compositions. 4,051,088, Cl. 260-20.000.
Giebeler, Bernhardt F., to BJ-Hughes Inc. Stroke actuated well testing tool. 4,050,512, Cl. 166-128.000.
Gieske, Henry Anthony; and Juneja, Prem Sagar, to Procter & Gamble Company, The. Oral compositions for plaque, caries, and calculus retardation with reduced staining tendencies. 4,051,234, Cl. 424-52.000.
Gilb, Tyrell, to Simpson Manufacturing Co., Inc. Ridge connector for light composite trusses. 4,050,210, Cl. 52-639.000.
Giles, Michael K.; and Iverson, Myren L., to United States of America, Navy. Photoparamp array multiplexer. 4,051,364, Cl. 250-199.000.
Gillon, John: *See—*
Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, 4,051,154, Cl. 260-346.220.
Gilmore, Guy T., to Multi-Fab, Inc. Portable grooving tool. 4,050,335, Cl. 82-4.00C.
Gilmour, Richard C. Beach cleaning apparatus. 4,050,518, Cl. 171-116.000.
Girling Limited: *See—*
Harries, David Anthony; and Mortimer, Ivan, 4,050,749, Cl. 303-119.000.
Margetts, Hugh Grenville, 4,050,548, Cl. 188-71.800.
Giuffre, Anthony A. Environmental hood and duct structure for griddles. 4,050,446, Cl. 126-299.00E.
Glaesel, Gottfried, to Hego Electric GmbH. Insulating casing for electrical spade terminal sockets. 4,050,757, Cl. 339-59.00R.
Glanz, Ronald Paul, to Chemetron Corporation. Double-sigmoid connector. 4,050,829, Cl. 403-205.000.
Glumac, Nick P., to Toter-Tee, Inc. Liftable bed truck body configuration for removable storage unit. 4,050,707, Cl. 280-43.230.
Gnyra, Bohdan, to Alcan Research and Development Limited. Coarsening of partially calcined alumina dust. 4,051,222, Cl. 423-127.000.
Godfrey, John Carl; and Rubinfeld, Joseph, to Bristol-Myers Company. 6''-Deoxykanamycin B and 6''-deoxytobramycin. 4,051,315, Cl. 536-10.000.
Goffe, Charles A., deceased (by Goffe, Patricia A., executrix); Rand, Royden N.; and Wu, Tai W., to Eastman Kodak Company. Integral analytical element. 4,050,898, Cl. 23-253.0TP.
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Goldammer, Georg: *See—*
Landwehrkamp, Hans; Hoeber, W. Gerhard; Goldammer, Georg; and Oexler, Rudolf, 4,050,228, Cl. 57-58.950.
Golden Vale Food Products Limited: *See—*
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Goldenberg, Emmanuel: *See—*
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Goldenberg, Harold Jacob: *See—*
Harris, Don Navarro; Phillips, Marie B.; and Goldenberg, Harold Jacob, 4,051,236, Cl. 424-101.000.
Goldhagen, Samuel; Heller, Harry; and Rothenstein, Julius, to United States of America, Navy. Explosive composition containing a hydroxyalkyl acrylate copolymer binder. 4,050,968, Cl. 149-19.400.
Goldmann, Wolf; Schepers, Georg; Heinemann, Otto; Schmits, Heinz-Herbert; and Ritzmann, Horst, to Polysius AG. Apparatus and methods for the heat treatment of fine-grained materials. 4,050,883, Cl. 432-14.000.
Gollnick, Cyril R., to Leach Company. Refuse loading apparatus. 4,050,594, Cl. 214-83.300.
Golobay, Gary L., to J. I. Case Company. Incremental digital control circuit. 4,051,416, Cl. 318-85.000.
Goltsos, Costas E., to Teckton, Inc. Package for heating food in electrical appliances. 4,051,266, Cl. 426-120.000.
Goodwin, William D., to Introtech. Vegetable protein isolate and method of producing same. 4,051,114, Cl. 260-123.500.
Goodyear Tire & Rubber Company, The: *See—*
Olsen, Richard J., 4,050,495, Cl. 152-187.000.
Gordon, Jason Morse, to United Technologies Corporation. Optical apparatus for sensing clustered package orientation. 4,051,366, Cl. 250-223.00B.
Gorski, Dennis M.; Neuber, Dieter; and Wildmoser, Martin Michael, to Arenco Machine Company, Inc. Package for orienting a plurality of articles. 4,050,579, Cl. 206-460.000.
Gorter, Werner: *See—*
Kresta, Erich; and Gorter, Werner, 4,051,292, Cl. 428-212.000.
Goto, Tatsuo: *See—*
Shimomura, Raiji; Habu, Toru; Itoh, Hisaaki; Sakai, Naomi; and Goto, Tatsuo, 4,050,293, Cl. 73-105.000.

Goto, Tokuju: *See—*
Tsuruta, Motohiro; Kimura, Hiroshiro; Koshimo, Akio; Nara, Hirohisa; Goto, Tokuju; and Amemiya, Kunio, 4,051,215, Cl. 264-137.000.
Gottfried Bischoff Bau kompl. Gasreinigungs-und Wasserruckkuhlanlagen Kommanditgesellschaft: *See—*
Kleeberg, Ulrich; Leimkuhler, Jurgen; Knospe, Jurgen; and Stohr, Manfred, 4,050,871, Cl. 425-317.000.
Gouinlock, Edward V., Jr.; and Rosenfeld, Jerold C., to Hooker Chemicals & Plastics Corporation. High molecular weight copolyester resins having a high degree of alternating structure. 4,051,106, Cl. 260-47.00C.
Graco Inc.: *See—*
Vork, William Duncan, 4,050,859, Cl. 417-386.000.
Graham, Alfred Rapp, to General Electric Company. Liquid propellant gun (controlled leakage regenerative piston). 4,050,348, Cl. 89-7.000.
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Grandi Motori Trieste S.p.A. G.M.T. - Fiat, Ansaldo, C.R.D.A.: *See—*
Cendak, Bruno, 4,050,421, Cl. 123-41.720.
Granges NYBY AB: *See—*
Aslund, Christer, 4,050,143, Cl. 29-420.500.
Grant, Graham Cameron. Apparatus for saturated gas delivery. 4,051,205, Cl. 261-70.000.
Grapha-Holding AG: *See—*
Muller, Hans, 4,050,573, Cl. 198-366.000.
Grat, Felix R., to Rame-Hart, Inc. Drop measuring apparatus, and a method of evaluating materials wettability. 4,050,822, Cl. 356-171.000.
Great Lakes Industries, Inc.: *See—*
Secor, Arthur D., 4,050,643, Cl. 242-72.00R.
Greaves, Melvin J.; and Razgaitis, Frank V., to Arthur G. McKee & Company. Charging apparatus for shaft furnaces. 4,050,592, Cl. 214-18.200.
Greenaway, Philip Ernest; and Rollett, John Mortimer, to Post Office, The. Active networks and signalling equipment. 4,051,385, Cl. 307-233.00R.
Greer Hydraulics, Inc.: *See—*
Harris, Newton T., III, 4,051,338, Cl. 200-85.00R.
Gretsch-Unitas GmbH Baubeschlagfabrik: *See—*
Maus, Julius, 4,050,364, Cl. 98-37.000.
Griffith, Louis E.: *See—*
Ebner, Peter R.; and Griffith, Louis E., 4,051,486, Cl. 354-7.000.
Griffiths, David Thomas, to Youngflex, S.A. Seat frames. 4,050,738, Cl. 297-452.000.
Griffiths, Frank Anthony. Signal processor for reducing interference between frequency-modulated signals. 4,051,533, Cl. 358-167.000.
Grigat, Ernst; and Hetzel, Hartmut, to Bayer Aktiengesellschaft. Process for the continuous degradation of plastics. 4,051,212, Cl. 264-102.000.
Grijalba, Abel D.: *See—*
Warner, Ronald E.; Healey, Francis J.; and Grijalba, Abel D., 4,050,134, Cl. 29-156.80R.
Groetsch, Ewald: *See—*
Coleman, Ronald J., 4,050,671, Cl. 254-7.00R.
Groetsch, Gilbert: *See—*
Coleman, Ronald J., 4,050,671, Cl. 254-7.00R.
Gross, Roger A.; Radloff, Marvin D.; and Gault, Donald D., to Bell & Howell Company. Microform reader. 4,050,799, Cl. 353-74.000.
Grosser, Horst; Liebold, Hans; and Wehnert, Jurgen, to Daimler-Benz Aktiengesellschaft. Process and apparatus for controlling the brake force on the wheels of trailers. 4,050,550, Cl. 188-112.000.
Grotnes Machine Works, Inc.: *See—*
Luedi, Hans R., 4,050,135, Cl. 29-159.100.
Grove Valve and Regulator Company: *See—*
Brumm, Richard S., 4,050,669, Cl. 251-5.000.
Grube, Kenneth E.; Harrington, Vincent E.; and Harrington, James V. Method and apparatus for fragmenting certain solid wastes. 4,050,899, Cl. 23-259.100.
Gruber, John R. Shell rotor direct current generator. 4,051,402, Cl. 310-266.000.
Gruner, Heinz Walter, to Sybron Corporation. Amplifier structure for low-level voltage measurements. 4,051,444, Cl. 330-68.000.
GTE Sylvania Incorporated: *See—*
Smithgall, Harry E., 4,050,763, Cl. 339-111.000.
Vibert, Edward J., 4,051,544, Cl. 361-45.000.
Guczoghy, Lajos; Pfliegel, Todor; Puklics, Maria; Institoris, Laszlo; and Seres, Jeno, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. N-(triaryl-methyl)-amidines, process for the preparation thereof and compositions containing the same. 4,051,156, Cl. 260-393.000.
Gudat, Wolfgang: *See—*
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse, Karl-Heinz, 4,050,747, Cl. 303-95.000.
Guenther, Ernst: *See—*
Kissel, Ernst; Neumann, Eckart; Guenther, Ernst; Valentin, Guenter; and Hoerauf, Werner, 4,051,113, Cl. 260-78.00L.
Guggemos, Kenneth F. Wall mounted hinged base. 4,051,362, Cl. 362-432.000.
Guild, George Arthur: *See—*
Wilson, Alister; Marr, William David; and Guild, George Arthur, 4,051,288, Cl. 428-102.000.
Guinter, S. Robert: *See—*
Provi, Mike A.; and Guinter, S. Robert, 4,050,532, Cl. 177-211.000.
Gulf South Research Institute: *See—*
Klein, Elias; Smith, James K.; and Morton, Frederick C., 4,051,300, Cl. 428-398.000.
Gullick Dobson Limited: *See—*
Phillips, Reginald Andrew; and Darbyshire, Kenneth, 4,050,256, Cl. 61-45.00D.
Gumb, Beverley William, to Northern Telecom Limited. Interconnector for adapting existing telephone outlets to plug-in outlets. 4,050,768, Cl. 339-154.00A.
Gunjima, Tomoki; and Ichiki, Toshio, to Asahi Glass Company, Ltd. Electrodialysis for aqueous solution of base. 4,051,002, Cl. 204-180.00P.
Gurgens, Rainer Eberhard: *See—*
Heider, Michael; and Gurgens, Rainer Eberhard, 4,050,565, Cl. 197-6.300.
Gurr, Robert H.; and Broggie, Roger E., to Walt Disney Productions. High capacity passenger transport apparatus. 4,050,385, Cl. 104-173.0ST.
Gutman, Arnold D., to Stauffer Chemical Company. Method of use and process for preparing phosphoroiminobenzoylurea insecticides. 4,051,239, Cl. 424-211.000.
Guy, George Trevor Palfreyman and Roger Jerome, executors: *See—*
Robbins, Joseph Henry, deceased; and Acton, John Edward, 4,050,674, Cl. 254-93.00H.
Gwozdz, Joseph W., to McKinney Manufacturing Company. Door hinge. 4,050,115, Cl. 16-128.00R.
Gyori, Robert Paul; and Tullio, Thomas, to De luxe General, Incorporated. Additive color printing method and apparatus. 4,050,808, Cl. 355-38.000.
H. & D. E. Watts Limited: *See—*
Watts, Horace, 4,050,475, Cl. 137-625.170.
Haaf, Franz: *See—*
Simak, Petr; Herrle, Karl; Haaf, Franz; and Hatzmann, Guenter, 4,051,200, Cl. 260-899.000.
Haag, Walter, to Albert Haag KG. Creeling device for bobbins. 4,050,649, Cl. 242-130.100.
Haavik, Harold K., to Nash Engineering Company, The. Liquid ring pumps and compressors using a ferrofluidic ring liquid. 4,050,851, Cl. 417-68.000.
Habegger, Harold. Thread-rolling head. 4,050,276, Cl. 72-104.000.
Hablitzel, Hermann, to Volkswagenwerk Aktiengesellschaft. Energy absorbing bumper. 4,050,726, Cl. 293-71.00R.
Habu, Teiji; Ishihara, Masao; Sakamoto, Eiichi; Yamada, Hiroshi; and Kaneshige, Masaaki, to Konishiroku Photo Industry Co., Ltd. Process for the preparation of a photographic material. 4,050,940, Cl. 96-114.500.
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Shimomura, Raiji; Habu, Toru; Itoh, Hisaaki; Sakai, Naomi; and Goto, Tatsuo, 4,050,293, Cl. 73-105.000.
Hachmann, Friedrich, to O & K Orenstein & Koppel Aktiengesellschaft. Control device for hydrostatic drive, especially for fork lift truck. 4,050,248, Cl. 60-445.000.
Haeny & Cie AG: *See—*
Jaggi, Hans; and Heimgartner, Hans, 4,050,356, Cl. 91-306.000.
Haffer, Gregor: *See—*
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,051,188, Cl. 260-590.0FA.
Hafner, Leo, to Treibacher Chemische Werke Aktiengesellschaft. Method of preparing fluorine-free rare earth metal compounds from such compounds containing fluorine. 4,051,219, Cl. 423-21.000.
Hage, Charles Thomas, to Eastman Kodak Company. Electrophotographic copying apparatus for two-sided copying. 4,050,805, Cl. 355-14.000.
Hahner, Reinhard: *See—*
Reibetanz, Wilbert; Wanner, Karl; and Hahner, Reinhard, 4,050,345, Cl. 85-68.000.
Hakata, Masayuki, to Casio Computer Co., Ltd. Keyboard controlled data converter. 4,051,356, Cl. 235-310.000.
Hake, Kenneth A., to Kent Manufacturing Co., Inc. Cultivator tooth clamp. 4,050,524, Cl. 172-707.000.
Halasa, Adel Farhan, to Firestone Tire & Rubber Company, The. Process for polymerizing butadiene with cobalt complex, AlR_3 and CS_2. 4,051,308, Cl. 526-141.000.
Hales, Louis S.; Hamilton, Don R.; Weller, Harry F.; and Burgbacher, Donald E., to General Electric Company. Method for shaping the edge of a blade element. 4,050,198, Cl. 51-281.00R.
Hall, John Emmett, to Downs Surgical Limited. Surgical cable tensioning instrument. 4,050,464, Cl. 128-303.00R.
Halpern, Otto: *See—*
Prince, Anthony; Halpern, Otto; and Ackrell, Jack, 4,051,148, Cl. 260-327.00B.
Hamada, Morio, to Murata, Tokao. Electric locking device. 4,051,548, Cl. 361-171.000.
Hamilton Communications, Inc.: *See—*
Webb, William E.; and Ehas, Stephan J., 4,050,566, Cl. 197-19.000.
Hamilton, Don R.: *See—*
Hales, Louis S.; Hamilton, Don R.; Weller, Harry F.; and Burgbacher, Donald E., 4,050,198, Cl. 51-281.00R.
Hamlin, Thomas J.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,050,688, Cl. 271-5.000.
Hammond, Peter R.; Schimitschek, Erhard J.; and Trias, John A., to

United States of America, Navy. 7-Amino coumarin dyes for flash-lamp-pumped dye lasers. 4,051,062, Cl. 252-301.170.
Hamaker, Glen P., to Exxon Research & Engineering Co. Hydrodesulfurization of hydrocarbon feed utilizing a silica stabilized alumina composite catalyst. 4,051,021, Cl. 208-216.000.
Hamrick, Joseph T.; and Rose, Lealie C., to World Energy Systems. Insitu hydrogenation of hydrocarbons in underground formations. 4,050,515, Cl. 166-303.000.
Hancock Laboratories, Inc.: *See*—
Hancock, Warren D.; and Sattler, Frederick P., 4,050,893, Cl. 8-94.110.
Hancock, Warren D.; and Sattler, Frederick P., to Hancock Laboratories, Inc. Arrangement for preparing natural tissue for implantation. 4,050,893, Cl. 8-94.110.
Hanny, John Franklin, to NCR Corporation. Light-reflecting analytical device. 4,050,820, Cl. 356-103.000.
Hansberg, Julius. Core-blowing machine for preparing moulds and foundry cores. 4,050,504, Cl. 164-201.000.
Hara, Shinichi; and Kato, Taro, to NGK Insulators, Ltd. Method of treating sewage sludge. 4,050,390, Cl. 110-15.000.
Harada, Fumio: *See*—
Inoue, Hajime; Harada, Fumio; Kato, Kazunobu; and Oikawa, Syoji, 4,051,001, Cl. 204-151.000.
Harada, Isamu: *See*—
Wakana, Hiroshi; Harada, Isamu; and Honma, Tsutomu, 4,050,605, Cl. 220-5.00A.
Harbor Products, Inc.: *See*—
Humberstone, John; Deal, William L.; and Edgington, Arthur E., 4,050,358, Cl. 92-103.00F.
Hardy, Edgar E.; and David, Donald J., to Monsanto Research Corporation. Optical analytical device, waveguide and method. 4,050,895, Cl. 23-230.00R.
Hardy, Michel; and Humbert, Daniel, to Roussel-UCLAF. Salts of 2-alkylthiazole-5-methanol derivatives. 4,051,249, Cl. 424-270.000.
Hargrove, Wilma Rae. Storage bag for use with a students chair-desk. 4,050,491, Cl. 150-1.600.
Harnisch, Horst: *See*—
Friedrich, Adolf; Harnisch, Horst; and Raue, Roderich, 4,051,134, Cl. 544-217.000.
Harpman, Webster B.; and Mahoney, Fred G., to Econo Fuel Systems, Inc. Hot fuel gas generator. 4,050,419, Cl. 123-3.000.
Harralson, John C.: *See*—
Schaab, Rudolph S.; and Harralson, John C., 4,050,267, Cl. 66-9.00B.
Harries, David Anthony; and Mortimer, Ivan, to Girling Limited. Control valve assemblies for vehicle anti-skid braking systems. 4,050,749, Cl. 303-119.000.
Harrington, Colin John: *See*—
Elliott, John Scotchford; Jayne, Gerald John Joseph; Askew, Herbert Frank; and Harrington, Colin John, 4,051,053, Cl. 252-78.300.
Harrington, James V.: *See*—
Grube, Kenneth E.; Harrington, Vincent E.; and Harrington, James V., 4,050,899, Cl. 23-259.100.
Harrington, Vincent E.: *See*—
Grube, Kenneth E.; Harrington, Vincent E.; and Harrington, James V., 4,050,899, Cl. 23-259.100.
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Harris, Edward J.: *See*—
Burchette, Robert L., Jr.; and Harris, Edward J., 4,050,645, Cl. 242-125.100.
Harris, Newton T., III, to Greer Hydraulics, Inc. Load responsive switch actuator. 4,051,338, Cl. 200-85.00R.
Harris, Nicholas D., to Morton-Norwich Products, Inc. Vinylbenzyl esters of N-BOC-amino acids. 4,051,171, Cl. 560-157.000.
Harris, Robert M.; Mills, Gene F.; and Shaffer, David T., to Union Insulating Company. Clamp for securing bar hanger to electrical wiring box. 4,050,603, Cl. 220-3.900.
Harrison, Ian T.: *See*—
Fried, John H.; and Harrison, Ian T., 4,051,233, Cl. 424-317.000.
Harrod, Michael K.: *See*—
Mueller, Edward E.; Painter, Thomas H.; and Harrod, Michael K., 4,050,635, Cl. 241-24.000.
Harshaw Chemical Company, The: *See*—
Swinehart, Carl F., 4,050,905, Cl. 23-301.000.
Harter, Joseph William; and Beitzel, Stuart Wallace, to O-3 Company. Apparatus for fluid treatment by electron emission. 4,051,043, Cl. 250-531.000.
Hartman, William Law, to Procter & Gamble Company, The. Abrasive scouring compositions. 4,051,056, Cl. 252-99.000.
Hartmann, Max: *See*—
Eggmann, Jean; and Hartmann, Max, 4,050,660, Cl. 248-19.000.
Harvey, Donald Malcolm, to Eastman Kodak Company. Programmed exposure control apparatus. 4,051,497, Cl. 354-231.000.
Harvey, Norman L. Digital measuring system for engine fuel performance. 4,050,295, Cl. 73-114.000.
Harwood, Leopold Albert, to RCA Corporation. Phase control circuit suitable for use in a tint control stage of a color television system. 4,051,519, Cl. 358-21.000.
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Hasegawa, Yoshikazu: *See*—
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Hashimoto, Masahiro; and Furumaya, Kenichi, to Hitachi, Ltd. Management table apparatus in memory hierarchy system. 4,051,461, Cl. 364-900.000.
Hashizume, Hiroshi: *See*—
Kimura, Tsuneo; Hashizume, Hiroshi; and Izumisawa, Yoshiaki, 4,051,178, Cl. 260-524.00R.
Hasircoglu, Alexander William, to Du Pont de Nemours, E. I., and Company. Electrical connector. 4,050,755, Cl. 339-17.0CF.
Hastik, Walter: *See*—
Cappel, Fred; Hastik, Walter; Fleming, Georg; and Hofmann, Pierre, 4,050,924, Cl. 75-5.000.
Hastings, Jerome K., to Cutler-Hammer, Inc. Snap-in bushing switch removal tool. 4,050,148, Cl. 29-764.000.
Hata, Kazuo; and Mitani, Sumio, to Dainippon Screen Seizo Kabushiki-Kaisha. Method for coating the photoresist onto a belt-like material comprising a perforated carrier and metallic foil. 4,051,274, Cl. 427-172.000.
Hatano, Isao; Nagano, Akira; and Urasaki, Kazuaki, to Omron Tateisi Electronics Co. Key input means providing common key identifying and display driving digit timing signals. 4,051,471, Cl. 340-365.00S.
Hatano, Keizo: *See*—
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Hatch, Kenneth F., to Picker Corporation. Delay line clipping in a scintillation camera system. 4,051,373, Cl. 250-363.00S.
Hatchett, George L.: *See*—
Laikin, Milton; and Hatchett, George L., 4,051,523, Cl. 358-99.000.
Hattori, Kinya: *See*—
Watanabe, Akinori; Tanoshima, Katsuhide; Noguchi, Matsusaburo; and Hattori, Kinya, 4,050,377, Cl. 101-114.000.
Hatzmann, Guenter: *See*—
Simak, Petr; Herrle, Karl; Haaf, Franz; and Hatzmann, Guenter, 4,051,200, Cl. 260-899.000.
Hauk, Peter: *See*—
Matthews, John W.; Sigel, Harry Dennis; and Hauk, Peter, 4,050,665, Cl. 248-358.00R.
Haupin, Warren E., to Aluminum Company of America. Thermoelectric heat flow transducer. 4,050,302, Cl. 73-190.00H.
Hauser, Helmut: *See*—
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,051,188, Cl. 260-590.0FA.
Hauser, Raimund: *See*—
Wendisch, Irmgard, 4,050,788, Cl. 350-184.000.
Haveg Industries, Inc.: *See*—
Anderson, Robert W., deceased; and Smith, Robert E., Jr., 4,051,324, Cl. 174-121.00R.
Hawkins, Wallace H. Dolly for lifting and transporting vehicle wheels. 4,050,597, Cl. 214-331.000.
Hawksworth, Frederick James, to Rolls-Royce Motors Limited. Transmission mechanisms. 4,050,320, Cl. 74-112.000.
Hayahusa, Nobuyuki; and Uno, Hiroaki, to Toshiba Kikai Kabushiki Kaisha. Friction type yarn false twisting apparatus. 4,050,229, Cl. 57-77.400.
Hayakawa, Koji: *See*—
Okamoto, Tomiyasu; Nishimoto, Tsunanori; Sawada, Kaoru; Hayakawa, Koji; and Kurihara, Tomomichi, 4,050,609, Cl. 220-9.0LG.
Hayashi, Kazuhige; Minemura, Norihiro; Fujimoto, Iwao; Ozaki, Kiyotaka; Yoshida, Norio; Morishita, Toshio; and Shinoki, Takanori, to Teijin Limited. Raised woven or knitted fabric and process for producing the same. 4,051,287, Cl. 428-91.000.
Hayashi, Takao; and Kato, Hajime, to Fuji Photo Film Co., Ltd. Recording sheet. 4,051,303, Cl. 428-411.000.
Hayashi, Yoshihiro: *See*—
Yamada, Makoto; Sasaki, Shiro; Kanazawa, Shigenori; and Hayashi, Yoshihiro, 4,050,717, Cl. 280-744.000.
Hayes, John C., to UOP Inc. Dehydrogenation method and sulfided nonacidic multimetallic catalytic composite for use therein. 4,051,071, Cl. 252-439.000.
Hayner, Paul F.; Eldridge, David G.; Bernier, Edgar R.; and Henderson, Richard B., to Sanders Associates, Inc. Low noise hydraulic servo valve. 4,050,476, Cl. 137-625.620.
Hayward, William George. Magnetic loops closure elements for electric motor. 4,051,401, Cl. 310-216.000.
Hazdra, James J.; Rausch, David J.; and Munninger, Karl O., to Hutchinson, John L., a part interest. Antithrombogenic hemo dialysis membranes. 4,051,040, Cl. 210-321.00B.
Healey, Francis J.: *See*—
Warner, Ronald E.; Healey, Francis J.; and Grijalba, Abel D., 4,050,134, Cl. 29-156.80R.
Healy, James W.; and Currier, Bob L., to Jonathan Systems. Patient monitoring system. 4,051,522, Cl. 358-86.000.
Heaney, Donald F., to Dravo Corporation. Activated sewage plant and process. 4,051,039, Cl. 210-274.000.
Hecht, Ulrich: *See*—
Adalbert, Gerhard; Hess, Jurgen; and Hecht, Ulrich, 4,050,263, Cl. 62-243.000.
Hecker, Wolfgang: *See*—
Schmedemann, Walter; and Hecker, Wolfgang, 4,050,551, Cl. 188-181.00C.

Heckman, LeRoy Francis, Jr., to RCA Corporation. Radio frequency coupler. 4,051,447, Cl. 333-24.00R.
Heckman, Ronald A. Hang glider. 4,050,654, Cl. 244-49.000.
Hegedus, Louis; and Summers, Jack C., to General Motors Corporation. Pellet-type oxidation catalyst. 4,051,073, Cl. 252-466.0PT.
Hego Electric GmbH: *See*—
Glaesel, Gottfried, 4,050,757, Cl. 339-59.00R.
Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Pfizenmaier, Wolfgang, 4,050,380, Cl. 101-365.000.
Heider, Michael; and Gurgens, Rainer Eberhard, to Adrema Pitney Bowes. Keyboard controlled electronic embossing machine. 4,050,565, Cl. 197-6.300.
Heidt, Henry M., to Babcock & Wilcox Company, The. Method for reducing uranium tetrafluoride. 4,051,227, Cl. 423-259.000.
Heilhecker, Joe K.; Lock, Everett H.; and Deily, Fred H., to Exxon Production Research Company. Apparatus for establishing and maintaining electric continuity in drill pipe. 4,051,456, Cl. 340-18.0LD.
Heim, Thomas M., executor: *See*—
Turner, James Wesley, deceased; and Spinks, Ray E., 4,050,122, Cl. 24-230.00A.
Heimgartner, Hans: *See*—
Jaggi, Hans; and Heimgartner, Hans, 4,050,356, Cl. 91-306.000.
Hein, Helmut; Hermann geb Gleissner, Rosmarie; and Schaefer, Hartmann, to Byk Gulden Lomberg Chemische Fabrik GmbH. Microbicidal nitrofuryl compounds. 4,051,253, Cl. 424-285.000.
Hein, Joseph N.: *See*—
Neal, Ronald D.; Ross, Richard; and Hein, Joseph N., 4,050,651, Cl. 244-15.000.
Heinemann, Otto: *See*—
Goldmann, Wolf; Schepers, Georg; Heinemann, Otto; Schmits, Heinz-Herbert; and Ritzmann, Horst, 4,050,883, Cl. 432-14.000.
Heinemann, Robert W., to United States of America, Army. Low density indirect fire munition system (U). 4,050,381, Cl. 102-4.000.
Heissler, Herbert; Hitsch, Eckart; and Scheer, Wolfgang, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method of manufacturing a fiber reinforced composite material. 4,050,997, Cl. 204-28.000.
Heller, Harry: *See*—
Goldhagen, Samuel; Heller, Harry; and Rothenstein, Julius, 4,050,968, Cl. 149-19.400.
Hellmann, James J. Manual trash compactor. 4,050,373, Cl. 100-240.000.
Helminiak, Thaddeus E.; and Arnold, Fred E., to United States of America, Air Force. Preparation of films and coatings of para ordered aromatic heterocyclic polymers. 4,051,108, Cl. 260-47.0CP.
Hemp, John; and Wyatt, Derek Gerald, to National Research Development Corporation. Fluid flow meters. 4,050,303, Cl. 73-194.0EM.
Hemsath, Klaus H.; and Thekdi, Arvind C., to Midland-Ross Corporation. Apparatus for cooling hot gases. 4,050,912, Cl. 55-223.000.
Henderson, Richard B.: *See*—
Hayner, Paul F.; Eldridge, David G.; Bernier, Edgar R.; and Henderson, Richard B., 4,050,476, Cl. 137-625.620.
Henkel & Cie GmbH: *See*—
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,058, Cl. 252-186.000.
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,059, Cl. 252-186.000.
Henrich KG, Firma: *See*—
Henrich, Werner, 4,050,640, Cl. 242-25.00R.
Henrich, Werner, 4,050,641, Cl. 242-47.000.
Henrich, Werner, to Henrich KG, Firma. Apparatus for winding wire and the like. 4,050,640, Cl. 242-25.00R.
Henrich, Werner, to Henrich KG, Firma. Apparatus for winding wire. 4,050,641, Cl. 242-47.000.
Henricksen, Clifford A., to Altec Corporation. Acoustical transformer for horn-type loudspeaker. 4,050,541, Cl. 181-159.000.
Herbert, Edward. Tracking lens system for solar collectors and skylights. 4,050,789, Cl. 350-226.000.
Hercules Incorporated: *See*—
Reid, Albert Richard, 4,051,086, Cl. 260-17.4GC.
Towle, Gordon Anson, 4,051,317, Cl. 536-114.000.
Hereford, Judson A.; and Beard, Franklin. Fluid lifting apparatus. 4,050,854, Cl. 417-121.000.
Hergt, Peter: *See*—
Metzinger, Wolfgang; Boll, Bernd; and Hergt, Peter, 4,050,846, Cl. 415-182.000.
Herkt, Karl-Heinz: *See*—
Pfeiffer, Kurt; Dietrich, Johannes; Beckmann, Gunter; and Herkt, Karl-Heinz, 4,050,901, Cl. 23-285.000.
Herlihy, Patricia: *See*—
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Hermann geb Gleissner, Rosmarie: *See*—
Hein, Helmut; Hermann geb Gleissner, Rosmarie; and Schaefer, Hartmann, 4,051,253, Cl. 424-285.000.
Hermans, Marie E. A.: *See*—
Kanij, Johannes B. W.; Noothout, Arend J.; and Hermans, Marie E. A., 4,051,060, Cl. 252-301.1R.
Herrle, Karl: *See*—
Simak, Petr; Herrle, Karl; Haaf, Franz; and Hatzmann, Guenter, 4,051,200, Cl. 260-899.000.
Herskowitz, Nat H.: *See*—
Forman, Tracy H.; Herskowitz, Nat H.; and Lawida, Arthur E., 4,050,658, Cl. 248-13.000.
Herzog, Gunter, to Ernst Koch & Co. Inner cooling system on drawing die drums. 4,050,282, Cl. 72-286.000.
Hess, Bernhard; and Raichle, Karl, to Bayer Aktiengesellschaft. Hard-enable moulding compositions containing a thermoplastic polymer a copolymerizable vinyl compound and a polyesterurethane. 4,051,085, Cl. 260-16.000.
Hess, Jurgen: *See*—
Adalbert, Gerhard; Hess, Jurgen; and Hecht, Ulrich, 4,050,263, Cl. 62-243.000.
Hesse, Karl-Heinz: *See*—
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Hetzel, Hartmut: *See*—
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Heuvelmans, Jean Johan: *See*—
van der Werf, Jan Evert; Heuvelmans, Jean Johan; and van Toggeren, Hendricus Franciscus Johannes Jacobus, 4,051,407, Cl. 315-106.000.
Hewlett-Packard Company: *See*—
Welsh, Paul Bryce, 4,050,911, Cl. 55-197.000.
Hickok, William Kelsey: *See*—
Metzger, Lenard M.; and Hickok, William Kelsey, 4,051,515, Cl. 358-8.000.
Higgins, David M., to Comptex, Inc. Bagging machine. 4,050,219, Cl. 53-183.000.
Higuchi, Hisashi: *See*—
Imanari, Mamoru; Takeuchi, Makoto; Shimizu, Shozo; and Higuchi, Hisashi, 4,051,429, Cl. 324-.50A.
Hikasa, Tadashi: *See*—
Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Hikasa, Tadashi, 4,051,225, Cl. 423-235.000.
Hilbert, Francis H.; and Rzeszewski, Theodore S., to Matsushita Electric Company of America. Auxiliary signal processing circuit for television receivers. 4,051,532, Cl. 358-142.000.
Hildebrandt, William J., to Stanley Works, The. Power boring bits. 4,050,841, Cl. 408-213.000.
Hile, John W., to General Motors Corporation. Ion implanted zener diode. 4,051,504, Cl. 357-13.000.
Hill, James David: *See*—
Carmichael, John Michael; Hill, James David; and West, Donald Lee, 4,050,564, Cl. 197-1.00R.
Himuro, Masami: *See*—
Takeuchi, Kouichi; Itoh, Norio; Koyama, Kuniyoshi; Shimada, Satoshi; and Himuro, Masami, 4,051,513, Cl. 358-60.000.
Hines, Clyde Kenneth; Long, Everett James; and Wysocki, Lawrence Eugene, to Everett/Charles, Inc. Telescoping spring probe having separate wiper contact member. 4,050,762, Cl. 339-108.0TP.
Hiraishi, Hisashi: *See*—
Murakami, Shinichi; Akamatsu, Katsutaro; and Hiraishi, Hisashi, 4,050,927, Cl. 75-122.000.
Murakami, Shinichi; Akamatsu, Katsutaro; Morichika, Toshiaki; and Hiraishi, Hisashi, 4,050,929, Cl. 75-171.000.
Hiramoto, Seigo: *See*—
Shimada, Wataru; and Hiramoto, Seigo, 4,050,958, Cl. 148-9.500.
Hiratsuka, Kosai: *See*—
Nakazato, Norio; Hiratsuka, Kosai; and Furukawa, Tokinobu, 4,050,953, Cl. 127-60.000.
Hirose, Fumio: *See*—
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Hirose, Masahiko: *See*—
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Hitachi, Ltd.: *See*—
Fujinawa, Masaki; Takeyasu, Kiyoo; Iiruka, Kenichi; Uchida, Motokazu; and Uzuhashi, Hideo, 4,051,417, Cl. 318-138.000.
Hashimoto, Masahiro; and Furumaya, Kenichi, 4,051,461, Cl. 364-900.000.
Horie, Noboru, 4,051,506, Cl. 357-55.000.
Imai, Kunio, 4,051,428, Cl. 323-4.000.
Inoue, Fumiyuki; Fujikata, Kenji; and Yokozawa, Norio, 4,051,457, Cl. 340-146.3MA.
Inoue, Hajime; Harada, Fumio; Kato, Kazunobe; and Oikawa, Syoji, 4,051,001, Cl. 204-151.000.
Kaneko, Kenji; and Okabe, Takahiro, 4,051,389, Cl. 307-291.000.
Kataoka, Hiroyuki; Yahiro, Seinosuke; and Suzuki, Kazuo, 4,050,547, Cl. 187-29.00R.
Nakazato, Norio; Hiratsuka, Kosai; and Furukawa, Tokinobu, 4,050,953, Cl. 127-60.000.
Seki, Kunio; Suzuki, Yukio; and Sakamoto, Yoshio, 4,051,443, Cl. 330-258.000.
Seno, Shougo; Toyama, Tatsuro; Takai, Teruo; and Ueda, Yasuomi, 4,051,550, Cl. 361-402.000.
Shimada, Satoshi; Yamada, Kazuji; Matsuda, Yasumasa; Kimura, Ichiro; Shimazoe, Michitaka; and Takahashi, Yukio, 4,050,313, Cl. 73-398.0AR.
Shimomura, Raiji; Habu, Toru; Itoh, Hisaki; Sakai, Naomi; and Goto, Tatsuo, 4,050,293, Cl. 73-105.000.
Suzuki, Nobuyuki; and Nishihara, Toyotaro, 4,051,514, Cl. 358-65.000.
Takeda, Yasutsugu; Nakamura, Hisashi; Tsunoda, Yoshio; Tsukada, Toshihisa; and Miyauchi, Toshimitsu, 4,051,528, Cl. 358-128.000.
Watanabe, Takao, 4,050,418, Cl. 122-451.00R.
Yamazaki, Seishi, 4,051,442, Cl. 330-281.000.
Hitachi Metals, Ltd.: *See*—
Shimomura, Raiji; Habu, Toru; Itoh, Hisaki; Sakai, Naomi; and Goto, Tatsuo, 4,050,293, Cl. 73-105.000.

Hitachi Shipbuilding & Engineering Co.: *See—*
Okamoto, Tomiyasu; Nishimoto, Tsunanori; Sawada, Kaoru; Hayakawa, Koji; and Kurihara, Tomomichi, 4,050,609, Cl. 220-9.0LG.

Hitachi Shipbuilding & Engineering Co., Ltd.: *See—*
Nakanishi, Tetsuichiro, 4,050,252, Cl. 60-641.000.

Hite, Frederick S.: *See—*
Luey, A. Thomas; and Hite, Frederick S., 4,050,499, Cl. 162-317.000.

Hitomi, Shimo: *See—*
Yasuhiro, Ikuta; and Hitomi, Shimo, 4,050,429, Cl. 123-119.00A.

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Heissler, Herbert; Hitsch, Eckart; and Scheer, Wolfgang, 4,050,997, Cl. 204-28.000.

Hjortzberg, Bernhard A., to BASF Aktiengesellschaft. Hybrid sequential and carrier encoded color television transmission method and circuits. 4,051,517, Cl. 358-15.000.

Hoadley, Howard W. Portable slating device. 4,050,793, Cl. 352-5.000.

Hoare, Robert C., to Allied Chemical Corporation. Anthraquinone dyes. 4,051,155, Cl. 260-379.000.

Hobbs, Jim F.; and Smyser, Craig, to Shirco, Ltd. Incineration apparatus. 4,050,900, Cl. 23-277.00R.

Hochtemperatur-Reaktorbau GmbH: *See—*
Arndt, Erhard; Brodmann, Nikolaus; and Roser, Horst R., 4,050,984, Cl. 176-60.000.

Hocker, Lon O.: *See—*
Dewey, C. Forbes, Jr.; and Hocker, Lon O., 4,051,371, Cl. 250-339.000.

Hodges, Carl N.: *See—*
Peck, John F.; and Hodges, Carl N., 4,050,443, Cl. 126-270.000.

Hodogaya Chemical Co., Ltd.: *See—*
Takematsu, Tetsuo; Konnai, Makoto; Isogawa, Takayuki; and Kodama, Koshiro, 4,050,920, Cl. 71-88.000.

Hoeber, W. Gerhard: *See—*
Landwehrkamp, Hans; Hoeber, W. Gerhard; Goldammer, Georg; and Oexler, Rudolf, 4,050,228, Cl. 57-58.950.

Hoechst Aktiengesellschaft: *See—*
Rebadat, Siegfried; Mayer, Sigmund; and Alfranseder, Josef, 4,051,068, Cl. 252-412.000.
Stroszynski, Joachim, 4,050,410, Cl. 118-410.000.

Hoefler, Andrew Charles: *See—*
Sanderson, Gary Warner; Hoefler, Andrew Charles; Graham, Harold Nathaniel; and Coggon, Philip, 4,051,264, Cl. 426-52.000.

Hoerauf, Werner: *See—*
Kissel, Ernst; Neumann, Eckart; Guenther, Ernst; Valentin, Guenter; and Hoerauf, Werner, 4,051,113, Cl. 260-78.00L.

Hoesch Werke Aktiengesellschaft: *See—*
Gantke, Franz; Walter, Harald; and Zywietz, Walter, 4,050,212, Cl. 52-726.000.

Hoffmann-La Roche Inc.: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 4,051,319, Cl. 542-413.000.
Cohen, Noal; and Saucy, Gabriel, 4,051,153, Cl. 260-345.500.
Stoller, Hansjorg; and Wagner, Hans Peter, 4,051,174, Cl. 560-234.000.

Hoffmeister, Friedrich: *See—*
Mayer, Karl Heinrich; Petersen, Siegfried; Klauke, Erich; Hoffmeister, Friedrich; and Wuttke, Wolfgang, 4,051,252, Cl. 424-273.00P.

Hoffmeyer, Uwe: *See—*
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Hofmann, Dionys, to Gebr. Hofmann KG, Maschinenfabrik. Apparatus for compensating for unbalance of a rotary body. 4,050,195, Cl. 51-169.000.

Hofmann, Pierre: *See—*
Cappel, Fred; Hastik, Walter; Fleming, Georg; and Hofmann, Pierre, 4,050,924, Cl. 75-5.000.

Holbert, Marvin Lee, Jr.: *See—*
Coone, Malcolm G.; Malone, Billy C.; and Holbert, Marvin Lee, Jr., 4,050,731, Cl. 294-86.240.

Holik, Melville J.; and Kraemer, John F., to International Minerals & Chemical Corporation. Foundry core composition of aggregate and a binder therefor. 4,051,092, Cl. 260-29.300.

Holleboom, Bruce W., to General Motors Corporation. Air-fuel ratio control system. 4,050,425, Cl. 123-119.0EC.

Hollenberg, Glenn W.: *See—*
Sharpe, William N., Jr.; and Hollenberg, Glenn W., 4,050,818, Cl. 356-32.000.

Hollett, Reginald; and Potter, James Charles, to CAV Limited. Liquid fuel injection pumping apparatus. 4,050,437, Cl. 123-139.0AC.

Holliday, Carl F., to Holliday Guidance Systems, Inc. Pontoon boat guidance system. 4,050,398, Cl. 115-18.00R.

Holliday Guidance Systems, Inc.: *See—*
Holliday, Carl F., 4,050,398, Cl. 115-18.00R.

Hollins, James E., to Ford Motor Company. Carburetor automatic choke construction. 4,050,427, Cl. 123-119.00F.

Holloway Farm Supply, Inc.: *See—*
Cartwright, Dwayne L., 4,050,944, Cl. 106-19.000.

Holloway, John Ambrose, to B. F. Goodrich Company, The. Injection moldable polyurethanes. 4,051,111, Cl. 260-75.0NP.

Holzapfel, Immanuel, to Daimler-Benz Aktiengesellschaft. Film evaporating combustion chamber. 4,050,238, Cl. 60-39.230.

Holzman, Allen L.; and Corcoran, William J., to United States of America, Navy. Combination solid fuel ramjet injector/port cover. 4,050,243, Cl. 60-245.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Takahashi, Shuichi, 4,051,419, Cl. 318-227.000.

Honda, Kenji: *See—*
Senoo, Tadao; and Honda, Kenji, 4,050,230, Cl. 57-149.000.

Honda, Masahiro: *See—*
Asano, Toyohide; and Honda, Masahiro, 4,050,278, Cl. 72-257.000.

Honeycomb Systems, Inc.: *See—*
Bryand, Edward T., 4,050,131, Cl. 29-121.300.

Honeywell Inc.: *See—*
Dukich, Peter P.; Metzger, Isaac W.; and Volk, John A., 4,051,534, Cl. 358-210.000.
Huang, Jack S. T., 4,051,464, Cl. 340-173.00R.
Nelson, Lorne W., 4,050,291, Cl. 73-38.000.

Honma, Tsutomu: *See—*
Wakana, Hiroshi; Harada, Isamu; and Honma, Tsutomu, 4,050,605, Cl. 220-5.00A.

Hoogovens Ijmuiden BV: *See—*
Kooy, Albertus Adrianus; and van Rijkom, Jacobus, 4,051,213, Cl. 264-109.000.

Hooker Chemicals & Plastics Corporation: *See—*
Gouinlock, Edward V., Jr.; and Rosenfeld, Jerold C., 4,051,106, Cl. 260-47.00C.
Pawlak, Joseph A.; Lemper, Anthony L.; and Pattison, Victor A., 4,051,107, Cl. 260-47.00C.
Shepard, Alvin F.; and Dannels, Bobby F., 4,051,189, Cl. 260-619.00A.

Hooker, Marvin L., Jr., to Rockwell International Corporation. Input tracking threshold detector. 4,051,473, Cl. 343-7.00A.

Hoover, Carl W., Jr.: *See—*
Feingold, Robert M.; Hoover, Carl W., Jr.; and Rennie, John, 4,051,403, Cl. 313-105.0CM.

Hope, Frederick John Charles; and Pigney, James Malcolm, to Hope Technical Developments Limited. Manually operated control valve and testing apparatus incorporating such valve. 4,050,298, Cl. 73-121.000.

Hope Technical Developments Limited: *See—*
Hope, Frederick John Charles; and Pigney, James Malcolm, 4,050,298, Cl. 73-121.000.

Hopkins, John Root; Renn, Robert Maurice; and Southard, Robert Keith, to AMP Incorporated. Intrinsic certification assembly technique for wiring components into an electrical apparatus. 4,050,764, Cl. 339-103.00M.

Hori, Toshio; and Nakagawa, Tadao, to Nisshin Kogyo Kabushiki Kaisha. Disc brake device for motorcycles and the like. 4,050,549, Cl. 188-72.800.

Horie, Noboru, to Hitachi, Ltd. Complementary semiconductor device. 4,051,506, Cl. 357-55.000.

Horowitz, Carl; Dichter, Michael; and Shah, Navinchandra Bhogilal, to Polygulf Associates. Adhesive bonding. 4,051,090, Cl. 260-23.70M.

Horwinski, Elwood R., to Automobile Corporation of America. Grate and stove heating unit. 4,050,441, Cl. 126-121.000.

Hossle, Ludwig. Sacrificial anodes for cathodic protection. 4,051,007, Cl. 204-197.000.

Hotton, Joseph G., to Neumann Engraving Company. Method of welding plastic seams. 4,051,218, Cl. 264-248.000.

Houtman, John L.: *See—*
Ference, Edward W.; Houtman, John L.; and Waldby, Robert N., 4,050,986, Cl. 176-61.000.

Hovy, Jan Willem: *See—*
Dahm, Johann; Borck, Joachim; Wild, Albrecht; and Hovy, Jan Willem, 4,051,250, Cl. 424-272.000.

Howlett, Richard Martin: *See—*
Elliott, John Scotchford; Davis, Bryan Terence; and Howlett, Richard Martin, 4,051,049, Cl. 252-51.50A.

Hsieh, Henry L.: *See—*
Udipi, Kishore; and Hsieh, Henry L., 4,051,199, Cl. 260-880.00R.

Hsu, Ming Chiag. Electric-powered adjustable rear-view mirror for vehicles with disengageable worm gear. 4,050,776, Cl. 350-289.000.

Huang, Jack S. T., to Honeywell Inc. Semiconductor memory cell. 4,051,464, Cl. 340-173.00R.

Huang, Wann-Sheng: *See—*
Wu, Ching H.; Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 4,050,513, Cl. 166-274.000.

Hubbard, S. Eugene; and Biebuyck, Lawrence F., to Kawneer Company, Inc. Wall construction having a continuous sill with gutter means. 4,050,201, Cl. 52-97.000.

Hubbs, Robert J., to Raymond Lee Organization, Inc., The, a part interest. Revolver gun. 4,050,174, Cl. 42-59.000.

Huber, Reinhold: *See—*
Bertschmann, Silvio; Koester, Waldemar; and Huber, Reinhold, 4,050,207, Cl. 52-396.000.

Huber, Theodor: *See—*
Wagensonner, Eduard; Huber, Theodor; and von Fischern, Bernhard, 4,050,795, Cl. 352-141.000.

Huckaba, Charles E.: *See—*
Castellana, Frank S.; Byrne, John C.; and Huckaba, Charles E., 4,050,449, Cl. 128-2.00S.

Hughes, Raymond H.; and Clay, Carl D., to Marathon Oil Company. Transporting heavy fuel oil as a slurry. 4,050,742, Cl. 302-66.000.

Hugin Kassaregister AB: *See—*
Englund, Sven, 4,051,349, Cl. 235-130.00R.

Huiet, George E., Jr. Liquids separating system. 4,051,030, Cl. 210-114.000.

Humberstone, John; Deal, William L.; and Edgington, Arthur E., to Harbor Products, Inc. Diaphragm and method of making. 4,050,358, Cl. 92-103.00F.

Humbert, Daniel: *See—*
Hardy, Michel; and Humbert, Daniel, 4,051,249, Cl. 424-270.000.

Hunter, Charles A., II: *See—*
Morrow, James G., Sr.; Pech, David J.; Hunter, Charles A., II; and Porubcansky, Kenneth J., 4,050,586, Cl. 212-59.00R.

Hunter, Lee. Vehicle lifting jack assembly. 4,050,545, Cl. 187-8.430.

Huse, Henry, to Atlantic Fluidics, Inc. Solar energy collection system. 4,050,445, Cl. 126-271.000.

Hutchinson, John L.: *See—*
Hazdra, James J.; Rausch, David J.; and Munninger, Karl O., 4,051,040, Cl. 210-321.00B.

Hutchinson-Mapa: *See—*
de Massacre, Guy, 4,050,144, Cl. 29-427.000.

Hutson, Clifford L. Apparatus for handling delicate articles such as silicon wafers. 4,050,729, Cl. 294-64.00R.

Hydro Products, Inc.: *See—*
Laikin, Milton; and Hatchett, George L., 4,051,523, Cl. 358-99.000.

Hynst, Karel, to Adamovske strojirny, narodni podnik. Arrangement for generating a rocking motion of a transfer cylinder of an inking system. 4,050,383, Cl. 101-349.000.

I'Anson, Thomas. Pintle-type industrial conveyor chain. 4,050,323, Cl. 74-251.00C.

Ichiki, Toshio: *See—*
Gunjima, Tomoki; and Ichiki, Toshio, 4,051,002, Cl. 204-180.00P.

Ichimaru, Hiroshi: *See—*
Kashiwara, Teruo; and Ichimaru, Hiroshi, 4,050,539, Cl. 181-280.000.

ICI Australia Limited: *See—*
Barnett, George Henry, 4,050,970, Cl. 149-88.000.

Idel, Vladimir Viktorovich. Method of setting saw teeth and device for realization thereof. 4,050,333, Cl. 76-112.000.

Iguchi, Shozo: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, 4,050,142, Cl. 29-403.000.

Iida, Yozo; Akasaka, Shigeo; and Kawahara, Yasuhito, to Nippon Kogaku K.K. Remote control camera. 4,051,496, Cl. 354-219.000.

Iizuka, Kenichi: *See—*
Fujinawa, Masaaki; Takeyasu, Kiyoo; Iizuka, Kenichi; Uchida, Motokazu; and Uzuhashi, Hideo, 4,051,417, Cl. 318-138.000.

Ikeda, Teppei: *See—*
Takeda, Keiji; Murata, Masataka; and Ikeda, Teppei, 4,050,936, Cl. 96-28.000.

Ikeda, Toshimitu: *See—*
Ueda, Yasuo; Kamezawa, Yasutoki; Aizawa, Tatsuo; and Ikeda, Toshimitu, 4,051,052, Cl. 252-62.10L.

Ikeno, Hitoshi; Sugita, Mitsuyuki; and Yanagi, Hirofumi, to Kabushiki Kaisha Seikosha. Method for adjusting frequency-temperature characteristic of GT cut quartz oscillator. 4,050,126, Cl. 29-25.350.

Imai, Kunio, to Hitachi, Ltd. Current control circuit with current proportional circuit. 4,051,428, Cl. 323-4.000.

Imamura, Hitoshi: *See—*
Ogawa, Kazuyuki; Hirose, Masahiko; Yada, Masaaki; and Imamura, Hitoshi, 4,051,382, Cl. 250-531.000.

Imanari, Mamoru; Takeuchi, Makoto; Shimizu, Shozo; and Higuchi, Hisashi, to Nihon Denshi Kabushiki Kaisha. Nuclear magnetic resonance apparatus. 4,051,429, Cl. 324-.50A.

IMC Chemical Group, Inc.: *See—*
Shipchandler, Mohammed T., 4,051,128, Cl. 260-239.570.

Imperial Chemical Industries Limited: *See—*
Andrew, Herbert Francis; Stead, Cecil Vivian; and Thompson, Ronald, 4,051,175, Cl. 260-502.500.
Barr, Dennis Arthur; and Rose, John Brewster, 4,051,109, Cl. 260-49.000.
Caunt, Anthony David; and Fortuin, Michael Stanley, 4,051,307, Cl. 526-77.000.
Swallow, Douglas Lintin, 4,051,256, Cl. 424-304.000.

Inada, Masami; Kawabata, Yasuhiro; Sato, Katsujiro; and Osanai, Akinori, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition timing adjusting device for internal combustion engines. 4,050,423, Cl. 123-117.00A.

Inata, Hiroo: *See—*
Kuratsuji, Takatoshi; Inata, Hiroo; and Kawase, Shoji, 4,051,112, Cl. 260-75.00T.

Independent Broadcasting Authority: *See—*
Baldwin, John Lewis Edwin, 4,051,531, Cl. 358-140.000.

Industrie Pirelli Societa per Azioni: *See—*
Ferrentino, Antonio; Brovedan, Antonio; and Sala, Angelo, 4,050,867, Cl. 425-114.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Badagnani, Guido; and Carioli, Giancarlo, 4,051,326, Cl. 179-2.0DP.

Ingenieur, Kurt Murrle, to Pforzheimer Uhren-Rohwerke Rudolf Wehner. Stepping mechanism for watches. 4,050,233, Cl. 58-58.000.

Ingersoll-Rand Company: *See—*
Buse, Frederic W., 4,050,862, Cl. 417-539.000.
Webb, Paul Dale, 4,050,701, Cl. 277-125.000.

Inglis, James M. Magnification of television images. 4,051,535, Cl. 358-231.000.

Inose, Fumiyuki; Fujikata, Kenji; and Yokozawa, Norio, to Hitachi, Ltd. System for generating a character pattern. 4,051,457, Cl. 340-146.3MA.

Inoue, Hajime; Harada, Fumio; Kato, Kazunobu; and Oikawa, Syoji, to Hitachi, Ltd. Process for regenerating etching solution. 4,051,001, Cl. 204-151.000.

Inoue, Nobuyoshi; and Saito, Toshihisa, to Copal Company Limited. Built-in self-timer for cameras. 4,051,501, Cl. 354-239.000.

Institoris, Laszlo: *See—*
Guczoghy, Lajos; Pfliegel, Todor; Puklics, Maria; Institoris, Laszlo; and Seres, Jeno, 4,051,156, Cl. 260-393.000.

Institut Francais du Petrole: *See—*
Cholet, Jacques; and Layotte, Pierre-Claude, 4,050,540, Cl. 181-114.000.

Institut Francais du Petrole, des Carburants et Lubrifiants: *See—*
Dawans, Francois; and Goldenberg, Emmanuel, 4,051,172, Cl. 526-90.000.

Institute po Metaloznanie i Technologia na Metalite: *See—*
Balevski, Angel Tonchev; Nikolov, Ivan Dimov; Nenov, Dragan Iliev; and Momchilov, Emil Nikolov, 4,050,503, Cl. 164-155.000.

Institutul de Cercetari si Proiectari de Masini Agricole-ICPMA: *See—*
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,050,704, Cl. 280-6.00R.

Intel Corporation: *See—*
Schwartz, Samuel, 4,051,358, Cl. 364-716.000.

International Business Machines Corporation: *See—*
Abbas, Shakir Ahmed; and Dockerty, Robert Charles, 4,051,273, Cl. 427-86.000.
Basi, Jagtar S., 4,050,954, Cl. 134-2.000.
Carmichael, John Michael; Hill, James David; and West, Donald Lee, 4,050,564, Cl. 197-1.00R.
Chu, Richard C.; and Moran, Kevin P., 4,050,507, Cl. 165-1.000.
Eichelberger, Edward Baxter; Muehldorf, Eugene Igor; Walther, Ronald Gene; and Williams, Thomas Walter, 4,051,352, Cl. 364-716.000.
Esteban, Daniel J.; and Menez, Jean E., 4,051,470, Cl. 340-347.0AD.
Fox, Sidney Jared; Martin, Van Clifton; and Van Hook, Danny Allen, 4,051,538, Cl. 358-296.000.
Lee, Hua-Tung, 4,051,353, Cl. 364-716.000.
McGinnis, Bernard William; and Weidenhammer, James Amos, 4,051,541, Cl. 360-98.000.

International Engineering Company, Inc.: *See—*
Meheen, Homayoun J.; and Nielson, Farrel D. (said Farrel D. Nielson assors. to), 4,050,254, Cl. 61-39.000.

International Harvester Company: *See—*
Borrill, James L., 4,050,733, Cl. 296-28.00C.
Virtue, Eugene P.; and Lech, Richard J., 4,050,478, Cl. 137-625.660.
Windecker, Leo J., 4,051,296, Cl. 428-311.000.

International Minerals & Chemical Corporation: *See—*
Batzer, Othmer F.; and Stewart, John A., 4,051,027, Cl. 210-42.00R.
Holik, Melville J.; and Kraemer, John F., 4,051,092, Cl. 260-29.300.

International Nickel Company, Inc., The: *See—*
Crum, James Roy, 4,050,928, Cl. 75-124.000.
Gendron, Aubrey Stewart; Abe, Shinichiro; Ettel, Victor Alexander; and O'Neill, Charles Edward, 4,051,000, Cl. 204-106.000.

International Standard Electric Corporation: *See—*
Kimmich, Klaus, 4,050,411, Cl. 118-625.000.

International Telephone and Telegraph Corporation: *See—*
Acar, Ali, 4,050,477, Cl. 137-625.650.
Albanese, Damian F.; and Waer, Richard R., 4,051,472, Cl. 343-5.0PD.
Aronoff, Elihu J.; and Dhami, Kewal Singh, 4,051,003, Cl. 204-159.170.
Curley, James H., 4,050,758, Cl. 339-74.00R.
Moore, John R., 4,050,756, Cl. 339-59.00M.
Pickett, Robert B.; and Baghdady, Elie J., 4,051,438, Cl. 325-45.000.

Introtech: *See—*
Goodwin, William D., 4,051,114, Cl. 260-123.500.

in't Veld, Cornelis, to National Marine Service, Inc. Flow control vane for a skimmer-type oil boom. 4,051,038, Cl. 210-242.00S.

Inukai, Hidemori, to Nippon Electric Company, Ltd. Flip-flop accompanied by two current switches, one having a smaller current sink capability than the other. 4,051,388, Cl. 307-279.000.

Ioffe, Vladimir Fedorovich: *See—*
Lavrentiev, Konstantin Nikitich; Borisova, Natalya Isaakievna; Vasiliev, Jury Ivanovich; Rodionov, Jury Nikolaevich; Strashinsky, Vadim Konstantinovich; Ioffe, Vladimir Fedorovich; and Vyatskin, Iosif Yakovlevich, deceased, 4,051,422, Cl. 318-570.000.

Iowa State University Research Foundation, Inc.: *See—*
Fanslow, Glenn Ellsworth, 4,051,435, Cl. 324-95.000.

Ipri, Alfred C.; and Sarace, John C., to United States of America, Air Force. Simultaneous fabrication of CMOS transistors and bipolar devices. 4,050,965, Cl. 148-175.000.

Isa, Isao; Shibuya, Morioki; and Ebisawa, Makoto, to Japan Carlit Co., Ltd., The. Process for manufacturing chlorine dioxide. 4,051,229, Cl. 423-478.000.

Isaka, Ichiro: *See—*
Murakami, Masuo; Isaka, Ichiro; and Kashiwagi, Teruya, 4,051,126, Cl. 260-239.100.

Ishida, Akira: *See—*
Yamada, Shinichiro; Ishida, Akira; and Mukai, Hisakazu, 4,051,460, Cl. 364-900.000.

Ishihara, Masao: *See—*
Habu, Teiji; Ishihara, Masao; Sakamoto, Eiichi; Yamada, Hiroshi; and Kaneshige, Masaaki, 4,050,940, Cl. 96-114.500.

Ishihara, Takao; Sanpei, Kiyoji; Nabatame, Hiroshi; and Motokawa, Shoichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Apparatus and

method for removing pitch from thermally cracked gas. 4,050,910, Cl. 55-96.000.

Ishii, Hiromichi: *See—*
Sonobe, Hiroshi; Kato, Masaaki; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, 4,051,179, Cl. 260-530.00N.

Ishii, Kenshun: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 4,050,103, Cl. 4-110.000.

Ishii, Yoshiyasu: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, 4,050,103, Cl. 4-110.000.

Ishikawa, Noboru; Nakamura, Hidehisa; Maruyama, Kazuyoshi; and Shoji, Akio, to Dainippon Ink and Chemicals, Inc. Thermosetting resin composition for powder paint comprising of a (I) polymer consisting of β-methylglycidyl (meth)acrylate, styrene, unsaturated diallkyl ester, alkylacrylate and (II) saturated aliphatic dibasic acid. 4,051,194, Cl. 260-836.000.

Ishikawa, Soji. Medical needle holder assembly and method of and apparatus for manufacturing medical needle holding assembly. 4,050,150, Cl. 29-777.000.

Ishiyama, Jiro: *See—*
Motomura, Yoshie; and Ishiyama, Jiro, 4,050,919, Cl. 71-86.000.

Isogawa, Takayuki: *See—*
Takematsu, Tetsuo; Konnai, Makoto; Isogawa, Takayuki; and Kodama, Koshiro, 4,050,920, Cl. 71-88.000.

Italiano, Victor J.: *See—*
Crump, Leslie L.; and Italiano, Victor J., 4,050,569, Cl. 197-120.000.

Itek Corporation: *See—*
Ebner, Peter R.; and Griffith, Louis E., 4,051,486, Cl. 354-7.000.

Ito, Isao; and Karita, Yoichi, to NGK Insulators, Ltd. Radioactive matter containing waste gas treating installation. 4,050,638, Cl. 241-222.000.

Ito, Yoichiro, to United States of America, Health, Education and Welfare. Preparative countercurrent chromatography with a slowly rotating helical tube array. 4,051,025, Cl. 210-31.00C.

Ito, Yoshio; Ariga, Masao; and Suda, Masashi, to Canon Kabushiki Kaisha. Separator device in a copying machine. 4,050,691, Cl. 271-124.000.

Itoh, Hisaaki: *See—*
Shimomura, Raiji; Habu, Toru; Itoh, Hisaaki; Sakai, Naomi; and Goto, Tatsuo, 4,050,293, Cl. 73-105.000.

Itoh, Norio: *See—*
Takeuchi, Kouichi; Itoh, Norio; Koyama, Kuniyoshi; Shimada, Satoshi; and Himuro, Masami, 4,051,513, Cl. 358-60.000.

Itou, Michihisa: *See—*
Nakamura, Yasushi; Itou, Michihisa; and Uchimura, Mitsuo, 4,050,960, Cl. 148-16.000.

ITT Industries, Incorporated: *See—*
Belart, Juan, 4,050,748, Cl. 303-114.000.

Iverson, Myren L.: *See—*
Giles, Michael K.; and Iverson, Myren L., 4,051,364, Cl. 250-199.000.

Iwanaga, Yoshiharu: *See—*
Koizumi, Yutaka; and Iwanaga, Yoshiharu, 4,050,812, Cl. 355-66.000.

Iwase, Koji: *See—*
Nakaoka, Kazuhide; Araki, Kenji; Iwase, Koji; Koike, Yasuo; and Fukunaka, Shiro, 4,050,959, Cl. 148-12.300.

Iwema Forpackningar AB: *See—*
Stenberg, Folke Gustav Adolf, 4,050,216, Cl. 53-14.000.

Izumi, Kazuo; and Izumi, Kazuto, to Nippon Telegraph and Telephone Public Corporation. Multiplex digital echo suppression system. 4,051,332, Cl. 179-170.200.

Izumi, Kazuto: *See—*
Izumi, Kazuo; and Izumi, Kazuto, 4,051,332, Cl. 179-170.200.

Izumisawa, Yoshiaki: *See—*
Kimura, Tsuneo; Hashizume, Hiroshi; and Izumisawa, Yoshiaki, 4,051,178, Cl. 260-524.00R.

J. I. Case Company: *See—*
Golobay, Gary L., 4,051,416, Cl. 318-85.000.
Ralston, Harold A.; and Christensen, Alton B., 4,050,522, Cl. 172-311.000.

J. M. Huber Corporation: *See—*
Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., 4,050,869, Cl. 425-222.000.

Jablin, Richard. Slag waste heat boiler. 4,050,884, Cl. 432-29.000.

Jabs, Gert; and Loew, Gunther, to Bayer Aktiengesellschaft. Process for making hydrophilic polyurethane foams. 4,051,081, Cl. 260-2.5AD.

Jaccard, Roland, to Ciba-Geigy Corporation. Process for the conversion of liquid phases of non-metallic substances, especially polymerizable or crystallizable substances, into solid phases. 4,051,208, Cl. 264-5.000.

Jackson, Harold Ernest, to Tecalemit Limited. Fuel injection systems for internal combustion engines. 4,050,431, Cl. 123-139.0AW.

Jackson, Robert Andrew, III; and Willis, Harry G., to Motorola, Inc. Zero-insertion-withdrawal force connector. 4,050,759, Cl. 339-75.00M.

Jackson, Robert R., to Owens-Corning Fiberglas Corporation. Method and apparatus for advancing strand. 4,050,639, Cl. 242-18.00G.

Jacoba, Eli S.: *See—*
Russell, James T., 4,050,811, Cl. 355-46.000.

Jaeger, Kurt S.: *See—*
Bond, Desmond H.; Taggart, George W.; and Jaeger, Kurt S., 4,051,231, Cl. 423-659.000.

Jaffrey Fire Protection Company, Inc.: *See—*
Leach, Paul A., 4,050,857, Cl. 417-309.000.

Jaggi, Hans; and Heimgartner, Hans, to Haeny & Cie AG. Apparatus for controlling a fluid medium. 4,050,356, Cl. 91-306.000.

James Neill Holdings Limited: *See—*
Wooldridge, John, 4,050,661, Cl. 248-285.000.

Jamieson, Allan Geoffrey; Samuelson, Hans Olof; Smedman, Leif Ake; and Sondell, Kent Ivar, to Mo och Domsjo Aktiebolag. Process for the delignification of lignocellulosic material by maintaining a concentration of carbon monoxide in the presence of oxygen and alkali. 4,050,981, Cl. 162-37.000.

Janin, Andre. Rotary cutting tool. 4,050,842, Cl. 408-226.000.

Janousek, Jan: *See—*
Brozkova, Marie; Burysek, Frantisek; Janousek, Jan; Mikulecky, Karel; and Skoda, Stanislav, 4,050,226, Cl. 57-34.00R.

Janssen, Almuth, heir: *See—*
Gelbein, Abraham P.; Janssen, Paul, deceased; and Richtzenhain, Hermann, 4,051,140, Cl. 260-290.00P.

Janssen, Paul, deceased: *See—*
Gelbein, Abraham P.; Janssen, Paul, deceased; and Richtzenhain, Hermann, 4,051,140, Cl. 260-290.00P.

Japan Atomic Energy Research Institute: *See—*
Takeshita, Isao, 4,051,369, Cl. 250-321.000.

Japan Carlit Co., Ltd., The: *See—*
Isa, Isao; Shibuya, Morioki; and Ebisawa, Makoto, 4,051,229, Cl. 423-478.000.

Jarman, Alonzo B.: *See—*
Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,050,596, Cl. 214-131.00A.

Jauch, Christian M. J., to Spartus Corporation. Clock having ornamental pendulum with adjustable period. 4,050,236, Cl. 58-132.000.

Javan, Ali; and Davis, Charles F., Jr., to Massachusetts Institute of Technology. Computer memory. 4,051,462, Cl. 340-173.0LT.

Jayne, Gerald John Joseph: *See—*
Elliott, John Scotchford; Jayne, Gerald John Joseph; Askew, Herbert Frank; and Harrington, Colin John, 4,051,053, Cl. 252-78.300.

Jean Walterscheid GmbH: *See—*
von Allworden, Wilhelm, 4,050,715, Cl. 280-508.000.

Jelenko, Carl, III. Topical veterinary dermatological medicament. 4,051,257, Cl. 424-312.000.

Jennings, Martin C. Container spillage prevention system. 4,050,600, Cl. 215-11.00R.

Jensen, Harry: *See—*
Drostholm, Frede Hilmar; Jensen, Harry; and Willadsen, Per, 4,050,865, Cl. 425-183.000.

Jero, John P.: *See—*
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,051,100, Cl. 260-42.180.

Jester, Willi; and Tack, Hans, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Milling cutter. 4,050,129, Cl. 407-45.000.

Jidai, Eiki: *See—*
Shibayama, Kyoichi; Ono, Hiroshi; Jidai, Eiki; and Fujii, Akira, 4,051,091, Cl. 260-29.2TN.

Jilla, Dara Ardeshir, to Martin Processing Co., Inc. Coloring polyester materials with acid dyes. 4,050,892, Cl. 8-4.000.

Johansen, Johan Peter: *See—*
Van Sluis, Jan Adolf; Reinhart, Frans Remko; Johansen, Johan Peter; and Pedersen, Rolf, 4,050,467, Cl. 131-147.00A.

Johansson, Carl-Gustaf: *See—*
Tuvesson, Par-Ake; and Johansson, Carl-Gustaf, 4,050,703, Cl. 277-207.00A.

John D. Hollingsworth on Wheels, Inc.: *See—*
Freeman, Joseph L., 4,050,119, Cl. 19-106.00R.

John O. Butler Company: *See—*
Tisma, Stevan, 4,050,648, Cl. 242-129.800.

John Wyeth & Brother Limited: *See—*
Curran, Adrian Charles Ward, 4,051,139, Cl. 260-290.0HL.

Johnson, Arthur F., to R.C.M. Corporation. Process for the production and use of activated alumina in refining steel. 4,050,925, Cl. 75-30.000.

Johnson, Arthur F., to R.C.M. Corporation. Process for the production and use of activated alumina to produce aluminum. 4,050,999, Cl. 204-67.000.

Johnson, Arthur L.: *See—*
Boschen, William O.; Annichiarico, Angelo V.; and Johnson, Arthur L., 4,051,035, Cl. 210-220.000.

Johnson, Frank W. Rod butt with integral reel seat. 4,050,179, Cl. 43-22.000.

Johnson, James A., to UOP Inc. Method for loading finely divided particulate matter into a vessel. 4,051,019, Cl. 208-146.000.

Johnson, Richard Servern: *See—*
Davies, Michael LaVar; Johnson, Richard Servern; Noker, Alvin John; and Wilde, Veldon Lawrence, 4,050,568, Cl. 197-90.000.

Johnson, Robert E., to Sterling Drug Inc. 1-(Arylamino)-and 1-(arylimino)-pyrroles. 4,051,147, Cl. 260-326.470.

Johnson, Roy W. P., to Tower Technology, Inc. Method of erecting a tower structure. 4,050,214, Cl. 52-745.000.

Johnston, John R.: *See—*
Coleman, Ronald J., 4,050,671, Cl. 254-7.00R.

Jonathan Systems: *See—*
Healy, James W.; and Currier, Bob L., 4,051,522, Cl. 358-86.000.

Jonda, Wolfgang, to Messerschmitt-Bolkow-Blohm G.m.b.H. Force transmitting structural member. 4,050,827, Cl. 403-11.000.

Jones, Donald Keith: *See—*
Bogue, Robert Edgar; Jones, Donald Keith; Riggs, Ray Vere; and Vogele, Bruno Joseph, 4,050,655, Cl. 244-137.00R.

Jones, Henry B.: *See—*
Bunn, Dorrance P., Jr.; Williams, Dale; Jones, Henry B.; and MacLean, John P., 4,051,069, Cl. 252-417.000.

Jones, Howard S., Jr.: *See—*
Reggia, Frank; and Jones, Howard S., Jr., 4,051,480, Cl. 343-705.000.

Jones & Laughlin Steel Corporation: *See—*
Butler, John F., 4,051,270, Cl. 427-8.000.

Jones, Marvin H.: *See—*
Thomas, Robert J.; and Jones, Marvin H., 4,050,327, Cl. 74-502.000.

Jones, Noel C., to Noel C. Jones & Associates, Inc. Apparatus for repairing indentions in a rigid skin. 4,050,271, Cl. 72-37.000.

Jones, Trevor D.: *See—*
Kwolek, John P.; Urso, William G.; and Jones, Trevor D., 4,050,620, Cl. 228-162.000.

Jongeling, Herman, to D.E.J. International Research Company B.V. Process for stabilizing tea extract and product. 4,051,267, Cl. 426-330.300.

Jordan, Lawrence E.: *See—*
Stanwick, Casmer P.; and Jordan, Lawrence E., 4,051,399, Cl. 310-51.000.

Jordan, Ruth Frances. Support harness. 4,050,737, Cl. 297-389.000.

Jorwa, Mildred M. Self-styling and utility mirror with four surfaces. 4,050,790, Cl. 350-305.000.

Joy Manufacturing Company: *See—*
Turner, John W.; and McLaughlin, Russell A., 4,050,300, Cl. 73-139.000.

Juneja, Prem Sagar: *See—*
Gieske, Henry Anthony; and Juneja, Prem Sagar, 4,051,234, Cl. 424-52.000.

Junghans, Klaus, to Schering Aktiengesellschaft. Electrolytic reduction of aromatic steroids. 4,050,998, Cl. 204-59.00R.

Junkert, Kenneth G.; and Voznick, Henry P., to William Wahl Corporation. Method and apparatus for measuring temperature. 4,050,309, Cl. 73-362.0AR.

Jurasek, Stanley J., to Eagle Picher Industries, Inc. Collapsible material handling container. 4,050,606, Cl. 220-7.000.

Jutte, Ralph B.; and Lehman, Roger L., to Owens-Corning Fiberglas Corporation. Sink-free panels. 4,051,290, Cl. 428-168.000.

K-Krete, Inc.: *See—*
Brewer, William E.; and Zimmer, Franklin V., 4,050,258, Cl. 61-50.000.
Brewer, William E.; and Zimmer, Franklin V., 4,050,261, Cl. 61-105.000.
Brewer, William E.; and Zimmer, Franklin V., 4,050,950, Cl. 106-97.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Yoshihashi, Akira; and Yamada, Hiraku, 4,050,750, Cl. 305-54.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See—*
Suzuki, Ikuo; and Nishiyama, Shuji, 4,050,342, Cl. 84-95.00C.

Kabushiki Kaisha Seikosha: *See—*
Fujita, Masanori; and Suzuki, Sukenori, 4,050,787, Cl. 350-160.0LC.
Ikeno, Hitoshi; Sugita, Mitsuyuki; and Yanagi, Hirofumi, 4,050,126, Cl. 29-25.350.

Kabushiki Kaisha Suwa Seikosha: *See—*
Toshio, Mori, 4,050,234, Cl. 58-85.500.

K.K. Tokai Rika Denki Seisakusho: *See—*
Tanaka, Hiroshi, 4,050,272, Cl. 70-100.000.

Kai, Toshio: *See—*
Tanaka, Junzo; and Kai, Toshio, 4,051,341, Cl. 219-10.55D.

Kakinuma, Toshihide. Hem-line marker. 4,050,159, Cl. 33-9.00R.

Kalafus, Edward F.: *See—*
van Gils, Gerard E.; and Kalafus, Edward F., 4,051,281, Cl. 427-379.000.

Kalke, Henry J. Side lift for side dumping wagons. 4,050,593, Cl. 214-44.00C.

Kaloi, Cyril M., to United States of America, Navy. Notched/diagonally fed electric microstrip antennas. 4,051,478, Cl. 343-700.0MS.

Kalve, Uldis H., to Wallace Business Forms, Inc. Sealed envelope assembly with locking pockets for free insert material. 4,050,582, Cl. 206-627.000.

Kalyan, Jagdish C.; and Dickinson, Bryan J. Lubrication system for an air motor. 4,050,544, Cl. 184-6.600.

Kamezawa, Yasutoki: *See—*
Ueda, Yasuo; Kamezawa, Yasutoki; Aizawa, Tatsuo; and Ikeda, Toshimitu, 4,051,052, Cl. 252-62.10L.

Kan, Peter Tai-Yuen: *See—*
Cenker, Moses; and Kan, Peter Tai-Yuen, 4,051,082, Cl. 260-2.5AR.

Kanai, Kenji, to Matsushita Electric Industrial Co., Ltd. Magnetic head with thin sheet exhibiting magnetoresistive property. 4,051,542, Cl. 360-113.000.

Kanaya, Fumio: *See—*
Kuroda, Hideo; and Kanaya, Fumio, 4,051,530, Cl. 358-136.000.

Kanazawa, Shigenori: *See—*
Yamada, Makoto; Sasaki, Shiro; Kanazawa, Shigenori; and Hayashi, Yoshihiro, 4,050,717, Cl. 280-744.000.

Kaneko, Kenji; and Okabe, Takahiro, to Hitachi, Ltd. Flip-flop circuit. 4,051,389, Cl. 307-291.000.

Kaneko, Masakatsu: *See—*
Shimizu, Bunji; Saito, Akio; Kaneko, Masakatsu; Yanagisawa, Hiroaki; and Nakao, Hideo, 4,051,129, Cl. 544-21.000.

Kaneshige, Masaaki: *See—*
Habu, Teiji; Ishihara, Masao; Sakamoto, Eiichi; Yamada, Hiroshi; and Kaneshige, Masaaki, 4,050,940, Cl. 96-114.500.

Kang, Jung Wong; and Oziomek, James, to Firestone Tire & Rubber Company, The. Process for copolymerizing conjugated diene and alpha-olefin. 4,051,309, Cl. 526-141.000.

Kang, Jung Wong: *See—*
Lohr, Delmar Frederick, Jr.; and Kang, Jung Wong, 4,051,103, Cl. 260-45.75W.

Kanij, Johannes B. W.; Noothout, Arend J.; and Hermans, Marie E. A., to Reactor Centrum Nederland (Stichting). Method for the preparation of concentrated nitrate-deficient salt solutions. 4,051,060, Cl. 252-301.1R.

Kaplan, Nathan O., to University of California, The Regents of the. Amino-propranolol. 4,051,186, Cl. 260-570.700.

Kappler, Guenter; and Fehler, Adolf, to Motoren- und Turbinen-Union Munchen GmbH; and M.A.N. Maybach Mercedes-Benz. Thermodynamic prime mover with heat exchanger. 4,050,239, Cl. 60-39.51R.

Karis, Lyle A.: *See—*
Kohl, Robert F.; Karis, Lyle A.; and Shy, James L., 4,050,882, Cl. 432-14.000.

Karita, Yoichi: *See—*
Ito, Isao; and Karita, Yoichi, 4,050,638, Cl. 241-222.000.

Karmell, Yale, to Samuel Bingham Co. Hydrolyzed polyurethane plasticizer. 4,051,095, Cl. 260-31.8DR.

Karp, Natan. Compactable furniture. 4,050,736, Cl. 297-135.000.

Kashiwagi, Teruya: *See—*
Murakami, Masuo; Isaka, Ichiro; and Kashiwagi, Teruya, 4,051,126, Cl. 260-239.100.

Kashiwara, Teruo; and Ichimaru, Hiroshi, to Kashiwara, Teruo. Exhaust apparatus for internal combustion engine. 4,050,539, Cl. 181-280.000.

Kataoka, Hiroyuki; Yahiro, Seinosuke; and Suzuki, Kazuo, to Hitachi, Ltd. Floor controller for an elevator. 4,050,547, Cl. 187-29.00R.

Kato, Hajime: *See—*
Hayashi, Takao; and Kato, Hajime, 4,051,303, Cl. 428-411.000.

Kato Hatsujyo Co., Ltd.: *See—*
Yamaguchi, Takehisa, 4,050,120, Cl. 24-73.0HS.

Kato, Hiroai; and Fujita, Hideo, to Dainichi-Nippon Cables, Ltd. Chlorinated elastomer compositions. 4,051,078, Cl. 260-2.00A.

Kato, Kazunobu: *See—*
Inoue, Hajime; Harada, Fumio; Kato, Kazunobu; and Oikawa, Syoji, 4,051,001, Cl. 204-151.000.

Kato, Koji: *See—*
Katsumata, Takuma; Kato, Koji; Kishigami, Hisao; and Kuroda, Noriyasu, 4,050,642, Cl. 242-55.000.

Kato, Masaaki: *See—*
Sonobe, Hiroshi; Kato, Masaaki; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, 4,051,179, Cl. 260-530.00N.

Kato, Taro: *See—*
Hara, Shinichi; and Kato, Taro, 4,050,390, Cl. 110-15.000.

Katoh, Yoshihisa: *See—*
Takemura, Takeshi; Katoh, Yoshihisa; Kurita, Shigeyuki; Sasaki, Susumu; Funabiki, Kyohei; and Hatano, Keizo, 4,051,098, Cl. 260-38.000.

Katsube, Hideo: *See—*
Shichida, Hiromichi; Katsube, Hideo; Oyama, Shigeaki; Toyoda, Kenichi; and Saito, Mitsuo, 4,050,837, Cl. 408-35.000.

Katsumata, Takeshi: *See—*
Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Hikasa, Tadashi, 4,051,225, Cl. 423-235.000.

Katsumata, Takuma; Kato, Koji; Kishigami, Hisao; and Kuroda, Noriyasu, to Mitsubishi Jukogyo Kabushiki Kaisha. Winding or rewinding film. 4,050,642, Cl. 242-55.000.

Katzman, Allison W.; and Keller, Albert G., to Marvin Glass & Associates. Arts and crafts molding device. 4,050,875, Cl. 425-429.000.

Kauffman, Ivan L.; and Kellogg, Robert C., to Monsanto Company. Rotary stretch blow molding apparatus. 4,050,876, Cl. 425-529.000.

Kaufhold, Frederick Daniel: *See—*
Ericson, Eric Axel; and Kaufhold, Frederick Daniel, 4,051,335, Cl. 200-50.0AA.

Kautz, Walter C., Jr. Pyrolytic reducer and condenser apparatus. 4,050,991, Cl. 202-99.000.

Kavtaev, Evgeny Emelyanovich: *See—*
Zaikovsky, Vladimir Borisovich; Kutuzov, Jury Prokhorovich; Zakharov, Mikhail Fedorovich; Kavtaev, Evgeny Emelyanovich; Poedinschikov, Jury Grigorievich; Bazhanov, Jury Mikhailovich; and Schapov, Valentin Andrianovich, 4,050,288, Cl. 72-468.000.

Kawabata, Yasuhiro: *See—*
Inada, Masami; Kawabata, Yasuhiro; Sato, Katsujiro; and Osanai, Akinori, 4,050,423, Cl. 123-117.00A.

Kawaguchi, Hiroshi; Tomita, Koji; Tsukiura, Hiroshi; and Konishi, Masataka, to Bristol-Myers Company. Glycopeptide antibiotics Bu-2231 A and B and process for producing same. 4,051,237, Cl. 424-117.000.

Kawahara, Yasuhito: *See—*
Iida, Yozo; Akasaka, Shigeo; and Kawahara, Yasuhito, 4,051,496, Cl. 354-219.000.

Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photographic exposure meter circuit having temperature compensation. 4,051,490, Cl. 354-24.000.

Kawasaki, Masahiro: *See—*
Uno, Nayuki; Shono, Tetsuji; Urano, Fumio; Kawasaki, Masahiro; and Miyata, Katsuhiko, 4,051,503, Cl. 354-289.000.

Kawasaki, Shuichi: *See—*
Sato, Yasuhiro; Sato, Toshio; Kawasaki, Shuichi; Takaishi, Toshio; Okuyama, Sadao; and Yamanashi, Norio, 4,050,371, Cl. 99-550.000.

Kawase, Shoji: *See—*
Kuratsuji, Takatoshi; Inata, Hiroo; and Kawase, Shoji, 4,051,112, Cl. 260-75.00T.

Kawneer Company, Inc.: *See—*
Hubbard, S. Eugene; and Biebuyck, Lawrence F., 4,050,201, Cl. 52-97.000.

Kayser, Detlev: *See—*
Schacht, Erich; Mehrhof, Werner; Simane, Zdenek; Kayser, Detlev; and Nowak, Herbert, 4,051,170, Cl. 560-62.000.

Kazi, Abdulla M. Z.: *See—*
Crompton, Charles E.; and Kazi, Abdulla M. Z., 4,051,064, Cl. 252-309.000.

Keefe, Jack D., to Monarch Marking Systems, Inc. Selective printing apparatus. 4,050,376, Cl. 101-111.000.

Keiser, Dennis L. Exercising apparatus. 4,050,310, Cl. 73-379.000.

Keith, Gareth A.: *See—*
Borg, Karl S.; and Keith, Gareth A., 4,050,670, Cl. 251-14.000.

Kell, Nathaniel B., to General Motors Corporation. Transmission control with governor discontinuance control valve. 4,050,330, Cl. 74-759.000.

Keller, Albert G.: *See—*
Katzman, Allison W.; and Keller, Albert G., 4,050,875, Cl. 425-429.000.

Keller, Eduard: *See—*
Beriger, Conrad; and Keller, Eduard, 4,051,509, Cl. 357-82.000.

Kellogg, Harlan F. Shelving apparatus. 4,050,386, Cl. 108-111.000.

Kellogg, Robert C.: *See—*
Kauffman, Ivan L.; and Kellogg, Robert C., 4,050,876, Cl. 425-529.000.

Kelly, Daniel L., to Anderson Safeway Guard Rail Corporation. Raisable and lowerable surveillance camera assembly. 4,051,525, Cl. 358-108.000.

Kelly, George B., Jr.: *See—*
Williams, John C.; and Kelly, George B., Jr., 4,051,276, Cl. 427-248.00C.

Kelly, Henry W., to McCullough, Wanda, a part interest. Barricade system. 4,050,401, Cl. 116-63.00P.

Kelly, Robert George: *See—*
Lawson, Frank; Waverley, Glen; Ward, Denby Harcourt; and Kelly, Robert George, 4,050,926, Cl. 75-78.000.

Kelso Marine, Inc.: *See—*
Linam, Richard L., 4,050,647, Cl. 242-129.800.

Kemner, Rudolf; and Zonneveld, Frans Wessel, to U.S. Philips Corporation. Scanning X-ray examination apparatus. 4,051,377, Cl. 250-401.000.

Kemper, Gert; and Melzer, Roland, to Badische Maschinenfabrik GmbH. Jarring moulding machine. 4,050,505, Cl. 164-206.000.

Kemper, James M.; O'Neill, Robert J.; Wagenhals, Bruce E.; and Adams, Jack W., to Monogram Industries, Inc. Recirculating toilet system. 4,050,102, Cl. 4-10.000.

Kendall Company, The: *See—*
Samour, Carlos M.; and Richards, Mildred C., 4,051,158, Cl. 260-404.500.

Kennametal Inc.: *See—*
Kita, John F., 4,050,525, Cl. 173-17.000.
Niskanen, Karl G., 4,050,355, Cl. 90-56.00R.

Kennedy, Timothy James: *See—*
Shires, Philip John; and Kennedy, Timothy James, 4,051,268, Cl. 426-548.000.

Kent Manufacturing Co., Inc.: *See—*
Hake, Kenneth A., 4,050,524, Cl. 172-707.000.

Khalid, Syed J., to General Electric Company. Method and apparatus for measuring pressures. 4,050,306, Cl. 73-212.000.

Kikkoman Shoyu Co., Ltd.: *See—*
Motomura, Yoshie; and Ishiyama, Jiro, 4,050,919, Cl. 71-86.000.

Kikuchi, Masaru: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, 4,050,142, Cl. 29-403.000.

Kilgore, Lee A.; Taylor, Edgar R., Jr.; and South, William H., to Westinghouse Electric Corporation. Supervisory system for detecting torsional oscillation in the shaft of a rotating electro-mechanical system. 4,051,427, Cl. 322-99.000.

Kilsdonk, Harley, to Akzo N.V. Apparatus for melt-spinning. 4,050,866, Cl. 425-192.00S.

Kimball of Minnesota, Inc.: *See—*
Mayer, Joseph E., 4,050,627, Cl. 237-55.000.

Kimberly-Clark Corporation: *See—*
Woon, Lin-Sun; and Endres, Dan D., 4,050,462, Cl. 128-287.000.

Kimmich, Klaus, to International Standard Electric Corporation. Apparatus for marking insulated electrical conductors. 4,050,411, Cl. 118-625.000.

Kimura, Hiroshiro: *See—*
Tsuruta, Motohiro; Kimura, Hiroshiro; Koshimo, Akio; Nara, Hirohisa; Goto, Tokuju; and Amemiya, Kunio, 4,051,215, Cl. 264-137.000.

Kimura, Ichiro: *See—*
Shimada, Satoshi; Yamada, Kazuji; Matsuda, Yasumasa; Kimura, Ichiro; Shimazoe, Michitaka; and Takahashi, Yukio, 4,050,313, Cl. 73-398.0AR.

Kimura, Tsuneo; Hashizume, Hiroshi; and Izumisawa, Yoshiaki, to Mitsubishi Chemical Industries Limited. Process for producing terephthalic acid. 4,051,178, Cl. 260-524.00R.

King, Jack C. Downrigger reel and temperature indicator. 4,050,180, Cl. 43-27.400.

Kinoshita, Haruo: *See—*
Koseki, Toshinori; Maeda, Kunio; Aboshi, Michihiro; and Kinoshita, Haruo, 4,051,096, Cl. 260-31.80M.

Kircher, Morton S.: *See—*
Ford, James M.; Kircher, Morton S.; and Mosher, Hugh A., 4,051,008, Cl. 204-266.000.

Kirshenbaum, Gerald S.; and Vogelfanger, Elliot A., to Celanese Corporation. Package for light and oxygen sensitive food. 4,051,265, Cl. 426-107.000.

Kishigami, Hisao: *See—*
Katsumata, Takuma; Kato, Koji; Kishigami, Hisao; and Kuroda, Noriyasu, 4,050,642, Cl. 242-55.000.

Kissel, Ernst; Neumann, Eckart; Guenther, Ernst; Valentin, Guenter; and Hoerauf, Werner, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Extraction of polylactams. 4,051,113, Cl. 260-78.00L.

Kita, John F., to Kennametal Inc. Down-the-hole hammer. 4,050,525, Cl. 173-17.000.

Kitai, Kiyoshi, to Seiko Koki Kabushiki Kaisha. Camera electric shutter with mechanical delay device. 4,051,498, Cl. 354-234.000.

Kitamura, Nobu: *See—*
Ohkubo, Noriyoshi; and Kitamura, Nobu, 4,051,284, Cl. 428-36.000.

Klauke, Erich: *See—*
Mayer, Karl Heinrich; Petersen, Siegfried; Klauke, Erich; Hoffmeister, Friedrich; and Wuttke, Wolfgang, 4,051,252, Cl. 424-273.00P.

Kleeberg, Ulrich; Leimkuhler, Jurgen; Knospe, Jurgen; and Stohr, Manfred, to Gottfried Bischoff Bau kompl. Gasreinigungs-und Wasserruckkuhlaalagen Kommanditgesellschaft; and STEAG Aktiengesellschaft. Apparatus for making pellets usable as aggregate or filler. 4,050,871, Cl. 425-317.000.

Kleimola, Frank W., to Nucledyne Engineering Corporation. Passive containment system. 4,050,983, Cl. 176-38.000.

Klein, Elias; Smith, James K.; and Morton, Frederick C., to Gulf South Research Institute. Hollow synthetic fibers. 4,051,300, Cl. 428-398.000.

Klein, Max, to Normac, Inc. Reactor apparatus. 4,050,897, Cl. 23-252.00R.

Klein, Schanzlin & Becker Aktiengesellschaft: *See—*
Metzinger, Wolfgang; Boll, Bernd; and Hergt, Peter, 4,050,846, Cl. 415-182.000.

Kleiss, Joachim: *See—*
Brachert, Heinrich; and Kleiss, Joachim, 4,051,207, Cl. 264-3.00B.

Klemm, Kurt; and Langenscheid, Erhard, to Byk Gulden Lomberg Chemische Fabrik GmbH. Substituted N-acyl-N"-(3-amino-2-cyanoacryloyl-)formamidrazones. 4,051,242, Cl. 424-246.000.

Kline, Melbert A. Rigid saddle bag type carrier for bicycles. 4,050,615, Cl. 224-32.00A.

Klingenmaier, Otto J., to General Motors Corporation. Electochemically exchanging a steel surface with a pure iron surface. 4,050,996, Cl. 204-28.000.

Klinkmann, Kurt: *See—*
Wagner, Kuno; and Klinkmann, Kurt, 4,051,165, Cl. 260-453.0AB.

Klockner-Werke AG: *See—*.
Langhammer, Hans Jurgen, 4,050,683, Cl. 266-164.000.

Kloss, Albert, to BBC Brown Boveri & Company Limited. Apparatus for overvoltage protection of a direct converter in the rotor circuit of an asynchronous machine. 4,051,545, Cl. 361-58.000.

KLT Industries, Inc.: *See—*
Knochel, Wayne L.; and Traeger, Robert S., 4,050,414, Cl. 119-1.000.

Kluge, Arthur F., to Syntex (U.S.A.) Inc. 3-(2-Dialkylamino-2-dialkylphosphonylvinyl)-6,11-dihydrodibenzo-[b.e.]-thiepin-11-one. 4,051,150, Cl. 260-327.00B.

Knapik, H. Peter G.; and Adams, Frank H., to UOP Inc. Hydrocarbon conversion with a selectively sulfided acidic multimetallic catalytic composite. 4,051,018, Cl. 208-139.000.

Kneip, Jakob. Arrangement for drilling holes to apply builders' hardware on windows. 4,050,838, Cl. 408-46.000.

Knight, Bill J. Method for casting anodes. 4,050,961, Cl. 148-32.000.

Knight, David John, to Bendix Westinghouse Limited. Load dependent control arrangements. 4,050,743, Cl. 303-22.00R.

Knoble, David W., to General Electric Company. Discharge lamp operating circuit. 4,051,410, Cl. 315-205.000.

Knoble, David W.; and Morais, Don, to General Electric Company. Discharge lamp operating circuit. 4,051,411, Cl. 315-205.000.

Knoble, David W.; and Owen, Daniel V., to General Electric Company. Discharge lamp operating circuit. 4,051,412, Cl. 315-205.000.

Knochel, Wayne L.; and Traeger, Robert S., to KLT Industries, Inc. Animal toilet. 4,050,414, Cl. 119-1.000.

Knorr-Bremse GmbH: *See—*
Pollinger, Hans; and Scheffel, Bernd, 4,050,553, Cl. 188-203.000.
Scheffel, Bernd, 4,050,554, Cl. 188-203.000.

Knorre, Helmut; Fischer, Joachim; and Pohl, Gerhard, to Deutsch Gold-und Silber-Scheideanstalt. Preventing caking and obtaining flowability of alkali chlorides and salt mixtures thereof. 4,051,228, Cl. 423-268.000.

Knospe, Jurgen: *See—*
Kleeberg, Ulrich; Leimkuhler, Jurgen; Knospe, Jurgen; and Stohr, Manfred, 4,050,871, Cl. 425-317.000.

Knupfer, Hans: *See—*
Braden, Rudolf; Knupfer, Hans; and Ziemann, Heinz, 4,051,177, Cl. 260-510.000.

Kobayashi, Kohroh, to Nippon Selfoc Company, Limited. Light beam coupler for axially discoincident optical fibers. 4,050,784, Cl. 350-96.00C.

Kobayashi, Masao: *See—*
Sonobe, Hiroshi; Kato, Masaaki; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, 4,051,179, Cl. 260-530.00N.

Kobayashi, Masayoshi; and Yuzawa, Yasutaka, to Diesel Kiki Co., Ltd.

Dash pot arrangement for distribution-type fuel injection pump cut off barrel. 4,050,856, Cl. 417-289.000.

Kobiella, Robert J., to Signode Corporation. Automatic strapping machine. 4,050,372, Cl. 100-2.000.

Kodama, Koshiro: *See—*
Takematsu, Tetsuo; Konnai, Makoto; Isogawa, Takayuki; and Kodama, Koshiro, 4,050,920, Cl. 71-88.000.

Koerbacher, Kathleen C. Endotracheal tube. 4,050,466, Cl. 128-351.000.

Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Henning, to BASF Aktiengesellschaft. Manufacture of ferromagnetic, acicular metallic iron particles by hydrogen reduction. 4,050,962, Cl. 148-105.000.

Koester, Waldemar: *See—*
Bertschmann, Silvio; Koester, Waldemar; and Huber, Reinhold, 4,050,207, Cl. 52-396.000.

Kohl, Robert F.; Karis, Lyle A.; and Shy, James L., to Allis-Chalmers Corporation. Dual variable orifice for reinforced preheater. 4,050,882, Cl. 432-14.000.

Kohn, Thomas F., to Belco Industries, Incorporated. Rotary oven. 4,050,889, Cl. 432-130.000.

Koike, Yasuo: *See—*
Nakaoka, Kazuhide; Araki, Kenji; Iwase, Koji; Koike, Yasuo; and Fukunaka, Shiro, 4,050,959, Cl. 148-12.300.

Koizumi, Yutaka; and Iwanaga, Yoshiharu, to Ricoh Co., Ltd. Light shield curtain assembly for reciprocating optical scanning head. 4,050,812, Cl. 355-66.000.

Komaki, Saiji. Apparatus for manufacturing concrete panels with surface pattern decorations. 4,050,864, Cl. 425-134.000.

Komine, Yoshio, to Canon Kabushiki Kaisha. Motion picture camera presenting a foldable grip. 4,050,796, Cl. 352-243.000.

Kominiak, Andrew A.: *See—*
Storck, Glenn E.; and Kominiak, Andrew A., 4,050,149, Cl. 29-630.00R.

Komori, Akito: *See—*
Takahashi, Yasuro; Fujima, Yukihisa; Oguri, Masaharu; and Komori, Akito, 4,050,879, Cl. 431-174.000.

Kondo, Toshihiro, to Kondo, Toshihiro; and Fuji Film Co., Ltd. Coil means for driving a linear motor. 4,051,398, Cl. 310-12.000.

Kondo, Toshihiro, to Kondo, Toshihiro; and Fuji Photo Film Co., Ltd. Linear motor-driven focal plane shutter. 4,051,499, Cl. 354-234.000.

Kondoh, Mitsuru, to Ricoh Co., Ltd. Facsimile receiving apparatus. 4,051,537, Cl. 358-264.000.

Koninklijke Bedrijven Theodorus Niemeyer B.V.: *See—*
Van Sluis, Jan Adolf; Reinhart, Frans Remko; Johansen, Johan Peter; and Pedersen, Rolf, 4,050,467, Cl. 131-147.00A.

Konishi, Masataka: *See—*
Kawaguchi, Hiroshi; Tomita, Koji; Tsukiura, Hiroshi; and Konishi, Masataka, 4,051,237, Cl. 424-117.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Habu, Teiji; Ishihara, Masao; Sakamoto, Eiichi; Yamada, Hiroshi; and Kaneshige, Masaaki, 4,050,940, Cl. 96-114.500.
Mayama, Masayoshi; and Miura, Kiyoyuki, 4,051,302, Cl. 428-411.000.

Konnai, Makoto: *See—*
Takematsu, Tetsuo; Konnai, Makoto; Isogawa, Takayuki; and Kodama, Koshiro, 4,050,920, Cl. 71-88.000.

Konnerth, Andrew, III. Heat reclaimer. 4,050,628, Cl. 237-55.000.

Konontsev, Valery Vasilievich: *See—*
Tagirov, Kurban Magomedovich; Akopian, Nikolai Rubenovich; Konontsev, Valery Vasilievich; and Lutsenko, Jury Nikolaevich, 4,050,529, Cl. 175-422.000.

Kooy, Albertus Adrianus; and van Rijkom, Jacobus, to Hoogovens Ijmuiden BV. Process for pressing briquettes from fine-grained fluorspar and pressed briquettes thus obtained. 4,051,213, Cl. 264-109.000.

Kopf, Wolfgang, to Daimler-Benz Aktiengesellschaft. Safety steering column for passenger motor vehicles. 4,050,326, Cl. 74-492.000.

Koppe, Rudolf P.: *See—*
Davidse, Jan; and Koppe, Rudolf P., 4,051,520, Cl. 358-22.000.

Koppers Company, Inc.: *See—*
Davies, Dan L., 4,051,282, Cl. 427-393.000.

Koreki, Jan: *See—*
Fairbairn, Geoffrey; Cooke, George Frederick; Winkworth, Reginald; and Koreki, Jan, 4,050,289, Cl. 73-1.00F.

Kornylak Corporation: *See—*
Tabler, Charles P., 4,051,209, Cl. 264-39.000.

Korous, Donald J.: *See—*
Neuzil, Richard W.; and Korous, Donald J., 4,051,192, Cl. 260-674.0SA.

Korteling, Gerrit-Jan: *See—*
Bogaard, Johan J. H.; and Korteling, Gerrit-Jan, 4,050,601, Cl. 220-2.10A.

Koseki, Toshinori; Maeda, Kunio; Aboshi, Michihiro; and Kinoshita, Haruo, to Asahi Kasei Kogyo Kabushiki Kaisha. Resin composition. 4,051,096, Cl. 260-31.80M.

Koshimo, Akio: *See—*
Tsuruta, Motohiro; Kimura, Hiroshiro; Koshimo, Akio; Nara, Hirohisa; Goto, Tokuju; and Amemiya, Kunio, 4,051,215, Cl. 264-137.000.

Kossett, Allen J., to Will Ross, Inc. Tube mold. 4,050,667, Cl. 249-82.000.

Koyama, Kuniyoshi: *See—*
Takeuchi, Kouichi; Itoh, Norio; Koyama, Kuniyoshi; Shimada, Satoshi; and Himuro, Masami, 4,051,513, Cl. 358-60.000.

Kozak, John: *See—*
Allyn, Jerome B.; Wileman, Richard D.; and Kozak, John, 4,050,502, Cl. 164-68.000.

Kraemer, John F.: *See—*
Holik, Melville J.; and Kraemer, John F., 4,051,092, Cl. 260-29.300.

Kraft, Derald H., to Aspro, Inc. Multi V-grooved pulley structure and method of making same. 4,050,321, Cl. 74-230.800.

Kraftwerk Union Aktiengesellschaft: *See—*
Gemein, Rudolf; and Wotschofsky, Franz, 4,050,845, Cl. 415-172.00A.

Krambeck, Robert Harold; Sequin, Carlo Heinrich; and Walden, Robert Henry, to Bell Telephone Laboratories, Incorporated. Two-dimensional transfer in charge transfer device. 4,051,505, Cl. 357-24.000.

Kramer, Norman C., to Carnation Company. Can orienting device. 4,050,570, Cl. 198-398.000.

Kramer, William E., to Xerox Corporation. Tearable edge strip for plastic sheet. 4,051,285, Cl. 428-43.000.

Krascella, Nicholas Leo, to United Technologies Corporation. Photolytic production of hydrogen. 4,051,005, Cl. 204-157.10R.

Krausz, Francois, to C M Industries. Preparation of benzodiazepine derivatives. 4,051,127, Cl. 260-239.30D.

Krautkramer-Branson, Incorporated: *See—*
Bloch, Peter K., 4,050,292, Cl. 73-67.50R.

Kreckel, Kurt H., to Bausch & Lomb Incorporated. Contact lens disinfecting circuit. 4,051,348, Cl. 219-506.000.

Kreis, Philipp. Braking device for ski scooters. 4,050,705, Cl. 280-11.1BT.

Kresta, Erich; and Gorter, Werner, to Semperit Aktiengesellschaft. Pneumatic tire blanks and process. 4,051,292, Cl. 428-212.000.

Kretschmer, Sylvain: *See—*
Blondet, Bruno; Kretschmer, Sylvain; Lacotte, Jean Pierre; and Peltier, Jean Paul, 4,051,329, Cl. 179-100.30N.

Krimmel, Carl Peter, to G. D. Searle & Co. Piperazinyl cyclobutenones. 4,051,136, Cl. 260-268.00R.

Krippner, Kenneth E., to Artronix, Inc. High speed x-ray pulsing device. 4,051,378, Cl. 250-421.000.

Kronman, Albert F.: *See—*
Peters, Melville F., 4,050,777, Cl. 350-292.000.

Kronstadt, Rachel. Ski carry. 4,050,706, Cl. 280-12.00R.

Kubelka, Axel; and Schweizer, Gottfried, to TMC Corporation. Ski binding. 4,050,716, Cl. 280-614.000.

Kubota, Ltd.: *See—*
Murakami, Shinichi; Akamatsu, Katsutaro; and Hiraishi, Hisashi, 4,050,927, Cl. 75-122.000.
Murakami, Shinichi; Akamatsu, Katsutaro; Morichika, Toshiaki; and Hiraishi, Hisashi, 4,050,929, Cl. 75-171.000.

Kuhlthau, Hans-Peter; and Beecken, Hermann, to Bayer Aktiengesellschaft. Cationic dyestuffs. 4,051,084, Cl. 260-158.000.

Kuhlthau, Hans-Peter; and Beecken, Hermann, to Bayer Aktiengesellschaft. Triazole-azo-phenyl cationic dyestuffs. 4,051,117, Cl. 260-146.00R.

Kuhnert, Hans, to Friedrich Deckel Aktiengesellschaft. Machine tool equipped with a magazine. 4,050,354, Cl. 90-13.00C.

Kulite Semiconductor Products, Inc.: *See—*
Kurtz, Anthony D.; Mallon, Joseph R.; and Brosh, Amnon, 4,051,451, Cl. 338-42.000.

Kume, Masahiro: *See—*
Motoyoshi, Kenya; Kume, Masahiro; and Amano, Yoshinari, 4,050,930, Cl. 75-173.00A.

Kumpf, Sherman S.: *See—*
Smith, James H.; and Kumpf, Sherman S., 4,050,379, Cl. 101-327.000.

Kung, Jo-Fen Tung; and Epstein, Martin Franklin, to General Foods Corporation. Enol ester of α-diketones. 4,051,164, Cl. 260-448.80R.

Kunioka, Kazuo; Mihara, Yutaka; and Noguchi, Takao, to Nippon Kokan Kabushiki Kaisha. Method of quenching large-diameter thin-wall metal pipe. 4,050,963, Cl. 148-128.000.

Kuntz, Irving, to Exxon Research & Engineering Co. Sulfur vulcanizable interpolymers. 4,051,312, Cl. 526-329.000.

Kupsky, George A., to Panel Technology, Inc. Gas discharge display panel with fused sealing plug. 4,051,404, Cl. 313-220.000.

Kuramochi, Shigeaki. Shift mechanism for typewriter. 4,050,567, Cl. 197-72.000.

Kuratsuji, Takatoshi; Inata, Hiroo; and Kawase, Shoji, to Teijin Limited. Polyester granule for melt-shaping and process for the preparation thereof. 4,051,112, Cl. 260-75.00T.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Ishihara, Takao; Sanpei, Kiyoji; Nabatame, Hiroshi; and Motokawa, Shoichi, 4,050,910, Cl. 55-96.000.
Ohtsuka, Shigeto; Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,051,314, Cl. 536-1.000.

Kurihara, Tomomichi: *See—*
Okamoto, Tomiyasu; Nishimoto, Tsunanori; Sawada, Kaoru; Hayakawa, Koji; and Kurihara, Tomomichi, 4,050,609, Cl. 220-9.0LG.

Kurita, Shigeyuki: *See—*
Takemura, Takeshi; Katoh, Yoshihisa; Kurita, Shigeyuki; Sasaki, Susumu; Funabiki, Kyohei; and Hatano, Keizo, 4,051,098, Cl. 260-38.000.

Kuroda, Hideo; and Kanaya, Fumio, to Nippon Telegraph and Telephone Public Corporation. Frame-to-frame coding system. 4,051,530, Cl. 358-136.000.

Kuroda, Noriyasu: *See—*
Katsumata, Takuma; Kato, Koji; Kishigami, Hisao; and Kuroda, Noriyasu, 4,050,642, Cl. 242-55.000.

Kurtz, Anthony D.; Mallon, Joseph R.; and Brosh, Amnon, to Kulite

Semiconductor Products, Inc. Beam type transducers employing dual direction force limiting means. 4,051,451, Cl. 338-42.000.
Kurtz, Bruce E.; and Smalley, Edmund W., to Allied Chemical Corporation. Process for producing ethylene from ethane. 4,051,193, Cl. 260-683.300.
Kushigian, Anthony. Walking beam transfer mechanism with single actuator means to cause both lifting and carrying. 4,050,571, Cl. 198-774.000.
Kusters, Eduard: *See*—
Ahrweiler, Karl-Heinz, 4,050,872, Cl. 425-371.000.
Kutuzov, Jury Prokhorovich: *See*—
Zaikovsky, Vladimir Borisovich; Kutuzov, Jury Prokhorovich; Zakharov, Mikhail Fedorovich; Kavtaev, Evgeny Emelyanovich; Poedinschikov, Jury Grigorievich; Bazhanov, Jury Mikhailovich; and Schapov, Valentin Andrianovich, 4,050,288, Cl. 72-468.000.
Kuwabara, Hideo: *See*—
Yamamoto, Yoshihiko; Shigenobu, Masahiro; and Kuwabara, Hideo, 4,051,045, Cl. 250-536.000.
Kuwana, Noriaki; Hasegawa, Yoshikazu; and Nozu, Yukio, to Eisai Co., Ltd. Process of preparing desacyl-pepsidine with *bacillus pumilus*. 4,050,989, Cl. 195-29.000.
Kwolek, John P.; Urso, William G.; and Jones, Trevor D., to Bendix Corporation, The. Method of welding a friction material to a reinforcing member. 4,050,620, Cl. 228-162.000.
Lacotte, Jean Pierre: *See*—
Blondet, Bruno; Kretschmer, Sylvain; Lacotte, Jean Pierre; and Peltier, Jean Paul, 4,051,329, Cl. 179-100.30N.
LaHaye, Paul G.: *See*—
Craig, Glenn D.; Feuling, David T.; and LaHaye, Paul G., 4,050,877, Cl. 431-76.000.
Laikin, Milton; and Hatchett, George L., to Hydro Products, Inc. Submersible camera. 4,051,523, Cl. 358-99.000.
Laitar, Robert, to CPC International Inc. Furan-phenolic resin coated sand for collapsible foundry molds. 4,051,301, Cl. 428-404.000.
Lamberts, Robert Lewis: *See*—
Drexhage, Karl Heinz; and Lamberts, Robert Lewis, 4,051,374, Cl. 250-370.000.
Lancaster, Patrick R., III; and Lancaster, William G., to Lantech, Inc. Stretch-wrapped package, process and apparatus. 4,050,221, Cl. 53-211.000.
Lancaster, Patrick R., III: *See*—
Lancaster, William G.; and Lancaster, Patrick R., III, 4,050,220, Cl. 53-198.00R.
Lancaster, William G.; and Lancaster, Patrick R., III. Spiral bundler. 4,050,220, Cl. 53-198.00R.
Lancaster, William G.: *See*—
Lancaster, Patrick R., III; and Lancaster, William G., 4,050,221, Cl. 53-211.000.
Landwehrkamp, Hans; Hoeber, W. Gerhard; Goldammer, Georg; and Oexler, Rudolf, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Sliver supply apparatus for resolving rollers in open end spinning machines. 4,050,228, Cl. 57-58.950.
Lane, Perry Joe. Trapezoidal lifter. 4,050,672, Cl. 254-10.00R.
Lang, Daniel B.: *See*—
Dimotakis, Paul E.; and Lang, Daniel B., 4,051,433, Cl. 324-78.00R.
Lange, Klaus, to Biax-Werkzeuge K.G. Wezel & Co. Prazisionswerkzeug-Fabrik. Milling cutter. 4,050,128, Cl. 407-59.000.
Langenscheid, Erhard: *See*—
Klemm, Kurt; and Langenscheid, Erhard, 4,051,242, Cl. 424-246.000.
Langhammer, Hans Jurgen, to Klockner-Werke AG. Smelting plant and method. 4,050,683, Cl. 266-164.000.
Langley, Kenneth Richard: *See*—
Needham, Peter Richard; and Langley, Kenneth Richard, 4,050,843, Cl. 415-116.000.
Lantech, Inc.: *See*—
Lancaster, Patrick R., III; and Lancaster, William G., 4,050,221, Cl. 53-211.000.
Large, William R.: *See*—
Collins, George R.; and Large, William R., 4,050,249, Cl. 60-290.000.
LaRos Equipment Company, Inc.: *See*—
Rossio, John H., 4,050,575, Cl. 198-834.000.
Laserplane Corporation: *See*—
Teach, Ted L., 4,050,171, Cl. 37-86.000.
Laskin, Irving; and Van Allen, David, to Polaroid Corporation. Photographic apparatus gear train having a unique set of gears. 4,051,492, Cl. 354-86.000.
Lasky, Harold J. Apparatus and method for supporting and positioning the body to facilitate radiographic mammography procedures. 4,051,380, Cl. 250-451.000.
Lauerer, Uta: *See*—
Wolfle, Rudolf; Rucker, Dieter; and Lauerer, Uta, 4,050,966, Cl. 148-188.000.
Lavrentiev, Konstantin Nikitich; Borisova, Natalya Isaakievna; Vasiliev, Jury Ivanovich; Rodionov, Jury Nikolaevich; Strashinsky, Vadim Konstantinovich; Ioffe, Vladimir Fedorovich; and Vyatskin, Iosif Yakovlevich, deceased (by Vyatskina, Itta Moiseevna, administrator). Programming apparatus for electroerosion cutting machine. 4,051,422, Cl. 318-570.000.
Lawida, Arthur E.: *See*—
Forman, Tracy H.; Herskowitz, Nat H.; and Lawida, Arthur E., 4,050,658, Cl. 248-13.000.
Lawrence, Norman Francis: *See*—
Rose, Larry Edward; and Lawrence, Norman Francis, 4,051,162, Cl. 426-448.000.
Lawrie, Duncan H.; and Vora, Chandrakant Ratilal, to Burroughs Corporation. Multidimensional parallel access computer memory system. 4,051,551, Cl. 364-200.000.
Lawson, Frank; Waverley, Glen; Ward, Denby Harcourt; and Kelly, Robert George, to Broken Hill Associated Smelters Proprietary Limited, The; and Monash University. Continuous sulphur drossing process. 4,050,926, Cl. 75-78.000.
Layotte, Pierre-Claude: *See*—
Cholet, Jacques; and Layotte, Pierre-Claude, 4,050,540, Cl. 181-114.000.
Leach Company: *See*—
Gollnick, Cyril R., 4,050,594, Cl. 214-83.300.
Leach, John Meredith. Sphygmomanometer. 4,050,311, Cl. 73-389.000.
Leach, Paul A., to Jaffrey Fire Protection Company, Inc. Incoming gated relief valve. 4,050,857, Cl. 417-309.000.
Lear Siegler, Inc.: *See*—
Tersch, Richard W.; and Bassoff, Arthur B., 4,050,350, Cl. 90-1.60R.
Learned, Samuel M. Self-propelled and contained trailer washing machine. 4,050,109, Cl. 15-53.00A.
Lebelle, Jean L. Vibrodriver apparatus. 4,050,527, Cl. 173-49.000.
LeBoeuf, Eugene A. Trailer deflector ramp. 4,050,709, Cl. 280-106.00T.
Lech, Richard J.: *See*—
Virtue, Eugene P.; and Lech, Richard J., 4,050,478, Cl. 137-625.660.
Lee, Arnold S. J., to Milstein Medical Research Foundation, Inc. Alarm actuation arrangement for an automatic blood pressure recorder. 4,050,452, Cl. 128-2.05A.
Lee, Hua-Tung, to International Business Machines Corporation. Accordion shift register and its application in the implementation of level sensitive logic system. 4,051,353, Cl. 364-716.000.
Lee, Hwalin: *See*—
Pallos, Ferenc M.; Lee, Hwalin; and Menn, Julius J., 4,051,262, Cl. 424-337.000.
Lee, Jimmy Luther. Electronic fish locator. 4,050,308, Cl. 73-362.0AR.
Lee, John H., to Minnesota Mining and Manufacturing Company. Internally powered traffic control device. 4,050,834, Cl. 404-16.000.
Lee, John N.; and Oswald, Robert B., Jr., to United States of America, Army. Method for controlling low-energy high current density electron beams. 4,051,405, Cl. 313-361.000.
Lee, Yoon C., to Monsanto Company. Interpolymers of a styrenic monomer, a maleic or halomaleic anhydride monomer and a brominated monomer. 4,051,311, Cl. 526-271.000.
Lehman, Roger L.: *See*—
Jutte, Ralph B.; and Lehman, Roger L., 4,051,290, Cl. 428-168.000.
Leigh Products, Inc.: *See*—
Malott, Richard C.; and Trainer, Donald J., 4,050,277, Cl. 72-129.000.
Leimkuhler, Jurgen: *See*—
Kleeberg, Ulrich; Leimkuhler, Jurgen; Knospe, Jurgen; and Stohr, Manfred, 4,050,871, Cl. 425-317.000.
Leir, Charles M.: *See*—
Schuppan, Dietrich; Gerster, John F.; and Leir, Charles M., 4,051,247, Cl. 424-258.000.
Leiser, Manfred; Wegehaupt, Karl-Heinrich; and Marsch, Wilhelm, to Wacker-Chemie GmbH. Adhesive compositions and flexible heating device fabricated therewith. 4,051,454, Cl. 338-328.000.
Lemay, Denis. Underground cable laying machine. 4,050,260, Cl. 61-72.600.
Lemay, Roger E.: *See*—
Welcher, Ray E.; and Lemay, Roger E., 4,050,393, Cl. 112-121.120.
Lemercier, Guy, to Commissariat a l'Energie Atomique. Heat-insulated device, for insulating the top part of the annular space between the main vessel and the safety vessel of a fast-neutron reactor. 4,050,988, Cl. 176-87.000.
Lemmer, Harold G., to General Motors Corporation. Colloidal graphite forging lubricant and method. 4,050,932, Cl. 75-211.000.
Lemper, Anthony L.: *See*—
Pawlak, Joseph A.; Lemper, Anthony L.; and Pattison, Victor A., 4,051,107, Cl. 260-47.00C.
Lenhard, Robert Herman: *See*—
Bernstein, Seymour; Lenhard, Robert Herman; and Conrow, Ransom Brown, 4,051,176, Cl. 260-506.000.
Lenmark, Voigt O. Tank heating and control unit. 4,051,346, Cl. 219-328.000.
Lenoir, John: *See*—
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauser, Thomas; and Tschopp, Paul, 4,051,123, Cl. 260-178.000.
Leonard Storch Enterprises, Inc.: *See*—
Storch, Leonard; and Thomas, George H., 4,051,487, Cl. 354-12.000.
Les Laboratoires Bruneau & Cie: *See*—
Buzas, Andre; and Bruneau, Jacques, 4,051,259, Cl. 424-324.000.
Lessin, Charles L. Combination fireplace/furnace. 4,050,440, Cl. 126-120.000.
Lester Construction Co.: *See*—
Miller, Harry, 4,050,588, Cl. 213-75.00B.
Leuven Research & Development VZW: *See*—
Cremers, Adrien Edgard Henri Julien; Maes, Andre Petrus Adolf; and Pleysier, Jozef Leonia, 4,051,026, Cl. 210-38.00B.
Lever Brothers Company: *See*—
Davies, Charles Bloor; and Davies, James Francis, 4,051,054, Cl. 252-89.00R.

LeVitre, Leo A.: *See*—
Park, William; and LeVitre, Leo A., 4,051,322, Cl. 174-65.00R.
Lewis, Roger N., to Argus Chemical Corporation. Alpha halo substituted peroxyesters and their use as polymerization initiators. 4,051,167, Cl. 260-453.0RZ.
Lewis, Roger N.; Pastorino, Ronald L.; and Wilts, James F., to Argus Chemical Corporation. Thermally stable high molecular weight acyl peroxycarbonic esters. 4,051,310, Cl. 526-230.000.
Li, Chi-Tang, to Owens-Illinois, Inc. Glasses, thermally stable high (beta)-cristobalite glass-ceramics and method. 4,050,946, Cl. 106-39.600.
Libby, McNeil & Libby: *See*—
Alleman, Raymond J.; Batina, Raymond T.; and Clark, Ralph J., 4,050,394, Cl. 113-120.00R.
Lichon, James F.; and Cone, Charles Earl. Vehicle identification signal device. 4,051,361, Cl. 362-211.000.
Lichterman, Noah, to Martin Yale Industries, Inc. Punching bag and support means for supporting same in a door frame and the like to prevent twisting or turning of the support means. 4,050,693, Cl. 272-78.000.
Lichtman, Samuel W., to United States of America, Navy. Undersea ranging-communications from altitude via laser. 4,050,819, Cl. 356-51.000.
Liebl, David Edmund. Method of preserving honey. 4,050,952, Cl. 127-46.00R.
Liebold, Hans: *See*—
Grossner, Horst; Liebold, Hans; and Wehnert, Jurgen, 4,050,550, Cl. 188-112.000.
Liermann, Peter: *See*—
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse, Karl-Heinz, 4,050,747, Cl. 303-95.000.
Lifferth, Henry R. Seal having fluent packing material. 4,050,700, Cl. 277-72.0FM.
Ligda, John P. Protective shield for utility opening in a building framing member. 4,050,205, Cl. 52-357.000.
Lile, Derek L.; and Davis, Neil M., to United States of America, Navy. Method and apparatus for semiconductor profiling using an optical probe. 4,051,437, Cl. 324-158.00R.
Limburg, William W.; Yanus, John F.; and Pai, Damodar M., to Xerox Corporation. Trigonal Se layer overcoated by bis(4-diethylamino-2-methylphenyl)phenylmethane containing polycarbonate. 4,050,935, Cl. 96-1.0PC.
Lin, Chung-Sing. Comb with disposable comb-teeth module. 4,050,469, Cl. 132-11.00R.
Lin, Juei-po, to NCR Corporation. Apparatus and method for increasing the efficiency of random access storage. 4,051,355, Cl. 235-302.300.
Linam, Richard L., to Kelso Marine, Inc. Support with drag arrangement. 4,050,647, Cl. 242-129.800.
Linca, Ion: *See*—
Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,050,704, Cl. 280-6.00R.
Lindab, Lindhs Industri AB: *See*—
Tuvesson, Par-Ake; and Johansson, Carl-Gustaf, 4,050,703, Cl. 277-207.00A.
Linde Aktiengesellschaft: *See*—
Ranke, Gerhard, 4,050,909, Cl. 55-68.000.
Lindvay, Michael W., to Velsicol Chemical Corporation. Halogenated isothiuronium salts as flame retardants. 4,051,101, Cl. 260-45.85R.
Linke, Gerda: *See*—
Mass, Dieter; and Linke, Gerda, 4,051,500, Cl. 354-239.000.
Lino, John Louis. Self-sealing holder for containers. 4,050,584, Cl. 211-76.000.
Lipe-Rollway Corporation: *See*—
Armstrong, Jack W., 4,050,572, Cl. 198-347.000.
Liston, Thomas V., to Chevron Research Company. Group II metal mixed salts of two different organic acids in lubricant. 4,051,047, Cl. 252-33.000.
Little, Albert P.: *See*—
Argo, Wesley B.; Edwards, James W.; Little, Albert P.; and Lumb, William M., 4,051,070, Cl. 252-428.000.
Little, Harold A.; and Balsley, Richard L., to General Motors Corporation. Concentric dual engine exhaust system. 4,050,245, Cl. 60-313.000.
Lock, Everett H.: *See*—
Heilhecker, Joe K.; Lock, Everett H.; and Deily, Fred H., 4,051,456, Cl. 340-18.0LD.
Loew, Gunther: *See*—
Jaba, Gert; and Loew, Gunther, 4,051,081, Cl. 260-2.5AD.
Logemann, Willy: *See*—
Ambrogi, Vittorio; Logemann, Willy; Parenti, Marc'Antonio; and Tommasini, Raffaele, 4,051,245, Cl. 424-250.000.
Logue, Clyde Sherman. Baffle for toilet bowl. 4,050,101, Cl. 4-1.000.
Lohr, Delmar Frederick, Jr.; and Kang, Jung Woog, to Firestone Tire & Rubber Company, The. Stabilization of polyfluorophosphazenes with zinc hippurate. 4,051,103, Cl. 260-45.75W.
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Lorenz, Kurt, to Carl Still, Firma. Method and apparatus for producing form coke. 4,050,990, Cl. 201-5.000.
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Tokashiki, Kanenobu, 4,050,433, Cl. 123-139.0AQ.
Lucchetti, Renato. Frame particularly for stretching a piece of painting canvas. 4,050,498, Cl. 160-374.100.
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Margetts, Hugh Grenville, to Girling Limited. Automatic adjusters for hydraulically operated disc brakes. 4,050,548, Cl. 188-71.800.
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Markley, Lowell D., to Dow Chemical Company, The. Substituted benzene-methanol compounds. 4,050,922, Cl. 71-106.000.
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Marsh, Dana G.; and Chu, Joseph Y. C., to Xerox Corporation. Imagewise exposing and heating a microimaging film containing an organo diselenide, a tertiary phosphine or phosphite and an organic peroxide. 4,050,937, Cl. 96-48.00R.
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Terzian, Rouben T., 4,050,185, Cl. 46-135.00A.
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Brozkova, Marie; Burysek, Frantisek; Janousek, Jan; Mikulecky, Karel; and Skoda, Stanislav, 4,050,226, Cl. 57-34.00R.
Miller Brothers: *See—*
Miller, Norman K., 4,051,336, Cl. 200-61.430.
Miller, David William, to Pandrol Limited. Fastening member for anchoring a railway rail. 4,050,284, Cl. 72-384.000.
Miller, Ercell Lynn. Dental floss holder and applicator assembly. 4,050,470, Cl. 132-89.000.
Miller, Georges Michel: *See—*
Millette, Louis Guy; Murphy, Peter; and Miller, Georges Michel, 4,051,430, Cl. 324-34.0TK.
Miller, Guy W.; and Norris, James R., to United Technologies Corporation. Connection between vane arm and unison ring in variable area stator ring. 4,050,844, Cl. 415-147.000.
Miller, Harry, to Lester Construction Co. Automatic mine car coupling. 4,050,588, Cl. 213-75.00B.
Miller, Jack V., to Acroform Corporation. Auto repair ramp with signal. 4,050,403, Cl. 116-124.00R.
Miller, Norman K., to Miller Brothers. Pressure sensitive door edge switch and actuator construction. 4,051,336, Cl. 200-61.430.
Miller, Robert C.: *See—*
Mallick, George T., Jr.; and Miller, Robert C., 4,051,351, Cl. 364-400.000.
Miller, Robert W.: *See—*
Long, David K.; and Miller, Robert W., 4,051,386, Cl. 307-271.000.
Millette, Louis Guy; Murphy, Peter; and Miller, Georges Michel, to Northern Telecom Limited. Apparatus for measuring, and indicating, the thickness of a non-metallic coating of an arcuate metal surface. 4,051,430, Cl. 324-34.0TK.
Mills, Gene F.: *See—*
Harris, Robert M.; Mills, Gene F.; and Shaffer, David T., 4,050,603, Cl. 220-3.900.
Milstein Medical Research Foundation, Inc.: *See—*
Lee, Arnold S. J., 4,050,452, Cl. 128-2.05A.

Minemura, Norihiro: *See*—
Hayashi, Kazushige; Minemura, Norihiro; Fujimoto, Iwao; Ozaki, Kiyotaka; Yoshida, Norio; Morishita, Toshio; and Shinoki, Takanori, 4,051,287, Cl. 428-91.000.

Minnesota Mining and Manufacturing: *See*—
Taylor, Allen L., 4,051,395, Cl. 310-329.000.

Minnesota Mining and Manufacturing Company: *See*—
Lee, John H., 4,050,834, Cl. 404-16.000.
Taylor, Allen L., 4,051,397, Cl: 310-351.000.
Verkins, Wayne R.; Podvin, Richard T.; and Rist, Karl Frederick, III, 4,050,971, Cl. 156-69.000.

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Mita Industrial Company Ltd.: *See*—
Ueda, Yasuo; Kamezawa, Yasutoki; Aizawa, Tatsuo; and Ikeda, Toshimitu, 4,051,052, Cl. 252-62.10L.

Mitani, Sumio: *See*—
Hata, Kazuo; and Mitani, Sumio, 4,051,274, Cl. 427-172.000.

Mitsubishi Chemical Industries Limited: *See*—
Kimura, Tsuneo; Hashizume, Hiroshi; and Izumisawa, Yoshiaki, 4,051,178, Cl. 260-524.00R.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Shibayama, Kyoichi; Ono, Hiroshi; Jidai, Eiki; and Fujii, Akira, 4,051,091, Cl. 260-29.2TN.
Shimada, Wataru; and Hiramoto, Seigo, 4,050,958, Cl. 148-9.500.
Yamamoto, Yoshihiko; Shigenobu, Masahiro; and Kuwabara, Hideo, 4,051,045, Cl. 250-536.000.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Suzuki, Takashi; and Naito, Susumu, 4,051,318, Cl. 560-131.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Katsumata, Takuma; Kato, Koji; Kishigami, Hisao; and Kuroda, Noriyasu, 4,050,642, Cl. 242-55.000.
Takahashi, Yasuro; Fujima, Yukihisa; Oguri, Masaharu; and Komori, Akito, 4,050,879, Cl. 431-174.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Sonobe, Hiroshi; Kato, Masaaki; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, 4,051,179, Cl. 260-530.00N.
Sunamori, Takashi; and Obana, Sachio, 4,051,004, Cl. 204-181.000.

Miura, Kiyoyuki: *See*—
Mayama, Masayoshi; and Miura, Kiyoyuki, 4,051,302, Cl. 428-411.000.

Miyakawa, Seiichi; and Eda, Tadahiro, to Ricoh Co., Ltd. Method and apparatus for electrically biasing developing electrode of electrophotographic device. 4,050,806, Cl. 355-14.000.

Miyaoka, Senri, to Sony Corporation. Focus control system with movable mirror. 4,051,529, Cl. 358-128.000.

Miyata, Katsuhiko: *See*—
Uno, Nayuki; Shono, Tetsuji; Urano, Fumio; Kawasaki, Masahiro; and Miyata, Katsuhiko, 4,051,503, Cl. 354-289.000.

Miyauchi, Terukatsu; and Furusaki, Shintaro, to W. L. Gore & Associates, Inc. Continuous enzymatic reactor. 4,051,011, Cl. 204-299.00R.

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Miyauchi, Toshimitsu: *See*—
Takeda, Yasutsugu; Nakamura, Hisashi; Tsunoda, Yoshito; Tsukada, Toshihisa; and Miyauchi, Toshimitsu, 4,051,528, Cl. 358-128.000.

Miyazaki, Yukifusa: *See*—
Morishima, Yasushi; and Miyazaki, Yukifusa, 4,050,676, Cl. 366-339.000.

Mjolkcentralen, Ekonomisk Forening: *See*—
Strisning, Olof Bo Sven, 4,051,269, Cl. 426-603.000.

Mo och Domsjo Aktiebolag: *See*—
Jamieson, Allan Geoffrey; Samuelson, Hans Olof; Smedman, Leif Ake; and Sondell, Kent Ivar, 4,050,981, Cl. 162-37.000.

Mobil Oil Corporation: *See*—
Maravetz, Lester L., 4,051,254, Cl. 424-285.000.
Tobias, Michael A.; and Martinez, Carlos J., 4,051,089, Cl. 260-22.00R.

Mochel, Ashton. Attachment for motorcycles. 4,050,399, Cl. 115-71.000.

Mochizuki, Atsushi: *See*—
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, 4,050,142, Cl. 29-403.000.

Modesett Engineering & Mfg.: *See*—
Rogers, George Alvin, 4,050,663, Cl. 248-316.00A.

Moen, George A. Hoist and dolly apparatus. 4,050,587, Cl. 212-59.00R.

Molnar, John, to Caterpillar Tractor Co. Multi-purpose cab for construction vehicles. 4,050,735, Cl. 296-102.000.

Monchilov, Emil Nikolov: *See*—
Balevski, Angel Tonchev; Nikolov, Ivan Dimov; Nenov, Dragan Iliev; and Monchilov, Emil Nikolov, 4,050,503, Cl. 164-155.000.

Monarch Marking Systems, Inc.: *See*—
Keefe, Jack D., 4,050,376, Cl. 101-111.000.

Monash University: *See*—
Lawson, Frank; Waverley, Glen; Ward, Denby Harcourt; and Kelly, Robert George, 4,050,926, Cl. 75-78.000.

Mongillo, Adolph V., to United States of America, Navy. Battery wedge for submarines or other installations. 4,050,675, Cl. 254-104.000.

Monogram Industries, Inc.: *See*—
Kemper, James M.; O'Neill, Robert J.; Wagenhals, Bruce E.; and Adams, Jack W., 4,050,102, Cl. 4-10.000.

Monsanto Company: *See*—
Argo, Wesley B.; Edwards, James W.; Little, Albert P.; and Lumb, William M., 4,051,070, Cl. 252-428.000.
Berggren, L. John; Chin, Charles L. D.; and Reilly, Joseph R., 4,050,887, Cl. 432-122.000.
Bloomfield, Jordan J.; and Owsley, Dennis C., 4,051,076, Cl. 252-522.000.
Kauffman, Ivan L.; and Kellogg, Robert C., 4,050,876, Cl. 425-529.000.
Lee, Yoon C., 4,051,311, Cl. 526-271.000.
Wilder, Gene Ray, 4,051,067, Cl. 252-401.000.

Monsanto Research Corporation: *See*—
Hardy, Edgar E.; and David, Donald J., 4,050,895, Cl. 23-230.00R.

Montedison S.p.A.: *See*—
Luciani, Luciano; and Nava, Gianni, 4,051,313, Cl. 528-496.000.

Moog, Robert A., to Norlin Music Company. Electronic music synthesizer. 4,050,343, Cl. 84-1.010.

Moore, Alvin Edward. Method for producing light-weight construction member. 4,050,978, Cl. 156-300.000.

Moore Business Forms, Inc.: *See*—
Traise, John E., 4,050,361, Cl. 93-1.00F.

Moore, Earl Phillip, Jr., to Du Pont de Nemours, E. I., and Company. Process for producing an azonitrile with improved color from an aminonitrile in an aqueous system comprising mixed surface active compounds. 4,051,124, Cl. 260-192.000.

Moore, John R., to International Telephone and Telegraph Corporation. Conductive elastomer connector and method of making same. 4,050,756, Cl. 339-59.00M.

Moorhead, John P.: *See*—
Stratton, Donald W.; and Moorhead, John P., 4,050,832, Cl. 403-321.000.

Morais, Don: *See*—
Knoble, David W.; and Morais, Don, 4,051,411, Cl. 315-205.000.

Moran, Kevin P.: *See*—
Chu, Richard C.; and Moran, Kevin P., 4,050,507, Cl. 165-1.000.

Morgan, David F., to Eaton Corporation. Controller for fluid pressure operated devices providing high pressure to an auxiliary device. 4,050,474, Cl. 137-596.000.

Mori, Katsuji. Buttonhole stitching device for zigzag sewing machine. 4,050,391, Cl. 112-77.000.

Morichika, Toshiaki: *See*—
Murakami, Shinichi; Akamatsu, Katsutaro; Morichika, Toshiaki; and Hiraishi, Hisashi, 4,050,929, Cl. 75-171.000.

Morikawa, Nobutaka; and Tanaka, Susumu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Cylinder head. 4,050,244, Cl. 60-282.000.

Moring, Peter Lothar Ernst, to Dunlop Limited. Belting. 4,050,322, Cl. 74-231.00J.

Morishima, Yasushi; and Miyazaki, Yukifusa. Mixing device and element therefor. 4,050,676, Cl. 366-339.000.

Morishita, Toshio: *See*—
Hayashi, Kazushige; Minemura, Norihiro; Fujimoto, Iwao; Ozaki, Kiyotaka; Yoshida, Norio; Morishita, Toshio; and Shinoki, Takanori, 4,051,287, Cl. 428-91.000.

Morrow, James G., Sr.; Pech, David J.; Hunter, Charles A., II; and Porubcansky, Kenneth J., to Manitowoc Company, Inc., The. Apparatus for raising & lowering a mast and boom on a mobile crane. 4,050,586, Cl. 212-59.00R.

Mortimer, Ivan: *See*—
Harries, David Anthony; and Mortimer, Ivan, 4,050,749, Cl. 303-119.000.

Morton, Frederick C.: *See*—
Klein, Elias; Smith, James K.; and Morton, Frederick C., 4,051,300, Cl. 428-398.000.

Morton-Norwich Products, Inc.: *See*—
Harris, Nicholas D., 4,051,171, Cl. 560-157.000.

Morton, Roger R., to Bausch & Lomb Incorporated. Video amplitude related measurements in image analysis. 4,051,458, Cl. 340-146.3AG.

Moscow, Larry B. Bumper-style bicycle carrying apparatus. 4,050,616, Cl. 224-42.03B.

Moser, Rabin, to Xerox Corporation. Roll fuser. 4,050,886, Cl. 432-60.000.

Mosher, Hugh A.: *See*—
Ford, James M.; Kircher, Morton S.; and Mosher, Hugh A., 4,051,008, Cl. 204-266.000.

Motokawa, Shoichi: *See*—
Ishihara, Takao; Sanpei, Kiyoji; Nabatame, Hiroshi; and Motokawa, Shoichi, 4,050,910, Cl. 55-96.000.

Motomura, Yoshie; and Ishiyama, Jiro, to Kikkoman Shoyu Co., Ltd. Process for developing seedless fleshy berry of grapes. 4,050,919, Cl. 71-86.000.

Motoren- und Turbinen-Union Friedrichshafen GmbH: *See*—
Zbikowski, Gerhard; and Geafer, Salahaddin, 4,050,434, Cl. 123-140.0FG.

Motoren- und Turbinen-Union Munchen GmbH: *See*—
Kappler, Guenter; and Fehler, Adolf, 4,050,239, Cl. 60-39.51R.

Motorola, Inc.: *See*—
Black, Stephen Read, 4,051,387, Cl. 307-273.000.
Jackson, Robert Andrew, III; and Willis, Harry G., 4,050,759, Cl. 339-75.00M.

Motosugi, Katsuhiko: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,050,422, Cl. 123-75.00B.

Motoyoshi, Kenya; Kume, Masahiro; and Amano, Yoshinari, to

Sumitomo Electric Industries, Ltd. Electrical contact material. 4,050,930, Cl. 75-173.00A.

Mott, Victor S.: *See*—
Coleman, Ronald J., 4,050,671, Cl. 254-7.00R.

Moyer, Wendell W., Jr.: *See*—
Smith-Johannsen, Robert; and Moyer, Wendell W., Jr., 4,051,075, Cl. 252-511.000.

Mrozek, Hinrich: *See*—
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,058, Cl. 252-186.000.
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,059, Cl. 252-186.000.

Muckenheim, Heribert: *See*—
Luchsinger, Peter; Muckenheim, Heribert; Riemann, Hanns-Helmut; Sonnenschein, Hans; and Michel, Erich, 4,050,387, Cl. 110-8.00A.

Muehldorf, Eugene Igor: *See*—
Eichelberger, Edward Baxter; Muehldorf, Eugene Igor; Walther, Ronald Gene; and Williams, Thomas Walter, 4,051,352, Cl. 364-716.000.

Mueller, Edward E.; Painter, Thomas H.; and Harrod, Michael K., to Whirl-Air-Flow Corporation. Method and apparatus for reclaiming sand. 4,050,635, Cl. 241-24.000.

Mueller, James F.: *See*—
Nelson, Robert K.; and Mueller, James F., 4,050,534, Cl. 180-24.090.

Mukai, Hisakazu: *See*—
Yamada, Shinichiro; Ishida, Akira; and Mukai, Hisakazu, 4,051,460, Cl. 364-900.000.

Mulinix, Lavern F. Loading devices for muzzle loading rifles. 4,050,175, Cl. 42-90.000.

Muller, George H.: *See*—
Barton, David W.; and Muller, George H., 4,050,689, Cl. 293-71.00P.

Muller, Hans, to Grapha-Holding AG. Distributing station for printed matter. 4,050,573, Cl. 198-366.000.

Muller, Hans; and Sotirianos, Konstantin, to Muller, Hans. Apparatus for mixing a liquid phase and a gaseous phase. 4,051,204, Cl. 261-36.00R.

Muller, Robert, to Dr. -Ing. H.c.F. Porsche Aktiengesellschaft. Synchronizing device. 4,050,558, Cl. 192-53.00G.

Muller, Walter, to Ruti Machinery Works Ltd. Undulated shed loom with electromagnetic shuttle drive. 4,050,481, Cl. 139-436.000.

Multi-Fab, Inc.: *See*—
Gilmore, Guy T., 4,050,335, Cl. 82-4.00C.

Multinorm, B.V.: *See*—
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,050,224, Cl. 56-295.000.

Mulvey, Dennis M.: *See*—
Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., 4,051,144, Cl. 260-307.0FA.

Mulvihill, Thomas Kevin; and Murphy, Denis, to Golden Vale Food Products Limited. Cheese vat. 4,050,369, Cl. 99-463.000.

Munninger, Karl O.: *See*—
Hazdra, James J.; Rausch, David J.; and Munninger, Karl O., 4,051,040, Cl. 210-321.00B.

Munro, David Farnham: *See*—
Cuthbert, John David; and Munro, David Farnham, 4,050,821, Cl. 356-156.000.

Murakami, Gisuke: *See*—
O'Berto, Gerald N.; and Murakami, Gisuke, 4,051,418, Cl. 318-227.000.

Murakami, Masuo; Isaka, Ichiro; and Kashiwagi, Teruya, to Yamanouchi Pharmaceutical Co., Ltd. Process for the preparation of 6-alkoxy-substituted penicillins. 4,051,126, Cl. 260-239.100.

Murakami, Shinichi; Akamatsu, Katsutaro; and Hiraishi, Hisashi, to Kubota, Ltd. Alloyed steel. 4,050,927, Cl. 75-122.000.

Murakami, Shinichi; Akamatsu, Katsutaro; Morichika, Toshiaki; and Hiraishi, Hisashi, to Kubota, Ltd. Heat resisting alloyed steel. 4,050,929, Cl. 75-171.000.

Muramatsu, Katsuji: *See*—
Fujita, Yoshihiro; Fuutagawa, Ikuo; and Muramatsu, Katsuji, 4,051,494, Cl. 354-145.000.

Murata, Masataka: *See*—
Takeda, Keiji; Murata, Masataka; and Ikeda, Teppei, 4,050,936, Cl. 96-28.000.

Murata, Tokuo: *See*—
Hamada, Morio, 4,051,548, Cl. 361-171.000.

Murib, Jawad H., to National Distillers and Chemical Corporation. Oxidation of allyl alcohol to acrylic acid. 4,051,181, Cl. 260-531.00R.

Murphy, David R., to S.A.E.S. Getters S.p.A. Accelerator for charged particles. 4,050,914, Cl. 55-387.000.

Murphy, Denis: *See*—
Mulvihill, Thomas Kevin; and Murphy, Denis, 4,050,369, Cl. 99-463.000.

Murphy, Lawrence R.; and Sanford, Gary G., to Ball Brothers Research Corporation. Wide beam microstrip radiator. 4,051,477, Cl. 343-700.0MS.

Murphy, Peter: *See*—
Millette, Louis Guy; Murphy, Peter; and Miller, Georges Michel, 4,051,430, Cl. 324-34.0TK.

Murphy, Philip. Aircraft parachute safety system. 4,050,657, Cl. 244-139.000.

Muterel, Roland: *See*—
Carre, Jean-Jacques; and Muterel, Roland, 4,050,251, Cl. 60-550.000.

Myers, Gary A.; and Wunderlich, Donald K., to Atlantic Richfield Company. Synthetic oil treatment. 4,051,022, Cl. 208-253.000.

Myrick, Alma Lillian. Gauge protector seal. 4,050,312, Cl. 73-395.000.

Nabatame, Hiroshi: *See*—
Ishihara, Takao; Sanpei, Kiyoji; Nabatame, Hiroshi; and Motokawa, Shoichi, 4,050,910, Cl. 55-96.000.

Naber, Jaap E.: *See*—
Staudinger, Gernot; and Naber, Jaap E., 4,051,226, Cl. 423-244.000.

Nacci, George Raymond, to Du Pont de Nemours, E. I., and Company. Nitroso-dimer-containing compositions and photoimaging process. 4,050,942, Cl. 96-115.00R.

Nadella: *See*—
Pitner, Alfred, 4,050,130, Cl. 29-149.50R.

Nadelson, Jeffrey: *See*—
Anderson, Paul L.; and Nadelson, Jeffrey, 4,051,261, Cl. 424-331.000.

Nadolski, Klaus: *See*—
Raffel, Reiner; Ebeling, Wilfried; Nadolski, Klaus; and Schulte, Klaus, 4,050,896, Cl. 23-230.00A.

Nagano, Akira: *See*—
Hatano, Isao; Nagano, Akira; and Urasaki, Kazuaki, 4,051,471, Cl. 340-365.00S.

Nagano, Toshihiro: *See*—
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, 4,050,142, Cl. 29-403.000.

Naito, Kiyoshi; and Shukuya, Akio, to Shinagawa Refractories Co. Ltd. Method and apparatus of baking carbonaceous molding. 4,050,880, Cl. 432-5.000.

Naito, Susumu: *See*—
Suzuki, Takashi; and Naito, Susumu, 4,051,318, Cl. 560-131.000.

Nakagawa, Sadao; Tsukamoto, Masaaki; and Dobashi, Toshio, to Nippon Kogaku K.K. Flash photographing device. 4,051,493, Cl. 354-126.000.

Nakagawa, Tadao: *See*—
Hori, Toshio; and Nakagawa, Tadao, 4,050,549, Cl. 188-72.800.

Nakamura, Hidehisa: *See*—
Ishikawa, Noboru; Nakamura, Hidehisa; Maruyama, Kazuyoshi; and Shoji, Akio, 4,051,194, Cl. 260-836.000.

Nakamura, Hisashi: *See*—
Takeda, Yasutsugu; Nakamura, Hisashi; Tsunoda, Yoshito; Tsukada, Toshihisa; and Miyauchi, Toshimitsu, 4,051,528, Cl. 358-128.000.

Nakamura, Katsuhiko: *See*—
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, 4,050,142, Cl. 29-403.000.

Nakamura, Yasushi; Itou, Michihisa; and Uchimura, Mitsuo, to Nippon Steel Corporation. Method for decreasing the amount of carbon and nitrogen contained in the ferrochrome alloy. 4,050,960, Cl. 148-16.000.

Nakanishi, Tetsuichiro, to Hitachi Shipbuilding & Engineering Co., Ltd. Ocean nuclear power equipment. 4,050,252, Cl. 60-641.000.

Nakanishi, Yoshitaka. Sash lock. 4,050,724, Cl. 292-241.000.

Nakao, Hideo: *See*—
Shimizu, Bunji; Saito, Akio; Kaneko, Masakatsu; Yanagisawa, Hiroaki; and Nakao, Hideo, 4,051,129, Cl. 544-21.000.
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, 4,051,320, Cl. 542-420.000.

Nakao, Shinroku; Ishii, Yoshiyasu; and Ishii, Kenshun, to Combi Co., Ltd. Urinating receiver. 4,050,103, Cl. 4-110.000.

Nakaoka, Kazuhide; Araki, Kenji; Iwase, Koji; Koike, Yasuo; and Fukunaka, Shiro, to Nippon Kokan Kabushiki Kaisha. Process of making a high strength cold reduced steel sheet having high bake-hardenability and excellent non-aging property. 4,050,959, Cl. 148-12.300.

Nakazato, Norio; Hiratsuka, Kosai; and Furukawa, Tokinobu, to Hitachi, Ltd. Process for continuously producing sugar. 4,050,953, Cl. 127-60.000.

Nalco Chemical Company: *See*—
Venema, Gerard J., 4,051,065, Cl. 252-359.00A.

Nara, Hirohisa: *See*—
Tsuruta, Motohiro; Kimura, Hiroshiro; Koshimo, Akio; Nara, Hirohisa; Goto, Tokuju; and Amemiya, Kunio, 4,051,215, Cl. 264-137.000.

Nash Engineering Company, The: *See*—
Haavik, Harold K., 4,050,851, Cl. 417-68.000.

National Distillers and Chemical Corporation: *See*—
Murib, Jawad H., 4,051,181, Cl. 260-531.00R.

National Gypsum Company: *See*—
Nowick, Chester R.; and DeFranza, Alfred, 4,050,885, Cl. 432-31.000.

National Marine Service, Inc.: *See*—
in't Veld, Cornelis, 4,051,038, Cl. 210-242.00S.

National Research Development Corporation: *See*—
Barlow, Harold Everard Monteagle, 4,051,450, Cl. 333-95.00R.
Hemp, John; and Wyatt, Derek Gerald, 4,050,303, Cl. 73-194.0EM.
Sayce, Leonard Alfred, deceased; and Pettigrew, Robert Martin, 4,051,367, Cl. 250-237.00G.

National Semiconductor Corporation: *See*—
Long, David K.; and Miller, Robert W., 4,051,386, Cl. 307-271.000.

Nava, Gianni: *See*—
Luciani, Luciano; and Nava, Gianni, 4,051,313, Cl. 528-496.000.

NCR Corporation: *See—*
Albertine, Herman, Jr.; Craycraft, Donald G.; and Coleman, William E., 4,051,408, Cl. 315-169.00R.
Craycraft, Donald Gregory, 4,051,409, Cl. 315-169.0TV.
Crump, Leslie L.; and Italiano, Victor J., 4,050,569, Cl. 197-120.000.
Hanny, John Franklin, 4,050,820, Cl. 356-103.000.
Lin, Juei-po, 4,051,355, Cl. 235-302.300.
Michelson, Gunnar P., 4,050,690, Cl. 271-125.000.
Smith, James H.; and Kumpf, Sherman S., 4,050,379, Cl. 101-327.000.
Neal, Ronald D.; Ross, Richard; and Hein, Joseph N., to Gates Rubber Company, The. Wing and reduced airspeed system for jet aircraft. 4,050,651, Cl. 244-15.000.
Neander, Allen: *See—*
Drennen, Thomas G.; and Neander, Allen, 4,050,265, Cl. 64-11.00R.
Needham, Peter Richard; and Langley, Kenneth Richard, to Rolls-Royce (1971) Limited. Gas turbine engines. 4,050,843, Cl. 415-116.000.
Nelson, Larry A.; and Crosby, Philip Stephen, to Tektronix, Inc. Phase locked demodulator. 4,051,440, Cl. 328-134.000.
Nelson, Lorne W., to Honeywell Inc. Filter condition responsive device compensated for changes in medium flow. 4,050,291, Cl. 73-38.000.
Nelson, Norman A.: *See—*
Bundy, Gordon L.; and Nelson, Norman A., 4,051,160, Cl. 260-413.000.
Nelson, Peter H.; and Untch, Karl G., to Syntex (U.S.A.) Inc. 2-Substituted-5-oxo-5H-dibenzo[a,d]cycloheptenes, and derivatives thereof, and methods and compositions for the use thereof. 4,051,260, Cl. 424-331.000.
Nelson, Richard Stuart; Pugh, Stanley Frederick; and Smith, Michael John Stapley, to United Kingdom Atomic Energy Authority. Storage of material. 4,051,063, Cl. 252-301.10W.
Nelson, Robert K.; and Mueller, James F., to Eaton Corporation. Drive axle system useable in 6 × 6 vehicle. 4,050,534, Cl. 180-24.090.
Nelson, Thomas A., to Ford Motor Company. Carburetor automatic choke construction. 4,050,424, Cl. 123-119.00F.
Nenov, Dragan Iliev: *See—*
Balevski, Angel Tonchev; Nikolov, Ivan Dimov; Nenov, Dragan Iliev; and Momchilov, Emil Nikolov, 4,050,503, Cl. 164-155.000.
Neti, Radhakrishna Murty; and Roggenkamp, Ray Lawrence, to Beckman Instruments, Inc. Portable electrochemical cell structure. 4,051,006, Cl. 204-195.00P.
Neuber, Dieter: *See—*
Gorski, Dennis M.; Neuber, Dieter; and Wildmoser, Martin Michael, 4,050,579, Cl. 206-460.000.
Neubert, Rolf; and Wehling, Rolf, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Spinning rotor for open-end spinning unit. 4,050,235, Cl. 57-58.890.
Neumann, Eckart: *See—*
Kissel, Ernst; Neumann, Eckart; Guenther, Ernst; Valentin, Guenter; and Hoerauf, Werner, 4,051,113, Cl. 260-78.00L.
Neumann Engraving Company: *See—*
Hotton, Joseph G., 4,051,218, Cl. 264-248.000.
Neumark, Gertrude F.: *See—*
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Neuzil, Richard W.; and Korous, Donald J., to UOP Inc. Separation of bi-alkyl substituted monocyclic aromatic isomers. 4,051,192, Cl. 260-674.0SA.
Neville, James J.; Ferrell, Wesley; and Schichman, Daniel, to Uniroyal Inc. Methods of building zero degree belted tires, using high soft stretch belt-forming tapes. 4,050,973, Cl. 156-123.00R.
New, Gordon R. A.; and Curry, William G., to Fram Corporation. Lightweight fan. 4,050,847, Cl. 416-132.00A.
Newcastle Company, Inc.: *See—*
Alduk, Frank P., 4,050,217, Cl. 53-62.000.
Newcomb, C. Lewis, Jr. Vehicle leveler system. 4,050,718, Cl. 280-763.000.
Newell, Carl W. Battery terminal connector. 4,050,773, Cl. 339-224.000.
Newell, Robert Keith, to Pettibone Corporation. Bearing housing adaptable to reworked shaft by reversal method of repair. 4,050,140, Cl. 29-401.00B.
Newman, Neil F., to Exxon Research & Engineering Co. Elastomer blends for tire components. 4,051,083, Cl. 260-5.000.
Newport Research Corporation: *See—*
Matthews, John W.; Sigel, Harry Dennis; and Hauk, Peter, 4,050,665, Cl. 248-358.00R.
Newton, Albert Eugene: *See—*
Elliott, Richard Montgomery; and Newton, Albert Eugene, 4,050,890, Cl. 432-210.000.
NGK Insulators, Ltd.: *See—*
Hara, Shinichi; and Kato, Taro, 4,050,390, Cl. 110-15.000.
Ito, Isao; and Karita, Yoichi, 4,050,638, Cl. 241-222.000.
Nichols Engineering & Research Corporation: *See—*
von Dreusche, Charles F., Jr., 4,050,389, Cl. 110-12.000.
Nielson, Farrel D.: *See—*
Meheen, Homayoun J.; and Nielson, Farrel D., 4,050,254, Cl. 61-39.000.
Niemeier, Gerd: *See—*
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Nihon Denshi Kabushiki Kaisha: *See—*
Imanari, Mamoru; Takeuchi, Makoto; Shimizu, Shozo; and Higuchi, Hisashi, 4,051,429, Cl. 324-.50A.
Nikolov, Ivan Dimov: *See—*
Balevski, Angel Tonchev; Nikolov, Ivan Dimov; Nenov, Dragan Iliev; and Momchilov, Emil Nikolov, 4,050,503, Cl. 164-155.000.
Ninomiya, Yuichi, to Nippon Hoso Kyokai. Charge-coupled amplifier. 4,051,469, Cl. 340-347.0AD.
Nippon Denso Co., Ltd.: *See—*
Yamada, Makoto; Sasaki, Shiro; Kanazawa, Shigenori; and Hayashi, Yoshihiro, 4,050,717, Cl. 280-744.000.
Nippon Electric Company, Ltd.: *See—*
Inukai, Hidemori, 4,051,388, Cl. 307-279.000.
Sato, Susumu; and Tsunemitsu, Hideo, 4,051,508, Cl. 357-71.000.
Uchida, Teiji; and Ueki, Atsufumi, 4,050,782, Cl. 350-96.00C.
Nippon Hoso Kyokai: *See—*
Ninomiya, Yuichi, 4,051,469, Cl. 340-347.0AD.
Nippon Kogaku K.K.: *See—*
Bromfield, Ian Derek; and Seddon, Peter, 4,050,817, Cl. 355-133.000.
Iida, Yozo; Akasaka, Shigeo; and Kawahara, Yasuhito, 4,051,496, Cl. 354-219.000.
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Toyoda, Kenji, 4,051,491, Cl. 354-60.00L.
Watanabe, Sataya, 4,050,791, Cl. 350-318.000.
Nippon Kokan Kabushiki Kaisha: *See—*
Kunioka, Kazuo; Mihara, Yutaka; and Noguchi, Takao, 4,050,963, Cl. 148-128.000.
Nakaoka, Kazuhide; Araki, Kenji; Iwase, Koji; Koike, Yasuo; and Fukunaka, Shiro, 4,050,959, Cl. 148-12.300.
Nippon Piston Ring Kabushiki Kaisha: *See—*
Sakamaki, Hiroshi; and Maeda, Toshiyuki, 4,050,855, Cl. 418-131.000.
Nippon Selfoc Company, Limited: *See—*
Kobayashi, Kohroh, 4,050,784, Cl. 350-96.00C.
Nippon Steel Corporation: *See—*
Nakamura, Yasushi; Itou, Michihisa; and Uchimura, Mitsuo, 4,050,960, Cl. 148-16.000.
Nippon Telegraph and Telephone Public Corporation: *See—*
Izumi, Kazuo; and Izumi, Kazuto, 4,051,332, Cl. 179-170.200.
Kuroda, Hideo; and Kanaya, Fumio, 4,051,530, Cl. 358-136.000.
Yamada, Shinichiro; Ishida, Akira; and Mukai, Hisakazu, 4,051,460, Cl. 364-900.000.
Nishihara, Toyotaro: *See—*
Suzuki, Nobuyuki; and Nishihara, Toyotaro, 4,051,514, Cl. 358-65.000.
Nishimoto, Tsunanori: *See—*
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Nishimura, Matsuo, to Yasui Sangyo Col. Ltd. Two-masted lifting apparatus. 4,050,673, Cl. 254-89.00H.
Nishiyama, Shuji: *See—*
Suzuki, Ikuo; and Nishiyama, Shuji, 4,050,342, Cl. 84-95.00C.
Niskanen, Karl G., to Kennametal Inc. Indexing device. 4,050,355, Cl. 90-56.00R.
Nissan Motor Co., Limited: *See—*
Amagai, Susumu; and Oikawa, Shigeru, 4,050,430, Cl. 123-122.00D.
Masaki, Kenji, 4,050,428, Cl. 123-119.0EC.
Nisshin Kogyo Kabushiki Kaisha: *See—*
Hori, Toshio; and Nakagawa, Tadao, 4,050,549, Cl. 188-72.800.
Noel C. Jones & Associates, Inc.: *See—*
Jones, Noel C., 4,050,271, Cl. 72-37.000.
Nogami, Tomoyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Safety device for use in a vehicle brake. 4,050,744, Cl. 303-24.00A.
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for supplying rich air/fuel mixture in an internal combustion engine. 4,050,422, Cl. 123-75.00B.
Noguchi, Matsusaburo: *See—*
Watanabe, Akinori; Tanoshima, Katsuhide; Noguchi, Matsusaburo; and Hattori, Kinya, 4,050,377, Cl. 101-114.000.
Noguchi, Takao: *See—*
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Noker, Alvin John: *See—*
Davies, Michael LaVar; Johnson, Richard Servern; Noker, Alvin John; and Wilde, Veldon Lawrence, 4,050,568, Cl. 197-90.000.
Noothout, Arend J.: *See—*
Kanij, Johannes B. W.; Noothout, Arend J.; and Hermans, Marie E. A., 4,051,060, Cl. 252-301.1R.
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Wenzel, Werner, 4,050,118, Cl. 17-54.000.
Norlin Music Company: *See—*
Moog, Robert A., 4,050,343, Cl. 84-1.010.
Normac, Inc.: *See—*
Klein, Max, 4,050,897, Cl. 23-252.00R.
Noro, Tadaomi. Method of interlocking a lateral member and the end of a hollow post and the joint construction used therein. 4,050,828, Cl. 403-201.000.
Norris, James R.: *See—*
Miller, Guy W.; and Norris, James R., 4,050,844, Cl. 415-147.000.
North American Philips Corporation: *See—*
Bhargava, Rameshwar Nath; and Neumark, Gertrude F., 4,051,061, Cl. 252-301.4P.
North State Pyrophyllite Company: *See—*
Boren, John A., 4,050,577, Cl. 206-322.000.
Northern Instruments Corporation: *See—*
Miksic, Boris A.; and Stern, Donovan P., 4,051,066, Cl. 252-389.00R.
Northern Telecom Limited: *See—*
Gumb, Beverley William, 4,050,768, Cl. 339-154.00A.
Millette, Louis Guy; Murphy, Peter; and Miller, Georges Michel, 4,051,430, Cl. 324-34.0TK.
Wei, John Shi Sun; and Westwood, William Dickson, 4,050,780, Cl. 350-6.000.
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Nowak, Herbert: *See—*
Schacht, Erich; Mehrhof, Werner; Simane, Zdenek; Kayser, Detlev; and Nowak, Herbert, 4,051,170, Cl. 560-62.000.
Schacht, Erich; Mehrhof, Werner; Simane, Zdenek; and Nowak, Herbert, 4,051,173, Cl. 560-255.000.
Nowick, Chester R.; and DeFranza, Alfred, to National Gypsum Company. Method of drying gypsum wallboard and apparatus therefor. 4,050,885, Cl. 432-31.000.
Nozu, Yukio: *See—*
Kuwana, Noriaki; Hasegawa, Yoshikazu; and Nozu, Yukio, 4,050,989, Cl. 195-29.000.
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Kleimola, Frank W., 4,050,983, Cl. 176-38.000.
Nulph, Robert J.: *See—*
Anderson, Arnold L.; and Nulph, Robert J., 4,051,105, Cl. 260-45.95G.
Nyswander, Reuben E., to United States of America, Navy. Short pulse magnetron transmitter. 4,051,439, Cl. 325-121.000.
O & K Orenstein & Koppel Aktiengesellschaft: *See—*
Hachmann, Friedrich, 4,050,248, Cl. 60-445.000.
O-3 Company: *See—*
Harter, Joseph William; and Beitzel, Stuart Wallace, 4,051,043, Cl. 250-531.000.
Obana, Sachio: *See—*
Sunamori, Takashi; and Obana, Sachio, 4,051,004, Cl. 204-181.000.
Oberth, Adolf E., to United States of America, Air Force. Catalytic system and polyurethane propellants. 4,050,969, Cl. 149-19.400.
O'Berto, Gerald N.; and Murakami, Gisuke. Three phase a.c. motor drive system. 4,051,418, Cl. 318-227.000.
Odom, Paul R.: *See—*
Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., 4,050,869, Cl. 425-222.000.
Oetiker, Hans. Perforating tool. 4,050,154, Cl. 30-363.000.
Oexler, Rudolf: *See—*
Landwehrkamp, Hans; Hoeber, W. Gerhard; Goldammer, Georg; and Oexler, Rudolf, 4,050,228, Cl. 57-58.950.
Ogawa, Hiroshi; and Ariga, Masao, to Canan Kabushiki Kaisha. Device for successive reproduction of information. 4,050,800, Cl. 355-75.000.
Ogawa, Kazuyuki; Hirose, Masahiko; Yada, Masaaki; and Imamura, Hitoshi, to Tokyo Shibaura Electric Co., Ltd. Activated gas reaction apparatus. 4,051,382, Cl. 250-531.000.
Ogura, Katsuyuki: *See—*
Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,051,151, Cl. 260-329.00S.
Oguri, Masaharu: *See—*
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Ohara, Katsunobu: *See—*
Tanaka, Keiji; Ando, Yujiro; and Ohara, Katsunobu, 4,050,802, Cl. 355-3.00R.
Ohkubo, Noriyoshi; and Kitamura, Nobu, to Furukawa Electric Company Limited, The. Method for producing heat resistant synthetic resin tubes. 4,051,284, Cl. 428-36.000.
Ohmura, Yoshio: *See—*
Ohtsuka, Shigeto; Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,051,314, Cl. 536-1.000.
Ohtsuka, Shigeto; Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Polysaccharides and method for producing same. 4,051,314, Cl. 536-1.000.
Oikawa, Shigeru: *See—*
Amagai, Susumu; and Oikawa, Shigeru, 4,050,430, Cl. 123-122.00D.
Oikawa, Syoji: *See—*
Inoue, Hajime; Harada, Fumio; Kato, Kazunobu; and Oikawa, Syoji, 4,051,001, Cl. 204-151.000.
Okabe, Takahiro: *See—*
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Okamoto, Tomiyasu; Nishimoto, Tsunanori; Sawada, Kaoru; Hayakawa, Koji; and Kurihara, Tomomichi, to Hitachi Shipbuilding & Engineering Co. Heat insulating device for low temperature liquified gas storage tanks. 4,050,609, Cl. 220-9.0LG.
Okamoto, Yasushi: *See—*
Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Hikasa, Tadashi, 4,051,225, Cl. 423-235.000.
Okamuro, James A., to Borroughs Tool & Equipment Corporation. Piston pin installing and removing apparatus. 4,050,139, Cl. 29-283.000.
Okerblom, Charles Lindberg. Billfold protective device. 4,050,123, Cl. 24-3.00D.
Oki Electric Industry Company, Ltd.: *See—*
Watanabe, Akinori; Tanoshima, Katsuhide; Noguchi, Matsusaburo; and Hattori, Kinya, 4,050,377, Cl. 101-114.000.
Yamada, Kozo, 4,051,485, Cl. 346-75.000.
Okuyama, Sadao: *See—*
Sato, Yasuhiro; Sato, Toshio; Kawasaki, Shuichi; Takaishi, Toshio; Okuyama, Sadao; and Yamanashi, Norio, 4,050,371, Cl. 99-550.000.
Olin Corporation: *See—*
Dorgnon, Roger, 4,050,344, Cl. 85-68.000.
Ford, James M.; Kircher, Morton S.; and Mosher, Hugh A., 4,051,008, Cl. 204-266.000.
Olsen, Niels Johan, to Bora, S.A., Firma. Laundry feeding apparatus. 4,050,173, Cl. 38-143.000.
Olsen, Richard J., to Goodyear Tire & Rubber Company, The. Removable tread belt. 4,050,495, Cl. 152-187.000.
Olson, John R. Cable and wire cutter. 4,050,152, Cl. 30-90.100.
Omron Tateisi Electronics Co.: *See—*
Fukuyama, Toshifumi; Asakura, Yasunori; and Onji, Norio, 4,051,365, Cl. 250-222.00R.
Hatano, Isao; Nagano, Akira; and Urasaki, Kazuaki, 4,051,471, Cl. 340-365.00S.
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Gendron, Aubrey Stewart; Abe, Shinichiro; Ettel, Victor Alexander; and O'Neill, Charles Edward, 4,051,000, Cl. 204-106.000.
O'Neill, Robert J.: *See—*
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Onji, Norio: *See—*
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Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, to Multinorm, B.V. Mowing implement. 4,050,224, Cl. 56-295.000.
Opprecht, Paul. Welding head for resistance - welding machine. 4,051,343, Cl. 219-84.000.
Orlens, Alfreds, to Pitney-Bowes, Inc. Label printing apparatus. 4,050,375, Cl. 101-110.000.
Orstein, Jacob L.; and Thomas, Seth R., to Texas Instruments Incorporated. Thermostatic metal. 4,050,906, Cl. 428-617.000.
Osanai, Akinori: *See—*
Inada, Masami; Kawabata, Yasuhiro; Sato, Katsujiro; and Osanai, Akinori, 4,050,423, Cl. 123-117.00A.
Ostling, Sture B. G.: *See—*
Lundgren, Bengt G. S.; and Ostling, Sture B. G., 4,050,949, Cl. 106-97.000.
Ostrowski, David Stanley: *See—*
Polanyi, Michael Lajos; and Ostrowski, David Stanley, 4,050,450, Cl. 128-2.00L.
Oswald, Alexis A.; and Valint, Paul L., to Ciba-Geigy Corporation. O,S-dialkyl-O-(4-phenylazophenyl)-thiophosphates and pesticidal compositions thereof. 4,051,240, Cl. 424-225.000.
Oswald, Robert B., Jr.: *See—*
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Outboard Marine Corporation: *See—*
DuBois, Edmund H., 4,050,831, Cl. 403-243.000.
Owaki, Masanao, to Sony Corporation. Temperature compensating circuit for use with a crystal oscillator. 4,051,446, Cl. 331-116.00R.
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Knoble, David W.; and Owen, Daniel V., 4,051,412, Cl. 315-205.000.
Owens-Corning Fiberglas Corporation: *See—*
Jackson, Robert R., 4,050,639, Cl. 242-18.00G.
Jutte, Ralph B.; and Lehman, Roger L., 4,051,290, Cl. 428-168.000.
Russell, Robert G., 4,050,916, Cl. 65-2.000.
Smith, Roy E., 4,050,608, Cl. 220-9.0LG.
Owens-Illinois, Inc.: *See—*
Li, Chi-Tang, 4,050,946, Cl. 106-39.600.
Tobias, John W.; Taylor, Lynn J.; and Gaumer, Stuart J., 4,051,306, Cl. 526-1.000.
Tom, Elgin Megginson; and Vogelpohl, Roland L., 4,050,602, Cl. 220-2.10A.
Owsley, Dennis C.: *See—*
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Oyama, Shigeaki: *See—*
Shichida, Hiromichi; Katsube, Hideo; Oyama, Shigeaki; Toyoda, Kenichi; and Saito, Mitsuo, 4,050,837, Cl. 408-35.000.
Ozaki, Kiyotaka: *See—*
Hayashi, Kazushige; Minemura, Norihiro; Fujimoto, Iwao; Ozaki, Kiyotaka; Yoshida, Norio; Morishita, Toshio; and Shinoki, Takanori, 4,051,287, Cl. 428-91.000.
Oziomek, James: *See—*
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Paap, Hans J.: *See—*
Arnold, Dan M.; Paap, Hans J.; and Scott, Hubert D., 4,051,368, Cl. 250-270.000.
Pace, Carl E. Footwear with detachable symbols. 4,050,168, Cl. 36-136.000.
Pai, Damodar M.: *See—*
Limburg, William W.; Yanus, John F.; and Pai, Damodar M., 4,050,935, Cl. 96-1.0PC.
Painter, Thomas H.: *See—*
Mueller, Edward E.; Painter, Thomas H.; and Harrod, Michael K., 4,050,635, Cl. 241-24.000.
Pakur, Henryk; and Tiemann, Reinhard, to Continental Gummi-Werke Aktiengesellschaft. Belt for belted tires and method of making same. 4,050,497, Cl. 152-361.0FP.
Pall Corporation: *See—*
Pall, David B.; and Roach, Charles J., 4,050,237, Cl. 60-39.080.
Roach, Charles J., 4,050,913, Cl. 55-276.000.
Pall, David B.; and Roach, Charles J., to Pall Corporation. Demister assembly for removing liquids from gases. 4,050,237, Cl. 60-39.080.

Pallos, Ferenc M.; Lee, Hwalin; and Menn, Julius J., to Stauffer Chemical Company. Certain geranyl phenyl ethers and their epoxides and their use in controlling insects. 4,051,262, Cl. 424-337.000.
Palm, Walter C., to Midland-Ross Corporation. Single-housing multi-trumpet air horn. 4,050,405, Cl. 116-142.0FP.
Palmer, Edward Paul: *See*—
Strong, William James; and Palmer, Edward Paul, 4,051,331, Cl. 179-107.00R.
Pan-X Corporation: *See*—
Rigsby, Jesse H., 4,051,327, Cl. 179-5.00R.
Pandrol Limited: *See*—
Miller, David William, 4,050,284, Cl. 72-384.000.
Panel Technology, Inc.: *See*—
Kupsky, George A., 4,051,404, Cl. 313-220.000.
Pannekeet, Wilhelmus; Steenken, Gerhard E. W. K.; and Voogd, Roeland H., to Akzona Incorporated. Process for the separate recovery of vanadium and molybdenum. 4,051,221, Cl. 423-54.000.
Papadatos, George. Mechanism for securing a door in open or closed position. 4,050,723, Cl. 292-164.000.
Parent, Guy, to Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel. Position measuring device. 4,051,350, Cl. 364-432.000.
Parenti, Marc'Antonio: *See*—
Ambrogi, Vittorio; Logemann, Willy; Parenti, Marc'Antonio; and Tommasini, Raffaele, 4,051,245, Cl. 424-250.000.
Park, William; and LeVitre, Leo A. Electrical junction box. 4,051,322, Cl. 174-65.00R.
Parker, Delmer G., to Xerox Corporation. Magnetic brush crossmixing system. 4,050,413, Cl. 118-647.000.
Parker-Hannifin Corporation: *See*—
Gasier, James Mills; and Currie, William Edgar, 4,050,286, Cl. 72-416.000.
Parks, Bernette Frederick: *See*—
Parks, Blanchard St. Clair; and Parks, Bernette Frederick, 4,050,257, Cl. 61-48.000.
Parks, Blanchard St. Clair; and Parks, Bernette Frederick. Demountable dock assembly. 4,050,257, Cl. 61-48.000.
Parma, John N. Tool for truck operators. 4,050,107, Cl. 7-1.00E.
Pasquier, Armand Rene, to Etudes Techniques et Realisations (E.T.R.). Snow distribution system. 4,050,169, Cl. 37-1.000.
Pastorino, Ronald L.: *See*—
Lewis, Roger N.; Pastorino, Ronald L.; and Wilts, James F., 4,051,310, Cl. 526-230.000.
Patamas, Esko. Casting machine for casting concrete elements. 4,050,868, Cl. 425-135.000.
Pattison, Victor A.: *See*—
Pawlak, Joseph A.; Lemper, Anthony L.; and Pattison, Victor A., 4,051,107, Cl. 260-47.00C.
Patzschke, Hans-Peter, to Dr. Kurt Herberts & Co. Gesellschaft mit Beschrankter Haftung Vorm. Otto Louis Herberts. Modified water-dilutable polymer oil imides containing carboxyl groups. 4,051,198, Cl. 260-879.000.
Paulin, Robert Charles; and Billings, Ronald Joseph, to Chemetron Corporation. Double-sigmoid connector. 4,050,830, Cl. 403-205.000.
Pawlak, Joseph A.; Lemper, Anthony L.; and Pattison, Victor A., to Hooker Chemicals & Plastics Corporation. Microstructured high molecular weight-low viscosity polyester polymers. 4,051,107, Cl. 260-47.00C.
Pazos, Jose Francisco, to Du Pont de Nemours, E. I., and Company. High resolution photohardensable coating compositions containing tetracyanoethane compounds. 4,050,941, Cl. 96-115.00P.
Pearson, Eugene Walford, to Canron, Inc. Power knife adjustment for a shear machine. 4,050,338, Cl. 83-641.000.
Pech, David J.: *See*—
Morrow, James G., Sr.; Pech, David J.; Hunter, Charles A., II; and Porubcansky, Kenneth J., 4,050,586, Cl. 212-59.00R.
Pechmeze, Jacques Pierre Edmond: *See*—
Dupre, Victor Marie; Pechmeze, Jacques Pierre Edmond; and Sureau, Robert Frederic Michel, 4,051,145, Cl. 548-372.000.
Peck, John F.; and Hodges, Carl N., to University Patents, Inc. Solar energy device and system. 4,050,443, Cl. 126-270.000.
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Peltier, Jean Paul: *See*—
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Baum, Joerg Peter, 4,050,682, Cl. 266-158.000.
Pereyra, Armand J. Rain-responsive control. 4,050,853, Cl. 417-44.000.
Perisse, Pierre. Automatic surgical apparatus for ligutaring blood vessels. 4,050,465, Cl. 128-326.000.
Perri, Joseph. Ingot mold with heat reflecting cover. 4,050,668, Cl. 249-106.000.
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Peters, Margot Elizabeth: *See*—
Peters, Melville F., 4,050,777, Cl. 350-292.000.
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Petersen, Gerald A. Excavator tooth, holder therefor and staple retainer. 4,050,172, Cl. 37-142.00A.
Petersen, Henning Borge: *See*—
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Petersen, Siegfried: *See*—
Mayer, Karl Heinrich; Petersen, Siegfried; Klauke, Erich; Hoffmeister, Friedrich; and Wuttke, Wolfgang, 4,051,252, Cl. 424-273.00P.
Peterson, Donald J., to Procter & Gamble Company, The. Protective coatings. 4,051,279, Cl. 427-355.000.
Peterson, Francis C., to C. Hager & Sons Hinge Manufacturing Company. Device for operating a pocket door. 4,050,189, Cl. 49-26.000.
Peterson Manufacturing Company: *See*—
Slater, Charles A., Jr.; and Darby, Spencer, 4,051,360, Cl. 362-363.000.
Peterson, Paul F., to United States of America, Air Force. Ejector rack. 4,050,656, Cl. 244-137.00R.
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Quinlan, Patrick M., 4,051,110, Cl. 260-72.00R.
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Petrulacci-Stephanopoli, Georges: *See*—
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Pettigrew, Robert Martin: *See*—
Sayce, Leonard Alfred, deceased; and Pettigrew, Robert Martin, 4,051,367, Cl. 250-237.00G.
Pettingell, James R.; and Armstrong, Lee R., to United Technologies Corporation. Measuring electrical parameters of an internal combustion engine during cranking. 4,050,297, Cl. 73-117.200.
Pfeiffer, Kurt; Dietrich, Johannes; Beckmann, Gunter; and Herkt, Karl-Heinz, to Chemische Werke Huls Aktiengesellschaft. Cooling unit for large polymerization vessels. 4,050,901, Cl. 23-285.000.
Pfiffner, Albert: *See*—
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 4,051,319, Cl. 542-413.000.
Pfister, Lewis; and Ehas, Edward, to Flynn Burner Corporation. Conveyor system for passing coated cans through chamber. 4,050,888, Cl. 432-124.000.
Pfizenmaier, Wolfgang, to Heidelberger Druckmaschinen Aktiengesellschaft. Ink fountain for printing machine. 4,050,380, Cl. 101-365.000.
Pfliegel, Todor: *See*—
Guczoghy, Lajos; Pfliegel, Todor; Puklics, Maria; Institoris, Laszlo; and Seres, Jeno, 4,051,156, Cl. 260-393.000.
Pforzheimer Uhren-Rohwerke Rudolf Wehner: *See*—
Ingenieur, Kurt Murrle, 4,050,233, Cl. 58-58.000.
Pfotenhauer, James M. Spring type projecting device. 4,050,438, Cl. 124-20.00R.
Phillips, Marie B.: *See*—
Harris, Don Navarro; Phillips, Marie B.; and Goldenberg, Harold Jacob, 4,051,236, Cl. 424-101.000.
Phillips Petroleum Company: *See*—
Fodor, Lawrence M., 4,051,197, Cl. 260-876.00B.
Scoggins, Lacey E.; and Campbell, Robert W., 4,051,087, Cl. 260-18.00N.
Small, William M., 4,050,506, Cl. 165-1.000.
Udipi, Kishore; and Hsieh, Henry L., 4,051,199, Cl. 260-880.00R.
Vanderveen, John W., 4,051,135, Cl. 23-259.500.
Phillips, Reginald Andrew; and Darbyshire, Kenneth, to Gullick Dobson Limited. Mine roof support control systems. 4,050,256, Cl. 61-45.00D.
Phone-Ducs, Inc.: *See*—
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Piccolo, Luigi; Calcagno, Benedetto; and Bossi, Emilio, to Societa' Italiana Resine S.I.R. S.p.A. Process for the post-treatment of titanium dioxide pigments. 4,050,951, Cl. 106-300.000.
Picker Corporation: *See*—
Hatch, Kenneth F., 4,051,373, Cl. 250-363.00S.
Pickering, David Harrison. Bracket. 4,050,662, Cl. 248-291.000.
Pickett, Robert B.; and Baghdady, Elie J., to International Telephone and Telegraph Corporation. Co-channel multiple signal broadcasting system. 4,051,438, Cl. 325-45.000.
Pigney, James Malcolm: *See*—
Hope, Frederick John Charles; and Pigney, James Malcolm, 4,050,298, Cl. 73-121.000.
Pilgram, Kurt H. G., to Shell Oil Company. Herbicidal semicarbazides. 4,050,918, Cl. 71-86.000.
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, to Ciba-Geigy AG. Sulfonic-acid-group containing disazo dyestuffs. 4,051,123, Cl. 260-178.000.
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Pitner, Alfred, to Nadella, a part interest. Method for mounting a bearing in a universal joint. 4,050,130, Cl. 29-149.50R.
Pitney-Bowes, Inc.: *See*—
Check, Frank T., Jr., 4,050,374, Cl. 101-91.000.
Orlens, Alfreds, 4,050,375, Cl. 101-110.000.
Storace, Anthony, 4,050,530, Cl. 177-1.000.
Pitocchi, Omero, to Raymond Lee Organization, Inc., The. Can opener gun. 4,050,155, Cl. 30-400.000.
Pitt, Harold M., to Stauffer Chemical Company. Process for the manufacture of α-chloropropionyl chloride. 4,051,182, Cl. 260-544.00Y.
Plant, Howard L.; Zukel, John W.; and Ames, Ronald B., to Uniroyal Inc. Regulation of the natural growth or development of plants with 2-sulfinyl or 2-sulfonyl pyridine N-oxide compounds. 4,050,921, Cl. 71-94.000.
Plastic Injectors, Inc.: *See*—
Burchette, Robert L., Jr.; and Harris, Edward J., 4,050,645, Cl. 242-125.100.
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Cremers, Adrien Edgard Henri Julien; Maes, Andre Petrus Adolf; and Pleysier, Jozef Leonia, 4,051,026, Cl. 210-38.00B.
Plumlee, Karl W.; and Vernon, Lonnie W., to Exxon Research & Engineering Co. Coal liquefaction process. 4,051,012, Cl. 208-8.000.
Plymate, Robert R. Method of preparing bovine colostrum for use in treating livestock. 4,051,235, Cl. 424-85.000.
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Verkins, Wayne R.; Podvin, Richard T.; and Rist, Karl Frederick, III, 4,050,971, Cl. 156-69.000.
Poedinschikov, Jury Grigorievich: *See*—
Zaikovsky, Vladimir Borisovich; Kutuzov, Jury Prokhorovich; Zakharov, Mikhail Fedorovich; Kavtaev, Evgeny Emelyanovich; Poedinschikov, Jury Grigorievich; Bazhanov, Jury Mikhailovich; and Schapov, Valentin Andrianovich, 4,050,288, Cl. 72-468.000.
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Pohl, Gerhard: *See*—
Knorre, Helmut; Fischer, Joachim; and Pohl, Gerhard, 4,051,228, Cl. 423-268.000.
Pohlke, Rolf: *See*—
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Poland, Robert L., to Chromalloy American Corporation. Folding wing disc harrow. 4,050,523, Cl. 172-311.000.
Polanyi, Michael Lajos; and Ostrowski, David Stanley, to American Optical Corporation. Reflection standard for fiber optic probe. 4,050,450, Cl. 128-2.00L.
Polaroid Corporation: *See*—
Laskin, Irving; and Van Allen, David, 4,051,492, Cl. 354-86.000.
Pollinger, Hans; and Scheffel, Bernd, to Knorr-Bremse GmbH. Automatic brake resetting device. 4,050,553, Cl. 188-203.000.
Polygulf Associates: *See*—
Horowitz, Carl; Dichter, Michael; and Shah, Navinchandra Bhogilal, 4,051,090, Cl. 260-23.70M.
Polysius AG: *See*—
Goldmann, Wolf; Schepers, Georg; Heinemann, Otto; Schmits, Heinz-Herbert; and Ritzmann, Horst, 4,050,883, Cl. 432-14.000.
Pompei, Arturo; and Winters, Alden Bernard, to Boeing Company, The. Aircraft interior ceiling panel assembly and attachment apparatus. 4,050,208, Cl. 52-460.000.
Ponczak, Samuel: *See*—
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Pontier, Andre J. A.: *See*—
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Portable Laboratories, Inc.: *See*—
Dykstra, Donald P., 4,050,752, Cl. 312-243.000.
Porubcansky, Kenneth J.: *See*—
Morrow, James G., Sr.; Pech, David J.; Hunter, Charles A., II; and Porubcansky, Kenneth J., 4,050,586, Cl. 212-59.00R.
Possell, Clarence R.; and Winkler, Robert J. Energy saving garbage disposal unit. 4,050,636, Cl. 241-46.00B.
Post Office, The: *See*—
Greenaway, Philip Ernest; and Rollett, John Mortimer, 4,051,385, Cl. 307-233.00R.
Potomac Applied Mechanics, Inc.: *See*—
Stubbings, James H., 4,050,336, Cl. 83-486.100.
Stubbings, James Henry, 4,051,342, Cl. 219-60.00A.
Potter, James Charles: *See*—
Hollett, Reginald; and Potter, James Charles, 4,050,437, Cl. 123-139.0AC.
Power, John M., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Electrically detonated explosive device. 4,050,382, Cl. 102-16.000.
Powers, Harold C.; and Cambron, Robert B., to Caterpillar Tractor Co. Oil damped piston. 4,050,360, Cl. 92-127.000.
Pramstraller, Wilmuth, to Durst AG. Fabrik Fototechnischer Apparate Bozen. Lamp-adjusting mechanism, particularly for photographic enlarging apparatus. 4,050,813, Cl. 355-67.000.
Pramstraller, Wilmuth, to Durst S.p.A. Fabbrica Macchine ed Apparecchi Fototecnici. Photographic enlarging apparatus with hinged image holder. 4,050,815, Cl. 355-75.000.
Pravda, Milton F.: *See*—
Bienert, Walter B.; and Pravda, Milton F., 4,050,509, Cl. 165-45.000.
Prenn, Otto E., to Steel Company of Canada, Limited, The. Paraffin sucker rod scraper and rod centralizer. 4,050,514, Cl. 166-176.000.
Prescott, John Fraser; and Sanford, Emerson Cecil, to Atomic Energy of Canada Ltd. Process for the reclamation of alkali metal alkylamides. 4,051,185, Cl. 260-561.00R.
Prickett, Robert J.: *See*—
Archer, Donald H.; McOwen, Sherwood A., Jr.; and Prickett, Robert J., 4,051,476, Cl. 343-700.0MS.
Priegel, Jack C., to Autotronic Controls Corporation. Electronic carburetion system for low exhaust emissions of internal combustion engines. 4,050,878, Cl. 431-90.000.
Prince, Anthony; Halpern, Otto; and Ackrell, Jack, to Syntex (U.S.A.) Inc. 6,11-Dihydrodibenzo-[b.e.]-thiepin-11-one-3-carboxaldehyde. 4,051,148, Cl. 260-327.00B.
Princeton Electronic Products, Inc.: *See*—
Waxman, Albert S., 4,051,406, Cl. 313-391.000.
Pristash, David J. Power drive system. 4,050,536, Cl. 180-66.00B.
Privee, James A., to United States of America, Navy. Digital amp-hour monitor. 4,051,424, Cl. 320-48.000.
Procter & Gamble Company, The: *See*—
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Gieske, Henry Anthony; and Juneja, Prem Sagar, 4,051,234, Cl. 424-52.000.
Hartman, William Law, 4,051,056, Cl. 252-99.000.
Peterson, Donald J., 4,051,279, Cl. 427-355.000.
Shires, Philip John; and Kennedy, Timothy James, 4,051,268, Cl. 426-548.000.
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Produits Chimiques Ugine Kuhlmann: *See*—
Dupre, Victor Marie; Pechmeze, Jacques Pierre Edmond; and Sureau, Robert Frederic Michel, 4,051,145, Cl. 548-372.000.
Proehl, Norman P., to Proehl, Norman P. Dredge cutter head. 4,050,170, Cl. 37-67.000.
Proskow, Stephen, to Du Pont de Nemours, E. I., and Company. Ultraviolet screening agents and coating materials containing organosilane ester groups. 4,051,161, Cl. 260-448.8QR.
Protze, Karl-Heinz, to Eltra KG Leicht & Trambauer. Arrangement for detecting the presence of snow, ice and other freezing precipitation, particularly on railway track structures, and the like. 4,051,466, Cl. 340-234.000.
Protzman, Walter P.; and Evans, George L., to Schering Corporation. Serologic test for systemic candidiasis. 4,051,232, Cl. 424-12.000.
Provi, Mike A.; and Guinter, S. Robert, to Brearley Company, The. Platform type weighing scale. 4,050,532, Cl. 177-211.000.
Pugh, Stanley Frederick: *See*—
Nelson, Richard Stuart; Pugh, Stanley Frederick; and Smith, Michael John Stapley, 4,051,063, Cl. 252-301.10W.
Puklics, Maria: *See*—
Guczoghy, Lajos; Pfliegel, Todor; Puklics, Maria; Institoris, Laszlo; and Seres, Jeno, 4,051,156, Cl. 260-393.000.
Pulak, Richard P., to UOP Inc. Spent catalyst regeneration with internal and external regenerated-catalyst recycle means. 4,050,902, Cl. 23-288.00B.
Purdue Research Foundation: *See*—
Geddes, Leslie A.; and Bourland, Joe D., 4,051,539, Cl. 360-44.000.
Puritan-Bennett Corporation: *See*—
Friend, Jack M., 4,050,458, Cl. 128-145.800.
Purviance, John R. Game and game apparatus. 4,050,697, Cl. 273-139.000.
QSI Systems, Inc.: *See*—
Baxter, Larry K., 4,051,524, Cl. 358-108.000.
Quatrochi, Philip J.: *See*—
Adelman, Stanley M.; Ellington, Donal G.; and Quatrochi, Philip J., 4,050,347, Cl. 86-20.00R.
Query, Grady W.; and Query, O. Grady. Fluid dispersion method and apparatus. 4,050,629, Cl. 239-11.000.
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Query, Grady W.; and Query, O. Grady, 4,050,629, Cl. 239-11.000.
Quinlan, Patrick M., to Petrolite Corporation. Methylene phosphonates of polymerized polyalkylenepolyamines. 4,051,110, Cl. 260-72.00R.
R.C.M. Corporation: *See*—
Johnson, Arthur F., 4,050,925, Cl. 75-30.000.
Johnson, Arthur F., 4,050,999, Cl. 204-67.000.
Radiochemical Centre Ltd., The: *See*—
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Radloff, Marvin D.: *See*—
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Raffel, Reiner; Ebeling, Wilfried; Nadolski, Klaus; and Schulte, Klaus, to Maschinenfabrik Hennecke GmbH; and Bayer Aktiengesellschaft. Method and apparatus for the production of reaction mixtures from liquid reaction components. 4,050,896, Cl. 23-230.00A.
Raichle, Karl: *See*—
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Raine, Thomas: *See*—
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Rajchman, Jan Aleksander, to RCA Corporation. Apparatus and method for modulating a flat panel display device. 4,051,468, Cl. 340-324.00M.
Ralph B. Carter Company: *See*—
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Ralph M. Parsons Company, The: *See*—
McNamee, Gerald P.; Roszkowski, Theodore R.; Stanbridge, David W.; and White, Gerald A., 4,050,908, Cl. 48-210.000.
Ralston, Harold A.; and Christensen, Alton B., to J. I. Case Company. Multi-section harrow assembly. 4,050,522, Cl. 172-311.000.
Rame-Hart, Inc.: *See*—
Grat, Felix R., 4,050,822, Cl. 356-171.000.
Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Bicyclic hindered amino acids, metal salts thereof and stabilized compositions. 4,051,102, Cl. 260-45.80N.
Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Substituted piperazine diones and polymeric compositions stabilized thereby. 4,051,137, Cl. 260-268.0TR.

Rand, Royden N.: *See—*
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Ranke, Gerhard, to Linde Aktiengesellschaft. Process and apparatus for the production of hydrogen and carbon dioxide. 4,050,909, Cl. 55-68.000.
Rapoza, Edward J., to Becton, Dickinson and Company. Pipette aspirator device. 4,050,316, Cl. 73-425.600.
Raue, Roderich: *See—*
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Raufeisen, Robert: *See—*
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Rausch, David J.: *See—*
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Ray, Ranjan: *See—*
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Raychem Corporation: *See—*
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Biggs, Donald William; and Rayfield, Wilson Parker, 4,050,617, Cl. 226-1.000.
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Brown, Albert, 4,050,698, Cl. 273-152.410.
Davis, Robert, Jr., 4,050,334, Cl. 81-119.000.
DeToia, Vincent D., 4,050,652, Cl. 244-23.00C.
Hubbs, Robert J., 4,050,174, Cl. 42-59.000.
Lopez, Aaron; and Lopez, Juan, 4,050,231, Cl. 58-13.000.
Marceaux, Lionel J., 4,050,105, Cl. 4-243.000.
Pitocchi, Omero, 4,050,155, Cl. 30-400.000.
Samardzija, Momcilo M.; and Samardzija, Cheryl, 4,050,708, Cl. 280-47.260.
Smith, Lennie R., 4,050,455, Cl. 128-80.00F.
Raytheon Company: *See—*
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Rosvold, Warren C., 4,051,507, Cl. 357-60.000.
Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Herlihy, Patricia, to Sharps Associates. Oxo C-ring benzopyrans. 4,051,152, Cl. 260-345.300.
Razgaitis, Frank V.: *See—*
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RCA Corporation: *See—*
Ahmed, Adel Abdel Aziz, 4,051,391, Cl. 307-297.000.
Cochran, Larry Allen, 4,051,510, Cl. 358-28.000.
Harwood, Leopold Albert, 4,051,519, Cl. 358-21.000.
Harwood, Leopold Albert, 4,051,521, Cl. 358-30.000.
Heckman, LeRoy Francis, Jr., 4,051,447, Cl. 333-24.00R.
Rajchman, Jan Aleksander, 4,051,468, Cl. 340-324.00M.
Rosenthal, Bruce David; and Dingwall, Andrew Gordon Francis, 4,051,392, Cl. 307-297.000.
Rosnowski, Wojciech; and Ponczak, Samuel, 4,050,967, Cl. 148-189.000.
Sendelweck, Gene Karl, 4,051,518, Cl. 358-20.000.
Wheatley, Carl Franklin, Jr., 4,051,441, Cl. 330-288.000.
Reactor Centrum Nederland (Stichting): *See—*
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Rebadat, Siegfried; Mayer, Sigmund; and Alfranseder, Josef, to Hoechst Aktiengesellschaft. Process for reactivating silver catalysts used in the manufacture of ethylene oxide by direct oxidation. 4,051,068, Cl. 252-412.000.
Redmore, Derek; and Woodson, Alfred E., to Petrolite Corporation. Process of inhibiting scale formation with mixtures of thio-, oxygen or thio-oxygen phosphates and pyrophosphates. 4,051,029, Cl. 210-58.000.
Reeves, Charlie F., to United States of America, Navy. Parallel/time-shared variable time delay generator with common timing control and fast recovery. 4,051,390, Cl. 307-293.000.
Reggia, Frank; and Jones, Howard S., Jr., to United States of America, Army. Conformal edge-slot radiators. 4,051,480, Cl. 343-705.000.
Reibetanz, Wilbert; Wanner, Karl; and Hahner, Reinhard, to Robert Bosch G.m.b.H. Self drilling anchoring dowel. 4,050,345, Cl. 85-68.000.
Reichel, Fritz: *See—*
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Reid, Albert Richard, to Hercules Incorporated. Absorption rate of absorbent polymers by treating with glyoxal. 4,051,086, Cl. 260-17.4GC.
Reilly, Joseph R.: *See—*
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Reinhart, Frans Remko: *See—*
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de Boer, Jan; and Reinink, Jan, 4,050,151, Cl. 30-34.100.
Reiters, Ludvigs O., to Bofors America, Inc. Strain gage application. 4,050,976, Cl. 156-233.000.
Remington, Richard W., to Electron Emission Systems. Low-temperature thermionic emitter. 4,051,272, Cl. 427-54.000.
Reneau, Bobby J. Hot tap for pipeline. 4,050,720, Cl. 285-18.000.
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Reni, Mario, 4,050,406, Cl. 118-19.000.
Reni, Mario, to Reni-Cirillo S.r.l. Coating machine for confectionery, pharmaceuticals and similar products. 4,050,406, Cl. 118-19.000.
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Hopkins, John Root; Renn, Robert Maurice; and Southard, Robert Keith, 4,050,764, Cl. 339-103.00M.
Rennie, John: *See—*
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Rentschler, Waldemar; and Starp, Franz, to Carl Zeiss Stiftung. Single lens reflex camera with interchangeable lens. 4,051,495, Cl. 354-152.000.
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Reuter, Franz Gottfried; and Menzel, Tankred, 4,051,094, Cl. 260-29.60M.
Reynolds, George A.: *See—*
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Rhone-Poulenc-Textile: *See—*
Bolliand, Robert; and Saligny, Claude, 4,050,982, Cl. 162-100.000.
Rice, Clifford Brant; and Mastroianni, David Paul, to Rice Packaging Inc. Carton end closure and reinforcing construction. 4,050,625, Cl. 229-38.000.
Rice, Jessie A. Multi-angle sander. 4,050,194, Cl. 51-128.000.
Rice Packaging Inc.: *See—*
Rice, Clifford Brant; and Mastroianni, David Paul, 4,050,625, Cl. 229-38.000.
Richard, Douglas B. Roll-up truck cover assembly. 4,050,734, Cl. 296-98.000.
Richard Wolf GmbH: *See—*
Wurster, Helmut, 4,051,431, Cl. 324-61.00R.
Richards, Mildred C.: *See—*
Samour, Carlos M.; and Richards, Mildred C., 4,051,158, Cl. 260-404.500.
Richman, Edward B., to Avery International Corporation. Single substrate tab fastener. 4,050,121, Cl. 24-73.0VA.
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, to Upjohn Company, The. Araliphatic diisocyanates. 4,051,166, Cl. 260-453.0AR.
Richtzenhain, Hermann: *See—*
Gelbein, Abraham P.; Janssen, Paul, deceased; and Richtzenhain, Hermann, 4,051,140, Cl. 260-290.00P.
Ricoh Co., Ltd.: *See—*
Koizumi, Yutaka; and Iwanaga, Yoshiharu, 4,050,812, Cl. 355-66.000.
Kondoh, Mitsuru, 4,051,537, Cl. 358-264.000.
Miyakawa, Seiichi; and Eda, Tadahiro, 4,050,806, Cl. 355-14.000.
Yamauchi, Satoshi; and Yamazaki, Shigeru, 4,050,165, Cl. 35-8.00A.
Ridgeway, Rex L. Portable water bailing device for a boat. 4,050,396, Cl. 114-183.00R.
Riede, Gerhard, to Gambro AG. Device for diffusion of substances between two fluids through semipermeable membranes. 4,051,041, Cl. 210-321.00B.
Riemann, Hanns-Helmut: *See—*
Luchsinger, Peter; Muckenheim, Heribert; Riemann, Hanns-Helmut; Sonnenschein, Hans; and Michel, Erich, 4,050,387, Cl. 110-8.00A.
Riester, Hubert: *See—*
Evans, Daniel J.; and Riester, Hubert, 4,050,305, Cl. 73-209.000.
Rigassi, Norbert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwiester, Ulrich; and Suchy, Milos, 4,051,319, Cl. 542-413.000.
Riggs, Ray Vere: *See—*
Bogue, Robert Edgar; Jones, Donald Keith; Riggs, Ray Vere; and Vogele, Bruno Joseph, 4,050,655, Cl. 244-137.00R.
Rigo, Larry E. Junction box terminal block. 4,050,770, Cl. 339-198.00G.
Rigsby, Jesse H., to Pan-X Corporation. Telephone alarm system. 4,051,327, Cl. 179-5.00R.
Riken Keikinzoku Kogyo Kabushiki Kaisha: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, 4,050,142, Cl. 29-403.000.
Riker Laboratories, Inc.: *See—*
Schuppan, Dietrich; Gerster, John F.; and Leir, Charles M., 4,051,247, Cl. 424-258.000.
Rist, Karl Frederick, III: *See—*
Verkins, Wayne R.; Podvin, Richard T.; and Rist, Karl Frederick, III, 4,050,971, Cl. 156-69.000.
Ritzmann, Horst: *See—*
Goldmann, Wolf; Schepers, Georg; Heinemann, Otto; Schmits, Heinz-Herbert; and Ritzmann, Horst, 4,050,883, Cl. 432-14.000.
Roach, Charles J., to Pall Corporation. Vortex air cleaner assembly with acoustic attenuator. 4,050,913, Cl. 55-276.000.
Roach, Charles J.: *See—*
Pall, David B.; and Roach, Charles J., 4,050,237, Cl. 60-39.080.
Robbins, Dennis R. Remote control for an arc welding machine. 4,051,344, Cl. 219-132.000.
Robbins, Joseph Henry, deceased (by Guy, George Trevor Palfreyman and Roger Jerome, executors); and Acton, John Edward, to Tangye Limited. Hydraulic jack. 4,050,674, Cl. 254-93.00H.
Robert Bosch G.m.b.H.: *See—*
Adalbert, Gerhard; Hess, Jurgen; and Hecht, Ulrich, 4,050,263, Cl. 62-243.000.
Poetsch, Dieter, 4,051,511, Cl. 358-29.000.
Reibetanz, Wilbert; Wanner, Karl; and Hahner, Reinhard, 4,050,345, Cl. 85-68.000.
Robinson, Charles A., to American Home Products Corporation (Del.). Intermediates for preparing cephalosporins. 4,051,131, Cl. 544-28.000.
Rockwell International Corporation: *See—*
Anders, Ronald J., 4,050,836, Cl. 408-20.000.
Hooker, Marvin L., Jr., 4,051,473, Cl. 343-7.00A.
McFadden, Thomas A., 4,050,814, Cl. 355-71.000.
Rocquet, Francois Louis Albert: *See—*
Mattioda, Georges Dominique; and Rocquet, Francois Louis Albert, 4,051,244, Cl. 424-250.000.
Rode, Daniel Leon, to Bell Telephone Laboratories, Incorporated. Growing smooth epitaxial layers on misoriented substrates. 4,050,964, Cl. 148-171.000.
Rodionov, Jury Nikolaevich: *See—*
Lavrentiev, Konstantin Nikitich; Borisova, Natalya Isaakievna; Vasiliev, Jury Ivanovich; Rodionov, Jury Nikolaevich; Strashinsky, Vadim Konstantinovich; Ioffe, Vladimir Fedorovich; and Vyatskin, Iosif Yakovlevich, deceased, 4,051,422, Cl. 318-570.000.
Roetling, Paul G., to Xerox Corporation. Electronic halftone imaging system. 4,051,536, Cl. 358-298.000.
Rogers, George Alvin, to Modesett Engineering & Mfg. Mounting bracket. 4,050,663, Cl. 248-316.00A.
Rogers, Jack M.: *See—*
Tsoucalas, Michael; Barclay, Kenneth W.; and Rogers, Jack M., 4,051,159, Cl. 260-404.500.
Roggenkamp, Ray Lawrence: *See—*
Neti, Radhakrishna Murty; and Roggenkamp, Ray Lawrence, 4,051,006, Cl. 204-195.00P.
Rogoff, Gerardo: *See—*
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Rohm and Haas Company: *See—*
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Rohrl, Franz; Ackermann, Josef; and Detterbeck, Heinrich, to Siemens Aktiengesellschaft. Method and apparatus for baking food in a closed cooking space in which heated air is circulated. 4,051,347, Cl. 219-400.000.
Rollei-Werke Franke & Heidecke: *See—*
Mielke, Bodo, 4,051,502, Cl. 354-249.000.
Rollett, John Mortimer: *See—*
Greenaway, Philip Ernest; and Rollett, John Mortimer, 4,051,385, Cl. 307-233.00R.
Rolls-Royce Motors Limited: *See—*
Hawksworth, Frederick James, 4,050,320, Cl. 74-112.000.
Rolls-Royce (1971) Limited: *See—*
Needham, Peter Richard; and Langley, Kenneth Richard, 4,050,843, Cl. 415-116.000.
Romick, Rowland C., to Eaton Corporation. Four-wheel drive vehicle with drive transfer gear assembly. 4,050,328, Cl. 74-711.000.
Ronco, Karl, to Ciba-Geigy Corporation. Disazo pigments containing tetracarboxylic acid ester groups. 4,051,122, Cl. 260-174.000.
Rose, John Brewster: *See—*
Barr, Dennis Arthur; and Rose, John Brewster, 4,051,109, Cl. 260-49.000.
Rose, Larry Edward; and Lawrence, Norman Francis, to General Foods Corporation. Method of making puffed dough pieces of varying configuration. 4,051,162, Cl. 426-448.000.
Rose, Leslie C.: *See—*
Hamrick, Joseph T.; and Rose, Leslie C., 4,050,515, Cl. 166-303.000.
Rosenfeld, Jerold C.: *See—*
Gouinlock, Edward V., Jr.; and Rosenfeld, Jerold C., 4,051,106, Cl. 260-47.00C.
Rosenthal, Bruce David; and Dingwall, Andrew Gordon Francis, to RCA Corporation. Circuit for starting current flow in current amplifier circuits. 4,051,392, Cl. 307-297.000.
Roser, Horst R.: *See—*
Arndt, Erhard; Brodmann, Nikolaus; and Roser, Horst R., 4,050,984, Cl. 176-60.000.
Rosnowski, Wojciech; and Ponczak, Samuel, to RCA Corporation. Method of selective aluminum diffusion. 4,050,967, Cl. 148-189.000.
Ross, Donald R., Jr., to U-S Safety Trolley Corporation. Trolley rail assembly. 4,050,555, Cl. 191-23.00A.
Ross, Richard: *See—*
Neal, Ronald D.; Ross, Richard; and Hein, Joseph N., 4,050,651, Cl. 244-15.000.
Rossio, John H., to LaRos Equipment Company, Inc. Belt conveyor. 4,050,575, Cl. 198-834.000.
Rosvold, Warren C., to Raytheon Company. Semiconductor structures. 4,051,507, Cl. 357-60.000.
Roszkowski, Theodore R.: *See—*
McNamee, Gerald P.; Roszkowski, Theodore R.; Stanbridge, David W.; and White, Gerald A., 4,050,908, Cl. 48-210.000.
Roth, Marvin E.; and Vallere, Donald J., to Western Electric Company, Inc. Sputtering apparatus. 4,051,010, Cl. 204-298.000.
Rothenstein, Julius: *See—*
Goldhagen, Samuel; Heller, Harry; and Rothenstein, Julius, 4,050,968, Cl. 149-19.400.
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Bonin, Jean Claude, 4,050,193, Cl. 51-101.00R.
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Hardy, Michel; and Humbert, Daniel, 4,051,249, Cl. 424-270.000.
Rowan, Robert A. Combined turnplow and subsoiler. 4,050,521, Cl. 172-196.000.
Rowlett, Glenford: *See—*
Stephens, Frederick N.; Rowlett, Glenford; and Beard, James D., 4,050,222, Cl. 53-381.00R.
Roy, Leo T., to Craft, Inc. Easel hinge construction. 4,050,117, Cl. 16-178.000.
Rubinfeld, Joseph: *See—*
Godfrey, John Carl; and Rubinfeld, Joseph, 4,051,315, Cl. 536-10.000.
Ruby, Max H. Stoma irrigation system. 4,050,461, Cl. 128-227.000.
Rucker, Dieter: *See—*
Wolfle, Rudolf; Rucker, Dieter; and Lauerer, Uta, 4,050,966, Cl. 148-188.000.
Rudy, Christopher John, to Thresher Institutes Incorporated. Accurate adjustable sling-shot. 4,050,439, Cl. 124-20.00R.
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse, Karl-Heinz, to WABCO Westinghouse GmbH. Digital wheel speed circuit arranged to compensate for dimensional irregularities of sensor rotor member. 4,050,747, Cl. 303-95.000.
Ruppert, Juergen: *See—*
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,051,188, Cl. 260-590.0FA.
Russell, James T., to Jacobs, Eli S. Optical data record copier having array of lenses with field gaps aligned with data gaps. 4,050,811, Cl. 355-46.000.
Russell, Robert G., to Owens-Corning Fiberglas Corporation. Method and apparatus for forming kinky fibers from glass. 4,050,916, Cl. 65-2.000.
Ruti Machinery Works Ltd.: *See—*
Muller, Walter, 4,050,481, Cl. 139-436.000.
Steiner, Alois, 4,050,480, Cl. 139-55.100.
Rzeszewski, Theodore S.: *See—*
Hilbert, Francis H.; and Rzeszewski, Theodore S., 4,051,532, Cl. 358-142.000.
S.A.E.S. Getters S.p.A.: *See—*
Murphy, David R., 4,050,914, Cl. 55-387.000.
S.A.R. L. Salice France: *See—*
Salice, Luciano, 4,050,116, Cl. 16-163.000.
Saari, Walfred S., to Merck & Co., Inc. Amino acid esters. 4,051,169, Cl. 560-40.000.
Sagami Chemical Research Center: *See—*
Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,051,151, Cl. 260-329.00S.
Saggers, David Thomas: *See—*
Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, 4,051,154, Cl. 260-346.220.
Saito, Akio: *See—*
Shimizu, Bunji; Saito, Akio; Kaneko, Masakatsu; Yanagisawa, Hiroaki; and Nakao, Hideo, 4,051,129, Cl. 544-21.000.
Saito, Mitsuo: *See—*
Shichida, Hiromichi; Katsube, Hideo; Oyama, Shigeaki; Toyoda, Kenichi; and Saito, Mitsuo, 4,050,837, Cl. 408-35.000.
Saito, Takeo; and Seki, Youichi, to Seiko Koki Kabushiki Kaisha. Exposure time control device for electric camera shutter. 4,051,489, Cl. 354-23.00D.
Saito, Toshihisa: *See—*
Inoue, Nobuyoshi; and Saito, Toshihisa, 4,051,501, Cl. 354-239.000.
Saitou, Tadashi: *See—*
Sakai, Toshimitsu; Saitou, Tadashi; and Suzuki, Isamu, 4,050,861, Cl. 417-471.000.
Sakai, Kiyotoshi. Method and apparatus for controlling the furnace top gas pressure of blast furnaces. 4,050,679, Cl. 266-44.000.
Sakai, Naomi: *See—*
Shimomura, Raiji; Habu, Toru; Itoh, Hisaaki; Sakai, Naomi; and Goto, Tatsuo, 4,050,293, Cl. 73-105.000.
Sakai, Toshimitsu; Saitou, Tadashi; and Suzuki, Isamu, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Kogyo Kabushiki Kaisha. Diaphragm pump. 4,050,861, Cl. 417-471.000.
Sakamaki, Hiroshi; and Maeda, Toshiyuki, to Nippon Piston Ring Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Dry air rotary pump or compressor. 4,050,855, Cl. 418-131.000.
Sakamoto, Eiichi: *See—*
Habu, Teiji; Ishihara, Masao; Sakamoto, Eiichi; Yamada, Hiroshi; and Kaneshige, Masaaki, 4,050,940, Cl. 96-114.500.
Sakamoto, Yoshio: *See—*
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Sala, Angelo: *See—*
Ferrentino, Antonio; Brovedan, Antonio; and Sala, Angelo, 4,050,867, Cl. 425-114.000.
Sales, Maurice, to Societe Pyreneenne du Silico-Manganese. Process for the passivation of ferrosilicon. 4,050,957, Cl. 148-6.300.
Salice, Luciano, to S.A.R. L. Salice France. Self-closing hinge. 4,050,116, Cl. 16-163.000.
Saligny, Claude: *See—*
Bolliand, Robert; and Saligny, Claude, 4,050,982, Cl. 162-100.000.

Salzgeber, Daniel Edwin: *See—*
Davis, Charles W.; Raufeisen, Robert; and Salzgeber, Daniel Edwin, 4,050,432, Cl. 123-139.0AQ.

Samardzija, Cheryl: *See—*
Samardzija, Momcilo M.; and Samardzija, Cheryl, 4,050,708, Cl. 280-47.260.

Samardzija, Momcilo M.; and Samardzija, Cheryl, to Raymond Lee Organization, Inc., The. Hamper and cart. 4,050,708, Cl. 280-47.260.

Samour, Carlos M.; and Richards, Mildred C., to Kendall Company, The. Monomeric emulsion stabilizers derived from alkyl/alkenyl succinic anhydride. 4,051,158, Cl. 260-404.500.

Samuel Bingham Co.: *See—*
Karmell, Yale, 4,051,095, Cl. 260-31.8DR.

Samuel Moore and Company: *See—*
Thomas, Robert J.; and Jones, Marvin H., 4,050,327, Cl. 74-502.000.

Samuelson, Hans Olof: *See—*
Jamieson, Allan Geoffrey; Samuelson, Hans Olof; Smedman, Leif Ake; and Sondell, Kent Ivar, 4,050,981, Cl. 162-37.000.

Sanchez, Anacleto Montero. Hypodermic syringe. 4,050,459, Cl. 128-218.00C.

Sanderow, Howard I.; and Merz, Kenneth M., to Stanadyne, Inc. Impervious metal object and method of making the same. 4,050,933, Cl. 75-246.000.

Sanders Associates, Inc.: *See—*
Hayner, Paul F.; Eldridge, David G.; Bernier, Edgar R.; and Henderson, Richard B., 4,050,476, Cl. 137-625.620.

Sanders, Franklin C. Velocity sensitive dual rate shock strut. 4,050,684, Cl. 267-65.00R.

Sanderson, Charles H. Method and apparatus for treating liquid fuel. 4,050,426, Cl. 123-119.00E.

Sanderson, Gary Warner; Hoefler, Andrew Charles; Graham, Harold Nathaniel; and Coggon, Philip, to Thomas J. Lipton, Inc. Cold water extractable tea leaf and process. 4,051,264, Cl. 426-52.000.

Sandoz, Inc.: *See—*
Anderson, Paul L.; and Nadelson, Jeffrey, 4,051,261, Cl. 424-331.000.

Sandoz Ltd.: *See—*
Altermatt, Ruedi, 4,051,120, Cl. 260-158.000.
Dore, Jacky, 4,051,116, Cl. 260-145.00A.
Tcherkinsky, Boris; and Wasem, Hans, 4,051,121, Cl. 260-174.000.

Sanford, Emerson Cecil: *See—*
Prescott, John Fraser; and Sanford, Emerson Cecil, 4,051,185, Cl. 260-561.00R.

Sanford, Gary G.: *See—*
Murphy, Lawrence R.; and Sanford, Gary G., 4,051,477, Cl. 343-700.0MS.

Sankyo Company Limited: *See—*
Shimizu, Bunji; Saito, Akio; Kaneko, Masakatsu; Yanagisawa, Hiroaki; and Nakao, Hideo, 4,051,129, Cl. 544-21.000.
Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, 4,051,320, Cl. 542-420.000.

Sanpei, Kiyoji: *See—*
Ishihara, Takao; Sanpei, Kiyoji; Nabatame, Hiroshi; and Motokawa, Shoichi, 4,050,910, Cl. 55-96.000.

SAPAL Societe Anonyme des Plieuses Automatiques: *See—*
Chenevard, Alexis; and Torres, Jean, 4,050,574, Cl. 198-458.000.

Sarace, John C.: *See—*
Ipri, Alfred C.; and Sarace, John C., 4,050,965, Cl. 148-175.000.

Sarjeant, Walter J., to Canadian Patents & Development Limited. Attenuator for measuring high voltage fast rise time pulses. 4,051,432, Cl. 324-72.500.

Sasaki, Shiro: *See—*
Yamada, Makoto; Sasaki, Shiro; Kanazawa, Shigenori; and Hayashi, Yoshihiro, 4,050,717, Cl. 280-744.000.

Sasaki, Susumu: *See—*
Takemura, Takeshi; Katoh, Yoshihisa; Kurita, Shigeyuki; Sasaki, Susumu; Funabiki, Kyohei; and Hatano, Keizo, 4,051,098, Cl. 260-38.000.

Sato, Katsujiro: *See—*
Inada, Masami; Kawabata, Yasuhiro; Sato, Katsujiro; and Osanai, Akinori, 4,050,423, Cl. 123-117.00A.

Sato, Susumu; and Tsunemitsu, Hideo, to Nippon Electric Company, Ltd. Semiconductor device having multistepped bump terminal electrodes. 4,051,508, Cl. 357-71.000.

Sato Tekko Co., Ltd.: *See—*
Tada, Seiji, 4,050,273, Cl. 72-69.000.

Sato, Toshio: *See—*
Sato, Yasuhiro; Sato, Toshio; Kawasaki, Shuichi; Takaishi, Toshio; Okuyama, Sadao; and Yamanashi, Norio, 4,050,371, Cl. 99-550.000.

Sato, Yasuhiro; Sato, Toshio; Kawasaki, Shuichi; Takaishi, Toshio; Okuyama, Sadao; and Yamanashi, Norio, to Toyo Seikan Kaisha Ltd. Fruit treating apparatus. 4,050,371, Cl. 99-550.000.

Sattler, Frederick P.: *See—*
Hancock, Warren D.; and Sattler, Frederick P., 4,050,893, Cl. 8-94.110.

Saucy, Gabriel: *See—*
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Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Novel bicycloalkane derivatives and the production thereof. 4,051,188, Cl. 260-590.0FA.

Saurer-Allma GmbH Allgauer Maschinenbau: *See—*
Berend, Wolfgang, 4,050,227, Cl. 57-34.500.

Saviano, A.G.: *See—*
Boyer, Jo Clara, 4,050,268, Cl. 66-19.000.

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Okamoto, Tomiyasu; Nishimoto, Tsunanori; Sawada, Kaoru; Hayakawa, Koji; and Kurihara, Tomomichi, 4,050,609, Cl. 220-9.0LG.

Sawano, Keijiro. Quick replay device. 4,050,699, Cl. 274-15.00A.

Saxon, Bernhard. Industrial floor cleaning machine with vacuum dust collector. 4,050,112, Cl. 15-300.00A.

Sayce, Ethel Margaret Lindsay, executrix: *See—*
Sayce, Leonard Alfred, deceased; and Pettigrew, Robert Martin, 4,051,367, Cl. 250-237.00G.

Sayce, Leonard Alfred, deceased (by Sayce, Ethel Margaret Lindsay, executrix); and Pettigrew, Robert Martin, to National Research Development Corporation. Measurement apparatus. 4,051,367, Cl. 250-237.00G.

Sayer, Raymond Oliver, to M.I.M. Rolling Consultants (H.K.) Limited. Rod rolling. 4,050,280, Cl. 72-234.000.

Sayers, Bernard. Balloon. 4,050,653, Cl. 244-32.000.

Schaab, Rudolph S.; and Harralson, John C. Sliver high pile fabric knitting machine. 4,050,267, Cl. 66-9.00B.

Schaar, Charles H., to Colgate-Palmolive Company. Diapers. 4,050,463, Cl. 128-287.000.

Schacht, Erich; Mehrhof, Werner; Simane, Zdenek; Kayser, Detlev; and Nowak, Herbert, to Merck Patent Gesellschaft mit beschrankter Haftung. Diphenoxyacetic acid derivatives. 4,051,170, Cl. 560-62.000.

Schacht, Erich; Mehrhof, Werner; Simane, Zdenek; and Nowak, Herbert, to Merck Patent Gesellschaft mit beschrankter Haftung. Phenoxyalkanol derivatives. 4,051,173, Cl. 560-255.000.

Schaefer, Hartmann: *See—*
Hein, Helmut; Hermann geb Gleissner, Rosmarie; and Schaefer, Hartmann, 4,051,253, Cl. 424-285.000.

Schapov, Valentin Andrianovich: *See—*
Zaikovsky, Vladimir Borisovich; Kutuzov, Jury Prokhorovich; Zakharov, Mikhail Fedorovich; Kavtaev, Evgeny Emelyanovich; Poedinschikov, Jury Grigorievich; Bazhanov, Jury Mikhailovich; and Schapov, Valentin Andrianovich, 4,050,288, Cl. 72-468.000.

Scheer, Wolfgang: *See—*
Heissler, Herbert; Hitsch, Eckart; and Scheer, Wolfgang, 4,050,997, Cl. 204-28.000.

Scheffel, Bernd, to Knorr-Bremse GmbH. Automatic brake resetting device. 4,050,554, Cl. 188-203.000.

Scheffel, Bernd: *See—*
Pollinger, Hans; and Scheffel, Bernd, 4,050,553, Cl. 188-203.000.

Scheithauer, Eric A., to Cook Electric Company. Gas tube arrester protector. 4,051,546, Cl. 361-124.000.

Schepers, Georg: *See—*
Goldmann, Wolf; Schepers, Georg; Heinemann, Otto; Schmits, Heinz-Herbert; and Ritzmann, Horst, 4,050,883, Cl. 432-14.000.

Schering Aktiengesellschaft: *See—*
Junghans, Klaus, 4,050,998, Cl. 204-59.00R.
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,051,188, Cl. 260-590.0FA.

Schering Corporation: *See—*
Protzman, Walter P.; and Evans, George L., 4,051,232, Cl. 424-12.000.

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Scherrer, Kurt, to U. Scharer Sohne AG, (USM). Braceable rail. 4,050,753, Cl. 312-257.0SK.

Scheuer, Raymond I.: *See—*
Thomas, Richard E.; Florence, Robert T.; Dalal, Rustom H.; and Scheuer, Raymond I., 4,051,283, Cl. 428-29.000.

Schichman, Daniel: *See—*
Neville, James J.; Ferrell, Wesley; and Schichman, Daniel, 4,050,973, Cl. 156-123.00R.

Schimitschek, Erhard J.: *See—*
Hammond, Peter R.; Schimitschek, Erhard J.; and Trias, John A., 4,051,062, Cl. 252-301.170.

Schlegel, Fred, to Eaton Corporation. Method and apparatus for aligning a valve head. 4,050,275, Cl. 72-92.000.

Schlussler, Hans-Joachim: *See—*
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,058, Cl. 252-186.000.
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,059, Cl. 252-186.000.

Schmedemann, Walter; and Hecker, Wolfgang, to U.S. Philips Corporation. Device for braking a counterweight in an x-ray examining apparatus. 4,050,551, Cl. 188-181.00C.

Schmidt, Fred L.; and Steffes, Frank J., to Crown Zellerbach Corporation. Selective delamination of wood chips. 4,050,980, Cl. 162-24.000.

Schmidt, Louis Charles; and Farbolin, Richard P., to Schmidt, Trustee under Harry J. Hoenselaar Trust Agreement of Oct. 4, 1973, Mary Jane. Spiral meat slicer with improved reciprocating knife structure. 4,050,370, Cl. 99-538.000.

Schmidt, Trustee under Harry J. Hoenselaar Trust Agreement of Oct. 4, 1973, Mary Jane: *See—*
Schmidt, Louis Charles; and Farbolin, Richard P., 4,050,370, Cl. 99-538.000.

Schmits, Heinz-Herbert: *See—*
Goldmann, Wolf; Schepers, Georg; Heinemann, Otto; Schmits, Heinz-Herbert; and Ritzmann, Horst, 4,050,883, Cl. 432-14.000.

Schmitt, Ewald, to Messer Griesheim GmbH. Device for linear measurement. 4,050,160, Cl. 33-141.00B.

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Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Henning, 4,050,962, Cl. 148-105.000.

Schneider, Myles Z.: *See—*
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Schober, Franz, to Bayerisches Leichtmetallwerk Graf Blucher von Wahlstatt KG. Method and apparatus for forging bevel gears. 4,050,283, Cl. 72-344.000.

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Scholten, James R., to United States of America, Navy. Catoptric lens arrangement. 4,050,775, Cl. 350-200.000.

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Schroter, Friedrich. Process and apparatus for blanking cardboard and the like. 4,050,362, Cl. 93-58.00R.

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Landwehrkamp, Hans; Hoeber, W. Gerhard; Goldammer, Georg; and Oexler, Rudolf, 4,050,228, Cl. 57-58.950.

Schuetz, Adolph August; and Bossak, Gary Edward, to Combustion Engineering, Inc. Discriminating flame detector. 4,051,375, Cl. 250-372.000.

Schulte, Klaus: *See—*
Raffel, Reiner; Ebeling, Wilfried; Nadolski, Klaus; and Schulte, Klaus, 4,050,896, Cl. 23-230.00A.

Schulz, Wallace W., to United States of America, Energy Research and Development Administration. Method for purifying bidentate organophosphorus compounds. 4,051,203, Cl. 260-990.000.

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Schwartz, Samuel, to Intel Corporation. Apparatus and method for composing digital information on a data bus. 4,051,358, Cl. 364-716.000.

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Bodem, Johann; and Raine, Thomas, 4,050,127, Cl. 407-107.000.

Schweickart, Albert John; Collins, Stephen Michael; and Bortak, John Joseph, to BASF Wyandotte Corporation. Bipolar electrolytic filter press cell frame. 4,051,009, Cl. 204-279.000.

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Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 4,051,319, Cl. 542-413.000.

Schwippert, Guustaaf Arthur; and Van Zeggeren, Wilhelm Aart, to Mars, Inc. Banknote escrow and stacker apparatus and method. 4,050,562, Cl. 194-4.00E.

Schwoerer, Danial W.: *See—*
Ahlgren, Raymond E.; Schwoerer, Danial W.; and Lundstrom, Boyce H., 4,050,947, Cl. 106-52.000.

Scoggins, Lacey E.; and Campbell, Robert W., to Phillips Petroleum Company. Copolyamide. 4,051,087, Cl. 260-18.00N.

Scott, Harley D., to Cyclops Corporation. Controlled destructive panel assembly. 4,050,204, Cl. 52-262.000.

Scott, Hubert D.: *See—*
Arnold, Dan M.; Paap, Hans J.; and Scott, Hubert D., 4,051,368, Cl. 250-270.000.

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Secor, Arthur D., to Great Lakes Industries, Inc. Expandable coreshafts. 4,050,643, Cl. 242-72.00R.

Sedam, Jason K.: *See—*
Amon, Anton; and Sedam, Jason K., 4,051,034, Cl. 210-206.000.

Seddon, Peter: *See—*
Bromfield, Ian Derek; and Seddon, Peter, 4,050,817, Cl. 355-133.000.

Sedlacek, Raymond. Lunch bucket and beverage bottle combination. 4,050,581, Cl. 206-544.000.

Segre, Eugene J., to Syntex (U.S.A.) Inc. Method of treating diseases by daily administration of 6-chloro-11β,17α,21-trihydroxypregna-1,4,6-triene-3,20-dione. 4,051,241, Cl. 424-243.000.

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Saito, Takeo; and Seki, Youichi, 4,051,489, Cl. 354-23.00D.

Seitz, Peter. Conveyor for stacking cases in a run-through storage structure. 4,050,561, Cl. 193-35.00R.

Seiverling, John S., to Aladdin Industries, Incorporated. Emergency mantle lamp for a gas stove. 4,050,442, Cl. 126-213.000.

Seki, Kunio; Suzuki, Yukio; and Sakamoto, Yoshio, to Hitachi, Ltd. Differential amplifier. 4,051,443, Cl. 330-258.000.

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Longhetto, Francesco, 4,050,314, Cl. 73-406.000.

Sendelweck, Gene Karl, to RCA Corporation. Burst gate pulse generator. 4,051,518, Cl. 358-20.000.

Seno, Shougo; Toyama, Tatsuro; Takai, Teruo; and Ueda, Yasuomi, to Hitachi, Ltd. Thick film integrated circuits. 4,051,550, Cl. 361-402.000.

Senoo, Tadao; and Honda, Kenji, to Ube Nitto Kasei Co., Ltd.; and Toyo Rope Manufacturing Co., Ltd. Rope. 4,050,230, Cl. 57-149.000.

Senske, Roger Alvin: *See—*
Andrews, Michael Joseph; Davis, William Allen; and Senske, Roger Alvin, 4,050,294, Cl. 73-105.000.

Senter, Jonas. Article of footwear with a three-dimension inset figure in its recessed sole and method of making the same. 4,050,167, Cl. 36-32.00R.

Sequin, Carlo Heinrich: *See—*
Krambeck, Robert Harold; Sequin, Carlo Heinrich; and Walden, Robert Henry, 4,051,505, Cl. 357-24.000.

Seres, Jeno: *See—*
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Sethna, Darius N.: *See—*
Winter, Heinrich; and Sethna, Darius N., 4,050,147, Cl. 29-599.000.

Seubert, Jurgen; Pohlke, Rolf; Thomas, Herbert; and Andrews, Peter, to Merck Patent Gesellschaft mit beschrankter Haftung. Ring substituted pyrazino-isoquinoline derivatives and their preparation. 4,051,243, Cl. 424-250.000.

Shaffer, David T.: *See—*
Harris, Robert M.; Mills, Gene F.; and Shaffer, David T., 4,050,603, Cl. 220-3.900.

Shah, Navinchandra Bhogilal: *See—*
Horowitz, Carl; Dichter, Michael; and Shah, Navinchandra Bhogilal, 4,051,090, Cl. 260-23.70M.

Shakertown Corporation: *See—*
Barker, Frank S., deceased; and Pehl, Willis G., 4,050,209, Cl. 52-478.000.

Shakespear, Horacio: *See—*
Denzer, Richard E.; Marsh, Gerald J.; and Shakespear, Horacio, 4,050,712, Cl. 280-278.000.

Sharpe, William N., Jr.; and Hollenberg, Glenn W., to United States of America, Air Force. Method for determining changes in spacing between two positions of interest. 4,050,818, Cl. 356-32.000.

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Razdan, Raj Kumar; Dalzell, Haldean Cloyce; and Herlihy, Patricia, 4,051,152, Cl. 260-345.300.

Shatterproof Glass Corporation: *See—*
Veigel, Neil D., 4,051,297, Cl. 428-336.000.

Shaw, Wilfrid G.; and Terrill, David B., to Standard Oil Company, The. Preparation of acrylic acid and methacrylic acid. 4,051,180, Cl. 260-530.00N.

Sheets, Herman E. Hydrodynamic transmission for ship propulsion. 4,050,849, Cl. 416-171.000.

Sheldon, Luther M., to General Electric Company. Cap and connector for five-wire applications. 4,050,774, Cl. 339-264.00R.

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Binsbergen, Frederik L.; and Van Namen, Dick J., 4,051,051, Cl. 252-59.000.
Pilgram, Kurt H. G., 4,050,918, Cl. 71-86.000.
Staudinger, Gernot; and Naber, Jaap E., 4,051,226, Cl. 423-244.000.

Shepard, Alvin F.; and Dannels, Bobby F., to Hooker Chemicals & Plastics Corporation. Cyclic ethers of phenolic compounds and polymers thereof. 4,051,189, Cl. 260-619.00A.

Sheppard, William L., to AVM Corporation. Fluid valve. 4,050,472, Cl. 137-242.000.

Shibayama, Kyoichi; Ono, Hiroshi; Jidai, Eiki; and Fujii, Akira, to Mitsubishi Denki Kabushiki Kaisha. Water-dispersion varnish for electrodeposition and process for making said water dispersion varnish. 4,051,091, Cl. 260-29.2TN.

Shibuya, Morioki: *See—*
Isa, Isao; Shibuya, Morioki; and Ebisawa, Makoto, 4,051,229, Cl. 423-478.000.

Shichida, Hiromichi; Katsube, Hideo; Oyama, Shigeaki; Toyoda, Kenichi; and Saito, Mitsuo, to Fujitsu Fanuc Limited. Drilling machine with automatic tool changer. 4,050,837, Cl. 408-35.000.

Shields, James R., Jr. Film-sound synchronization system. 4,050,794, Cl. 352-12.000.

Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Hikasa, Tadashi, to Sumitomo Chemical Company, Limited. Method for the heat recovery in the processes of the removal of nitrogen oxides from exhaust gases. 4,051,225, Cl. 423-235.000.

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Yamamoto, Yoshihiko; Shigenobu, Masahiro; and Kuwabara, Hideo, 4,051,045, Cl. 250-536.000.

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Shimada, Katsuji; and Shimada, Katsuyuki, 4,050,622, Cl. 229-19.000.

Shimada, Satoshi; Yamada, Kazuji; Matsuda, Yasumasa; Kimura, Ichiro; Shimazoe, Michitaka; and Takahashi, Yukio, to Hitachi, Ltd. Semiconductor pressure transducer. 4,050,313, Cl. 73-398.0AR.

Shimada, Satoshi: *See*—
Takeuchi, Kouichi; Itoh, Norio; Koyama, Kuniyoshi; Shimada, Satoshi; and Himuro, Masami, 4,051,513, Cl. 358-60.000.
Shimada, Wataru; and Hiramoto, Seigo, to Mitsubishi Denki Kabushiki Kaisha. Method of removing surface defects of a steel product. 4,050,958, Cl. 148-9.500.
Shimazoe, Michitaka: *See*—
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Shimizu, Shozo: *See*—
Imanari, Mamoru; Takeuchi, Makoto; Shimizu, Shozo; and Higuchi, Hisashi, 4,051,429, Cl. 324-.50A.
Shimomura, Raiji; Habu, Toru; Itoh, Hisaaki; Sakai, Naomi; and Goto, Tatsuo, to Hitachi, Ltd.; and Hitachi Metals, Ltd. Device for detecting the unevenness of a curved surface. 4,050,293, Cl. 73-105.000.
Shinagawa Refractories Co. Ltd.: *See*—
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Shinoki, Takanori: *See*—
Hayashi, Kazushige; Minemura, Norihiro; Fujimoto, Iwao; Ozaki, Kiyotaka; Yoshida, Norio; Morishita, Toshio; and Shinoki, Takanori, 4,051,287, Cl. 428-91.000.
Shipchandler, Mohammed T., to IMC Chemical Group, Inc. Steroid ethers. 4,051,128, Cl. 260-239.570.
Shirco, Ltd.: *See*—
Hobbs, Jim F.; and Smyser, Craig, 4,050,900, Cl. 23-277.00R.
Shires, Philip John; and Kennedy, Timothy James, to Procter & Gamble Company, The. Dry low calorie beverage crystals. 4,051,268, Cl. 426-548.000.
Shishido, Yoshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Speed change gear apparatus for an automobile transmission. 4,050,325, Cl. 74-473.00R.
Shoei Kagaku Kogyo Kabushiki Kaisha: *See*—
Asada, Eiichi, 4,051,074, Cl. 252-503.000.
Shoji, Akio: *See*—
Ishikawa, Noboru; Nakamura, Hidehisa; Maruyama, Kazuyoshi; and Shoji, Akio, 4,051,194, Cl. 260-836.000.
Shono, Tetsuji: *See*—
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Short, Clifton Stanley. Process and apparatus for drying grain in situ. 4,050,163, Cl. 34-22.000.
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Shults, Otto C.; and Boddicker, Major L. Sound producer. 4,050,186, Cl. 46-180.000.
Shultz, William E. Bearing race driver. 4,050,136, Cl. 29-724.000.
Shum, Yick-Mow: *See*—
Wu, Ching H.; Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 4,050,513, Cl. 166-274.000.
Shy, James L.: *See*—
Kohl, Robert F.; Karis, Lyle A.; and Shy, James L., 4,050,882, Cl. 432-14.000.
Sibler, Guenter W., to Sutton Engineering Company. Extrusion press with multipurpose side cylinders. 4,050,281, Cl. 72-265.000.
Siemens Aktiengesellschaft: *See*—
Mattern, Alfred, 4,051,328, Cl. 179-15.0AL.
Rohrl, Franz; Ackermann, Josef; and Detterbeck, Heinrich, 4,051,347, Cl. 219-400.000.
Wolfle, Rudolf; Rucker, Dieter; and Lauerer, Uta, 4,050,966, Cl. 148-188.000.
Sigel, Harry Dennis: *See*—
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Signode Corporation: *See*—
Kobiella, Robert J., 4,050,372, Cl. 100-2.000.
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Silverberg, Morton, to Xerox Corporation. Liquid ink imaging system. 4,050,804, Cl. 355-10.000.
Simak, Petr; Herrle, Karl; Haaf, Franz; and Hatzmann, Guenter, to BASF Aktiengesellschaft. Thermoplastic vinyl chloride polymer compositions with improved processing properties. 4,051,200, Cl. 260-899.000.
Simane, Zdenek: *See*—
Schacht, Erich; Mehrhof, Werner; Simane, Zdenek; Kayser, Detlev; and Nowak, Herbert, 4,051,170, Cl. 560-62.000.
Schacht, Erich; Mehrhof, Werner; Simane, Zdenek; and Nowak, Herbert, 4,051,173, Cl. 560-255.000.
Simmons, Jorge E.: *See*—
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Simpson, Earl L. Vehicle luggage carrier. 4,050,614, Cl. 224-29.00R.
Simpson Manufacturing Co., Inc.: *See*—
Gilb, Tyrell, 4,050,210, Cl. 52-639.000.
SKF Nova AB: *See*—
Lundgren, Bengt G. S.; and Ostling, Sture B. G., 4,050,949, Cl. 106-97.000.
Skingle, Thomas Jerome, to Acme-Cleveland Corporation. Radially adjustable rotary cutting tool. 4,050,840, Cl. 408-144.000.
Skoda, Stanislav: *See*—
Brozkova, Marie; Burysek, Frantisek; Janousek, Jan; Mikulecky, Karel; and Skoda, Stanislav, 4,050,226, Cl. 57-34.00R.
Slater, Charles A., Jr.; and Darby, Spencer, to Peterson Manufacturing Company. Lamp and mounting structure therefor. 4,051,360, Cl. 362-363.000.
Small, William M., to Phillips Petroleum Company. Stepwise turndown by closing heat exchanger passageways responsive to measured flow. 4,050,506, Cl. 165-1.000.
Smalley, Edmund W.: *See*—
Kurtz, Bruce E.; and Smalley, Edmund W., 4,051,193, Cl. 260-683.300.
Smedman, Leif Ake: *See*—
Jamieson, Allan Geoffrey; Samuelson, Hans Olof; Smedman, Leif Ake; and Sondell, Kent Ivar, 4,050,981, Cl. 162-37.000.
Smeltzer, Ronald K.; and Bean, Kenneth E., to Texas Instruments Incorporated. Process for thinning silicon with special application to producing silicon on insulator. 4,050,979, Cl. 156-647.000.
Smith, C. Ed: *See*—
Bussard, Leon M., 4,050,595, Cl. 214-84.000.
Smith, Charles S. Containerized liquid stirrer. 4,050,678, Cl. 366-130.000.
Smith, Hubert Stacy, to Dow Chemical Company, The. Insulation of vessels having curved surfaces. 4,050,607, Cl. 220-9.0LG.
Smith, James H.; and Kumpf, Sherman S., to NCR Corporation. Inking apparatus. 4,050,379, Cl. 101-327.000.
Smith, James K.: *See*—
Klein, Elias; Smith, James K.; and Morton, Frederick C., 4,051,300, Cl. 428-398.000.
Smith, Jerry L., to Telephone Utilities and Communications Industries, Inc. AC to DC power supply circuit. 4,051,425, Cl. 363-86.000.
Smith-Johannsen, Robert; and Moyer, Wendell W., Jr., to Raychem Corporation. Coated particles and conductive compositions therefrom. 4,051,075, Cl. 252-511.000.
Smith, Lennie R., to Raymond Lee Organization, Inc., The. Foot and leg brace. 4,050,455, Cl. 128-80.00F.
Smith, Michael John Stapley: *See*—
Nelson, Richard Stuart; Pugh, Stanley Frederick; and Smith, Michael John Stapley, 4,051,063, Cl. 252-301.10W.
Smith R.P.M. Corporation: *See*—
Smith, Roy R., Jr., 4,050,378, Cl. 101-147.000.
Smith, Richard E.: *See*—
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,050,688, Cl. 271-5.000.
Smith, Robert E., Jr.: *See*—
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Smith, Roy E., to Owens-Corning Fiberglas Corporation. Cross-shaped joint cover member for generally rectangular composite insulating panels forming wall portion of insulated cryogenic liquid container. 4,050,608, Cl. 220-9.0LG.
Smith, Roy R., Jr., to Smith R.P.M. Corporation. Metered spray dampening system. 4,050,378, Cl. 101-147.000.
Smith, Wendell F., Jr; and Reynolds, George A., to Eastman Kodak Company. Photographic elements incorporating chelated-metal quenching compounds. 4,050,938, Cl. 96-84.00R.
Smithgall, Harry E., to GTE Sylvania Incorporated. Base and socket means for an electron tube. 4,050,763, Cl. 339-111.000.
Smyser, Craig: *See*—
Hobbs, Jim F.; and Smyser, Craig, 4,050,900, Cl. 23-277.00R.
Snook, James Chetwood, to Chloride Group Limited. Electric batteries. 4,051,304, Cl. 429-94.000.
Snyder, Jan S.; and Bright, Clark I., to Xerox Corporation. Method and apparatus for inverting the polarity of an input image formed on a surface of an image recording device. 4,051,463, Cl. 340-173.0TP.
Societa' Italiana Resine S.I.R. S.p.A.: *See*—
Piccolo, Luigi; Calcagno, Benedetto; and Bossi, Emilio, 4,050,951, Cl. 106-300.000.
S.A. Beauplat Fils & Cie: *See*—
Allemand, Pierre M., 4,050,337, Cl. 83-552.000.
Societe Anonyme D.B.A.: *See*—
Carre, Jean-Jacques; and Muterel, Roland, 4,050,251, Cl. 60-550.000.
Societe Anonyme dite: Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Beauhaire, Pierre, 4,050,781, Cl. 350-96.00C.
Parent, Guy, 4,051,350, Cl. 364-432.000.
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Stauff, Emile J., 4,050,351, Cl. 89-1.701.
Societe d'Etudes Generales de Communications Industrielles et Civiles-Segic: *See*—
Desenfant, Andre L., 4,050,53R, Cl. 181-210.000.
Societe Pyreneenne du Silico-Manganese: *See*—
Sales, Maurice, 4,050,957, Cl. 148-6.300.
Sofrance S.A.: *See*—
Billault, Michel, 4,051,037, Cl. 210-236.000.
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Sokolowski, James H., to Upjohn Company, The. Treatment of genital tract diseases of domestic animals with prostaglandins. 4,051,238, Cl. 424-181.000.
Soleri, Richard A. Automatic carousel-type meat cutting machine. 4,050,339, Cl. 83-703.000.
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Sondhe, Ratanjit S. Treatment material and method for exposed aggregate concrete casting. 4,050,943, Cl. 106-12.000.

Sonnenschein, Hans: *See*—
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Sonobe, Hiroshi; Kato, Masaaki; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, to Mitsubishi Rayon Co., Ltd. Catalytic process for the preparation of unsaturated carboxylic. 4,051,179, Cl. 260-530.00N.
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Sordello, Frank J.: *See*—
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Sorensen, Bent, to Softal Elektronik Erik Blumenfeld KG. Electric discharge surface treating apparatus. 4,051,044, Cl. 250-531.000.
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South, William H.: *See*—
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Southgate, Donald Alan, to British Petroleum Company Limited, The. Method and apparatus for launching pipeline clearing spheres. 4,050,955, Cl. 134-8.000.
Souza, Thomas, Jr. Stairs and railing system for multi-floored buildings and method of constructing same. 4,050,203, Cl. 52-185.000.
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Watson, Richard D.; and Sowash, Thomas R., 4,050,771, Cl. 339-263.00R.
Spartus Corporation: *See*—
Jauch, Christian M. J., 4,050,236, Cl. 58-132.000.
Spence-Bate, Harry Arthur Hele. Microfiche handling device. 4,050,687, Cl. 271-3.100.
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Vecchia, Gino Dalla, 4,050,270, Cl. 68-158.000.
Sperry Rand Corporation: *See*—
Davies, Michael LaVar; Johnson, Richard Servern; Noker, Alvin John; and Wilde, Veldon Lawrence, 4,050,568, Cl. 197-90.000.
Matthews, Hugh B., 4,050,517, Cl. 166-315.000.
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Spinks, Ray E.: *See*—
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Spivack, John D.; and Luzzi, John J., to Ciba-Geigy Corporation. Benzoyloxybenzoates and compositions stabilized therewith. 4,051,104, Cl. 260-45.85B.
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Stanadyne, Inc.: *See*—
Davis, Charles W.; Raufeisen, Robert; and Salzgeber, Daniel Edwin, 4,050,432, Cl. 123-139.0AQ.
Sanderow, Howard I.; and Merz, Kenneth M., 4,050,933, Cl. 75-246.000.
Stanbridge, David W.: *See*—
McNamee, Gerald P.; Roszkowski, Theodore R.; Stanbridge, David W.; and White, Gerald A., 4,050,908, Cl. 48-210.000.
Standard Oil Company, The: *See*—
Shaw, Wilfrid G.; and Terrill, David B., 4,051,180, Cl. 260-530.00N.
Standard Telephones and Cables Ltd.: *See*—
Weston, Martin, 4,051,516, Cl. 358-11.000.
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., to Xerox Corporation. Orthogonal document handling apparatus. 4,050,688, Cl. 271-5.000.
Stange, Klaus K., to Xerox Corporation. Document carousel. 4,050,751, Cl. 312-197.000.
Stanley, Richard B. Linear actuator. 4,050,319, Cl. 74-89.150.
Stanley Works, The: *See*—
Hildebrandt, William J., 4,050,841, Cl. 408-213.000.
Stanwick, Casmer P.; and Jordan, Lawrence E., to General Electric Company. Dynamoelectric machine including gas baffles. 4,051,399, Cl. 310-51.000.
Starp, Franz: *See*—
Rentschler, Waldemar; and Starp, Franz, 4,051,495, Cl. 354-152.000.
Staudinger, Gernot; and Naber, Jaap E., to Shell Oil Company. Prevention of explosive mixtures in the regeneration of sulfur oxide acceptors. 4,051,226, Cl. 423-244.000.
Stauff, Emile J., to Societe Anonyme Dite: Societe Europeenne de-Propulsion. Assembly for launching a projectile. 4,050,351, Cl. 89-1.701.
Stauffer Chemical Company: *See*—
Arneklev, Duane R.; Baker, Don R.; and Walker, Francis H., 4,051,184, Cl. 260-559.00B.
Baker, Don R.; and Walker, Francis H., 4,050,923, Cl. 71-118.000.
Gutman, Arnold D., 4,051,239, Cl. 424-211.000.
Pallos, Ferenc M.; Lee, Hwalin; and Menn, Julius J., 4,051,262, Cl. 424-337.000.
Pitt, Harold M., 4,051,182, Cl. 260-544.00Y.
Weil, Edward D., 4,051,201, Cl. 260-930.000.
Stauner, Thomas: *See*—
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, 4,051,123, Cl. 260-178.000.
Stead, Cecil Vivian: *See*—
Andrew, Herbert Francis; Stead, Cecil Vivian; and Thompson, Ronald, 4,051,175, Cl. 260-502.500.
STEAG Aktiengesellschaft: *See*—
Kleeberg, Ulrich; Leimkuhler, Jurgen; Knospe, Jurgen; and Stohr, Manfred, 4,050,871, Cl. 425-317.000.
Steeg, Emil; and Hoffmeyer, Uwe, to Automation Steeg and Hoffmeyer GmbH. Device for unpacking bottles or similar articles in a shrink foil package. 4,050,223, Cl. 53-381.00R.
Steel Company of Canada, Limited, The: *See*—
Prenn, Otto E., 4,050,514, Cl. 166-176.000.
Steenken, Gerhard E. W. K.: *See*—
Pannekeet, Wilhelmus; Steenken, Gerhard E. W. K.; and Voogd, Roeland H., 4,051,221, Cl. 423-54.000.
Steffes, Frank J.: *See*—
Schmidt, Fred L.; and Steffes, Frank J., 4,050,980, Cl. 162-24.000.
Stein, Walter. Cake of soap, especially for washing hands. 4,050,825, Cl. 401-19.000.
Steinbacher, Jack T., to Eaton Corporation. Method of making a shell mold. 4,050,500, Cl. 164-16.000.
Steiner, Alois, to Ruti Machinery Works Ltd. Apparatus for selective moving of lamella shaped heddles. 4,050,480, Cl. 139-55.100.
Steinkopf, Wolfgang Otto Gotthard; and Drabek, Rudolf, to U.S. Philips Corporation. Television system comprising a video storage device and a television receiver. 4,051,526, Cl. 358-127.000.
Steinmiller, William G., to Fiber Industries Inc. Synthetic fibers of enhanced processability. 4,051,299, Cl. 428-394.000.
Stemmle, Denis J., to Xerox Corporation. Document handling system. 4,050,816, Cl. 355-75.000.
Stenberg, Folke Gustav Adolf, to Iwema Forpacknings AB. Method of providing a package with a handle. 4,050,216, Cl. 53-14.000.
Stephens, Frederick N.; Rowlett, Glenford; and Beard, James D., to Stephens Industries, Inc. Envelope opening apparatus. 4,050,222, Cl. 53-381.00R.
Stephens Industries, Inc.: *See*—
Stephens, Frederick N.; Rowlett, Glenford; and Beard, James D., 4,050,222, Cl. 53-381.00R.
Steranko, James Joseph; Rogoff, Gerardo; Scott, Randall Dean; Gallagher, Angela Frances; and Burger, Peter, to Editext Word Processing, Inc. Stored program controlled typewriting/editing system. 4,051,459, Cl. 364-900.000.
Sterling Drug Inc.: *See*—
Johnson, Robert E., 4,051,147, Cl. 260-326.470.
Stern, Donovan P.: *See*—
Miksic, Boris A.; and Stern, Donovan P., 4,051,066, Cl. 252-389.00R.
Stewart, John A.: *See*—
Batzer, Othmer F.; and Stewart, John A., 4,051,027, Cl. 210-42.00R.
Still, Carl Otto; and Aust, Walter Dean, to Carl Still, Firma. Housing construction extending over the coke discharge area of a horizontal coke oven battery. 4,050,992, Cl. 202-227.000.
Stinebiser, Karl W.: *See*—
Yant, Howard W.; Stinebiser, Karl W.; and Anzur, Gregory C., 4,050,985, Cl. 176-61.000.
Stitt, Thomas Deltor: *See*—
Brinner, Thomas Richard; and Stitt, Thomas Deltor, 4,051,421, Cl. 318-367.000.
Stohr, Manfred: *See*—
Kleeberg, Ulrich; Leimkuhler, Jurgen; Knospe, Jurgen; and Stohr, Manfred, 4,050,871, Cl. 425-317.000.
Stolle Corporation, The: *See*—
Beck, Edward G., Jr., 4,050,200, Cl. 52-19.000.
Stoller, Hansjorg; and Wagner, Hans Peter, to Hoffmann-La Roche Inc. Isomerization process. 4,051,174, Cl. 560-234.000.
Stolz, Hermann, to MATO Maschinen- und Metallwarenfabrik Curt Matthaei GmbH & Co. KG. Apparatus for attaching connectors to the ends of a conveyor belt. 4,050,138, Cl. 29-243.510.
Stone, Clement A., to Merck & Co., Inc. Novel anti-hypertensive compositions. 4,051,251, Cl. 424-273.00R.
Stone, Thomas, to Silver, Jules. Dispensing container. 4,050,612, Cl. 222-135.000.
Storace, Anthony, to Pitney-Bowes, Inc. Method and apparatus for determining weight and mass. 4,050,530, Cl. 177-1.000.
Storch, Leonard; and Thomas, George H., to Leonard Storch Enterprises, Inc. Film font for photocomposing apparatus. 4,051,487, Cl. 354-12.000.
Storck, Glenn E.; and Kominiak, Andrew A., to Amerace Corporation. Methods and apparatus for electrical contact assembly. 4,050,149, Cl. 29-630.00R.
Strashinsky, Vadim Konstantinovich: *See*—
Lavrentiev, Konstantin Nikitich; Borisova, Natalya Isaakievna; Vasiliev, Jury Ivanovich; Rodionov, Jury Nikolaevich; Strashinsky, Vadim Konstantinovich; Ioffe, Vladimir Fedorovich; and Vyatskin, Iosif Yakovlevich, deceased, 4,051,422, Cl. 318-570.000.
Stratton, Donald W.; and Moorhead, John P., to Anderson Company, The. Windshield wiper pivot arm connection. 4,050,832, Cl. 403-321.000.
Streicher, Heinz, to General Electric Company. Electric multiple flash arrangement. 4,051,359, Cl. 362-4.000.
Streit, Kenneth F., to Phone-Ducs, Inc. Reinforced plastic pipe. 4,050,721, Cl. 285-93.000.

Strinning, Olof Bo Sven, to Mjolkcentralen, Ekonomiak Forening. Low calorie, high protein tablespreads from sweet milk and their production. 4,051,269, Cl. 426-603.000.
Strom, John A.: *See*—
Mack, Richard B.; Strom, John A.; and Martinez, Anthony, 4,051,474, Cl. 343-100.0LE.
Strong, William James; and Palmer, Edward Paul, to Brigham Young University. Speech coding hearing aid system utilizing formant frequency transformation. 4,051,331, Cl. 179-107.00R.
Stroszynski, Joachim, to Hoechst Aktiengesellschaft. Apparatus for the manufacture of a series of photoconductor webs. 4,050,410, Cl. 118-410.000.
Strother, Charles W., to UOP Inc. Fluid catalytic cracking process for upgrading a gasoline-range feed. 4,051,013, Cl. 208-78.000.
Stubbings, James H., to Potomac Applied Mechanics, Inc. Insulation cutter. 4,050,336, Cl. 83-486.100.
Stubbings, James Henry, to Potomac Applied Mechanics, Inc. Continuous welder. 4,051,342, Cl. 219-60.00A.
Stubbs, Joseph E.: *See*—
Fuller, Harold L., Jr.; and Stubbs, Joseph E., 4,050,435, Cl. 123-198.00F.
Sturm, Helmut, to Frank L. Wells Company. Coil spring feeding apparatus. 4,050,610, Cl. 221-171.000.
Suchy, Milos: *See*—
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 4,051,319, Cl. 542-413.000.
Suda, Masashi: *See*—
Ito, Yoshio; Ariga, Masao; and Suda, Masashi, 4,050,691, Cl. 271-124.000.
Sugita, Mitsuyuki: *See*—
Ikeno, Hitoshi; Sugita, Mitsuyuki; and Yanagi, Hirofumi, 4,050,126, Cl. 29-25.350.
Sumitomo Chemical Company, Limited: *See*—
Shiga, Shujiro; Katsumata, Takeshi; Okamoto, Yasushi; and Hikasa, Tadashi, 4,051,225, Cl. 423-235.000.
Sumitomo Durez Company, Ltd.: *See*—
Takemura, Takeshi; Katoh, Yoshihisa; Kurita, Shigeyuki; Sasaki, Susumu; Funabiki, Kyohei; and Hatano, Keizo, 4,051,098, Cl. 260-38.000.
Sumitomo Electric Industries, Ltd.: *See*—
Motoyoshi, Kenya; Kume, Masahiro; and Amano, Yoshinari, 4,050,930, Cl. 75-173.00A.
Summers, Jack C.: *See*—
Hegedus, Louis; and Summers, Jack C., 4,051,073, Cl. 252-466.0PT.
Sunamori, Takashi; and Obana, Sachio, to Mitsubishi Rayon Co., Ltd. Electrodeposition coating method using alternating current. 4,051,004, Cl. 204-181.000.
Sureau, Robert Frederic Michel: *See*—
Dupre, Victor Marie; Pechmeze, Jacques Pierre Edmond; and Sureau, Robert Frederic Michel, 4,051,145, Cl. 548-372.000.
Sutton Engineering Company: *See*—
Sibler, Guenter W., 4,050,281, Cl. 72-265.000.
Suzuki, Eiji, to Taisei Kogyo Co., Ltd. Filter apparatus. 4,051,031, Cl. 210-133.000.
Suzuki, Ikuo; and Nishiyama, Shuji, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Music box toy. 4,050,342, Cl. 84-95.00C.
Suzuki, Isamu: *See*—
Sakai, Toshimitsu; Saitou, Tadashi; and Suzuki, Isamu, 4,050,861, Cl. 417-471.000.
Suzuki, Kazuo: *See*—
Kataoka, Hiroyuki; Yahiro, Seinosuke; and Suzuki, Kazuo, 4,050,547, Cl. 187-29.00R.
Suzuki, Masane, to Fuji Photo Optical Co., Ltd. System for measuring and recording three dimensional configuration of object. 4,051,483, Cl. 346-33.00A.
Suzuki, Nobuyuki; and Nishihara, Toyotaro, to Hitachi, Ltd. High-voltage circuit for post focusing type color picture tube. 4,051,514, Cl. 358-65.000.
Suzuki, Sukenori: *See*—
Fujita, Masanori; and Suzuki, Sukenori, 4,050,787, Cl. 350-160.0LC.
Suzuki, Takashi; and Naito, Susumu, to Mitsubishi Gas Chemical Company, Inc. Process for preparing formate esters of alkyl-substituted aromatic hydroxy compounds. 4,051,318, Cl. 560-131.000.
Suzuki, Yoshio. Heat-sensitive color-producing compositions and articles using same. 4,050,945, Cl. 106-21.000.
Suzuki, Yukio: *See*—
Seki, Kunio; Suzuki, Yukio; and Sakamoto, Yoshio, 4,051,443, Cl. 330-258.000.
Svensson, Roger Ronny Jochen: *See*—
Svensson, Ulf, 4,050,792, Cl. 350-319.000.
Svensson, Ulf, to Svensson, Roger Ronny Jochen. Observation port assembly. 4,050,792, Cl. 350-319.000.
Swallow, Douglas Lintin, to Imperial Chemical Industries Limited. Guanidine derivatives. 4,051,256, Cl. 424-304.000.
Sweeney, Patrick E., to AAI Corporation. Cutting torch arrangement. 4,050,680, Cl. 266-48.000.
Sweet, Douglas W., to General Motors Corporation. Digital frequency measuring circuitry. 4,051,434, Cl. 324-78.00D.
Swistosz, Edmund; and Marshall, Albert H., to United States of America, Navy. Recoil simulator. 4,050,166, Cl. 35-25.000.
Swinehart, Carl F., to Harshaw Chemical Company, The. Growth of doped crystals. 4,050,905, Cl. 23-301.000.
Sybron Corporation: *See*—
Gruner, Heinz Walter, 4,051,444, Cl. 330-68.000.
Syltebo, Bjarne Elroy, to Boeing Company, The. Jet engine nozzle for controlling the direction of thrust. 4,050,631, Cl. 239-265.250.
Sylvester, John L., to Ecodyne Corporation. Fin tube distribution nozzle. 4,050,634, Cl. 239-601.000.
Syntex Corporation: *See*—
Fried, John H.; and Harrison, Ian T., 4,051,233, Cl. 424-317.000.
Syntex (U.S.A.) Inc.: *See*—
Ackrell, Jack, 4,051,149, Cl. 260-327.00B.
Kluge, Arthur F., 4,051,150, Cl. 260-327.00B.
Nelson, Peter H.; and Untch, Karl G., 4,051,260, Cl. 424-331.000.
Prince, Anthony; Halpern, Otto; and Ackrell, Jack, 4,051,148, Cl. 260-327.00B.
Segre, Eugene J., 4,051,241, Cl. 424-243.000.
Szabo, Michael V. Bicycle stand. 4,050,583, Cl. 211-20.000.
Tabler, Charles P., to Kornylak Corporation. Continuous rigid foam panel production. 4,051,209, Cl. 264-39.000.
Tack, Hans: *See*—
Jester, Willi; and Tack, Hans, 4,050,129, Cl. 407-45.000.
Tada, Akio; and Torihata, Hideyuki. Hook latching device. 4,050,730, Cl. 294-82.00R.
Tada, Seiji, to Sato Tekko Co., Ltd. Cross-roll forging machine. 4,050,273, Cl. 72-69.000.
Taddicken, Hermann, to Eisele Apparate-und Geratebau GmbH. Button selector feed for a button sewing machine. 4,050,392, Cl. 112-113.000.
Taga, Yutaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil pressure control system for an automatic transmission system. 4,050,332, Cl. 74-869.000.
Taggart, George W.: *See*—
Bond, Desmond H.; Taggart, George W.; and Jaeger, Kurt S., 4,051,231, Cl. 423-659.000.
Tagirov, Kurban Magomedovich; Akopian, Nikolai Rubenovich; Konontsev, Val.-y Vasilievich; and Lutsenko, Jury Nikolaevich. Apparatus for treating rock surrounding a wellbore. 4,050,529, Cl. 175-422.000.
Taisei Kogyo Co., Ltd.: *See*—
Suzuki, Eiji, 4,051,031, Cl. 210-133.000.
Takahashi, Eiichi: *See*—
Ohtsuka, Shigeto; Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,051,314, Cl. 536-1.000.
Takahashi, Juhei: *See*—
Mafune, Yasuo; and Takahashi, Juhei, 4,051,325, Cl. 179-1.0HF.
Takahashi, Shuichi, to Honda Giken Kogyo Kabushiki Kaisha. Control system of an alternating-current motor. 4,051,419, Cl. 318-227.000.
Takahashi, Toshiro; Nagano, Toshihiro; Iguchi, Shozo; Kikuchi, Masaru; Nakamura, Katsuhiko; and Mochizuki, Atsushi, to Riken Keikinzoku Kogyo Kabushiki Kaisha. Method and apparatus for manufacturing extruded structural profiles from aluminum based metal scraps. 4,050,142, Cl. 29-403.000.
Takahashi, Yasuro; Fujima, Yukihisa; Oguri, Masaharu; and Komori, Akito, to Mitsubishi Jukogyo Kabushiki Kaisha. Fuel combustion apparatus. 4,050,879, Cl. 431-174.000.
Takahashi, Yukio: *See*—
Shimada, Satoshi; Yamada, Kazuji; Matsuda, Yasumasa; Kimura, Ichiro; Shimazoe, Michitaka; and Takahashi, Yukio, 4,050,313, Cl. 73-398.0AR.
Takai, Teruo: *See*—
Seno, Shougo; Toyama, Tatsuro; Takai, Teruo; and Ueda, Yasuomi, 4,051,550, Cl. 361-402.000.
Takaishi, Toshio: *See*—
Sato, Yasuhiro; Sato, Toshio; Kawasaki, Shuichi; Takaishi, Toshio; Okuyama, Sadao; and Yamanashi, Norio, 4,050,371, Cl. 99-550.000.
Takeda, Keiji; Murata, Masataka; and Ikeda, Teppei, to Fuji Photo Film Co., Ltd. Image forming process with photopolymer layers between a support and a substrate. 4,050,936, Cl. 96-28.000.
Takeda, Yasutsugu; Nakamura, Hisashi; Tsunoda, Yoshito; Tsukada, Toshihisa; and Miyauchi, Toshimitsu, to Hitachi, Ltd. Apparatus for optically reconstructing information. 4,051,528, Cl. 358-128.000.
Takematsu, Tetsuo; Konnai, Makoto; Isogawa, Takayuki; and Kodama, Koshiro, to Hodogaya Chemical Co., Ltd. Herbicidal composition for paddy field use. 4,050,920, Cl. 71-88.000.
Takemura, Takeshi; Katoh, Yoshihisa; Kurita, Shigeyuki; Sasaki, Susumu; Funabiki, Kyohei; and Hatano, Keizo, to Sumitomo Durez Company, Ltd.; and Daiichi Tanso Kogyo K.K. Method of preparing shaped active carbon. 4,051,098, Cl. 260-38.000.
Takeshita, Isao, to Japan Atomic Energy Research Institute. Method for inspecting nuclear fuel rod or irradiation capsule. 4,051,369, Cl. 250-321.000.
Takeuchi, Kouichi; Itoh, Norio; Koyama, Kuniyoshi; Shimada, Satoshi; and Himuro, Masami, to Sony Corporation. Color image projecting apparatus. 4,051,513, Cl. 358-60.000.
Takeuchi, Makoto: *See*—
Imanari, Mamoru; Takeuchi, Makoto; Shimizu, Shozo; and Higuchi, Hisashi, 4,051,429, Cl. 324-.50A.
Takewell, Robert B.; Brandon, Paul W.; and Odom, Paul R., to J. M. Huber Corporation. Apparatus for agglomerating powders. 4,050,869, Cl. 425-222.000.
Takeyasu, Kiyoo: *See*—
Fujinawa, Masaaki; Takeyasu, Kiyoo; Iizuka, Kenichi; Uchida, Motokazu; and Uzuhashi, Hideo, 4,051,417, Cl. 318-138.000.
Tanaka, Hiroshi, to K.K. Tokai Rika Denki Seisakusho. Lock assembly. 4,050,272, Cl. 70-100.000.
Tanaka, Junzo; and Kai, Toshio, to Matsushita Electric Industrial Co., Ltd. Microwave oven door screen. 4,051,341, Cl. 219-10.55D.
Tanaka, Keiji; Ando, Yujiro; and Ohara, Katsunobu, to Canon Kabushiki Kaisha. Electrophotographic copying machine. 4,050,802, Cl. 355-3.00R.
Tanaka, Mikio, to Makoto Takugyo Kabushikikaisha. Refrigerating container. 4,050,264, Cl. 62-457.000.
Tanaka, Satoru; and Watanabe, Hideaki, to Eisai Co., Ltd. 1,3-Benzodioxol derivatives. 4,051,125, Cl. 260-239.0BC.
Tanaka, Susumu: *See*—
Morikawa, Nobutaka; and Tanaka, Susumu, 4,050,244, Cl. 60-282.000.
Tanaka, Yukiyasu: *See*—
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,050,422, Cl. 123-75.00B.
Tangye Limited: *See*—
Robbins, Joseph Henry, deceased; and Acton, John Edward, 4,050,674, Cl. 254-93.00H.
Tanikoshi, Kinji, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. Hall motor control system. 4,051,420, Cl. 318-254.000.
Tanner, Lee Elliot; Ray, Ranjan; and Cline, Carl F., to Allied Chemical Corporation. Amorphous metal alloys in the beryllium-titanium-zirconium system. 4,050,931, Cl. 75-175.500.
Tanoshima, Katsuhide: *See*—
Watanabe, Akinori; Tanoshima, Katsuhide; Noguchi, Matsusaburo; and Hattori, Kinya, 4,050,377, Cl. 101-114.000.
Tardy, Andre, to Compagnie Generale d'Electricite. Connector for an optical fibre link. 4,050,783, Cl. 350-96.00C.
Tarr, Walter R., to Bendix Corporation, The. Method of attaching a friction lining to a reinforcing cup. 4,050,619, Cl. 228-162.000.
Tassie, Douglas Pray, to General Electric Company. Renewable liquid investment seal. 4,050,352, Cl. 89-7.000.
Tatton, James: *See*—
Tatton, Nelson; and Tatton, James, 4,050,400, Cl. 116-26.000.
Tatton, Nelson; and Tatton, James. Marine navigation instrument. 4,050,400, Cl. 116-26.000.
Taubitz, Christof: *See*—
Wendel, Kurt; Reichel, Fritz; and Taubitz, Christof, 4,051,093, Cl. 260-29.6TA.
Taylor, Allen L., to Minnesota Mining and Manufacturing. Weight actuated piezolelectric polymeric transducer. 4,051,395, Cl. 310-329.000.
Taylor, Allen L., to Minnesota Mining and Manufacturing Company. Two sensitivity level kinetic sensor. 4,051,397, Cl. 310-351.000.
Taylor, Edgar R., Jr.: *See*—
Kilgore, Lee A.; Taylor, Edgar R., Jr.; and South, William H., 4,051,427, Cl. 322-99.000.
Taylor, George W.: *See*—
Fincke, George C.; and Taylor, George W., 4,051,449, Cl. 333-73.00C.
Taylor, Larry A.: *See*—
Williams, Joel L.; Tulis, Jerry J.; and Taylor, Larry A., 4,050,576, Cl. 206-210.000.
Taylor, Lynn J.: *See*—
Tobias, John W.; Taylor, Lynn J.; and Gaumer, Stuart J., 4,051,306, Cl. 526-1.000.
Tcherkinsky, Boris; and Wasem, Hans, to Sandoz Ltd. Azo pigments having two 2-halo-5-trifluoromethylphenyl diazo component radicals and a bis-(2-hydroxynaphthoyl-3-amino)-2,5-dihalobenzene coupling component radical. 4,051,121, Cl. 260-174.000.
Teach, Ted L., to Laserplane Corporation. Depth control for endless chain type trencher. 4,050,171, Cl. 37-86.000.
Tecalemit Limited: *See*—
Jackson, Harold Ernest, 4,050,431, Cl. 123-139.0AW.
Techne(Cambridge) Limited: *See*—
Fairbairn, Geoffrey; Cooke, George Frederick; Winkworth, Reginald; and Koreki, Jan, 4,050,289, Cl. 73-1.00F.
"Technico Development and Financing S. A."Firma: *See*—
Mehnert, Walter, 4,050,262, Cl. 62-160.000.
Teckton, Inc.: *See*—
Goltsos, Costas E., 4,051,266, Cl. 426-120.000.
Teijin Limited: *See*—
Hayashi, Kazushige; Minemura, Norihiro; Fujimoto, Iwao; Ozaki, Kiyotaka; Yoshida, Norio; Morishita, Toshio; and Shinoki, Takanori, 4,051,287, Cl. 428-91.000.
Kuratsuji, Takatoshi; Inata, Hiroo; and Kawase, Shoji, 4,051,112, Cl. 260-75.00T.
Tektronix, Inc.: *See*—
Nelson, Larry A.; and Crosby, Philip Stephen, 4,051,440, Cl. 328-134.000.
Telecommunications Radioelectriques et Telephoniques T.R.T.: *See*—
Bonnerot, Georges, 4,051,357, Cl. 364-726.000.
Telephone Utilities and Communications Industries, Inc.: *See*—
Smith, Jerry L., 4,051,425, Cl. 363-86.000.
Terracciano, Andrew. Deep fat fryer heated fat supply reservoir and fat replenishment device. 4,050,447, Cl. 126-374.000.
Terrill, David B.: *See*—
Shaw, Wilfrid G.; and Terrill, David B., 4,051,180, Cl. 260-530.00N.
Tersch, Richard W.; and Bassoff, Arthur B., to Lear Siegler, Inc. Gear finishing. 4,050,350, Cl. 90-1.60R.
Terzian, Rouben T., to Marvin Glass & Associates. Facial liquid excreting doll. 4,050,185, Cl. 46-135.00A.
Texaco Inc.: *See*—
Arnold, Dan M.; Paap, Hans J.; and Scott, Hubert D., 4,051,368, Cl. 250-270.000.
Bunn, Dorrance P., Jr.; Williams, Dale; Jones, Henry B.; and MacLean, John P., 4,051,069, Cl. 252-417.000.
Wu, Ching H.; Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, 4,050,513, Cl. 166-274.000.
Texas Instruments Incorporated: *See*—
Choate, William Clay, 4,051,354, Cl. 235-312.000.
Orstein, Jacob L.; and Thomas, Seth R., 4,050,906, Cl. 428-617.000.
Smeltzer, Ronald K.; and Bean, Kenneth E., 4,050,979, Cl. 156-647.000.
Teyssandier, Gaston. Transmission gear mechanism. 4,050,324, Cl. 74-397.000.
Thekdi, Arvind C.: *See*—
Hemsath, Klaus H.; and Thekdi, Arvind C., 4,050,912, Cl. 55-223.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industrie-gesellschaft m.b.H. Rail grinding machine. 4,050,196, Cl. 51-178.000.
Theysohn, Helmuth. Calender heating roll. 4,050,510, Cl. 165-89.000.
Thomas, Alan, to Lucas Industries Limited. Apparatus for measuring mass flow of fluids. 4,050,304, Cl. 73-194.00B.
Thomas & Betts Corporation: *See*—
Churla, John J., 4,051,323, Cl. 174-78.000.
Thomas, George H.: *See*—
Storch, Leonard; and Thomas, George H., 4,051,487, Cl. 354-12.000.
Thomas, Herbert: *See*—
Seubert, Jurgen; Pohlke, Rolf; Thomas, Herbert; and Andrews, Peter, 4,051,243, Cl. 424-250.000.
Thomas J. Dillon & Co., Inc.: *See*—
Dillon, Thomas J., 4,050,213, Cl. 52-743.000.
Thomas J. Lipton, Inc.: *See*—
Sanderson, Gary Warner; Hoefler, Andrew Charles; Graham, Harold Nathaniel; and Coggon, Philip, 4,051,264, Cl. 426-52.000.
Thomas, Richard E.; Florence, Robert T.; Dalal, Rustom H.; and Scheuer, Raymond I., to A. B. Dick Company. Printed sheets containing concealed images and method and materials for preparation and visual development of same. 4,051,283, Cl. 428-29.000.
Thomas, Robert J.; and Jones, Marvin H., to Samuel Moore and Company. Fast-make connection for a push-pull control cable assembly. 4,050,327, Cl. 74-502.000.
Thomas, Seth R.: *See*—
Orstein, Jacob L.; and Thomas, Seth R., 4,050,906, Cl. 428-617.000.
Thompson, Nelson L., administrator: *See*—
Thompson, Willis F., deceased; and Thompson, Nelson L., administrator, 4,050,197, Cl. 51-208.000.
Thompson, Ronald: *See*—
Andrew, Herbert Francis; Stead, Cecil Vivian; and Thompson, Ronald, 4,051,175, Cl. 260-502.500.
Thompson, Willis F., deceased; and by Thompson, Nelson L., administrator. Blade and scissors sharpener. 4,050,197, Cl. 51-208.000.
Thomson-Brandt: *See*—
Blondet, Bruno; Kretschmer, Sylvain; Lacotte, Jean Pierre; and Peltier, Jean Paul, 4,051,329, Cl. 179-100.30N.
Thomson-CSF: *See*—
Coussot, Gerard, 4,051,448, Cl. 333-30.00R.
Trotel, Jacques, 4,051,381, Cl. 250-492.00A.
Thresher Institutes Incorporated: *See*—
Rudy, Christopher John, 4,050,439, Cl. 124-20.00R.
Tidd, James Alfred, to Alphatype Corporation. Phototypesetting machine. 4,051,488, Cl. 354-13.000.
Tieden, Jansey D., to Boeing Company, The. Zero crossing AC relay control circuit. 4,051,394, Cl. 307-310.000.
Tiemann, Reinhard: *See*—
Pakur, Henryk; and Tiemann, Reinhard, 4,050,497, Cl. 152-361.0FP.
Tinnefeld, Bernd: *See*—
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,058, Cl. 252-186.000.
Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,059, Cl. 252-186.000.
Tisma, Stevan, to John O. Butler Company. Thread storage and dispensing system. 4,050,648, Cl. 242-129.800.
TMC Corporation: *See*—
Kubelka, Axel; and Schweizer, Gottfried, 4,050,716, Cl. 280-614.000.
Tobias, John W.; Taylor, Lynn J.; and Gaumer, Stuart J., to Owens-Illinois, Inc. Controlled environmental deterioration of plastics. 4,051,306, Cl. 526-1.000.
Tobias, Michael A.; and Martinez, Carlos J., to Mobil Oil Corporation. Water reducible short oil alkyd resins and process of making same. 4,051,089, Cl. 260-22.00R.
Tokai Rika Denki Seisakusho K.K.: *See*—
Yamada, Makoto; Sasaki, Shiro; Kanazawa, Shigenori; and Hayashi, Yoshihiro, 4,050,717, Cl. 280-744.000.
Tokashiki, Kanenobu, to Lucas Industries Limited. Liquid fuel pumping apparatus. 4,050,433, Cl. 123-139.0AQ.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Ogawa, Kazuyuki; Hirose, Masahiko; Yada, Masaaki; and Imamura, Hitoshi, 4,051,382, Cl. 250-531.000.
Tom, Elgin Megginson; and Vogelpohl, Roland L., to Owens-Illinois, Inc. Color television tube structure and method of manufacture. 4,050,602, Cl. 220-2.10A.
Tomita, Koji: *See*—
Kawaguchi, Hiroshi; Tomita, Koji; Tsukiura, Hiroshi; and Konishi, Masataka, 4,051,237, Cl. 424-117.000.

Tommasini, Raffaele: *See—*
Ambrogi, Vittorio; Logemann, Willy; Parenti, Marc'Antonio; and Tommasini, Raffaele, 4,051,245, Cl. 424-250.000.
Tomy Kogyo Co., Inc.: *See—*
Watanabe, Ietatsu, 4,050,183, Cl. 46-4.000.
Torihata, Hideyuki: *See—*
Tada, Akio; and Torihata, Hideyuki, 4,050,730, Cl. 294-82.00R.
Torres, Jean: *See—*
Chenevard, Alexis; and Torres, Jean, 4,050,574, Cl. 198-458.000.
Torstenfelt, N. A. Ragnar, to Stal-Laval Turbin AB. Fluid pressure actuated clutch for starting multi-stage turbine. 4,050,560, Cl. 192-85.0AT.
Toshiba Kikai Kabushiki Kaisha: *See—*
Hayahusa, Nobuyuki; and Uno, Hiroaki, 4,050,229, Cl. 57-77.400.
Toshio, Mori, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece hand-return mechanism. 4,050,234, Cl. 58-85.500.
Toter-Tee, Inc.: *See—*
Glumac, Nick P., 4,050,707, Cl. 280-43.230.
Touchton, James J.; Cuda, John; and Sordello, Frank J., to Sperry Rand Corporation. Servo system with feedback signal compensation. 4,051,423, Cl. 318-611.000.
Tower Technology, Inc.: *See—*
Johnson, Roy W. P., 4,050,214, Cl. 52-745.000.
Towle, Gordon Anson, to Hercules Incorporated. Xanthan recovery process. 4,051,317, Cl. 536-114.000.
Toyama, Tatsuro: *See—*
Seno, Shougo; Toyama, Tatsuro; Takai, Teruo; and Ueda, Yasuomi, 4,051,550, Cl. 361-402.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Anahara, Meiji; and Fujita, Takayoshi, 4,050,225, Cl. 57-34.0HS.
Toyo Rope Manufacturing Co., Ltd.: *See—*
Senoo, Tadao; and Honda, Kenji, 4,050,230, Cl. 57-149.000.
Toyo Seikan Kaisha Ltd.: *See—*
Sato, Yasuhiro; Sato, Toshio; Kawasaki, Shuichi; Takaishi, Toshio; Okuyama, Sadao; and Yamanashi, Norio, 4,050,371, Cl. 99-550.000.
Toyoda, Kenichi: *See—*
Shichida, Hiromichi; Katsube, Hideo; Oyama, Shigeaki; Toyoda, Kenichi; and Saito, Mitsuo, 4,050,837, Cl. 408-35.000.
Toyoda, Kenji, to Nippon Kogaku K.K. Indicating exposure meter for a camera. 4,051,491, Cl. 354-60.00L.
Toyoda Koki Kabushiki Kaisha: *See—*
Doi, Yoshio, 4,050,274, Cl. 72-82.000.
Toyooka, Terumasa. Unloading apparatus of truck. 4,050,739, Cl. 298-19.00V.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Inada, Masami; Kawabata, Yasuhiro; Sato, Katsujiro; and Osanai, Akinori, 4,050,423, Cl. 123-117.00A.
Morikawa, Nobutaka; and Tanaka, Susumu, 4,050,244, Cl. 60-282.000.
Nogami, Tomoyuki, 4,050,744, Cl. 303-24.00A.
Noguchi, Masaaki; Tanaka, Yukiyasu; Sekiya, Setsuro; and Motosugi, Katsuhiko, 4,050,422, Cl. 123-75.00B.
Sakai, Toshimitsu; Saitou, Tadashi; and Suzuki, Isamu, 4,050,861, Cl. 417-471.000.
Sakamaki, Hiroshi; and Maeda, Toshiyuki, 4,050,855, Cl. 418-131.000.
Shishido, Yoshio, 4,050,325, Cl. 74-473.00R.
Taga, Yutaka, 4,050,332, Cl. 74-869.000.
Yamada, Makoto; Sasaki, Shiro; Kanazawa, Shigenori; and Hayashi, Yoshihiro, 4,050,717, Cl. 280-744.000.
Yasuhiro, Ikuta; and Hitomi, Shimo, 4,050,429, Cl. 123-119.00A.
Traeger, Robert S.: *See—*
Knochel, Wayne L.; and Traeger, Robert S., 4,050,414, Cl. 119-1.000.
Trainer, Donald J.: *See—*
Malott, Richard C.; and Trainer, Donald J., 4,050,277, Cl. 72-129.000.
Traise, John E., to Moore Business Forms, Inc. Plow folding and heat sealer apparatus for continuous business forms. 4,050,361, Cl. 93-1.00F.
Transparent Conductors, Inc.: *See—*
Feldman, Bernard, 4,050,786, Cl. 350-160.0LC.
Treibacher Chemische Werke Aktiengesellschaft: *See—*
Hafner, Leo, 4,051,219, Cl. 423-21.000.
Trias, John A.: *See—*
Hammond, Peter R.; Schimitschek, Erhard J.; and Trias, John A., 4,051,062, Cl. 252-301.170.
Trinh, Toan; and Yeazell, Bruce Albert, to Procter & Gamble Company, The. Cleansing compositions. 4,051,055, Cl. 252-95.000.
Troncoso, Fernando, Jr. Archery arrow. 4,050,696, Cl. 273-106.50B.
Trost, Barry M.; and Verhoeven, Thomas R., to Wisconsin Alumni Research Foundation. Catalytic allylic alkylation. 4,051,157, Cl. 260-397.100.
Trotel, Jacques, to Thomson-CSF. Device for the programmed tracing of designs by particle bombardment. 4,051,381, Cl. 250-492.00A.
Trott, Arthur F.: *See—*
Foltz, Carl L.; Troutner, Vernon H.; and Trott, Arthur F., 4,050,528, Cl. 173-163.000.
Troutner, Vernon H.: *See—*
Foltz, Carl L.; Troutner, Vernon H.; and Trott, Arthur F., 4,050,528, Cl. 173-163.000.
TRW Inc.: *See—*
Altshuler, Saul, 4,051,479, Cl. 343-703.000.
Cohen, Lawrence S., 4,050,760, Cl. 339-97.00R.
Tschopp, Paul: *See—*
Piller, Bernhard; Lenoir, John; Froehlich, Alfred; Stauner, Thomas; and Tschopp, Paul, 4,051,123, Cl. 260-178.000.
TSN Company, Inc.: *See—*
Woodrow, Arthur F.; and Simmons, Jorge E., 4,050,824, Cl. 356-197.000.
Tsoucalas, Michael; Barclay, Kenneth W.; and Rogers, Jack M., to Avon Products, Inc. Transparent fragrance releasing composition and method of making same. 4,051,159, Cl. 260-404.500.
Tsuchihashi, Genichi; and Ogura, Katsuyuki, to Sagami Chemical Research Center. Thiophene derivatives and process for preparation thereof. 4,051,151, Cl. 260-329.00S.
Tsuchimochi, Yoshihisa: *See—*
Mabuchi, Kenichi; and Tsuchimochi, Yoshihisa, 4,050,487, Cl. 144-28.500.
Tsukada, Toshihisa: *See—*
Takeda, Yasutsugu; Nakamura, Hisashi; Tsunoda, Yoshito; Tsukada, Toshihisa; and Miyauchi, Toshimitsu, 4,051,528, Cl. 358-128.000.
Tsukamoto, Masaaki: *See—*
Nakagawa, Sadao; Tsukamoto, Masaaki; and Dobashi, Toshio, 4,051,493, Cl. 354-126.000.
Tsukiura, Hiroshi: *See—*
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Takeda, Yasutsugu; Nakamura, Hisashi; Tsunoda, Yoshito; Tsukada, Toshihisa; and Miyauchi, Toshimitsu, 4,051,528, Cl. 358-128.000.
Tsuruta, Motohiro; Kimura, Hiroshiro; Koshimo, Akio; Nara, Hirohisa; Goto, Tokuju; and Amemiya, Kunio, to Unitika Kabushiki Kaisha. Process for imparting elasticity to woven textile fabrics. 4,051,215, Cl. 264-137.000.
Tucker, Benjamin W.: *See—*
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,051,166, Cl. 260-453.0AR.
Tulis, Jerry J.: *See—*
Williams, Joel L.; Tulis, Jerry J.; and Taylor, Larry A., 4,050,576, Cl. 206-210.000.
Tull, Roger J.: *See—*
Weinstock, Leonard M.; Tull, Roger J.; and Mulvey, Dennis M., 4,051,144, Cl. 260-307.0FA.
Tullier, Leo D.; and Vignone, John F. Fluid flow filtering arrangement. 4,051,042, Cl. 210-409.000.
Tullio, Thomas: *See—*
Gyori, Robert Paul; and Tullio, Thomas, 4,050,808, Cl. 355-38.000.
Turner, James Wesley, deceased (by Heim, Thomas M., executor); and Spinks, Ray E., to United States of America, Navy. Side-mounted automatic power release attachment for manual connectors. 4,050,122, Cl. 24-230.00A.
Turner, John Cameron; and Chan, Rosalind Po-Kuen, to Biorex Laboratories Limited. Derivatives of 1,2-diphenyl-ethane. 4,051,263, Cl. 424-347.000.
Turner, John W.; and McLaughlin, Russell A., to Joy Manufacturing Company. Torque indicating assembly. 4,050,300, Cl. 73-139.000.
Turner, Sam R., to Xerox Corporation. Electron acceptor monomers and polymers. 4,050,934, Cl. 96-1.00R.
Tuvesson, Par-Ake; and Johansson, Carl-Gustaf, to Lindab, Lindhs Industri AB. Tubular connectors. 4,050,703, Cl. 277-207.00A.
U-S Safety Trolley Corporation: *See—*
Ross, Donald R., Jr., 4,050,555, Cl. 191-23.00A.
U. Scharer Sohne AG, (USM): *See—*
Scherrer, Kurt, 4,050,753, Cl. 312-257.0SK.
Uba, Toshio: *See—*
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Ube Industries, Ltd.: *See—*
Asano, Toyohide; and Honda, Masahiro, 4,050,278, Cl. 72-257.000.
Ube Nitto Kasei Co., Ltd.: *See—*
Senoo, Tadao; and Honda, Kenji, 4,050,230, Cl. 57-149.000.
Uchida, Motokazu: *See—*
Fujinawa, Masaaki; Takeyasu, Kiyoo; Iizuka, Kenichi; Uchida, Motokazu; and Uzuhashi, Hideo, 4,051,417, Cl. 318-138.000.
Uchida, Teiji; and Ueki, Atsufumi, to Nippon Electric Company, Ltd. Mode separator and delay equalizer for multimode optical fiber transmission systems. 4,050,782, Cl. 350-96.00C.
Uchimura, Mitsuo: *See—*
Nakamura, Yasushi; Itou, Michihisa; and Uchimura, Mitsuo, 4,050,960, Cl. 148-16.000.
Udipi, Kishore; and Hsieh, Henry L., to Phillips Petroleum Company. Epoxidized copolymers of styrene, butadiene and isoprene. 4,051,199, Cl. 260-880.00R.
Ueda, Yasuo; Kamezawa, Yasutoki; Aizawa, Tatsuo; and Ikeda, Toshimitu, to Mita Industrial Company Ltd. Liquid developer. 4,051,052, Cl. 252-62.10L.
Ueda, Yasuomi: *See—*
Seno, Shougo; Toyama, Tatsuro; Takai, Teruo; and Ueda, Yasuomi, 4,051,550, Cl. 361-402.000.
Ueki, Atsufumi: *See—*
Uchida, Teiji; and Ueki, Atsufumi, 4,050,782, Cl. 350-96.00C.
Ueno, Saburo: *See—*
Ohtsuka, Shigeto; Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Ohmura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,051,314, Cl. 536-1.000.

Uitti, Kenneth D.: *See—*
Bunas, Bennie I.; and Uitti, Kenneth D., 4,051,206, Cl. 261-109.000.
Ulrich, Henri: *See—*
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,051,166, Cl. 260-453.0AR.
Underwood, John F. Electromagnetic pickup for stringed musical instruments. 4,050,341, Cl. 84-1.150.
Union Carbide Corporation: *See—*
Melby, Earl George, 4,051,079, Cl. 260-2.20R.
Union Fork & Hoe Company, The: *See—*
Bonnes, David R., 4,050,727, Cl. 294-49.000.
Union Insulating Company: *See—*
Harris, Robert M.; Mills, Gene F.; and Shaffer, David T., 4,050,603, Cl. 220-3.900.
Uniroyal Inc.: *See—*
Neville, James J.; Ferrell, Wesley; and Schichman, Daniel, 4,050,973, Cl. 156-123.00R.
Plant, Howard L.; Zukel, John W.; and Ames, Ronald B., 4,050,921, Cl. 71-94.000.
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United States Gypsum Company: *See—*
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Helminiak, Thaddeus E.; and Arnold, Fred E., 4,051,108, Cl. 260-47.0CP.
Ipri, Alfred C.; and Sarace, John C., 4,050,965, Cl. 148-175.000.
Mack, Richard B.; Strom, John A.; and Martinez, Anthony, 4,051,474, Cl. 343-100.0LE.
Oberth, Adolf E., 4,050,969, Cl. 149-19.400.
Peterson, Paul F., 4,050,656, Cl. 244-137.00R.
Sharpe, William N., Jr.; and Hollenberg, Glenn W., 4,050,818, Cl. 356-32.000.
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Adelman, Stanley M.; Ellington, Donal G.; and Quatrochi, Philip J., 4,050,347, Cl. 86-20.00R.
Bly, Vincent T., 4,051,370, Cl. 250-331.000.
Brody, Philip S., 4,051,465, Cl. 340-173.200.
Campbell, Donn V., 4,051,475, Cl. 343-180.000.
de Claire, Robert B., 4,050,494, Cl. 151-49.000.
Feingold, Robert M.; Hoover, Carl W., Jr.; and Rennie, John, 4,051,403, Cl. 313-105.0CM.
Fincke, George C.; and Taylor, George W., 4,051,449, Cl. 333-73.00C.
Heinemann, Robert W., 4,050,381, Cl. 102-4.000.
Lee, John N.; and Oswald, Robert B., Jr., 4,051,405, Cl. 313-361.000.
McMullen, Willard C.; Gee, Samuel, Sr., deceased; Whitney, Patricia E., legal representative; and Bennett, Joan E., legal representative, 4,050,307, Cl. 73-337.000.
Reggia, Frank; and Jones, Howard S., Jr., 4,051,480, Cl. 343-705.000.
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Williams, John C.; and Kelly, George B., Jr., 4,051,276, Cl. 427-248.00C.
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Arnold, Wesley D., Jr., 4,051,202, Cl. 260-990.000.
Ference, Edward W.; Houtman, John L.; and Waldby, Robert N., 4,050,986, Cl. 176-61.000.
Schulz, Wallace W., 4,051,203, Cl. 260-990.000.
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Ito, Yoichiro, 4,051,025, Cl. 210-31.00C.
Navy: *See—*
Drennen, Thomas G.; and Neander, Allen, 4,050,265, Cl. 64-11.00R.
Fish, Franklin H., 4,051,363, Cl. 250-199.000.
Giles, Michael K.; and Iverson, Myren L., 4,051,364, Cl. 250-199.000.
Goldhagen, Samuel; Heller, Harry; and Rothenstein, Julius, 4,050,968, Cl. 149-19.400.
Hammond, Peter R.; Schimitschek, Erhard J.; and Trias, John A., 4,051,062, Cl. 252-301.170.
Holzman, Allen L.; and Corcoran, William J., 4,050,243, Cl. 60-245.000.
Kaloi, Cyril M., 4,051,478, Cl. 343-700.0MS.
Lichtman, Samuel W., 4,050,819, Cl. 356-51.000.
Lile, Derek L.; and Davis, Neil M., 4,051,437, Cl. 324-158.00R.
Mongillo, Adolph V., 4,050,675, Cl. 254-104.000.
Nyswander, Reuben E., 4,051,439, Cl. 325-121.000.
Privee, James A., 4,051,424, Cl. 320-48.000.
Reeves, Charlie F., 4,051,390, Cl. 307-293.000.
Scholten, James R., 4,050,775, Cl. 350-200.000.
Swiatosz, Edmund; and Marshall, Albert H., 4,050,166, Cl. 35-25.000.
Turner, James Wesley, deceased; and Spinks, Ray E., 4,050,122, Cl. 24-230.00A.
Will, Albert S.; Wilson, Robert R.; and Culver, Paul L., 4,051,339, Cl. 200-153.00L.
Will, Albert S.; Wilson, Robert R.; and Black, Samuel J., 4,051,414, Cl. 361-415.000.
Veterens Affairs: *See—*
Seamone, Woodrow, 4,050,533, Cl. 180-6.500.
U.S. Philips Corporation: *See—*
Bogaard, Johan J. H.; and Korteling, Gerrit-Jan, 4,050,601, Cl. 220-2.10A.
Braat, Josephus Johannes Maria, 4,051,527, Cl. 358-128.000.
Davidse, Jan; and Koppe, Rudolf P., 4,051,520, Cl. 358-22.000.
de Boer, Jan; and Reinink, Jan, 4,050,151, Cl. 30-34.100.
Kemner, Rudolf; and Zonneveld, Frans Wessel, 4,051,377, Cl. 250-401.000.
Meier, Otto, 4,050,199, Cl. 51-285.000.
Schmedemann, Walter; and Hecker, Wolfgang, 4,050,551, Cl. 188-181.00C.
Steinkopf, Wolfgang Otto Gotthard; and Drabek, Rudolf, 4,051,526, Cl. 358-127.000.
van der Werf, Jan Evert; Heuvelmans, Jean Johan; and van Tongeren, Hendricus Franciscus Johannes Jacobus, 4,051,407, Cl. 315-106.000.
van Roosmalen, Johannes Hendrikus Theodorus; and Zuidhof, Pieter, 4,051,512, Cl. 358-51.000.
United Technologies Corporation: *See—*
Benedict, Richard S., 4,050,296, Cl. 73-116.000.
Gordon, Jason Morse, 4,051,366, Cl. 250-223.00B.
Krascella, Nicholas Leo, 4,051,005, Cl. 204-157.10R.
Miller, Guy W.; and Norris, James R., 4,050,844, Cl. 415-147.000.
Pettingell, James R.; and Armstrong, Lee R., 4,050,297, Cl. 73-117.200.
Unitika Kabushiki Kaisha: *See—*
Tsuruta, Motohiro; Kimura, Hiroshiro; Koshimo, Akio; Nara, Hirohisa; Goto, Tokuju; and Amemiya, Kunio, 4,051,215, Cl. 264-137.000.
Unitron Industries Ltd.: *See—*
Cole, William A., 4,051,330, Cl. 179-107.0FD.
University of California, The Regents of the: *See—*
Kaplan, Nathan O., 4,051,186, Cl. 260-570.700.
University Patents, Inc.: *See—*
Peck, John F.; and Hodges, Carl N., 4,050,443, Cl. 126-270.000.
Uno, Hiroaki: *See—*
Hayahusa, Nobuyuki; and Uno, Hiroaki, 4,050,229, Cl. 57-77.400.
Uno, Nayuki; Shono, Tetsuji; Urano, Fumio; Kawasaki, Masahiro; and Miyata, Katsuhiko, to Asahi Kogaku Kogyo Kabushiki Kaisha. Exposure display device for a single lens reflex camera. 4,051,503, Cl. 354-289.000.
Untch, Karl G.: *See—*
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UOP Inc.: *See—*
Bailey, Charles H.; and Dillon, James E., 4,050,903, Cl. 23-288.0FC.
Buhas, Bennie I.; and Uitti, Kenneth D., 4,051,206, Cl. 261-109.000.
Hayes, John C., 4,051,071, Cl. 252-439.000.
Johnson, James A., 4,051,019, Cl. 208-146.000.
Knapik, H. Peter G.; and Adams, Frank H., 4,051,018, Cl. 208-139.000.
Markfelt, Reinhold S., 4,050,315, Cl. 73-425.40R.
Neuzil, Richard W.; and Korous, Donald J., 4,051,192, Cl. 260-674.0SA.
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Uno, Nayuki; Shono, Tetsuji; Urano, Fumio; Kawasaki, Masahiro; and Miyata, Katsuhiko, 4,051,503, Cl. 354-289.000.
Urasaki, Kazuaki: *See—*
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Urso, William G.: *See—*
Kwolek, John P.; Urso, William G.; and Jones, Trevor D., 4,050,620, Cl. 228-162.000.
USM Corporation: *See—*
Elliott, Richard Montgomery; and Newton, Albert Eugene, 4,050,890, Cl. 432-210.000.
Welcher, Ray E.; and Lemay, Roger E., 4,050,393, Cl. 112-121.120.
Utsuyama, Akira. Expansion jointing material for placing concrete, mortar or the like. 4,050,206, Cl. 52-396.000.
Uzuhashi, Hideo: *See—*
Fujinawa, Masaaki; Takeyasu, Kiyoo; Iizuka, Kenichi; Uchida, Motokazu; and Uzuhashi, Hideo, 4,051,417, Cl. 318-138.000.
Vacchi, Giorgio. Containing box for various products. 4,050,623, Cl. 229-23.00R.
Valentin, Guenter: *See—*
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Valint, Paul L.: *See—*
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Vallere, Donald J.: *See—*
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Valo, Antti Tapani. Lopping machine for stems of trees. 4,050,485, Cl. 144-2.00Z.
Van Allen, David: *See—*
Laskin, Irving; and Van Allen, David, 4,051,492, Cl. 354-86.000.

Vanderleest, Siebold, to Boeing Company, The. Foil fence for hydrofoil craft. 4,050,397, Cl. 114-274.000.
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, to C. van der Lely N. V. Cultivator with screening device. 4,050,520, Cl. 172-59.000.
van der Lely, Cornelis. Soil cultivating machines. 4,050,519, Cl. 172-49.000.
Vanderveen, John W., to Phillips Petroleum Company. Carbon black reactor. 4,051,135, Cl. 23-259.500.
van der Werf, Jan Evert; Heuvelmans, Jean Johan; and van Tongeren, Hendricus Franciscus Johannes Jacobus, to U.S. Philips Corporation. Arrangement including a gas and/or vapor discharge lamp. 4,051,407, Cl. 315-106.000.
van Gils, Gerard E.; and Kalafus, Edward F., to General Tire & Rubber Company, The. Composite of rubber bonded to glass fibers. 4,051,281, Cl. 427-379.000.
Van Hook, Danny Allen: *See*—
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Vanlandingham, Harold W.; Boggs, Roger L.; Bullock, David A.; and Maytum, James N., to Caterpillar Tractor Co. Track bush turning tool. 4,050,141, Cl. 29-401.00R.
Van Namen, Dick J.: *See*—
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van Rijkom, Jacobus: *See*—
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van Roosmalen, Johannes Hendrikus Theodorus; and Zuidhof, Pieter, to U.S. Philips Corporation. Color television camera having at least two pick-up tubes. 4,051,512, Cl. 358-51.000.
Van Sluis, Jan Adolf; Reinhart, Frans Remko; Johansen, Johan Peter; and Pedersen, Rolf, to Koninklijke Bedrijven Theodorus Niemeyer B.V.; and Andresen, Joh. H. Apparatus for orienting tobacco leaves. 4,050,467, Cl. 131-147.00A.
van Staveren, Hendricus Cornelis: *See*—
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,050,224, Cl. 56-295.000.
Van Tichelt, Jake W. Mold ejector multiplier. 4,050,666, Cl. 249-68.000.
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van der Werf, Jan Evert; Heuvelmans, Jean Johan; and van Tongeren, Hendricus Franciscus Johannes Jacobus, 4,051,407, Cl. 315-106.000.
van Wingerden, Aart. Seedling growing container. 4,050,188, Cl. 47-85.000.
Van Zeggeren, Wilhelm Aart: *See*—
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Varro, Stephen. Process of conversion of solid waste into workable material with predetermined characteristics and/or into fertilizers or soil improving agents. 4,050,917, Cl. 71-9.000.
Vasiliev, Jury Ivanovich: *See*—
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Vaught, John M., to General Motors Corporation. Variable air admission device for a combustor assembly. 4,050,240, Cl. 60-39.650.
VCA Corporation: *See*—
Beres, Steve W., 4,050,860, Cl. 417-444.000.
Veb Werkzeugmaschinenkombinat "7.Oktober: *See*—
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Vecchia, Gino Dalla, to Sperotto Brevetti S.p.A. Apparatus for washing and scouring fabrics. 4,050,270, Cl. 68-158.000.
Veigel, Neil D., to Shatterproof Glass Corporation. Transparent article and method of making the same. 4,051,297, Cl. 428-336.000.
Veilleux, Florian Leo. Support for flexible bag. 4,050,492, Cl. 150-4.000.
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Anderson, Arnold L.; and Nulph, Robert J., 4,051,105, Cl. 260-45.95G.
Lindvay, Michael W., 4,051,101, Cl. 260-45.85R.
Venema, Gerard J., to Nalco Chemical Company. Apparatus for dissolving water soluble polymers and gums in water. 4,051,065, Cl. 252-359.00A.
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Verkins, Wayne R.; Podvin, Richard T.; and Rist, Karl Frederick, III, to Minnesota Mining and Manufacturing Company. Device for fusing leagths of film over the open ends of cups. 4,050,971, Cl. 156-69.000.
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Vibert, Edward J., to GTE Sylvania Incorporated. Fail-safe ground fault receptacle circuit. 4,051,544, Cl. 361-45.000.
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Virtue, Eugene P.; and Lech, Richard J., to International Harvester Company. Combined fixed and variable displacement pump system. 4,050,478, Cl. 137-625.660.
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Bowing, Walter Grosse; Mrozek, Hinrich; Schlussler, Hans-Joachim; Tinnefeld, Bernd; and Vogele, Peter, 4,051,059, Cl. 252-186.000.
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Vogt, B. Richard; and Cullison, David A., to E. R. Squibb & Sons, Inc. 1,3,8-Triazaspiro(4.5)decan-4-one derivatives. 4,051,248, Cl. 424-267.000.
Vogt, Berthold Richard: *See*—
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Volk, David. Apparatus for farming ophthalmic lens for presbyopia and aphakia. 4,050,192, Cl. 51-33.00R.
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Volkswagenwerk Aktiengesellschaft: *See*—
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von Allworden, Wilhelm, to Jean Walterscheid GmbH. Coupling hook for a guide member of a three-point attachment of a tractor. 4,050,715, Cl. 280-508.000.
von der Crone, Jost, to Ciba-Geigy Corporation. Process for the dyeing of thermoplastics in the melt. 4,051,099, Cl. 260-40.00P.
von Dreusche, Charles F., Jr., to Nichols Engineering & Research Corporation. Method and apparatus for incinerating waste material. 4,050,389, Cl. 110-12.000.
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Voogd, Roeland H.: *See*—
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Wade, Elman E., to Westinghouse Electric Corporation. Rotating plug bearing and seal. 4,050,987, Cl. 176-87.000.
Wade, Peter C.; and Vogt, Berthold Richard, to E. R. Squibb & Sons, Inc. 2-Substituted-1H-benz(de)-isoquinoline-1,3-(2H)-diones. 4,051,246, Cl. 424-258.000.
Wadleigh, Edward R. Synchronated index film drive mechanism. 4,050,650, Cl. 242-206.000.
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Wahman, Lorentz. Coupling device for joining together reinforced concrete elements, such as concrete piles or pillars. 4,050,211, Cl. 52-726.000.
Wakana, Hiroshi; Harada, Isamu; and Honma, Tsutomu, to Bridgestone Tire Company Limited. Panel assembled tank. 4,050,605, Cl. 220-5.00A.
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Ward, Dennis J., to UOP Inc. Solid phosphoric acid catalyzed alkylation of aromatic hydrocarbons. 4,051,191, Cl. 260-671.00R.
Warner, Ronald E.; Healey, Francis J.; and Grijalba, Abel D., to Westinghouse Electric Corporation. Method for removing rotatable blades without removing the casting of a turbine. 4,050,134, Cl. 29-156.80R.
Warrin, George E., to Cavitron Corporation. Dental handpiece switch. 4,051,337, Cl. 200-61.850.
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Watanabe, Sataya, to Nippon Kogaku K.K. Filter holder insertable into the lens barrel of a camera. 4,050,791, Cl. 350-318.000.
Watanabe, Takao, to Hitachi, Ltd. Control system for steam generator. 4,050,418, Cl. 122-451.00R.
Watson, James J., Jr., to Carrier Corporation. Remote heating process. 4,050,881, Cl. 432-5.000.
Watson, Richard D.; and Sowash, Thomas R., to General Motors Corporation. Threaded terminal assembly for dynamoelectric machine. 4,050,771, Cl. 339-263.00R.
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Weiss, Jean M. Method and apparatus for obtaining images of different color intensities combinations and relationships. 4,050,797, Cl. 353-30.000.
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Wendel, Kurt; Reichel, Fritz; and Taubitz, Christof, to BASF Aktiengesellschaft. Manufacture of shear-resistant aqueous copolymer emulsions. 4,051,093, Cl. 260-29.6TA.
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Wenzel, Werner, to Nordischer Maschinenbau Rud. Baader. Fish processing machines. 4,050,118, Cl. 17-54.000.
Werner, Harvey Albert. Method for fabricating a lamp base. 4,050,489, Cl. 144-315.00R.
Werner, Harvey Albert. Method for fabricating a lamp and shade. 4,050,490, Cl. 144-316.000.
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Wiechert, Rudolf: *See*—
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,051,188, Cl. 260-590.0FA.

Wieland, Werner, to Audi NSU Auto Union Aktiengesellschaft; and Wankel GmbH. Method of producing a housing for circular piston combustion engine of trochoid type. 4,050,132, Cl. 29-156.40R.

Wiklund, Curt Helmer; and Frodin, Gunnar Sten. Grating. 4,050,366, Cl. 98-110.000.

Wild, Albrecht: *See*—
Dahm, Johann; Borck, Joachim; Wild, Albrecht; and Hovy, Jan Willem, 4,051,250, Cl. 424-272.000.

Wilde, Veldon Lawrence: *See*—
Davies, Michael LaVar; Johnson, Richard Servern; Noker, Alvin John; and Wilde, Veldon Lawrence, 4,050,568, Cl. 197-90.000.

Wilder, Gene Ray, to Monsanto Company. Stabilization of unsaturated carboxylic acid esters with mixtures of polyalkyleneamines and arylenediamines. 4,051,067, Cl. 252-401.000.

Wilder, Leslie N.; Whitney, James C.; and Matison, Gary, to Dictaphone Corporation. Instruction indicating apparatus for a record and/or playback device. 4,051,540, Cl. 360-72.000.

Wildmoser, Martin Michael: *See*—
Gorski, Dennis M.; Neuber, Dieter; and Wildmoser, Martin Michael, 4,050,579, Cl. 206-460.000.

Wileman, Richard D.: *See*—
Allyn, Jerome B.; Wileman, Richard D.; and Kozak, John, 4,050,502, Cl. 164-68.000.

Wiley, Donald F., to Coaden Oil & Chemical Company. Co-extrusion of polyvinylidene fluoride/polystyrene multiple-layered sheeting. 4,051,293, Cl. 428-213.000.

Wilkinson, Robert M.; and Lyon, James R., to Alton Box Board Company. Rigid-when-wet paperboard containers and their manufacture. 4,051,277, Cl. 427-288.000.

Will, Albert S.; Wilson, Robert R.; and Culver, Paul L., to United States of America, Navy. Variable time missile safety timer. 4,051,339, Cl. 200-153.00L.

Will, Albert S.; Wilson, Robert R.; and Black, Samuel J., to United States of America, Navy. Missile adaptation kit assembly. 4,051,414, Cl. 361-415.000.

Will Ross, Inc.: *See*—
Kossett, Allen J., 4,050,667, Cl. 249-82.000.

Willadsen, Per: *See*—
Drostholm, Frede Hilmar; Jensen, Harry; and Willadsen, Per, 4,050,865, Cl. 425-183.000.

William Wahl Corporation: *See*—
Junkert, Kenneth G.; and Voznick, Henry P., 4,050,309, Cl. 73-362.0AR.

Williams, Dale: *See*—
Bunn, Dorrance P., Jr.; Williams, Dale; Jones, Henry B.; and MacLean, John P., 4,051,069, Cl. 252-417.000.

Williams, Donald F. One-piece box with tapered sides and method of making same. 4,050,624, Cl. 229-33.000.

Williams, Jerry K., to General Motors Corporation. Cambering device for cambering vehicle. 4,050,713, Cl. 280-278.000.

Williams, Joel L.; Tulis, Jerry J.; and Taylor, Larry A., to Becton, Dickinson and Company. Polymeric sterilant assembly. 4,050,576, Cl. 206-210.000.

Williams, John C.; and Kelly, George B., Jr., to United States of America, Congress. Method of deacidifying paper. 4,051,276, Cl. 427-248.00C.

Williams Manufacturing Company: *See*—
Ekholm, Carl Roger, 4,050,454, Cl. 128-70.000.

Williams, Thomas Walter: *See*—
Eichelberger, Edward Baxter; Muehldorf, Eugene Igor; Walther, Ronald Gene; and Williams, Thomas Walter, 4,051,352, Cl. 364-716.000.

Willis, Harry G.: *See*—
Jackson, Robert Andrew, III; and Willis, Harry G., 4,050,759, Cl. 339-75.00M.

Wilms, Carl A., to Ameron, Inc. Hydraulically balanced marine loading arm. 4,050,585, Cl. 212-48.000.

Wilson, Alister; Marr, William David; and Guild, George Arthur. Method of producing reinforced sheet material. 4,051,288, Cl. 428-102.000.

Wilson, Robert R.: *See*—
Will, Albert S.; Wilson, Robert R.; and Culver, Paul L., 4,051,339, Cl. 200-153.00L.
Will, Albert S.; Wilson, Robert R.; and Black, Samuel J., 4,051,414, Cl. 361-415.000.

Wilson, Virgil D. Mobile rescue apparatus. 4,050,542, Cl. 182-10.000.

Wilson, William. Process container. 4,050,580, Cl. 206-511.000.

Wilson, William Crawford; and Anderson, David Bowen, to Eastman Kodak Company. Latch assembly. 4,050,725, Cl. 292-304.000.

Wilson, Woodrow, Jr., to Deepwater Salvage, Inc. Elevator structure. 4,050,546, Cl. 187-12.000.

Wilts, James F.: *See*—
Lewis, Roger N.; Pastorino, Ronald L.; and Wilts, James F., 4,051,310, Cl. 526-230.000.

Windecker, Leo J., to International Harvester Company. Silicone rubber mold. 4,051,296, Cl. 428-311.000.

Wing, Robert E.; and Doane, William M., to United States of America, Agriculture. Removal of heavy metal ions from aqueous solutions with insoluble crosslinked-starch-xanthates. 4,051,316, Cl. 536-107.000.

Wingard, Robert E.: *See*—
Wang, Patricia C.; and Wingard, Robert E., 4,051,138, Cl. 260-278.000.

Winkler, Robert J.: *See*—
Possell, Clarence R.; and Winkler, Robert J., 4,050,636, Cl. 241-46.00B.

Winkworth, Reginald: *See*—
Fairbairn, Geoffrey; Cooke, George Frederick; Winkworth, Reginald; and Koreki, Jan, 4,050,289, Cl. 73-1.00F.

Winne, David H.: *See*—
Armor, Anthony F.; and Winne, David H., 4,051,400, Cl. 310-58.000.

Winter, Heinrich; and Sethna, Darius N. Method for the production of ductile and stable particle-superconductors. 4,050,147, Cl. 29-599.000.

Winters, Alden Bernard: *See*—
Pompei, Arturo; and Winters, Alden Bernard, 4,050,208, Cl. 52-460.000.

Wisconsin Alumni Research Foundation: *See*—
Trost, Barry M.; and Verhoeven, Thomas R., 4,051,157, Cl. 260-397.100.

Wolf, Kenneth J. Sidereal rate drive mechanism for a telescope mount. 4,050,318, Cl. 74-89.150.

Wolfe, Lester. Folding bed assembly. 4,050,106, Cl. 5-10.00R.

Wolfle, Rudolf; Rucker, Dieter; and Lauerer, Uta, to Siemens Aktiengesellschaft. Method for the preparation of diffused silicon semiconductor components. 4,050,966, Cl. 148-188.000.

Wolski, Jerome C., to Westinghouse Electric Corporation. Overload relay reset assembly. 4,051,340, Cl. 200-329.000.

Womack, Robert C., to AAA Products International Inc. Hydraulic tapping apparatus. 4,050,835, Cl. 408-11.000.

Wood, Frederick. Solid state relay. 4,051,547, Cl. 361-160.000.

Wood, Peter, to White-Westinghouse Corporation. Shoot through protected current driven transistor inverter circuit. 4,051,426, Cl. 363-131.000.

Woodrow, Arthur F.; and Simmons, Jorge E., to TSN Company, Inc. Method and apparatus for inspecting bottled goods. 4,050,824, Cl. 356-197.000.

Woodson, Alfred E.: *See*—
Redmore, Derek; and Woodson, Alfred E., 4,051,029, Cl. 210-58.000.

Wooldridge, John, to James Neill Holdings Limited. Adjustable mounting. 4,050,661, Cl. 248-285.000.

Woon, Lin-Sun; and Endres, Dan D., to Kimberly-Clark Corporation. Disposable diaper with elastically constricted crotch section. 4,050,462, Cl. 128-287.000.

World Energy Systems: *See*—
Hamrick, Joseph T.; and Rose, Leslie C., 4,050,515, Cl. 166-303.000.

Wotschofsky, Franz: *See*—
Gemein, Rudolf; and Wotschofsky, Franz, 4,050,845, Cl. 415-172.00A.

Wright, Gordon Thomas; and Doubleday, Eric George. Vacuum cleaners. 4,050,113, Cl. 15-315.000.

Wu, Ching H.; Brown, Alfred; Huang, Wann-Sheng; and Shum, Yick-Mow, to Texaco Inc. Method of treating a high temperature formation to permit the use therein of temperature sensitive hydrophilic, viscosity increasing polymers. 4,050,513, Cl. 166-274.000.

Wu, Tai W.: *See*—
Goffe, Charles A., deceased; Rand, Royden N.; and Wu, Tai W., 4,050,898, Cl. 23-253.0TP.

Wunderlich, Donald K.: *See*—
Myers, Gary A.; and Wunderlich, Donald K., 4,051,022, Cl. 208-253.000.

Wunsch, Gerd: *See*—
Koester, Eberhard; Wunsch, Gerd; Schoenafinger, Eduard; and Schneehage, Henning, 4,050,962, Cl. 148-105.000.

Wurster, Helmut, to Richard Wolf GmbH. Apparatus for measuring rates of urine flow electrically. 4,051,431, Cl. 324-61.00R.

Wuttke, Wolfgang: *See*—
Mayer, Karl Heinrich; Petersen, Siegfried; Klauke, Erich; Hoffmeister, Friedrich; and Wuttke, Wolfgang, 4,051,252, Cl. 424-273.00P.

Wyatt, Derek Gerald: *See*—
Hemp, John; and Wyatt, Derek Gerald, 4,050,303, Cl. 73-194.0EM.

Wynnyk, Eugene E. Reusable pocket ash receptacle. 4,050,468, Cl. 131-232.000.

Wyse, Harold G., to Gad-Jets, Inc. Low noise air nozzle. 4,050,632, Cl. 239-425.000.

Wysocki, Lawrence Eugene: *See*—
Hines, Clyde Kenneth; Long, Everett James; and Wysocki, Lawrence Eugene, 4,050,762, Cl. 339-108.0TP.

Xerox Corporation: *See*—
Fisher, Donald J., 4,051,077, Cl. 252-62.10P.
Kramer, William E., 4,051,285, Cl. 428-43.000.
Limburg, William W.; Yanus, John F.; and Pai, Damodar M., 4,050,935, Cl. 96-1.0PC.
Marsh, Dana G.; and Chu, Joseph Y. C., 4,050,937, Cl. 96-48.00R.
Marsh, Dana G.; and Chu, Joseph Y. C., 4,050,939, Cl. 96-88.000.
McCarroll, Alan F.; and Connolly, Douglas P., 4,050,801, Cl. 355-3.00R.
McCarroll, Alan F., 4,050,803, Cl. 355-3.00R.
Moser, Rabin, 4,050,886, Cl. 432-60.000.
Parker, Delmer G., 4,050,413, Cl. 118-647.000.
Roetling, Paul G., 4,051,536, Cl. 358-298.000.
Silverberg, Morton, 4,050,804, Cl. 355-10.000.
Snyder, Jan S.; and Bright, Clark I., 4,051,463, Cl. 340-173.0TP.
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,050,688, Cl. 271-5.000.
Stange, Klaus K., 4,050,751, Cl. 312-197.000.
Stemmle, Denis J., 4,050,816, Cl. 355-75.000.
Turner, Sam R., 4,050,934, Cl. 96-1.00R.

Yabashi, Tokutaro. True north meridian indicator. 4,050,161, Cl. 33-270.000.

Yada, Masaaki: *See*—
Ogawa, Kazuyuki; Hirose, Masahiko; Yada, Masaaki; and Imamura, Hitoshi, 4,051,382, Cl. 250-531.000.

Yaguinuma, Jusuke, to Copal Company Limited. Construction of a frame of a digital clock. 4,050,232, Cl. 58-52.00R.

Yahiro, Seinosuke: *See*—
Katsoka, Hiroyuki; Yahiro, Seinosuke; and Suzuki, Kazuo, 4,050,547, Cl. 187-29.00R.

Yamada, Hiraku: *See*—
Yoshihashi, Akira; and Yamada, Hiraku, 4,050,750, Cl. 305-54.000.

Yamada, Hiroshi: *See*—
Habu, Teiji; Ishihara, Masao; Sakamoto, Eiichi; Yamada, Hiroshi; and Kaneshige, Masaaki, 4,050,940, Cl. 96-114.500.

Yamada, Kazuji: *See*—
Shimada, Satoshi; Yamada, Kazuji; Matsuda, Yasumasa; Kimura, Ichiro; Shimazoe, Michitaka; and Takahashi, Yukio, 4,050,313, Cl. 73-398.0AR.

Yamada, Kozo, to Oki Electric Industry Company, Ltd. Printing apparatus. 4,051,485, Cl. 346-75.000.

Yamada, Makoto; Sasaki, Shiro; Kanazawa, Shigenori; and Hayashi, Yoshihiro, to Toyota Jidosha Kogyo Kabushiki Kaisha; Nippon Denso Co., Ltd.; and Tokai Rika Denki Seisakusho K.K. Seat belt system. 4,050,717, Cl. 280-744.000.

Yamada, Shinichiro; Ishida, Akira; and Mukai, Hisakazu, to Nippon Telegraph and Telephone Public Corporation. Apparatus for accessing an information storage device having defective memory cells. 4,051,460, Cl. 364-900.000.

Yamaguchi, Takehisa, to Kato Hatsujyo Co., Ltd. Fastener. 4,050,120, Cl. 24-73.0HS.

Yamamoto, Yoshihiko; Shigenobu, Masahiro; and Kuwabara, Hideo, to Mitsubishi Denki Kabushiki Kaisha. Ozone generating apparatus. 4,051,045, Cl. 250-536.000.

Yamanashi, Norio: *See*—
Sato, Yasuhiro; Sato, Toshio; Kawasaki, Shuichi; Takaishi, Toshio; Okuyama, Sadao; and Yamanashi, Norio, 4,050,371, Cl. 99-550.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Murakami, Masuo; Isaka, Ichiro; and Kashiwagi, Teruya, 4,051,126, Cl. 260-239.100.

Yamauchi, Satoshi; and Yamazaki, Shigeru, to Ricoh Co., Ltd. Teacher-students' intercommunication system. 4,050,165, Cl. 35-8.00A.

Yamazaki, Seishi, to Hitachi, Ltd. Gain control circuits for audio amplifiers. 4,051,442, Cl. 330-281.000.

Yamazaki, Shigeru: *See*—
Yamauchi, Satoshi; and Yamazaki, Shigeru, 4,050,165, Cl. 35-8.00A.

Yanagi, Hirofumi: *See*—
Ikeno, Hitoshi; Sugita, Mitsuyuki; and Yanagi, Hirofumi, 4,050,126, Cl. 29-25.350.

Yanagisawa, Hiroaki; Ando, Akiko; Fukushima, Masami; and Nakao, Hideo, to Sankyo Company Limited. Process for preparing alkoxylated derivatives of cephalosporin compounds. 4,051,320, Cl. 542-420.000.

Yanagisawa, Hiroaki: *See*—
Shimizu, Bunji; Saito, Akio; Kaneko, Masakatsu; Yanagisawa, Hiroaki; and Nakao, Hideo, 4,051,129, Cl. 544-21.000.

Yant, Howard W.; Stinebiser, Karl W.; and Anzur, Gregory C., to Westinghouse Electric Corporation. Nuclear reactor. 4,050,985, Cl. 176-61.000.

Yanus, John F.: *See*—
Limburg, William W.; Yanus, John F.; and Pai, Damodar M., 4,050,935, Cl. 96-1.0PC.

Yasuhiro, Ikuta; and Hitomi, Shimo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system for an automobile engine, including a high altitude compensator. 4,050,429, Cl. 123-119.00A.

Yasui Sangyo Col. Ltd.: *See*—
Nishimura, Matsuo, 4,050,673, Cl. 254-89.00H.

Yeazell, Bruce Albert: *See*—
Trinh, Toan; and Yeazell, Bruce Albert, 4,051,055, Cl. 252-95.000.

Yokozawa, Norio: *See*—
Inose, Fumiyuki; Fujikata, Kenji; and Yokozawa, Norio, 4,051,457, Cl. 340-146.3MA.

Yoshida Kogyo K.K.: *See*—
Azuma, Akira, 4,050,191, Cl. 49-360.000.

Yoshida, Norio: *See*—
Hayashi, Kazushige; Minemura, Norihiro; Fujimoto, Iwao; Ozaki, Kiyotaka; Yoshida, Norio; Morishita, Toshio; and Shinoki, Takanori, 4,051,287, Cl. 428-91.000.

Yoshihashi, Akira; and Yamada, Hiraku, to Kabushiki Kaisha Komatsu Seisakusho. Two-piece master track link. 4,050,750, Cl. 305-54.000.

Yoshikumi, Chikao: *See*—
Ohtsuka, Shigeto; Ueno, Saburo; Yoshikumi, Chikao; Hiroae, Fumio; Ohmura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,051,314, Cl. 536-1.000.

Young, Alastair John, to Automotive Products Limited. Individual load-sensitive vale devices for vehicle fluid pressure braking systems. 4,050,552, Cl. 188-195.000.

Young, Robert S.: *See*—
Young, Walter M.; and Young, Robert S., 4,050,181, Cl. 43-42.060.

Young, Walter M.; and Young, Robert S. Artificial fishing worm. 4,050,181, Cl. 43-42.060.

Youngflex, S.A.: *See*—
Griffiths, David Thomas, 4,050,738, Cl. 297-452.000.

Yuzawa, Yasutaka: *See*—
Kobayashi, Masayoshi; and Yuzawa, Yasutaka, 4,050,856, Cl. 417-289.000.

Zacher, Albert R., Jr., to Artronix, Inc. Axial tomographic apparatus and detector. 4,051,379, Cl. 250-445.00T.

Zagorski, Edward J.: *See*—
McCain, William B.; Cosgrove, James F.; and Zagorski, Edward J., 4,050,686, Cl. 270-54.000.

Zaikovsky, Vladimir Borisovich; Kutuzov, Jury Prokhorovich; Zakharov, Mikhail Fedorovich; Kavtaev, Evgeny Emelyanovich; Poedinschikov, Jury Grigorievich; Bazhanov, Jury Mikhailovich; and Schapov, Valentin Andrianovich. Die for extruding articles with variable cross-section profile. 4,050,288, Cl. 72-468.000.

Zaiser, Wolfgang; and Diegelmann, Helmut, to Daimler-Benz Aktiengesellschaft. Planetary gear change-speed transmission for vehicles. 4,050,329, Cl. 74-750.00R.

Zakharov, Mikhail Fedorovich: *See*—
Zaikovsky, Vladimir Borisovich; Kutuzov, Jury Prokhorovich; Zakharov, Mikhail Fedorovich; Kavtaev, Evgeny Emelyanovich; Poedinschikov, Jury Grigorievich; Bazhanov, Jury Mikhailovich; and Schapov, Valentin Andrianovich, 4,050,288, Cl. 72-468.000.

Zbikowski, Gerhard; and Geafer, Salahaddin, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Hydraulic servo-motor. 4,050,434, Cl. 123-140.0FG.

Zeuner, Kenneth W.; and Jarman, Alonzo B., to Control Concepts, Inc. Electrohydraulic valve assembly for front end loader attachment to farm tractor. 4,050,596, Cl. 214-131.00A.

Ziemann, Heinz: *See*—
Braden, Rudolf; Knupfer, Hans; and Ziemann, Heinz, 4,051,177, Cl. 260-510.000.

Zimmer, Franklin V.: *See*—
Brewer, William E.; and Zimmer, Franklin V., 4,050,258, Cl. 61-50.000.
Brewer, William E.; and Zimmer, Franklin V., 4,050,261, Cl. 61-105.000.
Brewer, William E.; and Zimmer, Franklin V., 4,050,950, Cl. 106-97.000.

Zonneveld, Frans Wessel: *See*—
Kemner, Rudolf; and Zonneveld, Frans Wessel, 4,051,377, Cl. 250-401.000.
Zuidhof, Pieter: *See*—
van Roosmalen, Johannes Hendrikus Theodorus; and Zuidhof, Pieter, 4,051,512, Cl. 358-51.000.
Zukel, John W.: *See*—
Plant, Howard L.; Zukel, John W.; and Ames, Ronald B., 4,050,921, Cl. 71-94.000.
Zunkel, Richard L., to Eaton Corporation. Door closer assembly. 4,050,114, Cl. 16-48.500.
Zywietz, Walter: *See*—
Gantke, Franz; Walter, Harald; and Zywietz, Walter, 4,050,212, Cl. 52-726.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF SEPTEMBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

DeCraene, Denis F., to Diamond Shamrock Technologies S.A. Finely divided RuO_2/plastic matrix. Re. 29,419, Cl. 204-290.00F.
Diamond Shamrock Technologies S.A.: *See*—
DeCraene, Denis F., Re. 29,419, Cl. 204-290.00F.
Dunn, Lyman D.: *See*—
Ricobene, Sam; and Dunn, Lyman D., Re. 29,415, Cl. 206-550.000.
Hekkanen, Eero M.; and Tokola, Alpo J., to Kaiser Steel Corporation. Method and apparatus for fabricating an off-shore structure. Re. 29,413, Cl. 61-96.000.
Hunt, Robert F., to International Paper Company. Flexible ceramic member having a pre-loaded tensile force applying means. Re. 29,418, Cl. 162-274.000.
Hunt, Robert F.: *See*—
Lee, Charles A.; and Hunt, Robert F., Re. 29,417, Cl. 162-274.000.
International Harvester Company: *See*—
Prokop, Josef F., Re. 29,414, Cl. 74-477.000.
International Paper Company: *See*—
Hunt, Robert F., Re. 29,418, Cl. 162-274.000.
Lee, Charles A.; and Hunt, Robert F., Re. 29,417, Cl. 162-274.000.
Jonsson, Bo Folke: *See*—
Lindstrom, Jan Nils; Jonsson, Bo Folke; and Ohlsson, Fall Johan Olof William, Re. 29,420, Cl. 428-336.000.
Kaiser Steel Corporation: *See*—
Hekkanen, Eero M.; and Tokola, Alpo J., Re. 29,413, Cl. 61-96.000.
Lee, Charles A.; and Hunt, Robert F., to International Paper Company. Papermaking system including a flexible ceramic member having a pre-loaded tensile force applying means. Re. 29,417, Cl. 162-274.000.
Lindstrom, Jan Nils; Jonsson, Bo Folke; and Ohlsson, Fall Johan Olof William, to Sandvik Aktiebolag. Sintered cemented carbide body coated with two layers. Re. 29,420, Cl. 428-336.000.
Ohlsson, Fall Johan Olof William: *See*—
Lindstrom, Jan Nils; Jonsson, Bo Folke; and Ohlsson, Fall Johan Olof William, Re. 29,420, Cl. 428-336.000.
Peille, Jean-Marie Raymond, to Societe Industrielle de Stratifies. Equipment for the continuous production of panels of synthetic material. Re. 29,416, Cl. 425-115.000.
Prokop, Josef F., to International Harvester Company. Shift mechanism for mechanical transmissions. Re. 29,414, Cl. 74-477.000.
Ricobene, Sam; and Dunn, Lyman D. Food container assembly. Re. 29,415, Cl. 206-550.000.
Sandvik Aktiebolag: *See*—
Lindstrom, Jan Nils; Jonsson, Bo Folke; and Ohlsson, Fall Johan Olof William, Re. 29,420, Cl. 428-336.000.
Scott, Warner C., to Texas Instruments Incorporated. Laser system having electronically selectable gain. Re. 29,421, Cl. 331-94.50Q.
Societe Industrielle de Stratifies: *See*—
Peille, Jean-Marie Raymond, Re. 29,416, Cl. 425-115.000.
Texas Instruments Incorporated: *See*—
Scott, Warner C., Re. 29,421, Cl. 331-94.50Q.
Tokola, Alpo J.: *See*—
Hekkanen, Eero M.; and Tokola, Alpo J., Re. 29,413, Cl. 61-96.000.
Zinn, Daniel L. Studs. Re. 29,412, Cl. 52-720.000.

LIST OF PLANT PATENTEES

Conard-Pyle Company, The: *See*—
Zebehazy, Alex J., 4,111, Cl. 54.000.
Fischer, Arnold W., to Geo. J. Ball, Inc. African violet plant named Rachel. 4,113, 9-27-77, Cl. 69.000.
Fischer, Arnold W., to Geo. J. Ball, Inc. African violet plant named Dolly. 4,114, 9-27-77, Cl. 69.000.
Fischer, Arnold W., to Geo. J. Ball, Inc. African violet plant named Abby. 4,115, 9-27-77, Cl. 69.000.
Geo. J. Ball, Inc.: *See*—
Fischer, Arnold W., 4,113, Cl. 69.000.
Fischer, Arnold W., 4,114, Cl. 69.000.
Fischer, Arnold W., 4,115, Cl. 69.000.
Roberts, Alfred N., 4,112, Cl. 56.000.
Reynolds, Samuel M. Almond tree. 4,116, 9-27-77, Cl. 30.000.
Roberts, Alfred N., to Geo. J. Ball, Inc. Azalea plant named Cotton Candy. 4,112, 9-27-77, Cl. 56.000.
Zebehazy, Alex J., to Conard-Pyle Company, The. *Pieris japonica* - Zebris variety. 4,111, 9-27-77, Cl. 54.000.

LIST OF DESIGN PATENTEES

Abe, Kuniomi: *See*—
Masuyama, Kazuo; Abe, Kuniomi; and Maekawa, Yuji, 245,912, Cl. D16-58.000.
Alter, Harold E.; and Alter, Roger W. Lawn game goal. 245,931, 9-27-77, Cl. D34-5.0PP.
Alter, Roger W.: *See*—
Alter, Harold E.; and Alter, Roger W., 245,931, Cl. D34-5.0PP.
American Optical Corporation: *See*—
Armbruster, John T., 245,917, Cl. D24-17.000.
Ansul Company, The: *See*—
Montambo, Roger Jay, 245,929, Cl. D29-5.000.
Armbruster, John T., to American Optical Corporation. Optometer. 245,917, 9-27-77, Cl. D24-17.000.
B & B Italia S.p.A.: *See*—
Bellini, Mario, 245,888, Cl. D6-71.000.
Beall, Lester, to Trend Line Furniture Corporation. Sofa or similar article. 245,887, 9-27-77, Cl. D6-63.000.
Bellini, Mario, to B & B Italia S.p.A. Seat. 245,888, 9-27-77, Cl. D6-71.000.
Benson, James L., to Custom Carpets, Inc. Carpet sample display carrier. 245,944, 9-27-77, Cl. D87-1.00R.
Beran, Anthony V. Coupler for respiratory apparatus. 245,921, 9-27-77, Cl. D24-53.000.
Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, to International Business Machines Corporation. Electrophotographic machine or the like. 245,911, 9-27-77, Cl. D16-27.000.
Blankenship, Dovie. Boy doll. 245,930, 9-27-77, Cl. D34-4.00R.
Blum, Stephen E. Dice agitator. 245,933, 9-27-77, Cl. D34-5.0GG.
Bolick, Fred C., Jr., to Lanier Business Products, Inc. Cassette changer or the like. 245,907, 9-27-77, Cl. D14-6.000.
Cassia, Antonio Macchi, to Steiner American Corporation. Soap dispenser. 245,889, 9-27-77, Cl. D6-95.000.
Certain-teed Corporation: *See*—
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60 4,050,953
CLASS 128
1 R 4,050,448
2 F 4,050,451
2 L 4,050,450
2 S 4,050,449
2.05 A 4,050,452
2.06 E 4,050,453
70 4,050,454
80 F 4,050,455
88 4,050,456
145.5 4,050,457
145.8 4,050,458
218 C 4,050,459
223 4,050,460
227 4,050,461
287 4,050,462
4,050,463
303 R 4,050,464
326 4,050,465
351 4,050,466
CLASS 131
147 A 4,050,467
232 4,050,468
CLASS 132
11 R 4,050,469
89 4,050,470
CLASS 134
2 4,050,954
8 4,050,955
CLASS 137
39 4,050,471
242 4,050,472
244 4,050,473
596 4,050,474
625.17 4,050,475
625.62 4,050,476
625.65 4,050,477
625.66 4,050,478
CLASS 138
42 4,050,479
CLASS 139
55.1 4,050,480
436 4,050,481
CLASS 141
1.1 4,050,482
4 4,050,483
34 4,050,484
CLASS 144
2 Z 4,050,485
4,050,486
28.5 4,050,487
309 AC 4,050,488
315 R 4,050,489
316 4,050,490
CLASS 148
6 4,050,956
6.3 4,050,957
9.5 4,050,958
12.3 4,050,959
16 4,050,960
32 4,050,961
105 4,050,962
128 4,050,963
171 4,050,964
175 4,050,965
188 4,050,966
189 4,050,967
CLASS 149
19.4 4,050,968
4,050,969
88 4,050,970
CLASS 150
1.6 4,050,491
4 4,050,492
35 4,050,493
CLASS 151
49 4,050,494
CLASS 152
187 4,050,495
241 4,050,496
361 FP 4,050,497
CLASS 156
69 4,050,971
71 4,050,972
123 R 4,050,973
159 4,050,974
217 4,050,975
233 4,050,976
283 4,050,977
300 4,050,978
647 4,050,979
CLASS 160
374.1 4,050,498
CLASS 162
24 4,050,980
37 4,050,981
100 4,050,982
274 Re.29,417
Re.29,418
317 4,050,499
CLASS 164
16 4,050,500
68 4,050,501
4,050,502
155 4,050,503
201 4,050,504
206 4,050,505
CLASS 165
1 4,050,506
4,050,507
32 4,050,508
45 4,050,509
89 4,050,510
162 4,050,511
CLASS 166
128 4,050,512
176 4,050,514
274 4,050,513
303 4,050,515
305 R 4,050,516
315 4,050,517
CLASS 171
116 4,050,518
CLASS 172
49 4,050,519
59 4,050,520
196 4,050,521
311 4,050,522
4,050,523
707 4,050,524
CLASS 173
17 4,050,525
27 4,050,526
49 4,050,527
163 4,050,528
CLASS 174
57 4,051,321
65 R 4,051,322
78 4,051,323
121 R 4,051,324
CLASS 175
422 4,050,529
CLASS 176
38 4,050,983
60 4,050,984
61 4,050,985
4,050,986
87 4,050,987
4,050,988
CLASS 177
1 4,050,530
198 4,050,531
211 4,050,532
CLASS 179
1 HF 4,051,325
2 DP 4,051,326
5 R 4,051,327
15 AL 4,051,328
100.3 N 4,051,329
107 FD 4,051,330
107 R 4,051,331
170.2 4,051,332
175.3 R 4,051,333
CLASS 180
6.5 4,050,533
24.09 4,050,534
51 4,050,535
66 B 4,050,536
91 4,050,537
CLASS 181
114 4,050,540
159 4,050,541
210 4,050,538
280 4,050,539
CLASS 182
10 4,050,542
CLASS 184
6.3 4,050,543
6.6 4,050,544
CLASS 187
8.43 4,050,545
12 4,050,546
29 R 4,050,547
CLASS 188
71.8 4,050,548
72.8 4,050,549
112 4,050,550
181 C 4,050,551
195 4,050,552
203 4,050,553
4,050,554
CLASS 191
23 A 4,050,555
CLASS 192
4 B 4,050,556
4 R 4,050,557
53 G 4,050,558
58 B 4,050,559
85 AT 4,050,560
CLASS 193
35 R 4,050,561
CLASS 194
4 E 4,050,562
CLASS 195
29 4,050,989
CLASS 197
1 R 4,050,563
4,050,564
6.3 4,050,565
19 4,050,566
72 4,050,567
90 4,050,568
120 4,050,569
CLASS 198
347 4,050,572
366 4,050,573
398 4,050,570
458 4,050,574
774 4,050,571
834 4,050,575
CLASS 200
50 AA 4,051,334
4,051,335
61.43 4,051,336
61.85 4,051,337
85 R 4,051,338
153 L 4,051,339
329 4,051,340
CLASS 201
5 4,050,990
CLASS 202
99 4,050,991
227 4,050,992
CLASS 203
9 4,050,993
35 4,050,994
CLASS 204
1 T 4,050,995
28 4,050,996
4,050,997
59 R 4,050,998
67 4,050,999
106 4,051,000
151 4,051,001
157.1 R 4,051,005
159.17 4,051,003
180 P 4,051,002
181 4,051,004
195 P 4,051,006
197 4,051,007
266 4,051,008
279 4,051,009
290 F Re.29,419
298 4,051,010
299 R 4,051,011
CLASS 206
210 4,050,576
322 4,050,577
340 4,050,578
460 4,050,579
511 4,050,580
544 4,050,581
550 Re.29,415
627 4,050,582
CLASS 208
8 4,051,012
78 4,051,013
88 4,051,014
108 4,051,015
127 4,051,016
135 4,051,017
139 4,051,018
146 4,051,019
213 4,051,020
216 4,051,021
253 4,051,022
CLASS 209
223 A 4,051,023
CLASS 210
30 A 4,051,024
31 C 4,051,025
38 B 4,051,026
42 R 4,051,027
47 4,051,028
58 4,051,029
114 4,051,030
133 4,051,031
142 4,051,032
193 4,051,033
206 4,051,034
220 4,051,035
232 4,051,036
236 4,051,037
242 S 4,051,038
274 4,051,039
321 B 4,051,040
4,051,041
409 4,051,042
CLASS 211
20 4,050,583
76 4,050,584
CLASS 212
48 4,050,585
59 R 4,050,586
4,050,587
CLASS 213
75 B 4,050,588
CLASS 214
1 PA 4,050,589
2.5 4,050,590
6 D 4,050,591
18.2 4,050,592
44 C 4,050,593
83.3 4,050,594
84 4,050,595
131 A 4,050,596
331 4,050,597
518 4,050,598
730 4,050,599
CLASS 215
11 R 4,050,600
CLASS 219
10.55 D 4,051,341
60 A 4,051,342
84 4,051,343
132 4,051,344
288 4,051,345
328 4,051,346
400 4,051,347
506 4,051,348
CLASS 220
2.1 A 4,050,601
4,050,602
3.9 4,050,603
4 F 4,050,604
5 A 4,050,605
7 4,050,606
9 LG 4,050,607
4,050,608
4,050,609
CLASS 221
171 4,050,610
CLASS 222
88 4,050,611
135 4,050,612
321 4,050,613
CLASS 224
29 R 4,050,614
32 A 4,050,615
42.03 B 4,050,616
CLASS 226
1 4,050,617
CLASS 228
6 A 4,050,618
162 4,050,619
4,050,620
180 R 4,050,621
CLASS 229
19 4,050,622
23 R 4,050,623
33 4,050,624
38 4,050,625
CLASS 235
130 R 4,051,349
302.3 4,051,355
310 4,051,356
312 4,051,354
CLASS 237
1 A 4,050,626
55 4,050,627
4,050,628
CLASS 239
11 4,050,629
121 4,050,630
265.25 4,050,631
425 4,050,632
550 4,050,633
601 4,050,634
CLASS 241
24 4,050,635
46 B 4,050,636
56 4,050,637
222 4,050,638
CLASS 242
18 G 4,050,639
25 R 4,050,640
47 4,050,641
55 4,050,642
72 R 4,050,643
107.4 A 4,050,644
125.1 4,050,645
4,050,646
129.8 4,050,647
4,050,648
130.1 4,050,649
206 4,050,650
CLASS 244
15 4,050,651
23 C 4,050,652
32 4,050,653
49 4,050,654
137 R 4,050,655
4,050,656
139 4,050,657
CLASS 248
13 4,050,658
19 4,050,659
4,050,660
285 4,050,661
291 4,050,662
316 A 4,050,663
346 4,050,664
358 R 4,050,665
CLASS 249
68 4,050,666
82 4,050,667
106 4,050,668
CLASS 250
199 4,051,363
4,051,364
222 R 4,051,365
223 B 4,051,366
237 G 4,051,367
270 4,051,368
321 4,051,369
331 4,051,370
339 4,051,371
343 4,051,372
363 S 4,051,373
370 4,051,374
372 4,051,375
381 4,051,376
401 4,051,377
421 4,051,378
445 T 4,051,379
451 4,051,380
492 A 4,051,381
531 4,051,043
4,051,044
4,051,382
536 4,051,045
CLASS 251
5 4,050,669
14 4,050,670
CLASS 252
8.6 4,051,046
33 4,051,047
51.5 A 4,051,049
51.5 R 4,051,048
4,051,050
59 4,051,051
62.1 L 4,051,052
62.1 P 4,051,077
78.3 4,051,053
89 R 4,051,054
95 4,051,055
99 4,051,056
100 4,051,057
186 4,051,058
4,051,059
301.1 W 4,051,063
301.17 4,051,062
309 4,051,064
359 A 4,051,065
389 R 4,051,066
401 4,051,067
412 4,051,068
417 4,051,069
428 4,051,070
439 4,051,071
464 4,051,072
466 PT 4,051,073
303 4,051,074
311 4,051,075
322 4,051,076
CLASS 254
7 R 4,050,671
10 R 4,050,672
89 H 4,050,673
93 H 4,050,674
104 4,050,675
CLASS 260
2 A 4,051,078
2.2 R 4,051,079
2.3 4,051,080
2.5 AD 4,051,081
2.5 AR 4,051,082
5 4,051,083
16 4,051,085
17.4 GC 4,051,086
18 N 4,051,087
20 4,051,088
22 R 4,051,089
23.7 M 4,051,090
29.2 TN 4,051,091
29.3 4,051,092
29.6 M 4,051,094
29.6 TA 4,051,093
31.8 DR 4,051,095
31.8 M 4,051,096
38 4,051,097
4,051,098
40 P 4,051,099
42.18 4,051,100
45.75 W 4,051,103
45.8 N 4,051,102
45.85 B 4,051,104
45.85 R 4,051,101
45.95 G 4,051,105
47 C 4,051,106
4,051,107
47 CP 4,051,108
49 4,051,109
72 R 4,051,110
75 NP 4,051,111
75 T 4,051,112
78 L 4,051,113
123.5 4,051,114
124 R 4,051,115
145 A 4,051,116
146 R 4,051,117
153 4,051,118
156 4,051,119
158 4,051,084
4,051,120
174 4,051,121
4,051,122
178 4,051,123
192 4,051,124
239 BC 4,051,125
239.1 4,051,126
239.3 D 4,051,127
239.57 4,051,128
268 R 4,051,136
268 TR 4,051,137
278 4,051,138
290 HL 4,051,139
290 P 4,051,140
294.8 C 4,051,141
294.9 4,051,142
295.5 R 4,051,143
307 FA 4,051,144
314.5 4,051,146
326.47 4,051,147
327 B 4,051,148
4,051,149
4,051,150
329 S 4,051,151
345.3 4,051,152
345.5 4,051,153
346.22 4,051,154
379 4,051,155
393 4,051,156
397.1 4,051,157
404.5 4,051,158
4,051,159
413 4,051,160

448.2 N 4,051,163
448.8 R 4,051,161
4,051,164
453 AB 4,051,165
453 AR 4,051,166
453 RZ 4,051,167
456 R 4,051,168
502.5 4,051,175
506 4,051,176
510 4,051,177
524 R 4,051,178
530 N 4,051,179
4,051,180
531 R 4,051,181
544 Y 4,051,182
553 A 4,051,183
559 B 4,051,184
561 R 4,051,185
570.7 4,051,186
575 4,051,187
590 FA 4,051,188
619 A 4,051,189
651 R 4,051,190
671 R 4,051,191
674 SA 4,051,192
683.3 4,051,193
836 4,051,194
837 R 4,051,195
857 PG 4,051,196
876 B 4,051,197
879 4,051,198
880 R 4,051,199
899 4,051,200
930 4,051,201
990 4,051,202
4,051,203
CLASS 261
36 R 4,051,204
70 4,051,205
109 4,051,206
CLASS 264
3 B 4,051,207
5 4,051,208
39 4,051,209
45.4 4,051,210
51 4,051,211
102 4,051,212
109 4,051,213
137 4,051,214
4,051,215
157 4,051,216
230 4,051,217
248 4,051,218
CLASS 266
44 4,050,679
48 4,050,680
82 4,050,681
158 4,050,682
164 4,050,683
CLASS 267
65 R 4,050,684
CLASS 269
296 4,050,685
CLASS 270
54 4,050,686
CLASS 271
3.1 4,050,687
5 4,050,688
124 4,050,691
125 4,050,690
267 4,050,692
CLASS 272
78 4,050,693
CLASS 273
26 E 4,050,694
53 4,050,695
106.5 B 4,050,696
139 4,050,697
152.41 4,050,698
CLASS 274
15 A 4,050,699
CLASS 277
72 FM 4,050,700
125 4,050,701
148 4,050,702
207 A 4,050,703
CLASS 280
6 R 4,050,704
11.1 BT 4,050,705
12 R 4,050,706
43.23 4,050,707
47.26 4,050,708
106 T 4,050,709
112 A 4,050,710
278 4,050,711
4,050,712
4,050,713
495 4,050,714
508 4,050,715
614 4,050,716
744 4,050,717
763 4,050,718
CLASS 283
36 4,050,719
CLASS 285
18 4,050,720
93 4,050,721
175 4,050,722
CLASS 292
164 4,050,723
241 4,050,724
304 4,050,725
CLASS 293
4 4,051,428
CLASS 294
49 4,050,727
58 4,050,728
64 R 4,050,729
82 R 4,050,730
86.24 4,050,731
CLASS 296
23 A 4,050,732
28 C 4,050,733
98 4,050,734
102 4,050,735
CLASS 297
135 4,050,736
389 4,050,737
452 4,050,738
CLASS 298
19 V 4,050,739
CLASS 299
6 4,050,740
CLASS 302
13 4,050,741
66 4,050,742
CLASS 303
22 R 4,050,743
24 A 4,050,744
36 4,050,745
40 4,050,746
95 4,050,747
114 4,050,748
119 4,050,749
CLASS 305
54 4,050,750
CLASS 307
11 4,051,383
18 4,051,384
233 R 4,051,385
271 4,051,386
273 4,051,387
279 4,051,388
291 4,051,389
293 4,051,390
297 4,051,391
4,051,392
306 4,051,393
310 4,051,394
CLASS 310
12 4,051,398
51 4,051,399
58 4,051,400
216 4,051,401
266 4,051,402
329 4,051,395
340 4,051,396
351 4,051,397
CLASS 312
197 4,050,751
243 4,050,752
257 SK 4,050,753
319 4,050,754
CLASS 313
105 CM 4,051,403
220 4,051,404
361 4,051,405
391 4,051,406
CLASS 315
106 4,051,407
169 R 4,051,408
169 TV 4,051,409
205 4,051,410
4,051,411
4,051,412
219 4,051,413
CLASS 318
7 4,051,415
85 4,051,416
138 4,051,417
227 4,051,418
4,051,419
254 4,051,420
367 4,051,421
570 4,051,422
611 4,051,423
CLASS 320
48 4,051,424
CLASS 322
99 4,051,427
CLASS 323
CLASS 324
.5 A 4,051,429
34 TK 4,051,430
61 R 4,051,431
72.5 4,051,432
78 D 4,051,434
78 R 4,051,433
95 4,051,435
102 4,051,436
158 R 4,051,437
CLASS 325
45 4,051,438
121 4,051,439
CLASS 328
134 4,051,440
CLASS 330
68 4,051,444
258 4,051,443
281 4,051,442
288 4,051,441
CLASS 331
94.5 Q Re.29,421
113 A 4,051,445
116 R 4,051,446
CLASS 333
24 R 4,051,447
30 R 4,051,448
73 C 4,051,449
95 R 4,051,450
CLASS 338
42 4,051,451
51 4,051,452
171 4,051,453
328 4,051,454
CLASS 339
17 CF 4,050,755
59 M 4,050,756
59 R 4,050,757
74 R 4,050,758
75 M 4,050,759
97 R 4,050,760
4,050,761
103 M 4,050,764
108 TP 4,050,762
111 4,050,763
117 P 4,050,766
117 R 4,050,765
135 4,050,767
154 A 4,050,768
196 M 4,050,769
198 G 4,050,770
220 R 4,050,772
224 4,050,773
263 R 4,050,771
264 R 4,050,774
CLASS 340
9 4,051,455
18 LD 4,051,456
146.3 AG 4,051,458
146.3 MA 4,051,457
173 LT 4,051,462
173 R 4,051,464
173 TP 4,051,463
173.2 4,051,465
234 4,051,466
239 S 4,051,467
324 M 4,051,468
347 AD 4,051,469
4,051,470
365 S 4,051,471
CLASS 343
5 PD 4,051,472
7 A 4,051,473
100 LE 4,051,474
180 4,051,475
700 MS 4,051,476
4,051,477
4,051,478
703 4,051,479
705 4,051,480
895 4,051,481
CLASS 346
23 4,051,482
33 A 4,051,483
74.1 4,051,484
75 4,051,485
CLASS 380
2 4,050,778
4,050,779
6 4,050,780
96 C 4,050,781
4,050,782
4,050,783
4,050,784
160 LC 4,050,786
4,050,787
184 4,050,788
200 4,050,775
226 4,050,789
289 4,050,776
292 4,050,777
305 4,050,790
318 4,050,791
319 4,050,792
CLASS 351
120 4,050,785
CLASS 352
5 4,050,793
12 4,050,794
141 4,050,795
243 4,050,796
CLASS 353
30 4,050,797
35 4,050,798
4,050,809
74 4,050,799
CLASS 354
7 4,051,486
12 4,051,487
13 4,051,488
23 D 4,051,489
24 4,051,490
60 L 4,051,491
86 4,051,492
126 4,051,493
145 4,051,494
152 4,051,495
219 4,051,496
231 4,051,497
234 4,051,498
4,051,499
239 4,051,500
4,051,501
249 4,051,502
289 4,051,503
CLASS 355
3 R 4,050,801
4,050,802
4,050,803
10 4,050,804
14 4,050,805
4,050,806
32 4,050,807
38 4,050,808
40 4,050,810
46 4,050,811
66 4,050,812
67 4,050,813
71 4,050,814
75 4,050,800
4,050,815
4,050,816
133 4,050,817
CLASS 356
32 4,050,818
51 4,050,819
103 4,050,820
156 4,050,821
171 4,050,822
186 4,050,823
197 4,050,824
CLASS 357
13 4,051,504
24 4,051,505
55 4,051,506
60 4,051,507
71 4,051,508
82 4,051,509
CLASS 358
8 4,051,515
11 4,051,516
15 4,051,517
20 4,051,518
21 4,051,519
22 4,051,520
28 4,051,510
29 4,051,511
30 4,051,521
51 4,051,512
60 4,051,513
65 4,051,514
86 4,051,522
99 4,051,523
108 4,051,524
4,051,525
127 4,051,526
128 4,051,527
4,051,528
136 4,051,530
140 4,051,531
142 4,051,532
167 4,051,533
210 4,051,534
231 4,051,535
264 4,051,537
296 4,051,538
298 4,051,536
CLASS 360
44 4,051,539
72 4,051,540
98 4,051,541
113 4,051,542
CLASS 361
18 4,051,543
45 4,051,544
58 4,051,545
124 4,051,546
160 4,051,547
171 4,051,548
399 4,051,549
402 4,051,550
415 4,051,414
CLASS 362
4 4,051,359
211 4,051,361
363 4,051,360
432 4,051,362
CLASS 363
86 4,051,425
131 4,051,426
CLASS 364
200 4,051,551
400 4,051,351
432 4,051,350
716 4,051,352
4,051,353
4,051,358
726 4,051,357
900 4,051,459
4,051,460
4,051,461
CLASS 366
11 4,050,677
130 4,050,678
339 4,050,676
CLASS 401
19 4,050,825
196 4,050,826
CLASS 403
11 4,050,827
201 4,050,828
205 4,050,829
4,050,830
243 4,050,831
321 4,050,832
405 4,050,833
CLASS 406
16 4,050,834
72 4,050,839
CLASS 407
45 4,050,129
59 4,050,128
107 4,050,127
CLASS 408
11 4,050,835
20 4,050,836
35 4,050,837
46 4,050,838
144 4,050,840
213 4,050,841
226 4,050,842
CLASS 415
116 4,050,843
147 4,050,844
172 A 4,050,845
182 4,050,846
CLASS 416
132 A 4,050,847
146 A 4,050,848
171 4,050,849
221 4,050,850
CLASS 417
44 4,050,853
68 4,050,851
121 4,050,854
234 4,050,858
273 4,050,852
289 4,050,856
309 4,050,857
386 4,050,859
444 4,050,860
471 4,050,861
539 4,050,862
CLASS 418
131 4,050,855
CLASS 423
21 4,051,219
24 4,051,220
54 4,051,221
127 4,051,222
157 4,051,223
210 4,051,224
235 4,051,225
244 4,051,226
259 4,051,227
268 4,051,228
478 4,051,229
658.5 4,051,230
659 4,051,231
CLASS 424
12 4,051,232
52 4,051,234
85 4,051,235
101 4,051,236
117 4,051,237
181 4,051,238
211 4,051,239
225 4,051,240
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285 4,051,253
4,051,254
289 4,051,255
304 4,051,256
312 4,051,257
317 4,051,233
322 4,051,258
324 4,051,259
331 4,051,260
4,051,261
337 4,051,262
347 4,051,263
CLASS 425
84 4,050,863
114 4,050,867
115 Re.29,416
134 4,050,864
135 4,050,868
183 4,050,865
192 S 4,050,866
222 4,050,869
317 4,050,870
4,050,871
371 4,050,872
4,050,873
382 R 4,050,874
429 4,050,875
529 4,050,876
CLASS 426
52 4,051,264
107 4,051,265
120 4,051,266
330.3 4,051,267
448 4,051,162
548 4,051,268
603 4,051,269
CLASS 427
8 4,051,270
43 4,051,271
54 4,051,272
86 4,051,273
172 4,051,274
201 4,051,275
248 C 4,051,276
288 4,051,277
326 4,051,278
355 4,051,279
373 4,051,280
379 4,051,281
393 4,051,282

CLASSIFICATION OF PATENTS

CLASS 428																							
29	4,051,283	311	4,051,296	CLASS 431			124	4,050,888	CLASS 528			18	4,051,133										
36	4,051,284	336	Re.29,420	76	4,050,877		130	4,050,889	496	4,051,313		20	4,051,132										
43	4,051,285		4,051,297	90	4,050,878		210	4,050,890	CLASS 536			21	4,051,129										
77	4,051,286	383	4,051,298	174	4,050,879		CLASS 526		1	4,051,314		28	4,051,131										
91	4,051,287	394	4,051,299	CLASS 432			1	4,051,306	10	4,051,315		217	4,051,134										
102	4,051,288	398	4,051,300	5	4,050,880		77	4,051,307	107	4,051,316		CLASS 548											
113	4,051,289	404	4,051,301		4,050,881		90	4,051,172	114	4,051,317		372	4,051,145										
168	4,051,290	411	4,051,302	14	4,050,882		141	4,051,308	CLASS 542			CLASS 560											
201	4,051,291		4,051,303		4,050,883			4,051,309	413	4,051,319		40	4,051,169										
212	4,051,292	617	4,050,906	29	4,050,884		230	4,051,310	420	4,051,320		62	4,051,170										
213	4,051,293	CLASS 429		31	4,050,885		271	4,051,311	CLASS 544			131	4,051,318										
283	4,051,294	94	4,051,304	60	4,050,886		329	4,051,312	11	4,051,130		157	4,051,171										
288	4,051,295	217	4,051,305	122	4,050,887							234	4,051,174										
												255	4,051,173										

CLASSIFICATION OF DESIGNS

D2—	40	245,881	D7—	107	245,884		156	245,903		69	245,914		71	245,925	D48—	2	245,936
		245,882		137	245,885		182	245,904	D23—	13	245,915		80	245,926		20 C	245,939
D4—	14	245,883	D8—	499	245,894	D13—	41	245,905		28	245,916	D29—	5	245,929		20 E	245,937
D6—	31	245,886	D9—	179	245,895			245,906	D24—	17	245,917	D30—	3	245,927			245,938
	63	245,887		220	245,896	D14—	6	245,907		26	245,918	D31—	24	245,928		32 R	245,940
	71	245,888		245	245,897		11	245,908			245,919	D34—	4 R	245,930	D56—	1 E	245,941
	95	245,889	D10—	38	245,898		73	245,909		33	245,920		5 GG	245,933	D87—	1 R	245,944
		245,890		128	245,899	D15—	29	245,910		53	245,921		5 GH	245,932	D96—	12 R	245,942
		245,891	D11—	133	245,900	D16—	27	245,911		57	245,922		5 PP	245,931			245,943
	113	245,892		139	245,901		58	245,912	D25—	3	245,923		15 C	245,935			245,945
	139	245,893	D12—	62	245,902	D19—	25	245,913		35	245,924		15 R	245,934			

CLASSIFICATION OF PLANTS

P.—	30	4,116	54	4,111	56	4,112	69	4,113		4,114		4,115

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 :	4,050,626		4,050,685		4,051,372		4,050,851		4,050,135		4,051,190						
2 :	4,050,395		4,050,690		4,051,386		4,050,860		4,050,136		4,051,191						
	4,050,587		4,050,696		4,051,390		4,050,874		4,050,141		4,051,192						
4 :	4,050,443		4,050,698		4,051,406		4,050,887		4,050,170		4,051,206						
	4,050,659		4,050,729		4,051,423		4,050,899		4,050,185		4,051,283						
	4,050,824		4,050,754		4,051,424		4,050,921		4,050,219		4,051,291						
	4,050,882		4,050,758		4,051,433		4,051,005		4,050,301		4,051,301						
	4,050,961		4,050,762		4,051,436		4,051,033		4,050,318		4,051,316						
5 :	4,050,312		4,050,773		4,051,437		4,051,166		4,050,360		4,051,340						
	4,050,756		4,050,786		4,051,438		4,051,298		4,050,372		4,051,380						
6 :	Re.29,413		4,050,793		4,051,439		4,051,334		4,050,386		4,051,408						
	4,050,102		4,050,808		4,051,445		4,051,335		4,050,394		4,051,409						
	4,050,122		4,050,814		4,051,457		4,051,373		4,050,412		4,051,418						
	4,050,139		4,050,819		4,051,463		4,051,375		4,050,454		4,051,532						
	4,050,152		4,050,833		4,051,472		4,051,425		4,050,463		4,051,546						
	4,050,172		4,050,848		4,051,476		4,051,484		4,050,478		4,051,551						
	4,050,210		4,050,853		4,051,478	10 :	4,050,163		4,050,523	18 :	4,050,145						
	4,050,231		4,050,893		4,051,479		4,050,911		4,050,532		4,050,240						
	4,050,243		4,050,904		4,051,507		4,050,941		4,050,566		4,050,330						
	4,050,247		4,050,907		4,051,517		4,050,942		4,050,582		4,050,414						
	4,050,268		4,050,908		4,051,522		4,051,086		4,050,648		4,050,426						
	4,050,308		4,050,915		4,051,523		4,051,124		4,050,667		4,050,694						
	4,050,309		4,050,918	8 :	4,050,176		4,051,161		4,050,686		4,050,707						
	4,050,310		4,050,923		4,050,186		4,051,168		4,050,693		4,050,708						
	4,050,338		4,050,968		4,050,254		4,051,210		4,050,719		4,050,709						
	4,050,339		4,050,969		4,050,482		4,051,255		4,050,721		4,050,771						
	4,050,358		4,050,994		4,050,513	11 :	4,050,435		4,050,735		4,050,829						
	4,050,363		4,051,006		4,050,611	12 :	4,050,099		4,050,742		4,050,830						
	4,050,385		4,051,043		4,050,706		4,050,101		4,050,752		4,050,832						
	4,050,403		4,051,047		4,051,220		4,050,125		4,050,759		4,050,839						
	4,050,417		4,051,062		4,051,477		4,050,166		4,050,760		4,051,128						
	4,050,458		4,051,075		4,051,538		4,050,179		4,050,778		4,051,363						
	4,050,477		4,051,115	9 :	4,050,133		4,050,209		4,050,779		4,051,453						
	4,050,489		4,051,138		4,050,214		4,050,341		4,050,810		4,051,510						
	4,050,490		4,051,148		4,050,292		4,050,365		4,050,831		4,051,518						
	4,050,512		4,051,150		4,050,296		4,050,373		4,050,875		4,051,539						
	4,050,541		4,051,167		4,050,297		4,050,453		4,050,902	19 :	4,050,140						
	4,050,570		4,051,182		4,050,374		4,050,528		4,050,903		4,050,164						
	4,050,578		4,051,184		4,050,375		4,050,595		4,050,972		4,050,396						
	4,050,585		4,051,186		4,050,432		4,050,764		4,050,975		4,050,993						
	4,050,591		4,051,211		4,050,441		4,051,383		4,051,013		4,051,435						
	4,050,613		4,051,233		4,050,445	13 :	4,050,157		4,051,014		4,051,473						
	4,050,624		4,051,239		4,050,447		4,050,178		4,051,018	20 :	4,050,137						
	4,050,634		4,051,241		4,050,461		4,050,521		4,051,019		4,050,222						
	4,050,636		4,051,260		4,050,492		4,050,770		4,051,027		4,050,378						
	4,050,650		4,051,262		4,050,612		4,051,030		4,051,040		4,050,455						
	4,050,654		4,051,272		4,050,625		4,051,034		4,051,064		4,050,524						
	4,050,656		4,051,310		4,050,675		4,051,114		4,051,065		4,050,615						
	4,050,663		4,051,322		4,050,734		4,051,257		4,051,071		4,050,651						
	4,050,665		4,051,338		4,050,789	15 :	4,050,203		4,051,092		4,050,728						
	4,050,669		4,051,355		4,050,841		4,051,321		4,051,095		4,051,360						
	4,050,678		4,051,358		4,050,844	17 :	Re.29,414		4,051,100		4,051,416						
	4,050,684		4,051,364		4,050,849		Re.29,415		4,051,136	21 :	4,050,200						

4,050,220 4,050,711 4,050,653 4,050,803 4,050,946 4,050,267
4,050,221 4,050,712 4,050,658 4,050,804 4,050,950 4,050,334
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4,050,671 4,050,932 4,050,873 4,050,913 4,051,111 4,051,202
4,051,015 4,050,983 4,050,891 4,050,917 4,051,180 4,051,294
4,051,016 4,050,995 4,050,897 4,050,934 4,051,181 4,051,327
4,051,021 4,050,996 4,050,925 4,050,935 4,051,209 48 : Re.29,421
4,051,300 4,051,009 4,050,931 4,050,937 4,051,268 4,050,194
23 : 4,050,131 4,051,032 4,050,933 4,050,938 4,051,275 4,050,253
4,050,197 4,051,072 4,050,964 4,050,939 4,051,279 4,050,300
24 : Re.29,419 4,051,073 4,050,965 4,050,954 4,051,281 4,050,335
4,050,336 4,051,082 4,050,967 4,051,077 4,051,289 4,050,357
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4,050,600 4,051,130 4,050,999 4,051,104 4,051,309 4,050,491
4,050,680 4,051,160 4,051,020 4,051,106 4,051,396 4,050,531
4,051,025 4,051,162 4,051,024 4,051,107 4,051,402 4,050,546
4,051,280 4,051,218 4,051,035 4,051,137 40 : 4,050,271 4,050,597
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25 : 4,050,117 27 : 4,050,291 4,051,144 4,051,278 4,050,401 4,050,878
4,050,295 4,050,315 4,051,153 4,051,285 4,050,581 4,050,900
4,050,393 4,050,440 4,051,159 4,051,315 4,050,604 4,050,944
4,050,450 4,050,474 4,051,164 4,051,337 4,050,630 4,050,948
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4,051,415 4,051,534 4,051,393 4,050,188 4,050,525 50 : 4,050,352
4,051,459 28 : 4,050,236 4,051,441 4,050,367 4,050,536 4,050,415
4,051,462 4,050,672 4,051,449 4,050,368 4,050,555 4,051,324
4,051,467 4,050,978 4,051,451 4,050,576 4,050,580 51 : 4,050,259
4,051,474 29 : 4,050,189 4,051,468 4,050,577 4,050,596 4,050,388
4,051,482 4,050,265 4,051,475 4,050,629 4,050,668 4,050,511
4,051,488 4,050,470 4,051,505 4,050,836 4,050,701 4,050,515
4,051,492 4,050,545 4,051,519 4,051,299 4,050,755 4,050,542
4,051,524 4,050,767 4,051,521 4,051,410 4,050,821 4,050,614
4,051,535 26 : Re.29,412 4,050,798 35 : 4,050,516 4,051,411 4,050,862 4,050,892
4,050,168 4,050,809 36 : 4,050,106 4,051,412 4,050,884 4,050,914
4,050,180 4,051,029 4,050,124 39 : 4,050,107 4,050,985 4,051,196
4,050,201 4,051,070 4,050,156 4,050,121 4,050,986 4,051,227
4,050,205 4,051,076 4,050,167 4,050,162 4,050,987 4,051,276
4,050,245 4,051,110 4,050,182 4,050,171 4,051,010 4,051,370
4,050,249 4,051,277 4,050,215 4,050,175 4,051,023 4,051,403
4,050,250 4,051,378 4,050,237 4,050,192 4,051,039 52 : 4,050,294
4,050,275 4,051,379 4,050,311 4,050,198 4,051,119 53 : 4,050,109
4,050,277 30 : 4,050,700 4,050,317 4,050,213 4,051,131 4,050,323
4,050,319 31 : 4,050,460 4,050,343 4,050,241 4,051,142 4,050,397
4,050,328 4,051,235 4,050,348 4,050,242 4,051,169 4,050,488
4,050,350 32 : 4,050,190 4,050,349 4,050,258 4,051,248 4,050,584
4,050,370 4,050,398 4,050,361 4,050,261 4,051,251 4,050,631
4,050,402 4,050,599 4,050,379 4,050,266 4,051,270 4,050,685
4,050,405 33 : 4,050,112 4,050,413 4,050,286 4,051,282 4,050,811
4,050,420 4,050,476 4,050,449 4,050,306 4,051,317 4,050,980
4,050,424 4,050,563 4,050,451 4,050,321 4,051,336 4,051,203
4,050,425 4,050,857 4,050,456 4,050,327 4,051,351 4,051,344
4,050,427 4,051,486 4,050,468 4,050,376 4,051,404 4,051,394
4,050,438 34 : 4,050,100 4,050,486 4,050,419 4,051,421 54 : 4,050,588
4,050,439 4,050,110 4,050,507 4,050,495 4,051,426 4,050,603
4,050,472 4,050,149 4,050,530 4,050,502 4,051,427 4,050,928
4,050,483 4,050,155 4,050,569 4,050,534 4,051,447 55 : 4,050,148
4,050,493 4,050,174 4,050,572 4,050,592 4,051,544 4,050,218
4,050,494 4,050,177 4,050,617 4,050,602 44 : 4,050,123 4,050,359
4,050,499 4,050,279 4,050,619 4,050,608 4,050,774 4,050,486
4,050,500 4,050,307 4,050,620 4,050,632 45 : 4,050,104 4,050,462
4,050,571 4,050,316 4,050,652 4,050,727 4,050,119 4,050,522
4,050,575 4,050,347 4,050,688 4,050,737 4,050,181 4,050,586
4,050,583 4,050,381 4,050,695 4,050,820 4,050,436 4,050,594
4,050,606 4,050,389 4,050,722 4,050,840 4,050,466 4,050,610
4,050,607 4,050,452 4,050,725 4,050,852 4,050,597 4,050,799
4,050,633 4,050,484 4,050,751 4,050,895 4,050,639 4,050,877
4,050,643 4,050,518 4,050,761 4,050,905 4,050,645 4,050,952
4,050,666 4,050,579 4,050,763 4,050,912 4,050,646 4,051,157
4,050,689 4,050,584 4,050,794 4,050,916 47 : Re.29,417 4,051,452
4,050,697 4,050,618 4,050,801 4,050,943 Re.29,418 56 : 4,050,526

DESIGN PATENTS

6 : 245,884 245,944 245,930 28 : 245,886 245,925 245,934
245,890 9 : 245,885 245,945 34 : 245,883 245,936 42 : 245,899
245,891 245,911 25 : 245,933 245,913 245,940 245,939
245,892 13 : 245,907 26 : 245,905 245,914 245,942 245,943
245,898 17 : 245,904 245,906 245,935 37 : 245,887 48 : 245,893
245,900 18 : 245,918 245,931 36 : 245,894 39 : 245,897 245,901
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